INSTITUTE OF AGRICULTURAL RESEARCH STATISTICS

NATIONAL INDEX

OF

AGRICULTURAL

FIELD

EXPERIMENTS

VOL. 11 PART 1

PUNJAB, HIMACHAL PRADESH
AND
JAMMU & KASHMIR

1948–53

PUBLISHED BY

INDIAN COUNCIL OF AGRICULTURAL RESEARCH NEW DELHI
FOREWORD

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

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

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

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

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

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

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

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

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

The compendium is divided into 15 volumes one each for (1) Andhra Pradesh (2) Assam, Manipur and Tripura (3) Bihar (4) Gujarat (5) Kerala (6) Madhya Pradesh (7) Madras (8) Maharashtra (9) Mysore (10) Orissa (11) Punjab, Jammu & Kashmir and Himachal Pradesh (12) Rajasthan (13) Uttar Pradesh (14) West Bengal and (15) all Central Institutes. In each volume 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 fertilisers (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. Sahni, B.P. Dyundi, S.D. Bal and P.K. Jain of the statistical staff of the Institute deserve special mention for their careful scrutiny of the data and preparation of the material for the compendium. Thanks are also due to Dr. Uttam Chand, Professor of Statistics, now with the Central Statistical Organisation, Shri K.S. Avadhany, Assistant Statistician, also now with the Central Statistical Organisation, and Shri K.C. Raut, Statistician in this office who were associated with the scheme in its initial stages.

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

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

Owing to transfers and other changes more than one Regional Supervisor have been shown against several states as these officers have acted as Regional Supervisors during different periods from 1955 to 1962.
<table>
<thead>
<tr>
<th></th>
<th>State/Province</th>
<th>Representative</th>
<th>Position/Agency</th>
</tr>
</thead>
<tbody>
<tr>
<td>8.</td>
<td>Mysore (Bangalore)</td>
<td>Shri A. Anant Padmanabha Rau</td>
<td>State Statistician, Mysore State.</td>
</tr>
<tr>
<td>10.</td>
<td>Punjab, Jammu &amp; Kashmir and Himachal Pradesh (Chandigarh)</td>
<td>Shri P.S. Sahota</td>
<td>Statistician, Department of Agriculture, Punjab.</td>
</tr>
<tr>
<td>11.</td>
<td>Rajasthan (Jaipur)</td>
<td>Shri H.C. Kothari</td>
<td>Statistician, Department of Agriculture, Rajasthan.</td>
</tr>
<tr>
<td>12.</td>
<td>Uttar Pradesh (Lucknow)</td>
<td>Dr. K. Kishen</td>
<td>Chief Statistician, Government of U.P. Department of Agriculture, U.P.</td>
</tr>
<tr>
<td>13.</td>
<td>West Bengal (Calcutta)</td>
<td>Shri S.N. Mukherjee</td>
<td>Statistical Officer, Director of Agriculture, West Bengal.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Dr. S. Basu</td>
<td>Statistical Officer, Director of Agriculture, West Bengal.</td>
</tr>
</tbody>
</table>
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>Bh.</td>
<td>Bihar</td>
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<tr>
<td>Dl.</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>
</tr>
<tr>
<td>K.</td>
<td>Kerala</td>
</tr>
<tr>
<td>M.</td>
<td>Madras</td>
</tr>
<tr>
<td>Mn.</td>
<td>Manipur</td>
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<tr>
<td>Mh.</td>
<td>Maharashtra</td>
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<tr>
<td>Ms.</td>
<td>Mysore</td>
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<tr>
<td>M.P.</td>
<td>Madhya Pradesh</td>
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<tr>
<td>Or.</td>
<td>Orissa</td>
</tr>
<tr>
<td>Ph.</td>
<td>Punjab</td>
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<tr>
<td>Rj.</td>
<td>Rajasthan</td>
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<tr>
<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>
</tr>
</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—Irrigation
- M—Manural
- R—Rotational
- V—Varietal
- X—Mixed cropping

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>Amm. Phos.</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>C.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>C/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.G.—Municipal Compost. T.C.—Town compost.

BASAL CONDITIONS

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

A. For annual crops:
   (i) (a) Crop rotation if any. (b) Previous crop. (c) Manuring of previous crops,
      (State amount and kind). (ii) (a) Crop rotation. (b) Soil type. (c) 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.
      (f) 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.—Facto-
      rial. (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 treat-
      ments are randomised (separately in each block).

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

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

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

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

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

C. For experiments on cultivators' fields:
(i) Crop condition during growth. (ii) Incidence of pests and diseases with control measures taken. (iii) Quantitative observations taken. (iv) In case of repetition in successive years, (a) from what year to what year, (b) whether treatments were assigned to the same plots in the same manner every year, (c) reference to combined analysis, if any. (v) In case of repetition in other places names of places along with reference. (vi) Abnormal occurrences, like heavy rains, frost, storm etc., if any. (vii) Any other important information.
<table>
<thead>
<tr>
<th>Sl. No.</th>
<th>Name of Crop</th>
<th>Botanical name</th>
<th>Assamese</th>
<th>Bengali</th>
<th>Oriya</th>
<th>Telugu</th>
<th>Tamil</th>
<th>Malayalam</th>
<th>Kannada</th>
<th>Marathi</th>
<th>Gujarati</th>
<th>Hindi</th>
<th>Punjabi &amp; Kashmiri</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>Paddy</td>
<td>Oryza sativa L.</td>
<td>Dhan</td>
<td>Dhan</td>
<td>Dhano</td>
<td>Vaditu</td>
<td>Nel</td>
<td>Nellu</td>
<td>Bhatta</td>
<td>Bhat</td>
<td>Dangar</td>
<td>Dhan</td>
<td>Dhan ; Chawal</td>
</tr>
<tr>
<td>2.</td>
<td>Wheat</td>
<td>Triticum Sativum</td>
<td>Gam</td>
<td>Gaham</td>
<td>Ghehu</td>
<td>Biyamunu</td>
<td>Godumalu</td>
<td>Kothumai</td>
<td>Godhi</td>
<td>Gahu</td>
<td>Ghahu</td>
<td>Gau</td>
<td>Chawal</td>
</tr>
<tr>
<td>4.</td>
<td>Bajra</td>
<td>Pennisetum typhoides</td>
<td>Bajra</td>
<td>Bajra</td>
<td></td>
<td>Kamba</td>
<td>Kambu</td>
<td>Saije</td>
<td>Bajri</td>
<td>Bajri</td>
<td>Bajra</td>
<td>Bajra</td>
<td>Bajra</td>
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<tr>
<td>7.</td>
<td>Soybean</td>
<td>Glycine hispida ; Glycine maxe Merr.</td>
<td>Gari kalai</td>
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<tr>
<td>8.</td>
<td>Gram</td>
<td>Cicer arietinum L.</td>
<td>Butmah</td>
<td>Chola</td>
<td>Boot</td>
<td>Sangal</td>
<td>Kadalai</td>
<td>Kadalai</td>
<td>Harbara</td>
<td>Chana</td>
<td>Chana</td>
<td>Chhole ; Chana</td>
<td>—</td>
</tr>
<tr>
<td>9.</td>
<td>Mash</td>
<td>Phaseolus mungo var. radiatus Linn</td>
<td>Matimah</td>
<td>Mashkalai</td>
<td>Biri</td>
<td>Minumulu</td>
<td>Uzhundu</td>
<td>Uzhundu</td>
<td>Uddu</td>
<td>Udidi</td>
<td>Adid ; Chavli</td>
<td>Chavli</td>
<td>Urd</td>
</tr>
<tr>
<td>10.</td>
<td>Cowpeas</td>
<td>Vigna catingi Wolp ; Vigna sinesis Savi</td>
<td>—</td>
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<tr>
<td>13.</td>
<td>Colocasia</td>
<td>Colocasia antiquorum Schott.</td>
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<tr>
<td>14.</td>
<td>Sugarcane</td>
<td>Saccharum officinarum L.</td>
<td>Kuhiar</td>
<td>Akh</td>
<td>—</td>
<td>Cherukul</td>
<td>Sambu</td>
<td>Sapan ; Kizangu</td>
<td>Karumulu</td>
<td>Kambu</td>
<td>Oos</td>
<td>Sherdi</td>
<td>—</td>
</tr>
<tr>
<td>16.</td>
<td>Tobacco</td>
<td>Nicotiana tabacum L.</td>
<td>Dhapat</td>
<td>Tamak</td>
<td>Unapatra</td>
<td>Pogakul</td>
<td>Pugayilai</td>
<td>Pukayila</td>
<td>Hoge-soppa</td>
<td>Kadal-mug</td>
<td>Tambahu</td>
<td>Tamaku ; Tambahu</td>
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<tr>
<td>Sl. No</td>
<td>Name of Crop</td>
<td>Botanical name</td>
<td>Assamese</td>
<td>Bengali</td>
<td>Oriya</td>
<td>Telugu</td>
<td>Tamil</td>
<td>Malayalam</td>
<td>Kannada</td>
<td>Marathi</td>
<td>Gujarati</td>
<td>Hindi</td>
<td>Punjabi &amp; Kashmiri</td>
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</tr>
<tr>
<td>20.</td>
<td>Toria (Indian rape)</td>
<td>Brassica compestris var. toria Duthie</td>
<td>Sariah</td>
<td>Tori sarisha</td>
<td>--</td>
<td>Avu</td>
<td>Kudugu</td>
<td>--</td>
<td>Saras</td>
<td>Sarsav</td>
<td>Toria</td>
<td>Toria</td>
<td>Toria</td>
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<tr>
<td>22.</td>
<td>Berseem</td>
<td>Trifolium alexandrinum L.</td>
<td>—</td>
<td>—</td>
<td>—</td>
<td>—</td>
<td>—</td>
<td>—</td>
<td>—</td>
<td>—</td>
<td>—</td>
<td>—</td>
<td>Berseem</td>
</tr>
<tr>
<td>24.</td>
<td>Sudan grass</td>
<td>Sorghum sudanense stapf.</td>
<td>—</td>
<td>—</td>
<td>—</td>
<td>—</td>
<td>—</td>
<td>—</td>
<td>—</td>
<td>—</td>
<td>—</td>
<td>—</td>
<td>Sudan ghas</td>
</tr>
<tr>
<td>25.</td>
<td>Teosinte</td>
<td>Euchlaena mexicana Schrad.</td>
<td>—</td>
<td>—</td>
<td>Not known</td>
<td>Tyosente</td>
<td>—</td>
<td>—</td>
<td>—</td>
<td>—</td>
<td>—</td>
<td>—</td>
<td>—</td>
</tr>
<tr>
<td>26.</td>
<td>Oats</td>
<td>Avena sativa L.</td>
<td>Oat</td>
<td>Jai</td>
<td>Ota</td>
<td>Yavalu</td>
<td>Oat arisi</td>
<td>Oat</td>
<td>Thoke godhi</td>
<td>Jai</td>
<td>Jav</td>
<td>Jai</td>
<td>Jai</td>
</tr>
<tr>
<td>27.</td>
<td>Senji (Indian clover)</td>
<td>Melilotus parviflora Desv.</td>
<td>—</td>
<td>Banmethi</td>
<td>Barsim</td>
<td>—</td>
<td>—</td>
<td>—</td>
<td>—</td>
<td>—</td>
<td>—</td>
<td>Senji</td>
<td>Senji</td>
</tr>
<tr>
<td>29.</td>
<td>Para grass</td>
<td>Panicum purpurascens Raddi</td>
<td>Para gah</td>
<td>Nardul</td>
<td>Ghara gahsa</td>
<td>Enumu gaddi</td>
<td>Neerpul</td>
<td>—</td>
<td>—</td>
<td>—</td>
<td>Mauritius huilu</td>
<td>Para gavat</td>
<td>Para ghas</td>
</tr>
<tr>
<td>30.</td>
<td>Tea</td>
<td>Camellia thea; Camellia sinensis O Kize.</td>
<td>Chah</td>
<td>Cha</td>
<td>Cha</td>
<td>Theyaku</td>
<td>Theyilai</td>
<td>Theyila</td>
<td>Tea</td>
<td>Chaha</td>
<td>Chah</td>
<td>Chaie</td>
<td>Chah</td>
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<tr>
<td>Wheat</td>
<td>51</td>
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<td>181</td>
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<td><em>Bajra</em></td>
<td>185</td>
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<tr>
<td><em>Jowar</em></td>
<td>190</td>
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<tr>
<td>Maize</td>
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<td>237</td>
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<td>Vegetable crops (Potato, Sweet Potato &amp; <em>Colocasia</em>)</td>
<td>250</td>
</tr>
<tr>
<td>Sugarcane</td>
<td>271</td>
</tr>
<tr>
<td>Cotton</td>
<td>371</td>
</tr>
<tr>
<td>Tobacco</td>
<td>436</td>
</tr>
<tr>
<td>Oilseed crops (Groundnut, <em>Sarson</em>, <em>Raya</em>, <em>Toria</em> and <em>Linseed</em>)</td>
<td>494</td>
</tr>
<tr>
<td>Fodder crops (Berseem, Lucerne, <em>Chari</em>, <em>Guara</em>, Sudan Grass, Teosinte, Oats, Rape, <em>Senji</em>, Kudzu Vine and <em>Para grass</em>)</td>
<td>527</td>
</tr>
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<td>Tea</td>
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<td>Mixed cropping</td>
<td>582</td>
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<td>HIMACHAL PRADESH</td>
<td></td>
</tr>
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<td>593</td>
</tr>
<tr>
<td>Barley</td>
<td>604</td>
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<td>Potato</td>
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<tr>
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<tr>
<td>Wheat</td>
<td>658</td>
</tr>
<tr>
<td>Maize</td>
<td>671</td>
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</tbody>
</table>
PUNJAB

1. GENERAL

Punjab is one of the new North-Western territories of India which came into existence as a result of partition of India in August 1947. It is bound in the West by Punjab (Pakistan) and Bahawalpur States, on North by Kashmir, a block of Himachal Pradesh and Tibet and on East by river Jamuna. On Southern border it is bound by Rajasthan. According to Survey of India it has total area of 47,456 square miles lying between 27° and 34° North.

There are three administrative divisions viz., Ambala, Jullundur and Patiala. Punjab State has been divided into 18 districts, viz., Hisar, Rohtak, Gurgaon, Karnal, Ambala, Hoshiarpur, Amritsar, Jullundur, Ludhiana, Ferozepur, Gurdaspur, Kangra, Simla, Patiala, Bhatinda, Sangrur, Kapurthala and Mohindergarh.

The main occupation of the State is agriculture, nearly 66.5% of the population being dependent upon it.

The total area of Punjab according to village records pertaining to agricultural year 1955-56 is 30,289,000 acres as per details given below:

<table>
<thead>
<tr>
<th>Area Description</th>
<th>Acres</th>
</tr>
</thead>
<tbody>
<tr>
<td>Area under forests</td>
<td>844,000</td>
</tr>
<tr>
<td>Area not available for cultivation</td>
<td>7,781,000</td>
</tr>
<tr>
<td>Cultivable waste other than current fallows</td>
<td>2,381,000</td>
</tr>
<tr>
<td>Current fallows</td>
<td>1,489,000</td>
</tr>
<tr>
<td>Net area shown</td>
<td></td>
</tr>
<tr>
<td>(a) Irrigated</td>
<td>8,062,000</td>
</tr>
<tr>
<td>(b) Unirrigated</td>
<td>9,732,000</td>
</tr>
<tr>
<td>Total</td>
<td>30,289,000</td>
</tr>
</tbody>
</table>

2. PHYSICAL FEATURES

Physically, the state is divided into three natural divisions, namely (i) Himalayan, (ii) Sub-Himalayan and (iii) the Indo-Gangetic plain.

The Himalayan division includes Simla and Kangra districts i.e., the country lying on the sides of outer range of Himalayas, whereas the Sub-Himalayan division is a narrow strip adjoining Himalayas called the sub-mountainous region where some of the spurs of Himalayas such as Shivaliks and the high hills of Kasauli and Dalhousie are situated. It is in the Sub-Himalayan region that Ambala, Hoshiarpur and Gurdaspur districts lie. The third region is the Indo-Gangetic plain comprising of the remaining 13 districts viz., Hisar, Rohtak, Gurgaon, Karnal, Jullundur, Ludhiana, Amritsar, Ferozepur, Bhatinda, Patiala, Sangrur, Kapurthala and Mohindergarh.

There are only three principal snowfed rivers which came to the share of this State as a result of the partition of Punjab. They are Sutlej, Beas and a part of Ravi. These rivers, however, neither give access to the sea nor they are navigable even for medium sized crafts. In the early parts of their course amidst the snow-clad ranges, they do not serve any purpose, except that at Jogindernagar in Kangra district, water of the river Uhl, a tributary of Beas, which joins latter in Mandi district of Himachal Pradesh, is utilised to produce 48,000 kws. of electric power. In the plains too, even until the partition, these rivers were put to much use for the benefit of western part of Punjab. The Bhakra-Nangal Project over the river Sutlej now provides the main source of irrigation and electric power to this State.
3. SOILS

The land area of Punjab may be grouped as follows from several points of view and these groups reflect to a certain extent the type of vegetation and land use:—

(1) The moutain tract.
(2) Sub-mountain region and (3) Alluvial soil.

Agriculturally, the Himalayan tract is secondary in importance. The soils are not deep, but have well-developed profile. They are somewhat deficient in lime and phosphoric acid. Their reaction is acidic to neutral. The soils contain very little soluble salts. They are quite rich in humus. The soils of Punjab plain belong to the same class of alluvial soils, typical of Indo-Gangetic plains. Majority of the soils consist of soil crust of varying depths perched on a permanent sand stratum in which usually the water table is situated. The soil crust generally contains 10 to 15% clay and has an average depth of 10". The soils have generally an alkaline reaction due to the presence of sodium in the clay samples. Sodium salts are usually present in the soil crust and to control their movement is one of the major problems of the state. Chemically the soils are adequately supplied with mineral matter. They are deficient in organic matter and are low in nitrogen. Most of the soils of the plains are sandy loam to loam in mechanical composition. They have no definite profile characteristic and are structure-less. Soluble salts are found throughout the profile, Kankar (nodular CaCO₃) is usually met with in lower layers.

PEPSU Division consisting of 5 districts (Kapurthala, Bhatinda, Patiala, Sangrur and Mohidergarh) may be divided into two parts for the purpose of soil classification viz. (i) Dokar, (ii) Rausli and (iii) Bhur. The dokar soil is a very stiff loam, blackish grey in colour and requires several waterings and ploughings and is considered to be the best of soils but it requires abundant rainfall and then yields bumper wheat crop. Bhur is a sandy soil consisting of tibbas and is generally not very productive. In Bhatinda district, the land is classed as Ksarar (hard loam requiring heavy rain to make it fertile). Gasra land is less harder than Ksarar requiring less rains and can grow almost anything. Gasra land situated on the plateau is called Dair. Doshi land is the land with surface of sand and hard ground beneath and tibia land is that of sandy soil. In Kapurthala, the following classes of soils are recognised:— (1) Chapi, (2) Jhulari, a land situated on the banks of nullah, (3) Bet or low lying river land—is a good loam soil and yields excellent crops, (4) Rez is the land always irrigable by flood water, (5) Bona is high lying land and is divided into three sub-classes viz., (a) Nohi which is a stiff loam, yielding good crops after heavy rain, (b) Sawa, lighter loam and (c) Bhur or sandy soils and (6) the barari lands are clayey soils and need good rainfall for the crop produced by them.

4. RAINFALL AND CLIMATE

There are two well-marked rainfall seasons in the State (i) the monsoon period lasting from middle of June till September on which the autumn crops and spring sowing periods depend and (ii) the Winter rains which fall early in January and although insignificant in amount, materially affect the prosperity of spring harvest. Since the monsoon gets exhausted in its passage over the great plains of Sindh and Rajasthan while west winds from Baluchistan pass over arid tracts and leave such moisture as they have collected on the western slopes of Sulemann range, Punjab has to depend largely on South winds from the Bay of Bengal. According to rainfall the state can be divided into three main natural divisions in each of which the general meteorological conditions are believed to be homogeneous. These are mountainous ( Stations like Simla, Dalhousie and Dharmasala), the sub-montane region (Hoshiarpur, Pathankot etc.) and Plains.

The rainfall in the foot hills averages 30", but a large part of Punjab has rainfall under 20" a year and in the driest portion the rainfall amounts to only 4". The irrigated area is situated in the rainfall belt below 20".
The climate of Punjab, over the greater part of it, is of a most pronounced continental character, extreme summer heat alternating with great winter cold. The maximum temperature occurs in May and June and may be as high as 120°F. The minimum temperature occurs in January when at places the temperature comes down to freezing point.

5. IRRIGATION.

Punjab after partition came to inherit large tract of unirrigated areas. Out of a total of over 140 lakh acres of canal irrigated area in the United Punjab only 30 lakh acres (i.e. about 21%) came to its lot. In addition to the major Bhakra-Nangal Project which consists of 690 miles of main canals and branches and 2200 miles of distributaries which would provide irrigation to 48 lakh acres, several minor irrigation schemes and tube well schemes also are undertaken some of which have already been completed to irrigate nearly 48% of the total cultivable area in the State.

The total area under irrigation by different sources in 1955-56 is given in table 1 below:

<table>
<thead>
<tr>
<th>TABLE 1</th>
</tr>
</thead>
<tbody>
<tr>
<td>Table showing the area irrigated by different sources</td>
</tr>
<tr>
<td>Acres</td>
</tr>
<tr>
<td>(1) By Canals.</td>
</tr>
<tr>
<td>(2) By wells and tanks.</td>
</tr>
<tr>
<td>(3) By other sources.</td>
</tr>
<tr>
<td>Total</td>
</tr>
</tbody>
</table>

6. AGRICULTURAL PRODUCTION AND NORMAL CROPPING PATTERN

In the matter of food production, Punjab is the second largest wheat and gram producing area in the Union, third in barley and maize, fourth in bajra and sugarcane, while it produces considerable quantities of jowar, cotton, rice, rape, mustard and small quantities of tea, tobacco, groundnut and linseed. The production of cotton in Punjab amounts to one fifth of the total production in the country.

Area and production of principal crops (1956-57) are shown in table 2 below:

<table>
<thead>
<tr>
<th>TABLE 2</th>
</tr>
</thead>
<tbody>
<tr>
<td>Crop</td>
</tr>
<tr>
<td>(1000 acres)</td>
</tr>
<tr>
<td>1. Paddy.</td>
</tr>
<tr>
<td>2. Maize.</td>
</tr>
<tr>
<td>3. Jowar.</td>
</tr>
<tr>
<td>4. Bajra.</td>
</tr>
<tr>
<td>5. Wheat.</td>
</tr>
<tr>
<td>6. Gram.</td>
</tr>
<tr>
<td>7. Barley.</td>
</tr>
<tr>
<td>8. Sugarcane (gur)</td>
</tr>
<tr>
<td>9. Cotton.</td>
</tr>
<tr>
<td>10. Groundnut.</td>
</tr>
</tbody>
</table>

* in 1000 bales of 392 lb. each.
In *Kharif* season (15th April to 15th October) the main crops are Gram, Cotton, Sugarcane, Paddy and Maize. In *Rabi* season (15th October to 15th April) Wheat is the principal crop, while *tona* gram and barley also are grown as *rabi* crops.

The distribution of different crops among the districts is given below:

**Wheat** :- Almost all districts, except Ambala, Kangra, Kapurthala and Mohindergarh account for 90% of the total production of the crop.

**Gram** :- Hisar, Rohtak, Karnal, Ferozepur, Sangrur and Bhatinda districts produce more than 75% of the total.

**Paddy** :- Karnal, Kangra, Ferozepur, Amritsar and Gurdaspur districts account for nearly 75% of the total.

**Bajra** :- Hisar, Rohtak, Gurgaon and Mohindergarh are major bajra producing districts.

**Sugarcane** :- Rohtak, Karnal, Ambala, Jullundur, Amritsar, Gurdaspur, Patiala and Sangrur produce gur accounting for about 66% of the total production.

**Cotton** :- Ferozepur district alone accounts for about 41% of the total production. Hisar, Bhatinda, Sangrur and Amritsar are other districts which grow cotton.

7. **AGRICULTURAL EXPERIMENTATION AND RESEARCH STATIONS**

Besides the research work on plant breeding and evolving out new varieties of different crops the research work on agronomic problems is one of the main activities of the department of agriculture.

There were 32 experimental research stations which reported the agronomic experiments in the state for the period 1948-53. Kangra district has the maximum number of research stations i.e. eight in all. There are one or two research stations in each of the districts of Ferozepur, Ambala, Faridkot, Hisar and Ludhiana. The other research stations have been distributed among Jullundur, Gurdaspur and Gurgaon. Most of these research stations have sandy loam and clayey loam to loam soil.

Research on wheat, which is the main crop, is carried out mainly at farms in Jullundur and Gurdaspur districts. The other farms at Ambala, Karnal and Gummar also carry out research on wheat. Research on paddy is carried out at Rice Breeding Station, Gurdaspur. Research work on cotton is carried out at Faridkot, Abohar, Hansi and Jullundur and that on Sugarcane is concentrated at Sugarcane Research Stations at Jullundur and Gurdaspur. Experimentation on tobacco is mostly done at Ferozepur Research Station.

The table giving details of these research farms is appended. Research on fodder and grass crops is being done at Sirsa Farm.

8. **EXPERIMENTS**

There were 739 experiments available for the period 1948—1953 in the State.
The distribution of these experiments according to crops and types of treatments is given in Table 3 below.

**Table 3**

The distribution of experiments according to crops and treatments tried.

<table>
<thead>
<tr>
<th>Crop</th>
<th>M</th>
<th>MV</th>
<th>C</th>
<th>CM</th>
<th>CV</th>
<th>CMV</th>
<th>I</th>
<th>IM</th>
<th>IMV</th>
<th>IC</th>
<th>IMC</th>
<th>IV</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Paddy</td>
<td>12</td>
<td>4</td>
<td>4</td>
<td>2</td>
<td>3</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>25</td>
</tr>
<tr>
<td>Wheat</td>
<td>132</td>
<td>3</td>
<td>11</td>
<td>7</td>
<td>3</td>
<td>2</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>159</td>
</tr>
<tr>
<td>Barley</td>
<td>5</td>
<td>1</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>6</td>
</tr>
<tr>
<td>Jowar</td>
<td>7</td>
<td>3</td>
<td>1</td>
<td>3</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>18</td>
</tr>
<tr>
<td>Bajra</td>
<td>4</td>
<td></td>
<td>1</td>
<td></td>
<td></td>
<td>1</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>6</td>
</tr>
<tr>
<td>Maize</td>
<td>35</td>
<td>7</td>
<td>4</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>46</td>
</tr>
<tr>
<td>Soyabean</td>
<td>1</td>
<td>2</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>4</td>
</tr>
<tr>
<td>Pulses</td>
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<td>11</td>
<td>2</td>
<td>1</td>
<td></td>
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<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>21</td>
</tr>
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<td>Potato</td>
<td>7</td>
<td>1</td>
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<td></td>
<td></td>
<td></td>
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<td>8</td>
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<td>Sweet potato</td>
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</tr>
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<td></td>
<td>7</td>
</tr>
<tr>
<td>Sugarcane</td>
<td>62</td>
<td>16</td>
<td>7</td>
<td>5</td>
<td>2</td>
<td>7</td>
<td>7</td>
<td>1</td>
<td>3</td>
<td>18</td>
<td></td>
<td></td>
<td>129</td>
</tr>
<tr>
<td>Cotton</td>
<td>36</td>
<td>16</td>
<td>5</td>
<td></td>
<td>1</td>
<td>2</td>
<td></td>
<td>1</td>
<td>3</td>
<td>2</td>
<td>1</td>
<td></td>
<td>79</td>
</tr>
<tr>
<td>Tobacco</td>
<td>33</td>
<td>32</td>
<td></td>
<td></td>
<td></td>
<td>4</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>1</td>
<td>77</td>
</tr>
<tr>
<td>Oilsed</td>
<td>21</td>
<td>13</td>
<td>4</td>
<td>1</td>
<td>3</td>
<td></td>
<td></td>
<td>4</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>48</td>
</tr>
<tr>
<td>Berseem.</td>
<td>26</td>
<td>2</td>
<td>1</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>1</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>35</td>
</tr>
<tr>
<td>Lucerne</td>
<td>5</td>
<td></td>
<td>5</td>
<td>1</td>
<td>1</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>9</td>
</tr>
<tr>
<td>Others</td>
<td>10</td>
<td>3</td>
<td>6</td>
<td></td>
<td>2</td>
<td></td>
<td></td>
<td>2</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>25</td>
</tr>
<tr>
<td>Tea</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>3</td>
</tr>
<tr>
<td>Total</td>
<td>403</td>
<td>16</td>
<td>141</td>
<td>44</td>
<td>24</td>
<td>5</td>
<td>12</td>
<td>12</td>
<td>11</td>
<td>14</td>
<td>4</td>
<td>5</td>
<td>27</td>
</tr>
</tbody>
</table>

From the table it is revealed that the maximum number of agronomic experiments was carried out on wheat crop which occupies the maximum area of nearly 5 million acres in the State and is the principal crop of the State. Very few experiments were reported for Bajra crop (only 6) although it occupies nearly 3 million acres in the State. Most of the experiments on this crop are plant breeding trials. The cereal crop which received attention next to wheat was Maize, there being 46 experiments on this crop. This crop, so far as area under it is considered, is the third in order among cereals.

Among commercial crops sugarcane received highest attention. There were 129 experiments reported on this crop. Cotton comes next although it occupies more than double the area under sugarcane. There were only 79 experiments conducted on this crop. Tobacco also received better attention and all the experiments on it were carried out at Ferozepur Research station. Only a few experiments were conducted on pulses.

So far as the types of treatments tried is concerned it is found that more than 50% of the experiments were of manurial type. Next in order was cultural type of experiments. On wheat crop alone nearly 85% of the experiments had manurial treatments, 75% of the experiments on Maize crop were also manurial. For other crops the experiments with manurial treatments accounted for about 30 to 50%.

In almost all the manurial experiments on Wheat, Maize, Bajra, Cotton, and Sugarcane the source of nitrogen was Ammonium Sulphate and for phosphoric acid, it was Super
Phosphate. The levels of nitrogen and phosphoric acid for the crops excepting sugarcane varied from (excepting 0 level) 25 lb./ac. to 75 lb./ac. The manures like F.Y.M. and mahwa eake were also tried for comparative merits in some of the experiments. These were applied to give about 100-150 lb./ac. of nitrogen. For sugarcane, the experiments were tried with varying doses of nitrogen from 100 lb. to 200 lb./ac. Wherever combinations of different fertilizers were tried, the fertilizers were N, P and K with sources as indicated above.

The Randomised Block design was widely adopted both for studying the comparative merits of different manures and fertilizers and factorial combinations. The confounded (incomplete block) designs were not utilized although there were very few experiments for three types of fertilizers (N, P and K) at three levels each ($3^3$ confounded). Split-plot designs were also utilized wherever there were cultural treatments and also when bulky manures like F.Y.M. and lime were tried.

In R.B.D. the number of plots per block varied from 2 to 11 normally, although there were few experiments with as many as 27 plots per block. In split-plot designs there were three splits in some of the experiments. The number of main-plots per replication varied from 2 to 6 at the most and the number of sub-plots per main-plot varied from 3 to 6. The number of replications varied from 4 to 6. The net plot size normally varied from 1/40th of an acre. to 1/80th of an acre. There were few experiments where even the plot size of 1/220th of an acre was adopted.

The results of experiments on cultivators’ fields under Stewarts’ scheme of I.C.A.R. and T.C.M. trials are also included in the compendium. The experiments under Stewarts’ scheme on cultivators’ fields were conducted in Ludhiana district on wheat during 1953-1954. These were about 46 in number. The experiments under this scheme in Patiala district of former PEPSU State during 1953-1954 on wheat were also conducted in cultivators’ fields. The details of T.C.M. trials are given in the two reports published by the I.C.A. R. (1955) on paddy and wheat.
HIMACHAL PRADESH

1. GENERAL

Himachal Pradesh, one of the young States in the Indian Union came into existence in 1948 on the integration of some 30 hill States of the western Himalayas. Apart from the States of Chamba, Sirmur, Mandi, Suket and Rampur-Bushahr, the merged States were only tiny units, the largest in size being Rampur-Bushahr with an area of 3,439 square miles.

Himachal Pradesh lies on the route to Tibet. It is surrounded on the North and North-West by Jammu and Kashmir; on the North-East; South-West and West by Punjab, on the East by Tibet and on the South-East by Uttar Pradesh. It has a total area of 10,904 square miles.

Himachal Pradesh lies between North latitudes 30° 30' and 33° 10' and East longitudes 75° 55' and 79° 50'. The territory is divided into 5 administrative districts of Mahasu, Sirmur, Mandi, Chamba and Bilaspur.

The revenue records of Himachal Pradesh account for an area of only 23.13 lakh acres, which is nearly 33% of the total geographical area of the State. The remaining 67% area is under high hills and thick forests, which have not been surveyed so far. A rough classification of the recorded area is as follows:

<table>
<thead>
<tr>
<th>Area in acres</th>
</tr>
</thead>
<tbody>
<tr>
<td>Forests</td>
</tr>
<tr>
<td>Barren and uncultivable land</td>
</tr>
<tr>
<td>Land put to non-agricultural uses and cultivable waste</td>
</tr>
<tr>
<td>Permanent pastures and grazing land</td>
</tr>
<tr>
<td>Current fallows</td>
</tr>
<tr>
<td>Other fallow land</td>
</tr>
<tr>
<td>Net area sown</td>
</tr>
<tr>
<td>Miscellaneous</td>
</tr>
<tr>
<td><strong>Total</strong></td>
</tr>
</tbody>
</table>

It would be seen that only 6.79 lakh acres i.e., nearly 29% of the area shown in the revenue records or 9.8% of the total geographical area, are available for cultivation. The holdings are, therefore, generally very small and the rewards from agriculture, poor. Cultivation is carried on wherever possible, both on hill slopes and in valleys.

2. PHYSICAL FEATURES

The State can broadly be divided into three regions: — (i) Outer Himalayan Region; (ii) Inner Himalayan Region and (iii) Alpine Pastures.

The boundaries of the Outer Himalayan region touch the plains of Punjab. The whole area abounds in valleys and each group of villages, is bounded by hills and streams. The Inner Himalayan region is thinly populated having high mountains and narrow valleys. The Alpine Pasture lands which remain under snow for about six months in the year, are very sparsely populated. Wherever cultivation is done, yaks are used for ploughing the fields. Most of the inhabitants migrate during the winter months to warmer parts and return to their homes only when snow begins to melt. The mountain system (excluding Bushahr) may be mapped out roughly into three portions: the chairpeak and the spurs radiating from it, occupying the South-Eastern corner; the Simla range extending
from central Himalayas to the neighbourhood of Sabathuj and the mountains of the Sub-Himalayan series, running from north-west to south-east, and forming boundary of Ambala plains. The last mentioned group may be sub-divided into Sub-Himalayas proper and an outer range corresponding to the Shivalik hills of Hoshiarpur on the one side and of the Gangetic Doab on the other. The Sub-Himalayan and the Shivalik ranges form parallel lines, having between them an open space of varying width known as Kiarda Dun, a broad and well cultivated valley.

The principal rivers by which the drainage of the Simla Hills is effected are the Sutlej, the Pabar, the Gori or Giri Ganga, the Gambhar and the Sirsa. Sutlej enters Bushahr by a pass between two peaks and flows south-west through Bushahr, receiving the drainage from the central Himalayas on one side and from the Spiti hills on the other, till it reaches the border of Kulu. The Pabar which is one of the principal rivers of the Tons, rises in Bushahr having feeders on the southern slopes of both central Himalayas and the transverse Simla range. The Gori, or Giri Ganga rises in the hills north of the Chaur, and collecting the drainage of the whole tract between that mountain and the Simla range, flows in the south-west direction meeting the outer Himalayas, and turns sharply to the South-east near Sirmur. The Gambhar rises in the Dagshai hills.

3. SOILS.

The soils of Himachal Pradesh fall into five major zones; Low Hills, Middle Hills, High hills, Mountain and Dry hills.

**Low Hills zone:** This includes Pamta valley and covers Nahan tehsil of Sirmur district, parts of Arki, Kasumpti and Suni tehsils of Mahasu district, Solan and Ghumarwin areas of Bilaspur district, Mandi and Jogindernagar tehsils of Mandi district and Bhattiyah of Chamba district. The altitude of the area ranges from 1500 ft. to 3000 ft. above sea level; and the soils are located mainly in the narrow valleys through which numerous hill streams flow.

The soils are mostly sandy loams, varying from light grey to brown in colour. They are not very deep and abound in pebbles stones and boulders. Irrigation facilities are available at a number of places and the soils are well drained. They are neutral and respond well to organic manures and chemical fertilizers.

**Middle Hills zone:** This includes lower part of Rainka tehsil and the Ces-Giri area of Pachhad tehsil in Sirmur district, parts of Arki, Solan, Kasumpti, Suni, and Theog tehsils of Mahasu district, Sarkaghat, Sundernagar, Chacliot and part of Karsog tehsil in Mandi district and Chamba and part of Tissa tehsil of Chamba district. It lies over an altitude of 3000 ft. to 5000 ft. above sea-level.

The soils in this zone are located mostly on the hilly slopes which are of varying gradients. They vary from loam to silt-loam; texture is medium fine and colour ranges from grey to black. On account of rapid sub-soil drainage they are susceptible to draught. The response to organic manures as well as fertilizers is good. The soil reaction varies from neutral to slightly acidic.

**High Hills zone:** The zone comprises the upper parts of Rainka tehsil and the Trans-Giri area of Pachhad tehsil of Sirmur district, Theog, Jubbal, Chopal and Rampur tehsils of Mahasu district, Karsog tehsil of Mandi and Dharmour, Chamba and Tissa tehsils of Chamba district. The altitude varies from 5000 ft. to 7000 ft. above sea-level.

The soils are of a very fine texture and darkish brown in colour. They vary from silt loam to dry loam, with little gravel percentage. They are often quite deep, the depth at some places being 60 ft. There are no irrigation facilities. The soils have good drainage and fertility is also quite high. They are rich in potassium and respond well to
Mountainsous zone:—The zone comprises of the high elevation tracts in Mahasu, Chamba and Sirmut districts, which vary in altitude from 7000 ft. to 10,000 ft. above sea level. The area is mostly under forests and only in some parts potato and temperate fruits are grown. There are good grazing grounds in the region.

The soils of this area are generally more shallow than those in High hills zone. They range from slightly acidic to moderately acidic. The surface drainage is very good, and the sub-soil drainage is fairly good. The carbon and nitrogen contents are very high.

Dry Hill zone:—Chini tehsil of Mahasu district and Pangi tehsil of Chamba district, where rainfall is almost negligible, form a separate zone called the Dry Hill zone. These areas are suitable for the cultivation of dry fruits.

4. RAINFALL AND CLIMATE.

Himachal Pradesh is largely a mountainous territory with an altitude ranging from 2000 ft. to 22,000 ft. and climatic conditions accordingly vary from the semi-tropical to semi-arctic. The climate in Beas valley is similar to that of Kangra and Shivalik area. The heat in summer is intense though less severe than that experienced in the plains of Punjab. The rainy season is heavy and prolonged. Winter is pleasant and bracing, with only a moderate variation in the day and night temperatures. Snowfall is rare. In the upper portions of Bhattiyat, adjoining the high range, the climate is temperate. The rainfall is very heavy, and in winter snow for some months to a considerable depth are covered as on main range.

In the Ravi valley, the climatic conditions vary with altitude. In the lower portion they are semi-tropical in character. The heat is more and rainy season well marked, while the winter is mild, and the snowfall light. In Chamba the average maximum temperature is about 80° F and the average minimum about 65° F, though temperatures of 108° F and 30° F have also been recorded. From there upwards the conditions are most severe and vary from temperate to semi-arctic.

In the Chandrabhaga valley the climate is temperate in summer and semi-arctic in winter. As the lowest altitude in the Pangi valley is 7000 ft., severe heat is never experienced. The summer is exceedingly mild and pleasant while owing to scanty rainfall, humidity is always low. The winter generally is very severe. Snowfall begins in October and after December the whole valley is under snow till March or April. Communications are sometimes cut off and the villages are completely isolated.

The yearly average rainfall in Chamba is about 50”. The major portion of it falls during the summer months from June to September, the average being 23”. The average precipitation between January and May is about 21”. The remaining months of the year, i.e. from October to December, show an average of only 3 to 4”. The rainfall is heaviest in the Dhauladhar, Dhauladhar and Pangi ranges.

In Bhattiyat, south of Dhauladhar, the rains are heavy and the Ravi valley also receives a fair proportion of rain. The Brahmaputra area has probably the lowest rainfall. Owing to the high altitude of the Pangi range the rain clouds deposit most of their burden on its southern slopes and only a part of the rain cloud reaches the Chandrabhaga valley, where it rains in heavy showers during July and August. The yearly average is not more than 25”.

nitrogenous and phosphatic fertilizers. They yield a very good crop of seed potato and temperate fruits. There is wide difference in the carbon and nitrogen content of the soil and rate of decomposition is low. The soil is acidic in reaction.
In Simla hills, the monsoon rains are heaviest in the southern parts. The rainfall becomes less and less towards the south-west and north-east and is practically nil in the northern portion of Kanawa in Bushahr.

Along the valley of Sutlej as far east as Wangtu and on Pabar side of the watershed, the rainfall does not greatly vary from that at Simla (i.e. about 65"), but beyond Wangtu the difference is considerable, the rainfall becoming less and less as Shipki is approached, so that the climate of upper Kanawar is semi-arid. West of Wangtu the Sutlej valley has an annual rainfall of about 70". At Kilba, ten miles east of Wangtu, this drops to 43" and at Poe, same twelve miles from the border at Shipki to 16". The monsoon is spent before it reaches Chini. During summer months heat is intense along the Sutlej, and in the secluded valleys at low elevations. The Pabar valley is too hot, the temperature in inhabited places is moderate in summer, and in the Kanawar valley the winters are comparatively genial. The snow line varies with locality and is lower in the North than on the South side of hills.

5. IRRIGATION.

Out of the total cropped area of 1067 thousand acres in 1957-1958 about 161 thousand acres were irrigated (i.e. nearly 15%). The net irrigated area was 93 thousand acres.

The table I below shows the source-wise break up of the net area irrigated.

<table>
<thead>
<tr>
<th>Source</th>
<th>Area (acres)</th>
</tr>
</thead>
<tbody>
<tr>
<td>(1) Wells</td>
<td>63</td>
</tr>
<tr>
<td>(2) Other sources</td>
<td>93,316</td>
</tr>
<tr>
<td>Total</td>
<td>93,379</td>
</tr>
</tbody>
</table>

The table I below shows the source-wise break up of the net area irrigated.

6. AGRICULTURAL PRODUCTION AND NORMAL CROPPING PATTERN.

**Rabi Crops:**—The principal rabi crops are wheat, barley, paddy, peas, coriander and lentils.

**Wheat:**—It is the principal food crop, grown mostly at lower and mid-elevations. Wheat is grown generally as a rain-fed crop as very limited irrigation facilities are available.

**Barley:**—It is generally grown in bakhal lands.

**Kharif Crops:**—These consist mainly of maize, paddy, sugarcane, potato, millets and bhang. Maize is grown abundantly throughout the State and paddy is alternated with maize and is grown both as rainfed and irrigated crop.

Gram is grown on a small scale in Bilaspur district and some other areas of lower elevation. Sugarcane is grown in the valleys adjoining the plains, particularly in Paonter valley and parts of Sirmur and Sundernagar in Mandi district.

Potato is the most important cash crop of Himachal Pradesh. The rural economy largely depends on the seed potato produced for export which meets nearly 20% of the total seed requirements of the country. The production is concentrated mainly in Mahasu district, being more than 70% of the total quantity of seed potato produced in the State.

Two crops of potato are raised annually, but the summer crop is more important as 98% of total potato growing area is devoted to its cultivation.

Himachal Pradesh is best suited for cultivation of disease free ginger seed, but the acreage under the crop is small. It is grown mostly in Sirmur and Mahasu districts.
Fruits: Apple, pear, peach, apricot and plum are the principal fruits grown in the State. Their cultivation is mostly confined to Kotgarh, Kotkhai Suburbs of Simla, Arki, Solan and Rampur-Bushahr in Mahasu district. Citrus fruits are also grown at places, mainly in the sub-montane parts of Sirmur and Mandi districts.

The table 2 below shows the area and production of different crops in the State.

**TABLE 2.**

<table>
<thead>
<tr>
<th>Crop</th>
<th>Area ('000 acres)</th>
<th>Production ('000 tons)</th>
<th>Av. yield in lb./ac.</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Rice</td>
<td>111.13</td>
<td>43.36</td>
<td>874</td>
</tr>
<tr>
<td>2. Maize</td>
<td>285.43</td>
<td>69.99</td>
<td>549</td>
</tr>
<tr>
<td>3. Ragi</td>
<td>38.34</td>
<td>8.20</td>
<td>479</td>
</tr>
<tr>
<td>4. Millets</td>
<td>63.74</td>
<td>10.82</td>
<td>380</td>
</tr>
<tr>
<td>5. Wheat</td>
<td>346.84</td>
<td>95.60</td>
<td>617</td>
</tr>
<tr>
<td>6. Barley</td>
<td>77.32</td>
<td>15.86</td>
<td>459</td>
</tr>
<tr>
<td>7. Pulses</td>
<td>72.53</td>
<td>13.25</td>
<td></td>
</tr>
<tr>
<td>8. Potato</td>
<td>27.61</td>
<td>27.26</td>
<td>2,222</td>
</tr>
<tr>
<td>9. Sugarcane (gur)</td>
<td>3.42</td>
<td>1.95</td>
<td>1,227</td>
</tr>
<tr>
<td>10. Ginger</td>
<td>3.24</td>
<td>0.48</td>
<td>332</td>
</tr>
<tr>
<td>11. Chillies</td>
<td>0.59</td>
<td>0.09</td>
<td>342</td>
</tr>
<tr>
<td>12. Tobacco</td>
<td>2.23</td>
<td>0.37</td>
<td>377</td>
</tr>
<tr>
<td>13. Oilseeds</td>
<td>11.65</td>
<td>1.10</td>
<td></td>
</tr>
<tr>
<td>14. Cotton</td>
<td>1.64</td>
<td>0.20 @</td>
<td>75*</td>
</tr>
<tr>
<td>15. Tea</td>
<td>1.96</td>
<td>0.08</td>
<td>91</td>
</tr>
</tbody>
</table>

@ in '000 bales of 392 lb each. * in '000 lbs.

7. AGRICULTURAL EXPERIMENTATION AND RESEARCH STATIONS

There were only 5 agricultural farms which reported experiments for the period 1948-53. Bhangretu, Banota and Dhualakua farms are situated in Mandi, Chamba and Sirmur districts respectively. The farms at Parala and Shilaroo are situated in Mahasu district. Shilaroo Farm conducts varietal, agronomic trials on potato and produces disease-trees, nucleus seed stock of potato. The other farms are engaged in conducting varietal and agronomic trials on cereals and multiplication of improved seed varieties.

8. EXPERIMENTS.

There were 28 experiments in all reported for the period 1948-53. These were distributed as shown below:

**TABLE 3.**

<table>
<thead>
<tr>
<th>Crop/Type</th>
<th>M</th>
<th>MV</th>
<th>C</th>
<th>CV</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Wheat</td>
<td>2</td>
<td>2</td>
<td></td>
<td>6</td>
<td>10</td>
</tr>
<tr>
<td>Barley</td>
<td>1</td>
<td></td>
<td></td>
<td></td>
<td>1</td>
</tr>
<tr>
<td>Potato</td>
<td>10</td>
<td></td>
<td>6</td>
<td></td>
<td>16</td>
</tr>
<tr>
<td>Berseem</td>
<td>1</td>
<td></td>
<td></td>
<td></td>
<td>1</td>
</tr>
<tr>
<td>Total</td>
<td>14</td>
<td>2</td>
<td>6</td>
<td>6</td>
<td>28</td>
</tr>
</tbody>
</table>
1. GENERAL

The State of Jammu and Kashmir with an area of 85,861 square miles (i.e. 54 million acres) extends from 32° 17' to 36' 58' N—and from 73° 26' to 80° 30' E. It is situated east of Indus and west of Ravi. For administrative purposes, the state is divided into two regions: Kashmir (including the frontier district) and Jammu regions. In Kashmir—Srinagar, Baramulla, Anantnag and the frontier district of Ladakh; In Jammu—Jammu—Kathua, Udhampur and Doda.

Agriculture is the main occupation of the people. But the soil is not fertile. Only 3.6 percent of the total area is cultivable and the remaining portion is full of mountains and deserts. The total amount of land actually under cultivation in the state is 2,069,767 acres.

2. PHYSICAL FEATURES

The state shows two broad physical divisions: the south-western division through which flow Jhelum, Kishanganga and Chenab and the north-eastern division which comprises of the area drained by Indus and its tributaries. The south-western region may be divided into three parts: the belt of the outer hills, the middle mountains and the Kashmir valley. The north-eastern region has three administrative divisions, namely, Ladakh or Little Tibet, Baltistan which is called Chira Bhotan by the Kashmiris and Dardistan. The dividing line between the two regions is formed by the great central mountain range which runs from Nanga Parbat in a south-east direction for about 240 miles before it enters the territory of Lahaul.

3. SOILS

No detailed survey of the soils of the Jammu & Kashmir has been made. The available data are summarised below:

<table>
<thead>
<tr>
<th>Locality</th>
<th>Nature</th>
<th>N</th>
<th>Available P&lt;sub&gt;2&lt;/sub&gt;O&lt;sub&gt;5&lt;/sub&gt;</th>
<th>Available KaO</th>
<th>CO&lt;sub&gt;2&lt;/sub&gt; Loss on ignition</th>
<th>pH</th>
<th>CaO</th>
<th>T.S.S.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Taparkarewa</td>
<td>Saffron soil</td>
<td>.105</td>
<td>0.044</td>
<td>0.022</td>
<td>0.138</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Tehsil Bera.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Srinagar</td>
<td>Garden soil</td>
<td>0.12</td>
<td>0.023</td>
<td>0.016</td>
<td>0.23</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Kishnoor</td>
<td>Saffron soil</td>
<td>0.049</td>
<td>0.17</td>
<td>0.70</td>
<td>5.07</td>
<td></td>
<td>7.3</td>
<td>0.97</td>
</tr>
<tr>
<td>Shilvat</td>
<td></td>
<td></td>
<td>0.404</td>
<td>0.224</td>
<td>2.556</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Hoon* has carried out an investigation of soil profiles under Deodar, Blue Pine, Silver Fir and Chir in the hill forests of the main valley and Batote Range in Jammu. The Blue Pine soils of the Kashmir valley appear to belong to the podsol group. The Deodar soil of Batote belongs to the brown earth group. Hoon suggests that podsols of Kashmir valley are more allied to the Kulu Coniferous soils of the podsol group than to the recognised type of podsol.

The Valley proper possesses a large area of alluvial soil, which may be divided into two classes; the new alluvium, found in bays and deltas of the mountain rivers; and the old alluvium, lying above the banks of the Jhelum and extending as far as Karuwas. The

first is of great fertility and every year is renewed and enriched by silt from the mountain streams. Upto the present, in spite of lax system of forest conservancy, the silt of the mountain streams is rich and dark in colour; but the Sind river brings down increasing amount of sandy deposit, which is partly due to the reckless felling of trees.

The Kashmiris recognise four classes of soil. These are known as Gratu, Bahil, Sekil and Dazanlad. Gratu soil contains a large proportion of clay. It holds water, and in years of scanty rainfall is the safest land for rice. But if the rains become heavy, the soil cakes and the out-turn of the crop is poor. Bahil is rich loam of great natural strength and there is always a danger that by over-manuring the soil may become too strong and plant run to blade. Sekil is light loam with a sandy sub-soil and if there be sufficient irrigation and good rains, the out-turn of rice is always large. Dazanlad soil is chiefly found in low-lying areas near the swamps, but it sometimes occurs in the higher villages also. Special precautions are taken to run off irrigation water when the rice plant shows signs of a too rapid growth and if these are taken in time, the out-turn in Dazanlad land is sometimes very heavy. A peculiarity of this soil is that the irrigation water turns red in colour. Near the banks of Jhelum and in the vicinity of the Wular lake, is found a rich, peaty soil ( nambal), which in years of fair rainfall yields enormous crops of rapeseed and maize. This will not produce rice and requires no manure. It is, however, custom to burn standing weeds and the stubble of the previous year’s crop before ploughing.

The karewas, which form so striking feature in the scenery of the country, form the most part of Gratu soil, with varieties distinguished by colour. The most fertile is the dark blackish soil known as Surkhzamin, the red Gratu is the next best, while yellow soil is considered worst of all.

4. RAINFALL AND CLIMATE

The climatic conditions in Kashmir show great diversity due to marked differences in the altitude of various regions, the elevation varying from 1200 ft. at Jammu to 2500 ft. on the highest mountain peaks.

The mean daily temperature is the lowest in January and highest in June or July. At Srinagar, the average for January is about 33° F, and for July, which is the hottest month about 74° F. The range of temperature between maximum and minimum is 25° to 78° F at Skardu, 3° to 85° F at Deas, 18° to 62° F at Leh and 37° to 85° F at Gilgit.

The noteworthy features of the annual variation are the very rapid increase of temperature in March or April at the end of winter and an equally rapid decrease in October when skies clear after the south-west monsoon.

The precipitation is confined to two well-defined periods namely winter season from December to April, and south-west monsoon periods from June to September. The rainfall in October and November is small in amount, and November is usually the driest month of the year. The cold season precipitation from December to March is chiefly due to storms from Persia and Baluchistan. These disturbances occasionally give very stormy weather in Kashmir with violent winds on the higher elevations and much snow.

5. IRRIGATION

The total area of the State is about 54 million acres. Out of this the cultivable area is of the order of 2.1 million acres. The area under irrigation in 1955 was 744,000 acres.

With the completion of several new irrigation canals and lift irrigation projects, 47,225 acres of land was brought under cultivation.

6. AGRICULTURAL PRODUCTION AND NORMAL CROPPING PATTERN

The principal crops are Paddy Maize, Cotton, Saffron, Tobacco, Millets, Amarnath, buckwheat, pulses and sesame in the autumn and Wheat, Barley, Poppy, Rape flax,
Peas and beans in the spring. In Kashmir rice and maize are main crops while in Jammu, wheat and maize are the main crops.

Rice:—Rice is grown throughout the entire Kashmir part of the State. There are a number of varieties of rice grown in Kashmir, but they may roughly be divided into two classes, the white and red. The white varieties are held in esteem, the best among them being the basmati and the kanyum.

Maize:—In importance, maize is second only to rice. Enormous crops are raised in the black peaty land bordering the banks of Jhelum, as also in the high tracts occupied by the Guzar graziers.

Another important millet is Cheena or ping (panicum miliaceum) which is very much like rice in appearance, but is grown on dry land.

Amarnath:—The ganhar or amarnath, with its fold, coral and crimson stalks and flowers is an exceedingly beautiful crop. It is frequently sown in rows in the cotton fields or on borders of maize plots.

Buck-Wheat:—Trumba or buck-wheat (Fagopyrum esculentum) is a very useful plant as it can be sown late in any soil.

Pulses:—Pulses till lately were not popular, only mung (Phaseolus mungo) was having some importance. The other pulses are mah (Phaseolus radiatus) and methi (P. acenitigolium.)

Oilseeds:—The principal oilseed is rape. Linseed is cultivated all over the valley, but best fields are on the lower slopes of mountains. Til is also a very common crop.

Cotton:—Cotton is grown up to certain elevations only. Its cultivation is concentrated mostly in the Karewas and low-lying rice land.

Wheat & Barley:—These are the major spring crops of the valley. From the point of view of area, barley is more important of the two.

Saffron:—It is cultivated in the vast plateau of Pampur.

Fruits:—Kashmir is a land of fruits and flowers. Apple, peas, vine, mulberry, walnut, hazel, cheug, peach, apricot, raspberry, goosebery, currant, plum and strawberry are grown in most parts of the Valley.

The table below shows the area, production and yield per acre of the principal crops in the State.

### TABLE 1.

<table>
<thead>
<tr>
<th>Crop</th>
<th>Area ('000 acres)</th>
<th>Production ('000 tons)</th>
<th>Yield (lb./ac.)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Paddy.</td>
<td>352</td>
<td>162</td>
<td>1031</td>
</tr>
<tr>
<td>2. Jowar.</td>
<td>1</td>
<td>—</td>
<td>—</td>
</tr>
<tr>
<td>3. Bajra.</td>
<td>32</td>
<td>—</td>
<td>—</td>
</tr>
<tr>
<td>4. Maize.</td>
<td>343</td>
<td>101</td>
<td>669</td>
</tr>
<tr>
<td>5. Small millets.</td>
<td>43</td>
<td>12</td>
<td>625</td>
</tr>
<tr>
<td>6. Wheat.</td>
<td>303</td>
<td>78</td>
<td>577</td>
</tr>
<tr>
<td>7. Barley.</td>
<td>41</td>
<td>11</td>
<td>604</td>
</tr>
<tr>
<td>8. Pulses.</td>
<td>12</td>
<td>3</td>
<td>560</td>
</tr>
<tr>
<td>9. Rape &amp; Mustard.</td>
<td>45</td>
<td>11</td>
<td>548</td>
</tr>
<tr>
<td>10. Linseed.</td>
<td>23</td>
<td>5</td>
<td>487</td>
</tr>
</tbody>
</table>
7. AGRICULTURAL RESEARCH AND RESEARCH STATIONS

There are six experimental farms from which experiments for the period 1948-53 are available. The details of these research stations are given in the statement appended.

The Gramwala Tehsil farm conducts varietal and cultural experiments on Wheat and Maize. Tehsil farm, Kawa carries out research on Maize and fodder crops.

Khudwani farm conducts manurial, cultural and breeding experiments on paddy and also hybrid maize experiments. Rajhani farm conducts experiments on paddy, wheat, gram, barley and fodder crop. In Shalamar and Tabab-tillo experimental farms research is done on paddy, wheat, maize, vegetables, pulses and fruits.

8. EXPERIMENTS

There were 73 experiments reported from this State for the period 1948-53. They were distributed as shown below.

### TABLE 2

Distribution of experiments according to crops and types of treatments tried.

<table>
<thead>
<tr>
<th>Crop</th>
<th>M</th>
<th>MV</th>
<th>C</th>
<th>CV</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Paddy.</td>
<td>31</td>
<td>2</td>
<td>4</td>
<td>13</td>
<td>50</td>
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<tr>
<td>2. Wheat.</td>
<td>9</td>
<td>4</td>
<td>5</td>
<td>3</td>
<td>21</td>
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<tr>
<td>3. Maize.</td>
<td>1</td>
<td></td>
<td>1</td>
<td></td>
<td>2</td>
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<tr>
<td></td>
<td>41</td>
<td>6</td>
<td>10</td>
<td>16</td>
<td>73</td>
</tr>
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</table>
# STATEMENT SHOWING DETAILS OF EXPERIMENTAL STATIONS

## PUNJAB

<table>
<thead>
<tr>
<th>Sl. No.</th>
<th>Name of the Experimental Station</th>
<th>Location</th>
<th>Tract it represents</th>
<th>Year of establishment</th>
<th>Major crops</th>
<th>Soil type and soil analysis, if any</th>
<th>Normal rainfall (annual) in inches</th>
<th>Irrigation facilities</th>
<th>No. of experiments</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td><strong>Abohar:</strong> Cotton Research Station</td>
<td>Abohar Railway Station.</td>
<td>—</td>
<td>1949</td>
<td>Gram and Cotton, Sandy loam to loam.</td>
<td>10&quot;</td>
<td>Canal</td>
<td>9—Cotton.</td>
<td></td>
</tr>
<tr>
<td>2</td>
<td><strong>Ambala:</strong> Agricultural Station</td>
<td>Ambala, ½ mile from Ambala city Railway Station.</td>
<td>Barani tract of sub-mountainous area</td>
<td>1945</td>
<td>Wheat, Sugarcane Cotton, Maize, Gram, Jowar and Mash.</td>
<td>28&quot;</td>
<td>Tubewell</td>
<td>13—Wheat. 5—Jowar. 5—Maize. 5—Sugarcane. 1—Cherry. 29—Total.</td>
<td></td>
</tr>
<tr>
<td>No.</td>
<td>District</td>
<td>Location</td>
<td>Year</td>
<td>Land Use</td>
<td>Other Details</td>
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<tr>
<td>3.</td>
<td>Faridkot</td>
<td>Distt. Bhatinda, 6 furlongs from Faridkot Railway Station.</td>
<td>1910</td>
<td>Cotton, Maize, Wheat, Oilseeds and fodder.</td>
<td>Loam, pH = 8.20, Conductance = 0.38, Organic Carbon = 0.42, Available phosphorus = High, Calcium Carbonate = 3.83, Canal = 16(^\circ)</td>
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<td>(i) Cotton, (ii) Cotton.</td>
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<td>2 - Sarson, 1 - Toria.</td>
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<td>7 - Total.</td>
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<tr>
<td>4.</td>
<td>Ferozepur</td>
<td>Ferozepur, 3½ miles from Ferozepur Cantt. Rly. Station.</td>
<td>1927</td>
<td>Gram, Bajra and Tobacco.</td>
<td>Varies from clay loam to sandy loam, Persian wheel, tube-well and canal = 18(^\circ), Total.</td>
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<td></td>
<td>Agri. Res. Stn.</td>
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<td>77 - Tobacco.</td>
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<td>2 - Bajra.</td>
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<td>1 - Gram.</td>
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<td>80 - Total.</td>
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<td></td>
<td>Dem. cum seed multiplication Farm. (Oilseeds sub-station).</td>
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<td>12 - Wheat</td>
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<td>1 - Maize</td>
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<td>2 - Paddy</td>
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<td>15 - Total.</td>
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### STATEMENT SHOWING DETAILS OF EXPERIMENTAL STATIONS.

**PUNJAB (Contd.)**

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<th>10</th>
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</thead>
<tbody>
<tr>
<td><strong>6.</strong> Gurdaspur :</td>
<td>Gurdaspur</td>
<td>(i) Sugarcane Res. Stn. (i) &amp; (ii) ½ mile from Gurdaspur Rly. Station. (iii) 1 furlong from Gurdaspur Rly. Station.</td>
<td>(i) N.A. (ii) 1910 (iii) 1950</td>
<td>(i) Sugarcane. (ii) Barley, Wheat, Maize, Cotton and Sugarcane. (iii) Paddy, Wheat and Gram.</td>
<td>Sandy loam to loam. (i) 38&quot; (ii) 38&quot; (iii) 33&quot;</td>
<td>(i) Tube-well. (ii) Tube-well. (iii) Canal.</td>
<td>(i) 14—Sugarcane. (ii) 35—Wheat. (iii) 11—Sugarcane. 8—Cotton. 11—Maize. 2—Berseem. 1—Senji. 1—Mash. 1—Paddy.</td>
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<tr>
<td><strong>7.</strong> Gurgaon :</td>
<td>Gurgaon.</td>
<td>(i) Barley Res. Station. (i) 3½ miles from Gurgaon Rly. Station.</td>
<td>(i) 1940</td>
<td>(i) Barley, Wheat, Cotton, Bajra, Jowar, Brassica, Gram, Mung and Tobacco.</td>
<td>Sandy loam. (i) 25&quot;</td>
<td>Pumping set. (i) 4—Barley. 3—Wheat. 1—Brassica.</td>
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<td></td>
<td>South-eastern district of the state.</td>
<td>(ii) Oilseeds Res. Station.</td>
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<td>8—Total.</td>
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<td>(ii) 5—Brown sarson. 4—Raya.</td>
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<td>9—Total.</td>
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<td>70—Total.</td>
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<td>12—Paddy.</td>
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### STATEMENT SHOWING DETAILS OF EXPERIMENTAL STATIONS.

#### PUNJAB (Contd.)

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</thead>
<tbody>
<tr>
<td>8</td>
<td>Hansi:</td>
<td>Distt. Hissar, 4½ miles from Hansi Railway Station.</td>
<td>South-Eastern district of the State</td>
<td>(i) 1914</td>
<td>(i) Wheat, Cotton, Sugarcane, Methi, Lucerne, and Barley etc.</td>
<td>Loam to clay loam.</td>
<td>(i) 16.68&quot;.</td>
<td>(ii) 15&quot;.</td>
<td>Canal</td>
<td>(i) 24—Cotton.</td>
<td>14—Wheat.</td>
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<td></td>
<td>5—Gram.</td>
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<tr>
<td>9</td>
<td>Jach:</td>
<td>Distt. Kangra, Govt. Seed Farm, Nurpur Road, ½ mile.</td>
<td></td>
<td></td>
<td>1949</td>
<td>Wheat.</td>
<td>Clayey soil.</td>
<td>60°.</td>
<td>N.A.</td>
<td>(i) 8—Cotton.</td>
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<td></td>
<td>3—Wheat.</td>
</tr>
<tr>
<td>No.</td>
<td>Station</td>
<td>Location</td>
<td>District</td>
<td>Year</td>
<td>Crop Details</td>
<td>Soils &amp; Properties</td>
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<tr>
<td>10</td>
<td>Jullundur.</td>
<td>Jullundur. ½ mile from Jullundur</td>
<td>Punjab</td>
<td></td>
<td>(i) Wheat, Cotton Sugarcane, Maize, Groundnut, Potato etc.</td>
<td>(i) Loam, sandy loam and sandy. (ii) Loam and sandy loam. Organic carbon = 0.02 to 0.50% Nitrogen = 0.01 to 0.06% CaCO₃ = 0 to 0.50% pH = 6.8 to 8.9 Exchangeable cations = 11.0 to 20.1 per 100 gms. of soil.</td>
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<td></td>
<td>(ii) Sugarcane Res. Stn.</td>
<td></td>
<td></td>
<td>1934</td>
<td>(i) Tube-well</td>
<td>(i) Tube-well.</td>
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<td>28°.</td>
<td>29°.</td>
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<td>11</td>
<td>Kangra</td>
<td>Kangra</td>
<td>N.A.</td>
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<td>Wheat and Maize</td>
<td>Loamy, clay-loam.</td>
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<td></td>
<td>Distt. and Demonstration Farm</td>
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<td></td>
<td>N.A.</td>
<td>Kuhal</td>
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<td>11—Wheat.</td>
<td>4—Soybean.</td>
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<td>4—Wheat.</td>
<td>17—Maize.</td>
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<td>4—Soybean.</td>
<td>3—Maize.</td>
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<td>1—Linseed.</td>
<td>1—Linseed.</td>
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<td>19—Total.</td>
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STATEMENT SHOWING DETAILS OF EXPERIMENTAL STATIONS
PUNJAB (Contd.)
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<td></td>
<td>Vegetable Res. Stn.</td>
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<tr>
<td></td>
<td>Cereal Breeding Sub-Station.</td>
<td></td>
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</table>

STATEMENT SHOWING DETAILS OF EXPERIMENTAL STATIONS
PUNJAB (Contd.)

<table>
<thead>
<tr>
<th></th>
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</thead>
<tbody>
<tr>
<td>12.—Wheat.</td>
<td>12.—Wheat.</td>
<td>3.—Wheat.</td>
</tr>
<tr>
<td>4.—Sugarcane.</td>
<td>4.—Sugarcane.</td>
<td>2.—Potato.</td>
</tr>
<tr>
<td>7.—Berseem.</td>
<td>7.—Berseem.</td>
<td>5.—Total.</td>
</tr>
<tr>
<td>2.—Cotton.</td>
<td>2.—Cotton.</td>
<td></td>
</tr>
<tr>
<td>1.—Maize.</td>
<td>1.—Maize.</td>
<td></td>
</tr>
<tr>
<td>1.—Gram.</td>
<td>1.—Gram.</td>
<td></td>
</tr>
<tr>
<td>27.—Total.</td>
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N.A. = Not Applicable
### STATEMENT SHOWING DETAILS OF EXPERIMENTAL STATIONS.

**PUNJAB (Contd.)**

<table>
<thead>
<tr>
<th>No.</th>
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<th>Location</th>
<th>Year</th>
<th>crops</th>
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<tr>
<td>15.</td>
<td>Nagrota Bagwan</td>
<td>Distt Kangra, 1 mile from Nagrota Rly. Stn.</td>
<td>1945</td>
<td>Linseed, Wheat and Soyabean</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Kagra valley</td>
<td></td>
<td>Clay loam.</td>
</tr>
<tr>
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<td></td>
<td></td>
<td></td>
<td>100°</td>
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<td></td>
<td>Kuhal</td>
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<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>(i) Linseed, Wheat and Soyabean</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>(ii) Loam to clayey loam.</td>
</tr>
<tr>
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<td></td>
<td></td>
<td>(iii) Rice, Wheat and Maize.</td>
</tr>
<tr>
<td></td>
<td>Palampur</td>
<td>Govt. Tea Farm, 3 miles from Morninda Rly. Stn.</td>
<td>1938</td>
<td>Tea.</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Red clayey.</td>
</tr>
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<td>100°</td>
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<td>N.A.</td>
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<td></td>
<td>3—Tea.</td>
</tr>
<tr>
<td></td>
<td>Rauni</td>
<td>Bhupindra Agril. Farm, 5 miles from Patiala Rly. Stn.</td>
<td>1923</td>
<td>Wheat, Jowar, Millets, bajra, Gram, Oats, Cotton, Oilseeds, Sugarcane, Rice, Pulses etc.</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Clayey with Kalar patches.</td>
</tr>
<tr>
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<td></td>
<td>24°</td>
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<td></td>
<td>Canal</td>
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<td>4—Wheat.</td>
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<td>7—Cotton.</td>
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<tr>
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<td></td>
<td>2—Sugarcane.</td>
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<td></td>
<td></td>
<td>1—Bersem.</td>
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<td>1—Potato.</td>
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<td></td>
<td>2—Paddy.</td>
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<td></td>
<td></td>
<td>2—Maize.</td>
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<tr>
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<td>19—Total.</td>
</tr>
<tr>
<td>No.</td>
<td>State</td>
<td>Station Type</td>
<td>District</td>
<td>Tract</td>
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<tr>
<td>18</td>
<td>Punjab</td>
<td>18. Rohtak</td>
<td>Rohtak</td>
<td>Haryana</td>
</tr>
<tr>
<td></td>
<td></td>
<td>(i) Millet Sub-Station</td>
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<td></td>
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<td>(ii) Soil Sub-Station</td>
<td></td>
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<tr>
<td></td>
<td></td>
<td>(iii) Agri. Farm</td>
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</tr>
</tbody>
</table>

Canal:

(i) 1—Groundnut.
(ii) 2—Berseem.
(iii) 3—Bajra.
1—Wheat.
1—Jowar.
1—Kabuli gram.
8—Total.

(continued on next page)
**STATEMENT SHOWING DETAILS OF EXPERIMENTAL STATIONS**

**PUNJAB** (Contd.)

<table>
<thead>
<tr>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>6</th>
<th>7</th>
<th>8</th>
<th>9</th>
<th>10</th>
</tr>
</thead>
<tbody>
<tr>
<td>19. Samrala</td>
<td>Distt. Ludhiana</td>
<td>7</td>
<td>—</td>
<td>1946</td>
<td>Groundnut</td>
<td>Sandy</td>
<td>—</td>
<td>26°</td>
<td>Well, but most of the area is barren.</td>
</tr>
<tr>
<td>Groundnut Exptl. Farm</td>
<td>miles from Khanna Rly. Stn.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>16—Groundnut.</td>
</tr>
</tbody>
</table>

### Soil analysis:

- **Chemical analysis**:
  - Organic matter = 0.131 to 0.296
  - Total Nitrogen = 0.035 to 0.042
  - Av. $P_2O_5$ = 0.0049 to 0.0080
  - pH = 7.30

- **Mechanical analysis**:

<table>
<thead>
<tr>
<th>Depth</th>
<th>Course sand %</th>
<th>Fine sand %</th>
<th>Silt %</th>
<th>Clay %</th>
</tr>
</thead>
<tbody>
<tr>
<td>0—6&quot;</td>
<td>57.65</td>
<td>22.80</td>
<td>10.32</td>
<td>6.48</td>
</tr>
<tr>
<td>6&quot;—12&quot;</td>
<td>47.60</td>
<td>23.55</td>
<td>15.06</td>
<td>10.04</td>
</tr>
<tr>
<td>12&quot;—24&quot;</td>
<td>40.65</td>
<td>22.92</td>
<td>16.88</td>
<td>14.20</td>
</tr>
</tbody>
</table>
## STATEMENT SHOWING DETAILS OF EXPERIMENTAL STATIONS.
**PUBJAB (Contd.)**

<table>
<thead>
<tr>
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<th>7</th>
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<th>10</th>
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<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>CaO $= 2.53 %$</td>
<td>13—Berseem.</td>
</tr>
<tr>
<td></td>
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<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Available P$_{2}O_5$ $= 0.067%$</td>
<td>9—Oats.</td>
</tr>
<tr>
<td></td>
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<td></td>
<td></td>
<td></td>
<td>K$_2$O $= 0.725%$</td>
<td>5—Teosinte.</td>
</tr>
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<td></td>
<td></td>
<td>Available K$_2$O $= 0.033%$</td>
<td>2—Sudangrass.</td>
</tr>
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<td></td>
<td></td>
<td>Phosphorous as P$_{2}O_5$ $= 0.227%$</td>
<td>6—Rape.</td>
</tr>
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<td></td>
<td>Nitrogen $= 0.67 %$</td>
<td>1—Cherry grass.</td>
</tr>
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<td></td>
<td>Calcium carbonate $= 2.00 %$</td>
<td>7—Lucerne.</td>
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<td></td>
<td>Organic matter $= 0.68 %$</td>
<td>2—Maize cowpeas.</td>
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<td></td>
<td></td>
<td>(ii) Mechanical analysis: Coarse sand $= 1.78 %$</td>
<td>1—Jowar.</td>
</tr>
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<td></td>
<td></td>
<td></td>
<td></td>
<td>Fine sand $= 69.00 %$</td>
<td>1—Guara.</td>
</tr>
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<td></td>
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<td></td>
<td>Silt $= 13.60 %$</td>
<td>2—Senji.</td>
</tr>
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<td></td>
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<td></td>
<td>Clay $= 12.20 %$</td>
<td>2—Kudzu vine.</td>
</tr>
<tr>
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<td></td>
<td></td>
<td></td>
<td>Moisture $= 0.74 %$</td>
<td>1—Cowpeas.</td>
</tr>
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<td></td>
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<td>64—Total.</td>
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</table>
## STATEMENT SHOWING DETAILS OF EXPERIMENTAL STATIONS

### HIMACHAL PRADESH

<table>
<thead>
<tr>
<th>No.</th>
<th>Station</th>
<th>District</th>
<th>Location</th>
<th>Year</th>
<th>Crops</th>
<th>Soil Type</th>
<th>Temperature</th>
<th>Hallmark</th>
<th>Remarks</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Bhangrotu: Agri. Farm.</td>
<td>Mandi</td>
<td>4 miles from Jogindernagar Rly. Sta.</td>
<td>1949</td>
<td>Wheat, Rice, Maize, Sugarcane etc.</td>
<td>Medium to hard.</td>
<td>60°</td>
<td>—</td>
<td>—</td>
</tr>
<tr>
<td>3</td>
<td>Dhaura Kuan: Agri. Res. Sta.</td>
<td>Sirmur</td>
<td>Low hills and valley area</td>
<td>1949</td>
<td>Wheat, Maize, Barley, Sugarcane etc.</td>
<td>Sandy loam.</td>
<td>60°</td>
<td>Deisel pump</td>
<td>—</td>
</tr>
</tbody>
</table>

### Soil Analysis

(i) Chemical analysis:
- Total N = 0.095 to 0.117%
- P = 0.126 to 0.219%
- K = 0.099 to 0.162%
- OM = 0.81 to 1.78%
- pH = 6.0 to 7.1

Available N = 130 to 200 lb./ac.
- P = 20 to 50 lb./ac.
- K = 40 to 100 lb./ac.

(ii) Mechanical analysis:
- N.A.
<table>
<thead>
<tr>
<th></th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>6</th>
<th>7</th>
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</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>28 miles from Simla Rly. Stn.</td>
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<tr>
<td>1948</td>
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<tr>
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<td>32 miles from Simla Rly. Stn.</td>
<td></td>
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<td></td>
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</tr>
<tr>
<td>1949</td>
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</tr>
<tr>
<td>7.</td>
<td>Shilaroo</td>
<td>Distt. Mahasu</td>
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</tr>
</tbody>
</table>

HIMACHAL PRADESH (Contd.)

Cereals.
Potato.
Kuhal.
Wheat.
Potato.
Total.
Table I

Showing the Chemical characteristics of the soils from Seed Multiplication Cum Demonstration Farm, Bhanota

<table>
<thead>
<tr>
<th>Horizon depth in inches</th>
<th>Organic carbon</th>
<th>Total Nitrogen</th>
<th>pH</th>
<th>Total Cao</th>
<th>Total sesqui oxide</th>
<th>Total P₂O₅</th>
<th>Total K₂O</th>
<th>Exchange Capacity</th>
<th>Exchangable Cao</th>
<th>Exchangeable K₂O</th>
</tr>
</thead>
<tbody>
<tr>
<td>0-9 Field No's 1 and 2</td>
<td>0.675</td>
<td>0.042</td>
<td>5.9</td>
<td>0.266</td>
<td>7.15</td>
<td>0.073</td>
<td>0.318</td>
<td>7.28</td>
<td>5.4</td>
<td>0.54</td>
</tr>
<tr>
<td>0-9 Field No. 3</td>
<td>0.645</td>
<td>0.073</td>
<td>6.1</td>
<td>0.252</td>
<td>4.90</td>
<td>0.114</td>
<td>0.357</td>
<td>6.60</td>
<td>5.2</td>
<td>0.48</td>
</tr>
<tr>
<td>0-9 Field No. 4</td>
<td>0.765</td>
<td>0.067</td>
<td>5.9</td>
<td>0.252</td>
<td>5.60</td>
<td>0.134</td>
<td>0.346</td>
<td>6.40</td>
<td>5.2</td>
<td>0.75</td>
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<tr>
<td>0-9 Field No. 5</td>
<td>0.645</td>
<td>0.050</td>
<td>6.3</td>
<td>0.224</td>
<td>5.00</td>
<td>0.103</td>
<td>0.335</td>
<td>6.40</td>
<td>5.6</td>
<td>0.54</td>
</tr>
<tr>
<td>0-9 Field No. 6, 7 and 8</td>
<td>0.600</td>
<td>0.039</td>
<td>6.3</td>
<td>0.196</td>
<td>5.00</td>
<td>0.076</td>
<td>0.305</td>
<td>6.0</td>
<td>5.5</td>
<td>0.54</td>
</tr>
</tbody>
</table>

Profile Sample from field No. 2:—

| 0-9         | 0.585 | 0.034 | 6.1 | 0.252 | 4.60 | 0.063 | 0.246 | 5.16 | 4.9 | 0.30 |
| 9-28        | 0.285 | 0.034 | 6.8 | 0.350 | 5.40 | 0.082 | 0.346 | 9.00 | 6.6 | 0.15 |
| 28-38       | 0.270 | 0.072 | 6.9 | 0.336 | 5.50 | 0.133 | 0.320 | 8.80 | 5.9 | 0.14 |
| 38-60       | 0.240 | 0.020 | 7.1 | 0.406 | 12.75 | 0.136 | 0.280 | 13.80 | 11.2 | 0.34 |

Profile Samples from field No. 3:—

| 0-9         | 0.645 | 0.065 | 6.1 | 0.238 | 9.40 | 0.151 | 0.329 | 8.68 | 4.9 | 0.22 |
| 9-33        | 0.315 | 0.039 | 6.6 | 0.322 | 4.85 | 0.145 | 0.275 | 8.60 | 6.4 | 0.31 |
| 38-48       | 0.240 | 0.028 | 6.9 | 0.322 | 5.00 | 0.145 | 0.312 | 9.20 | 4.8 | 0.56 |
| 48-60       | 0.345 | 0.045 | 6.9 | 0.364 | 6.65 | 0.183 | 0.306 | 9.20 | 8.1 | 0.56 |
Table II

Showing the Physical characteristics of the soils from Seed Multiplication cum Demonstration Farm, Bhanota.

<table>
<thead>
<tr>
<th>Horizon Depth in inches</th>
<th>Physical description</th>
<th>Colour</th>
<th>Gravel %</th>
<th>Mechanical analysis (% on air dry basis)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Coarse Sand</td>
</tr>
<tr>
<td>0-9</td>
<td>Representative surface sample from Field No. 1 and 2.</td>
<td>5y 6/3 (Pale olive)</td>
<td>12.38</td>
<td>8.540</td>
</tr>
<tr>
<td></td>
<td>0-9 Representative surface sample from Field No. 3</td>
<td>10 y R 6/3 (Pale brown)</td>
<td>26.67</td>
<td>20.600</td>
</tr>
<tr>
<td></td>
<td>0-9 Representative surface sample from Field No. 4</td>
<td>2.5 y 6/2 (Lt. brown gray)</td>
<td>20.83</td>
<td>17.570</td>
</tr>
<tr>
<td></td>
<td>0-9 Representative surface sample from Field No. 5</td>
<td>10 yR. 6/3 (Pale brown)</td>
<td>21.24</td>
<td>23.675</td>
</tr>
<tr>
<td></td>
<td>0-9 Representative surface sample from Field No. 6, 7 and 8</td>
<td>10 yR. 6/3 (Pale brown)</td>
<td>11.94</td>
<td>24.730</td>
</tr>
<tr>
<td>0-9</td>
<td>Pale brown, sandy loam, compact</td>
<td>10 yR. 6/3 (Pale brown)</td>
<td>17.24</td>
<td>18.000</td>
</tr>
<tr>
<td>38-60</td>
<td>Light yellowish brown, clay loam, compact, concretions present ; water logged</td>
<td>10 yR 6/4 (Lt. yellowish brown)</td>
<td>7.41</td>
<td>2.610</td>
</tr>
</tbody>
</table>

Contd.
<table>
<thead>
<tr>
<th>Profiles Sample from field No. 3</th>
<th></th>
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<th></th>
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</thead>
<tbody>
<tr>
<td>0—9 Pale brown, loam, compact, grass roots present</td>
<td>10 yR 6/3</td>
<td>20.65</td>
<td>19.755</td>
<td>40.800</td>
<td>22.0</td>
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<tr>
<td></td>
<td>(Pale brown)</td>
<td></td>
<td></td>
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<td></td>
</tr>
<tr>
<td>9—33 Pale brown, loam, compact</td>
<td>10 yR 6/3</td>
<td>23.22</td>
<td>20.600</td>
<td>42.485</td>
<td>21.9</td>
</tr>
<tr>
<td></td>
<td>(Pale brown)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>33—48 Pale brown, loam, concretion present</td>
<td>10 yR 6/3</td>
<td>25.64</td>
<td>29.600</td>
<td>37.060</td>
<td>20.8</td>
</tr>
<tr>
<td></td>
<td>(Pale brown)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>48—60 Pale brown, loam, hard, compact</td>
<td>10 yR 6/3</td>
<td>27.27</td>
<td>23.600</td>
<td>43.055</td>
<td>20.9</td>
</tr>
<tr>
<td>S. No.</td>
<td>Name of the Experimental Station</td>
<td>Location</td>
<td>Tract it represents</td>
<td>Year of establishment</td>
<td>Major crops</td>
</tr>
<tr>
<td>-------</td>
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<td>----------------</td>
</tr>
<tr>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
<td>6</td>
</tr>
<tr>
<td>---</td>
<td>---</td>
<td>---</td>
<td>---</td>
<td>---</td>
<td>---</td>
</tr>
</tbody>
</table>
Crop :- Paddy (Kharif).

Site :- Oil seed Sub.-Stn., Gummar.

Object :- To study the effect of A/S and Ammo. Phos. on the yield of Paddy.

1. BASAL CONDITIONS:
   (i) (a) Nil. (b) Fallow. (c) Nil. (ii) (a) Clayey loam. (b) N.A. (iii) 14 to 19.7.1948. (iv) (a) N.A. (b) Transplanting. (c) --. (d) and (e) N.A. (v) Nil. (vi) Lal Nikanda, 41 (medium). (vii) Unirrigated. (viii) N.A. (ix) 60.07". (x) 27.10.1948.

2. TREATMENTS:
   1. Control (no manure).
   2. 30 lb./ac. of N as A/S.

3. DESIGN:
   (i) R.B.D. (ii) (a) 3. (b) N.A. (iii) 5. (iv) (a) and (b) 1/20 ac. (v) Nil. (vi) Yes.

4. GENERAL:
   (i) Good. No lodging. (ii) Nil. (iii) Grain yield. (iv) (a) Not contd. (b) --. (c) --. (v) (a) No. (b) --. (vi) and (vii) Nil.

5. RESULTS:
   (i) 1006 lb./ac.
   (ii) 354.9 lb./ac.
   (iii) Treatments are not significantly different.
   (iv) Av. yield of grain in lb./ac.
   Treatment  | Av. yield
   1.          | 1012
   2.          | 993
   3.          | 1014
   S.E./mean  | 158.7 lb./ac.

Crop :- Paddy (Kharif).

Site :- Oil seed Sub. Stn., Gummar.

Ref :- Pb. 51 (141).

Type :- 'M'.

Object :- To study the effect of A/S and Super alone and in combination on the yield of Paddy.

1. BASAL CONDITIONS:
   (i) (a) Nil. (b) Fallow. (c) Nil. (ii) (a) Clayey loam. (b) N.A. (iii) 28 and 29.7.1951. (iv) (a) N.A. (b) Transplanting. (c) --. (d) N.A. (e) N.A. (f) Nil. (vi) Lal Nikanda-41 (medium). (vii) Unirrigated (viii) N.A. (ix) 40.89" approx. (x) 8.11.1951.

2. TREATMENTS:
   All combinations of (1) and (2).
   (1) 2 levels of N as A/S : N0=0 and N1=50 lb./ac.
   (2) 2 levels of P2O5 as Super : P0=0 and P1=50 lb./ac.

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

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

5. RESULTS:
   (i) 516.5 lb./ac.
   (ii) 88.27 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>Mean</th>
</tr>
</thead>
<tbody>
<tr>
<td>N₀</td>
<td>430.3</td>
<td>521.1</td>
<td>475.7</td>
</tr>
<tr>
<td>N₁</td>
<td>438.9</td>
<td>675.4</td>
<td>557.2</td>
</tr>
</tbody>
</table>

Mean = 36.04 lb./ac.
S.E. of body of table = 50.96 lb./ac.

Crop: Paddy.
Site: Govt. Agri. Strn., Gurdaspur.

Object: To find out the best manurial treatment to Paddy crop.

1. BASAL CONDITIONS:
   (i) Nil. (b) Fallow. (c) Nil. (ii) (a) Loam. (b) N.A. (iii) 22,23.7.1953. (iv) (a) 5 ploughings, 2 puddlings and 4 sohaga. (b) N.A. (c) 9 sr./ac. (d) 9′x9′. (e) N.A. (v) Nil. (vi) 349 Jhona (medium), (vii) Irrigated. (viii) One weeding on 10.8.1953. (ix) 27.5.8. (x) 15.10.1953.

2. TREATMENTS:
   1. Control (no manure).
   2. 100 lb./ac. of N as A/S.
   3. 50 lb./ac. of N as A/S+ 50 lb./ac. of P₂O₅ as Super.
   4. 100 lb./ac. of N as A/S+ 50 lb./ac. of P₂O₅ as Super.
   5. 100 lb./ac. of N as A/S+100 lb./ac. of P₂O₅ as Super.
   6. 100 lb./ac. of N as A/S+100 lb./ac. of P₂O₅ as Super+25 lb./ac. of K₂O as Pot. Sul.


3. DESIGN:
   (i) R.B.D. (ii) (a) 6. (b) N.A. (iii) 5. (iv) (a) 18′x79′. (b) 18′x75′9′. (v) Approx. 3′ on one side and 1′9′ on the other side of the length of each plot left out as non experimental area. (vi) Yes.

4. GENERAL:
   (i) Normal; no lodging. (ii) Nil. (iii) Grain yield. (iv) (a) 1953—continuing. (b) and (c) No. (v) (a) and (b) No. (vi) Nil. (vii) Number of treatments increased after 1953.

5. RESULTS:
   (i) 3187 lb./ac.
   (ii) 356.7 lb./ac.
   (iii) Treatments are significantly different.
   (iv) Av. yield of grain in lb./ac.

<table>
<thead>
<tr>
<th>Treatment</th>
<th>Av. yield</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>2502</td>
</tr>
<tr>
<td>2.</td>
<td>3327</td>
</tr>
<tr>
<td>3.</td>
<td>3103</td>
</tr>
<tr>
<td>4.</td>
<td>3295</td>
</tr>
<tr>
<td>5.</td>
<td>3486</td>
</tr>
<tr>
<td>6.</td>
<td>3410</td>
</tr>
</tbody>
</table>

S.E./mean = 178.4 lb./ac.

Ref: Pb. 53(66).
Type: ‘M’.
Crop: Paddy.
Site: Govt. Agri. Stn., Hansi.

Object: To find out the manurial formula for Paddy crop.

1. BASAL CONDITIONS:
   (i) (a) Nil. (b) Mash. (c) Nil. (ii) (a) Heavy loam. (b) N.A. (iii) 12.7.1952. (iv) (a) 1 raja, 2 desi plough and 2 roller. (b) N.A. (c) 10 sr./ac. (d) and (e) N.A. (v) Nil. (vi) 349 Jhuma (medium). (vii) Irrigated. (viii) 3 weedings on 3, 27.8.1953 and 10.9.1953. (ix) 2.57°. (x) 19.10.1953.

2. TREATMENTS:
   1. Control.
   2. 50 lb./ac. of N as A/S.
   3. 100 lb./ac. of N as A/S.
   4. 50 lb./ac. of N as A/S + 12 lb./ac. of N/P 2O 5 as Super.
   5. 100 lb./ac. of N as A/S + 25 lb./ac. of N/P 2 O 5 as Super.
   6. 100 lb./ac. of N as A/S + 12 lb./ac. of N/P 2 O 5 as Super + 13 lb./ac. of K 2 O as Pot. Sul. Super broadcast on 23.7.1953, A/S and Pot. Sul. broadcast on 6.8.1953.

3. DESIGN:
   (i) R.B.D. (ii) (a) 6. (b) N.A. (iii) 4. (iv) (a) 13°x52°. (b) 13°x49°—3.3°. (v) N.A. (vi) Yes.

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

5. RESULTS:
   (i) 3895 lb./ac.
   (ii) 292.4 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>3165</td>
</tr>
<tr>
<td>2.</td>
<td>3352</td>
</tr>
<tr>
<td>3.</td>
<td>4065</td>
</tr>
<tr>
<td>4.</td>
<td>4004</td>
</tr>
<tr>
<td>5.</td>
<td>4319</td>
</tr>
<tr>
<td>6.</td>
<td>4284</td>
</tr>
<tr>
<td>S.E./mean</td>
<td>=146.2 lb./ac.</td>
</tr>
</tbody>
</table>

Crop: Paddy.
Site: Céreal Breeding Sub-Stn. Kulu.

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

1. BASAL CONDITIONS:
   (i) (a) Nil. (b) Fallow. (c) Nil. (ii) (a) Loam. (b) N.A. (iii) 12.7.1952. (iv) (a) to (c) N.A. (v) Nil. (vi) 5-43 (early, improved). (vii) Irrigated. (viii) N.A. (ix) 7.04°. (x) N.A.

2. TREATMENTS:
   All combinations of (1) and (2)
   (1) 3 levels of N as A/S: N 0 =0, N 1 =45 and N 2 =60 lb./ac.
   (2) 2 levels of N/P 2O 5 as Super: P 0 =0, P 1 =50 lb./ac.

3. DESIGN:
   (i) Fact. in R.B.D. (ii) (a) 6. (b) N.A. (iii) 2. (iv) (a) N.A. (b) 33°x51°. (v) N.A. (vi) Yes.
4. GENERAL:

(i) N.A. (ii) Nil. (iii) Grain yield. (iv) (a) 1952-1953. (b) No. (c) Nil. (v) (a) No. (b) Nil. (vi) and (vii) Nil.

5. RESULTS:

(i) 2427 lb./ac.
(ii) 110.1 lb./ac.
(iii) Only N effect and interaction N×P are highly significant.
(iv) Av. yield of grain in lb./ac.

<table>
<thead>
<tr>
<th></th>
<th>$P_0$</th>
<th>$P_1$</th>
<th>Mean</th>
</tr>
</thead>
<tbody>
<tr>
<td>$N_0$</td>
<td>2175</td>
<td>2253</td>
<td>2214</td>
</tr>
<tr>
<td>$N_1$</td>
<td>2391</td>
<td>2715</td>
<td>2553</td>
</tr>
<tr>
<td>$N_2$</td>
<td>2623</td>
<td>2407</td>
<td>2315</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th></th>
<th>Mean</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>S.E. of marginal mean of N</td>
<td>=55.1 lb./ac.</td>
<td></td>
</tr>
<tr>
<td>S.E. of marginal mean of</td>
<td>=45.0 lb./ac.</td>
<td></td>
</tr>
<tr>
<td>S.E. of body of table</td>
<td>=77.9 lb./ac.</td>
<td></td>
</tr>
</tbody>
</table>

Crop : Paddy.

Site : Cereal Breeding Sub.-Stn., Kulu.

Type : ‘M’.

Ref : Pb. 53(43).

Object :—To study the effect of fertilizers on the growth and yield of Paddy crop.

1. BASAL CONDITIONS:

(i) (a) Paddy—Fallow. (b) Fallow. (c) Nil. (ii) (a) Loam. (b) N.A. (iii) 6.7.1953. (iv) (a) N.A. (b) Transplanting. (c) —. (d) Row to row 9" and plant to plant 3". (e) N.A. (v) N.A. (vi) S—43 (Dundar improved, early). (vii) Irrigated. (viii) 2-3 weedings. (ix) 14.25". (x) 30.10.1953.

2. TREATMENTS:

All possible combinations of (1) and (2)

(1) 3 levels of N as A/S: $N_0=0$, $N_1=45$ and $N_2=60$ lb./ac.
(2) 2 levels of $P_2O_5$ as Super : $P_0=0$ and $P_1=50$ lb./ac.

Half of A/S at the time of transplanting and half after one month of transplanting by broadcast.

3. DESIGN:

(i) Fact. in R.B.D. (ii) (a) 6. (b) N.A. (iii) 2. (iv) (a) and (b) 33½". (v) Nil. (vi) Yes.

4. GENERAL:

(i) Normal. (ii) N.A. (iii) Yield of grain in lb./ac. (iv) (a) 1952-1953. (b) No. (c) Nil. (v) (a) No. (b) Nil. (vi) and (vii) Nil.

5. RESULTS:

(i) 2381 lb./ac.
(ii) 223.8 lb./ac.
(iii) None of the effects is significant.
(iv) Av. yield of grain in lb./ac.

<table>
<thead>
<tr>
<th></th>
<th>$P_0$</th>
<th>$P_1$</th>
<th>Mean</th>
</tr>
</thead>
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<td>$N_0$</td>
<td>2160</td>
<td>2222</td>
<td>2191</td>
</tr>
<tr>
<td>$N_1$</td>
<td>2407</td>
<td>2407</td>
<td>2407</td>
</tr>
<tr>
<td>$N_2$</td>
<td>2623</td>
<td>2469</td>
<td>2546</td>
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</table>

<table>
<thead>
<tr>
<th></th>
<th>Mean</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>S.E. of marginal mean of N</td>
<td>=111.9 lb./ac.</td>
<td></td>
</tr>
<tr>
<td>S.E. of marginal mean of</td>
<td>= 91.4 lb./ac.</td>
<td></td>
</tr>
<tr>
<td>S.E. of body of table</td>
<td>=158.2 lb./ac.</td>
<td></td>
</tr>
</tbody>
</table>
Crop :- Paddy (Kharif).
Site :- Rice Breeding Sub-Stn., Nagrota Bagwan.

Object :- To find out suitable time of applying A/S to Paddy crop.

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

2. TREATMENTS:
1. Control.
2. 25 lb./ac. of N placed deep before transplanting.
3. 25 lb./ac. of N applied 15 days after transplanting.
4. 25 lb./ac. of N placed one month after transplanting.
5. 25 lb./ac. of N applied as in Tr. 3 and as in Tr. 4.

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

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

5. RESULTS:
(i) 8.727 lb./plot.
(ii) 1.305 lb./plot.
(iii) Treatments do not differ significantly.
(iv) Av. yield of grain in lb./plot.

<table>
<thead>
<tr>
<th>Treatment</th>
<th>Av. yield</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>7.764</td>
</tr>
<tr>
<td>2.</td>
<td>8.643</td>
</tr>
<tr>
<td>3.</td>
<td>9.394</td>
</tr>
<tr>
<td>4.</td>
<td>9.116</td>
</tr>
<tr>
<td>5.</td>
<td>8.687</td>
</tr>
</tbody>
</table>
S.E/mean = 0.5328 lb./plot.

Crop :- Paddy.
Site :- Rice Breeding Sub-Stn., Nagrota Bagwan.

Object :- To find out suitable dose of A/S for Paddy crop.

1. BASAL CONDITIONS:
(i) (a) Wheat—Paddy—Wheat. (b) Wheat. (c) 300 md./ac. of F.V.M. (ii) (a) Clayey loam. (b) N.A. (iii) 2.7.1952. (iv) (a) Two-dry ploughings before transplanting. (b) Transplanting. (c) —. (d) and (e) N.A. (v) No. (vi) Ramjawain. 100 (medium). (vii) Irrigated. (viii) 2 weedings and hoeing. (ix) 53.30°. (x) 3.10. — 925.

2. TREATMENTS:
1. Control.
2. 15 lb./ac. of N as A/S.
3. 30 lb./ac. of N as A/S.
4. 45 lb./ac. of N as A/S.
5. 60 lb./ac. of N as A/S.
A/S broadcast on 18.7.1952.

3. DESIGN:
(i) R.B.D. (ii) (a) 5. (b) N.A. (iii) 6. (iv) (a) 13'0" x 26'6". (b) 12' x 25'. (v) 9° border area on each side. (vi) Yes.

4. GENERAL:
(i) Normal. (ii) Attack of rice hispa, sprayed with gammaxene on 12.8.1952. (iii) Grain yield. (iv) (a) 1952—1954. (b) No. (c) Nil. (v) (a) No. (b) —. (vi) and (vii) Nil.
5. RESULTS:
(i) 1700 lb./ac.
(ii) 237.6 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>1366</td>
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<tr>
<td>2.</td>
<td>1690</td>
</tr>
<tr>
<td>3.</td>
<td>1917</td>
</tr>
<tr>
<td>4.</td>
<td>1907</td>
</tr>
<tr>
<td>5.</td>
<td>1621</td>
</tr>
</tbody>
</table>

S.E/mean = 57.0 lb./ac.

---

Crop: Paddy.
Site: Rice Breeding Sub-Stn., Nagrota Bagwan.
Ref: Pb. 53(38).
Type: 'M'.

Object: To find out suitable dose of A/S for Paddy crop.

1. BASAL CONDITIONS:
   (i) (a) Paddy-Wheat. (b) Wheat. (c) 300 md./ac. of F.Y.M. (ii) (a) Clay loam. (b) N.A. (iii) 4.7.1953.
   (iv) (a) 2 desi plough. (b) N.A. (c) 10 sr./ac. (d) and (e) N.A. (v) No. (vi) Ramjawain. 100 (medium)
   (vii) Irrigated. (viii) 2 weedings and 2 hoeings. (ix) 77.72°. (x) N.A.

2. TREATMENTS:
   1. Control (no manure).
   2. 15 lb./ac. of N as A/S.
   3. 30 lb./ac. of N as A/S.
   4. 45 lb./ac. of N as A/S.
   A/S broadcast on 15.7.1953.

3. DESIGN:
   (i) R.B.D. (ii) (a) 4. (b) N.A. (iii) 6. (iv) (a) 9'-6"x31'-6". (b) 8'x30". (v) 9" on all sides of each plot. (vi) Yes.

4. GENERAL:
   (i) Normal. (ii) No. (iii) Grain yield. (iv) (a) 1952—1954. (b) No. (c) Nil. (v) (a) No. (b) —. (vi) Nil.
   (vii) Upland rice land. Poor soil.

5. RESULTS:
   (i) 1948 lb./ac.
   (ii) 248.1 lb./ac.
   (iii) Treatments are significantly different.
   (iv) Av. yield of grain in lb./ac.

<table>
<thead>
<tr>
<th>Treatment</th>
<th>Av. yield</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>1750</td>
</tr>
<tr>
<td>2.</td>
<td>1789</td>
</tr>
<tr>
<td>3.</td>
<td>2197</td>
</tr>
<tr>
<td>4.</td>
<td>2054</td>
</tr>
</tbody>
</table>

S.E./mean = 101.3 lb./ac.
Crop : Paddy.  
Site : Rice Breeding Sub-Stn., Nagrota Bagwan.  
Ref : Pb. 52(20).  
Type : 'M'.

Object :—To find out a suitable method of application of A/S to Paddy crop.

1. BASAL CONDITIONS :
   (i) (a) Paddy-Fallow-Paddy. (b) Fallow. (c) Nil. (ii) (a) Loam. (b) N.A. (iii) 26.6.1952. (iv) (a) 3 ploughings. (b) Transplanting. (c) —. (d) and (e) N.A. (v) 200 md./ac. of F.Y.M. broadcast with the first ploughing in the month of April 1952. (vi) Ramjawain. 100 (medium). (vii) Irrigated. (viii) 2 weedings and hoeing. (ix) 58.30°. (x) 3.10.1952.

2. TREATMENTS :
   1. Control (no manure).
   4. Deep application 15 days after transplanting (11.7.1952) by pellets prepared by mixing A/S with soil.

A/S applied at 25 lb./ac. of N.

3. DESIGN :
   (i) R.B.D. (ii) 6. (b) N.A. (iii) 6. (iv) (a) 8'x20'. (b) 1/36th of an acre. (v) N.A. (vi) Yes.

4. GENERAL :
   (i) Normal. No lodging. (ii) No. (iii) No. of tillers per plant, grain yield. (iv) (a) 1952-1954 (continued with modification). (b) No. (c) Nil. (v) (a) No. (b) —. (vi) Nil. (vii) Standing crop in 2 to 4 treatment plots distinctly dark green than in other plots and also greater in height.

5. RESULTS :
   (i) 3158 lb./ac.  
   (ii) 250.1 lb./ac.
   (iii) Treatments are highly significantly different.
   (iv) Av. yield of grain in lb./ac.
   Treatment | Av. yield
   --- | ---
   1. | 2859
   2. | 3382
   3. | 3034
   4. | 3283
   5. | 3131
   6. | 3075
   S.E./mean = 102.1 lb./ac.

---

Crop : Paddy.  
Site : Rice Breeding Sub-Stn., Nagrota Bagwan.  
Ref : Pb. 53(39).  
Type : 'M'.

Object :—To find out suitable method of applying A/S to Paddy crop.

1. BASAL CONDITIONS :
   (i) (a) Fallow-Paddy-Fallow. (b) Fallow. (c) No. (ii) (a) Loam. (b) N.A. (iii) 1.7.1953. (iv) (a) 3 ploughings. (b) Transplanting. (c) —. (d) to (e) N.A. (v) 200 md./ac. of F.Y.M. broadcast in April 1953. (vi) Ramjawain. 100 (medium). (vii) Irrigated. (viii) 2 weedings and hoeing. (ix) 77.72°(x) N.A.

2. TREATMENTS :
   1. Control (no manure.)
   2. 25 lb./ac. of N as A/S applied deep, before transplanting by drilling behind the plough.
   3. 25 lb./ac. of N as A/S surface application 15 days after transplanting by broadcast.
   4. 25 lb./ac. of N as A/S deep application, 15 days after transplanting by pellet method.

3. DESIGN :
   (i) R.B.D. (ii) 4. (b) N.A. (iii) 6. (iv) (a) N.A. (b) 8'x15'. (v) N.A. (vi) Yes.
4. GENERAL:
(i) Normal. (ii) Nil. (iii) Grain yield. (iv) (a) 1952 to 1954 continued with modification). (b) No. (c) Nil. (v) (a) No. (b) —. (vi) and (vii) Nil.

5 RESULTS:
(i) 4975 lb./ac.
(ii) 756.0 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>4644</td>
</tr>
<tr>
<td>2.</td>
<td>5313</td>
</tr>
<tr>
<td>3.</td>
<td>4932</td>
</tr>
<tr>
<td>4.</td>
<td>5009</td>
</tr>
</tbody>
</table>
S.E/mean = 308.6 lb./ac.

Crop: Paddy.
Site: Chemical Section, B.A. Farm, Rauni.
Ref: Pb. 53(109).
Type: 'M'.

Object: To study the best manurial formula along with time of its application for Paddy.

1. BASAL CONDITIONS:
(i) (a) Nil. (b) Fallow. (c) Nil. (ii) (a) Heavy loam. (b) N.A. (iii) 7, 8, 7.1953. (iv) (a) 5 ploughings and 4 planking. (b) N.A. (c) 10-12 sr./ac. (d) 9° x 9°. (e) N.A. (v) Nil. (vi) N.A. (vii) Irrigated. (viii) One weeding. (ix) 23.69°. (x) 28.10.1953.

2. TREATMENTS:
Main-plot treatments:
7 manures: \( M_0 = 0 \), \( M_1 = 30 \) lb./ac. of N as A/S, \( M_2 = 60 \) lb./ac. of N as A/S, \( M_3 = 90 \) lb./ac. of N as A/S, \( M_4 = M_1 + 30 \) lb./ac. of \( P_2O_5 \) as Super, \( M_5 = M_2 + 60 \) lb./ac. of \( P_2O_5 \) as Super, and \( M_6 = M_3 + 90 \) lb./ac. of \( P_2O_5 \) as Super.

Sub-plot treatments:
2 times of application of manures: \( T_1 \) = Whole of Super + 1/10 A/S applied at puddling and 1/10 A/S given as top dressing after one month of transplanting and \( T_2 \) = Whole of Super and A/S applied at puddling time.

3. DESIGN:
(i) Split-plot. (ii) (a) 7 main-plots/block and 2 sub-plots/main-plot. (b) N.A. (iii) 4. (v) (a) 1/70 ac. (b) 1/100 ac. (v) N.A. (vi) Yes.

4. GENERAL:
(i) Stand very good. Crop partially lodged due to high velocity wind on 4.9.1953. (ii) Rice bug attack on 28.8.1953; 10% B.H.C. dusted on 5, 7.9.1953. (iii) Grain yield. (iv) (a) Not continued. (b) —. (c) —. (v) (a) No. (b) —. (vi) and (vii) Nil.

5. RESULTS:
(i) 1786 lb./ac.
(ii) (a) 580.7 lb./ac.
(b) 374.8 lb./ac.
(iii) Only sub-plot treatments are significantly different.
(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>( M_5 )</th>
<th>Mean</th>
</tr>
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<tbody>
<tr>
<td>( T_1 )</td>
<td>—</td>
<td>1713</td>
<td>2305</td>
<td>2179</td>
<td>1787</td>
<td>1858</td>
<td>1970</td>
</tr>
<tr>
<td>( T_2 )</td>
<td>—</td>
<td>1948</td>
<td>1803</td>
<td>2044</td>
<td>1344</td>
<td>1501</td>
<td>1710</td>
</tr>
<tr>
<td>Mean</td>
<td>1421</td>
<td>1831</td>
<td>2054</td>
<td>2112</td>
<td>1565</td>
<td>1679</td>
<td>1840</td>
</tr>
</tbody>
</table>

S.E. of difference of two.
1. M marginal means = 290.3 lb./ac.
2. T marginal means = 100.1 lb./ac.
3. T means at the same level of M = 265.0 lb./ac.
4. M means at the same level of T = 345.6 lb./ac.
Crop :- Paddy.
Site :- Rice Breeding Sub. Stn., Gurdaspur.

Object :- To determine the optimum dose of N in the form of A/S for different varieties of Paddy.

1. BASAL CONDITIONS :
   (i) (a) Nil. (b) Wheat. (c) Nil. (ii) (a) Sandy loam. (b) N.A. (iii) 2 ploughings, 3 hoeings. (b) N.A. (c) 12 sr./ac. (d) 9°x9°. (e) N.A. (v) Nil. (vi) As per treatments. (vii) Irrigated. (viii) 2 weedings. (ix) 22.1.5, 19.9.1952 and 7.10.1952.

2. TREATMENTS :
   All combinations of (1) and (2)
   (1) 2 varieties : V1 = Jhona 349 (early) and V2 = Basmati 370 (late).
   (2) 5 levels of N : N0 = 0, N1 = 20, N2 = 40, N3 = 60 and N4 = 80 lb/ac.

3. DESIGN :
   (i) Fact. (ii) 10. (b) N.A. (iii) 4. (iv) (a) 9°x9°. (b) 8.25°x7.5°. (v) N.A. (vi) Yes.

4. GENERAL :
   (i) Normal. No lodging. (ii) Nil. (iii) Grain yield data. (iv) (a) 1951 to 1954. (b) No. (c) Nil. (v) (a) Nil. (b) No. (vi) and (vii) Nil.

5. RESULTS :
   (i) 1400 lb/ac.
   (ii) 263.9 lb/ac.
   (iii) V effect is highly significant. N effect is significant while interaction is not significant.
   (iv) Av. yield of grain in lb/ac.

<table>
<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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<tbody>
<tr>
<td>V1</td>
<td>1544</td>
<td>1760</td>
<td>2214</td>
<td>1974</td>
<td>1958</td>
<td>1890</td>
</tr>
<tr>
<td>V2</td>
<td>659</td>
<td>839</td>
<td>954</td>
<td>1022</td>
<td>.</td>
<td>909</td>
</tr>
<tr>
<td>Mean</td>
<td>1102</td>
<td>1300</td>
<td>1534</td>
<td>1498</td>
<td>1514</td>
<td>1400</td>
</tr>
</tbody>
</table>

S.E. of marginal mean of V = 59.0 lb/ac.
S.E. of marginal mean of N = 93.3 lb/ac.
S.E. of body of table = 131.9 lb/ac.

Crop :- Paddy.
Site :- Rice Breeding Sub-Stn., Gurdaspur.

Object :-To determine the optimum dose of N in the form of A/S for different Paddy varieties.

1. BASAL CONDITIONS :
   (i) (a) Lentils-Paddy-Lentils. (b) Lentils. (c) No. (ii) (a) Sandy. (b) N.A. (iii) 2.7.1953. (iv) (a) 1 raja plough, 3 desi plough. (b) N.A. (c) Approx. 10 sr./ac. (d) 9°x9°. (e) N.A. (v) No. (vi) As per treatments. (vii) Irrigated. (viii) 2 weedings and 2 hoeings. (ix) 25.4.53. (x) 14.10.1953 and 26.10.1953.

2. TREATMENTS :
   All combinations of (1) and (2)
   (1) 2 varieties : V1 = Jhona 349 (early) and V2 = Basmati 370 (late).
   (2) 5 levels of N : N0 = 0, N1 = 20, N2 = 40, N3 = 60 and N4 = 80 lb/ac.

Half A/S broadcast at the time of transplanting and half on 22.7.1953.
3. DESIGN:
   (i) Fact. in R.B.D.  (ii) (a) 10.  (b) N.A.  (iii) 4.  (iv) (a) 9' x 80'.  (b) 8.25' x 75' - 5".  (v) N.A.  (vi) Yes.

4. GENERAL:
   (i) Normal. No lodging. (ii) Nil.  (iii) Grain yield.  (iv) (a) 1951 to 1954.  (b) No'.  (c) Nil.  (v) (a) No.  (b) ---.  (vi) and (vii) Nil.

5. RESULTS:
   (i) 1144 lb./ac.  (ii) 167.8 lb./ac.  (iii) All the effects are highly significant.  (iv) Av. yield of grain in lb./ac.

<table>
<thead>
<tr>
<th>V</th>
<th>N₀</th>
<th>N₁</th>
<th>N₂</th>
<th>N₃</th>
<th>N₄</th>
<th>Mean</th>
</tr>
</thead>
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<tr>
<td>V₁</td>
<td>1063</td>
<td>1348</td>
<td>1523</td>
<td>1444</td>
<td>1418</td>
<td>1359</td>
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<tr>
<td>V₂</td>
<td>3516</td>
<td>674</td>
<td>853</td>
<td>1160</td>
<td>1435</td>
<td>928</td>
</tr>
<tr>
<td>Mean</td>
<td>790</td>
<td>1011</td>
<td>1183</td>
<td>1302</td>
<td>1427</td>
<td>1144</td>
</tr>
</tbody>
</table>

S.E. of marginal mean of V = 37.5 lb./ac.
S.E. of marginal mean of N = 59.3 lb./ac.
S.E. of body of table = 83.9 lb./ac.

Crop : Paddy.
Site : Rice Breeding Sub-Stn., Gurdaspur.
Ref : Pb. 52(14).
Type : ‘MV’.

Object : To find out the best source of N in combination with different varieties of Paddy.

1. BASAL CONDITIONS:
   (i) (a) Nil.  (b) Fallow.  (c) Nil.  (ii) (a) Sandy loam.  (b) N.A.  (iii) 21.7.1952.  (iv) (a) One raja plough-desi plough, 3 sohaga.  (b) N.A.  (c) 10 sr./ac.  (d) 9' x 80'.  (e) N.A.  (v) No.  (vi) As per treatments.  (vii) Irrigated.  (viii) 3 weedings.  (ix) 22.19".  (x) 22.10.52 to 7.11.52.

2. TREATMENTS:
   All combinations of (1) and (2)
   (1) 2 varieties : V₁ = Jhona 349 (early) and V₂ = Basmati 370 (late).
   (2) 5 manures : M₀ = 0, M₁ = 50 lb./ac. of N as A/S, M₂ = 50 lb./ac. of N as G.N.C., M₃ = 50 lb./ac. of N as A/S and G.N.C. in 1 : 1 ratio and M₄ = Dhaingcha G.M. (details N A.).

Manures applied at the time of planting.

3. DESIGN:
   (i) Fact. in R.B.D.  (ii) (a) 10.  (b) N.A.  (iii) 4.  (iv) (a) 9' x 79'  (b) 8.25' x 75' - 5".  (v) N.A.  (vi) Yes.

4. GENERAL:
   (i) Satisfactory; no lodging.  (ii) Nil.  (iii) Yield data.  (iv) (a) Yes, 1951—1954.  (b) and (c) Nil.  (v) (a) and (b) Nil.  (vi) and (vii) Nil.

5. RESULTS:
   (i) 1186 lb./ac.
   (ii) 217.5 lb./ac.
   (iii) Only M effect and interaction M x V are highly significant.
(iv) Av. yield of grain in lb./ac.

<table>
<thead>
<tr>
<th></th>
<th>M₀</th>
<th>M₁</th>
<th>M₂</th>
<th>M₃</th>
<th>M₄</th>
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</tr>
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<tbody>
<tr>
<td>V₁</td>
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<td>1505</td>
<td>1109</td>
<td>1393</td>
<td>1321</td>
<td>1274</td>
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<tr>
<td>V₂</td>
<td>756</td>
<td>968</td>
<td>1468</td>
<td>1341</td>
<td>1008</td>
<td>1098</td>
</tr>
<tr>
<td>Mean</td>
<td>900</td>
<td>1236</td>
<td>1264</td>
<td>1367</td>
<td>1164</td>
<td>1186</td>
</tr>
</tbody>
</table>

S.E. of marginal mean of V = 48.6 lb./ac.
S.E. of marginal mean of M = 76.9 lb./ac.
S.E. of body of table = 108.8 lb./ac.

Crop: Paddy.
Site: Rice Breeding Sub-Stn., Gurdaspur.
Ref: Pb. 53(33).
Type: 'MV'.

Object: To find out the best source of N in combination with different varieties of Paddy.

1. BASAL CONDITIONS:
   (i) (a) Lentils—Paddy—Lentils. (b) Lentils. (c) Nil (ii) (a) Sandy loam. (b) N.A. (iii) 29.7.1953.
   (iv) (a) 3 raja plough, 3 desi plough. (b) Transplanting. (c) —. (d) —. (v) No. (vi) As per treatments.
   (vii) Irrigated. (viii) 2 hoeings and weedings. (ix) 25.43°. (x) 26.31.10.1953.

2. TREATMENTS:
   All combinations of (1) and (2)
   (1) 2 varieties: V₁=Jhona 349 (early) and V₂=Basmati 370 (late).
   (2) 5 manures: M₀=0, M₁=50 lb./ac. of N as A/S, M₂=50 lb./ac. of N as G.N.C., M₃=50 lb./ac. of N as A/S and G.N.C. in 1:1 ratio and M₄=Dhaincha G.M. (details N.A.).
   Manures applied at the time of planting.

3. DESIGN
   (i) R.B.D. (Fact.). (ii) (a) 10. (b) N.A. (iii) 4. (iv) (a) 9'×80'— (b) 8.25'×75'. (v) N.A. (vi) Yes.

4. GENERAL:
   (i) Normal; no lodging. (ii) Nil. (iii) Grain yield. (iv) (a) 1951—54. (b) and (c) No. (v) (a) and (b) No.
   (vi) and (vii) Nil.

5. RESULTS:
   (i) 561.4 lb./ac.
   (ii) 119.94 lb./ac.
   (iii) M effect is significant, V effect is highly significant while MV is not significant.
   (iv) Av. yield of grain in lb./ac.

<table>
<thead>
<tr>
<th></th>
<th>M₀</th>
<th>M₁</th>
<th>M₂</th>
<th>M₃</th>
<th>M₄</th>
<th>Mean</th>
</tr>
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<tr>
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<td>393.8</td>
<td>288.8</td>
<td>367.6</td>
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<td>322.9</td>
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<td>V₂</td>
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<td>770.1</td>
<td>857.6</td>
<td>901.4</td>
<td>844.5</td>
<td>799.9</td>
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<td>Mean</td>
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<td>582.0</td>
<td>573.2</td>
<td>634.5</td>
<td>579.8</td>
<td>561.4</td>
</tr>
</tbody>
</table>

S.E. of marginal mean of V = 26.82 lb./ac.
S.E. of marginal mean of M = 42.40 lb./ac.
S.E. of body of table = 59.97 lb./ac.
Crop : Paddy.  
Ref : Pb. 52(16).

Site : Rice Breeding Sub-Stn., Gurdaspur.  
Type : ‘C’.

Object :—To determine the optimum seed rate in the nursery and best age of seedlings at the time of transplanting.

1. **BASAL CONDITIONS** :
   (i) (a) Nil. (b) Wheat and Gram. (c) Nil.  
   (ii) (a) Sandy loam. (b) N.A.  
   (iv) (a) 5 Ploughings. 4 sohaga. (b) Transplanting.  
   (c) As per treatments. (d) N.A. (e) N.A. (v) 18 C.L. of F.Y.M. on 7.6.1952; 3 md. of gram bhusa on 13.6.1952 and 25 sr. of A/S on 14.7.1952. broadcast. (vi) 349 Jhona (early).  
   (vii) Irrigated.  

2. **TREATMENTS** :
   All combinations of (1) and (2)  
   (1) 4 ages of seedlings :  
      (a) $A_1 = 4$, $A_2 = 5$, $A_3 = 6$ and $A_4 = 7$ weeks.  
   (2) 3 seed rates : $R_1 = 80$, $R_2 = 160$ and $R_3 = 240$ sr./ac.

3. **DESIGN** :
   (i) Fact. in R.B.D. (ii) (a) 12. (b) N.A.  
   (iii) 5. (iv) (a) 9.75’x82’. (b) 9’x80.6’. (v) N.A.  
   (vi) Yes.

4. **GENERAL** :
   (i) Normal. No lodging. (ii) Nil. (iii) Grain yield.  
   (iv) (a) 1950—1954. (b) No. (c) Nil. (v) (a) No. (b)  
   (vi) (vii) Nil.

5. **RESULTS** :
   (i) 1058 lb./ac.  
   (ii) 164.9 lb./ac.  
   (iii) Only A effect is highly significant.  
   (iv) Av. yield of grain in lb./ac.

<table>
<thead>
<tr>
<th></th>
<th>$R_1$</th>
<th>$R_2$</th>
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<td>1317</td>
<td>1169</td>
<td>1195</td>
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<tr>
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<td>1011</td>
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<td>$A_4$</td>
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<td>1002</td>
<td>817</td>
<td>951</td>
</tr>
<tr>
<td>Mean</td>
<td>1082</td>
<td>1099</td>
<td>994</td>
<td>1058</td>
</tr>
</tbody>
</table>

   S.E. of marginal mean of A = 47.7 lb./ac.  
   S.E. of marginal mean of R = 41.3 lb./ac.  
   S.E. of body of table = 82.7 lb./ac.

---

Crop : Paddy.  
Ref : Pb. 53(35).  
Type : ‘C’.

Site : Rice Breeding Sub-Stn., Gurdaspur.  
Object :—To determine the optimum seed rate in the nursery and best age of seedlings at the time of transplanting.

1. **BASAL CONDITIONS** :
   (i) (a) Paddy—wheat (§ portion) and Paddy-fallow (§ portion). (b) Fallow, wheat. (c) Nil.  
   (ii) (a) Sandy loam. (b) N.A. (iii) 7.7 1953.  
   (iv) (a) 1 raja plough and 2 desl plough. (c) As per treatments. (d) 9’x9’.  
   (e) N.A. (v) No. (vi) 349 Jhona (early). (vii) Irrigated  
   (viii) 3 weedings and 2 or 3 hoeing. (ix) 25.43’. (x) 23.10.1953.
2. TREATMENTS:
   All combinations of (1) and (2)
   (1) 4 ages of seedlings: A_1 = 4, A_2 = 5, A_3 = 6 and A_4 = 7 weeks
   (2) 3 seed rates: R_1 = 80, R_2 = 160 and R_3 = 240 sri/ac.

3. DESIGN:
   (i) Fact. in R.B.D. (ii) 12. (b) N.A. (iii) 4. (iv) (a) 80' x 10.5'. (b) 74' - 5' x 9.75'. (v) N.A. (vi) Yes.

4. GENERAL:
   (i) Normal. No lodging. (ii) Nil. (iii) Yield only. (iv) (a) 1950 - 1954 (with some modifications) (b) No.
   (c) Nil. (v) (a) Nil. (b) --. (vi) and (vii) Nil.

5. RESULTS:
   (i) 817.3 lb./ac.
   (ii) 132.75 lb./ac.
   (iii) A effect is highly significant. R effect is significant.
   (iv) Av. yield of grain in lb./ac.

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Mean = 891.1, 813.2, 747.6, 817.3

S.E. of marginal mean of A = 38.32 lb./ac.
S.E. of marginal mean of R = 33.19 lb./ac.
S.E. of body of table = 66.37 lb./ac.

Crop: Paddy.
Site: Rice Breeding Sub.-Stn., Gurdaspur.
Ref: Pb. 52 (18).
Type: 'C'.

Object: To find the best spacing and optimum number of plants per hill.

1. BASAL CONDITIONS:
   (i) (a) Wheat—Paddy—Wheat. (b) Wheat. (c) Nil. (ii) (a) Sandy loam. (b) N.A. (iii) 23.7.1952. (iv) (a) 4 Ploughing—3 Sohaga. (b) N.A. (c) 10-12 sr./ac. (d) As per treatments. (e) N.A. (v) Nil. (vi) 349 honna (early). (vii) Irrigated. (viii) 2 weedings. (ix) 22.19'. (x) 25.10.1952.

2. TREATMENTS:
   All combinations of (1) and (2)
   (1) 3 spacings: S_1 = 6' x 6', S_2 = 9' x 9' and S_3 = 12' x 12'.
   (2) 3 No. of seedlings/hill : P_1 = 1, P_2 = 2 and P_3 = 3 seedlings/hill.

3. DESIGN:
   (i) Fact. in R.B.D. (ii) 9. (b) N.A. (iii) 6. (iv) (a) 80' x 10'11'. (b) 75'1' x 9'. (v) N.A. (vi) Yes.

4. GENERAL:
   (i) Normal; no lodging. (ii) Nil. (iii) Grain yield. (iv) (a) 1950—1954 (contd. with modification). (b) No. (c) Nil. (v) (a) No. (b) --. (vi) and (vii) Nil.

5. RESULTS:
   (i) 1121 lb./ac.
   (ii) 168.6 lb./ac.
   (iii) All the effects are highly significant.
(iv) Av. yield of grain in lb./ac.

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S.E. of any marginal mean = 39.7 lb./ac.
S.E. of body of table = 68.8 lb./ac.

Crop: Paddy.
Site: Chemical Section, B.A. Farm, Rauni.
Ref: Pb. 53 (110).
Type: 'C'.

Object: To study the effect of No. of seedlings and spacing on yield of Paddy.

1. BASAL CONDITIONS:
   (i) (a) Nil. (b) Wheat. (c) Nil.  (ii) (a) Heavy loam.  (b) N.A.  (iii) 14, 17.7.1953.  (iv) (a) 5 ploughings – 4 zohaga.  (b) N.A.  (c) 10-12 in. ac.  (d) and (e) As per treatments.  (v) 1 md./ac. of A/S, broadcast on 20.8.1953.  (vi) 370 Bismarck (medium).  (vii) Irrigated.  (viii) 1 hoeing. (ix) 23.69". (x) 28.10.1953.

2. TREATMENTS:
   Main-plot treatments:
   3 No. of seedlings/hill: \(P_1=1\), \(P_2=2\) and \(P_3=4\) seedlings/hill.
   Sub-plot treatments:
   3 spacings: \(S_1=6'\times 6'\), \(S_2=9'\times 9'\), and \(S_3=12'\times 12'\).

3. DESIGN:
   (i) Split—plot.  (ii) (a) 3 main-plots/block and 3 sub-plots/main-plot.  (b) N.A.  (iii) 3.  (iv) (a) N.A.  (b) 22'x33'.  (v) N.A.  (vi) Yes.

4. GENERAL:
   (i) Normal.  Crop partially lodged due to high velocity winds on 4.9.1953.  (ii) Severe infestation of rice bug 10% B.H.C. dusted 7.9.1953.  (iii) Grain yield.  (iv) (a) 1953—1956.  (b) No.  (c) Nil.  (v) (a) No.  (b) —.  (vi) and (vii) Nil.

5. RESULTS:
   (i) 2939 lb./ac.
   (ii) (a) 448.3 lb./ac.
   (b) 410.4 lb./ac.
   (iii) None of the effects is significant.
   (iv) Av. yield of grain in lb./ac.

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S.E. of difference of two
1. P marginal means = 211.3 lb./ac.
2. S marginal means = 193.4 lb./ac.
3. S means at the same level of P = 335.1 lb./ac.
4. P means at the same level of S = 345.7 lb./ac.
Crop: Paddy.
Site: Rice Breeding Sub-Stn., Gurdaspur.
Object: To know the best spacing of seedling and optimum number of seedlings per hill.

1. BASAL CONDITIONS:
   (i) (a) Wheat-Paddy-Wheat. (b) Wheat. (c) Nil. (ii) (a) Sapd loam. (b) N.A. (iii) 24.7.1953. (iv) (a) 1 raja plough, 3 desi plough, 2 plankings. (b) Transplanting. (c)— (d) and (e) As per treatments. (v) 48 see of A/S broadcast on 19.8.1953. (vi) As per treatments. (vii) Irrigated. (viii) N.A. (ix) 25.43'. (x) 26.10.1953 for V1 and 1.11.1953 for V2.

2. TREATMENTS:
   Main-plot treatments:
   2 varieties: V1=249 Jhona (early) and V2=S-20 (late).
   Sub-plot treatments:
   All combinations of (1) and (2)
   (1) 3 spacings: S1=6", S2=9" and S3=12".
   (2) 3 no. of seedlings/hill: P1=1, P2=2 and P3=3 seedlings/hill.

3. DESIGN:
   (i) Split-plot. (ii) (a) 2 main-plots/block; 9 sub-plots/main-plot. (b) N.A. (iii) 4. (iv) (a) N.A. (b) 75.63'x6'
   (v) N.A. (vi) Yes.

4. GENERAL:
   (i) Normal. No lodging. (ii) Nil. (iii) Grain yield. (iv) (a) 1950-1954. (b) No. (c) Nil. (y) (a) No, (b)—. (vi) and (vii) Nil.

5. RESULTS:
   (i) 1309 lb./ac.
   (ii) (a) 552.5 lb./ac.
   (b) 265.5 lb./ac.
   (iii) V effect is significant. S' and P effects are highly significant, while all other effects are not significant.
   (iv) Av. yield of grain in lb./ac.

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S.E. of marginal mean of S or P =54.2 lb./ac.
S.E. of body of table =93.9 lb./ac.
S.E. of difference of two
1. V marginal means =130.2 lb./ac.
2. S or P means at the same level of V =108.4 lb./ac.
3. V means at the same level of S or P =157.5 lb./ac.
Object: To study the effect of nodded seedlings on yield of Paddy crop.

1. BASAL CONDITIONS:
   (i) (a) Paddy-Wheat-Paddy. (b) Wheat. (c) Nil. (ii) (a) Sandy loam. (b) N.A. (iii) 19.7.1952. (iv) (a) 3 ploughings and 2 sohaga. (b) and (c) N.A. (d) 9"x9". (e) N.A. (v) 5 C.L. of F.Y.M. on 11.7.1952., 16 sr. of A/S on 1.8.1952 and 30 seers of A/S on 20.8.1952 broadcast. (vi) As per treatments. (vii) Irrigated. (viii) 2 weedings. (ix) 2219'. (x) 16.10.1952., 6.11.1952.

2. TREATMENTS:
   All combinations of (1) and (2)
   (1) 2 varieties: V₁ = Jhona. 349 (early) and V₂ = Basmati. 370 (late).
   (2) 2 types of seedlings: S₁ = Un-noded and S₂ = Noded seedlings.

3. DESIGN:
   (i) Fact. in R.B.D. (ii) 4. (b) N.A. (iii) 6. (iv) (a) 6'-9"x80'. (b) 6'x72.6'. (v) N.A. (vi) Yes.

4. GENERAL:
   (i) Normal. No lodging. (ii) Nil. (iii) Grain yield. (iv) (a) 1950—1954. (b) No. (c) Nil. (v) (a) Nil. (b) —. (vi) and (vii) Nil.

5. RESULTS:
   (i) 1413 lb./ac.
   (ii) 195.7 lb./ac.
   (iii) All the effects are highly significant.
   (iv) Av. yield of grain in lb./ac.

   \[\begin{array}{ccc}
   & S_1 & S_2 \\
   V_1 & 1839 & 1236 & 1538 \\
   V_2 & 1352 & 1224 & 1288 \\
   \text{Mean} & 1596 & 1230 & 1413 \\
   \end{array}\]

   S.E. of any marginal mean = 56.5 lb./ac.
   S.E. of body of table = 79.9 lb./ac.

Crop :- Paddy.
Site :- Rice Breeding Sub-Stn., Gurdaspur.

Object: To study the effect of nodded seedlings on yield of Paddy crop.

1. BASAL CONDITIONS:
   (i) (a) Gram-Paddy-Gram. (b) Gram. (c) Nil. (ii) (a) Sandy Loam. (b) N.A. (iii) 31.7.1953. (iv) (a) Raja plough—3 desti plough—2 planking. (b) to (e) N.A. (v) 48 seer/ac. of A/S broadcast on 19.8.1953. (vi) As per treatments. (vii) Irrigated. (viii) 3 hoeings. (ix) 25.4". (x) 2.11.1953 for V₁ and 8.11.1953 for V₂.

2. TREATMENTS:
   All combinations of (1) and (2).
   (1) 2 varieties: V₁ = Jhona. 349 (early) and V₂ = Basmati. 370 (late).
   (2) 2 types of seedlings: S₁ = Unnoded and S₂ = Noded seedlings.

3. DESIGN:
   (i) R.B.D. (Fact). (ii) (a) 4. (b) N.A. (iii) 5. (iv) 3 x 15'. (v) 74'-5"x9.75". (vi) N.A. (vi) Yes.
4. GENERAL:
(i) Normal, no lodging. (ii) Nil. (iii) Yield only. (iv) 1950 to 1954. (b) Nil. (c) Nil. (v) (a) No. (b) No. (vi) and (vii) Nil.

5. RESULTS:
(i) 1124 lb./ac.
(ii) 90.7 lb./ac.
(iii) All the effects are highly significant.
(iv) Av. yield of grain in lb./ac.

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S.E. of any marginal mean = 26.2 lb./ac.
S.E. of body of table = 37.0 lb./ac.

Crop: Paddy (Kharij).
Site: Rice Breeding Sub-Stn., Gurdaspur.
Object: To find the best combination of transplanting dates, N, P2O5 and spacing on yield of Paddy.

1. BASAL CONDITIONS:
(i) (a) Paddy-Wheat-Paddy. (b) Wheat. (c) Nil. (ii) (a) Sandy loam. (b) N.A. (iii) As per treatments. (iv) (a) 3 ploughing—4 sohaga and puddling. (b) and (c) N.A. (d) As per treatments. (e) N.A. (v) No. (vi) Jhoma 349—(early). (vii) Irrigated. (viii) 3 weeding. (x) 22.19%. (x) 20.9, 4.10 and 6.11.1952.

2. TREATMENTS:
Main-plot treatments:
- 3 dates of sowing: D1 = 15.6.1952, D2 = 5.7.1952 and D3 = 25.7.1952.
- All combinations of (1) and (2)
  (1) 3 levels of N as A/S: N0 = 0, N1 = 40 and N2 = 80 lb./ac.
  (2) 3 levels of P2O5 as Super: P0 = 0, P1 = 40 and P2 = 80 lb./ac.
Sub-plot treatments:
- 3 spacings: S1 = 6" × 6", S2 = 9" × 9" and S3 = 12" × 12".

3. DESIGN:
(i) Split-Split-plot. (ii) (a) 3 main-plots/block; 9 sub-plots/main-plot and 3 Sub-Sub-plots/sub-plot. (b) N.A. (iii) 3. (iv) (a) 62" × 6'. (b) 60" × 6'. (v) One foot on two sides of each plot left out. (vi) Yes.

4. GENERAL:
(i) Normal; no lodging. (ii) Nil. (iii) Grain yield. (iv) (a) 1951 to 1954. (b) No. (c) Nil. (v) (a) No. (b) No. (vi) and (vii) Nil.

5. RESULTS:
(i) 1170 ,lb./ac.
(ii) (a) 1204.3 lb./ac.
(b) 337.4 lb./ac.
(c) 139.5 lb./ac.
(iii) D effect is significant. N, S effects and interactions D × S, D × N × S are highly significant. No other interaction is significant.
(iv) Av. yield of grain in lb./ac.

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S.E. of marginal mean of N or P = 37.5 lb./ac.
S.E. of body of table N x P = 64.9 lb./ac.
S.E. of difference of two
1. D marginal means = 189.2 lb./ac.
2. S marginal means = 21.9 lb./ac.
3. N or P means at the same level of D = 91.8 lb./ac.
4. D means at the same level of N or P = 352.5 lb./ac.
5. S means at the same level of D = 38.0 lb./ac.
6. D means at the same level of S = 191.8 lb./ac.
7. S means at the same level of N or P = 38.0 lb./ac.
8. N or P means at the same level of S = 61.6 lb./ac.

Crop: Paddy.
Site: Rice Breeding Sub-Stn., Gurdaspur.
Type: 'CM'.

Object: To find the best combination of transplanting dates, N, P₂₀, and spacing on yield of Paddy.

1. BASAL CONDITIONS:
(i) (a) Wheat-Paddy-Wheat. (b) Wheat. (c) Nil. (ii) (a) Sandy loam. (b) N.A. (iii) As per treatments.
(iv) (a) 1 raja plough-2 desi plough-2 planking. (b) and (c) N.A. (d) As per treatments. (e) N.A.

2. TREATMENTS:
Main-plot treatments:
3 dates of planting: D₁ = 15.6.1953, D₂ = 5.7.1953 and D₃ = 25.7.1953.
Sub-plot treatments:
All combinations of (1) and (2)
(1) 3 levels of N as A/S: N₀ = 0, N₁ = 40, and N₂ = 80 lb./ac.
(2) 3 levels of P₂₀ as Super: P₀ = 0, P₁ = 40 and P₂ = 80 lb./ac.
Sub-sub-plot treatments:
3 spacings: S₁ = 6' x 6", S₂ = 9' x 9" and S₃ = 12' x 12".

3. DESIGN:
(i) Split-Split-plot. (ii) (a) 3 main-plots/block; 9 sub-plots/main-plot. and 3 sub-sub-plots/sub-plot.
(b) N.A. (iii) 3. (iv) (a) sub-plot 25' x 62'. (b) sub-sub-plot 6' x 60'. (v) N.A. (vi) Yes.

4. GENERAL:
(i) Normal. No lodging. (ii) Nil. (iii) Grain yield. (iv) (a) 1951 to 1954. (b) No. (c) Nil. (v) (a) No. (b)—. (vi) and (vii) Nil.
5. RESULTS:

(i) 1177 lb./ac.
(ii) (a) 727.0 lb./ac.,
   (b) 151.3 lb./ac.,
   (c) 160.9 lb./ac.
(iv) Av. yield of grain in lb./ac.

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<td></td>
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</tr>
<tr>
<td>P1</td>
<td>931</td>
<td>1222</td>
<td>1388</td>
<td></td>
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<tr>
<td>P2</td>
<td>888</td>
<td>1325</td>
<td>1400</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

S.E. of marginal-mean of N or P = 16.8 lb./ac.
S.E. of body of table N×P = 29.1 lb./ac.
S.E. of difference of two
1. D marginal means = 14.3 lb./ac.
2. S marginal means = 25.3 lb./ac.
3. N or P means at the same level of D = 41.2 lb./ac.
4. D means at the same level of N or P = 119.1 lb./ac.
5. S means at the same level of D = 43.8 lb./ac.
6. D means at the same level of S = 119.7 lb./ac.
7. S means at the same level of N or P = 43.8 lb./ac.
8. N or P means at the same level of S = 42.9 lb./ac.

Crop: Wheat.
Site: Distt. and Demonstration Farm, Ambala.
Object: To study the effect of different sources of N on yield of Wheat.

1. BASAL CONDITIONS:
(i) (a) Nil. (b) N.A. (c) Nil.; (ii) (a) Hard clay. (b) N.A.; (iii) 4.11.1948. (iv) (a) and (b) N.A. (v) 35 sr./ac. (d) and (e) N.A. (v) Nil. (vi) C. 591 (medium). (vii) Irrigated. (viii) Nil. (ix) 7.68". (x) 20.4.1949.

2. TREATMENTS:
1. Control.
2. 30 lb./ac. of N as F.Y.M.
3. 30 lb./ac. of N as A/S.
4. 30 lb./ac. of N as Ammo. Phos.
5. 60 lb./ac. of N as F.Y.M.
6. 60 lb./ac. of N as A/S.
7. 60 lb./ac. of N as Ammo. Phos.
8. 30 lb./ac. of N as F.Y.M. + 30 lb./ac. of N as A/S.
9. 30 lb./ac. of N as F.Y.M. + 30 lb./ac. of N as Ammo. Phos.

Ref: Pb. 48 (42). Type: 'M'.
3. DESIGN:
   (i) R.B.D. (ii) (a) 9. (b) N.A. (iii) 4. (iv) (a) and (b) 11' x 99'. (v) Nil. (vi) Yes.

4. GENERAL:
   (i) Fair to good. No lodging. (ii) Nil. (iii) Grain and straw yield. (iv) (a) 1948 to 1949. (b) No (c) -. (v) (a) No. (b) -. (vi) and (vii) Nil.

5. RESULTS:
   (i) 1509 lb./ac.
   (ii) 187.7 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>1254</td>
</tr>
<tr>
<td>2.</td>
<td>1382</td>
</tr>
<tr>
<td>3.</td>
<td>1554</td>
</tr>
<tr>
<td>4.</td>
<td>1666</td>
</tr>
<tr>
<td>5.</td>
<td>1484</td>
</tr>
<tr>
<td>6.</td>
<td>1602</td>
</tr>
<tr>
<td>7.</td>
<td>1536</td>
</tr>
<tr>
<td>8.</td>
<td>1452</td>
</tr>
<tr>
<td>9.</td>
<td>1652</td>
</tr>
<tr>
<td>S.E./mean</td>
<td>= 93.9 lb./ac.</td>
</tr>
</tbody>
</table>

Crop :- Wheat.
Site :- Distt. and Demonstration Farm, Ambala.
Object :- To study effect of different sources of N on the yield of Wheat.

Ref :- Pb. 49(73).
Type :- ‘M’.

1. BASAL CONDITIONS:
   (i) (a) Nil. (b) N.A. (c) Nil. (ii) (a) Clayey loam. (b) N.A. (iii) 9.11.1949. (iv) (a) and (b) N.A. (c) 36 sr./ac. (d) and (e) N.A. (v) Nil. (vi) C-591 (medium). (vii) Irrigated. (viii) Hoeing on 21.1.1950. (ix) 5.33°. (x) 19.4.1950.

2. TREATMENTS:
   1. Control.
   2. 30 lb./ac. of N as F.Y.M.
   3. 30 lb./ac. of N as A/S.
   4. 30 lb./ac. of N as Ammo. Phos.
   5. 60 lb./ac. of N as F.Y.M.
   6. 60 lb./ac. of N as A/S.
   7. 60 lb./ac. of N as Ammo. Phos.
   8. 30 lb./ac. of N as F.Y.M. + 30 lb./ac. of N as A/S.
   9. 30 lb./ac. of N as F.Y.M + 30 lb./ac. of N as Ammo. Phos.

3. DESIGN:
   (i) R.B.D. (ii) (a) 9. (b) N.A. (iii) 4. (iv) (a) and (b) 20' x 60.5'. (v) Nil. (vi) Yes.

4. GENERAL:
   (i) Fair, no lodging. (ii) Nil. (iii) Grain and stalk yield. (iv) (a) 1948-49. (b) and (c) No. (v) (a) and (b) No. (vi) and (vii) Nil.

5. RESULTS:
   (i) 1768 lb./ac.
   (ii) 410.8 lb./ac.
   (iii) Treatments are not significantly different.
Crop: Wheat.  
Site: Distt. and Demonstration Farm, Ambala.  
Ref: Pb. 50(82).  
Type: 'M'.

Object: To find the best source of N for Wheat crop.

1. BASAL CONDITIONS:
   (i) (a) Nil. (b) Fallow. (c) Nil. (ii) (a) Hard clay. (b) N.A. (iii) 1.11.1950. (iv) (a) to (c) N.A.  
   (v) Nil. (vi) C-591 (medium). (vii) Irrigated. (viii) N.A. (ix) 2.88". (x) N.A.

2. TREATMENTS:
   All combinations of (1) and (2) + a Control.  
   (1) 3 sources of N: S1=F.Y.M., S2=A/S and S3=Ammo. Phos.  
   (2) 2 doses of N: M1=16 lb./ac and M2=25 lb./ac.

3. DESIGN:
   (i) R.B.D.  
   (ii) (a) 7. (b) N.A. (iii) 6. (iv) (a) and (b) 1/60th ac. (v) Nil. (vi) Yes.

4. GENERAL:
   (i) Fair. No lodging. (ii) Nil. (iii) Grain yield. (iv) (a) Not contd. (b) and (c) No. (v) (a) and (b) No. (vi) and (vii) Nil.

5. RESULTS:
   (i) 885.1 lb./ac.  
   (ii) 148.0 lb./ac.  
   (iii) S effect is highly significant while other effects are not significant.  
   (iv) Av. yield of grain in lb./ac.

   Control=825.4 lb./ac.

   \[
   \begin{array}{ccc}
   & M_1 & M_2 \\
   S_1 & 726.4 & 768.9 \\
   S_2 & 973.3 & 1019.6 \\
   S_3 & 910.3 & 972.0 \\
   \hline
   \text{Mean} & 870.0 & 920.2 \\
   \end{array}
   \]

   Mean 895.1

   S.E. of marginal mean of S = 42.73 lb./ac.
   S.E. of marginal mean of M = 34.89 lb./ac.
   S.E. of body of table = 60.44 lb./ac.
Crop :- Wheat.  
Site :- Distt. and Demonstration Farm, Ambala.  
Object :- To find the best source of N for Wheat crop.

1. BASAL CONDITIONS:
   (i) (a) Nil. (b) Fallow. (c) Nil. (ii) (a) Very hard clay. (b) N.A. (iii) 2.11.1952. (iv) (a) to (e) N.A. (v) Nil. (vi) C-591 (medium). (vii) Irrigated. (viii) N.A. (ix) 14.2. (x) 11.4.1953.

2. TREATMENTS:
   All combinations of (1) and (2) + a Control.
   (1) 3 sources of N : S1=F.Y.M., S2=A/S and S3=Ammo. Phos.
   (2) 2 doses of N : M1=16 lb./ac. and M2=25 lb./ac.

3. DESIGN:
   (i) R.B.D. (ii) (a) 7. (b) N.A. (iii) 6. (iv) (a) and (b) 11'x66'. (v) Nil. (vi) Yes.

4. GENERAL:
   (i) Fair. No lodging. (ii) Nil. (iii) Grain & straw yield. (iv) (a) 1952—1953. (b) No. (c)—. (v) (a) No. (b)—. (vi) and (vii) Nil.

5. RESULTS:
   (i) 1850 lb./ac.
   (ii) 532.3 lb./ac.
   (iii) All the effects are highly significant.
   (iv) Av. yield of grain in lb./ac.

   Control =1490 lb./ac.

<table>
<thead>
<tr>
<th></th>
<th>M1</th>
<th>M2</th>
<th>Mean</th>
</tr>
</thead>
<tbody>
<tr>
<td>S1</td>
<td>1518</td>
<td>1615</td>
<td>1566</td>
</tr>
<tr>
<td>S2</td>
<td>1781</td>
<td>1765</td>
<td>1773</td>
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<tr>
<td>S3</td>
<td>1453</td>
<td>3330</td>
<td>2392</td>
</tr>
<tr>
<td>Mean</td>
<td>1584</td>
<td>2237</td>
<td>1910</td>
</tr>
</tbody>
</table>

S.E. of marginal mean of S =153.7 lb./ac.
S.E. of marginal mean of M =125.5 lb./ac.
S.E. of body of table =217.3 lb./ac.

---

Crop :- Wheat.
Site :- Distt. and Demonstration Farm, Ambala.
Object :- To find the best source of N for Wheat.

1 BASAL CONDITIONS:
   (i) (a) Nil. (b) Fallow. (c) Nil. (ii) (a) Clay. (b) N.A. (iii) 6.11.1953. (iv) (a) to (e) N.A. (v) Nil. (vi) C-591 (medium). (vii) Irrigated. (viii) N.A. (ix) 6.95. (x) 26.4.1954.

2. TREATMENTS:
   All combinations of (1) and (2)+a Control.
   (1) 3 sources of N : S1=F.Y.M., S2=A/S and S3=Ammo. Phos.
   (2) 2 doses of N : M1=16 lb. and M2=25 lb./ac.

3. DESIGN:
   (i) R.B.D. (ii) (a) 7. (b) N.A. (iii) 6. (iv) (a) 11'x66'. (b) 11'x66'. (v) Nil. (vi) Yes.
4. GENERAL:
(i) Fair. No lodging. (ii) N.A. (iii) Grain and straw yield. (iv) (a) 1952-1953. (b) N.o. (c) —. (v) (a) No. (b) —. (vi) and (vii) Nil.

5. RESULTS:
(i) 2330 lb./ac.
(ii) 661.1 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>Mean</th>
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<td>2291</td>
<td>2362</td>
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<td>S₂</td>
<td>2349</td>
<td>2345</td>
<td>2347</td>
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<tr>
<td>S₃</td>
<td>2271</td>
<td>2318</td>
<td>2294</td>
</tr>
<tr>
<td>Mean</td>
<td>2351</td>
<td>2318</td>
<td>2334</td>
</tr>
</tbody>
</table>

S.E. of marginal mean of S = 190.1 lb./ac.
S.E. of marginal mean of M = 153.8 lb./ac.
S.E. of body of table = 269.9 lb./ac.

**Crop**: Wheat.
**Site**: Distt. and Demonstration Farm, Ambala.
**Object**: To study the suitability of C/N in comparison with A/S for Wheat.

1. BASAL CONDITIONS:
(i) (a) Nil. (b) Fallow. (c) Nil. (d) (a) Clayey. (b) N.A. (c) 22.12.1953. (iv) (a) to (e) N.A. (v) Nil. (vi) C—591 (medium). (vii) Irrigated. (viii) N.A. (ix) 6.95°. (x) 4.5.1954.

2. TREATMENTS:
All combinations of (1) and (2)+a Control (no manure)
(1) Two sources of 40 lb./ac. of N : N₁=A/S and N₂=C/N₂.
(2) Two doses of P₂O₅ as Super : P₀=0 and P₁=20 lb./ac.

3. DESIGN:
(i) R.B.D. (ii) (a) 5. (b) N.A. (iii) 4. (iv) (a) N.A. (b) 1/24th ac. (v) N.A. (vi) Yes.

4. GENERAL:
(i) No lodging. (ii) N.A. (iii) Grain and straw yield. (iv) (a) Not contd. (b) —. (c) —. (v) (a) No. (b) —. (vi) and (vii) Nil.

5. RESULTS:
(i) 1552 lb./ac.
(ii) 311.2 lb./ac.
(iii) Only 'Control vs other treatments' effect is significant.
(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>Control</td>
<td>1,173</td>
</tr>
<tr>
<td>P₀</td>
<td>1,660</td>
</tr>
<tr>
<td>P₁</td>
<td>1,717</td>
</tr>
<tr>
<td>Mean</td>
<td>1,688</td>
</tr>
</tbody>
</table>

S.E. of any marginal mean = 110.0 lb./ac.
S.E. of body of table = 155.6 lb./ac.

Crop: Wheat (Rabi).
Site: Oilseed Sub-Stn., Gummar.

Object: To study the effect of application of fertilizers on yield of Wheat.

1. BASAL CONDITIONS:
   (i) (a) Nil. (b) Maize. (c) Nil. (ii) (a) Clayey loam. (b) N.A. (iii) N.A. (iv) (a) N.A. (b) Broadcast.
   (c) 35 sr./ac. (d) and (e) —. (v) Nil. (vi) C—250 (medium). (vii) Unirrigated. (viii) Nil. (ix) 14.02".
   (x) N.A.

2. TREATMENTS:
   1. Control (no manure).
   2. 24 lb./ac. of N as A/S.
   3. 30 lb./ac. of N as A/S and 30 lb./ac. of P₂O₅ as Super.
   4. 24 lb./ac. of N and 30 lb./ac. of P₂O₅ as Ammo. Phos.

3. DESIGN:
   (i) R.B.D. (ii) (a) 5. (b) N.A. (iii) 4. (iv) (a) and (b) 1/46th ac., 2/85th ac., 1/45th ac., and 1/48th ac. for each replication (v) Nil. (vi) Yes.

4. GENERAL
   (i) Yes. (ii) Nil. (iii) Grain yield. (iv) (a) Not contd. (b) —. (c) —. (v) (a) No. (b) —. (vi) and (vii) Nil.

5. RESULTS
   (i) 648.4 lb./ac.
   (ii) 167.08 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 (lb./ac.)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>560.5</td>
</tr>
<tr>
<td>2.</td>
<td>653.0</td>
</tr>
<tr>
<td>3.</td>
<td>648.3</td>
</tr>
<tr>
<td>4.</td>
<td>803.6</td>
</tr>
<tr>
<td>5.</td>
<td>576.8</td>
</tr>
<tr>
<td>S.E./mean</td>
<td>83.54</td>
</tr>
</tbody>
</table>
Crop : Wheat (Rabi).

Site : Oilseed Sub-Stn., Gummar.

Object :—To study the effect of A/S and Super on yield of Wheat.

1. BASAL CONDITIONS:
   (i) (a) Nil. (b) Maize. (c) Nil. (ii) (a) Clayey loam. (b) N.A. (iii) 5.11.1950. (iv) (a) N.A. (b) Broadcast. (c) 35 sr./ac. (d) and (e)—. (v) Nil. (vi) C-250 (medium). (vii) Unirrigated. (viii) One weeding. (ix) 10.14" approx. (x) 2 and 3.5.1951.

2. TREATMENTS:
   All combinations of (1) and (2)
   (1) 2 levels of N : N₀ = 0 and N₁ = 25 lb./ac.
   (2) 2 levels of P₂O₅ : P₀ = 0 and P₁ = 32 lb./ac.
   N as A/S applied on 20.1.1951 while P₂O₅ as Super applied at sowing.

3. DESIGN:
   (i) Fact. in R.B.D. (ii) (a) 4. (b) N.A. (iii) 4. (iv) (a) and (b) 1/169th of an ac. (v) Nil. (vi) Yes.

4. GENERAL:
   (i) Germination and condition normal. No lodging. (ii) Nil. (iii) Grain yield. (iv) (a) Not contd. (b)—. (c)—. (v) (a) No. (b)—. (vi) and (vii) Nil.

5. RESULTS:
   (i) 1081 lb./ac.
   (ii) 144.6 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>
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</tr>
</thead>
<tbody>
<tr>
<td>N₀</td>
<td>967</td>
<td>1104</td>
<td>1036</td>
</tr>
<tr>
<td>N₁</td>
<td>1139</td>
<td>1123</td>
<td>1127</td>
</tr>
<tr>
<td>Mean</td>
<td>1049</td>
<td>1114</td>
<td>1081</td>
</tr>
</tbody>
</table>

S.E. of any marginal mean = 51.1 lb./ac.
S.E. of body of table = 72.3 lb./ac.

---

Crop : Wheat (Rabi).

Site : Oilseed Sub-Stn., Gummar.

Object :—To study the effect of method of application of A/S and Super on yield of Wheat.

1. BASAL CONDITIONS:
   (i) (a) Nil. (b) Maize. (c) Nil. (ii) (a) Clayey loam. (b) N.A. (iii) 7.11.1951. (iv) (a) N.A. (b) Broadcast. (c) 35 sr./ac. (d) and (e)—. (v) Nil. (vi) C-250 (medium). (vii) Unirrigated. (viii) N.A. (ix) 11.49" approx. (x) N.A.

2. TREATMENTS:
   1. Control (no manure).
   2. 25 lb./ac. of N as A/S + 25 lb./ac. of P₂O₅ as Super—broadcast.
   3. 25 lb./ac. of N as A/S + 25 lb./ac. of P₂O₅ as Super—depth application.
   4. 25 lb./ac. of N as A/S—broadcast.
   5. 25 lb./ac. of P₂O₅ as Super—broadcast.
   6. 25 lb./ac. of P₂O₅ as Super—depth application.

3. DESIGN:
   (i) R.B.D. (ii) (a) 6. (b) N.A. (iii) 4. (iv) (a) and (b) 1/169th of an ac. (v) Nil. (vi) Yes.
4. GENERAL:
(i) Germination good, condition very poor. No lodging. (ii) Nil. (iii) Grain yield. (iv) (a) Not contd. (b)—. (c)—. (v) (a) No. (b)—. (vi) and (vii) Nil.

5. RESULTS:
(i) 577.2 lb./ac.
(ii) 67.10 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>375.4</td>
</tr>
<tr>
<td>2</td>
<td>788.4</td>
</tr>
<tr>
<td>3</td>
<td>746.2</td>
</tr>
<tr>
<td>4</td>
<td>750.9</td>
</tr>
<tr>
<td>5</td>
<td>384.8</td>
</tr>
<tr>
<td>6</td>
<td>417.7</td>
</tr>
<tr>
<td>S.E./mean</td>
<td>35.55 lb./ac.</td>
</tr>
</tbody>
</table>

Crop: Wheat (Rabi).  
Site: Oilseed Sub- Stn., Gummar.  
Ref: Pb. 51(143).  
Type: 'M'.

Object: To study the effect of application of lime on yield of Wheat when applied alone and with A/S and C/N.

1. BASAL CONDITIONS:
(i) (a) Nil. (b) Maize. (c) Nil. (ii) (a) Clayey loam. (b) N.A. (iii) 19.11.1951. (iv) (a) N.A. (b) Broadcast. (c) 35 sr./ac. (d) and (e)—. (v) Nil. (vi) C–250 (medium). (vii) Rainfed. (viii) N.A. (ix) 11.49° approx. (x) 2.5.1952.

2. TREATMENTS:
All combinations of (1) and (2)
(1) 2 levels of lime: $L_0=0$ and $L_1=200$ lb./ac.
(2) 3 applications of $N$: $N_0=0$, $N_1=20$ lb./ac. of N as A/S and $N_2=20$ lb./ac. of N as C/N.

3. DESIGN:
(i) Fact. in R.B.D. (ii) (a) 6. (b) N.A. (iii) 4. (iv) (a) and (b) 1/138th ac. (v) Nil. (vi) Yes.

4. GENERAL:
(i) Good. No lodging. (ii) Nil. (iii) Grain yield. (iv) (a) Not contd. (b)—. (c)—. (v) (a) No. (b)—. (vi) and (vii) Nil.

5. RESULTS:
(i) 533.0 lb./ac.
(ii) 100.45 lb./ac.
(iii) N effect is significant while others are not significant.
(iv) Av. yield of grain in lb./ac.

<table>
<thead>
<tr>
<th></th>
<th>$L_0$</th>
<th>$L_1$</th>
<th>Mean</th>
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<tr>
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<td>417.0</td>
<td>474.6</td>
<td>445.8</td>
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<tr>
<td>$N_1$</td>
<td>585.5</td>
<td>563.3</td>
<td>574.4</td>
</tr>
<tr>
<td>$N_2$</td>
<td>603.3</td>
<td>554.5</td>
<td>578.9</td>
</tr>
<tr>
<td>Mean</td>
<td>535.3</td>
<td>530.8</td>
<td>533.0</td>
</tr>
</tbody>
</table>

S.E. of marginal mean of $N$ = 35.51 lb./ac.
S.E. of marginal mean of $L$ = 29.00 lb./ac.
S.E. of body of table = 50.22 lb./ac.
Crop :- Wheat (Rabi).
Site :- Oilseed Sub-Stn., Gummar.

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

1. BASAL CONDITIONS :
   (i) (a) Nil. (b) Fallow. (c) Nil. (ii) (a) Clayey loam. (b) N.A. (iii) 6.12.1952. (iv) (a) N.A. (b) Broadcast.
   (c) 38 sr./ac. (d) and (e) —. (v) Nil. (vi) C-250 (medium). (vii) Unirrigated. (viii) N.A. (ix) 14.00" approx. (x) 7.5.1953.

2. TREATMENTS :
   1. Control (no manure).
   2. 20 lb./ac. of N as A/S by broadcast at sowing.
   3. 20 lb./ac. of N as A/S in contract with seed.
   4. 20 lb./ac. of N as A/S applied 1" below seed.

3. DESIGN :
   (i) R.B.D. (ii) (a) 4. (b) N.A. (iii) 4. (iv) (a) and (b) 6.0S'x60'. (v) Nil. (vi) Yes.

4. GENERAL :
   (i) Nil. (ii) Nil. (iii) Grain yield. (iv) (a) Not contd. (b) —. (c) —. (v) (a) No. (b) —. (vi) and (vii) Nil.

5. RESULTS :
   (i) 686.1 lb./ac.
   (ii) 85.54 lb./ac.
   (iii) Treatments are not significantly different.
   (iv) Av. yield of grain in lb./ac.
      Treatment       Av. yield
      1.             688.5
      2.             659.6
      3.             659.6
      4.             736.7
      S.E./mean    = 44.77 lb./ac.

---

Crop :- Wheat (Rabi).
Site :- Oilseed Sub-Stn., Gummar.

Object :- To study the effect of A/S and Super on yield of Wheat.

1. BASAL CONDITIONS :
   (i) (a) Nil. (b) Fallow. (c) Nil. (ii) (a) Clayey loam. (b) N.A. (iii) 6/7.12.1952. (iv) (a) N.A. (b) Sown in lines.
   (c) 5 chhks/plot. (d) and (e) N.A. (v) Nil. (vi) C—250 (medium). (vii) Unirrigated. (viii) N.A. (ix) 19.13" approx. (x) 7.5.1953.

2. TREATMENTS :
   1. Control (no manure).
   2. 20 lb./ac. of N as A/S by broadcast.
   3. 20 lb./ac. of P\textsubscript{2}O\textsubscript{5} as Super by broadcast.
   4. 20 lb./ac. of P\textsubscript{2}O\textsubscript{5} as Super by kerz.

3. DESIGN :
   (i) R.B.D. (ii) (a) 4. (b) N.A. (iii) 4. (iv) (a) and (b) 32'x11'—3'. (v) Nil. (vi) Yes.

4. GENERAL :
   (i) N.A. (ii) Nil. (iii) Grain yield. (iv) (a) Not contd. (b) —. (c) —. (v) (a) No. (b) —. (vi) and (vii) Nil.
5. RESULTS:
(i) 818.3 lb./ac.
(ii) 168.92 lb./ac.
(iii) Treatments not significantly different.
(iv) Av. yield of grain in lb./ac.

<table>
<thead>
<tr>
<th>Treatments</th>
<th>Av. yield</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>722.4</td>
</tr>
<tr>
<td>2.</td>
<td>819.2</td>
</tr>
<tr>
<td>3.</td>
<td>815.5</td>
</tr>
<tr>
<td>4.</td>
<td>916.0</td>
</tr>
<tr>
<td>S.E./mean</td>
<td>=84.46 lb./ac.</td>
</tr>
</tbody>
</table>

Crop: Wheat (Rabi)
Site: Oilseed Sub-Stn., Gummar.

Object: To study the effect of time of application of A/S on yield of Wheat.

1. BASAL CONDITIONS:
(i) (a) Nil. (b) Maize. (c) Nil. (ii) (a) Clayey loam. (b) N.A. (iii) 13.11.1953. (iv) (a) N.A. (b) Line sown. (c) 35 sr./ac. (d) 9\" row to row. (e) N.A. (v) Nil. (vi) C—259 (medium). (vii) Unirrigated. (viii) N.A. (ix) 19.13' approx. (x) 24.4.1954.

2. TREATMENTS:
1. Control.
2. 20 lb./ac. of N as A/S applied below seed on 13.11.1953.
3. 20 lb./ac. of N as A/S applied in contact with seed on 13.11.1953.
4. 20 lb./ac. of N as A/S broadcast before sowing on 13.11.1953.
5. 20 lb./ac. of N as A/S broadcast with 1st shower of rain on 28.12.1953.

3. DESIGN:
(i) R.B.D. (ii) (a) 5. (b) N.A. (iii) 4. (iv) (a) and (b) 33\'×16\' =1/30th ac. (v) Nil. (vi) Yes.

4. GENERAL:
(i) Germination normal, condition and stand good. No lodging. (ii) Nil. (iii) Grain yield and straw weight.
(iv) (a) Not contd. (b) —. (c) —. (v) (a) No. (b) —. (vi) and (vii) Nil.

5. RESULTS:
(i) 749.8 lb./ac.
(ii) 104.61 lb./ac.
(iii) Treatments 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>619.7</td>
</tr>
<tr>
<td>2.</td>
<td>833.1</td>
</tr>
<tr>
<td>3.</td>
<td>786.9</td>
</tr>
<tr>
<td>4.</td>
<td>735.4</td>
</tr>
<tr>
<td>5.</td>
<td>774.0</td>
</tr>
<tr>
<td>S.E./mean</td>
<td>=52.31 lb./ac.</td>
</tr>
</tbody>
</table>
Crop: Wheat (Rabi).  
Site: Oilseed Sub-Stn., Gummar. 
Ref: Pb. 53(270).  
Object: To study the effect of method of application of A/S with and without Super.

1. BASAL CONDITIONS:
   (i) (a) Nil. (b) Fallow. (c) Nil. (ii) (a) Clayey loam. (b) N.A. (iii) 13.11.1953. (iv) (a) N.A. (b) Sown in lines. (c) 38 sr./ac. (d) 9” row and row. (e) N.A. (vi) C-230 (medium). (vii) Unirrigated. (viii) One weeding. (ix) 19.13° approx. (x) 24.4.1954.

2. TREATMENTS:
   All combinations of (1) and (2)
   (1) 3 doses of N: N₀ = 0, N₁ = 30 lb/ac. of N as A/S applied below seed and N₂ = 30 lb/ac. as C/N drilled below seed.
   (2) 2 doses of P₂O₅ as Super: P₀ = 0 and P₁ = 30 lb/ac. A/S applied on 13.11.1953 and Super before sowing.

3. DESIGN:
   (i) Fact. in R.B.D. (ii) (a) 6. (b) N.A. (iii) 4. (iv) (a) and (b) 33”x16½” = 1/10th of an ac. (v) Nil. (vi) Yes.

4. GENERAL:
   (i) Normal. No lodging. (ii) Nil (iii) Grain yield and straw weight. (iv) (a) Not contd. (b) —. (c) —. (v) (a) No. (b) —. (vi) and (vii) Nil.

5. RESULTS:
   (i) 850.4 lb/ac.
   (ii) 138.96 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>699.4</td>
<td>871.7</td>
<td>946.3</td>
<td>839.1</td>
</tr>
<tr>
<td>P₁</td>
<td>812.6</td>
<td>941.1</td>
<td>879.4</td>
<td>877.7</td>
</tr>
<tr>
<td>Mean</td>
<td>756.0</td>
<td>906.4</td>
<td>912.9</td>
<td>858.4</td>
</tr>
</tbody>
</table>

   S.E. of marginal mean of P = 40.11 lb/ac.
   S.E. of marginal mean of N = 49.13 lb/ac.
   S.E. of body of table = 69.48 lb/ac.

Crop: Wheat (Rabi).  
Site: Oilseed Sub-Stn. Gummar. 
Ref: Pb. 53(271). 
Object: To study the effect of application of A/S and Super on yield of Wheat.

1. BASAL CONDITIONS:
   (i) (a) Nil. (b) Fallow. (c) Nil. (ii) (a) Clayey loam. (b) N.A. (iii) 13.11.1953. (iv) (a) N.A. (b) Sown in line. (c) 38 sr./ac. (d) 2” row to row. (e) N.A. (vi) Nil. (vii) C-250 (medium). (viii) Unirrigated. (ix) N/A. (x) 12.13°. (x) 23.4.1954.

2. TREATMENTS:
   1. Control (no manure).
   2. 20 lb/ac. of N of A/S.
   3. 20 lb/ac. of P₂O₅ as Super.
3. DESIGN:
(i) R.B.D. (ii) 3. (b) N.A. (iii) 4. (iv) (a) and (b) 33' x 164' (v) Nil. (vi) Yes.

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

5. RESULTS:
(i) 734.6 lb./ac.
(ii) 71.73 lb./ac.
(iii) Treatments are significantly different.
(iv) Av. yield of grain in lb./ac.

<table>
<thead>
<tr>
<th>Treatment</th>
<th>Av. yield</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>637.7</td>
</tr>
<tr>
<td>2.</td>
<td>812.6</td>
</tr>
<tr>
<td>3.</td>
<td>753.4</td>
</tr>
<tr>
<td>S.E./mean</td>
<td>35.87 lb./ac.</td>
</tr>
</tbody>
</table>

Object:—To study the effect of application of A/S and Super on yield of Wheat.

1. BASAL CONDITIONS:
(i) (a) Nil. (b) Fallow. (c) Nil. (ii) (a) Clayey loam. (b) N.A. (iii) 31.11.1953. (iv) (a) N.A. (b) Broadcast. (c) 35-38 sr./ac. (d) and (e) →. (v) Nil. (vi) C-250 (medium). (vii) Unirrigated. (viii) N.A. (ix) 19.13* approx. (x) 24.5.1954.

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_1 = 0 and P_2 = 20 lb./ac.

3. DESIGN:
(i) Fact. in R.B.D. (ii) 4. (b) N.A. (iii) 4. (iv) (a) and (b) 1/100th of an ac. (v) Nil. (vi) Yes.

4. GENERAL:
(i) Normal. No lodging. (ii) Nil. (iii) Grain yield and straw weight. (iv) (a) No. (b) and (c) No. (v) (a) and (b) No. (vi) and (vii) Nil.

5. RESULTS:
(i) 805.2 lb./ac.
(ii) 111.2 lb./ac.
(iii) None of the effects is significant.
(iv) Av. yield of grain in lb./ac.

<table>
<thead>
<tr>
<th>P_0</th>
<th>P_1</th>
<th>Mean</th>
</tr>
</thead>
<tbody>
<tr>
<td>N_0</td>
<td>845.4</td>
<td>777.9</td>
</tr>
<tr>
<td>N_1</td>
<td>739.3</td>
<td>858.2</td>
</tr>
<tr>
<td>Mean</td>
<td>792.4</td>
<td>818.1</td>
</tr>
</tbody>
</table>

S.E. of any marginal mean = 39.30 lb./ac.
S.E. of body of table = 55.58 lb./ac.
Crop: Wheat.  
Site: Barley Res. Farm, Gurgaon.  
Object: To assess the value of N and P$_2$O$_5$ fertilizers in relation to grain yield.

1. BASAL CONDITIONS:
   (i) (a) Not followed. (b) Guara (green manure). (c) Nil.  
   (ii) (a) Sandy loam. (b) N.A. (iii) 10.11.1952.  
   (iv) (a) hindustan plough and 4 desi ploughs. (b) Pore. (c) 1 md./ac. (d) 6’ row to row. (e) —,  
   (v) Guara green manure. (vi) C-281 (early). (vii) Irrigated. (viii) 2 hoeings and one weeding. (x) 2.27”,  
   (x) 6.4.1953.

2. TREATMENTS:
   All combinations of (1) and (2).  
   (1) 3 levels of N as A/S: N$_0$=0, N$_1$=25 and N$_2$=50 lb./ac.  
   (2) 3 levels of P$_2$O$_5$ as Super: P$_0$=0, P$_1$=25 and P$_2$=50 lb./ac.  
   Super drilled along with seed and A/S added at the time of first irrigation.

3. DESIGN:
   (i) Fact. in R.B.D. (ii) 9. (b) N.A. (iii) 6. (iv) (a) 12’×66’. (b) 11’×64’. (v) Two rows on each side of  
   the plot kept as border. (vi) Yes.

4. GENERAL:
   (i) Stand of crop good. No lodging. (ii) Nil. (iii) Height, ear length, no. of grains/ear and grain weight.  
   (iv) (a) 1952–54. (b) No. (c) Nil. (v) (a) and (b) No. (vi) and (vii) Nil.

5. RESULTS:
   (i) 152 lb./ac.  
   (ii) 132.4 lb./ac.  
   (iii) N effect is highly significant. P effect is significant while interaction is not significant.  
   (iv) Av. yield of grain in lb./ac.

<table>
<thead>
<tr>
<th></th>
<th>P$_0$</th>
<th>P$_1$</th>
<th>P$_2$</th>
<th>Mean</th>
</tr>
</thead>
<tbody>
<tr>
<td>N$_0$</td>
<td>1191</td>
<td>1285</td>
<td>1386</td>
<td>1287</td>
</tr>
<tr>
<td>N$_1$</td>
<td>1501</td>
<td>1557</td>
<td>1600</td>
<td>1553</td>
</tr>
<tr>
<td>N$_2$</td>
<td>1724</td>
<td>1701</td>
<td>1781</td>
<td>1735</td>
</tr>
<tr>
<td>Mean</td>
<td>1472</td>
<td>1514</td>
<td>1558</td>
<td>1525</td>
</tr>
</tbody>
</table>

S.E. of marginal mean = 31.2 lb./ac.  
S.E. of body of table = 54.1 lb./ac.
3. DESIGN:
(i) Fact. in R.B.D. (ii) (a) 9. (b) N.A. (iii) 4. (iv) (a) 1/9th ac. (b) 40.3' x 9'. (v) One row on each side of
the plot kept as border. (vi) Yes.

4. GENERAL:
(i) Stand of crop good. No lodging. (ii) Nil. (iii) Height, ear length, no. of grains per ear and grain
weight. (iv) (a) 1952 to 1954. (b) No. (c) Nil. (v) (a) Nil. (b) —. (vi) Heavy showers of rain were
received on 5th, 20th and 21st Feb. 1951. (vii) Nil.

5. RESULTS:
(i) 935.6 lb./ac.
(ii) 143.4 lb./ac.
(iii) Only N effect is significant while other effects are not significant.
(iv) Av. yield of grain in lb./ac.

<table>
<thead>
<tr>
<th></th>
<th>P₀</th>
<th>P₁</th>
<th>P₂</th>
<th>Mean</th>
</tr>
</thead>
<tbody>
<tr>
<td>N₀</td>
<td>894.9</td>
<td>763.7</td>
<td>933.4</td>
<td>864.0</td>
</tr>
<tr>
<td>N₁</td>
<td>864.0</td>
<td>568.1</td>
<td>891.0</td>
<td>907.7</td>
</tr>
<tr>
<td>N₂</td>
<td>1064.6</td>
<td>1086.9</td>
<td>983.6</td>
<td>1035.0</td>
</tr>
<tr>
<td>Mean</td>
<td>941.2</td>
<td>929.6</td>
<td>936.0</td>
<td>935.6</td>
</tr>
</tbody>
</table>

S.E. for any marginal mean = 41.41 lb./ac.
S.E. of body of table = 71.72 lb./ac.

Crop :- Wheat.
Site :- Barley Res. Farm, Gurgaon.

Object :- To compare the effect of A/S and C/N on yield of Wheat.

Ref :- Pb. 53(7).
Type :- 'M'.

1. BASAL CONDITIONS:
(i) (a) Nil. (b) Guar (G.M.) (c) Nil. (i) (a) Sandy loam. (b) N.A. (iii) 22.11.1953. (iv) (a) One
kindsattan hoi ploughing and 4 desi hoi ploughing. (b) Pore. (c) 1 md./ac. (d) N.A. (e) —. (v) Nil.
(vi) C-281 (early). (vii) Irrigated. (viii) One weeding and two hoeings. (ix) 6.55°. (x) 15.4.1954.

2. TREATMENTS:
All combinations of (1) and (2)+a control.
(1) 2 doses of N: N₀=15 and N₂=30 lb./ac.
(2) 2 sources of N: S₁=A/S and S₂=C/N.
Fertilizers applied at the time of first irrigation.

3. DESIGN:
(i) R.B.D. (ii) (a) 5. (b) N.A. (iii) 4. (iv) (a) 1/9th ac. (b) 40.3' x 9'. (v) One row on each side of
the plot kept as border. (vi) Yes.

4. GENERAL:
(i) Stand of crop good. No lodging. (ii) Nil. (iii) Height, ear length, no. of grain per ear and grain
weight. (iv) (a) 1953 to 1954. (b) No. (c) —. (v) (a) Nil. (b) —. (vi) Heavy showers of rain
were received on 5th, 20th and 21st February. (vii) Nil.

5. RESULTS:
(i) 2153 lb./ac.
(ii) 266.7 lb./ac.
(iii) None of the effects is significant.
Crop :- Wheat.
Site :- Govt. Agri. Stn., Gurdaspur.
Object :- To study the effect of A/S and Ammo. Phos. on yield of Wheat.

1. BASAL CONDITIONS:
(i) (a) Nil. (b) Maize. (c) Nil. (ii) (a) Loam. (b) N.A. (iii) 6.11.1948. (iv) (a) 1 raja plough, 3 desi plough and 4 sohaga. (b) N.A. (c) 40 sr./ac. (d) 9" row to row. (e) N.A. (v) Nil. (vi) C—250 (medium). (vii) Irrigated. (viii) Nil. (ix) 5.337rrt(x) 29.4.1949.

2. TREATMENTS:
All combinations of (1) and (2) + a control (no manure),
(1) 2 levels of N : N1 =15 and N2 =30 lb./ac.
(2) 2 sources of N : S1 =A/S and S2 =Ammo. Phos.
Fertilizers were broadcast at sowing.

3. DESIGN:
(i) R.B.D. (ii) (a) 5. (b) N.A. (iii) 6. (iv) (a) 19.5'×61.5'. (b) 16.5'×52.8'. (v) About 4.5' along length and 1.5' along breadth. (vi) Yes.

4. GENERAL:
(i) Germination and growth satisfactory in Ammo. Phos. plots and poor in control and N1S1 plots. No lodging. (ii) Nil. (iii) Grain yield. (iv) (a) 1948—1951. (b) No. (c) Nil. (v) (a) No. (b) —. (vi) and (vii) Nil.

5. RESULTS:
(i) 1207 lb./ac.
(ii) 156.7 lb./ac.
(iii) Main effects of S, control vs. others and interaction N×S are highly significant while N effect is not significant.
(iv) Av. yield of grain in lb./ac.

<table>
<thead>
<tr>
<th>Control</th>
<th>N1</th>
<th>N2</th>
<th>Mean</th>
</tr>
</thead>
<tbody>
<tr>
<td>S1</td>
<td>1183</td>
<td>1030</td>
<td>1107</td>
</tr>
<tr>
<td>S2</td>
<td>1280</td>
<td>1555</td>
<td>1418</td>
</tr>
<tr>
<td>Mean</td>
<td>1232</td>
<td>1293</td>
<td>1263</td>
</tr>
</tbody>
</table>

S.E. for any marginal mean = 45.2 lb./ac.
S.E. of body of table = 64.0 lb./ac.

---

(iv) Av. yield of grain in lb./ac.
Crop :- Wheat (Rabi).
Site :- Govt. Agri. Stn., Gurdaspur.
Object :- To study the effect of A/S and Ammo. Phos. on yield of Wheat.

1. BASAL CONDITIONS:
   (i) (a) Nil. (b) Maize (Fodder). (c) Nil. (ii) (a) Loam. (b) N.A. (iii) 1.11.1949. (iv) (a) 1 hindustan 4 desi plough and 5 Sohaga (b) N.A. (c) 1 nd./ac. (d) 6' row to row. (e) N.A. (v) Nil. (vi) C—250 (medium). (vii) Unirrigated. (viii) Nil. (ix) 7.52'. (x) 9.5.1950.

2. TREATMENTS:
   All combinations of (1) and (2)+ a control (no manure).
   (1) 2 levels of N : $N_1=15$ and $N_2=30$ lb./ac.
   (2) 2 sources of N : $S_1=A/S$ and $S_2=Ammo. Phos.$

3. DESIGN:
   (i) R.B.D. (ii) 5. (b) N.A. (iii) 6. (iv) (a) 16'x72'. (b) 141'x59.4'. (v) N.A. (vi) Yes.

4. GENERAL:
   (i) Germination and growth satisfactory. No lodging. (ii) Nil. (iii) Grain yield. (iv) 1948–1951. (b) No. (c) Nil. (v) (a) No. (b) —. (vi) and (vii) Nil.

5. RESULTS:
   (i) 1948 lb./ac. (ii) 211.4 lb./ac.
   (iii) Only S effect is significant while other effects are not significant.
   (iv) Av. yield of grain in lb./ac.

<table>
<thead>
<tr>
<th>Control</th>
<th>N1</th>
<th>N2</th>
<th>Mean</th>
</tr>
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<tbody>
<tr>
<td>S1</td>
<td>1869</td>
<td>1905</td>
<td>1887</td>
</tr>
<tr>
<td>S2</td>
<td>2028</td>
<td>2113</td>
<td>2071</td>
</tr>
<tr>
<td>Mean</td>
<td>1949</td>
<td>2009</td>
<td>1979</td>
</tr>
</tbody>
</table>

S.E. of any marginal mean = 61.0 lb./ac.
S.E. of body of table = 86.3 lb./ac.

Crop :- Wheat (Rabi).
Site :- Govt. Agri. Stn., Gurdaspur.
Object :- To study effect of A/S and Ammo. Phos. on yield of Wheat.

1. BASAL CONDITIONS:
   (i) (a) Nil. (b) Maize. (c) Nil. (ii) (a) Loam. (b) N.A. (iii) 28.10.1950. (iv) 5 ploughings, 7 sohaga and 1 roller. (b) and (c) N.A. (d) 9" row to row. (e) N.A. (v) Nil. (vi) C-250 (medium). (vii) Unirrigated. (viii) One weeding and hoeing. (ix) 4.86'. (x) 23.4.1951.

2. TREATMENTS:
   All combinations of (1) and (2)+ a control (no manure).
   (1) 2 levels of N : $N_1=15$ and $N_2=30$ lb./ac.
   (2) 2 sources of N : $S_1=A/S$ and $S_2=Ammo. Phos.$

3. DESIGN:
   (i) R.B.D. (ii) 5. (b) N.A. (iii) 6. (iv) (a) 19.5'x60.0'. (b) 16.5'x52.8'. (v) N.A. (vi) Yes.
4. **GENERAL**:

(i) Germination satisfactory but growth below normal due to persistent drought. No lodging. (ii) Nil. (iii) Grain yield. (iv) (a) 1948 to 1951. (b) No. (c) Nil. (v) (a) No. (b)-- (vi) and (vii) Nil.

5. **RESULTS**:

(i) 620.6 lb/ac.
(ii) 90.45 lb/ac.
(iii) $N$ and control vs. others effects are highly significant while other effects are not significant.
(iv) Av. yield of grain in lb/ac.

<table>
<thead>
<tr>
<th>Control</th>
<th>N1</th>
<th>N2</th>
<th>Mean</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>1951</td>
<td>1955</td>
<td>1960</td>
</tr>
<tr>
<td>S1</td>
<td>610.7</td>
<td>702.3</td>
<td>656.5</td>
</tr>
<tr>
<td>S2</td>
<td>597.3</td>
<td>764.5</td>
<td>680.9</td>
</tr>
<tr>
<td>Mean</td>
<td>604.0</td>
<td>733.4</td>
<td>668.7</td>
</tr>
</tbody>
</table>

S.E. of any marginal mean = 26.11 lb/ac.
S.E. of body of table = 36.93 lb/ac.

**Crop**: Wheat (Rabi).
**Site**: Govt. Agri. Stn., Gurdaspur.
**Ref**: Pb. 51 (78).
**Type**: ‘M’.

Object: To study the effect of A/S and Ammo. Phos. on yield of Wheat.

1. **BASAL CONDITIONS**:

(i) (a) Nil. (b) Guara. (c) Nil. (ii) (a) Loam. (b) N.A. (iii) 4.11.1951. (iv) (a) 1 raja and 5 Desi hal, 6 sohage and 1 roller. (b) N.A. (c) One md./ac. (d) and (e) N.A. (v) Nil. (vi) C-250 (medium). (vii) Unirrigated. (viii) One weeding. (ix) 8.34”. (x) 28.4.1952.

2. **TREATMENTS**:

All combinations of (1) and (2)+a control
(1) 2 levels of N : N1 =15 and N2 =30 lb/ac.
(2) 2 sources of N: S1 =A/S and S2 =Ammo. Phos.

3. **DESIGN**:

(i) R.B.D. (ii) (a) 5. (b) N.A. (iii) 6. (iv) (a) 19.5’×60’. (b) 16.5’×52.8’. (v) N.A. (vi) Yes.

4. **GENERAL**:

(i) Germination and growth satisfactory. No lodging. (ii) Nil. (iii) Grain yield. (iv) (a) 1948 to 1951. (b) No. (c) Nil. (v) (a) Nil. (b)--. (vi) and (vii) Nil.

5. **RESULTS**:

(i) 1028 lb/ac.
(ii) 126.9 lb/ac.
(iii) Only effects due to N and control vs. others are highly significant.
(iv) Av. yield of grain in lb/ac.

<table>
<thead>
<tr>
<th>Control</th>
<th>N1</th>
<th>N2</th>
<th>Mean</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>1948</td>
<td>1976</td>
<td>1962</td>
</tr>
<tr>
<td>S1</td>
<td>955</td>
<td>1141</td>
<td>1048</td>
</tr>
<tr>
<td>S2</td>
<td>1012</td>
<td>1139</td>
<td>1076</td>
</tr>
<tr>
<td>Mean</td>
<td>984</td>
<td>1140</td>
<td>1062</td>
</tr>
</tbody>
</table>

S.E. of any marginal mean = 36.6 lb/ac.
S.E. of body of table = 51.8 lb/ac.
Crop: Wheat.  
Site: Govt. Agri. Stn., Gurdaspur.  
Ref.: Pb. 48(7).  
Type: ‘M’.

Object: - To find out the best source of N for Wheat crop.

1. BASAL CONDITIONS:
(i) (a) Nil. (b) Maize. (c) Nil. (ii) (a) Loam. (b) N.A. (iii) 13.11.1948. (iv) (a) One raja and 2 desi ploughings, 1 panjdan and 3 plankings. (b) N.A. (c) 3 sr./ac. (d) and (e) N.A. (v) Nil. (vi) C-591 (medium). (vii) Irrigated. (viii) Nil. (ix) 5.33’. (x) 28,29,4.1949.

2. TREATMENTS:
All combinations of (1) and (2)+ a control.
(1) 3 sources of N: S1=A/S, S2=Amm. Phos. and S3=F.Y.M.  
(2) 2 levels of N: N1=25 and N2=50 lb./ac.

3. DESIGN:
(i) R.B.D. (ii) 7. (b) N.A. (iii) 4. (iv) (a) and (b) 72’-7’ X 12’. (v) Nil. (vi) Yes.

4. GENERAL:
(i) Germination satisfactory. No lodging. (ii) Nil. (iii) Grain and straw yield. (iv) (a) 1948—1951. (b) No. (c) Nil. (v) (a) No. (b)—. (vi) Nil. (vii) Experiments after this year tried with different varieties using split-plot design and are under category ‘MV’. Ref. numbers are Pb. 49 (11), Pb. 50(12) and Pb. 51(74).

5. RESULTS:
(i) 2241 lb./ac.  
(ii) 166.8 lb./ac.  
(iii) S effect is highly significant while N effect and interaction S X N is significant.  
(iv) Av. yield of grain in lb./ac.  

<table>
<thead>
<tr>
<th></th>
<th>Control =2207 lb./ac.</th>
<th>S1</th>
<th>S2</th>
<th>S3</th>
<th>Mean</th>
</tr>
</thead>
<tbody>
<tr>
<td>N1</td>
<td>2358</td>
<td>2249</td>
<td>2324</td>
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<td>2330</td>
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<tr>
<td>N2</td>
<td>2104</td>
<td>1849</td>
<td>2535</td>
<td></td>
<td>2163</td>
</tr>
<tr>
<td>Mean</td>
<td>2231</td>
<td>2049</td>
<td>2459</td>
<td></td>
<td>2246</td>
</tr>
</tbody>
</table>

S.E. of marginal means of S =59.0 lb./ac.  
S.E. of marginal means of N =48.2 lb./ac.  
S.E. of body of table =83.4 lb./ac.

Crop: Wheat (Rabi).  
Site: Govt. Agri. Stn., Gurdaspur.  
Ref.: Pb. 49(6).  
Type: ‘M’.

Object: - To find out the best source of N for Wheat crop.

1. BASAL CONDITIONS:
(i) (a) Nil. (b) Guara. (c) Nil. (ii) (a) Loam. (b) N.A. (iii) 18.11.1949. (iv) (a) 2 raja and 4 desi ploughs, 4 sikh and 1 roller. (b) N.A. (c) One md./ac. (d) and (e) N.A. (v) Nil. (vi) C-591 (medium). (vii) Irrigated. (viii) One weeding. (ix) 7.52’. (x) 8.5.1950.

2. TREATMENTS:
All combinations of (1) and (2)+ a control (no manure).
(1) 3 sources of N : S1=A/S, S2=Amm. Phos. and S3=F.Y.M.  
(2) 2 levels of N : N1=25 and N2=50 lb./ac.  
3. DESIGN:
(i) R.B.D. (ii) (a) 7. (b) N.A. (iii) 4. (iv) (a) $15'\times 78'\times 2'$. (b) $13'\times 73'\times 4'$. (v) N.A. (vi) Yes.

4. GENERAL:
(i) Germination and growth satisfactory, No lodging. (ii) Nil. (iii) Grain yield (iv) (a) 1948—1951. (b) No. (c) Nil. (v) (a) N.A. (b) —. (vi) and (vii) Nil.

5. RESULTS:
(i) 2222 lb./ac. (ii) 2684 lb./ac. (iii) S effect is highly significant while control vs. others effect 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>N1</td>
<td>2110</td>
<td>2529</td>
<td>1904</td>
<td>2181</td>
</tr>
<tr>
<td>N2</td>
<td>2500</td>
<td>2769</td>
<td>1878</td>
<td>2382</td>
</tr>
<tr>
<td>Mean</td>
<td>2305</td>
<td>2649</td>
<td>1891</td>
<td>2262</td>
</tr>
</tbody>
</table>

S.E. of marginal mean of S = 94.9 lb./ac.
S.E. of marginal mean of N = 77.5 lb./ac.
S.E. of body of table = 134.2 lb./ac.

Crop: Wheat (Rabi).
Site: Govt. Agri. Stn., Gurdaspur.

Object: To find out the best source of N for wheat crop.

1. BASAL CONDITIONS:
(i) (a) Nil. (b) Maize (fodder). (c) Nil. (ii) (a) Loam. (b) N.A. (iii) 9/11:1950. (iv) (a) 1 reja and 4 desh plough and 6 sphaga. (b) N.A. (c) 36 sr./ac. (d) 9" row to row. (e) N.A. (f) Nil. (v) C-591 (medium). (vi) Irrigated. (vii) One weeding. (ix) $4.86'$: (x) 17.5:1951.

2. TREATMENTS:
All combinations of (1) × (2) + a control (no manure).
(1) 3 sources of N: $S_1=A/S$, $S_2=Ammo. Phos.$ and $S_3=F.Y.M.$
(2) 2 levels of N: $N_1=25$ and $N_2=50$ lb./ac.

3. DESIGN:
(i) R.B.D. (ii) (a) 7. (b) N.A. (iii) 4. (iv) (a) $15'\times 81'\times 2'$. (b) $13'\times 6'\times 4'$. (v) N.A. (vi) Yes.

4. GENERAL:
(i) Germination satisfactory, and normal growth. No lodging. (ii) Nil. (iii) Grain yield. (iv) (a) 1948—1951. (b) No. (c) Nil. (v) (a) Nil. (b) —. (vi) and (vii) Nil.

5. RESULTS:
(i) 1889 lb./ac. (ii) 309.4 lb./ac. (iii) S effect is highly significant while other effects are not significant.
Crop: Wheat (Rabi).
Site: Govt. Agri. Stn., Gurdaspur.
Object: To find out the best source of N for Wheat crop.

1. BASAL CONDITIONS:
   (i) (a) Nil. (b) Fallow. (c) Nil. (ii) (a) Loam. (b) Nil. (iii) 24.10.1951. (iv) (a) 1 raja and 5 desi ha., 6 sohaga and 1 roller. (b) N.A. (c) 35 sr./ac. (d) and (e) N.A. (v) N.A. (vi) C-591 (medium). (vii) Irrigated. (viii) 1 weeding. (ix) 8.54°. (x) 22.4.1952.

2. TREATMENTS:
   All combinations of (1) and (2) + a control (no manure).
   (1) 3 sources of N: S1 = A/S, S2 = Ammo. Phos. and S3 = F.Y.M.
   (2) 2 levels of N: N1 = 25 and N2 = 50 lb./ac.

3. DESIGN:
   (i) R.B.D. (ii) (a) 7. (b) N.A. (iii) 4. (iv) (a) 15' × 80'. (b) 13' × 73' 4". (v) N.A. (vi) Yes.

4. GENERAL:
   (i) Germination below normal. Severe lodging in plots of A/S and Ammo. Phos. (ii) Nil. (iii) Grain yield. (iv) (a) 1948–1951. (b) No. (c) Nil. (v) N.A. (vi) No. (b) No. (vi) Nil. (vii) Low yield in plots other than the control might be due to some damage to crop due to lodging.

5. RESULTS:
   (i) 1368 lb./ac.
   (ii) 257.5 lb./ac.
   (iii) Only S effect is significant.
   (iv) Av. yield of grain in lb./ac.

<table>
<thead>
<tr>
<th>Control = 1583 lb./ac.</th>
<th>S1</th>
<th>S2</th>
<th>S3</th>
<th>Mean</th>
</tr>
</thead>
<tbody>
<tr>
<td>N1</td>
<td>1205</td>
<td>1260</td>
<td>1474</td>
<td>1313</td>
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<tr>
<td>N2</td>
<td>1271</td>
<td>1188</td>
<td>1592</td>
<td>1350</td>
</tr>
<tr>
<td>Mean</td>
<td>1238</td>
<td>1224</td>
<td>1533</td>
<td>1332</td>
</tr>
</tbody>
</table>

S.E. of marginal mean of S = 91.1 lb./ac.
S.E. of marginal mean of N = 74.3 lb./ac.
S.E. of body of table = 128.8 lb./ac.
Crop : Wheat (Rabi).
Site : Govt. Agri. Stn., Gurdaspur.

Object : To compare the effect of combined doses of N and Super on Wheat yield.

1. BASAL CONDITIONS :
(i) (a) Nil. (b) Maize. (c) Nil. (ii) (a) Loam. (b) N.A. (iii) 3.11.1949. (iv) (a) 1 *hindustan*, 5 *desi* ploughing and 5 *sohaga*. (b) to (e) N.A. (v) Nil. (vi) C-591 (medium). (vii) Irrigated. (viii) One hoeing. (ix) 7.5°. (x) 7.5.1950.

2. TREATMENTS :
1. Control.
2. Ammo. Phos. at 25 lb./ac. of N + 31 lb./ac. of P₂O₅ as Super.
3. Ammo. Phos. at 50 lb./ac. of N + 62 lb./ac. of P₂O₅ as Super.
4. A/S at 25 lb./ac. of N + 31 lb./ac. of P₂O₅ as Super.
5. A/S at 50 lb./ac. of N + 62 lb./ac. of P₂O₅ as Super.


3. DESIGN :
(i) R.B.D. (ii) (a) 12. (b) N.A. (iii) 6. (iv) (a) and (b) 16°-6° × 44°. (v) Nil. (vi) Yes.

4. GENERAL :
(i) Germination and growth satisfactory. No lodging. (ii) Nil. (iii) Grain yield. (iv) (a) No. (b) and (c) No. (v) (a) and (b) No. (vi) and (vii) Nil.

5. RESULTS :
(i) 1761 lb./ac.
(ii) 168.0 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>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>1365</td>
</tr>
<tr>
<td>2.</td>
<td>1705</td>
</tr>
<tr>
<td>3.</td>
<td>1992</td>
</tr>
<tr>
<td>4.</td>
<td>1751</td>
</tr>
<tr>
<td>5.</td>
<td>1900</td>
</tr>
<tr>
<td>S.E./mean</td>
<td>68.6 lb./ac.</td>
</tr>
</tbody>
</table>

Crop : Wheat (Rabi).
Site : Govt. Agri. Stn., Gurdaspur.

Object : To find out the best combination of N & P₂O₅ for Wheat crop.

1. BASAL CONDITIONS :
(i) (a) Nil. (b) *Guara*. (c) Nil. (ii) (a) Loam. (b) N.A. (iii) 15.11.1951. (iv) (a) 1 *raja*, 5 *desi* and 6 *sohaga*. (b) N.A. (c) 1 md./ac. (d) 6° rows to row. (e) N.A. (v) Nil. (vi) C-591 (medium). (vii) Irrigated. (viii) One hoeing. (ix) 8.54°. (x) 19, 21.4.1952.

2. TREATMENTS :
All combinations of (1) and (2)
(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.
P₂O₅ as Super applied on 15.11.1951 and N as A/S on 20.12.1951.

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

4. GENERAL :
(i) Germination satisfactory. No lodging. (ii) Nil. (iii) Grain yield. (iv) (a) No. (b) and (c) No. (v) (a) and (b) No. (vi) and (vii) Nil.
5. RESULTS:

(i) 1257 lb./ac.
(ii) 203.8 lb./ac.
(iii) N effect is highly significant while 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>Mean</th>
</tr>
</thead>
<tbody>
<tr>
<td>N₀</td>
<td>808</td>
<td>836</td>
<td>920</td>
<td>855</td>
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<td>1583</td>
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<tr>
<td>N₃</td>
<td>1489</td>
<td>1578</td>
<td>1496</td>
<td>1521</td>
</tr>
</tbody>
</table>

Mean 1171 1322 1279 1257

S.E. of marginal mean of P = 41.6 lb./ac.
S.E. of marginal mean of N = 48.0 lb./ac.
S.E. of body of table = 83.2 lb./ac.

Crop: Wheat (Rabi).
Site: Govt. Agri. Stn., Gurdaspur.
Object: To study the effect of graded dose of A/S and Ammo. Phos. on yield of Wheat.

1. BASAL CONDITIONS
(i) (a) Nil. (b) Sannhemp. (c) Nil. (ii) (a) Loam. (b) N.A. (iii) 12.11.1951. (iv) (a) 1 raja, 4 desi plough, 1 roller and 5 sehaga. (b) N.A. (c) 1 md./ac. (d) and (e) N.A. (v) Field was green manured by sannhemp and in addition 10 C.L. of F.Y.M. added as basal dose. (vi) C—518 (medium). (vii) Irrigated. (viii) 1 weeding. (ix) 8.54°. (x) 27.4.1952.

2. TREATMENTS:
All combinations of (1) × (2)+a control (no manure).
(1) 3 levels of N: N₁=25, N₂=50 and N₃=75 lb./ac.
(2) 2 sources of N: S₁=A/S and S₂=Ammo. Phos.

3. DESIGN:
(i) R.B.D. (ii) (a) 7. (b) N.A. (iii) 6. (iv) (a) and (b) 15°x66°. (v) Nil. (vi) Yes.

4. GENERAL:
(i) Germination and growth satisfactory. Lodging in plots treated with A/S and Ammo. Phos. (ii) Nil. (iii) Grain yield. (iv) (a) No. (b) —, (c) —. (v) (a) No. (b) —. (vi) Nil. (vii) Low yield in plots other than control might be due to lodging in these plots.

5. RESULTS:
(i) 1416 lb./ac.
(ii) 122.4 lb./ac.
(iii) N and control vs. others effects are highly significant while other effects are not significant.
(iv) Av. yield of grain in lb./ac.

Control=1580 lb./ac.

<table>
<thead>
<tr>
<th></th>
<th>N₁</th>
<th>N₂</th>
<th>N₃</th>
<th>Mean</th>
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<tr>
<td>S₂</td>
<td>1499</td>
<td>1343</td>
<td>1223</td>
<td>1355</td>
</tr>
</tbody>
</table>

Mean 1487 1395 1286 1389

S.E. of marginal mean of S = 28.9 lb./ac.
S.E. of marginal mean of N = 35.3 lb./ac.
S.E. of body of table = 50.0 lb./ac.
Object: To compare the effect of guara green manure on the following Wheat crop:

1. BASAL CONDITIONS:
   (i) (a) Nil. (b) Guara. (c) Nil. (ii) (a) Loam. (b) N.A. (iii) 1.12.1950. (iv) (a) 1 raja, 5 desi plough, 6 soharga and 1 roller. (b) N.A. (c) 35 sr./ac. (d) 9" row to row. (e) N.A. (v) Nil. (vi) C—228 (medium). (vii) Irrigated. (viii) One weeding. (ix) 4.36". (x) 17.5.1951.

2. TREATMENTS:
   1. Control (no guara sown).
   2. Guara crop fed to bullocks.
   3. Guara buried as G.M.
   4. Guara matured for seed.

3. DESIGN:
   (i) R.B.D. (ii) (a) 4. (b) N.A. (iii) 4. (iv) (a) and (b) 24' × 75’—7.5". (v) Nil. (vi) Yes.

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

5. RESULTS:
   (i) 1067 lb./ac.
   (ii) 1074 lb./ac.
   (iii) Treatments differ highly significantly.
   (iv) Av. yield of grain in lb./ac.  
   
   Treatment  | Av. yield  |
   ------------|------------|
   1.          | 852        |
   2.          | 1017       |
   3.          | 1482       |
   4.          | 916        |
   S.E./mean  | = 53.7 lb./ac. |

Crop :— Wheat (Rabi).  
Ref :- Pb. 50 (13).  
Site :— Govt. Agri. Stn., Gurdaspur.  
Type :- 'M'.

Crop :— Wheat (Rabi).  
Ref :- Pb. 51 (77).  
Site :— Govt. Agri. Stn., Gurdaspur.  
Type :- 'M'.

Object :— To compare the effect of guara green manure on the following Wheat crop.

1. BASAL CONDITIONS:
   (i) (a) Nil. (b) Guara. (c) Nil. (ii) (a) Loam. (b) N.A. (iii) 6.11.1951. (iv) (a) 1 raja, 5 desi plough, 6 soharga and 1 roller. (b) N.A. (c) 1 md./ac. (d) and (e) N.A. (v) Nil. (vi) C—591 (medium). (vii) Irrigated. (viii) One weeding. (ix) 8.54". (x) 24.4.1952.

2. TREATMENTS:
   1. Control (no guara sown).
   2. Guara crop fed to bullocks.
   3. Guara buried as G.M.
   4. Guara matured for seed.

3. DESIGN:
   (i) R.B.D. (ii) (a) 4. (b) N.A. (iii) 4. (iv) (a) and (b) 24' × 75’—7.5". (v) Nil. (vi) Yes.

4. GENERAL:
   (i) Satisfactory. No lodging. (ii) Nil. (iii) Grain yield. (iv) (a) 1950—1951. (b) [No. (c) Nil. (v) (a) Nil. (b) —. (vi) and (vii) Nil.
5. RESULTS:
(i) 1604 lb./ac.
(ii) 264.8 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>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>1618</td>
</tr>
<tr>
<td>2</td>
<td>1790</td>
</tr>
<tr>
<td>3</td>
<td>1590</td>
</tr>
<tr>
<td>4</td>
<td>1418</td>
</tr>
<tr>
<td>S.E./mean</td>
<td>=132.4 lb./ac.</td>
</tr>
</tbody>
</table>

Crop :- Wheat.
Site :- Govt. Agri. Stn., Gurdaspur.

Ref :- Pb. 52 (42).

Type :- 'M'.

Object :- To study the effect of placement of fertilizers on yield of Wheat crop under Barani condition.

1. BASAL CONDITIONS:
(i) (a) Nil. (b) Fallow. (c) Nil. (ii) (a) Sandy loam. (b) N.A. (iii) 15.11.1952. (iv) (a) 8 ploughing and 10 sowing (b) N.A. (c) 35 sr./ac. (d) and (e) N.A. (v) Nil. (vi) C-250 (medium). (vii) Unirrigated. (viii) 2 hoeings and weedings. (ix) 4.82'. (x) 20.4.1953.

2. TREATMENTS:
1. Control.
2. 10 lb./ac. of N as A/S applied 1' deep below seed by drilling.
3. 10 lb./ac. of N as A/S applied with seed by broadcast.
4. 10 lb./ac. of N as A/S broadcast before sowing.
5. 10 lb./ac. of N as A/S broadcast with 1st shower of rain.

3. DESIGN:
(i) R.B.D. (ii) 5. (b) N/A. (iii) 6. (iv) (a) 19.5' x 60'. (b) 16.5' x 52.8' (v) 1' along breadth and 3.6' along length. (vi) Yes.

4. GENERAL:
(i) Growth and germination satisfactory. No information about lodging. (ii) Nil. (iii) Grain yield. (iv) (a) No. (b) —. (c) —. (v) (a) No. (b) —. (vi) Nil. (vii) First shower of rain on 18.1.1953.

5. RESULTS:
(i) 1455 lb./ac.
(ii) 100.7 lb./ac.
(iii) Treatments are significantly different.
(iv) Av. yield of grain in lb./ac.

<table>
<thead>
<tr>
<th>Treatment</th>
<th>Av. yield</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>1342</td>
</tr>
<tr>
<td>2</td>
<td>1537</td>
</tr>
<tr>
<td>3</td>
<td>1504</td>
</tr>
<tr>
<td>4</td>
<td>1477</td>
</tr>
<tr>
<td>5</td>
<td>1464</td>
</tr>
<tr>
<td>S.E./mean</td>
<td>=41.1 lb./ac.</td>
</tr>
</tbody>
</table>
Crop: Wheat.
Site: Govt. Agri. Stn., Gurdaspur.

Object: To study the effect of placement of fertilizer on yield of Wheat crop under irrigated condition.

1. BASAL CONDITIONS:
   (i) (a) Nil. (b) Fallow. (c) Nil. (ii) (a) Sandy loam. (b) N.A. (iii) 20.11.1952. (iv) (a) 8 ploughings and 11 *sohaga* (b) N.A. (c) 34 sr./ac. (d) and (e) N.A. (vi) C-250 (medium). (vii) Irrigated. (viii) 2 hoeings and weedings. (ix) 4.82°. (x) 23.4.1953.

2. TREATMENTS:
   1. Control (no manure).
   2. 20 lb./ac. of N as A/S applied 1° below the seed by drilling.
   3. 20 lb./ac. of N as A/S applied in contact with seed.
   4. 20 lb./ac. of N as A/S broadcast before sowing.
   5. 20 lb./ac. of N as A/S broadcast with first irrigation.

3. DESIGN:
   (i) R.B.D. (ii) (a) 5. (b) N.A. (iii) 6. (iv) (a) 19.5'×60'. (b) 16.5'×52.8'. (v) 1° on breadth side and 3.6' on length side. (vi) Yes.

4. GENERAL:
   (i) Germination good. No lodging. (ii) Nil. (iii) Grain yield. (iv) (a) No. (b)—. (c)—. (v) (a) No. (b)—. (vi) and (vii) Nil.

5. RESULTS
   (i) 1944 lb./ac.
   (ii) 173.4 lb./ac.
   (iii) Treatments 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>1710</td>
</tr>
<tr>
<td>2.</td>
<td>2214</td>
</tr>
<tr>
<td>3.</td>
<td>1889</td>
</tr>
<tr>
<td>4.</td>
<td>2056</td>
</tr>
<tr>
<td>5.</td>
<td>1850</td>
</tr>
<tr>
<td>S.E./mean</td>
<td>70.8 lb./ac.</td>
</tr>
</tbody>
</table>

---

Crop: Wheat.
Site: Govt. Agri. Stn., Gurdaspur.

Object: To study the effects of different methods of application of A/S on Wheat crop.

1. BASAL CONDITIONS:
   (i) (a) Nil. (b) Sannhemp. (c) Nil. (ii) (a) Sandy loam. (b) N.A. (iii) 21.11.1952. (iv) (a) 8 ploughings and 12 *sohaga*. (b) N.A. (c) 34 sr./ac. (d) 5° row to row. (e) N.A. (v) Sannhemp buried on 5.8.1952 for green manuring the field. (vi) C-250 (medium). (vii) Irrigated. (viii) 1 hoeing and weeding. (ix) 4.82°. (x) 24.4.1953.

2. TREATMENTS:
   1. Control.
   2. 30 lb./ac. of N in contact with seed.
   3. 30 lb./ac. of N broadcast with 1st irrigation.
   4. 15 lb./ac. of N in contact with seed and 15 lb./ac. of N near ear formation.
   5. 20 lb./ac. of N in contact with seed.
   6. 20 lb./ac. of N broadcast with 1st irrigation.
   7. 10 lb./ac. of N in contact with seed+10 lb./ac. of N near ear formation.
3. DESIGN:
(i) R.B.D. (ii) (a) 7. (b) N.A. (iii) 6. (iv) (a) 15'×60'. (b) 12'×55'. (v) 1½ and 2½' on length and breadth side of each plot. (vi) Yes.

4. GENERAL:
(i) Germination satisfactory growth normal plots with 30 lb./ac. of N heavily lodged and plots with 20 lb./ac. of N very slightly lodged, date of lodging N.A. (ii) Damage by rat in almost all plots was observed, the wheat grain was heavily attacked by new burnt disease; control measures taken N.A. (iii) Grain yield/plot. (iv) (a) No. (b)—. (c)—. (v) (a) No. (b)—. (vi) and (vii) Nil.

5. RESULTS:
(i) 2048 lb./ac. 
(ii) 270.3 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>1970</td>
</tr>
<tr>
<td>2.</td>
<td>1974</td>
</tr>
<tr>
<td>3.</td>
<td>1796</td>
</tr>
<tr>
<td>4.</td>
<td>2168</td>
</tr>
<tr>
<td>5.</td>
<td>2225</td>
</tr>
<tr>
<td>6.</td>
<td>2025</td>
</tr>
<tr>
<td>7.</td>
<td>2179</td>
</tr>
<tr>
<td>S.E./mean</td>
<td>= 110.3 lb./ac.</td>
</tr>
</tbody>
</table>

Crop :- Wheat. 
Site :- Govt. Agri. Stn., Gurdaspur.

Object :- To study the effect of A/S and Super alone and in combination on yield of Wheat.

1. BASAL CONDITIONS:
(i) (a) No. (b) Fallow. (c) Nil. (ii) (a) Loam. (b) N.A. (iii) 14.11.1952. (iv) (a) 7 ploughings and 10 ashega. (b) N.A. (c) 32 sr./ac. (d) 9" row to row. (e) N.A. (v) 8 C.L. of F.Y.M. as basal dressing by broadcast one month before sowing. (vi) C-250.(medium). (vii) Irrigated. (viii) One hoeing and weeding. (ix) 4 82'. (x) 21.4.1953.

2. TREATMENTS:
1. Control (no manure). 
2. 30 lb./ac. of P_{2}O_{5} as Super. 
3. 15 lb./ac. of P_{2}O_{5} as Super +15 lb./ac. of N as A/S. 
4. 30 lb./ac. of N as A/S. 

3. DESIGN:
(i) R.B.D. (ii) (a) 4. (b) N.A. (iii) 6. (iv) (a) 81'×18'. (b) 72'-7"×15'. (v) N.A. (vi) Yes.

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

5. RESULTS:
(i) 1968 lb./ac. 
(ii) 171.0 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>1791</td>
</tr>
<tr>
<td>2.</td>
<td>2009</td>
</tr>
<tr>
<td>3.</td>
<td>2036</td>
</tr>
<tr>
<td>4.</td>
<td>2034</td>
</tr>
<tr>
<td>S.E./mean</td>
<td>= 69.8 lb./ac.</td>
</tr>
</tbody>
</table>
Crop : Wheat.

Site : Govt. Agri. Stn., Gurdaspur.

Ref : Pb. 52(47).

Type : 'M'.

Object : To study the effect of lateral placement of A/S compared to broadcast on yield of Wheat.

1. BASAL CONDITIONS:

(i) (a) Nil. (b) Maize. (c) 8 C.L. of F.Y.M. on 16.6.1952 by broadcast. (ii) (a) Heavy loam. (b) N.A. (iii) 13.11.1952. (iv) (a) 7 ploughings and 10 sawaha. (b) N.A. (c) 32 sr/ac. (d) and (e) N.A. (v) Nil. (vi) C-591 (medium). (vii) Irrigated. (viii) 2 hoeings and 3 weedings. (ix) 4.82'. (x) 28.4.1953.

2. TREATMENTS:

All combinations of (1)x(2)+ a Control (no manure).
(1) 3 levels of N as A/S: N₁=20, N₂=30 and N₃=40 lb./ac.
(2) 2 methods of application of N : M₁=Drilling and M₂=Broadcast. Treatments applied on 19.12.1952.

3. DESIGN:

(i) R.B.D. (ii) (a) 7. (b) N.A. (iii) 6. (iv) (a) 10'x89'. (b) 9'x73'-4'. (v) N.A. (vi) Yes

4. GENERAL:

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

5. RESULTS:

(i) 1959 lb./ac.
(ii) 238.4 lb./ac.

- Effects due to 'control vs others' is highly significant.
- Av. yield of grain in lb./ac.

<table>
<thead>
<tr>
<th>N₁</th>
<th>N₂</th>
<th>N₃</th>
<th>Mean</th>
</tr>
</thead>
<tbody>
<tr>
<td>1997</td>
<td>2102</td>
<td>2206</td>
<td>2102</td>
</tr>
<tr>
<td>1865</td>
<td>1977</td>
<td>2097</td>
<td>1986</td>
</tr>
<tr>
<td>Mean</td>
<td>2059</td>
<td>2152</td>
<td>2044</td>
</tr>
</tbody>
</table>

S.E. of marginal means of N = 68.8 lb./ac.
S.E. of marginal means of M = 56.2 lb./ac.
S.E. of body of table = 97.3 lb./ac.

Crop : Wheat.

Ref : Pb. 52(65).

Site : Govt. Agri. Stn., Gurdaspur.

Type : 'M'.

Object : To study the residual effect of A/S and Super (applied to maize) on Wheat crop.

1. BASAL CONDITIONS:

(i) (a) Nil. (b) Maize. (c) As per treatments. (ii) (a) Loam. (b) N.A. (iii) 2.11.1953. (iv) (a) 4 ploughings and 8 sawaha. (b) N.A. (c) 32 sr/ac. (d) and (e) N.A. (v) Nil. (vi) C-250 (medium). (vii) Irrigated. (viii) 1 hoeing. (ix) 10.33'. (x) 23.4.1954.

2. TREATMENTS:

1. Control (no manure).
2. 60 lb./ac. of N as A/S applied to maize crop.
3. 60 lb./ac. of P₂O₅ as Super applied to maize crop. Super applied on 22.6.1953 and A/S on 31.7.1953.
3. DESIGN:
   (i) R.B.D. (ii) (a) 3. (b) N.A. (iii) 6. (iv) (a) 81’x24’. (b) 75.6’x24’. (v) On one length side nearly 2.6’
   left on the other length side 3’ left. (vi) Yes.

4. GENERAL:
   (i) Fair. No lodging. (ii) Nil. (iii) Grain yield. (iv) (a) 1953-54. (b) and (c) No. (v) (a) and (b) No. (vi)
   and (vii) Nil.

5. RESULTS
   (i) 1178 lb./ac.
   (ii) 118.8 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>1088</td>
</tr>
<tr>
<td>2.</td>
<td>1372</td>
</tr>
<tr>
<td>3.</td>
<td>1075</td>
</tr>
<tr>
<td>S.E./mean</td>
<td>= 48.5 lb./ac.</td>
</tr>
</tbody>
</table>

Site :- Govt. Agri. Stn., Gurdaspur. Type :- 'M'.

Object :- To study the effect of time and method of application of N on Wheat.

1. BASAL CONDITIONS:
   (i) (a) Maize—Wheat (b) Maize. (c) 2 md. and 32 sr. of A/S by kera on 23.6.1953 and 2 md.
   8 srs. of A/S on 31.7.1953 by kera. (ii) (a) Loam. (b) N.A. (iii) 4.11.1953. (iv) (a) 5 desi
   plough, 10 sohaga and 2 horse hoe. (b) By kera. (c) 32 sr./ac. (d) 9” row to row. (e) —. (v) Nil.

2. TREATMENTS:
   1. Control (no manure).
   2. 30 lb./ac. of N as A/S broadcast with first irrigation.
   3. 30 lb./ac. of N as A/S applied in contact with seed by kera on 4.11.1953.
   4. 30 lb./ac. of N as A/S applied half as in treatment 3 and half near ear formation by broadcast.
   5. 30 lb./ac. of N as A/S applied half as in treatment 2 and half near ear formation by broadcast.

3. DESIGN:
   (i) R.B.D. (ii) (a) 5. (b) N.A. (iii) 6. (iv) (a) 81’x12’. (b) 55’x12’. (v) N.A. (vi) Yes.

4. GENERAL:
   (i) Normal. No lodging. (ii) Nil. (iii) Grain yield. (iv) (a) 1953-54. (b) and (c) No. (v) (a) and (b)
   No. (vi) and (vii) Nil.

5. RESULTS:
   (i) 1627 lb./ac.
   (ii) 144.9 lb./ac.
   (iii) Treatments are significantly different.
   (iv) Av. yield of grain in lb./ac.
   
<table>
<thead>
<tr>
<th>Treatment</th>
<th>Av. yield</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>1438</td>
</tr>
<tr>
<td>2.</td>
<td>1635</td>
</tr>
<tr>
<td>3.</td>
<td>1682</td>
</tr>
<tr>
<td>4.</td>
<td>1740</td>
</tr>
<tr>
<td>5.</td>
<td>1638</td>
</tr>
<tr>
<td>S.E./mean</td>
<td>= 92.2 lb./ac.</td>
</tr>
</tbody>
</table>
Crop: Wheat.
Site: Govt. Agr. Stn., Gurdaspur.

Object: To study the best method of application of N/S and its effect on germination, growth and yield of Wheat.

1. BASAL CONDITIONS:
   (i) (a) Not followed. (b) Fallow. (c) Nil. (ii) (a) Loam. (b) N.A. (iii) 4.11.1953. (iv) (a) 6 desi ploughings and 1 sahaga. (b) N.A. (c) 9' row to row. (d) 32 sr./ac. (e) N.A. (v) Nil. (vi) C-250 (medium). (vii) Irrigated. (viii) 2 hoeings um weeding. (ix) 10.33'. (x) 20.4.1954.

2. TREATMENTS:
1. Control (no manure).
2. 30 lb./ac. of N drilled below the seed row with pore by mixing seed and fertilizer before application.
3. 30 lb./ac. of N drilled below the seed row followed by sowing the seed with kera.
4. 30 lb./ac. of N applied in contact with seed by dropping the fertilizer in furrows by kera followed by seeding.
5. 30 lb./ac. of N as A/S broadcast before sowing.
6. 30 lb./ac. of N as A/S broadcast with first irrigation on 6.12.1953. N as A/S applied on 4.11.1953 in 2 to 5 treatments.

3. DESIGN:
   (i) R.B.D. (ii) 6. (b) N.A. (iii) 6. (iv) (a) 81' x 12'. (b) 55' x 12'. (v) N.A. (vi) Yes.

4. GENERAL:
   (i) Germination and growth normal, No lodging. (ii) Nil. (iii) Grain yield. (iv) (a) Not contd. (b) Nil. (c) Nil. (v) (a) No. (b) Nil (vi) and (vii) Nil.

5. RESULTS:
   (i) 1566 lb./ac.
   (ii) 2795 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></td>
<td></td>
</tr>
<tr>
<td>1.</td>
<td>1551</td>
</tr>
<tr>
<td>2.</td>
<td>1245</td>
</tr>
<tr>
<td>3.</td>
<td>1500</td>
</tr>
<tr>
<td>4.</td>
<td>1723</td>
</tr>
<tr>
<td>5.</td>
<td>1665</td>
</tr>
<tr>
<td>6.</td>
<td>1621</td>
</tr>
<tr>
<td>S.E./mean</td>
<td>114.3 lb./ac.</td>
</tr>
</tbody>
</table>

Crop: Wheat.
Site: Govt. Agri, Stn., Gurdaspur.

Object: To study the best method of application of N on yield of Barani Wheat crop.

1. BASAL CONDITIONS:
   (i) (a) Nil. (b) Fallow. (c) Nil. (ii) (a) Light loam. (b) N.A. (iii) 2.11.1953. (iv) (a) 6 ploughings and 8 sahaga. (b) N.A. (c) 32 sr./ac. (d) 9' row to row. (e) N.A. (v) Nil. (vi) C-250 (medium). (vii) Unirrigated, (viii) 3 hoeings, one roller taking and one weeding. (ix) 10.33'. (x) 17.4.1954.

2. TREATMENTS:
1. Control (no manure).
2. 20 lb./ac. of N drilled below seed with pore.
3. 20 lb./ac. of N drilled below seed row followed by sowing.
4. 20 lb./ac. of N applied in contact with seed.
5. 20 lb./ac. of N broadcast before sowing.
6. 20 lb./ac. of N broadcast with first rain shower. First shower is on 10.11.1953. N as A/S applied on 11.11.1953.
3. DESIGN:
(i) R.B.D. (ii) (a)6. (b) N.A. (iii) 6. (iv) (a) and (b) 15' x 48' = 5.8' (v) Nil. (vi) Yes.

4. GENERAL:
(i) Normal. No lodging. (ii) Nil. (iii) Grain yield and straw weight. (iv) (a) 1953-1954. (b) No. (c) Nil. (v) (a) No. (b) Nil. (vi) and (vii) Nil.

5. RESULTS:
(i) 1439 lb./ac.
(ii) 97.9 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>1300</td>
</tr>
<tr>
<td>2.</td>
<td>1182</td>
</tr>
<tr>
<td>3.</td>
<td>1628</td>
</tr>
<tr>
<td>4.</td>
<td>1530</td>
</tr>
<tr>
<td>5.</td>
<td>1552</td>
</tr>
<tr>
<td>6.</td>
<td>1441</td>
</tr>
<tr>
<td>S.E./mean</td>
<td>40.0 lb./ac.</td>
</tr>
</tbody>
</table>

Crop: Wheat.
Site: Govt. Agri. Stn., Gurdaspur.

Ref: Pb. 53(81).
Type: 'M'.

Object: To determine the suitability of blood meal as manure.

1. BASAL CONDITIONS:
(i) (a) Nil. (b) Sannhemp. (c) Nil. (ii) (a) Light loam. (b) N.A. (iii) 21.11.1953. (iv) (a) 6 ploughings and 10 sohaga. (b) N.A. (c) 32 sr./ac. (d) 9' row to row. (e) N.A. (v) Sannhemp was buried in the field by ploughing it for green manuring the field on 5.8.1953. (vi) C-250 (medium). (vii) Irrigated. (viii) 2 hoeing and weedings. (ix) 10.33". (x) 26.4.1954 and 1.5.1954.

2. TREATMENTS:
1. Control.
2. 40 lb./ac. of N as blood meal.
3. 40 lb./ac. of N as F.Y.M.
4. 40 lb./ac. of N as A/S.
Treatments broadcast on 21.11.1953 before sowing.

3. DESIGN:
(i) R.B.D. (ii) (a) 4. (b) N.A. (iii) 6. (iv) (a) and (b) 13.5' x 33'-9.3". (v) Nil. (vi) Yes.

4. GENERAL:
(i) Normal. No lodging. (ii) Nil. (iii) Grain yield. (iv) (a) Not contd. (b) Nil. (c) Nil. (v) (a) No. (b) Nil. (vi) and (vii) Nil.

5. RESULTS:
(i) 1264 lb./ac.
(ii) 103.0 lb./ac.
(iii) Treatments are highly significantly different.
(iv) Av. yield of grain in lb./ac.

<table>
<thead>
<tr>
<th>Treatment</th>
<th>Av. yield</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>559</td>
</tr>
<tr>
<td>2.</td>
<td>1445</td>
</tr>
<tr>
<td>3.</td>
<td>1356</td>
</tr>
<tr>
<td>4.</td>
<td>1715</td>
</tr>
<tr>
<td>S.E./mean</td>
<td>42.0 lb./ac.</td>
</tr>
</tbody>
</table>
Object:—To study the effect of application of B.M., B.M. compost and Super alone and in combination with A/S on the yield of irrigated Wheat.

1. BASAL CONDITIONS:
   (i) (a) Nil. (b) Sainhemp. (c) Nil. (ii) (a) Light loam. (b) N.A. (iii) 24.11.1953. (iv) (a) 6 ploughings & 10 sowing. (b) N.A. (c) 35 sr./ac. (d) 9\' row to row. (e) N.A. (v) Sainhemp buried in the soil for greed manuring on 5.8.1953. (vi) C—250 (medium). (vii) Irrigated. (viii) One hoeing. (ix) 10.33\'. (x) 25; 30/4.1954.

2. TREATMENTS:
   1. Control (no manure).
   2. 25 lb./ac. of P\textsubscript{2}O\textsubscript{5} as B.M.
   3. 25 lb./ac. of P\textsubscript{2}O\textsubscript{5} as B.M. compost.
   4. 25 lb./ac. of P\textsubscript{2}O\textsubscript{5} as B.M.+25 lb./ac. of P\textsubscript{2}O\textsubscript{5} as B.M. compost.
   5. 25 lb./ac. of P\textsubscript{2}O\textsubscript{5} as B.M.+25 lb./ac. of N as A/S.
   6. 25 lb./ac. of P\textsubscript{2}O\textsubscript{5} as B.M. compost+25 lb./ac. of N as A/S.  
   7. 25 lb./ac. of P\textsubscript{2}O\textsubscript{5} as Super.
   8. 25 lb./ac. of P\textsubscript{2}O\textsubscript{5} as Super+25 lb./ac.of N as A/S.

Treatments broadcast on 24.11.1953 before sowing.

3. DESIGN:
   (i) R.B.D. (ii) (a) 8... (b) N.A. (iii) 4. (iv) (a) and (b) 12'×55'. (v) Nil. (vi) Yes.

4. GENERAL:
   (i) Normal. No lodging. (ii) Nil. (iii) Grain yield. (iv) (a) 1953—contd. (b) No. (c) Nil. (v) (a) No. (b) Nil. (vi) and (vii) Nil.

5. RESULTS:
   (i) 1584 lb./ac.
   (ii) 109.9 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>
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<tr>
<td>2.</td>
<td>1426</td>
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<td>3.</td>
<td>1504</td>
</tr>
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<td>4.</td>
<td>1521</td>
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<td>5.</td>
<td>1737</td>
</tr>
<tr>
<td>6.</td>
<td>1667</td>
</tr>
<tr>
<td>7.</td>
<td>1542</td>
</tr>
<tr>
<td>8.</td>
<td>1854</td>
</tr>
<tr>
<td>S:E/mean</td>
<td>54.9 lb./ac.</td>
</tr>
</tbody>
</table>

---

Object:—To study the effect of different doses of N and P\textsubscript{2}O\textsubscript{5} alone and in combination on yield of unirrigated Wheat crop.

1. BASAL CONDITIONS:
   (i) (a) Nil. (b) Fallow. (c) 10 lb./ac. of N as A/S applied to previous wheat crop. (ii) (a) Loam; (b) N.A. (iii) 1.11.1953. (iv) (a) 6 ploughings, 8 soharga, and 1 horse. hoe.; (b) N.A. (c) 32 sr./ac. (d) 9' from row to row. (e) N.A. (v) Nil. (vi) C—250 (medium). (vii) Unirrigated. (viii) One hoeing and one rake running to break crust on 11.11.1953. (ix) 10.33\'. (x) 22.4.1954.
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) 3 levels of $P_2O_5$: $P_0 = 0$, $P_1 = 15$ and $P_2 = 30$ lb./ac.
N as A/S broadcast on 20.11.1952 and $P_2O_5$ as Super broadcast on 8.8.1952.

3. DESIGN:
(i) Fact. in R.B.D. (ii) (a) 9. (b) N.A. (iii) 6. (iv) (a) and (b) 12'×55'. (v) Nil. (vi) Yes.

4. GENERAL:
(i) Normal. No lodging. (ii) Nil. (iii) Grain yield. (iv) (a) Not contd. (b) Nil. (c) Nil. (v) (a) No. (b) Nil. (vi) and (vii) Nil.

5. RESULTS:
(i) 1489 lb./ac.
(ii) 163.2 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>$P_0$</th>
<th>$P_1$</th>
<th>$P_2$</th>
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<td>1339</td>
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<td>$N_1$</td>
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<td>1564</td>
<td>1532</td>
<td>1517</td>
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<td>$N_2$</td>
<td>1400</td>
<td>1776</td>
<td>1727</td>
<td>1634</td>
</tr>
<tr>
<td>Mean</td>
<td>1350</td>
<td>1560</td>
<td>1558</td>
<td>1489</td>
</tr>
</tbody>
</table>

S.E. of any marginal mean = 38.5 lb./ac.
S.E. of body of table = 66.6 lb./ac.

Crop :-Wheat.
Site :-Govt. Agri. Stn., Gurdaspur.
Ref :-Ph. 52 (46).
Type :-‘M’.

Object :-To determine a suitable combination of N and $P_2O_5$ for irrigated Wheat crop.

1. BASAL CONDITIONS:
(i) (a) Nil. (b) Sannhemp. (c) Nil. (ii) (a) Heavy loam. (b) N.A. (iii) 20.11.1952. (iv) (a) 7 ploughings & 10 sohaga. (b) N.A. (c) 1 md. 4 sr./ac. (d) 9' row to row. (e) N.A. (v) Sannhemp buried on 8.8.1952 as G.M. (vi) C—591 (medium). (vii) Irrigated. (viii) 3 hoeings and weedings. (ix) 4.82". (x) 3.5.1953.

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) 3 levels of $P_2O_5$ as Super: $P_0 = 0$, $P_1 = 15$ and $P_2 = 30$ lb./ac.
Fertilizers broadcast on 20.11.1952.

3. DESIGN:
(i) Fact. in R.B.D. (ii) (a) 9. (b) N.A. (iii) 6. (iv) (a) 13.5'×70'. (b) 12'×66'. (v) 9' bund on breadth sides, 1' bund on length sides and 1' border left on length sides. (vi) Yes.

4. GENERAL:
(i) Satisfactory. Slight lodging. (ii) Attack by field rats on all fields and loose smut attack; eradication of affected plants on 4.3.1953. (iii) Grain yield. (iv) (a) 1952—1954. (b) No. (c) Nil. (v) (a) No. (b) Nil. (vi) and (vii) Nil.
4. RESULTS:

(i) 2143 lb./ac.
(ii) 141.9 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>
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<th>P₂</th>
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<td>2199</td>
<td>2235</td>
<td>2144</td>
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<td>N₁</td>
<td>2105</td>
<td>2283</td>
<td>2164</td>
<td>2184</td>
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<td>N₂</td>
<td>1988</td>
<td>2164</td>
<td>2153</td>
<td>2102</td>
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<tr>
<td>Mean</td>
<td>2030</td>
<td>2215</td>
<td>2184</td>
<td>2143</td>
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</tbody>
</table>

S.E. of any marginal mean = 33.4 lb./ac.
S.E. of body of table = 57.9 lb./ac.

Object: To determine a suitable combination of N and P₂O₅ for irrigated Wheat crop.

1. BASAL CONDITIONS:
   (i) (a) Not followed. (b) Fallow. (c) Nil. (ii) (a) Loam. (b) N.A. (iii) 9.11.1953. (iv) (a) 4 ploughings, 7 Sogaha and 1 horse hoe. (b) N.A. (c) 32 sr./ac. (d) 9" row and row. (e) N.A. (v) (vi) C-230 (medium). (vii) Irrigated. (viii) 2 hoeings. (ix) 10.33". (x) 25.4.1954.

2. TREATMENTS:
   All combinations of (1) and (2)
   (1) 3 levels of N as A/S: N₀=0; N₁=25 and N₂=50 lb./ac.
   (2) 3 levels of P₂O₅ as Super: P₀=0; P₁=25 and P₂=50 lb./ac.

3. DESIGN:
   (i) Fact. in R.B.D. (ii) (a) 9. (b) N.A. (iii) 4. (iv) (a) and (b) 13.5'x53'-9.3". (v) Nil. (vi) Yes.

4. GENERAL:
   (i) Normal. No lodging. (ii) Nil. (iii) Grain yield. (iv) (a) 1952 to 1954. (b) No. (c) Nil. (v) (a) No. (b)→. (vi) and (vii) Nil.

5. RESULTS:
   (i) 1460 lb./ac.
   (ii) 195.5 lb./ac.
   (iii) N effect is significant while others are not significant.
   (iv) Av. yield of grain in lb./ac.

<table>
<thead>
<tr>
<th></th>
<th>P₀</th>
<th>P₁</th>
<th>P₂</th>
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<tr>
<td>Mean</td>
<td>1387</td>
<td>1454</td>
<td>1539</td>
<td>1460</td>
</tr>
</tbody>
</table>

S.E. of any marginal mean = 56.4 lb./ac.
S.E. of body of table = 97.8 lb./ac.
Crop: Wheat.

Site: Govt. Agri. Stn., Hansi.

Object: To find the best dose of A/S and Super for Wheat crop.

1. BASAL CONDITIONS:
   (i) (a) Nil. (b) Fallow. (c) Nil. (ii) (a) Loam. (b) N.A. (iii) 6.11.1951. (iv) (a) 15 Desi plough, 6 sohagas, 2 bar harrow, 1 roller and 1 horse hoe. (b) N.A. (c) 37.5 sr./ac. (d) and (e) N.A. (v) Nil. (vi) C-591 (medium). (vii) Irrigated. (viii) One bar harrow. (ix) 2.80'. (x) 4.4.1952.

2. TREATMENTS:
   All combinations of (1) and (2)
   (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.

N as A/S applied on 11.12.1951 and P2O5 as Super applied at sowing time.

3. DESIGN:
   (i) Fact. in R.B.D. (ii) (a) 12. (b) N.A. (iii) 6. (iv) (a) 74' x 12'. (b) 69'2" x 10'6". (v) N.A. (vi) Yes.

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

5. RESULTS:
   (i) 1977 lb./ac.
   (ii) 224.0 lb./ac.
   (iii) Only N effect is highly significant.
   (iv) Av. yield of grain in lb./ac.

<table>
<thead>
<tr>
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<td>1994</td>
</tr>
<tr>
<td>N2</td>
<td>1878</td>
<td>2137</td>
<td>2110</td>
<td>2042</td>
</tr>
<tr>
<td>N3</td>
<td>2122</td>
<td>2188</td>
<td>2218</td>
<td>2176</td>
</tr>
<tr>
<td>Mean</td>
<td>1926</td>
<td>2001</td>
<td>2005</td>
<td>1977</td>
</tr>
</tbody>
</table>

S.E. of marginal mean of N =52.8 lb./ac.
S.E. of marginal mean of P =45.7 lb./ac.
S.E. of body of table =91.5 lb./ac.
3. DESIGN:
(i) Fact. in R.B.D. (ii) (a) 12. (b) N.A. (iii) 6. (iv) (a) 74'×12' (b) 69'×2'×10'×9'. (v) N.A. (vi) Yes.

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

5. RESULTS:
(i) 24.07 lb./ac.
(ii) 28.13 lb./ac.
(iii) Only N effect is significantly different.
(iv) Av. yield of grain in lb./ac.

<table>
<thead>
<tr>
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<th>P₀</th>
<th>P₁</th>
<th>P₂</th>
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<tr>
<td>Mean</td>
<td>2296</td>
<td>2429</td>
<td>2496</td>
<td>2407</td>
</tr>
</tbody>
</table>

S.E. of marginal mean of N = 66.3 lb./ac.
S.E. of marginal mean of P = 57.4 lb./ac.
S.E. of body of table = 114.8 lb./ac.

Crop: Wheat.
Site: Govt. Agri. Stn., Hansi.

Object: To study the response of Wheat to A/S and Ammo. Phos.

1. BASAL CONDITIONS:
(i) (a) Nil. (b) Fallow. (c) Nil. (ii) (a) Heavy loam. (b) N.A. (iii) 14.11.1949. (iv) (a) 2 Raja plough, 9 desi plough, 1 horse hoe and 8 sohaga. (b) to (e) N.A. (v) Nil. (vi) C—591 (medium). (vii) Irrigated. (viii) Nil. (ix) 2.15'. (x) N.A.

2. TREATMENTS:
1. Control (no manure).
2. 25 lb./ac. of N as A/S at 1st irrigation.
3. 25 lb./ac. of N as A/S in February.
4. 50 lb./ac. of N as A/S at 1st irrigation.
5. 50 lb./ac. of N as A/S in February.
6. 25 lb./ac. of N as Ammo. Phos. at 1st Irrigation.
7. 25 lb./ac. of N as Ammo. Phos. in February.
8. 50 lb./ac. of N as Ammo. Phos. at 1st Irrigation.
9. 50 lb./ac. of N as Ammo. Phos. in February.
10. 25 lb./ac. of N as F.Y.M. before sowing + 25 lb./ac. of N as A/S in February.
11. 25 lb./ac. of N as F.Y.M. before sowing + 25 lb./ac. of N as Ammo. Phos. in February.

3. DESIGN:
(i) R.B.D. (ii) (a) 11. (b) N.A. (iii) 4. (iv) (a) 9'×80'-8'. (b) 9'×80'-8'. (v) Nil. (vi) Yes.

4. GENERAL:
(i) Normal. No lodging. (ii) Nil. (iii) Grain yield. (iv) (a) 1949—continued with changes in treatments from 1953. (b) No. (c) Nil (v) (a) No. (b) Nil. (vi) and (vii) Nil.
5. RESULTS

(i) 2518 lb./ac.
(ii) 275.6 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>Treatments</th>
<th>Av. yield</th>
</tr>
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<td>2247</td>
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<td>10.</td>
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<td>2922</td>
<td>11.</td>
<td>2700</td>
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<td>6.</td>
<td>2310</td>
<td>S.E./mean</td>
<td>137.6 lb./ac.</td>
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Crop :—Wheat.
Site :—Govt. Agri. Stn., Hansi.

Object :—To study the response of Wheat to A/S and Ammo. Phos.

1. BASAL CONDITIONS:
   (i) (i) Nil. (b) Fallow. (c) Nil. (ii) (a) Heavy loam. (b) N.A. (iii) 11.11.1950. (iv) (a) and b
   N.A. (c) 1 sq.-3 chk./plot. (d) and (e) N.A. (v) Nil. (vi) C—591 (medium). (vii) Irrigated. (viii)
   Nil. (ix) 1.20'. (x) 23.4.1951.

2. TREATMENTS:
   1. Control (no manure).
   2. 25 lb./ac. of N as A/S at 1st Irrigation.
   3. 25 lb./ac. of N as A/S in February.
   4. 50 lb./ac. of N as A/S at 1st irrigation.
   5. 50 lb./ac. of N as A/S in February.
   6. 25 lb./ac. of N as Ammo. Phos. at 1st irrigation.
   7. 25 lb./ac. of N as Ammo. Phos. in February.
   8. 50 lb./ac. of N as Ammo. Phos. at 1st irrigation.
   9. 50 lb./ac. of N as Ammo. Phos. in February.
   10. 25 lb./ac. of N as F.Y.M. before sowing + 25 lb./ac. of N as A/S in February.
   11. 25 lb./ac. of N as F.Y.M. before sowing + 25 lb./ac. of N as Ammo. Phos. in February.

3. DESIGN:
   (i) R.B.D. (ii) (a) 11. (b) N.A. (iii) 4. (iv) (a) 12' x 107'. (b) 1/40th ac. (v) N.A. (vi) Yes.

4. GENERAL:
   (i) Good. No lodging. (ii) Nil. (iii) Grain yield. (iv) (a) 1949—continued with changes in treatments
   from 1953. (b) No. (c) Nil. (v) (a) No. (b) Nil. (vi) and (vii) Nil.

5. RESULTS:
   (i) 2425 lb./ac.
   (ii) 154.2 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>
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<td>6.</td>
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<td>S.E./mean</td>
<td>77.1 lb./ac.</td>
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</table>
Crop: Wheat.
Site: Govt. Agri. Stn., Hansi.

Object: To study the response of Wheat to A/S and Ammo. Phos.

1. BASAL CONDITIONS:
   (i) (a) Nil.  (b) Berseem. (c) Nil.  (ii) (a) Loam.  (b) Nil.  (iii) 26.10.1951.  (iv) (a) 1 rajp plough, 3 desf plough, 2 horse hoe and 4 sohaga.  (b) N.A.  (c) 371 sr./ac.  (d) and (e) N.A.  (v) Nil.  (vi) C-591 (medium).  (vii) Irrigated.  (viii) Nil.  (ix) 2.89°.  (x) 14.4.1952.

2. TREATMENTS:
   1. Control (no manure).
   2. 25 lb/ac. of N as A/S at 1st irrigation.
   3. 25 lb/ac. of N as A/S applied on 1.2.1952.
   4. 50 lb/ac. of N as A/S at 1st irrigation.
   5. 50 lb/ac. of N as A/S applied on 1.2.1952.
   6. 25 lb/ac. of N as Ammo. Phos. at 1st irrigation.
   7. 25 lb/ac. of N as Ammo. Phos. applied on 1.2.1952.
   8. 50 lb/ac. of N as Ammo. Phos. at 1st irrigation.
   9. 50 lb/ac. of N as Ammo. Phos. applied on 1.2.1952.
10. 25 lb/ac. of N as F.Y.M. before sowing + 25 lb/ac. of N as A/S applied on 1.2.1952.
11. 25 lb/ac. of N as F.Y.M. before sowing + 25 lb/ac. of N as Ammo. Phos. applied on 1.2.1952. F.Y.M. applied on 26.10.1951. before sowing and treatments 2,4,6,8 applied on 23.11.1951.

3. DESIGN:
   (i) R.B.D.  (ii) (a) 11.  (b) N.A.  (iii) 4.  (iv) (a) 9'x80'-8a.  (b) 9'x80'-8".  (v) Nil.  (vi) Yes.

4. GENERAL:
   (i) Normal. No lodging.  (ii) Nil.  (iii) Grain yield.  (iv) (a) 1949—continued with changes in treatments from 1953.  (b) No.  (c) Nil.  (v) (a) No.  (b) Nil.  (vi) and (vii) Nil.

5. RESULTS:
   (i) 2827 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>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>2677</td>
</tr>
<tr>
<td>2.</td>
<td>2615</td>
</tr>
<tr>
<td>3.</td>
<td>2893</td>
</tr>
<tr>
<td>4.</td>
<td>2665</td>
</tr>
<tr>
<td>5.</td>
<td>2854</td>
</tr>
<tr>
<td>6.</td>
<td>2621</td>
</tr>
<tr>
<td>S.E./mean</td>
<td>=120.3 lb/ac</td>
</tr>
</tbody>
</table>

Crop: Wheat.
Site: Govt. Agri. Stn., Hansi.

Object: To study the response of Wheat to A/S and Ammo. Phos.
2. TREATMENTS:

1. Control (no manure).
2. 25 lb./ac. of N as A/S at 1st irrigation on 29.12.1952.
3. 25 lb./ac. of N as A/S applied on 22.2.1953.
4. 50 lb./ac. of N as A/S at 1st irrigation on 29.12.1952.
5. 50 lb./ac. of N as A/S applied on 22.2.1953.
6. 25 lb./ac. of N as Ammo. Phos. at 1st irrigation on 29.12.1952.
7. 25 lb./ac. of N as Ammo. Phos. applied on 22.2.1953.
8. 50 lb./ac. of N as Ammo. Phos. at 1st irrigation on 29.12.1952.
9. 50 lb./ac. of N as Ammo. Phos. applied on 22.2.1953.
10. 25 lb./ac. of N as F.Y.M. before sowing + 25 lb./ac. of N as A/S applied on 22.2.1953.
11. 25 lb./ac. of N as F.Y.M. before sowing + 25 lb./ac. of N as Ammo. Phos. applied on 22.2.1953.

3. DESIGN:

(i) R.B.D. (ii) (a) 11. (b) N.A. (iii) 4. (iv) (a) 10'x9 1/2'. (b) 9'x80'. (v) N.A. (vi) Yes.

4. GENERAL:

(i) Good. No lodging. (ii) Nil. (iii) Grain yield. (iv) (a) 1949—contd. with changes in treatments in 1953. (b) No. (c) Nil. (v) (a) No. (b)—. (vi) and (vii) Nil.

5. RESULTS:

(i) 2547 lb./ac.
(ii) 230.1 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>2353</td>
<td>7.</td>
<td>2611</td>
</tr>
<tr>
<td>2.</td>
<td>2480</td>
<td>8.</td>
<td>2590</td>
</tr>
<tr>
<td>3.</td>
<td>2490</td>
<td>9.</td>
<td>2688</td>
</tr>
<tr>
<td>4.</td>
<td>2532</td>
<td>10.</td>
<td>2690</td>
</tr>
<tr>
<td>5.</td>
<td>2480</td>
<td>11.</td>
<td>2573</td>
</tr>
<tr>
<td>6.</td>
<td>2530</td>
<td></td>
<td></td>
</tr>
<tr>
<td>S.E./mean</td>
<td>115.0 lb./ac.</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Crop : Wheat.
Site : Govt. Agri. Stn., Hansi.
Obj.: To study the response of Wheat to C/N and A/S.

1. BASAL CONDITIONS:

(i) (a) Nil. (b) Guar. (c) Nil. (ii) (a) Heavy loam. (b) N.A. (iii) 19.11.1953. (iv) (a) 1 raja, 6 deshi plough, 6 zohaga and 2 roller. (b) 26 sr./ac. (c) N.A. (d) and (e) N.A. (v) Nil. (vi) C—591 (medium). (vii) Irrigated. (viii) Nil. (iv) 4.50'. (x) 20.4.1954.

2. TREATMENTS:

All combinations of (1), (2) and (3) and a control (no manure).

(1) 2 levels of N: N1 = 25 and N2 = 40 lb./ac.
(2) 2 sources of N: S1 = A/S and S2 = C/N.
(3) 2 times of application: T1 = At first irrigation on 20.12.1953 and T2 = At flowering stage on 14.2.1954 by broadcast.

3. DESIGN:

(i) R.B.D. (ii) (a) 9. (b) N.A. (iii) 4. (iv) (a) 96'x15'. (b) 82.5'x12'. (v) N.A. (vi) Yes.

4. GENERAL:

(i) Good. No lodging. (ii) Nil. (iii) Grain yield. (iv) (a) 1949—contd. 'treatments from this year changed. (b) No. (c) Nil. (v) (a) No. (b) Nil. (vi) and (vii) Nil.
5. RESULTS:

(i) 2290 lb./ac.
(ii) 298.4 lb./ac.

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

\[
\begin{array}{c|cc|c|cc}
 & S_1 & S_2 & \text{Mean} & T_1 & T_2 \\
N_1 & 2229 & 2289 & 2239 & 2303 & 2416 \\
N_2 & 2264 & 2252 & 2258 & 2169 & 2348 \\
\hline
\text{Mean} & 2296 & 2321 & 2309 & 2236 & 2282 \\
T_1 & 2286 & 2186 & 2236 & 2236 & 2236 \\
T_2 & 2307 & 2456 & 2382 & 2382 & 2382 \\
\end{array}
\]

S.E. of any marginal mean = 74.6 lb./ac.
S.E. of body of any table = 105.5 lb./ac.
S.E. of control mean = 149.2 lb./ac.

Crop: Wheat.
Site: Govt. Agri. Stn., Hansi.
Ref: Pb. 50 (84).
Type: 'M'.

Object: To study the effect of graded doses of A/S and Super.

1. BASAL CONDITIONS:

(i) (a) Nil. (b) Fallow. (c) Nil. (ii) (a) Loam. (b) N.A. (iii) 30.11.1950. (iv) (a) 1 rajah plough, 3 desti plough and 2 zohoga. (b) Sown by kera. (c) 35 st./ac. ; (d) and (e) N.A. (v) Nil. (vi) C—591 (medium). (vii) Irrigated. (viii) Nil. (ix) 1.20°. (x) 24.4.1951.

2. TREATMENTS:

All combinations of (1) and (2).

(1) 3 levels of N: N_0 = 0, N_1 = 20 and N_2 = 40 lb./ac.
(2) 3 levels of P_0O_5: P_0 = 0, P_1 = 25 and P_2 = 50 lb./ac.

N as A/S applied on 10.1.1951 while P_0O_5 as Super applied on 30.11.1950.

3. DESIGN:

(i) Fact. in R.B.D. (ii) (a) 9. (b) N.A. (iii) 5. (iv) (a) 12'×64'. (b) 12'×60'-6". (v) N.A. (vi) Yes.

4. GENERAL:

(i) Normal. No lodging. (ii) Nil. (iii) Grain yield. (iv) (a) Not continued. (b) No. (c) Nil. (v) (a) No. (b) Nil. (vi) and (vii) Nil.

5. RESULTS:

(i) 1089 lb./ac.
(ii) 180.9 lb./ac.

(iii) Effect of P alone is highly significant.
(iv) Av. yield of grain in lb./ac.

\[
\begin{array}{c|ccc|c}
P_0 & P_1 & P_2 & \text{Mean} \\
905 & 816 & 825 & 849 \\
1091 & 1061 & 1173 & 1108 \\
1228 & 1348 & 1350 & 1309 \\
\hline
\text{Mean} & 1075 & 1075 & 1116 & 1089 \\
\end{array}
\]

S.E. of any marginal mean = 46.7 lb./ac.
S.E. of body of table = 50.8 lb./ac.
Crop : Wheat.  
Ref : Pb. 48 (53).  
Site : Govt. Agri. Stn., Hansi.  
Type : 'M'.

Object : To study the effect of town compost and farm compost on yield of Wheat.

1. BASAL CONDITIONS:
   (i) (a) Nil. (b) Fallow. (c) Nil. (ii) (a) Loam. (b) N.A.  (iii) 28, 29.10.1948.  (iv) (a) and (b) N.A.  
   (c) 10.5 chk/plot. (d) N.A. (e) N.A. (v) Nil. (vi) C-591 (medium). (vii) Irrigated. (viii) Nil.  
   (ix) 0.71".  (x) 25.4.1949.

2. TREATMENTS:
   1. Control (no manure).
   2. Town compost at 10 ton/ac. applied before sowing.
   3. Farm compost at 10 ton/ac. applied before sowing.

3. DESIGN:
   (i) R.B.D. (ii) (a) 3. (b) N.A. (iii) 8. (iv) (a) 12'×74'×4". (b) 12′×60''×6". (v) N.A. (vi) Yes.

4. GENERAL:
   (i) Fair. No lodging. (ii) Nil. (iii) Grain yield. (iv) (a) 1948 to 1949. (b) No. (c) Nil. (v) (a) No.  
   (b) Nil. (vi) and (vii) Nil.

5. RESULTS:
   (i) 1590 lb./ac.
   (ii) 250.7 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>1713</td>
</tr>
<tr>
<td>2.</td>
<td>1494</td>
</tr>
<tr>
<td>3.</td>
<td>1562</td>
</tr>
<tr>
<td>S.E./mean</td>
<td>88.6 lb./ac.</td>
</tr>
</tbody>
</table>

---

Crop : Wheat (Rabi).  
Ref : Pb. 49 (74).  
Site : Govt. Agri. Stn., Hansi.  
Type : 'M'.

Object : To study the effect of town compost and farm compost on yield of Wheat.

1. BASAL CONDITIONS:
   (i) (a) Nil. (b) Fallow. (c) Nil. (ii) (a) Loam. (b) N.A.  (iii) 13.12.1949.  (iv) (a) 5 plough, 7 sohaga 
   and 1 roller. (b) N.A. (c) 36 st./ac. (d) N.A. (e) N.A. (v) Nil. (vi) C-591 (medium). (vii) Irrigated.  
   (viii) Nil. (ix) 2.15".  (x) 29.4.1950.

2. TREATMENTS:
   1. Control (no manure).
   2. Town compost 10 ton/ac.
   3. Farm compost 10 ton/ac.
   Manuring done on 4.11.1949 and 26.11.1949.

3. DESIGN:
   (i) R.B.D. (ii) (a) 3. (b) N.A. (iii) 8. (iv) (a) 10'×6"×69.1'. (b) 10′×6"×69.1'. (v) N.A. (vi) Yes.

4. GENERAL:
   (i) Germination good. No lodging. (ii) Nil. (iii) Grain and straw yield. (iv) (a) 1948 to 1949. (b) No.  
   (c) Nil (v) (a) Nil. (b) Nil. (vi) and (vii) Nil.
5. RESULTS:

(i) 2012 lb./ac.
(ii) 171.7 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>1799</td>
</tr>
<tr>
<td>2.</td>
<td>2074</td>
</tr>
<tr>
<td>3.</td>
<td>2164</td>
</tr>
<tr>
<td>S.E./mean</td>
<td>= 171.65 lb./ac.</td>
</tr>
</tbody>
</table>

Crop: Wheat.
Site: Govt. Agri. Stn., Hansi.

Object: To study the residual effect of guara on Wheat crop.

1. BASAL CONDITIONS:

(i) (a) Nil. (b) Guara. (c) Nil. (ii) (a) Loam. (b) N.A. (iii) 30.11.1951. (iv) (a) 3 desi plough and 4 sohaga. (b) N.A. (c) 37½ sr./ac. (d) and (e) N.A. (v) Nil. (vi) C-591 (medium). (vii) Irrigated. (viii) Nil. (ix) 1.86". (x) 15.4.1953.

2. TREATMENTS:

Previous crop:—
1. Fallow (control).
2. Guara for fodder.
3. Guara for green manuring.
4. Guara for seed.

3. DESIGN:

(i) R.B.D. (ii) (a) 4. (b) N.A. (iii) 6. (iv) (a) 24'×64'. (b) 24'×64'. (v) Nil. (vi) Yes.

4. GENERAL:

(i) Satisfactory. No lodging. (ii) Nil. (iii) Grain yield. (iv) (a) 1951-1952. (b) No. (c) Nil. (v) Nil. (vi) and (vii) Nil.

5. RESULTS:

(i) 684 lb./ac.
(ii) 165.2 lb./ac.
(iii) Treatments are significantly different.
(iv) Av. yield of grain in lb./ac.

<table>
<thead>
<tr>
<th>Treatment</th>
<th>Av. yield</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>679</td>
</tr>
<tr>
<td>2.</td>
<td>559</td>
</tr>
<tr>
<td>3.</td>
<td>893</td>
</tr>
<tr>
<td>4.</td>
<td>616</td>
</tr>
<tr>
<td>S.E./mean</td>
<td>= 67.5 lb./ac.</td>
</tr>
</tbody>
</table>

Crop: Wheat.
Site: Govt. Agri. Stn., Hansi.

Object: To study the residual effect of guara on yield of Wheat crop.

1. BASAL CONDITIONS:

(i) (a) Nil. (b) Fallow and guara. (c) Nil. (ii) (a) Heavy loam. (b) N.A. (iii) 3.12.1952. (iv) (a) 1 roja plough, 5 desi plough, 6 sohaga and 1 roller. (b) N.A. (c) 33½ sr./ac. (d) and (e) N.A. (v) Guara green manured on 28.8.1952. (vi) C-591 (medium). (vii) Irrigated. (viii) Nil. (ix) 1.86". (x) 15.4.1953.
2. TREATMENTS:
Previous crops:-
1. Fallow.
2. Guara for fodder.
3. Guara for seed.
4. Guara green manured.

3. DESIGN:
(i) R.B.D.  (ii) (a) 4.  (b) N.A.  (iii) 6.  (iv) (a) 66'x11'.  (b) 66'x11'.  (v) Nil.  (vi) Yes.

4. GENERAL:
(i) (a) Fair except in plots with treatments 2 and 3.  No lodging.  (ii) Nil.  (iii) Grain yield, (iv) 1951-1952.  (b) No.  (c) Nil.  (v) (a) Nil.  (b) Nil.  (vi) and (vii) Nil.

5. RESULTS:
(i) 660 lb./ac.
(ii) 69.7 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>789</td>
</tr>
<tr>
<td>2.</td>
<td>463</td>
</tr>
<tr>
<td>3.</td>
<td>369</td>
</tr>
<tr>
<td>4.</td>
<td>1000</td>
</tr>
<tr>
<td>S.E./mean</td>
<td>= 28.5 lb./ac.</td>
</tr>
</tbody>
</table>

Crop: - Wheat.
Site: - Govt. Agri. Stn., Hansi.

Object: - To study the effect of heaped manure and trenched manure on yield of Wheat.

1. BASAL CONDITIONS:
(i) (a) Nil.  (b) Fallow.  (c) Nil.  (ii) (a) Heavy loam.  (b) N.A.  (iii) 11.11.1948.  (iv) (a) to (e) N.A.  (v) Nil.  (vi) C-591 (medium).  (vii) Irrigated.  (viii) Nil.  (ix) 0.71'.  (x) 23.4.1949.

2. TREATMENTS:
1. Control (no manure).
2. Heaped manure (well rotten) 7 md.-34 sr./ gross plot.
3. Trenched manure (partly rotten) 12 md.-10 sr./ gross plot.

3. DESIGN:
(i) R.B.D.  (ii) (a) 3.  (b) N.A.  (iii) 8.  (iv) (a) 74'x16-6'.  (b) 60'x16'-5'.  (v) N.A.  (vi) Yes.

4. GENERAL:
(i) No lodging.  (ii) Nil.  (iii) Grain yield.  (iv) (a) Not contd.  (b) and (c) Nil.  (v) (a) and (b) No.  (vi) and (vii) Nil.

5. RESULTS:
(i) 1533 lb./ac.
(ii) 248.5 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>1.</td>
<td>1431</td>
</tr>
<tr>
<td>2.</td>
<td>1570</td>
</tr>
<tr>
<td>3.</td>
<td>1599</td>
</tr>
<tr>
<td>S.E./mean</td>
<td>= 87.9 lb./ac.</td>
</tr>
</tbody>
</table>
Crop : Wheat  
Site : Govt. Agri. Stn., Hansi.

Object :—To study the effect of A/S and C/N on yield of Wheat.

1. BASAL CONDITIONS :
   (i) (a) Nil. (b) Maize. (c) 75 lb./ac. of N as A/S. (ii) (a) Heavy loam. (b) N.A. (iii) 19.11.1953. 
   (iv) (a) 1 rajah plough, 9 desi plough, 7 roller plow and 1 roller. (b) N.A. (c) 37 sr./ac. (d) and (e) N.A. 


2. TREATMENTS :
   1. Control. 
   2. 40 lb./ac. of N as A/S. 
   3. 40 lb./ac. of N as C/N. 

   A/S and C/N applied on 10.1.1954 with watering.

3. DESIGN :
   (i) R.B.D. (ii) (a) 3. (b) N.A. (iii) 4. (iv) (a) 96' x 45' - 4". (b) 85' - 7' x 42' - 4". (v) N.A. (vi) Yes.

4. GENERAL :
   (i) Normal. (ii) Nil. (iii) Grain yield. (iv) (a) 1953-continuing. (b) and (c) Nil. (v) (a) and (b) No. (vi) and (vii) Nil.

5. RESULTS :
   (i) 2169 lb./ac. 
   (ii) 118.3 lb./ac. 
   (iii) Treatments are highly significantly different. 
   (iv) Av. yield of grain in lb./ac. 

<table>
<thead>
<tr>
<th>Treatment</th>
<th>Av. yield</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>2419</td>
</tr>
<tr>
<td>2</td>
<td>2264</td>
</tr>
<tr>
<td>S.E./mean</td>
<td>59.1 lb./ac.</td>
</tr>
</tbody>
</table>

Crop : Wheat (Rabi).  
Site : Govt. Seed Farm, Jacch.

Object :—To study the time of application of different kinds of manures.

1. BASAL CONDITIONS :
   (i) (a) Nil. (b) Maize. (c) Nil. (ii) (a) Clayey. (b) N.A. (iii) 10.12.1952. (iv) (a) N.A. (b) Sown in lines. 
   (c) 30 sr./ac. (d) 8' row to row. (e) —. (v) Nil. (vi) C—250- (medium). (vii) Unirrigated. (viii) N.A. (ix) 8.45'. (x) 28.5.1953.

2. TREATMENTS :
   All combinations of (1) and (2). 
   (1) 2 levels of N : N₀ = 0 and N₁= 25 lb./ac. 
   (2) 2 levels of P₂O₅: P₃= 0 and P₄= 25 lb./ac. 

   N as A/S applied when crop was one month old while P₂O₅ as super applied before sowing.

3. DESIGN :
   (i) Fact. in R.B.D. (ii) (a) 4. (b) N.A. (iii) 3. (iv) (a) and (b) 11' x 99'. (v) Nil. (vi) Yes.

GENERAL :
   (i) N.A. (ii) Nil. (iii) Grain yield (iv) (a) Not contd. (b) Nil. (c) Nil. (v) (a) No. (b) Nil. (vi) and (vii) Nil.
5. RESULTS:

(i) 632.6 lb./ac.
(ii) 45.13 lb./ac.
(iii) All the effects are highly significant.
(iv) Av. yield of grain in lb./ac.

\[
\begin{array}{c|cc|c}
& N_0 & N_1 & \text{Mean} \\
\hline
P_0 & 524.6 & 617.1 & 570.9 \\
P_1 & 966.9 & 421.7 & 694.3 \\
\hline
\text{Mean} & 745.8 & 519.4 & 632.6 \\
\end{array}
\]

S.E. of any marginal mean = 18.42 lb./ac.
S.E. of body of table = 26.05 lb./ac.

Crop : Wheat.
Site : Govt. Seed Farm, Jacch.
Object : To study the effect of fertilizer on yield of Wheat.

Ref : Pb. 52(191).
Type : ‘M’.

1. BASAL CONDITIONS:
   (i) (a) Nil. (b) Maize. (c) Nil. (ii) (a) Clayey. (b) N.A. (iii) 8.12.1952. (iv) (a) to (c) N.A. (v) Nil.

2. TREATMENTS:
   1. Control (no manure).
   2. 20 lb./ac. of N as A/S broadcast at sowing time.
   3. 20 lb./ac. of P_2O_5 as Super broadcast at sowing time.
   4. 23 lb./ac. of P_2O_5 as Super drilled immediately after sowing.

3. DESIGN:
   (i) R.B.D. (ii) 4. (b) N.A. (iii) 4. (iv) (a) and (b) 9’ x 121’. (v) Nil. (vi) Yes.

4. GENERAL:
   (i) N.A. (ii) Nil. (iii) Grain yield. (iv) (a) Not contd. (b) Nil. (c) Nil. (v) (a) No. (b) Nil. (vi) and (vii) Nil.

5. RESULTS:

(i) 543.9 lb./ac.
(ii) 65.26 lb./ac.
(iii) Treatments are highly significantly different.

<table>
<thead>
<tr>
<th>Treatment</th>
<th>Av. yield</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>362.6</td>
</tr>
<tr>
<td>2.</td>
<td>578.6</td>
</tr>
<tr>
<td>3.</td>
<td>540.0</td>
</tr>
<tr>
<td>4.</td>
<td>694.3</td>
</tr>
</tbody>
</table>

S.E./mean = 32.63 lb./ac.
Crop: Wheat (Rabi).

Site: Govt. Seed Farm, Jacch.

Object: To study the effect of placement of A/S on yield of Wheat.

1. BASAL CONDITIONS:
(i) (a) Nil. (b) Maize. (c) Nil. (ii) (a) Clayey. (b) N.A. (iii) 1.12.1952. (iv) (a) N.A. (b) Sown in lines. (c) 30 sr./ac. (d) 8' row to row. (e) →. (v) Nil. (vi) C—250 (medium). (vii) Unirrigated. (viii) One weeding. (ix) 8.48°. (x) 26.5.1953.

2. TREATMENTS:
1. Control (no manure).
2. 20 lb./ac. of N as A/S broadcast at sowing.
3. 20 lb./ac. of N as A/S applied by pore and seed sown by kera.
4. 20 lb./ac. of N as A/S applied in contact with seed.

3. DESIGN:
(i) R.B.D. (ii) (a) 4. (b) N.A. (iii) 4. (iv) (a) and (b) 8'×136'. (v) Nil. (vi) Yes.

4. GENERAL:
(i) N.A. (ii) Nil. (iii) Grain yield. (iv) (a) Not contd. (b) Nil. (c) Nil. (v) (a) No. (b) Nil. (vi) and (vii) Nil.

5. RESULTS:
(i) 517.5 lb./ac.
(ii) 65.45 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>369</td>
</tr>
<tr>
<td>2.</td>
<td>612</td>
</tr>
<tr>
<td>3.</td>
<td>567</td>
</tr>
<tr>
<td>4.</td>
<td>522</td>
</tr>
<tr>
<td>S.E./mean</td>
<td>32.73 lb./ac.</td>
</tr>
</tbody>
</table>

Crop: Wheat.

Site: Jullundur Agri. Stn., Jullundur.

Object: To find a suitable manure for Wheat crop.

1. BASAL CONDITIONS:
(i) (a) Nil. (b) Maize. (c) Nil. (ii) (a) Loam. (b) N.A. (iii) 4.11.1948. (iv) (a) 1 roja as d d d ploughings. (b) N.A. (c) 30 sr./ac. (d) N.A. (e) N.A. (f) Nil. (vi) C—591 (medium). (vii) Irrigated. (viii) One hoeing, weeding and topping. (ix) 6.29°. (x) 17.4.1949.

2. TREATMENTS:
1. Control (no manure).
2. 75 lb./ac. of N as A/S.
3. 75 lb./ac. of N as A/N.
4. 75 lb./ac. of N as Ammo. Phos.
5. 94.5 lb./ac. of P2O5 as Super.

Manures applied on 15.12.1948.

3. DESIGN:
(i) R.B.D. (ii) (a) 5. (b) N.A. (iii) 5. (iv) (a) 12'×52'. (b) 12'×45°44'. (v) N.A. (vi) Yes.
4. GENERAL:

5. RESULTS:
   (i) 2375 lb./ac.
   (ii) 293.3 lb./ac.
   (iii) Treatments are highly significantly different.
   (iv) Av. yield of grain in lb./ac.
      Treatment          Av. yield
      1.                 1942
      2.                 2691
      3.                 2530
      4.                 2622
      5.                 2049
      S.E./mean = 90.9 lb./ac.

6. RESULTS:
   (i) 2935 lb./ac.
   (ii) 252.6 lb./ac.
   (iii) Treatments are not significantly different.
   (iv) Av. yield of grain in lb./ac.
      Treatment          Av. yield
      1.                 2950
      2.                 2672
      3.                 2851
      4.                 2804
      5.                 3151
      6.                 2901
      7.                 3031
      S.E./mean = 103.1 lb./ac.

Crop:—Wheat.  
Site:—Jullundur Agri.Stn., Jullundur.  
Ref:—Pb. 48(12).  
Type:—'M'.

Object:—To study the effect of manures applied to previous Maize crop on the following Wheat crop.

1. BASAL CONDITIONS:
   (i) (a) Nil.  (b) Maize.  (c) As per treatments.  (iii) 4.11.1948.  (iv) (a) 3 desi plough. (b) to (e) N.A. (v) N.A. (vi) C-591 (medium). (vii) Irrigated. (viii) Nil.  (ix) 6.29.  (x) 15.4.1949.

2. TREATMENTS:
   1. Control (no manure).
   2. 100 lb./ac. of N as F.Y.M.
   3. 150 lb./ac. of N as F.Y.M.
   4. 100 lb./ac. of N as A/S.
   5. 150 lb./ac. of N as A/S.
   6. 50 lb./ac. of N as F.Y.M.+50 lb./ac. of N as A/S.
   7. 75 lb./ac. of N as F.Y.M.+75 lb./ac. of N as A/S.

Manure applied to the previous crop maize on 8.8.1948.

3. DESIGN:
   (i) R.B.D.  (ii) (a) 7.  (b) N.A. (iii) 6.  (iv) (a) 7'×47'. (b) 7'×43'-24'. (v) N.A. (vi) Yes.

4. GENERAL:
   (i) Slight lodging in patches in plots with treatment 4. (ii) Nil. (iii) Straw and grain yield. (iv) (a) Not contd. (b) No. (c) Nil. (v) (a) No. (b) Nil. (vi) and (vii) Nil.

5. RESULTS:
   (i) 2935 lb./ac.
   (ii) 252.6 lb./ac.
   (iii) Treatments are not significantly different.
   (iv) Av. yield of grain in lb./ac.
      Treatment          Av. yield
      1.                 2950
      2.                 2672
      3.                 2851
      4.                 2804
      5.                 3151
      6.                 2901
      7.                 3031
      S.E./mean = 103.1 lb./ac.
Crop :- Wheat (Rabi).
Site :- Jullundur Agri. Stn., Jullundur.

Ref :- Pb. 49(26).
Type :- ‘M’.

Object :- To study the effect of guara green manured with and without P2O5 on the yield of Wheat.

1. BASAL CONDITIONS :
   (i) (a) Nil. (b) Guara. (c) As per treatments. (ii) (a) Loam. (b) N.A. (iii) 3.11.1949. (iv) (a) One
   raja ploughing, 4 desi ploughing, 6 sohages and 1 roller. (b) N.A. (c) 30 sr./ac. (d) and (e) N.A. (v)

2. TREATMENTS :
   1. Guara green manured.
   2. Guara green manured + 10 lb./ac. of P2O5 as Sikker.

   Super applied on 3.11.1949.

3. DESIGN :
   (i) Paired plots. (ii) (a) 2. (b) N.A. (iii) 6. (iv) (a) and (b) 39.7" x 10". (v) Nil. (vi) Yes.

4. GENERAL :
   (i) Germination good. No lodging. (ii) Nil. (iii) Grain and straw yield. (iv) (a) Not contd. (b) No.
   (c) Nil. (v) (a) No. (b) Nil. (vi) and (vii) Nil.

5. RESULTS :
   (i) 2142 lb./ac.
   (ii) 292.4 lb./ac.
   (iii) Treatments are not significantly different.
   (iv) Av. yield of grain in lb./ac.

   Treatment       Av. yield
   1.              2144
   2.              2140
   S.E./mean = 119.4 lb./ac.

Crop :- Wheat (Rabi).
Site :- Jullundur Agri. Stn., Jullundur.

Ref :- Pb: 49(18).
Type :- ‘M’.

Object :- To study the residual effect of manures applied to previous crop and application of A/S on yield
of Wheat.

1. BASAL CONDITIONS :
   (i) (a) Nil. (b) Bajra. (c) As per main-plot treatments. (ii) (a) Loam. (b) N.A. (iii) 30.11.1949
   (iv) (a) 4 desi ploughings and 4 sohages (b) to (c) N.A. (v) Nil. (vi) C-591 (medium). (vii) Irrigated.
   (viii) One weeding. (ix) 6.14". (x) 30.4.1950.

2. TREATMENTS :
   Main-plot treatments :
   3 levels of N (applied to previous crop Bajra) : N0=0, N1=50 and N2=100 lb./ac.
   Sub-plot treatments :
   3 levels of N' : N'0=0, N'1=25 and N'2=50 lb./ac.
   N' as A/S applied in sub-plots on 30.12.1949.

3. DESIGN :
   (i) Split-plot. (ii) (a) 3 main-plots/block ; 3 sub-plots/main-plot. (b) N.A. (iii) 3. (iv) (a) N.A.
   (b) 6.75" x 59.63". (v) N.A. (vi) Yes.

4. GENERAL :
   (i) Slight lodging took place in plots in which 50 lb./ac. of N was applied to current wheat crop. (ii) Nil.
   (iii) Grain and straw yield. (iv) (a) Not contd. (b) Nil. (c) Nil. (v) (a) No. (b) Nil. (vi) and (vii) Nil.
5. RESULTS:

(i) 1811 lb./ac.
(ii) (a) 38.3 lb./ac.
(b) 168.7 lb./ac.

(iii) Both N and N' effects are highly significant while their interaction is not significant.
(iv) Av. yield of grain in lb./ac.

<table>
<thead>
<tr>
<th></th>
<th>N_0'</th>
<th>N_1'</th>
<th>N_2'</th>
<th>Mean</th>
</tr>
</thead>
<tbody>
<tr>
<td>N_0</td>
<td>663</td>
<td>1716</td>
<td>2530</td>
<td>1636</td>
</tr>
<tr>
<td>N_1</td>
<td>802</td>
<td>1932</td>
<td>2783</td>
<td>1839</td>
</tr>
<tr>
<td>N_2</td>
<td>1136</td>
<td>2018</td>
<td>2719</td>
<td>1958</td>
</tr>
<tr>
<td>Mean</td>
<td>867</td>
<td>1889</td>
<td>2677</td>
<td>1811</td>
</tr>
</tbody>
</table>

S.E. of difference of two
1. N marginal means = 18.1 lb./ac.
2. N' marginal means = 79.5 lb./ac.
3. N' means at the same level of N = 137.7 lb./ac.
4. N means at the same level of N' = 113.9 lb./ac.

Crop: Wheat (Rabi).
Site: Jullundur Agri. Stn., Jullundur.
Object: To study the effect of different doses of A/S on Wheat yield.

1. BASAL CONDITIONS:
(i) (a) Nil. (b) Maize. (c) Nil. (ii) (a) Loam. (b) N.A. (iii) 12.11.1949. (iv) (a) 5 Desi hal, 5 sohaga and 1 horse hoe. (b) N.A. (c) 30 sr./ac. (d) and (e) N.A. (v) Nil. (vi) C-591 (medium). (vii) Irrigated. (viii) One weeding and hoeing. (ix) 6.14°. (x) N.A.

2. TREATMENTS:
1. Control (no manure).
2. 25 lb./ac. of N as A/S.
3. 50 lb./ac. of N as A/S.
4. 75 lb./ac. of N as A/S.

3. DESIGN:
(i) R.B.D. (ii) (a) 4. (b) N.A. (iii) 24. (iv) (a) and (b) 1/48th ac. (v) Nil. (vi) Yes.

4. GENERAL:
(i) No lodging. (ii) N.A. (iii) Grain yield. (iv) (a) Not contd. (b) No. (c) Nil. (v) (a) No. (b) Nil. (vi) and (vii) Nil.

5. RESULTS:
(i) 2865 lb./ac.
(ii) 246.4 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>2685</td>
</tr>
<tr>
<td>2.</td>
<td>2876</td>
</tr>
<tr>
<td>3.</td>
<td>2925</td>
</tr>
<tr>
<td>4.</td>
<td>2973</td>
</tr>
</tbody>
</table>
S.E./mean = 50.3 lb./ac.
Crop :- Wheat.
Site :- Jullundur Agri. Stn., Jullundur.

Object :- 

1. BASAL CONDITIONS :
   (i) (a) Nil. (b) Fallow. (c) Nil. (ii) (a) Sandy. (b) Refer soil analysis, Jullundur. (iii) 22.10.1948. (iv) (a) 1 rafa, 6 desi plough, 1 horse hoe and 5 sohaga. (b) N.A. (c) 30 sr./ac. (d) and (e) N.A. (v) Nil. (vi) C-591 (medium). (vii) Irrigated. (viii) One hoeing and weeding. (ix) 6.14", (x) 22.23.4.1950.

2. TREATMENTS :
   All combinations of (1) and (2) + a control.

3. RESULTS :
   (i) 1290 lb./ac.
   (ii) 1423 lb./ac.
   (iii) Only S effect and "control vs., others" effect are highly significant.
   (iv) Avg. yield of grain in lb./ac.

Crop :- Wheat (Rabi).
Site :- Jullundur Agri. Stn., Jullundur.

Object :- 

1. BASAL CONDITIONS :
   (i) (a) Nil. (b) Guara (green manure). (c) Nil. (ii) (a) Loam. (b) Refer soil analysis, Jullundur. (iii) 29.10.1949. (iv) (a) 5 desi hal, 4 sohaga and 1 horse hoe. (b) to (e) N.A. (v) Guara green manure buried on 26,27.8.1949. (vi) C-591 (medium). (vii) Unirrigated. (viii) One hoeing and weeding. (ix) 6.14", (x) 22.23.4.1950.

2. TREATMENTS :
   All combinations of (1) and (2) + a control
3. DESIGN:
(i) R.B.D. (ii) (a) 7. (b) N.A. (iii) 6. (iv) (a) and (b) 79.2' x 13.75'. (v) Nil. (vi) Yes.

4. GENERAL:
(i) Germination good but growth below normal due to the absence of adequate rains. No lodging. (ii) Nil. (iii) Grain and straw yield. (iv) (a) 1948-1949. (b) No. (c) Nil. (v) (a) and (b) Nil. (vi) and (vii) Nil.

5. RESULTS:
(i) 1163 lb./ac.
(ii) 153.8 lb./ac.
(iii) Only N effect is highly significant.
(iv) Av. yield of grain in lb./ac.

<table>
<thead>
<tr>
<th></th>
<th>N₁</th>
<th>N₂</th>
<th>Mean</th>
</tr>
</thead>
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<td>S₁</td>
<td>1276</td>
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<td>1212</td>
<td>1056</td>
<td>1134</td>
</tr>
<tr>
<td>S₃</td>
<td>1248</td>
<td>1054</td>
<td>1151</td>
</tr>
<tr>
<td>Mean</td>
<td>1245</td>
<td>1073</td>
<td>1159</td>
</tr>
</tbody>
</table>

S.E. of marginal mean of S = 44.4 lb./ac.
S.E. of marginal mean of N = 36.3 lb./ac.
S.E. of body of table = 62.8 lb./ac.

Crop :- Wheat.
Site :- Jullundur Agri. Stn., Jullundur.

Object :- To study the effect of different manures on yield of Wheat crop.

1. BASAL CONDITIONS :
(i) (a) Nil. (b) Water melon. (c) N.A. (ii) (a) Loam. (b) Refer soil analysis, Jullundur. (iii) 8,11.1948.
(iv) (a) 1 raja, 4 desi, 3 horse hoe, 6 sohaga and 1 bar harrow. (b) N.A. (c) 32 sr./ac. (d) N.A. (e) N.A. (v) Nil. (vi) C—591 (medium). (vii) Irrigated. (viii) One hoeing. (ix) 6.29". (x) 15 to 17.4.1949.

2. TREATMENTS :
All combinations of (1) and (2)+a control.
(2) 2 levels of N : N₁=25 and N₂=40 lb./ac.

3. DESIGN :
(i) R.B.D. (ii) (a) 7. (b) N.A. (iii) 6. (iv) (a) and (b) 15' x 44'. (v) Nil. (vi) Yes.

4. GENERAL :
(i) Normal. No lodging. (ii) Slight attack of yellow rust. (iii) Grain and straw yield. (iv) (a) 1948 to 1950. (b) No. (c) —. (v) (a) No. (b) —. (vi) and (vii) Nil.
5. RESULTS:
(i) 1887 lb./ac.
(ii) 402.1 lb./ac.
(iii) Effects of S and "control vs. others" are highly significant. Other effects are not significant.
(iv) Av. yield of grain in lb./ac.

<table>
<thead>
<tr>
<th></th>
<th>Control =1383 lb./ac.</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>N1</td>
</tr>
<tr>
<td>S1</td>
<td>1484</td>
</tr>
<tr>
<td>S2</td>
<td>1935</td>
</tr>
<tr>
<td>S3</td>
<td>2230</td>
</tr>
</tbody>
</table>

Mean  
= 1883  
= 2059  
= 1971

S.E. of marginal mean of S = 116.1 lb./ac.
S.E. of marginal mean of N = 94.8 lb./ac.
S.E. of body of table = 164.1 lb./ac.

Crop:—Wheat (Rabi).  
Site:—Jullundur Agri. Strn., Jullundur,  
Ref:—Pb. 49(17).  
Type:—'M'.

Object:—To find the effect of different manures on yield of Wheat crop.

1. BASAL CONDITIONS:
(i) (a) Nil. (b) Bajra and Maize. (c) Nil. (ii) (a) Loam. (b) Refer soil analysis, Jullundur. (iii) 14.11.1949.

2. TREATMENTS:
All combinations of (1) and (2) + a control (no manure).
(1) 3 sources of N: S1 = F.Y.M.; S2 = A/S and S3 = Ammo. Phos.
(2) 2 doses of N: N1 = 25 lb./ac. and N2 = 40 lb./ac.

3. DESIGN:
(i) R.B.D; (ii) (a) 7. (b) N.A. (iii) 2; (iv) (a) and (b) 15'X44'. (v) Nil. (vi) Yes.

4. GENERAL:
(i) Germination good; growth good. No lodging. (ii) Nil. (iii) Grain and straw yield. (iv) (a) 1948 to 1950. (b) Nil. (c) Nil. (v) (a) Nil. (b) —. (vi) and (vii) Nil.

5. RESULTS:
(i) 2571 lb./ac.
(ii) 347.9 lb./ac.
(iii) None of the effects is significant.
(iv) Av. yield of grain in lb./ac.

<table>
<thead>
<tr>
<th></th>
<th>Control =2715 lb./ac.</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>N1</td>
</tr>
<tr>
<td>S1</td>
<td>3089</td>
</tr>
<tr>
<td>S2</td>
<td>2003</td>
</tr>
<tr>
<td>S3</td>
<td>2681</td>
</tr>
</tbody>
</table>

Mean  
2591  
2303  
2547

S.E. for marginal mean of S = 173.9 lb./ac.
S.E. for marginal mean of N = 142.0 lb./ac.
S.E. of body of table = 246.0 lb./ac.
Crop := Wheat (Rabi).
Site := Jullundur Agri. Stn., Jullundur.

Object := To find the effect of different manures on yield of Wheat crop.

1. BASAL CONDITIONS :
(i) (a) Wheat-Maize-Wheat. (b) Maize. (c) N.A. (ii) (a) Loam. (b) Refer soil analysis, Jallundur.
(iii) 14.11.1949. (iv) (a) 5 desi hal, 4 sohaga 1 roller and 1 horsehoe. (b) N.A. (c) 30 sr./ac. (d) and (e) N.A. (v) Nil. (vi) C-591 (medium). (vii) Irrigated. (viii) Hoeing and weeding. (ix) 6.14°. (x) 28.4.1950.

2. TREATMENTS :
All combinations of (1) and (2) + a control.
(1) 3 sources of N: S1 = F.Y.M., S2 = A/S and S3 = Ammo. Phos.
(2) 2 levels of N: N1 = 25 and N2 = 40 lb./ac.

3. DESIGN:
(i) R.B.D. (ii) (a) 7. (b) N.A. (iii) 3. (iv) (a) and (b) 1/65th ac. (v) Nil. (vi) Yes.

4. GENERAL:
(i) Germination and condition satisfactory. No lodging. (ii) Nil. (iii) Grain and straw yield. (iv) (a) 1948–1950. (b) Nil. (c) Nil. (d) and (e) N.A. (v) (a) No. (b) —. (vi) and (vii) Nil.

5. RESULTS:
(i) 2272 lb./ac.
(ii) 135.5 lb./ac.
(iii) Effect of S, N and "control vs. others" are highly significant.
(iv) Av. yield of grain in lb./ac.

<table>
<thead>
<tr>
<th>N1</th>
<th>N2</th>
<th>Mean</th>
</tr>
</thead>
<tbody>
<tr>
<td>2034</td>
<td>2123</td>
<td>2103</td>
</tr>
<tr>
<td>2337</td>
<td>2259</td>
<td>2433</td>
</tr>
<tr>
<td>2329</td>
<td>2719</td>
<td>2524</td>
</tr>
</tbody>
</table>

Mean = 2250
S.E. of marginal mean of S = 55.3 lb./ac.
S.E. of marginal mean of N = 45.2 lb./ac.
S.E. of body of table = 78.2 lb./ac.

Crop := Wheat.
Site := Jullundur Agri. Stn., Jullundur.

Object := To find the effect of different manures on yield of Wheat crop.

1. BASAL CONDITIONS :
(i) (a) Nil. (b) Onion. (c) Nil. (ii) (a) Loam. (b) Refer soil analysis, Jallundur. (iii) 7.11.1950. (iv) (a) 1 raja, 7 desi hal, 1 horseshoe and 4 sohaga. (b) No. (c) 36 sr./ac. (d) and (e) N.A. (v) Nil. (vi) C-591 (medium). (vii) Irrigated. (viii) Hoeing and weeding. (ix) 5.19°. (x) 26, 29, 30.4.1951.

2. TREATMENTS :
All combinations of (1) and (2) + a control.
(1) 4 sources of N: S1 = F.Y.M., S2 = A/S, S3 = Ammo. Phos. and S4 = G.N.C.
(2) 2 levels of N: N1 = 25 and N2 = 40 lb./ac.

3. DESIGN:
(i) R.B.D. (ii) (a) 9. (b) N.A. (iii) 6. (iv) (a) 10.5'×46.09'. (b) 9.0'×46.09'. (v) One furrow left on each side of length. (vi) Yes.
4. GENERAL:
   (i) Germination good; growth normal. No lodging.  (ii) Nil.  (iii) Grain and straw yield.  (iv) (a) 1948–1950.  (b) No.  (c) Nil.  (v) (a) Nil.  (b) Nil.  (vi) Nil.  (vii) Nil.

5. RESULTS:
   (i) 1560 lb./ac.
   (ii) 326.2 lb./ac.
   (iii) “Control vs others”, S and N effects are highly significant.
   (iv) Av. yield of grain in lb./ac.

<table>
<thead>
<tr>
<th></th>
<th>S1</th>
<th>S2</th>
<th>S3</th>
<th>S4</th>
<th>Mean</th>
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<tr>
<td>N2</td>
<td>1035</td>
<td>2052</td>
<td>2077</td>
<td>1921</td>
<td>1771</td>
</tr>
</tbody>
</table>

Mean 963 1883 1948 1788 1644
S.E. of marginal mean of S = 94.0 lb./ac.
S.E. of marginal mean of N = 66.6 lb./ac.
S.E. of body of table = 133.2 lb./ac.

Crop: Wheat (Rabi).
Site: Jullundur Agri. Stn., Jullundur.

Object: To study the effect of application of compost and FYM on yield of Wheat.

1. BASAL CONDITIONS:
   (i) (a) Nil.  (b) Guara (fodder).  (c) Nil.  (ii) (a) Lorem.  (b) Refer soil analysis, Jullundur.  (iii) 12.12.1949.
   (iv) (a) 1 raja ploughing, 3 des/ploughing, 6 sohaga, and 1 horse hoe.  (b) N.A.  (c) 1 mld./ac.  (d) and (e) N.A.  (v) Nil.  (vi) C—228 (medium).  (vii) Irrigated.  (viii) 2 weedings.  (ix) 6.14a.  (x) 4.5.1950.

2. TREATMENTS:
   1. Control (no manure).
   2. 10 ton/ac. of FYM.
   3. 10 ton/ac. of compost.


3. DESIGN:
   (i) R.B.D.  (ii) (a).  (b) N.A.  (iii) 6.  (iv) (a) 104’×19.5’.  (b) 100’-10”×18’.  (v) N.A.  (vi) Yes.

4. GENERAL:
   (i) Satisfactory.  No lodging.  (ii) Nil.  (iii) Grain and straw yield.  (iv) (a) 1949–1950.  (b) No.  (c) Nil.  (v) (a) No.  (b) Nil.  (vi) and (vii) Nil.

5. RESULTS:
   (i) 1120 lb./ac.
   (ii) 47.0 lb./ac.
   (iii) Treatments are highly significantly different.

<table>
<thead>
<tr>
<th>Treatment</th>
<th>Av. yield</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>876</td>
</tr>
<tr>
<td>2.</td>
<td>1025</td>
</tr>
<tr>
<td>3.</td>
<td>1460</td>
</tr>
</tbody>
</table>

S.E./mean = 19.2 lb./ac.

Object: To study the effect of compost and F.Y.M. on the yield of Wheat against no manure.

1. BASAL CONDITIONS:
   (i) (a) Nil. (b) Fallow. (c) Nil. (ii) (a) Loam. (b) Refer soil analysis, Jullundur. (iii) 7.11.1950.
   (iv) (a) 1 rajia plough, 6 desi hal, 2 horse hoe and 5 sohaga, (b) N.A. (c) 1 md./ac. (d) 9" row to row. (e) N.A. (v) Nil. (vi) C—591 (medium). (vii) Irrigated. (viii) 1 weeding-cum-hoeing. (ix) 5.19'. (x) 25.4.1951.

2. TREATMENTS:
   1. Control (no manure).
   2. 10 ton/ac. of F.Y.M.
   3. 10 ton/ac. of Compost.

3. DESIGN:
   (i) R.B.D. (ii) (a) 3. (b) N.A. (iii) 6. (iv) (a) 12'×100.83'. (b) 10.5'×100.83'. (v) One row on each side of length. (vi) Yes.

4. GENERAL:
   (i) Germination good. Growth satisfactory. (ii) Nil. (iii) Grain and straw yield. (iv) (a) 1949—1950. (b) No. (c) Nil. (v) (a) Nil. (b) —. (vi) and (vii) Nil.

5. RESULTS:
   (i) 873 lb./ac.
   (ii) 109.8 lb./ac.
   (iii) Treatments are highly significantly different.
   (iv) Av. yield of grain in lb./ac.
   Treatment        Av. yield
   1.                690
   2.                877
   3.                1053
   S.E./mean =44.8 lb./ac.

---


Object: To find the best dose of N obtained from A/S for Wheat crop.

1. BASAL CONDITIONS:
   (i) (a) Wheat—Maize. (b) Maize. (c) Nil. (ii) (a) Heavy loam. (b) Refer soil analysis, Jullundur. (iii) 22.23.11.1952. (iv) (a) 7 ploughing and 5 sohaga (b) N.A. (c) 30 sr./ac. (d) 8" row to row. (e) N.A. (v) Nil. (vi) C-518 (medium). (vii) Irrigated. (viii) One weeding and one hoeing. (ix) 2.8'. (x) 22.4.1953.

2. TREATMENTS:
   1. Control (no manure).
   2. 25 lb./ac. of N as A/S.
   3. 50 lb./ac. of N as A/S.
   4. 75 lb./ac. of N as A/S.

   Half A/S applied at sowing and half on 6.1.1953.

3. DESIGN:
   (i) R.B.D. (ii) (a) 4. (b) N.A. (iii) 16. (iv) (a) 110'×10'. (b) 90.75'×8.75'. (v) N.A. (vi) Yes.

4. GENERAL:
   (i) Germination and condition good. No lodging. (ii) Nil. (iii) Grain yield. (iv) (a) 1950—1952. (b) No. (c) Nil. (v) (a) and (b) Nil. (vi) and (vii) Nil.
5. RESULTS:
(i) 2381 lb./ac.
(ii) 308.0 lb./ac.
(iii) Treatments are highly significantly different.
(iv) Av. yield of grain in lb./ac.

<table>
<thead>
<tr>
<th>Treatment</th>
<th>Av. yield</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>1987</td>
</tr>
<tr>
<td>2.</td>
<td>2235</td>
</tr>
<tr>
<td>3.</td>
<td>2260</td>
</tr>
<tr>
<td>4.</td>
<td>2580</td>
</tr>
</tbody>
</table>

S.E./mean = 77.0 lb./ac.

Crop: Wheat (Rabi).
Site: Jullundur Agri. Stn., Jullundur.
Ref: Pb. 49(30).
Type: 'M'.

Object: To study the effect of different sources of N in presence and absence of Super on yield of Wheat.

1. BASAL CONDITIONS:
(i) (a) Nil. (b) Chari (fodder). (c) Nil. (ii) (a) Loam. (b) Refer soil analysis, Jullundur. (iii) 24.11.1949.
(iv) (a) 4 desi plough, 3 sohaga, 1 horse hoe and 1 roller. (b) N.A. (c) 30 sr./ac. (d) N.A. (e) N.A. (v) Nil.

2. TREATMENTS:
All combinations of (1) and (2) + a Control
(1) 3 doses of N: N1 = 100 md./ac. of F.Y.M., N2 = 100 md./ac. of Compost and N3 = 2 md./ac. of A/S.
(2) 2 levels of P2O5: P0 = 0 and P1 = 10.1b./ac. F.Y.M. and Compost applied on 23.11.1949, A/S on 23.12.1949 while P2O5 as Super broadcast on 23.12.1949.

3. DESIGN:
(i) R.B.D. (ii) (a) 7. (b) N.A. (iii) 4: (iv) (a) 32'×10'×6' (b) 30'.2'×9'. (v) N.A. (vi) Yes.

4. GENERAL:
(i) Satisfactory. No lodging. (ii) Nil. (iii) Grain and straw yield. (iv) (a) 1949—52. (b) No. (c) Nil.
(v) (a) No. (b) —. (vi) and (vii) Nil.

5. RESULTS:
(i) 2381 lb./ac.
(ii) 308.0 lb./ac.
(iii) N and 'control vs. others' effects are highly significant while other effects are not 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>
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<tbody>
<tr>
<td>1748</td>
<td>526</td>
<td>598</td>
<td>957</td>
</tr>
<tr>
<td>1841</td>
<td>511</td>
<td>567</td>
<td>973</td>
</tr>
</tbody>
</table>

Mean 1794 518 582 965
S.E. of marginal mean of P = 23.9 lb./ac.
S.E. of marginal mean of N = 19.5 lb./ac.
S.E. of body of table = 33.8 lb./ac.
Crop: Wheat.  
Site: Jullundur Agri. Stn., Jullundur.  
Object: To study the effect of different sources of N in presence and absence of Super on yield of Wheat.

1. BASAL CONDITIONS:
   (i) (a) Nil. (b) Bajra. (c) Nil. (ii) (a) Loam. (b) Refer soil analysis, Jullundur. (iii) 3.11.1950. (iv) (a) 1 raja, 5 desi hal and 6 sohaga. (b) N.A. (c) 36 sr./ac. (d) N.A. (e) N.A. (v) Nil. (vi) C-591 (medium). (vii) Irrigated. (viii) One weeding. (ix) 5.19°. (x) 30.4.1951 and 1.5.1951.

2. TREATMENTS:
   All combinations of (1) and (2) - a control.
   (1) 3 doses of N: N1 = F.Y.M. at 100 md./ac. and N2 = Compost at 100 md./ac. and N3 = A/S at 2 md./ac.
   (2) 2 levels of P2O5: P0 = 0 lb./ac. and N1 = 10 lb./ac. of P2O5.
   F.Y.M. and Compost applied on 29.11.1950, A/S on 11.1.1951 while P2O5 as Super applied on 27.11.1950.

3. DESIGN:
   (i) R.B.D. (ii) (a) 7. (b) N.A. (iii) 4. (iv) (a) 12' x 45.36'. (b) 10.5' x 45.36'. (v) One furrow left on each side of plot as non-experimental area. (vi) Yes.

4. GENERAL:
   (i) Germination and growth good. No lodging. (ii) Locust attack. (iii) Grain and straw yield. (iv) (a) 1949-1952. (b) No. (c) Nil. (v) (a) Nil. (b) - . (vi) and (vii) Nil.

5. RESULTS:
   (i) 645.5 lb./ac.
   (ii) 110.50 lb./ac.
   (iii) N and "control vs. others" effects are highly significant.
   (iv) Av. yield of grain in lb./ac.

<table>
<thead>
<tr>
<th>Control -305.6 lb./ac.</th>
<th>N1</th>
<th>N2</th>
<th>N3</th>
<th>Mean</th>
</tr>
</thead>
<tbody>
<tr>
<td>P0</td>
<td>382</td>
<td>408</td>
<td>1196</td>
<td>662</td>
</tr>
<tr>
<td>P1</td>
<td>418</td>
<td>403</td>
<td>1393</td>
<td>745</td>
</tr>
</tbody>
</table>

   Mean 410 406 1294 703

   S.E. of marginal mean of N = 39.1 lb./ac.
   S.E. of marginal means of P = 31.9 lb./ac.
   S.E. of body of table = 55.3 lb./ac.

Crop: Wheat (Rabi).  
Site: Jullundur Agri. Stn., Jullundur.  
Object: To study the effect of different sources of N in presence and absence of Super on yield of Wheat.

1. BASAL CONDITIONS:
   (i) (a) Nil. (b) Bajra. (c) Nil. (ii) (a) Sandy loam. (b) Refer soil analysis, Jullundur. (iii) 18.11.1951.
   (iv) (a) 5 ploughings and 6 sohaga. (b) N.A. (c) 32 sr./ac. (d) N.A. (e) N.A. (v) Nil. (vi) C-591 (medium). (vii) Irrigated. (viii) Nil. (ix) 3.85° (x) 17.4.1952.

2. TREATMENTS:
   All combinations of (1) and (2) - a control.
   (1) 3 doses of N: N1 = F.Y.M. at 100 md./ac. and N2 = Compost at 100 md./ac. and N3 = A/S at 2 md./ac.
   (2) 2 levels of P2O5: P0 = 0 and P1 = 10 lb./ac.
   P2O5 as Super, F.Y.M. and Compost applied on 18.11.1951 before sowing while A/S applied on 20.12.51 at 1st irrigation.
3. DESIGN:
(i) R.B.D. (ii) (a) 7, (b) N.A. (iii) 4. (iv) (a) 44.44' x 12', (b) 48.40' x 11.25'. (v) N.A. (vi) Yes.

4. GENERAL:
(i) Germination good; growth fair in F.Y.M. plots and ‘good’ in A/S plots. No lodging. (ii) Nil. (iii) Grain yield. (iv) (a) 1949—1952. (b) No. (c) Nil. (v) (a) Nil. (b)—. (vi) and (vii) Nil.

5. RESULTS:
(i) 362.5 lb./ac.
(ii) 64.34 lb./ac.
(iii) N and “control vs. others” effects are highly significant while interaction NP is significant.
(iv) Av. yield of grain in lb./ac.

<table>
<thead>
<tr>
<th></th>
<th>Control</th>
<th>N1</th>
<th>N2</th>
<th>N3</th>
<th>Mean</th>
</tr>
</thead>
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<tr>
<td>P0</td>
<td>614.6</td>
<td>630.0</td>
<td>1830.9</td>
<td>1025.2</td>
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<tr>
<td>P1</td>
<td>654.0</td>
<td>690.4</td>
<td>1713.9</td>
<td>1029.4</td>
<td></td>
</tr>
<tr>
<td>Mean</td>
<td>649.3</td>
<td>660.2</td>
<td>1772.4</td>
<td>1027.3</td>
<td></td>
</tr>
</tbody>
</table>

S.E. of marginal mean of N = 22.75 lb./ac.
S.E. of marginal mean of P = 18.57 lb./ac.
S.E. of body of table = 32.17 lb/ac.

Crop :- Wheat.
Site :- Jullundur Agri. Stn., Jullundur.
Type :- ‘M’.
Refer :- Pb. 52(55).

Object :- To find the best source of N in presence and absence of Super on yield of Wheat.

1. BASAL CONDITIONS:
(i) (a) Wheat-Fallow-Wheat. (b) Fallow. (c) Nil. (ii) (a) loam. (b) Refer soil analysis, Jullundur.
(iii) 12.11.1952. (iv) (a) 1 raja plough, 6 desi har, 4 sohaga and 1 horse hoe; (b) N.A. (c) 30 sr./ac. (d) and (e) N.A. (v) Nil. (vi) C—951 (medium). (vii) Irrigated. (viii) One hoeing—(ix) 2.8". (x) 2.5.1953.

2. TREATMENTS:
All combinations of (1) and (2) + a Control.
(1) 3 doses of N : N1 = F.Y.M. at 100 md./ac., N2 = Compost at 100 md./ac. and N3 = A/S at 2 md./ac.
(2) 2 levels of P2O5 : P0 = 0 and P1 = 10 lb./ac.
F.Y.M., Compost and P2O5 as Super were broadcast on 12.11.1952 while A/S was broadcast on 22.12.1952.

3. DESIGN:
(i) R.B.D. (ii) (a) 7. (b) N.A. (iii) 4. (iv) (a) 44.44' x 12', (b) 38.88' x 14'. (v) N.A. (vi) Yes.

4. GENERAL:
(i) Germination and growth, good. No lodging. (ii) Nil. (iii) Grain yield. (iv) (a) 1949 to 1952. (b) No.
(c) Nil. (v) (a) No. (b) —. (vi) and (vii) Nil.

5. RESULTS:
(i) 2188 lb./ac.
(ii) 261.4 lb./ac.
(iii) N effect is highly significant.
(vi) Av. yield of grain in lb./ac.

Control = 1945 lb./ac.

<table>
<thead>
<tr>
<th></th>
<th>N1</th>
<th>N2</th>
<th>N3</th>
<th>Mean</th>
</tr>
</thead>
<tbody>
<tr>
<td>P0</td>
<td>2073</td>
<td>2310</td>
<td>2488</td>
<td>2190</td>
</tr>
<tr>
<td>P1</td>
<td>1986</td>
<td>2037</td>
<td>2477</td>
<td>2167</td>
</tr>
</tbody>
</table>

Mean 2029 2174 2482 2228

S.E. of marginal mean of N 92.4 lb./ac.
S.E. of marginal mean of P 75.5 lb./ac.
S.E. of body of table 130.7 lb./ac.

Crop :- Wheat (Rabi).
Site :- Jullundur Agri. Sta., Jullundur.
Object :- To study the residual effect of manuring to previous crop and application of A/S to current Wheat crop.

1. BASAL CONDITIONS:
   (i) (a) Nil. (b) Maize. (c) As per treatments. (ii) (a) Loam. (b) Refer soil analysis, Jullundur. (iii) 16.11.1951. (iv) (a) One raja, 5 desi hal and 6 sohaga. (b) N.A. (c) 30 sr./ac. (d) N.A. (e) N.A. (f) Nil. (g) C-518 (medium). (h) Irrigated. (i) 3.85". (x) 22.4.1952.

2. TREATMENTS :
   Main-plot treatments :
   4 levels of N : N0 = 0, N1 = 50, N2 = 100 and N3 = 150 lb./ac. of N as A/S. A/S applied to previous maize crop.
   Sub-plot treatments :
   4 levels of N : M0 = 0, M1 = 25, M2 = 50 and M3 = 75 lb./ac. of N as A/S. A/S applied to present wheat crop on 15.12.1951.

3. DESIGN :
   (i) Split-plot. (ii) (a) 4 main-plots/block; 4 sub-plots/main-plot. (b) N.A. (iii) 4. (iv) (a) and (b) Sub-plot : 110’ x 10’. (v) Nil. (vi) Yes.

4. GENERAL :
   (i) Germination good. Growth satisfactory. No lodging. (ii) Nil. (iii) Only grain yield. (iv) (a) Not contd. (b) No. (c) -. (v) (a) Nil. (b) -. (vi) and (vii) Nil.

5. RESULTS :
   (i) 1507 lb./ac.
   (ii) (a) 135.9 lb./ac. (b) 180.3 lb./ac.
   (iii) N effect is highly significant. Interaction N x M is significant.
   (iv) Av. yield of grain in lb./ac.

<table>
<thead>
<tr>
<th></th>
<th>M0</th>
<th>M1</th>
<th>M2</th>
<th>M3</th>
<th>Mean</th>
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<tbody>
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<td>1550</td>
<td>1774</td>
<td>1611</td>
<td>1506</td>
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<tr>
<td>N1</td>
<td>1139</td>
<td>1494</td>
<td>1703</td>
<td>1590</td>
<td>1482</td>
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<tr>
<td>N2</td>
<td>1237</td>
<td>1721</td>
<td>1843</td>
<td>1324</td>
<td>1531</td>
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<tr>
<td>N3</td>
<td>1446</td>
<td>1661</td>
<td>1617</td>
<td>1306</td>
<td>1508</td>
</tr>
</tbody>
</table>

Mean 1227 1607 1734 1458 1507

S.E. of difference of two
1. N marginal means = 48.1 lb./ac.
2. M marginal means = 63.5 lb./ac.
3. M means at the same level of N = 127.5 lb./ac.
4. N means at the same level of M = 120.4 lb./ac.
Crop :- Wheat.
Site :- Jullundur Agri. Stn., Jullundur.

Object :- To study the effect of Guara green manure on soil fertility and on succeeding Wheat crop.

1. BASAL CONDITIONS :
(i) (a) Nil. (b) As per treatments. (c) Nil. (ii) (a) Loam. (b) Refer soil analysis, Jullundur. (iii) 8.12.1950. (iv) (a) 1 raja, 4 desi hal and 6 sohaga. (b) N.A. (c) 36 sr./ac. (d) and (e) N.A. (v) Nil. (vi) C-228 (late). (vii) Irrigated. (viii) One weeding. (ix) 5.1950. (x) 27.4.1951.

2. TREATMENTS :
1. Wheat sown after fallow (control)
2. Wheat sown after guara green manured.
3. Wheat sown after guara for fodder.
4. Wheat sown after guara kept for seed.

3. DESIGN :
(i) R.B.D. (ii) (a) 4. (b) N.A. (iii) 6. (iv) (a) and (b) 12' x 100.83'. (v) Nil. (vi) Yes.

4. GENERAL:
(i) Germination good; growth normal. No lodging. (ii) Attack by locust. (iii) Grain and straw yield.
(iv) (a) 1950 to 1952. (b) No. (c) Nil. (v) (a) No. (b) —. (vi) and (vii) Nil.

5. RESULTS :
(i) 1064 lb./ac.
(ii) 204.3 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>887</td>
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<tr>
<td>2.</td>
<td>1082</td>
</tr>
<tr>
<td>3.</td>
<td>1203</td>
</tr>
<tr>
<td>4.</td>
<td>1083</td>
</tr>
<tr>
<td>S.E./mean</td>
<td>83.4 lb./ac.</td>
</tr>
</tbody>
</table>

---

Crop :- Wheat (Rabi).
Site :- Jullundur Agri. Stn., Jullundur.

Object :- To study the effect of Guara green manure on soil fertility and on succeeding Wheat crop.

1. BASAL CONDITIONS :
(i) (a) Nil. (b) As per treatments. (c) Nil. (ii) (a) Sandy loam. (b) Refer soil analysis, Jullundur. (iii) 3.12.1951. (iv) (a) One roja plough, 4 desi hal and 7 sohaga. (b) N.A. (c) 36 sr./ac. (d) and (e) N.A. (v) Nil. (vi) C-228 (late). (vii) Irrigated. (viii) One weeding. (ix) 11.63'. (x) 28.4.1952.

2. TREATMENTS :
1. Wheat sown after fallow (control).
2. Wheat sown after guara green manured.
3. Wheat sown after guara cut for fodder.
4. Wheat sown after guara kept for seed.

3. DESIGN :
(i) R.B.D. (ii) (a) 4. (b) N.A. (iii) 6. (iv) (a) and (b) 12' x 100.83'. (v) Nil. (vi) Yes.

4. GENERAL:
(i) Fair to satisfactory. No lodging. (ii) Nil. (iii) Grain yield. (iv) (a) 1950 to 1952. (b) No. (c) —. (v) (a) Nil. (b) —. (vi) and (vii) Nil.
5. RESULTS:

(i) 682.0 lb./ac.
(ii) 146.48 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></td>
<td></td>
</tr>
<tr>
<td>1.</td>
<td>570.9</td>
</tr>
<tr>
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<td>646.5</td>
</tr>
<tr>
<td>3.</td>
<td>702.0</td>
</tr>
<tr>
<td>4.</td>
<td>808.5</td>
</tr>
<tr>
<td>S.E./mean</td>
<td>59.8 lb./ac.</td>
</tr>
</tbody>
</table>

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Crop: Wheat.
Site: Jullundur Agri. Stn., Jullundur.

Object: To study the effect of *Guara* green manure on soil fertility for Wheat yield.

1. BASAL CONDITIONS:

(i) (a) Nil. (b) As per treatments. (c) Nil. (ii) (a) Loam. (b) Refer soil analysis, Jullundur. (iii) 16.12.1952. (iv) (a) One *raja* plough, 4 *desi hal*, 6 *sohaga* and 1 horse hoc. (b) N.A. (c) 38.5 sr./ac. (d) 9" row to row. (e) N.A. (f) Nil. (g) C-218 (late). (h) Irrigated. (i) 2 weedings. (j) 2.8". (k) N.A.

2. TREATMENTS:

1. Wheat sown after fallow (control).
2. Wheat sown after *Guara* green manured.
3. Wheat sown after *Guara* cut for fodder.
4. Wheat sown after *Guara* kept for seed.

In treatment 2, *Guara* was ploughed in field on 8.9.1952; in treatment 3, *guara* was cut on 10.9.1952; and in treatment 4 *Guara* was kept for seed and was cut on 26.11.1952.

3. DESIGN:

(i) R.B.D. (ii) (a) 4. (b) N.A. (iii) 6. (iv) (a) 106' x 12'. (b) 100.83' x 12'. (v) N.A. (vi) Yes.

4. GENERAL:

(i) Germination good; condition poor. No lodging. (ii) Nil. (iii) Grain yield. (iv) (a) 1950-1952. (b) No. (c) Nil. (v) (a) No. (b) Yes. (vi) and (vii) Nil.

5. RESULTS:

(i) 452.7 lb./ac.
(ii) 78.72 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></td>
<td></td>
</tr>
<tr>
<td>1.</td>
<td>396.5</td>
</tr>
<tr>
<td>2.</td>
<td>445.1</td>
</tr>
<tr>
<td>3.</td>
<td>441.3</td>
</tr>
<tr>
<td>4.</td>
<td>527.7</td>
</tr>
<tr>
<td>S.E./mean</td>
<td>32.14 lb./ac.</td>
</tr>
</tbody>
</table>

---

Crop: Wheat.
Site: Jullundur Agri. Stn., Jullundur.

Object: To study the residual effect of manures applied to maize on the subsequent Wheat crop.

1. BASAL CONDITIONS:

(i) (a) Nil. (b) Maize. (c) As per treatments. (ii) (a) Loam. (b) Refer soil analysis, Jullundur. (iii) 7.11.1950. (iv) (a) 1 *raja* 5 *desi hal*, and 6 *sohaga*. (b) N.A. (c) 36 sr./ac. (d) and (e) N.A. (v) Nil. (vi) C-591 (medium). (vii) Irrigated. (viii) One weeding cum hoeing. (ix) 5.19". (x) 22.4.1951.
2. TREATMENTS:
1. Control.
2. 100 lb./ac. of N as F.Y.M.
3. 100 lb./ac. of N as A/S.
4. 100 lb./ac. of N as Ammo. Phos.
5. 100 lb./ac. of N as G.N.C.
6. 125 lb./ac. of P$_2$O$_5$ as Super.
Manures applied to previous maize crop.

3. DESIGN:
(i) R.B.D. (ii) (a) 6. (b) N.A. (iii) 4. (iv) (a) and (b) $8' \times 85.07'$. (v) Nil. (vi) Yes.

4. GENERAL:
(i) Germination and condition good. No lodging. (ii) Nil. (iii) Grain and straw yield. (iv) (a) 1950-1951. (b) No. (c) Nil. (v) (a) No. (b) Nil. (vi) and (vii) Nil.

5. RESULTS:
(i) 1435 lb./ac.
(ii) 171.2 lb./ac.
(iii) Treatments are not significantly different.
(iv) Av. yield of grain in lb./ac. of

<table>
<thead>
<tr>
<th>Treatment</th>
<th>Av. yield</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>1389</td>
</tr>
<tr>
<td>2.</td>
<td>1403</td>
</tr>
<tr>
<td>3.</td>
<td>1557</td>
</tr>
<tr>
<td>4.</td>
<td>1537</td>
</tr>
<tr>
<td>5.</td>
<td>1452</td>
</tr>
<tr>
<td>6.</td>
<td>1290</td>
</tr>
</tbody>
</table>

S.E./mean = 85.6 lb./ac.

CROP: Wheat (Rabi).
SITE: Jullundur Agri. Stn., Jullundur.
Ref: Ph. 51(83).
Type: ‘M’.

Object: To study the residual effect of manures applied to maize crop on subsequent Wheat crop.

1. BASAL CONDITIONS:
(i) (a) Wheat—Maize—Wheat. (b) Maize. (c) As per treatments. (ii) (a) Sandy loam. (b) Refer soil analysis, Jullundur. (iii) 1.11.1951. (iv) (a) 1 raja plough, 4 desi kal and 1 sokeha. (b) N.A. (c) 50 tr./ac. (d) and (e) N.A. (v) Nil. (vi) C-591 (medium). (vii) Irrigated. (viii) 1 weeding. (ix) 3.85'. (x) 15.4.1952.

2. TREATMENTS:
1. Control.
2. 100 lb./ac. of N as F.Y.M.
3. 100 lb./ac. of N as A/S.
4. 100 lb./ac. of N as Ammo. Phos.
5. 100 lb./ac. of N as G.N.C.
6. 125 lb./ac. of P$_2$O$_5$ as Super.
Manures applied to previous maize crop.

3. DESIGN:
(i) R.B.D. (ii) (a) 6. (b) N.A. (iii) 4. (iv) (a) and (b) $8' \times 85.07'$. (v) Nil. (vi) Yes.

4. GENERAL:
(i) Germination good; condition fair to satisfactory. No lodging. (ii) Nil. (iii) Grain yield. (iv) (a) 1950-51. (b) and (c) Nil. (v) (a) and (b) No. (vi) (i) Nil. (vii) Nil.
5. RESULTS:

(i) 2313 lb./ac.
(ii) 260.5 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>1.</td>
<td>2053</td>
</tr>
<tr>
<td>2.</td>
<td>2281</td>
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<tr>
<td>3.</td>
<td>2613</td>
</tr>
<tr>
<td>4.</td>
<td>2354</td>
</tr>
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<td>5.</td>
<td>2413</td>
</tr>
<tr>
<td>6.</td>
<td>2135</td>
</tr>
<tr>
<td>S.E./mean</td>
<td>= 130.3 lb./ac.</td>
</tr>
</tbody>
</table>

Crop: - Wheat.
Object: - To study the effect of different doses of N and P2O5 on yield of Wheat crop.

1. BASAL CONDITIONS:

(i) (a) Nil. (b) Fallow. (c) Nil. (ii) (a) Loam. (b) Refer soil analysis, Jullundur. (iii) 6 and 7.11.1952.
(iv) (a) 1 rajah plough, 7 desi har, 4 sohag and 1 horse hoe. (b) N.A. (c) 1 md./ac. (d) 9" row to row.
(e) N.A. (v) Nil. (vi) C 318 (m: Jau a). (vii) Irrigated. (viii) 3 hoings and weeding. (ix) 2.8'. (x) 22.4.1953.

2. TREATMENTS:

All combinations of (1) and (2)

(1) 4 levels of N: N0 =0, N1 =25, N2 =50 and N3 =75 lb./ac.
(2) 4 levels of P2O5: P0 =0, P1 =20, P2 =40 and P3 =60 lb./ac.
N as A/S and P2O5 as Super broadcast on 5.11.1952.

3. DESIGN:

(i) 4×4 Fact. in R.B.D. (ii) (a) 16. (b) N.A. (iii) 4. (iv) (a) 51.5'×11'. (b) 49.5'×9'. (v) One foot left around (vi) Yes.

4. GENERAL:

(i) Germination and growth good. No lodging. (ii) Nil. (iii) Grain yield. (iv) (a) Not contd. (b) and (c) ---. (v) (a) and (b) No. (vi) and (vii) Nil.

5. RESULTS:

(i) 3114 lb./ac.
(ii) 438.7 lb./ac.
(iii) Only N 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>Mean</th>
</tr>
</thead>
<tbody>
<tr>
<td>N0</td>
<td>2530</td>
<td>2979</td>
<td>2615</td>
<td>2904</td>
<td>2757</td>
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<tr>
<td>N1</td>
<td>3133</td>
<td>3376</td>
<td>3133</td>
<td>3435</td>
<td>3269</td>
</tr>
<tr>
<td>N2</td>
<td>3036</td>
<td>3300</td>
<td>3457</td>
<td>3061</td>
<td>3214</td>
</tr>
<tr>
<td>N3</td>
<td>3234</td>
<td>3432</td>
<td>3253</td>
<td>2942</td>
<td>3215</td>
</tr>
<tr>
<td>Mean</td>
<td>2983</td>
<td>3272</td>
<td>3115</td>
<td>3086</td>
<td>3114</td>
</tr>
</tbody>
</table>

S.E. of any marginal mean = 109.7 lb./ac.
S.E. of body of table = 219.3 lb./ac.
Crop: Wheat (Rabi).
Site: Jullundur Agri. Stn., Jullundur.

Object: To study the effect of different doses of N, P₂O₅ and K₂O on yield of Wheat.

1. BASAL CONDITIONS:
   (i) (a) Nil (b) Fallow (c) Nil (ii) (a) Loamy (b) Refer soil analysis, Jullundur. (iii) 5.11.1951. 
   (iv) (a) 8 desi hal and 9 sohaga (b) N.A. (c) 32 sr./ac. (d) and (e) N.A. (v) Nil. (vi) C=518 (medium). (vii) Irrigated. (viii) Nil. (ix) 1.85°. (x) 17.4.1952.

2. TREATMENTS:
   1. Control.
   2. 14.06 lb./ac. of N + 5.125 lb./ac. of P₂O₅ + 2.81 lb./ac. of K₂O.
   3. 28.12 lb./ac. of N + 10.25 lb./ac. of P₂O₅ + 5.62 lb./ac. of K₂O.
   4. 42.18 lb./ac. of N + 15.375 lb./ac. of P₂O₅ + 8.43 lb./ac. of K₂O.
   5. 56.24 lb./ac. of N + 20.5 lb./ac. of P₂O₅ + 11.24 lb./ac. of K₂O.
   6. 70.30 lb./ac. of N + 25.625 lb./ac. of P₂O₅ + 14.05 lb./ac. of K₂O.
   N as A/S applied on 8.12.1951. Source of P₂O₅ is Super and that of K₂O is Pot. Sul.

3. DESIGN:
   (i) L. Sq. (ii) (a) 6. (b) N.A. (iii) 6. (iv) (a) and (b) 50'×15'. (v) Nil. (vi) Yes.

4. GENERAL:
   (i) Germination and condition good. No lodging. (ii) Nil. (iii) Grain yield. (iv) (a) 1951—1952. 
   (b) No. (c) Nil. (d) Nil. (b) —. (vi) and (vii) Nil.

5. RESULTS:
   (i) 1389 lb./ac.
   (ii) 125.5 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>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>770</td>
</tr>
<tr>
<td>2.</td>
<td>998</td>
</tr>
<tr>
<td>3.</td>
<td>1339</td>
</tr>
<tr>
<td>4.</td>
<td>1630</td>
</tr>
<tr>
<td>5.</td>
<td>1834</td>
</tr>
<tr>
<td>6.</td>
<td>1764</td>
</tr>
<tr>
<td>S.E./mean</td>
<td>51.25 lb./ac.</td>
</tr>
</tbody>
</table>

Crop: Wheat.
Site: Jullundur Agri. Stn., Jullundur.

Object: To study the effect of different doses of N, P₂O₅ and K₂O on yield of Wheat.

1. BASAL CONDITIONS:
   (i) (a) Nil (p) Fallow (c) Nil (ii) (a) Loam (b) Refer soil analysis, Jullundur. (iii) 26.11.1952. (iv) (a) 2 raja plough, 4 desi hal, 5 sohaga and 1 roller. (b) N.A. (c) 32 sr./plot. (d) 9' row to row. (e) N.A. (v) Nil. (vi) C=518 (medium). (vii) Irrigated. (viii) Nil. (ix) 2.8'. (x) 29.4.1953.

2. TREATMENTS:
   1. Control.
   2. 14.06 lb./ac. of N + 5.125 lb./ac. of P₂O₅ + 2.81 lb./ac. of K₂O.
   3. 28.12 lb./ac. of N + 10.25 lb./ac. of P₂O₅ + 5.62 lb./ac. of K₂O.
   4. 42.18 lb./ac. of N + 15.375 lb./ac. of P₂O₅ + 8.43 lb./ac. of K₂O.
   5. 56.24 lb./ac. of N + 20.5 lb./ac. of P₂O₅ + 11.24 lb./ac. of K₂O.
   6. 70.30 lb./ac. of N + 25.625 lb./ac. of P₂O₅ + 14.05 lb./ac. of K₂O.

3. DESIGN:
   (i) L. Sq. (ii) (a) 6. (b) N.A. (iii) 6. (iv) (a) 59'×15'. (b) 43.22'×12'. (v) 1.5' on breadth sides and approx 3' on length sides. (vi) Yes.
4. GENERAL:
(i) Normal. No lodging. (ii) Nil. (iii) Grain yield. (iv) (a) 1951—1952. (b) No. (c) Nil. (v) (a) No. (b) Nil. (vi) and (vii) Nil.

5. RESULTS:
(i) 1667 lb./ac.
(ii) 192.1 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>864</td>
</tr>
<tr>
<td>2.</td>
<td>1337</td>
</tr>
<tr>
<td>3.</td>
<td>1703</td>
</tr>
<tr>
<td>4.</td>
<td>1843</td>
</tr>
<tr>
<td>5.</td>
<td>2082</td>
</tr>
<tr>
<td>6.</td>
<td>2172</td>
</tr>
<tr>
<td>S.E./mean</td>
<td>= 78.4 lb./ac.</td>
</tr>
</tbody>
</table>

Crop = Wheat.
Site = Jullundur Agri. Stn., Jullundur.

Object: To study the effect of time of application of A/S on Wheat crop.

1. BASAL CONDITIONS:
(i) (a) Wheat-fallow-wheat. (b) Fallow. (c) Nil. (ii) (a) Loam. (b) Refer soil analysis, Jullundur.
(iii) 29.1.1953. (iv) (a) 2 raja plough, 3 desi plough, 1 roller and 5 sohaga. (b) N.A. (c) 40 sr./ac.
(d) and (e) N.A. (v) Nil. (vi) C-591 (medium). (vii) Irrigated. (viii) One hoeing. (ix) 10.33°. (x) 17.5.1954.

2. TREATMENTS:
1. 50 lb./ac. of N as A/S half applied before sowing and half applied with first 3 irrigations on 29.1.1954 11.3.1954 and 4.4.1954.
2. 50 lb./ac. of N as A/S half applied before sowing, and half applied after earing on 27.2.1954.
3. 50 lb./ac. of N as A/S applied at the time of sowing.
4. 50 lb./ac. of N as A/S applied with 1st irrigation.

3. DESIGN:
(i) R.B D. (ii) (a) 4. (b) N.A. (iii) 4. (iv) (a) 106'x12'. (b) 102.16'x10.8'. (v) N.A. (vi) Yes.

4. GENERAL:
(i) Germination and condition good. Slight lodging due to hailstorm. (ii) Nil. (iii) Grain yield. (iv) (a) 1953 to 1954. (b) No. (c) Nil. (v) (a) No. (b) Nil. (vi) Hail storm effected the crop to the extent of 40%. (vii) Nil.

5. RESULTS:
(i) 1416 lb./ac.
(ii) 219.4 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>1526</td>
</tr>
<tr>
<td>2.</td>
<td>1403</td>
</tr>
<tr>
<td>3.</td>
<td>1330</td>
</tr>
<tr>
<td>4.</td>
<td>1403</td>
</tr>
<tr>
<td>S.E./mean</td>
<td>= 109.7 lb./ac.</td>
</tr>
</tbody>
</table>
Object :- To study the effect of A/S and C/N on Wheat crop.

1. BASAL CONDITIONS :
   (i) (a) Wheat Maize-Wheat. (b) Maize. (c) 20 lb./ac. of N as A/S and 20 lb./ac. of P₂O₅ as Super applied on 18.7.1953. (ii) (a) Loamy. (b) Refer soil analysis, Jullundur. (iii) 28.11.1953. (iv) (a) 2 raja plough, 3 desi plough, 5 sohaga and 1 horse hoe. (b) N.A. (c) 40 sr./ac. (d) and (e) N.A. (v) 20 lb./ac. of P₂O₅ as Super drilled before sowing. (vi) C-591 (medium). (vii) Irrigated. (viii) One hoeing. (ix) 10.33'. (x) 29.4.1954.

2. TREATMENTS :
   1. Control (no manure).
   2. 40 lb./ac. of N as A/S.
   3. 40 lb./ac. of N as C/N.
   Manures applied with 1st irrigation on 29.1.1954.

3. DESIGN :
   (i) R.B.D. (ii) (a) 3. (b) N.A. (iii) 4. (iv) (a) 106' x 12'. (b) 102.15' x 10.66'. (v) N.A. (vi) Yes.

4. GENERAL :
   (i) Germination and condition good. Lodging in manured plots. (ii) Rust attack. (iii) Grain and straw weight. (iv) (a) 1953 to 1955. (b) No. (c) Nil. (v) (a) No. (b) Nil. (vi) Hailstorm affected the crop and caused lodging. (vii) Nil.

5. RESULTS :
   (i) 1314 lb./ac.
   (ii) 240.3 lb./ac.
   (iii) Treatments are significantly different.
   (iv) Av. yield of grain in lb./ac.

   Treatment  | Av. yield
   ------------|------------
   1.          | 1563       
   2.          | 989        
   3.          | 1389       
   S.E./mean   | 120.2 lb./ac.

Object :- To study the method of application of A/S to Wheat crop.

1. BASAL CONDITIONS :
   (i) (a) Nil. (b) Maize. (c) Nil. (ii) (a) Loam. (b) Refer soil analysis, Jullundur. (iii) 8.12.1952. (iv) (a) 1 raja plough, 4 desi hal, 6 sohaga and 1 roller. (b) N.A. (c) One md./ac. (d) 9'' row to row. (e) N.A. (v) 30 lb./ac. of P₂O₅ as Super before sowing. (vi) C-281 (medium). (vii) Irrigated. (viii) 1 weeding. (ix) 2.8'. (x) 30.4.1953.

2. TREATMENTS :
   1. Control.
   2. 40 lb./ac. of N as A/S applied with 1st irrigation.
   3. 40 lb./ac. of N as A/S spread before sowing.
   4. 40 lb./ac. of N as A/S drilled at 4'' deep at sowing.
   5. 40 lb./ac. of N as A/S spread after sowing.

3. DESIGN :
   (i) L. Sq. (ii) (a) 5. (b) N.A. (iii) 5. (iv) (a) 12' x 44.9'. (b) 10.5' x 41.48'. (v) 2 rows on each side of length and 14' on each side of breadth. (vi) Yes.

4. GENERAL :
   (i) Germination and growth good. No lodging. (ii) Nil. (iii) Grain yield. (iv) (a) 1952 to 1954. (b) No. (c) Nil. (v) (a) No. (b) Nil. (vi) and (vii) Nil.
5. RESULTS:
(i) 1356 lb./ac.
(ii) 160.2 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>738</td>
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<td>2.</td>
<td>1762</td>
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<tr>
<td>3.</td>
<td>1427</td>
</tr>
<tr>
<td>4.</td>
<td>1327</td>
</tr>
<tr>
<td>5.</td>
<td>1528</td>
</tr>
<tr>
<td>S.E./mean</td>
<td>71.6 lb./ac.</td>
</tr>
</tbody>
</table>

Object:—To study the effect of method of application of A/S to Wheat crop.

1. BASAL CONDITIONS:
(i) (a) Wheat-Cotton-Wheat. (b) Cotton. (c) 8 C.L. of F.Y.M. on 5.5.1953. (iii) (a) Loam. (b) Refer soil analysis, Jullundur. (iii) 22.11.1953. (iv) (a) one roja plough, 6 desi plough and 3 sohaga. (b) N.A. (c) 35 sr./ac. (d) 9" row to row. (e) N.A. (v) 25 lb./ac. of P$_2$O$_5$ as Super applied 15 days before sowing to all plots. (vi) C—591 (medium). (vii) Irrigated. (viii) One hoeing. (ix) 10.33. (x) 24.4.1954.

2. TREATMENTS:
1. Control (no manure).
2. 40 lb./ac. of N as A/S spread before sowing.
3. 40 lb./ac. of N as A/S spread after sowing.
4. 40 lb./ac. of N as A/S drilled 4" deep at sowing.
5. 40 lb./ac. of N as A/S applied with 1st irrigation on 7.1.1954.

3. DESIGN:
(i) L. Sq. (ii) 5. (b) N.A. (iii) 5. (iv) (a) 30' x 30'. (b) 25.90' x 18.66'. (v) N.A. (vi, Yes.

4. GENERAL:
(i) Germination good, crop condition good. Slight lodging due to hailstorm. (ii) Nil. (iii) Grain yield. (iv) (a) 1952 to 1954. (b) No. (c) Nil. (v) (a) No. (b) Nil. (vi) Slight damage by hailstorm. (vii) Nil.

5. RESULTS:
(i) 1352 lb./ac.
(ii) 170.4 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>943</td>
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<tr>
<td>2.</td>
<td>1462</td>
</tr>
<tr>
<td>3.</td>
<td>1502</td>
</tr>
<tr>
<td>4.</td>
<td>1497</td>
</tr>
<tr>
<td>5.</td>
<td>1358</td>
</tr>
<tr>
<td>S.E./mean</td>
<td>76.3 lb./ac.</td>
</tr>
</tbody>
</table>
Crop: Wheat.  
Site: Jullundur Agri. Stn., Jullundur.

Object: To study the response of N, P_2O_5 and K_2O to the yield of Wheat.

1. BASAL CONDITIONS:

(i) (a) Cotton-fodder-Wheat. (b) Guar. (c) Nil. (ii) (a) Loamy. (b) Refer soil analysis, Jullundur. (iii) 26.11.1953. (iv) (a) 2 roja 7 desi, 5 sohaga and 1 horse hoe. (b) N.A. (c) 40 sr/ac. (d) and (e) N.A. (v) Nil. (vi) C-591 (medium). (vii) Irrigated. (viii) Nil. (ix) 10.33". (x) 28.4.1954.

2. TREATMENTS:

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

(1) 3 levels of N as A/S: N_0 = 0, N_1 = 25 and N_2 = 50 lb/ac.
(2) 3 levels of P_2O_5 as Super: P_0 = 0, P_1 = 20 and P_2 = 40 lb/ac.
(3) 3 levels of K_2O as Pot. Sul: K_0 = 0, K_1 = 8 and K_2 = 16 lb/ac.

3. DESIGN:

(i) 3⁵ partially confounding W, X, Y, Z components of NPK. (ii) (a) 9 plots/block; 3 blocks/replication. (b) N.A. (iii) 4. (iv) (a) 3′x10′. (b) 31.42′x8.66′. (v) N.A. (vi) Yes.

4. GENERAL:

(i) Normal. No lodging. (ii) Nil. (iii) Grain yield (iv) (a) Not c·Yntr. (b) No. (v) (a) Nil. (b)—. (vi) and (vii) Nil.

5. RESULTS:

(i) 1320 lb/ac.
(ii) 239.7 lb/ac.
(iii) K effect is highly significant, while other effects are not significant.
(iv) Av. yield of grain in lb/ac.

<table>
<thead>
<tr>
<th>P_0</th>
<th>P_1</th>
<th>P_2</th>
<th>Mean</th>
<th>K_0</th>
<th>K_1</th>
<th>K_2</th>
</tr>
</thead>
<tbody>
<tr>
<td>1213</td>
<td>1336</td>
<td>1286</td>
<td>1278</td>
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<td>1403</td>
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<td>1245</td>
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<td>1367</td>
<td>1322</td>
<td>1335</td>
<td>1256</td>
<td>1350</td>
<td>1401</td>
</tr>
</tbody>
</table>

Mean: 1311 1333 1316

K_0: 1211 1175 1220 1202
K_1: 1364 1480 1298 1381
K_2: 1358 1345 1431 1378

S. E. of marginal means = 39.9 lb/ac.
S. E. of body of any table = 69.2 lb/ac.

---

Crop: Wheat.  
Site: Jullundur Agri. Stn., Jullundur.

Object: To study the effect of different doses of N and P_2O_5 on the yield of Wheat.

1. BASAL CONDITIONS:

(i) (a) Nil. (b) Maize and Peas. (c) Nil. (ii) (a) Loamy. (b) Refer soil analysis, Jullundur. (iii) 8.11.1953. (iv) (a) 7 desi hal and 3 sohaga. (b) and (c) N.A. (d) 9′ between rows. (e) N.A. (v) Maize and Peas were ploughed in the fields for green manuring on 23.8.1953. (vi) C-518 (medium). (vii) Irrigated. (viii) Nil. (ix) 10.33". (x) 8.5.1954.
2. TREATMENTS:

All combinations of (1) and (2)

(1) 4 levels of N as A/S: \(N_0 = 0, N_1 = 20, N_2 = 30\) and \(N_3 = 40\) lb./ac.

(2) 4 levels of \(\text{P}_2\text{O}_5\) as Super: \(P_0 = 0, P_1 = 20, P_2 = 30\) and \(P_3 = 40\) lb./ac.

\(\text{P}_2\text{O}_5\) broadcast before sowing, while A/S broadcast on 10.3.1954.

3. DESIGN:

(i) R.B.D. (ii) (a) 16. (b) N.A. (iii) 4. (iv) (a) 52'\times 11'. (b) 47.16'\times 9.62'. (v) N.A. (vi) Yes.

4. GENERAL:

(i) Normal. Crop slightlylodged. (ii) Nil. (iii) Grain and straw yield. (iv) (a) No. (b) No. (c)—. (v) (a) No. (b) Nil. (vi) and (vii) Hailstorm effected the crop adversely particularly in plots with high dose of N.

5. RESULTS:

(i) 1264 lb./ac.

(ii) 162.2 lb./ac.

(iii) N effect alone is highly significant.

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

<table>
<thead>
<tr>
<th></th>
<th>(P_0)</th>
<th>(P_1)</th>
<th>(P_2)</th>
<th>(P_3)</th>
<th>Mean</th>
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<tr>
<td>(N_0)</td>
<td>1469</td>
<td>1423</td>
<td>1577</td>
<td>1450</td>
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<tr>
<td>(N_1)</td>
<td>1508</td>
<td>1670</td>
<td>1500</td>
<td>1373</td>
<td>1512</td>
</tr>
<tr>
<td>(N_2)</td>
<td>1225</td>
<td>1333</td>
<td>1151</td>
<td>1120</td>
<td>1207</td>
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<tr>
<td>(N_3)</td>
<td>775</td>
<td>805</td>
<td>981</td>
<td>867</td>
<td>857</td>
</tr>
<tr>
<td>Mean</td>
<td>1243</td>
<td>1308</td>
<td>1302</td>
<td>1203</td>
<td>1264</td>
</tr>
</tbody>
</table>

S.E. of any marginal mean = 40.6 lb./ac.

S.E. of body of table = 81.1 lb./ac.

Crop:—Wheat.

Site:—Jullundur Agri. Stn., Jullundur.

Ref:—Pb. 52(57).

Type:—‘M’.

Object:—To study the effect of different combinations of N and \(\text{P}_2\text{O}_5\) on yield of Wheat.

1. BASAL CONDITIONS:

(i) (a) Nil. (b) Fallow. (c) Nil. (ii) (a) Poor sandy loam. (b) Refer soil analysis, Jullundur. (iii) 28.11.1952. (iv) (a) 1 raja plough, 3 desi hal, 5 sohaga and 2 horse hoe. (b) N.A. (c) 32 sr./ac. (d) and (e) N.A. (v) Nil. (vi) C-591 (medium). (vii) Irrigated. (viii) 2 weedings. (ix) 2.8w. (x) 2.5.1953.

2. TREATMENTS:

All combinations of (1) and (2)

(1) 4 levels of N as A/S: \(N_0 = 0, N_1 = 20, N_2 = 30\) and \(N_3 = 40\) lb./ac.

(2) 4 levels of \(\text{P}_2\text{O}_5\) as Super: \(P_0 = 0, P_1 = 20, P_2 = 30\) and \(P_3 = 40\) lb./ac.


3. DESIGN:

(i) 4\times4 Fact. in R.B.D. (ii) (a) 16. (b) N.A. (iii) 4. (iv) (a) 72.6'\times7'. (b) 65.6'\times7'. (v) 3\frac{1}{2}' left on each side of length. (vi) Yes.

4. GENERAL:

(i) Germination and condition good. No lodging. (ii) Nil. (iii) Grain yield (iv) (a) 1952—1954. (b) No. (c) Nil. (v) (a) No. (b)—. (vi) and (vii) Nil.
5. RESULTS:
   (i) 1380 · lb./ac.
   (ii) 339.4 lb./ac.
   (iii) N effect alone 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>Mean</th>
</tr>
</thead>
<tbody>
<tr>
<td>N₀</td>
<td>696</td>
<td>1093</td>
<td>843</td>
<td>803</td>
<td>858</td>
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<td>N₁</td>
<td>1505</td>
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<td>1582</td>
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<tr>
<td>N₂</td>
<td>1298</td>
<td>1374</td>
<td>1246</td>
<td>1799</td>
<td>1429</td>
</tr>
<tr>
<td>N₃</td>
<td>1930</td>
<td>2067</td>
<td>1557</td>
<td>1539</td>
<td>1773</td>
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<tr>
<td>Mean</td>
<td>1357</td>
<td>1437</td>
<td>1307</td>
<td>1418</td>
<td>1382</td>
</tr>
</tbody>
</table>

S.E. of any marginal mean = 84.9 lb./ac.
S.E. of body of table = 169.7 lb./ac.

Crop : Wheat.
Site : Jullundur Agri. Stn., Jullundur.

Object : To study the effect of different doses of N and P₂O₅ on Wheat crop.

1. BASAL CONDITIONS :
   (i) (a) Nil. (b) Fodder. (c) Nil. (ii) (a) Poor sandy loam. (b) Refer soil analysis, Jullundur. (iii) 5,7,11.1953.
   (iv) (a) 4' desi hal and 5 sohaga. (b) N.A. (c) 35 sr./ac. (d) 6' from row to row. (e) N.A. (vi) C-591 (medium). (vii) Irrigated. (viii) N.A. (ix) 10.33'. 
   (x) 17.4.1954.

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.
   (2) 4 levels of P₂O₅ as Super : P₀=0, P₁=20, P₂=30 and P₃=40 lb./ac.

3. DESIGN :
   (i) 4×4 Fact. R.B.D. (ii) (a) 16. (b) N.A. (iii) 4. (iv) (a) 75'×8'. (b) 71'×6.66'. (v) 8' left on either side of breadth and 2' left on either side of length. (vi) Yes.

4. GENERAL :
   (i) Germination good, except in N₀ plots where germination and condition was poor. (ii) Nil. (iii) Grain and straw weight. (iv) (a) 1952–1954 (after 1952 dose of P₂O₅ changed). (b) No. (c) Nil. (v) (a) No. (b) — (vi) Hailstorm and rain 2.5" on 23.2.1954, was severe and damaged the crop. (vii) Planned for six but conducted in 4 replications only.

5. RESULTS :
   (i) 921.4 lb./ac.
   (ii) 302.0 lb./ac.
   (iii) N effect alone 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>Mean</th>
</tr>
</thead>
<tbody>
<tr>
<td>N₀</td>
<td>219.1</td>
<td>799.5</td>
<td>310.9</td>
<td>420.5</td>
<td>437.5</td>
</tr>
<tr>
<td>N₁</td>
<td>820.2</td>
<td>731.4</td>
<td>636.6</td>
<td>758.0</td>
<td>736.5</td>
</tr>
<tr>
<td>N₂</td>
<td>1119.3</td>
<td>947.5</td>
<td>997.9</td>
<td>1376.9</td>
<td>1110.4</td>
</tr>
<tr>
<td>N₃</td>
<td>1406.5</td>
<td>1483.5</td>
<td>1403.5</td>
<td>1311.7</td>
<td>1401.3</td>
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<tr>
<td>Mean</td>
<td>991.3</td>
<td>990.5</td>
<td>837.2</td>
<td>966.8</td>
<td>921.4</td>
</tr>
</tbody>
</table>

S.E. of any marginal mean = 75.5. lb./ac.
S.E. of body of table = 151.0 lb./ac.
Crop :- Wheat (\textit{Rabi}). \textit{Ref} :- Pb. 49(4).

Site :- Distt. and Demonstration Farm, Kangra. \textit{Type} :- ‘M’.

Object :- To find the manurial schedule for Wheat crop.

1. BASAL CONDITIONS :
   (i) (a) Nil. (b) Maize. (c) Nil. (ii) (a) Loamy. (b) N.A. (iii) 20,21.11.1949. (iv) (a) 4 ploughings and 4 \textit{sohaga}. (b) N.A. (c) 32 sr./ac. (d) and (e) N.A. (v) Nil. (vi) C-250 (medium). (vii) Irrigated. (viii) N.A. (ix) 15.23. (x) 10.5.1950.

2. TREATMENTS:
   1. Control (no manure).
   2. 24 lb./ac. of N as A/S.
   3. 36 lb./ac. of N as A/S.
   4. 24 lb./ac. of N as Ammo. Phos.
   5. 36 lb./ac. of N as Ammo. Phos.
   6. 30 lb./ac. of P\textsubscript{2}O\textsubscript{5} as Super.
   7. 45 lb./ac. of P\textsubscript{2}O\textsubscript{5} as Super.
   8. 24 lb./ac. of N as A/S + 30 lb./ac. of P\textsubscript{2}O\textsubscript{5} as Super.
   9. 36 lb./ac. of N as A/S + 45 lb./ac. of P\textsubscript{2}O\textsubscript{5} as Super.

Super drilled 3 to 4’ deep before sowing and A/S applied with 1st irrigation.

3. DESIGN:
   (i) R.B.D. (ii) (a) 9. (b) N.A. (iii) 4. (iv) (a) 52’ x 10’. (b) 52’ x 10’. (v) Nil. (vi) Yes.

4. GENERAL:
   (i) Germination and condition good. No lodging. (ii) Nil. (iii) Grain yield. (iv) (a) Not cont'd. (b) and (c) Nil. (v) (a) and (b) No. (vi) and (vii) Nil.

5. RESULTS:
   (i) 1687 lb./ac.
   (ii) 147.5 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>1.</td>
<td>1594</td>
</tr>
<tr>
<td>2.</td>
<td>1669</td>
</tr>
<tr>
<td>3.</td>
<td>1788</td>
</tr>
<tr>
<td>4.</td>
<td>1583</td>
</tr>
<tr>
<td>5.</td>
<td>1659</td>
</tr>
<tr>
<td>6.</td>
<td>1766</td>
</tr>
<tr>
<td>7.</td>
<td>1702</td>
</tr>
<tr>
<td>8.</td>
<td>1637</td>
</tr>
<tr>
<td>9.</td>
<td>1788</td>
</tr>
<tr>
<td>S.E./mean</td>
<td>= 73.8 lb./ac.</td>
</tr>
</tbody>
</table>

---

Crop :- Wheat (\textit{Rabi}). \textit{Ref} :- Pb. 50(1).

Site :- Distt. and Demonstration Farm, Kangra. \textit{Type} :- ‘M’.

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

1. BASAL CONDITIONS :
   (i) (a) Nil. (b) Soyabean. (c) Nil. (ii) (a) Loam. (b) N.A. (iii) 6.11.1950. (iv) (a) and (b) N.A. (c) 32 sr./ac. (d) and (e) N.A. (v) Nil. (vi) C-250 (medium). (vii) Irrigated. (viii) One weeding. (ix) 14,82\* (x) 4.5.1951.

2. TREATMENTS:
   All combinations of (1) and (2)
   (1) 2 levels of N as A/S : N\textsubscript{0}=0 and N\textsubscript{1}=25 lb./ac.
   (2) 2 levels of P\textsubscript{2}O\textsubscript{5} as Super : P\textsubscript{0}=0 and P\textsubscript{1}=32 lb./ac.
3. DESIGN:
   (i) 2x2 Fact. in R.B.D. (ii) (a) 4. (b) N.A. (iii) 4. (iv) (a) and (b), 7.3' x 49' 6". (v) Nil; (vi) Yes.

4. GENERAL:
   (i) Satisfactory. No lodging. (ii) Nil. (iii) Grain yield. (iv) (a) Not contd. (b) and (c) No. (v) (a) and (b) Nil. (vi) and (vii) Nil.

5. RESULTS:
   (i) 1615 lb./ac.
   (ii) 351.8 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>Mean</th>
</tr>
</thead>
<tbody>
<tr>
<td>P₀</td>
<td>1795</td>
<td>1724</td>
<td>1760</td>
</tr>
<tr>
<td>P₁</td>
<td>1260</td>
<td>1681</td>
<td>1471</td>
</tr>
</tbody>
</table>

S.E. of any marginal mean = 124.4 lb./ac.
S.E. of body of table = 175.9 lb./ac.

Crop :- Wheat.
Site :- Distt. and Demonstration Farm, Kangra.

Object :- To study the effect of methods of placement of fertilizers on yield of Wheat.

1. BASAL CONDITIONS:
   (i) (a) Nil. (b) Maize. (c) Nil. (ii) (a) Loam. (b) N.A. (iii) 21.11.1951. (iv) (a) to (e) N.A. (v) Nil. (vi) C—250 (medium). (vii) Irrigated. (viii) One weeding. (ix) 12.03. (x) 14.5.19 2.

2. TREATMENTS:
   All combinations of (1) and (2).
   (1) 2 levels of N as A/S: N₀=0 and N₁=25 lb./ac.
   (2) 3 applications of P₀₂₀: P₀=0 and P₁=25 lb./ac. broadcast and P₁'=25 lb./ac. applied by depth application.
P₀₂₀ as Super applied at the time of sowing.

3. DESIGN:
   i) 2x3 Fact. in R.B.D. (ii) (a) 6. (b) N.A. (iii) 4. (iv) (a) 1/16 1.7 ac. (b) 1/132 ac. (v) N.A. (vi) Yes.

4. GENERAL:
   (i) Normal. No lodging. (ii) Nil. (iii) Grain and straw yield. (iv) (a) Not contd. (b) — (c) — . (v) (a) No. (b) —. (vi) and (vii) Nil.

5. RESULTS:
   (i) 1487 lb./ac.
   (ii) 264.8 lb./ac.
   (iii) N, P effects and interaction N X P are highly significant.
   (iv) Av. yield of grain in lb./ac.

<table>
<thead>
<tr>
<th></th>
<th>P₀</th>
<th>P₁</th>
<th>P₁'</th>
<th>Mean</th>
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</thead>
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<tr>
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<td>1302</td>
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<tr>
<td>N₁</td>
<td>895</td>
<td>2321</td>
<td>1799</td>
<td>1672</td>
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</tbody>
</table>

Mean 975 1877 1608 1487
S.E. of marginal mean of P = 93.6 lb./ac.
S.E. of marginal mean of N = 76.4 lb./ac.
S.E. of body of table = 132.4 lb./ac.
Site : Distt. and Demonstration Farm, Kangra.  Type : 'M'.

Object : To study the effect of A/S and C/N applied alone and in combination with lime on Wheat.

1. BASAL CONDITIONS:
   (i) (a) Wheat—Maize—Wheat. (b) Maize. (c) Nil. (ii) (a) Loam. (b) N.A. (iii) 17, 18.11.1951. (iv)
   (a) 4 ploughings and 5 sohaga. (b) N.A. (c) 6 ch./plot. (d) 6" row to row. (e) N.A. (v) Nil. (vi)

2. TREATMENTS:
   All combinations of (1) and (2).
   (2) 5 applications 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) 4. (iv) (a) and (b) 1/103.5 ac. (v) Nil. (vi) Yes.

4. GENERAL:
   (i) Germination and condition satisfactory. No lodging. (ii) Nil. (iii) Grain and straw yield. (iv) (a)
   Not contd. (b) —. (c) —. (v) (a) No. (b) —. (vi) and (vii) Nil.

5. RESULTS:
   (i) 1315 lb./ac. 
   (ii) 291.3 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>
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<tbody>
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<td>1184</td>
<td>1221</td>
<td>1297</td>
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<td>1311</td>
<td>1577</td>
<td>1610</td>
<td>1467</td>
<td>948</td>
<td>1383</td>
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</tbody>
</table>

Mean 1261 1381 1466 1382 1085 1315

S.E. of marginal mean of N = 104.0 lb./ac,
S.E. of marginal mean of L = 65.8 lb./ac.
S.E. of body of table = 147.1 lb./ac.

---

Crop : Wheat (Rabi).  Ref : Pb. 52(134).
Site : Distt. and Demonstration Farm, Kangra.  Type : 'M'.

Object : To study the effect of different methods of application of A/S on yield of Wheat.

1. BASAL CONDITIONS:
   (i) (a) Wheat—Maize—Wheat. (b) Maize. (c) Nil. (ii) (a) Loam. (b) N.A. (iii) 20.10.1952. (iv) (a)
   Ploughing and sohaga. (b) N.A. (c) 5 ch./plot. (d) 6" row to row. (e) N.A. (v) Nil. (vi)

2. TREATMENTS:
   1. Control.
   2. 20 lb./ac. of N as A/S broadcast before sowing.
   3. 20 lb./ac. of N as A/S applied mixed with seed.
   4. 20 lb./ac. of N as A/S applied 1" below seed.
3. DESIGN:
(i) R.B.D. (ii) (a) 4, (b) N.A. (iii) 4. (iv) (a) 81' x 4.5'. (b) 81' x 4.5'. (v) Nil. (vi) Yes.

4. GENERAL:
(i) Normal. No lodging. (ii) Nil. (iii) Grain and straw yield. (iv) (a) Not contd. (b) No. (c) —. (v) (a) Nil. (b) —. (vi) and (vii) Nil.

5. RESULTS:
(i) 2147 lb./ac.
(ii) 199.2 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>1936</td>
</tr>
<tr>
<td>2.</td>
<td>2197</td>
</tr>
<tr>
<td>3.</td>
<td>2274</td>
</tr>
<tr>
<td>4.</td>
<td>2182</td>
</tr>
<tr>
<td>S.E./mean</td>
<td>=99.6 lb./ac.</td>
</tr>
</tbody>
</table>

Crop: Wheat (Rabi). Site: Distt. and Demonstration Farm, Kangra. Type: 'M'.

Object: To study the effect of different methods of application of A/S on yield of Wheat.

1. BASAL CONDITIONS:
(i) (a) Wheat-Maize-Wheat. (d) Maize. (c) Nil. (ii) (a) Loam. (b) N.A. (iii) 28.10.1952. (iv) (a) 4 Ploughings and 5 subha. (b) N.A. (c) 6 ch./plot. (d) and (e) N.A. (v) Nil. (vi) C—250° (medium). (vii) Irrigated (viii) One weeding. (ix) 13.19°. (x) 2.5.1953.

2. TREATMENTS:
1. Control (no manure).
2. 20 lb./ac. of N as A/S broadcast before sowing.
3. 20 lb./ac. of N as A/S applied mixed with seed.
4. 20 lb./ac. of N as A/S applied 1' deep below the seed.

3. DESIGN:
(i) R.B.D. (ii) (a) 4. (b) N.A. (iii) 4. (iv) (a) and (b) 7½ x 49½'. (v) Nil. (vi) Yes.

4. GENERAL:
(i) Germination and condition satisfactory. No lodging. (ii) Nil. (iii) Grain and straw yield. (iv) (a) Not contd. (b) No. (c) —. (v) (a) No. (b) —. (vi) and (vii) Nil.

5. RESULTS:
(i) 1119 lb./ac.
(ii) 143.5 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>1.</td>
<td>971</td>
</tr>
<tr>
<td>2.</td>
<td>1190</td>
</tr>
<tr>
<td>3.</td>
<td>1186</td>
</tr>
<tr>
<td>4.</td>
<td>1127</td>
</tr>
<tr>
<td>S.E./mean</td>
<td>=71.9 lb./ac.</td>
</tr>
</tbody>
</table>
Crop :- Wheat (Rabi).
Site :- Distt. and Demonstration Farm, Kangra.
Ref :- Pb. 52 (136).
Type :- 'M'.
Object :- To study the effect of A/S and Super on yield of Wheat.

1. BASAL CONDITIONS:
   (i) (a) Wheat-Maize-Wheat. (b) Maize. (c) Nil. (ii) (a) Loam. (b) N.A. (iii) 7.11.1952. (iv) (a) 5 ploughings and 4
   sodagra. (b) N.A. (c) 5 ch./plot. (d) and (e) N.A. (v) Nil. (vi) C-253 (medium). (vii) Irrigated. (viii) 1 weeding. (ix)
   13.19'. (x) 24.4.1953.

2. TREATMENTS:
   1. Control (no manure).
   2. 20 lb./ac. of N as A/S by broadcast.
   3. 20 lb./ac. of P₂O₅ as Super by broadcast.
   4. 20 lb./ac. of P₂O₅ as Super drilled 1" below seed.

3. DESIGN:
   (i) R.B.D. (ii) (a) 4. (b) N.A. (iii) 4. (iv) (a) and (b) 65'×5.5'. (v) Nil. (vi) Yes.

4. GENERAL:
   (i) Germination and condition normal. No lodging. (ii) Nil. (iii) Grain and straw yield. (iv) (a) Not contd. (b) No. (c)
   Nil. (d) Nil. (e) Nil. (f) Nil. (g) Nil. (h) C-253 (medium). (i) Irrigated. (j) 1 weeding. (k) 13.19'. (l) 24.4.1953.

5. RESULTS:
   (i) 2168 lb./ac.
   (ii) 177.9 lb./ac.
   (iii) Treatments are significantly different.
   (iv) Av. yield of grain In lb./ac.
       Treatment   | Av. yield
       |          |
       1.        | 2021
       2.        | 2453
       3.        | 2129
       4.        | 2067
       S.E./mean | 88.9 lb./ac.

---

Crop :- Wheat (Rabi).
Site :- Distt. and Demonstration Farm, Kangra.
Ref :- Pb. 52 (137).
Type :- 'M'.
Object :- To study the effect of A/S and Super on yield of Wheat.

1. BASAL CONDITIONS:
   (i) (a) Wheat-Maize-Wheat. (b) Maize. (c) Nil. (ii) (a) Loam. (b) N.A. (iii) 14.11.1952. (iv) (a) 5 ploughings and 4
   sodagra. (b) to (e) N.A. (v) Nil. (vi) C-253 (medium). (vii) Irrigated. (viii) 1 weeding. (ix) N.A. (x) 2.5.1953.

2. TREATMENTS:
   1. Control (no manure).
   2. 20 lb./ac. of N as A/S by broadcast.
   3. 20 lb./ac. of P₂O₅ as Super by broadcast.
   4. 20 lb./ac. of P₂O₅ as Super drilled 1" below seed.

3. DESIGN:
   (i) R.B.D. (ii) (a) 4. (b) N.A. (iii) 4. (iv) (a) and (b) 81'×4½'. (v) Nil. (vi) Yes.

4. GENERAL:
   (i) Normal. No lodging. (ii) Nil. (iii) Straw and grain yield. (iv) (a) Not contd. (b) No. (c)
   Nil. (d) Nil. (e) Nil. (f) Nil. (g) Nil. (h) C-253 (medium). (i) Irrigated. (j) 1 weeding. (k) 13.19'. (l) 24.4.1953.
5. RESULTS:

(i) 1438 lb./ac.
(ii) 161.0 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>1329</td>
</tr>
<tr>
<td>2.</td>
<td>1437</td>
</tr>
<tr>
<td>3.</td>
<td>1494</td>
</tr>
<tr>
<td>4.</td>
<td>1490</td>
</tr>
<tr>
<td>S.E./mean</td>
<td>= 80.5 lb./ac.</td>
</tr>
</tbody>
</table>

Crop: - Wheat.

Ref: - Pb. 53(47).

Object: - To determine the best method of application of A/S to Wheat crop.

1. BASAL CONDITIONS:

(i) (a) Paddy—Wheat. (b) Paddy. (c) Heavily manured with F.Y.M., Super and A/S. Details N.A. (ii) (a) Clay loam. (b) N.A. (iii) 16.11.1953. (iv) (a) 3 ploughings; 2 plankings. (b) N.A. (c) 6 ch. plot. (d) 8 rows/plot. (e) N.A. (v) Nil. (vi) C-220 (medium). (vii) Irrigated. (viii) Nil. (ix) 21.60. (x) 3.5.1954.

2. TREATMENTS:

1. Control (no manure).
2. 60 lb./ac. of N as A/S drilled below the seed row with pore.
3. 60 lb./ac. of N as A/S applied in contact with the seed.
4. 60 lb./ac. of N as A/S broadcast before sowing.
5. 60 lb./ac. of N as A/S broadcast with 1st irrigation in Dec. 1953.

3. DESIGN:

(i) R.B.D. (ii) (a) 5. (b) N.A. (iii) 4. (iv) (a) N.A. (b) 4½'×8'. (v) N.A. (vi) Yes.

4. GENERAL:

(i) Below normal. Crop lodged in manured plots. (ii) Brown and black rust attack on 2 and 3 treatments. (iii) Germination count, straw weight and grain weight. (iv) (a) No contd. (b) and (c) No. (v) (a) and (b) No. (vi) and (vii) Nil.

5. RESULTS:

(i) 1868 lb./ac.
(ii) 210.3 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>2005</td>
</tr>
<tr>
<td>2.</td>
<td>1905</td>
</tr>
<tr>
<td>3.</td>
<td>1971</td>
</tr>
<tr>
<td>4.</td>
<td>1805</td>
</tr>
<tr>
<td>5.</td>
<td>1706</td>
</tr>
<tr>
<td>S.E./mean</td>
<td>= 105.1 lb./ac.</td>
</tr>
</tbody>
</table>
Crop: - Wheat.
Site: - Distt. and Demonstration Farm, Kangra.

Object: - To study the effect of N and P₂O₅ alone and in combination on Wheat.

1. BASAL CONDITIONS:
   (i) (a) Soyabean—Wheat. (b) Soyabean. (c) Nil. (ii) (a) Clay loam. (b) N.A. (iii) 14,15.11.1953. (iv) (a) 3 ploughings and 2 plankings. (b) Broadcast. (c) 35 sr./ac. (d) and (e) - (v) Nil. (vi) C-250 (medium). (vii) Irrigated. (viii) Nil. (ix) 21.60°. (x) 2.5.1954.

2. TREATMENTS:
   All combinations of (1) and (2) (1) 2 levels of P₂O₅ as Super: P₀ = 0 and P₁ = 30 lb./ac. (2) 3 applications of N: N₀ = 0, N₁ = 30 lb./ac. of N as A/S and N₂ = 30 lb./ac. of N as C/N. Fertilizers broadcast at the time of sowing.

3. DESIGN:
   (i) 2 x 3 Fact. in R.B.D. (ii) (a) 6. (b) N.A. (iii) 4. (iv) (a) N.A. (b) 7'x77'-9½'. (v) N.A. (vi) Yes.

4. GENERAL:
   (i) Normal. No lodging. (ii) Attack of brown and black rust. (iii) Grain and straw yield. (iv) (a) 1953-54. (b) and (c) No. (v) (a) and (b) No. (vi) and (vii) Nil.

5. RESULTS:
   (i) 1621 lb./ac. (ii) 86.3 lb./ac. (iii) N effect alone 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>
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<td>1603</td>
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<td>14'4</td>
<td>1746</td>
<td>1756</td>
<td>1639</td>
</tr>
<tr>
<td>Mean</td>
<td>1360</td>
<td>1760</td>
<td>1742</td>
<td>1621</td>
</tr>
</tbody>
</table>

S.E. of marginal mean of N = 30.5 lb./ac.
S.E. of marginal mean of P = 24.9 lb./ac.
S.E. of body of table = 43.2 lb./ac.

---

Crop: - Wheat.
Site: - Agri. Stn., Karnal.

Object: - To find out the best manurial formula for Wheat crop.

1. BASAL CONDITIONS:
   (i) (a) Nil. (b) Fallow. (c) Nil. (ii) (a) Loam. (b) N.A. (iii) 2,12.1951. (iv) (a) 4 desi ploughings, 1 raja and 5 sohaga. (b) N.A. (c) 35 sr./ac. (d) N.A. (e) N.A. (v) Nil. (vi) C-591 (medium). (vii) Irrigated. (viii) One weeding. (ix) 3.56°. (x) N.A.

2. TREATMENTS:
   All combinations of (1) and (2) (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 lb. and P₂ = 50 lb./ac. P₂O₅ as Super broadcast before sowing and A/S on 22.1.1952.

3. DESIGN:
   (i) 4 x 3 Fact. in R.B.D. (ii) (a) 12. (b) N.A. (iii) 6. (iv) (a) 81°x6°. (b) 73°4"x6°. (v) N.A. (vi) Y-z.
4. GENERAL:
(i) Satisfactory. No lodging. (ii) Nil. (iii) Grain yield. (iv) (a) No. (b)—. (c)—. (v) (a) No. (b)—. (v) and (vi) Nil.

5. RESULTS:
(i) 1858 lb./ac.
(ii) 178.5 lb./ac.
(iii) P effect alone 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>Mean</th>
</tr>
</thead>
<tbody>
<tr>
<td>N₀</td>
<td>1710</td>
<td>1905</td>
<td>1939</td>
<td>1851</td>
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<td>N₁</td>
<td>1897</td>
<td>1877</td>
<td>1816</td>
<td>1863</td>
</tr>
<tr>
<td>N₂</td>
<td>1795</td>
<td>1952</td>
<td>1964</td>
<td>1904</td>
</tr>
<tr>
<td>N₃</td>
<td>1621</td>
<td>1865</td>
<td>1956</td>
<td>1814</td>
</tr>
<tr>
<td>Mean</td>
<td>1756</td>
<td>1900</td>
<td>1919</td>
<td>1858</td>
</tr>
</tbody>
</table>

S.E. of marginal mean of N = 42.1 lb./ac.
S.E. of marginal mean of P = 36.4 lb./ac.
S.E. of body of table = 72.9 lb./ac.

Crop: - Wheat.
Site: - Agri. Stn., Karnal.

Object: - To study the effect of A/S and Super on Wheat.

1. BASAL CONDITIONS:
(i) (a) Nil. (b) Guara. (c) Nil. (ii) (a) Loam. (b) N/A. (iii) 26.10.1951. (iv) (a) 3 ploughings and 4 sakha.
(b) N.A. (c) 32 sr./ac. (d) and (e) N.A. (v) Nil. (vi) C-591 (medium). (vii) Irrigated. (viii) One weeding.
(ix) 3.50°. (x) 1.4.1952.

2. TREATMENTS:
1. Control (no manure).
2. 100 lb./ac. of N as A/S.
3. 100 lb./ac. of N as Ammon. Phos.
4. 125 lb./ac. of P₂0₅ as Super.

3. DESIGN:
(i) R.B.D. (ii) (a) 4. (b) N/A. (iii) 12. (iv) (a) 80'×12'. (b) 80'×11'. (v) One foot left cut from plot to plot. (vi) Yes.

4. GENERAL:
(i) Satisfactory to normal. No lodging. (ii) Nil. (iii) Grain yield. (iv) (a) No. (b)—. (c)—. (v) (a) No. (b)—. (vi) and (vii) Nil.

5. RESULTS:
(i) 1839 lb./ac.
(ii) 299.6 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>1737</td>
</tr>
<tr>
<td>2.</td>
<td>1929</td>
</tr>
<tr>
<td>3.</td>
<td>1933</td>
</tr>
<tr>
<td>4.</td>
<td>1757</td>
</tr>
</tbody>
</table>
S.E./mean = 86.5 lb./ac.

Ref: - Pb. 51(56).
Type: - 'M'.
Crop : Wheat.  
Site : Agri. Stn., Karnal.  
Object : To study the effect of A/S and Super on the yield of Wheat.

1. BASAL CONDITIONS:
   (i) (a) Nil. (b) Fallow. (c) Nil. (iii) (a) Loam. (b) N.A. (iii) 25.10.1951. (iv) (a) 4 ploughings and 5 sohaga. (b) N.A. (c) 32 sr./ac. (d) and (e) N.A. (v) Nil. (vi) C-591 (medium). (vii) Irrigated. (viii) N.A. (ix) 5.50". (x) 1.4.1952.

2. TREATMENTS:
   1. Control.
   2. 100 lb./ac. of N as A/S.
   3. 100 lb./ac. of N as Ammo. Phos.
   4. 125 lb./ac. of P2O5 as Super.

3. DESIGN:
   (i) R.B.D. (ii) 4. (b) N.A. (iii) 6. (iv) (a) 12'x80'. (b) 10'x80'. (v) 2' left out from plot to plot. (vi) Yes.

4. GENERAL:
   (i) Satisfactory. No lodging. (ii) Nil. (iii) Grain yield. (iv) (a) No. (b) -, (c) -. (v) (a) No. (b) -. (vi) and (vii) Nil.

5. RESULTS:
   (i) 1640 lb./ac.
   (ii) 290.9 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>1344</td>
</tr>
<tr>
<td>2.</td>
<td>2219</td>
</tr>
<tr>
<td>3.</td>
<td>1748</td>
</tr>
<tr>
<td>4.</td>
<td>1248</td>
</tr>
</tbody>
</table>

   S.E./mean = 118.8 lb./ac.

---

Crop : Wheat.  
Site : Agri. Stn., Karnal.  
Object : To find the best source of N for Wheat crop.

1. BASAL CONDITIONS:
   (i) a, N.A. (b) N.A. (c) N.A. (ii) (a) Clay loam. (b) N.A. (iii) 15.12.1949. (iv) (a) 4 ploughing and 5 sohaga. (b) N.A. (c) 32 sr./ac. (d) and (e) N.A. (v) Nil. (vi) C-591 (medium). (vii) Irrigated. (viii) Nil. (ix) 4.13". (x) 25.5.1950.

2. TREATMENTS:
   1. Control (no manure).
   2. 50 lb./ac. of N as A/S applied on 16.1.1950.
   3. 50 lb./ac. of N as A/N.
   4. 50 lb./ac. of N as Ammo. Phos. applied on 16.1.1950.
   5. 50 lb./ac. of N as F.Y.M. applied before sowing.

3. DESIGN:
   (i) R.B.D. (ii) 5. (b) N.A. (iii) 6. (iv) (a) 81'x131'. (b) 81'x131'. (v) Nil. (vi) Y.s.

4. GENERAL:
   (i) Fair to normal. No lodging. (ii) Nil. (iii) Grain yield. (iv) (a) Not continued. (a) -, (c) -. (v) (a) No. (b) -. (vi) and (vii) Nil.
5. RESULTS:

(i) 1550 lb./ac.
(ii) 291.5 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>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>928</td>
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<tr>
<td>2.</td>
<td>1970</td>
</tr>
<tr>
<td>3.</td>
<td>1582</td>
</tr>
<tr>
<td>4.</td>
<td>1972</td>
</tr>
<tr>
<td>5.</td>
<td>1300</td>
</tr>
</tbody>
</table>

S.E./mean = 119.0 lb./ac.

Crop: Wheat.
Site: Agri. Stn., Karnal.

Object: To find a suitable form and dose of N for Wheat.

1. BASAL CONDITIONS:

(i) (a) Nil. (b) Fallow. (c) Nil. (ii) (a) Clay loam. (b) N.A. (iii) 13.12.1949. (iv) (a) 5 ploughings and 4 sowings. (b) N.A. (c) 35 sq./ac. (d) N.A. (e) N.A. (v) Nil. (vi) C-591 (medium). (vii) Irrigated. (viii) Nil. (ix) 4.13'. (x) 24.5.1950.

2. TREATMENTS:

All combinations of (1) and (2) + a control.
(1) 3 sources of N: S1 = A/S, S2 = Ammo. Phos. and S3 = F.Y.M.
(2) 2 doses of N: N1 = 40 and N2 = 60 lb./ac.

3. DESIGN:

(i) R.B.D. (ii) (a) 7. (b) N.A. (iii) 6. (iv) (a) N.A. (b) 80' x 11'. (v) N.A. (vi) Yes.

4. GENERAL:

(i) Fair to normal. No lodging. (ii) Nil. (iii) Grain yield. (iv) (a) Not continued. (b) N.A. (v) (a) No. (b) N.A. (vi) and (vii) Nil.

5. RESULTS:

(i) 1293 lb./ac.
(ii) 139.0 lb./ac.
(iii) None of the effects is significant.
(iv) Av. yield of grain in lb./ac.

<table>
<thead>
<tr>
<th></th>
<th>N1</th>
<th>N2</th>
<th>Mean</th>
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<tbody>
<tr>
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<td>1291</td>
<td>1309</td>
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<tr>
<td>S2</td>
<td>1325</td>
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<td>1309</td>
</tr>
<tr>
<td>S3</td>
<td>1321</td>
<td>1239</td>
<td>1280</td>
</tr>
</tbody>
</table>

S.E. of marginal mean of S = 40.1 lb./ac.
S.E. of marginal mean of N = 32.8 lb./ac.
S.E. of body of table = 56.8 lb./ac.
Crop :- Wheat.
Ref :- Pb. 49 (65).
Site :- Agri. Stn., Karnal.
Type :- 'M'.

Object :- To study the effect of A/S and Ammo. Phos. in presence and absence of Super.

1. BASAL CONDITIONS :
   (i) (a) Nil. (b) Guara (for green manuring). (c) Nil. (ii) (a) Clay loam. (b) N.A. (iii) 11.12.1949.
   (iv) (a) to (e) N.A. (v) Field green manured with Guara. (vi) C-217 (medium). (vii) Irrigated. (viii) Nil.
   (ix) 4.13'. (x) 24.5.1950.

2. TREATMENTS :
   All combinations of (1) and (2)+a control
   (1) 2 levels of $P_2O_5$ as Super: $P_0=0$ and $P_1=25$ lb./ac.
   (2) 2 sources of N : $S_1=A/S$ and $S_2=Ammo.$ Phos.

3. DESIGN :
   (i) R.B.D. (ii) (a) 5. (b) N.A. (iii) 6. (iv) (a) N.A. (b) 81' x 13.5'. (v) N.A. (vi) Yes.

4. GENERAL :
   (i) Satisfactory. No lodging. (ii) Nil. (iii) Grain yield. (iv) (a) Not contd. (b) No. (c)--. (v) (a) No.
   (b)--. (vi) and (vii) Nil.

5. RESULTS :
   (i) 1926 lb./ac.
   (ii) 166.0 lb./ac.
   (iii) $S$ and "control vs. others effects" are highly significant.
   (iv) Av. yield of grain in lb./ac.

<table>
<thead>
<tr>
<th></th>
<th>$P_0$</th>
<th>$P_1$</th>
<th>Mean</th>
</tr>
</thead>
<tbody>
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<td>2135</td>
<td>2099</td>
</tr>
<tr>
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<td>1857</td>
</tr>
<tr>
<td>Mean</td>
<td>1996</td>
<td>1960</td>
<td>1978</td>
</tr>
</tbody>
</table>

S.E. of any marginal mean = 47.9 lb./ac.
S.E. of body of table = 67.8 lb.ac.

---

Crop :- Wheat.
Ref :- Pb. 49(66).
Site :- Agri. Stn., Karnal.
Type :- 'M'.

Object :- To study the residual effect of manures applied to Berseem crop on succeeding Wheat crop.

1. BASAL CONDITIONS :
   (i) (a) Nil. (b) Berseem. (c) As per treatments. (ii) (a) Clay loam. (b) N.A. (iii) 8.12.1949. (iv) (a)
   and (b) N.A. (c) 40 sq.ac. (d) and (e) N.A. (v) N.A. (vi) C-591 (medium). (vii) Irrigated. (viii) Nil.
   (ix) 4.13'. (x) 23.5.1950.

2. TREATMENTS :
   1. Control (no manure).
   2. 100 lb./ac. of N as A/S applied to previous crop of berseem.
   3. 100 lb./ac. of N and 125 lb./ac. of $P_2O_5$ as Ammo. Phos. applied to previous crop of berseem.
   4. 125 lb./ac. of $P_2O_5$ as Super applied to previous crop of berseem.
3. DESIGN:
   (i) R.B.D. (ii) (a) 4. (b) N.A. (iii) 6. (iv) (a) 11' x 81'. (b) 11' x 81'. (v) Nil. (vi) Yes.

4. GENERAL:
   (i) Poor. No lodging. (ii) Nil. (iii) Grain yield. (iv) (a) Not contd. (b) N.A. (c) —. (v) (a) No. (b) —. (vi) and (vii) Nil.

5. RESULTS:
   (i) 1410 lb./ac.
   (ii) 209.6 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>1323</td>
</tr>
<tr>
<td>2.</td>
<td>1361</td>
</tr>
<tr>
<td>3.</td>
<td>1438</td>
</tr>
<tr>
<td>4.</td>
<td>1516</td>
</tr>
<tr>
<td>S.E./mean</td>
<td>85.6 lb./ac.</td>
</tr>
</tbody>
</table>

Crop: Wheat. Site: Agri. Stn., Karnal

Ref: Pb. 49(69). Type: 'M'.

Object: To study the residual effect of manures applied to Wheat crop last year.
Crop :- Wheat.  
Site :- Agri. Stn., Karnal. 

Object :- To find out the best manurial combination for Wheat crop when sown in fallow fields.

1. BASAL CONDITIONS:
(i) (a) Nil.  (b) Fallow.  (c) Nil.  (ii) (a) Clay loam.  (b) N.A.  (iii) 3.12.1950.  (iv) (a) 4 ploughings and 5 sohaga.  (b) N.A.  (c) 1 md./acre.  (d) and (e) N.A.  (v) N.A.  (vi) C—591 (medium).  (vii) Irrigated.  (viii) Nil.  (ix) 2.23'.  (x) 24.5.1951.

2. TREATMENTS:
All combinations of (1) and (2).
(1) 3 levels of N as A/S: N₀ = 0, N₁ = 20 and N₂ = 40 lb./acre.
(2) 3 levels of P₂O₅ as Super: P₀ = 0, P₁ = 25 and P₂ = 50 lb./acre.

3. DESIGN:
(i) 3 x 3 Fact. in R.B.D.  (ii) (a) 9.  (b) N.A.  (iii) 6.  (iv) (a) 81' x 8'.  (b) 75'-74' x 8'.  (v) N.A.  (vi) Yes.

4. GENERAL:
(i) Germination satisfactory.  No lodging.  (ii) Nil.  (iii) Grain yield.  (iv) (a) Not contd.  (b) No.  (c) —.  (v) (a) No.  (b) —.  (vi) and (vii) Nil.

5. RESULTS:
(i) 2157 lb./acre.
(ii) 141.8 lb./acre.
(iii) N and P effects are highly significant while interaction N x P is not significant.
(iv) Av. yield of grain in lb./acre.

<table>
<thead>
<tr>
<th>P₀</th>
<th>P₁</th>
<th>P₂</th>
<th>Mean</th>
</tr>
</thead>
<tbody>
<tr>
<td>N₀</td>
<td>1771</td>
<td>2069</td>
<td>2115</td>
</tr>
<tr>
<td>N₁</td>
<td>1882</td>
<td>2288</td>
<td>2354</td>
</tr>
<tr>
<td>N₂</td>
<td>1881</td>
<td>2445</td>
<td>2603</td>
</tr>
<tr>
<td>Mean</td>
<td>1845</td>
<td>2267</td>
<td>2257</td>
</tr>
</tbody>
</table>

S.E. of any marginal mean = 33.4 lb./acre.
S.E. of body of table = 57.9 lb./acre.
4. GENERAL:

(i) Germination and growth satisfactory and condition normal. No lodging.  (ii) Nil.  (iii) Grain yield.
(iv) (a) Not continued.  (b) No.  (c) —.  (v) (a) No.  (b) —.  (vi) and (vii) Nil.

5. RESULTS:

(i) 1845 lb./ac.
(ii) 110.2 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>Mean</th>
</tr>
</thead>
<tbody>
<tr>
<td>N0</td>
<td>1421</td>
<td>1467</td>
<td>1588</td>
<td>1492</td>
</tr>
<tr>
<td>N1</td>
<td>1639</td>
<td>1924</td>
<td>1969</td>
<td>1844</td>
</tr>
<tr>
<td>N2</td>
<td>1864</td>
<td>2268</td>
<td>2469</td>
<td>2200</td>
</tr>
<tr>
<td>Mean</td>
<td>1641</td>
<td>1886</td>
<td>2009</td>
<td>1845</td>
</tr>
</tbody>
</table>

S.E. of any marginal mean = 26.0 lb./ac.
S.E. of body of table = 45.0 lb./ac.

Crop :- Wheat.  
Site :- Agri. Stn., Karnal.  
Ref :- Pb. 49(67).  
Type :- 'M'.

Object : To study the effect of A/S and Super on yield of Wheat.

1. BASAL CONDITIONS:

(i) (a) Nil.  (b) Fallow.  (c) Nil.  (ii) (a) Clay loam.  (b) N.A.  (iii) 8.12.1949.  (iv) (a) 4 ploughings and 4
suhaga.  (b) N.A.  (c) 30 s.r./ac.  (d) and (e) N.A.  (v) Nil.  (vi) C-591 ('medium').  (vii) Irrigated, (viii) Nil.
(ix) 4.13°.  (x) 24.5.1950.

2. TREATMENTS:

1. Control (no manure).
2. A/S at 100 lb./ac. of N.
3. Ammo. Phos. at 100 lb./ac. of N and 125 lb./ac. of P2O5.
4. Super at 125 lb./ac. of P2O5.
Super applied on 8.12.1949 before sowing while A/S and Ammo. Phos. applied half dose before sowing on
8.12.49 and half dose on 16.1.1949 with 1st irrigation.

3. DESIGN:

(i) R.B.D.  (ii) (a) 4.  (b) N.A.  (iii) 6.  (iv) (a) 81' x 11'.  (b) 80' x 11'.  (v) N.A.  (vi) Yes.

4. GENERAL:

(i) Germination and condition good in plots with treatments 2 and 3 while it is poor in 1 and 4. No lodging,
(ii) Nil.  (iii) 'Grain yield.'  (iv) (a) 1949-50.  (b) No.  (c) Nil.  (v) (a) and (b) Nil.  (vi) and
(vii) Nil.

5. RESULTS:

(i) 1605 lb./ac.
(ii) 544.8 lb./ac.
(iii) Treatments are significantly different.
(iv) Av. yield of grain in lb./ac.

<table>
<thead>
<tr>
<th>Treatment</th>
<th>Av. yield</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>1336</td>
</tr>
<tr>
<td>2.</td>
<td>2121</td>
</tr>
<tr>
<td>3.</td>
<td>1860</td>
</tr>
<tr>
<td>4.</td>
<td>1102</td>
</tr>
</tbody>
</table>

S.E./mean = 222.4 lb./ac.
Crop :- Wheat.  
Site :- Agri. Stn., Karnal.  

Object :- To study the effect of A/S and Super on Wheat.

1. BASAL CONDITIONS:
   (i) Wheat-Berseem-Wheat.  
   (b) Berseem.  
   (c) ]N.A.  
   (ii) (a) Clay loam.  
   (b) N.A.  
   (iii) 23.11.50.  
   (iv) (a) Ploughing and såhága.  
   (b) N.A.  
   (c) 34 sr./ac.  
   (d) and (e) N.A.  
   (v) Nil.  
   (vi) C-591 (medium).  
   (vii) Irrigated.  

2. TREATMENTS:
   1. Control (no manure).
   2. A/S at 100 lb./ac. of N.
   3. Ammo. Phos. at 100 lb./ac. of N and 125 lb./ac. of P₂O₅.
   4. Super at 125 lb./ac. of P₂O₅.

3. DESIGN:
   (i) R.B.D.  
   (ii) (a) 4.  
   (b) N.A.  
   (iii) 12.  
   (iv) (a) N.A.  
   (b) 13'x80'.  
   (v) N.A.  
   (vi) Yes.

4. GENERAL:
   (i) Germination and condition satisfactory in plots with treatments 1 and 4 while it is below normal in plots with treatments 2 and 3.  
   (ii) N.A.  
   (iii) Grain yield.  
   (iv) (a) 1949-1950.  
   (b) and (c) No.  
   (v) (a) and (b) No.  
   (vi) and (vii) Nil.

5. RESULTS:
   (i) 1629 lb./ac.
   (ii) 150.4 lb./ac.
   (iii) Treatments are highly significantly different.  
   (iv) Av. yield of grain in lb./ac.
   Treatment  Av. yield
   1.  1161  
   2.  1810  
   3.  2310  
   4.  1233  
   S.E./mean  = 43.4 lb./ac.
4. GENERAL:
(i) Satisfactory  (ii) No.  (iii) Grain yield.  (iv) (a) 1952 to 1954.  (b) No. (c) Nil.  (v) (a) No.  (b) —.  
(vi) Weather during crop season was quite favourable.  (vii) Nil.

5. RESULTS:
(i) 2393 lb./ac.
(ii) 310.4 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>2334</td>
</tr>
<tr>
<td>2.</td>
<td>2342</td>
</tr>
<tr>
<td>3.</td>
<td>2503</td>
</tr>
<tr>
<td>S.E./mean</td>
<td>= 155.2 lb./ac.</td>
</tr>
</tbody>
</table>

Crop :- Wheat.  
Site :- Rice Breeding Sub-Stn., Nagrota Bagwan.  
Object :- To find out suitable dose of A/S for Wheat.

1. BASAL CONDITIONS:
(i) (a) Paddy-Wheat-Paddy.  (b) Paddy.  (c) N.A.  (ii) (a) Loam.  (b) N.A.  (iii) 18.11.1953.  (iv) (a) 2 desi ploughings and 3 plankings.  (b) N.A. (c) 1 mds./ac. (d) and (e) N.A.  (v) 200 mds./ac. of F.Y.M. broadcast.  (vi) C—250 (medium).  (vii) Irrigated.  (viii) 2 weedings and 2 hoeings.  (ix) 18.09".  (x) N.A.

2. TREATMENTS:
1. No manure.
2. 30 lb./ac. of N as A/S.
3. 40 lb./ac. of N as A/S.
4. 50 lb./ac. of N as A/S.

3. DESIGN:
(i) R.B.D.  (ii) (a) 4.  (b) N.A.  (iii) 4.  (iv) (a) N.A.  (b) 11’3”x26’;  (v) Two rows along the length on both sides left.  (vi) Yes.

4. GENERAL:
(i) There was lodging in all the plots except in those of control plots.  Lodging was more in plots with treatment 4.  (ii) Bunt disease due to heavy winter rains.  (iii) Grain yield.  (iv) (a) 1952 to 1954 with modifications.  (b) No.  (c) Nil.  (v) (a) No.  (b) —.  (vi) Heavy rains and hailstorm in the month of February 1954.  (vii) Nil.

5. RESULTS:
(i) 2254 lb./ac.
(ii) 186.6 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>1872</td>
</tr>
<tr>
<td>2.</td>
<td>2307</td>
</tr>
<tr>
<td>3.</td>
<td>2451</td>
</tr>
<tr>
<td>4.</td>
<td>2384</td>
</tr>
<tr>
<td>S.E./mean</td>
<td>= 93.3 lb./ac.</td>
</tr>
</tbody>
</table>
Crop :- Wheat.  
Site :- Cereal Breeding Sub-Stn., Kulu.  
Ref :- Pb. 52 (27).  
Type :- 'M'.

Object :- To see the effect of different combinations of A/S and Super on Wheat crop.

1. BASAL CONDITIONS :
   (i) (a) Wheat-Maize.  (b) Maize.  (c) N.A.  (ii) (a) Loam.  (b) N.A.  (iii) 18.10.1952.  (iv) (a) to (e) N.A.  

2. TREATMENTS :
   All combinations of (1) and (2)  
   (1) 3 levels of N as A/S : N_0 =0, N_1 =25 and N_2 =50 lb./ac.  
   (2) 2 levels of P_2O_5 as Super : P_0 =0 and P_1 =25 lb./ac.  
   A/S and Super broadcast on 18.10.1952 before sowing.

3. DESIGN :
   (i) 3×2 Fact. in R.B.D.  (ii) (a) 6.  (b) N.A.  (iii) 4.  (iv) (a) N.A.  (b) 22'-4'×9'.  (v) N.A.  (vi) Yes.

4. GENERAL :
   (i) No lodging.  (ii) Nil.  (iii) Grain yield.  (iv) (a) 1951 to 1952.  (b) No.  (c) Nil.  (v) (a) No.  (b) Nil,  
   (vi) and (vii) Nil.

5. RESULTS :
   (i) 2284 lb./ac.  
   (ii) 167.7 lb./ac.  
   (iii) None of the effects is significant.  
   (iv) Av. yield of grain in lb./ac.

<table>
<thead>
<tr>
<th></th>
<th>P_0</th>
<th>P_1</th>
<th>Mean</th>
</tr>
</thead>
<tbody>
<tr>
<td>N_0</td>
<td>2347</td>
<td>2013</td>
<td>2180</td>
</tr>
<tr>
<td>N_1</td>
<td>2333</td>
<td>2215</td>
<td>2274</td>
</tr>
<tr>
<td>N_2</td>
<td>2374</td>
<td>2423</td>
<td>2399</td>
</tr>
</tbody>
</table>

Mean 2351 2217 2284

S.E. of marginal mean of N =59.3 lb./ac.
S.E. of marginal mean of P =48.4 lb./ac.
S.E. of body of table =83.9 lb./ac.

Crop :- Wheat.  
Site :- Chemical Section (B. A. Farm), Rauni.  
Ref :- Pb. 52 (79).  
Type :- 'M'.

Object :- To find out the best source of N for Wheat crop.

1. BASAL CONDITIONS :
   (i) Nil.  (b) Chari.  (c) Nil.  (ii) (a) Heavy loam.  (b) N.A.  (iii) 18.11.1952.  (iv) (a) to (e) N.A.  (v) Nil,  

2. TREATMENTS :
   1. Control.  
   2. 30 lb./ac. of N as A/S.  
   3. 30 lb./ac. of N as F.Y.M.  
   4. 40 lb./ac. of N as A/S.  
   5. 40 lb./ac. of N as F.Y.M.  
   6. 20 lb./ac. of N as F.Y.M.+20 lb./ac. of N as A/S.  
   F.Y.M applied on 19,20,11.1952, 1/2 dose of A/S on 18.11.1952 and 1/2 dose of A/S on 5.1.1953 as top dressing.
3. **DESIGN:**
   (i) R.B.D. (ii) (a) 6. (b) N.A. (iii) 4. (iv) (a) 50.5' × 24'. (b) 83.75' × 20'. (v) N.A. (vi) Yes.

4. **GENERAL:**
   (i) Normal. No. lodging. (ii) Nil. (iii) Grain and stalk weights. (iv) (a) 1952 to 1955. (b) No. (c) Nil. (v) (a) No. (b) Nil. (vi) and (vii) Nil.

5. **RESULTS:**
   (i) 821.5 lb./ac.
   (ii) 112.84 lb./ac.
   (iii) Treatments are highly significantly different.
   (iv) Av. yield of grain in lb./ac.
       | Treatment | Av. yield |
       | 1.        | 688.6     |
       | 2.        | 922.6     |
       | 3.        | 718.7     |
       | 4.        | 939.3     |
       | 5.        | 720.4     |
       | 6.        | 939.3     |
       | S.E./mean | 56.42 lb./ac. |

**Crop:** Wheat.
**Site:** Chemical Section (B.A. Farm) Rauni.
**Type:** 'M'.

**Object:** To find out the best source of N for Wheat crop.

1. **BASAL CONDITIONS:**
   (i) (a) Cotton-Fallow-Wheat. (b) Fallow. (c) Nil. (ii) (a) Heavy loam. (b) N.A. (iii) 13.11.1953. (iv) (a) 4 ploughings. (b) N.A. (c) 35 sr./ac. (d) 6' row to row. (e) N.A. (v) Nil. (vi) C-591 (medium). (vii) Irrigated. (viii) One hoeing and two weedings. (ix) 7.25'. (x) 18.4.1954.

2. **TREATMENTS:**
   1. Control (no manure).
   2. 30 lb./ac. of N as A/S.
   3. 30 lb./ac. of N as F.Y.M.
   4. 40 lb./ac. of N as A/S.
   5. 40 lb./ac. of N as F.Y.M.
   6. 20 lb./ac. of N as A/S + 20 lb./ac. of N as F.Y.M.


3. **DESIGN:**
   (i) R.B.D. (ii) (a) 6. (b) N.A. (iii) 4. (iv) (a) 45.8' × 19'. (b) 1/75th ac. (v) N.A. (vi) Yes.

4. **GENERAL:**
   (i) Normal. Crop lodged in Feb. 1954. (ii) Rat infestation observed in some plots. (iii) Grain yield. (iv) (a) 1952—1955. (b) No. (c) Nil. (v) (a) Nil. (b) Nil. (vi) and (vii) Nil.

5. **RESULTS:**
   (i) 1335 lb./ac.
   (ii) 182.0 lb./ac.
   (iii) Treatments are significantly different.
   (iv) Av. yield of grain in lb./ac.
       | Treatment | Av. yield |
       | 1.        | 1125      |
       | 2.        | 1294      |
       | 3.        | 1519      |
       | 4.        | 1125      |
       | 5.        | 1556      |
       | 6.        | 1388      |
       | S.E./mean | 91.0 lb./ac. |
Crop :- Wheat. Ref:.- Pb. 52(75).
Site :.- Chemical Section (B.A. Farm), Rauni. Type:.- 'M'.

Object:- To study the residual effect of previous *guara* and *sanai* crops on the yield of Wheat crop.

1. BASAL CONDITIONS:
   (i) (a) Not followed. (b) As per treatments. (c) Nil. (iii) (a) Heavy loam. (b) N.A. (iii) 17.11.1952. (iv) (a) 5 ploughings and 4 soko. (b) N.A. (c) 1 md./ac. (d) 6". (e) N.A. (v) Nil. (vi) C-591 (medium). (vii) Irrigated. (viii) One weeding. (ix) 2.45". (x) N.A.

2. TREATMENTS:
   Previous crops.
   1. Fallow.
   2. *Guara* green manured.
   3. *Guara* sown and removed for seed.
   4. *Sanai* green manured.
   5. *Sanai* sown and removed for seed and fiber.

3. DESIGN:
   (i) R.B.D. (ii) (a) 5. (b) N.A. (iii) 4. (iv) (a) 25'x87.1'. (b) 20' x80.75'. (v) N.A. (vi) Yes.

4. GENERAL:
   (i) Normal. No lodging. (ii) Nil. (iii) *Bhoosa* and grain yield. (iv) (a) Not contd. (b) Nil. (c) Nil. (v) (a) No. (b) Nil. (vi) and (vii) Nil.

5. RESULTS:
   (i) 895.0 lb./ac.
   (ii) 204.16 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>592.6</td>
</tr>
<tr>
<td>2.</td>
<td>933.6</td>
</tr>
<tr>
<td>3.</td>
<td>674.4</td>
</tr>
<tr>
<td>4.</td>
<td>1354.1</td>
</tr>
<tr>
<td>5.</td>
<td>910.2</td>
</tr>
<tr>
<td>S.E./mean</td>
<td>=102.08 lb./ac.</td>
</tr>
</tbody>
</table>

---

Crop :- Wheat (*Rabi*). Ref:.- Pb. 53(108).
Site :- Chemical Section (B.A. Farm), Rauni. Type:.- 'M'.

Object:—To study the effect of previous crops on subsequent crop of Wheat.

1. BASAL CONDITIONS:
   (iv) (a) Nil. (b) As per treatments. (c) Nil. (ii) (a) Heavy loam. (b) N.A. (iii) 5.12.1953. (iv) (a) to (c) N.A. (v) Nil. (vi) C-591 (medium). (vii) Irrigated. (viii) N.A. (ix) 6.25". (x) 15.4.1954.

2. TREATMENTS:
   Previous crops.
   1. Control (fallow).
   2. *Sanai* (*Sannhemp*) green manured.
   4. *Sanai* sown and removed for seed.
   5. *Moong* sown and removed for seed.

3. DESIGN:
   (i) R.B.D. (ii) (a) 5. (b) N.A. (iii) 4. (iv) (a) 90.75'x24'. (b) 1/30th ac. (v) N.A. (vi) Yes.
4. GENERAL:
   (i) N.A. (ii) N.A. (iii) Grain yield. (iv) (a) No. (b) Nil. (c) Nil. (v) (a) No. (b) Nil. (vi) and (vii) Nil.

5. RESULTS:
   (i) 819.0 lb./ac.
   (ii) 166.70 lb./ac.
   (iii) Treatments are not significantly different.
   (iv) Av. yield of grain in lb./ac.
   Treatment       Av. yield
   1.               705.0
   2.               817.5
   3.               900.0
   4.               892.5
   5.               780.0
   S.E./mean       = 83.35 lb./ac.

---

Crop: Wheat.
Site: Soil Sub-Stn. Agri. Farm, Rohtak.

Ref: Pb. 53(162).
Type: 'M'.

Object: To find a suitable dose of A/S and Super for Wheat crop.

1. BASAL CONDITIONS:
   (i) (a) Nil. (b) N.A. (c) Nil. (ii) (a) Loam. (b) Refer soil analysis, Roh tak. (iii) 14.11.1953. (iv) 4 ploughings, and 5 sowing. (b) Por. (c) 40 sft./ac. (d) N.A. (e) N.A. (f) Nil. (vi) C-591 (medium). (vii) Irrigated. 
   (viii) One weeding. (ix) 8.10". (x) 18.4.1954.

2. TREATMENTS:
   All combinations of (1) and (2)
   (1) 3 levels of N as A/S: N₀ =0, N₁=25 and N₂=50 lb./ac.
   (2) 2 levels of P₂O₅ as Super: P₀=0 and P₁=25 lb./ac.
   Super applied by por while A/S applied in Dec. with 1st irrigation.

3. DESIGN:
   (i) 3 x 2 Fac. in R.B.D. (ii) (a) 6. (b) N.A. (iii) 4. (iv) (a) N.A. (b) 1/25th. ac. (v) N.A. (vi) Yes.

4. GENERAL:
   (i) Satisfactory. No lodging. (ii) Nil. (iii) Grain yield. (iv) (a) Not continued. (b) No. (c) Nil. (v) (a) No. (b) Nil. (vi) and (vii) Nil.

5. RESULTS:
   (i) 1848 lb./ac.
   (ii) 74.4 lb./ac.
   (iii) Only P effect is significant.
   (iv) Av. yield of grain in lb./ac.

<table>
<thead>
<tr>
<th></th>
<th>N₀</th>
<th>N₁</th>
<th>N₂</th>
<th>Mean</th>
</tr>
</thead>
<tbody>
<tr>
<td>P₀</td>
<td>1618</td>
<td>1699</td>
<td>1910</td>
<td>1742</td>
</tr>
<tr>
<td>P₁</td>
<td>1804</td>
<td>2122</td>
<td>1937</td>
<td>1954</td>
</tr>
<tr>
<td>Mean</td>
<td>1711</td>
<td>1910</td>
<td>1923</td>
<td>1848</td>
</tr>
</tbody>
</table>

S.E. of marginal mean of N = 84.6 lb./ac.
S.E. of marginal mean of P = 69.0 lb./ac.
S.E. of body of table = 119.6 lb./ac.
Crop :- Wheat. 
Site :- Soil Sub-Stn. Agri. Farm, Rohtak. 
Object :- To find the suitable manurial treatments for Wheat.

1. BASAL CONDITIONS :
(i) (a) Nil. (b) Fallow. (c) Nil. (ii) (a) Loamy. (b) Refer soil analysis, Rohtak. (iii) 11.11.1953. (iv) (a) 1 ro/a, 5 ploughings and 3 rohaga. (b) N.A. (c) 43 sr./ac. (d) and (e) N.A. (v) Nil. (vi) C—518 (medium). (vii) Irrigated. (viii) One weeding. (ix) 8.10. (x) 18.4.1954.

2. TREATMENTS :
1. Control (no manure).
2. 25 lb./ac. of P\textsubscript{2}O\textsubscript{5} as B.M.
3. 25 lb./ac. of P\textsubscript{2}O\textsubscript{5} as B.M. compost.
4. 25 lb./ac. of P\textsubscript{2}O\textsubscript{5} as compost manure.
5. 25 lb./ac. of P\textsubscript{2}O\textsubscript{5} as B.M. + 25 lb./ac. of N as A/S.
6. 25 lb./ac. of P\textsubscript{2}O\textsubscript{5} as B.M. compost + 25 lb./ac. of N as A/S.
7. 25 lb./ac. of P\textsubscript{2}O\textsubscript{5} as Super.
8. 25 lb./ac. of P\textsubscript{2}O\textsubscript{5} as Super + 25 lb./ac. of N as A/S.
9. 50 lb./ac. of P\textsubscript{2}O\textsubscript{5} as Super + 25 lb./ac. of N as A/S.

Time and method of application N.A.

3. DESIGN :
(i) R.B.D. (ii) (a) 9. (b) N.A. (iii) 4. (iv) (a) N.A. (b) 1/40th. ac. (v) N.A. (vi) Yes.

4. GENERAL :
(i) Satisfactory. Slight lodging. (ii) Nil. (iii) Grain yield. (iv) (a) Not contd. (b) No. (c) Nil. (v) (a) No. (b) Nil. (vi) and (vii) Nil.

5. RESULTS :
(i) 2261 lb./ac.
(ii) 286 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>2106</td>
</tr>
<tr>
<td>2.</td>
<td>2317</td>
</tr>
<tr>
<td>3.</td>
<td>2333</td>
</tr>
<tr>
<td>4.</td>
<td>2333</td>
</tr>
<tr>
<td>5.</td>
<td>2254</td>
</tr>
<tr>
<td>6.</td>
<td>2188</td>
</tr>
<tr>
<td>7.</td>
<td>2172</td>
</tr>
<tr>
<td>8.</td>
<td>2397</td>
</tr>
<tr>
<td>9.</td>
<td>2251</td>
</tr>
<tr>
<td>S.E./mean</td>
<td>=143.0 lb./ac.</td>
</tr>
</tbody>
</table>

---

Crop :- Wheat. 
Site :- Agri. Farm, Rohtak. 
Object :- To find a suitable dose of F.Y.M. for Wheat crop.

1. BASAL CONDITIONS :
(i) (a) Nil. (b) Fallow. (c) Nil. (ii) (a) Loamy. (b) Refer soil analysis, Rohtak. (iii) 5.11.1948. (iv) (a) and (b) N.A. (c) 40 sr./ac. (d) and (e) N.A. (v) Nil. (vi) D—9 (medium). (vii) Unirrigated (viii) Nil. (ix) 0.26". (x) 11.4.1949.

2. TREATMENTS :
1. Control (no manure).
2. 2\textsuperscript{1}/2 ton ac. of F.Y.M.
3. 5 ton/ac. of F.Y.M.
4. 7\textsuperscript{1}/2 ton/ac. of F.Y.M.
3. **DESIGN:**
   (i) **R.B.D.** (ii) (a) 4. (b) N.A. (iii) 6. (iv) (a) 24’×66’. (b) 20’×54.5’. (v) N.A. (vi) Yes.

4. **GENERAL:**
   (i) Germination good, stand and condition pcr. No lodging. (ii) Nil. (iii) Grain yield. (iv) (a) 1943—1948. (b) No. (c) Nil. (v) (a) No. (b) Nil. (vi and (vii) Nil.

5. **RESULTS:**
   (i) 214.7 lb./ac.
   (ii) 71.02 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>211.5</td>
</tr>
<tr>
<td>2.</td>
<td>164.4</td>
</tr>
<tr>
<td>3.</td>
<td>246.6</td>
</tr>
<tr>
<td>4.</td>
<td>236.3</td>
</tr>
<tr>
<td>S.E./mean</td>
<td>28.99 lb./ac.</td>
</tr>
</tbody>
</table>

---

**Crop:** Wheat.  
**Site:** Agri. Farm, Rohtak.  
**Ref:** Pb-49(91).  
**Type:** ‘M’.

Object:—To study the suitability of application of compost as manure for Wheat crop.

1. **BASAL CONDITIONS:**
   (i) (a) Nil. (b) Fallow. (c) Nil. (ii) (a) Loamy. (b) Refer soil analysis, Rohtak. (iii) 28.10.1949. (iv) (a) to (e) N.A. (v) Nil. (vi) C-591 (medium). (vii) Irrigated. (viii) Nil. (ix) 2.15. (x) 24.4.1950.

2. **TREATMENTS:**
   1. Control (no manure).
   2. 8 ton/ac. of urban compost.
   3. 8 ton/ac. of rural compost.

3. **DESIGN:**
   (i) **R.B.D.** (ii) (a) 3. (b) N.A. (iii) 6. (iv) (a) N.A. (b) 64’×17’. (v) N.A. (vi) Yes.

4. **GENERAL:**
   (i) Good. No lodging. (ii) Nil. (iii) Grain yield. (iv) (a) Not contd. (b) and (c) No. (v) (a) No. (b) Nil. (vi) and (vii) Nil.

5. **RESULTS:**
   (i) 223 lb./ac.
   (ii) 154.9 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>2219</td>
</tr>
<tr>
<td>2.</td>
<td>2447</td>
</tr>
<tr>
<td>3.</td>
<td>2028</td>
</tr>
<tr>
<td>S.E./mean</td>
<td>63.2 lb./ac.</td>
</tr>
</tbody>
</table>
Crop :- Wheat. Ref :- Pb. 50(102).
Site :- Agri. Farm, Rohtak. Type :- 'M'.

Object :- To study the effect of A/S and Super alone and in combination on yield of Wheat.

1. BASAL CONDITIONS:
   (i) (a) Cotton—Wheat. (b) Cotton. (c) Nil. (ii) (a) Loam. (b) Refer soil analysis, Rohtak. (iii) 9.11.1950.
   (iv) (a) to (c) N.A. (v) Nil. (vi) C-391 (medium). (vii) N.A. (viii) Nil. (ix) 1.83°. (x) 1st week of May 1951.

2. TREATMENTS:
   All combinations of (1) and (2)
   (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 = 50 lb./ac.

3. DESIGN:
   (i) 2 x 2 Fact. in R.B.D. (ii) (a) 4. (b) N.A. (iii) 4. (iv) (a) N.A. (b) 1/17.2 th. ac. (dimensions N.A.). (v) N.A. (vi) Yes.

4. GENERAL:
   (i) Poor to fair. No lodging. (ii) Nil. (iii) Grain yield. (iv) (a) Not contd. (b) and (c) No. (v) (a) and (b) No. (vi) and (vii) Nil.

5. RESULTS:
   (i) 410.4 lb./ac.
   (ii) 103.6 lb./ac.
   (iii) N effect is highly significant.
   (iv) Av. yield of grain in lb./ac.

<table>
<thead>
<tr>
<th></th>
<th>P₀</th>
<th>P₁</th>
<th>Mean</th>
</tr>
</thead>
<tbody>
<tr>
<td>N₀</td>
<td>193.5</td>
<td>219.5</td>
<td>206.5</td>
</tr>
<tr>
<td>N₁</td>
<td>529.6</td>
<td>698.3</td>
<td>614.2</td>
</tr>
<tr>
<td>Mean</td>
<td>361.6</td>
<td>459.2</td>
<td>410.4</td>
</tr>
</tbody>
</table>

S.E. of marginal means = 36.6 lb./ac.
S.E. of body of table = 51.8 lb./ac.

---

Crop :- Wheat. Ref :- Simple trials on cultivators' fields (Stewart's Scheme), 1953.
Site :- Ludhiana (Punjab). Type :- 'M'.

Object :- To study the effect of N and P₂O₅ on Wheat crop.

1. BASAL CONDITIONS:
   (i) (a) to (c) N.A. (ii) pH value from 7.9 to 8.6. Ca CO₃ is between 0—3.4%. organic matter varies from 0.2 to 1.59%. (iii) Nil. (iv) N.A. (v) N.A. (vi) October-November, 1953. (vii) Irrigated. (viii) N.A. (ix) N.A. (x) April-May, 1954.

2. TREATMENTS:
   1. Control (no manure).
   2. 25 lb./ac. of N as A/S.
   3. 40 lb./ac. of N as A/S.
   4. 40 lb./ac. of N as A/S + 25 lb./ac. of P₂O₅ as Super,
      Super drilled before sowing while N applied at the time of first irrigation.

3. DESIGN:
   (i) and (ii) Two experiments were laid out in one village. Selection of villages and site of experiments was by randomisation. No. of experiments—15. (iii) (a) and (b) N.A. (iv) Yes.
4. GENERAL:
   (i) Normal. (ii) Nil. (iii) Grain yield. (iv) (a) Not continued. (b) and (c) —. (v) Jagraon and Samrala. (vi) and (vii) Nil.

5. RESULTS:
   (i) 1914 lb./ac.
   (ii) 465.1 lb./ac.
   (iii) Treatments are highly significantly different.
   (iv) Av. yield of grain in lb./ac.
   Treatment       Av. yield
   1.               1352
   2.               1916
   3.               2037
   4.               2351
   S.E./mean       =120.1 lb./ac.

Crop: Wheat (Rabi). Ref: Simple trials on cultivators' fields (Stewart's Scheme), 1953
Site: Jagraon (Punjab). Type: 'M'.

Obj. 1:—To study the effect of N and P₂O₅ on Wheat crop.

1. BASAL CONDITIONS:
   (i) (a) to (c) N.A. (ii) Generally light but slightly heavier. pH value varies from 8.5 to 9.0. Organic matter contents vary between 0.75 to 1.30% and Ca CO₃: 0.3 to 4.8%. (iii) Nil. (iv) N.A. (v) N.A. (vi) October-November, 1953. (vii) Irrigated. (viii) N.A. (ix) N.A. (x) April-May, 1954.

2. TREATMENTS:
   1. Control (no manure).
   2. 25 lb./ac. of N as A/S.
   3. 40 lb./ac. of N as A/S.
   4. 40 lb./ac. of N as A/S + 25 lb./ac. of P₂O₅ as Super.
      Super drilled before sowing while N applied at the time of first irrigation.

3. DESIGN:
   (i) and (ii) Two experiments were laid out in one village. Selection of villages and site of experiments was by randomisation. No. of experiments—17. (iii) (a) and (b) N.A. (iv) Yes.

4. GENERAL:
   (i) Normal. (ii) Nil. (iii) Grain yield. (iv) (a) Not continued. (b) and (c) —. (v) Samrala and Ludhiana. (vi) and (vii) Nil.

5. RESULTS:
   (i) 1780 lb./ac.
   (ii) 168.2 lb./ac.
   (iii) Treatments are highly significantly different.
   (iv) Av. yield of grain in lb./ac.
   Treatment       Av. yield
   1.               1504
   2.               1817
   3.               1873
   4.               1924
   S.E./mean       =40.8 lb./ac.
Crop: Wheat (R_{bi}). Ref: Simple trials on cultivators’ fields (Stewart’s Scheme), 1953
Site: Samarala (Panjab). Type: ‘M’.

Objective: To study the effect of N and \( P_2O_5 \) on Wheat crop.

1. BASAL CONDITIONS:
   (i) (a) to (c) N.A. (ii) pH value varies from 7.9 to 8.9 Organic matter content is between 0.2 to 0.8% and CaCO\(_3\) between 0.5 to 9.5%. (iii) Nil. (iv) N.A. (v) N.A. (vi) October-November, 1953. (vii) Irrigated. (viii) N.A. (ix) N.A. (x) April-May 1954.

2. TREATMENTS:
   1. Control (no manure).
   2. 25 lb./ac. of N as A/S.
   3. 40 lb./ac. of N as A/S.
   4. 40 lb./ac. of N as A/S + 25 lb./ac. of \( P_2O_5 \) as Super.
      Super drilled before sowing while N applied at the time of first irrigation.

3. DESIGN:
   (i) and (ii) Two experiments were laid out in one village. Selection of villages and site of experiments was by randomisation. No. of experiments – 14. (iii) (a) and (b) N.A. (iv) Yes.

4. GENERAL:
   (i) Normal. (ii) Nil. (iii) Grain yield. (iv) (a) Not continued. (b) and (c) —. (v) Jagraon and Ludhiana. (vi) and (vii) Nil.

5. RESULTS:
   (i) 1394 lb./ac.
   (ii) 233.7 lb./ac.
   (iii) Treatments are highly significantly different.
   (iv) Av. yield of grain in lb./ac.
   \[
   \begin{array}{|c|}
   \hline
   \text{Treatment} & \text{Av. yield} \\
   \hline
   1. & 807 \\
   2. & 1424 \\
   3. & 1554 \\
   4. & 1789 \\
   \hline
   \text{S.E./mean} & 62.5 lb./ac. \\
   \hline
   \end{array}
   \]

Centre: Nilokheri (Punjab). Type: ‘M’.

Objective: To study different levels and types of N and P.

1. BASAL CONDITIONS:

2. TREATMENTS:
   \( O \) = Control.
   \( P \) = Super at 20 lb./ac. of \( P_2O_5 \)
   \( N_1P = A/S \) at 20 lb./ac. of N + 20 lb./ac. of \( P_2O_5 \) as Super.
   \( N_2P = A/S \) at 40 lb./ac. of N + 20 lb./ac. of \( P_2O_5 \) as Super.
   \( N_3P = A/N \) at 20 lb./ac. of N + 20 lb./ac. of \( P_2O_5 \) as Super.
   \( N_4P = A/N \) at 40 lb./ac. of N + 20 lb./ac. of \( P_2O_5 \) as Super.
   Fertilizers applied just before sowing.
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 of grain in lb./ac.</th>
</tr>
</thead>
<tbody>
<tr>
<td>O</td>
<td>1331</td>
</tr>
<tr>
<td>P</td>
<td>1627</td>
</tr>
<tr>
<td>N1P</td>
<td>1777</td>
</tr>
<tr>
<td>N2P</td>
<td>1707</td>
</tr>
<tr>
<td>N1P</td>
<td>1700</td>
</tr>
<tr>
<td>N2P</td>
<td>1871</td>
</tr>
<tr>
<td>G.M</td>
<td>1669</td>
</tr>
<tr>
<td>S.E./mean</td>
<td>143.5 lb./ac.</td>
</tr>
<tr>
<td>No. of experiments</td>
<td>3</td>
</tr>
</tbody>
</table>


Object: (i) To study different levels and types of N and P.

1. BASAL CONDITIONS:

2. TREATMENTS:
O = Control.
P = 20 lb./ac. of P2O5 as Super.
N1P = A/S at 20 lb./ac. of N+20 lb./ac. of P2O5 as Super.
N2P = A/S at 40 lb./ac. of N+20 lb./ac. of P2O5 as Super.
N1P = Urea at 20 lb./ac. of N+20 lb./ac. of P2O5 as Super.
N2P = Urea at 40 lb./ac. of N+20 lb./ac. of P2O5 as Super.
Fertilizers applied just before sowing.

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 of grain in lb./ac.</th>
</tr>
</thead>
<tbody>
<tr>
<td>O</td>
<td>1316</td>
</tr>
<tr>
<td>P</td>
<td>1283</td>
</tr>
<tr>
<td>N1P</td>
<td>1347</td>
</tr>
<tr>
<td>N2P</td>
<td>1334</td>
</tr>
<tr>
<td>N1P</td>
<td>1344</td>
</tr>
<tr>
<td>N2P</td>
<td>1307</td>
</tr>
<tr>
<td>G.M.</td>
<td>1322</td>
</tr>
<tr>
<td>S.E./mean</td>
<td>97.3 lb./ac.</td>
</tr>
<tr>
<td>No. of experiments</td>
<td>6</td>
</tr>
</tbody>
</table>
Crop :- Wheat. Ref :- Simple trials on cultivators' fields (T.C.M.), 1953.
Centre :- Nilokheri (Punjab). Type 'M'.

Object :- (i) (b) (iii) To study different levels and types of N and P.

1. BASAL CONDITIONS


2. TREATMENTS:

O = Control.
P₀ = 20 lb./ac. of P₂O₅ as Super.
N₀P₀ = A/N at 20 lb./ac. of N+20 lb./ac. of P₂O₅ as Super.
N₀P₁ = A/N at 40 lb./ac. of N+20 lb./ac. of P₂O₅ as Super.
N₁P₀ = Urea at 20 lb./ac. of N+20 lb./ac. of P₂O₅ as Super.
N₁P₁ = Urea at 40 lb./ac. of N+20 lb./ac. of P₂O₅ as Super.

Fertilizers applied just before sowing.

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 of grain in lb./ac.</th>
</tr>
</thead>
<tbody>
<tr>
<td>O</td>
<td>1637</td>
</tr>
<tr>
<td>P</td>
<td>1952</td>
</tr>
<tr>
<td>N₀P₀</td>
<td>1714</td>
</tr>
<tr>
<td>N₀P₁</td>
<td>1459</td>
</tr>
<tr>
<td>N₁P₀</td>
<td>1697</td>
</tr>
<tr>
<td>N₁P₁</td>
<td>1761</td>
</tr>
<tr>
<td>G.M.</td>
<td>1703</td>
</tr>
<tr>
<td>S.E./mean</td>
<td>= 102.1 lb./ac.</td>
</tr>
</tbody>
</table>

No. of expts. 3

Crop :- Wheat. Ref :- Simple trials on cultivators' fields (T.C.M.), 1953.
Centre :- Nilokheri (Punjab). Type :- 'M'.

Object :- (ii) To study the effect of manures (N,P,K).

1. BASAL CONDITIONS:


2. TREATMENTS:

O = Control.
N₀ = A/S at 20 lb./ac. of N.
N₀P₀ = A/S at 20 lb./ac. of N+Super at 20 lb./ac. of P₂O₅.
N₀P₁ = A/N at 20 lb./ac. of N+Super at 20 lb./ac. of P₂O₅.
N₁P₀ = Urea at 20 lb./ac. of N+Super at 20 lb./ac. of P₂O₅.

Fertilizers applied just before sowing.
4. GENERAL:

5. RESULTS:

<table>
<thead>
<tr>
<th>Treatment</th>
<th>Av. yield of grain in lb./ac.</th>
</tr>
</thead>
<tbody>
<tr>
<td>O</td>
<td>1037</td>
</tr>
<tr>
<td>N</td>
<td>1302</td>
</tr>
<tr>
<td>NP</td>
<td>1496</td>
</tr>
<tr>
<td>N'P</td>
<td>1316</td>
</tr>
<tr>
<td>N''P</td>
<td>1357</td>
</tr>
<tr>
<td>G.M.</td>
<td>1302</td>
</tr>
<tr>
<td>S.E./mean</td>
<td>57.6 lb./ac.</td>
</tr>
<tr>
<td>No. of expts.</td>
<td>12</td>
</tr>
</tbody>
</table>

Crop:—Wheat. Ref:—Simple trials on cultivators’ fields. (T.C.M), 1953.
Centre:—Nilokheri (Punjab.) Type:—‘M’.

Object:—(IV) (i) 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) Grey and brown soil of Indo-Gangetic basin impregnated with salts.

2. TREATMENTS:
O =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 P₂O₅
N'P =A/S at 40 lb./ac. of N + Super at 40 lb./ac. of P₂O₅.
N''P =A/S + Nitro. Phos. at 40 lb./ac. of N + 20 lb./ac. of P₂O₅.
N''P =A/S + Nitro. Phos. at 40 lb./ac. of N + 40 lb./ac. of P₂O₅.
Fertilizers applied just before sowing.

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 of grain in lb./ac.</th>
</tr>
</thead>
<tbody>
<tr>
<td>O</td>
<td>1034</td>
</tr>
<tr>
<td>N</td>
<td>1254</td>
</tr>
<tr>
<td>NP</td>
<td>1302</td>
</tr>
<tr>
<td>N'P</td>
<td>1290</td>
</tr>
<tr>
<td>N''P</td>
<td>1307</td>
</tr>
<tr>
<td>N''P</td>
<td>1362</td>
</tr>
<tr>
<td>G.M.</td>
<td>1258</td>
</tr>
<tr>
<td>S.E./mean</td>
<td>89.5 lb./ac.</td>
</tr>
<tr>
<td>No. of expts.</td>
<td>4</td>
</tr>
</tbody>
</table>
Centre: Nilokheri (Punjab). Type: 'M'.

Object: IV (i) To study the effect of types and levels of P and N.

1. BASAL CONDITIONS:

2. TREATMENTS:
   O =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.
   NP1* =A/S + Ammo. Phos. at 40 lb./ac. of N + 20 lb./ac. of P2O5.
   NP2* =A/S + Ammo. Phos. at 40 lb./ac. of N + 40 lb./ac. of P2O5.
   Fertilizers applied just before sowing.

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—56. (b) No. (c) N.A. (v) N.A. (vi) and (vii) Nil.

5. RESULTS:
   Treatment | Av. yield of grain in lb./ac.
   O          | 1041
   N          | 1187
   NP1        | 1453
   NP2        | 1470
   NP1*       | 1405
   NP2*       | 1167
   G.M.       | 1287
   S.E./mean  = 93.6 lb./ac.
   No. of expts. | 3
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) and (vii) Nil.

5. RESULTS:

<table>
<thead>
<tr>
<th>Treatment</th>
<th>Av. yield of grain in lb./ac.</th>
</tr>
</thead>
<tbody>
<tr>
<td>O</td>
<td>1502</td>
</tr>
<tr>
<td>N</td>
<td>1504</td>
</tr>
<tr>
<td>NP₁</td>
<td>1528</td>
</tr>
<tr>
<td>NP₂</td>
<td>1377</td>
</tr>
<tr>
<td>NP₁²</td>
<td>1561</td>
</tr>
<tr>
<td>NP₂²</td>
<td>1506</td>
</tr>
<tr>
<td>G.M.</td>
<td>1496</td>
</tr>
<tr>
<td>S.E./mean</td>
<td>109.3 lb./ac.</td>
</tr>
<tr>
<td>No. of experiments</td>
<td>3</td>
</tr>
</tbody>
</table>

Centre: Banga (Punjab). Type: 'M'.

Object: — (i) (a) (ii) To study the effect of different levels and sources of N.

1. BASAL CONDITIONS:

2. TREATMENTS:
O = Control.
N₁ = A/S at 20 lb./ac. of N.
N₂ = A/S at 40 lb./ac. of N.
N₁² = Urea at 20 lb./ac. of N.
N₂² = Urea at 40 lb./ac. of N.
Fertilizers applied just before sowing.

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 of grain in lb./ac.</th>
</tr>
</thead>
<tbody>
<tr>
<td>O</td>
<td>1576</td>
</tr>
<tr>
<td>N₁</td>
<td>1894</td>
</tr>
<tr>
<td>N₂</td>
<td>1973</td>
</tr>
<tr>
<td>N₁²</td>
<td>1990</td>
</tr>
<tr>
<td>N₂²</td>
<td>2094</td>
</tr>
<tr>
<td>G.M.</td>
<td>1906</td>
</tr>
<tr>
<td>S.E./mean</td>
<td>34.22 lb./ac.</td>
</tr>
<tr>
<td>No. of experiments</td>
<td>27</td>
</tr>
</tbody>
</table>
Crop :- Wheat.  Ref :- Simple trials on cultivators' fields (T.C.M.), 1953.
Centre :- Banga (Punjab).  Type :- 'M'.

Object :- IV (i) To study the effect of types and levels of P and N.

1. BASAL CONDITIONS :

2. TREATMENTS :
   O  = Control.
   N  = A/S at 40 lb./ac. of N.
   NP = A/S at 40 lb./ac. of N+Super at 40 lb./ac. of P₂O₅.
   N'P = A/S at 40 lb./ac. of N+Super at 40 lb./ac. of P₂O₅.
   N'P' = Urea at 40 lb./ac. of N+Super at 40 lb./ac. of P₂O₅.

   Fertilizers applied just before sowing.

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 :

   Treatment  | Av. yield of grain in lb./ac.
   -------- | ------------------------
   O         | 1656
   N         | 1918
   NP        | 1998
   N'P       | 1948
   N'P'      | 1906

   G.M.  | 1906
   S.E./mean  | = 39.16 lb./ac.
   No. of experiments  | 28
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 of grain in lb./ac.</th>
</tr>
</thead>
<tbody>
<tr>
<td>O</td>
<td>1608</td>
</tr>
<tr>
<td>N</td>
<td>1869</td>
</tr>
<tr>
<td>NP1</td>
<td>1988</td>
</tr>
<tr>
<td>NP2</td>
<td>2050</td>
</tr>
<tr>
<td>NP1*</td>
<td>1933</td>
</tr>
<tr>
<td>NP2*</td>
<td>1971</td>
</tr>
<tr>
<td>G.M.</td>
<td>1903</td>
</tr>
<tr>
<td>S.E./mean</td>
<td>44.35 lb./ac.</td>
</tr>
<tr>
<td>No. of experiments</td>
<td>13</td>
</tr>
</tbody>
</table>

Crop :—Wheat. Ref :—Simple trials on cultivators' fields (T.C.M.), 1953.
Centre :—Banga (Punjab). Type :—M'.

Object :—IV (ii) To study the effect of types and levels of P and N.

1. BASAL CONDITIONS:

2. TREATMENTS:
O =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.
NP1* =A/S at 40 lb./ac. of N+Super at 40 lb./ac. of P2O5.
NP2 =A/S+Ammo. Phos. at 40 lb./ac. of N+20 lb./ac. of P2O5.
NP2* =A/S+Ammo. Phos. at 40 lb./ac. of N+40 lb./ac. of P2O5.
Fertilizers applied just before sowing.

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 of grain in lb./ac.</th>
</tr>
</thead>
<tbody>
<tr>
<td>O</td>
<td>1517</td>
</tr>
<tr>
<td>N</td>
<td>1724</td>
</tr>
<tr>
<td>NP₁</td>
<td>1833</td>
</tr>
<tr>
<td>NP₂</td>
<td>1922</td>
</tr>
<tr>
<td>NP₁*</td>
<td>1870</td>
</tr>
<tr>
<td>NP₂*</td>
<td>1878</td>
</tr>
<tr>
<td>G.M.</td>
<td>1790</td>
</tr>
<tr>
<td>S.E./mean</td>
<td>38.67 lb./ac.</td>
</tr>
<tr>
<td>No. of experiments</td>
<td>8</td>
</tr>
</tbody>
</table>

Centre: Banga (Punjab). Type: 'M'.

Object: IV (v) To study the effect of sources and levels of P and N.

1. BASAL CONDITIONS:
   (i) (a) N.A. (b) N.A. (c) N.A.
   (ii) Grey and brown soils of Indo-Gangetic basin impregnated with salts.
   (iii) Texture loam-pH 8.0.
   (x) April.

2. TREATMENTS:
   O=Control.
   N=A/S at 40 lb./ac. of N.
   NP₁= A/S+Nitro. phos. at 40 lb./ac. of N+20 lb./ac. of P₂O₅.
   NP₂= A/S+Nitro. phos. at 40 lb./ac. of N+40 lb./ac. of P₂O₅.
   NP₁*= A/S+Ammo. Phos. at 40 lb./ac. of N+20 lb./ac. of P₂O₅.
   NP₂*= A/S+Ammo. Phos. at 40 lb./ac. of N+40 lb./ac. of P₂O₅.
   Fertilizers were applied just before sowing.

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>Treatments</th>
<th>Av. yield of grain in lb./ac.</th>
</tr>
</thead>
<tbody>
<tr>
<td>O</td>
<td>1414</td>
</tr>
<tr>
<td>N</td>
<td>1712</td>
</tr>
<tr>
<td>NP₁</td>
<td>1758</td>
</tr>
<tr>
<td>NP₁*</td>
<td>1810</td>
</tr>
<tr>
<td>NP₂</td>
<td>1883</td>
</tr>
<tr>
<td>NP₂*</td>
<td>2018</td>
</tr>
<tr>
<td>G.M.</td>
<td>1766</td>
</tr>
<tr>
<td>S.E./mean</td>
<td>43.53 lb./ac.</td>
</tr>
<tr>
<td>No. of experiments</td>
<td>10</td>
</tr>
</tbody>
</table>
Crop: Wheat (Rabi).
Site: Patiala.

Object: To draw manurial schedule or Wheat crop most suited to Patiala Tehsil.

1. BASAL CONDITIONS
(i) (a) N.A. (b) N.A. (c) N.A. (ii) Loamy for villages Gobindpur, Alampur, Bhunerheri, (one cultivator) Fatehpur (one cultivator), Loam-sand for Upali, Bhunerheri (one cultivator). Majal Khurd (one cultivator), Shekhpur and Uchhaan clayey for Fatehpur and Majal Khurd (one cultivator each).
(iii) Nil. (iv) Local for villages Gobindpur, and for one cultivator each for Bhunerheri, Majal Khurd and Shekhpur. Improved for villages Upali, Fatehpur, Alampur, Uchhaan, and one cultivator each for villages Bhunerheri, Majal Khurd and Shekhpur. (v) to (e) Local. (vi) 5.11.1953 to 22.11.1953. (vii) Irrigated. (viii) N.A. (ix) Approx. 24" in Patiala Tehsil. (x) 14.4.1954 to 24.4.1954.

2. TREATMENTS:
1. Control (no manure).
2. A/S at 25 lb./ac. of N.
3. A/S at 50 lb./ac. of N.
4. A/S at 25 lb./ac. of N + Super at 25 lb./ac. of P₂O₅.
5. A/S at 50 lb./ac. of N + Super at 25 lb./ac. of P₂O₅.
Super drilled 3"—6" deep while 1/ A/S at sowing time by broadcast and 1/ A/S with 1st irrigation.

3. DESIGN:
(i) and (ii) Replications: One for each cultivator or 16 for tehsil i.e. whole experiment. Eight villages were selected in Patiala Tehsil and in each village two cultivators were selected. (iii) (a) N.A. (b) 1/50 ac. (iv) Yes.

4. GENERAL:
(i) Normal. (ii) Nil. (iii) Height of plants, no of tillers/plant, length of spikes, and grain yield/plot. (iv) (a) N.A. (b) (v) and (vi) Nil.

5. RESULTS:
(i) 1732 lb./ac.
(ii) 170.3 lb./ac.
(iii) Villages, experiments within villages as well as treatments all 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>1513</td>
</tr>
<tr>
<td>2.</td>
<td>1635</td>
</tr>
<tr>
<td>3.</td>
<td>1778</td>
</tr>
<tr>
<td>4.</td>
<td>1883</td>
</tr>
<tr>
<td>5.</td>
<td>1890</td>
</tr>
</tbody>
</table>
S.E./mean = 42.6 lb./ac.

Crop: Wheat (Rabi).

Object: To draw manurial schedule for Wheat crop most suited to Rajpura Tehsil.

1. BASAL CONDITIONS:
(i) (a) N.A. (b) N.A. (c) Nil. (ii) Loamy in both cultivator's fields: Hasimpur, Sandy-Loamy in both cultivator's fields in village Chatar Nagar, Heavy clayey in both cultivator's fields in villages Gadapur, Loam to sandy loam in both cultivator's fields in village Ugana. For village Khanpur Gandian, N.A. Sandy loam for Kami Kalan, Ghazipur and Alampur (one cultivator each). Clayey for Kami Kalan (one cultivator). Loamy for Alampur (one cultivator). (iii) Nil. (iv) Improved for Chater Nagar, Hasimpur, Kami Kalan, Ugana, and Khanpur Gandian (both cultivators). Improved for Gadapur and Alampur (one cultivator field). Local for Ghazipur, Gadapur, and Alampur (one cultivator field). (v) (a) to (e) Local. (vi) 14.11.1953 to 3.12.1953. (vii) Irrigated. (viii) N.A. (ix) Approx. 6.57" in Rajpura Tehsil. (x) 14.4.1954 to 27.4.1954.
2. **TREATMENTS:**

1. Control.
2. A/S at 25 lb./ac. of N.
3. A/S at 50 lb./ac. of N.
4. A/S at 25 lb./ac. of N+Super at 25 lb./ac. of P2O5.
5. A/S at 50 lb./ac. of N+Super at 25 lb./ac. of P2O5.

Super drilled 3'-4' deep and 1/2 A/S at sowing time by broadcast and 1/2 A/S with 1st irrigation.

3. **DESIGN:**

(i) and (ii) 8 villages selected in Rajpura tehsil and 2 cultivators in each village were selected. Replication: 1 on each of cultivators’ field. For tehsil 16 replications. (iii) (a) N.A. (b) 1/50th ac. Dimension N.A. (iv) Yes.

4. **GENERAL:**

(i) Normal. No lodging. (ii) Nil. (iii) Height of plants, no. of tillers/plant, length of spikes and grain yield/plot. (iv) (a) 1953—contd. (b) N.A. (v) Nil. (vi) One experiment in Ghaziipur village rejected.

5. **RESULTS:**

(i) 1369 lb./ac.
(ii) 217.8 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>1134</td>
</tr>
<tr>
<td>2.</td>
<td>1327</td>
</tr>
<tr>
<td>3.</td>
<td>1449</td>
</tr>
<tr>
<td>4.</td>
<td>1448</td>
</tr>
<tr>
<td>5.</td>
<td>1486</td>
</tr>
<tr>
<td>S.E./mean</td>
<td>56.2 lb./ac.</td>
</tr>
</tbody>
</table>

**Crop:** Wheat (Rebi).

**Site:** Sirhind.

**Object:** To draw manurial schedule for Wheat crop in Sirhind Tehsil.

1. **BASAL CONDITIONS:**

(i) (a) N.A. (b) and (c) Nil. (ii) Loamy except the cultivator’s field in Bajipur where it is clayey. (iii) Nil. (iv) Improved. (v) (a) to (e) Local. (vi) 5.11.1953 to 29.11.1953. (vii) Irrigated. (viii) N.A. (ix) Approx. 6.30” in Sirhind. (x) 12.4.1954 to 25.4.1954.

2. **TREATMENTS:**

1. Control.
2. A/S at 25 lb./ac. of N.
3. A/S at 50 lb./ac. of N.
4. A/S at 25 lb./ac. of N and Super at 25 lb./ac. of P2O5.
5. A/S at 50 lb./ac. of N and Super at 25 lb./ac. of P2O5.

Super drilled 3'-4' deep and 1/2 A/S at sowing by broadcast and 1/2 A/S with 1st irrigation.

3. **DESIGN:**

(i) and (ii) 8 villages selected in Sirhind and 2 cultivators in each village were selected. No. of replications one on each of cultivator's field i.e. 16 in the whole Sirhind. (iii) (a) N.A. (b) 1/50th ac. dimension N.A. (iv) Yes.
4. GENERAL:
(i) Crop lodged heavily in all plots. (ii) Nil. (iii) Av. height of plants, no. of tillers/plot, length of spikes and grain yield/plot. (iv) (a) 1953—contd. (b) N.A. (v) Nil. (vi) One experiment in each of village Charithal Kalan, Kukur Majre and Saute were rejected for defective layouts etc.

5. RESULTS:
(i) 1760 lb./ac.
(ii) 265.0 lb./ac.
(iii) Treatments are highly significantly different.
(iv) Av. yield of grain in lb./ac.
Treatment Av. yield
1. 1440
2. 1733
3. 1752
4. 1938
5. 1937
S.E./mean =73.5 lb./ac.

Croy : - Wheat (Rabi).
Site : Nabha. (District Patiala.)
Ref : - Pb. 52 (72).
Type :- 'M'.
Object :- To find the suitable treatment combination of N and P₂O₅ on cultivators' fields.

1. BASAL CONDITIONS :
(i) (a) N.A. (b) Maize in one and cotton in the other. (c) Nil. (ii) Heavy loam. (iii) Nil. (iv) C-591 (Improved). (v) (a) to (e) 2 ploughings and 1 sohaga. 1 md./ac. (vi) 13.11.1952 and 24.11.1952. (vii) Irrigated.
(viii) N.A. (ix) 2.45'. (x) 1st week of April 1953 to 10.4.1953.

2. TREATMENTS : 
All combinations of (1) and (2)
(1) 3 levels of N as A/S : N₀=0, N₁=25 and N₂=50 lb./ac.
(2) 3 levels of P₂O₅ as Super : P₀=0, P₁=25 and P₂=50 lb./ac.
Super drilled 3" deep before sowing and A/S half dose at sowing and half on 20.12.1952.

3. DESIGN : 
(i) and (ii) Fact. in R.B.D. 4 fields in each of the two villages. (iiiii) (a) 49.5'x22' (b) 40.33'x18' (iv) Yes.

4. GENERAL:
(v) Nil. (vi) Experiment conducted into two villages.

5. RESULTS :
(i) 1346 lb./ac.
(ii) 212.4 lb./ac.
(iii) Only N effect is highly significant.
(iv) Av. yield of grain in lb./ac.

<table>
<thead>
<tr>
<th>P₀</th>
<th>P₁</th>
<th>P₂</th>
<th>Mean</th>
</tr>
</thead>
<tbody>
<tr>
<td>N₀</td>
<td>1112</td>
<td>1102</td>
<td>951</td>
</tr>
<tr>
<td>N₁</td>
<td>1528</td>
<td>1441</td>
<td>1443</td>
</tr>
<tr>
<td>N₂</td>
<td>1527</td>
<td>1386</td>
<td>1627</td>
</tr>
<tr>
<td>Mean</td>
<td>1389</td>
<td>1310</td>
<td>1340</td>
</tr>
</tbody>
</table>

S.E. of any marginal mean =43.4 lb./ac.
S.E. of body of table =75.1 lb./ac.
Crop :- Wheat. Ref :- Simple trials on cultivators' fields (T.C.M.), 1953.
Centre :- Nawanshar (Punjab). Type :- 'M'.

Object :- I (a) (ii) To study the effect of different levels and sources of N.

1. BASAL CONDITIONS:
(i) (a) N.A. (b) N.A. (c) N.A. (ii) Grey and brown soils of Indo-Gangetic basin impregnated with salts.

2. TREATMENTS:
0 = Control
N1 = A/S at 20 lb./ac. of N.
N2 = A/S at 40 lb./ac. of N.
N1* = Urea at 20 lb./ac. of N.
N2* = Urea at 40 lb./ac. of N.
Fertilizers drilled at the time of sowing.

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 of grain in lb./ac.</th>
</tr>
</thead>
<tbody>
<tr>
<td>O</td>
<td>1391</td>
</tr>
<tr>
<td>N1</td>
<td>1773</td>
</tr>
<tr>
<td>N2</td>
<td>2068</td>
</tr>
<tr>
<td>N1*</td>
<td>1581</td>
</tr>
<tr>
<td>N2*</td>
<td>1782</td>
</tr>
<tr>
<td>G.M.</td>
<td>1719</td>
</tr>
<tr>
<td>S.E./mean</td>
<td>37.52</td>
</tr>
<tr>
<td>No. of experiments</td>
<td>24</td>
</tr>
</tbody>
</table>

Crop :- Wheat. Ref :- Simple trials on cultivators' fields (T.C.M.), 1953.
Centre :- Nawanshar Punjab. Type :- 'M'.

Object :- II To study the effect of manures (N, P).

1. BASAL CONDITIONS:
(i) (a) N.A. (b) N.A. (c) N.A. (ii) Grey and brown soils of Indo-Gangetic basin impregnated with salts.

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 = 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.
Fertilizers drilled at the time of sowing.
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. (v) N.A. (vi) Nil and (vii) Nil.

5. RESULTS:

<table>
<thead>
<tr>
<th>Treatment</th>
<th>Av. yield of grain in lb./ac.</th>
</tr>
</thead>
<tbody>
<tr>
<td>O</td>
<td>1604</td>
</tr>
<tr>
<td>N</td>
<td>2143</td>
</tr>
<tr>
<td>NP</td>
<td>2391</td>
</tr>
<tr>
<td>N'P</td>
<td>2196</td>
</tr>
<tr>
<td>N''P</td>
<td>2162</td>
</tr>
<tr>
<td>G.M.</td>
<td>2321</td>
</tr>
<tr>
<td>S.E./mean</td>
<td>2135</td>
</tr>
<tr>
<td>No. of experiments</td>
<td>12</td>
</tr>
</tbody>
</table>

Object: -(IV) (ii) To study the effect of types and levels of P and N.

1. BASAL CONDITIONS:

2. TREATMENTS:
   \[O = \text{Control.}
   \]
   \[N = A/S \text{ at } 40 \text{ lb./ac. of } N.
   \]
   \[NP_1 = A/S + \text{Nitro. Phos. at } 40 \text{ lb./ac. of } N + \text{Super at } 20 \text{ lb./ac. of } P_2O_5.
   \]
   \[NP_2 = A/S + \text{Nitro. Phos. at } 40 \text{ lb./ac. of } N + \text{Super at } 40 \text{ lb./ac. of } P_2O_5.
   \]
   \[NP_1^* = A/S + \text{Ammo. Phos. at } 40 \text{ lb./ac. of } N + \text{Super at } 20 \text{ lb./ac. of } P_2O_5.
   \]
   \[NP_2^* = A/S + \text{Ammo. Phos. at } 40 \text{ lb./ac. of } N + \text{Super at } 40 \text{ lb./ac. of } P_2O_5.
   \]
   Fertilizers drilled at the time of sowing.

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:
   \begin{tabular}{|c|c|}
   \hline
   Treatment & Av. yield of grain in lb./ac. \\
   \hline
   O & 1641 \\
   N & 2304 \\
   NP_1 & 2552 \\
   NP_2 & 2668 \\
   NP_1^* & 2482 \\
   NP_2^* & 2454 \\
   G.M. & 2350 \\
   S.E./mean & \pm 78.74 lb./ac. \\
   No. of experiments & 8 \\
   \hline
   \end{tabular}

---


Object: -(IV) (v) To study the effect of sources and levels of P and N.

1. BASAL CONDITIONS:

2. TREATMENTS
   \[O = \text{Control.}
   \]
   \[N = A/S + \text{Nitro. Phos. at } 40 \text{ lb./ac. of } N + \text{Super at } 20 \text{ lb./ac. of } P_2O_5.
   \]
   \[NP_1 = A/S + \text{Nitro. Phos. at } 40 \text{ lb./ac. of } N + \text{Super at } 40 \text{ lb./ac. of } P_2O_5.
   \]
   \[NP_1^* = A/S + \text{Ammo. Phos. at } 40 \text{ lb./ac. of } N + \text{Super at } 20 \text{ lb./ac. of } P_2O_5.
   \]
   \[NP_2^* = A/S + \text{Ammo. Phos. at } 40 \text{ lb./ac. of } N + \text{Super at } 40 \text{ lb./ac. of } P_2O_5.
   \]
   Fertilizers applied just before sowing.
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 of grain in lb./ac.</th>
</tr>
</thead>
<tbody>
<tr>
<td>O</td>
<td>1558</td>
</tr>
<tr>
<td>N</td>
<td>1962</td>
</tr>
<tr>
<td>N₁</td>
<td>2039</td>
</tr>
<tr>
<td>N₂</td>
<td>2049</td>
</tr>
<tr>
<td>N₁</td>
<td>2134</td>
</tr>
<tr>
<td>N₂</td>
<td>2134</td>
</tr>
<tr>
<td>G.M.</td>
<td>1980</td>
</tr>
<tr>
<td>S.E./mean</td>
<td>=. 99.56 lb./ac.</td>
</tr>
<tr>
<td>No. of expts</td>
<td>8</td>
</tr>
</tbody>
</table>

Centre: Bhadson (Pepsu). Type: 'M.'

Object: (i) (a) (ii) To study the effect of different levels and sources of N.

1. BASAL CONDITIONS:

2. TREATMENTS:
O = Control.
N₁ = A/S at 20 lb./ac. of N,
N₂ = A/S at 40 lb./ac. of N,
N₁ = Urea at 20 lb./ac. of N,
N₂ = Urea at 40 lb./ac. of N,
Fertilizers were broadcast before sowing.

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>Treatments</th>
<th>Av. yield of grain in lb./ac.</th>
</tr>
</thead>
<tbody>
<tr>
<td>O</td>
<td>1245</td>
</tr>
<tr>
<td>N₁</td>
<td>1463</td>
</tr>
<tr>
<td>N₂</td>
<td>1567</td>
</tr>
<tr>
<td>N₁</td>
<td>1575</td>
</tr>
<tr>
<td>N₂</td>
<td>1566</td>
</tr>
<tr>
<td>G.M.</td>
<td>1456</td>
</tr>
<tr>
<td>S.E./mean</td>
<td>= 58.17 lb./ac.</td>
</tr>
<tr>
<td>No. of expts</td>
<td>16</td>
</tr>
</tbody>
</table>
Centre: Bhadson (Pepsu). Type: 'M'.

Object: (b) (ii) To study different levels and types of N and P.

1. BASAL CONDITIONS:


2. TREATMENTS

- Control,
- P = 20 lb./ac. of P₂O₅ as Super.
- N₁P = A/S at 20 lb./ac. of N + 20 lb./ac. of P₂O₅ as Super.
- N₂P = A/S at 40 lb./ac. of N + 20 lb./ac. of P₂O₅ as Super.
- N₁²P = Urea at 20 lb./ac. of N + 20 lb./ac. of P₂O₅ as Super.
- N₂²P = Urea at 40 lb./ac. of N + 20 lb./ac. of P₂O₅ as Super.

Nitrogenous fertilizers broadcast before sowing while phosphatic fertilizers were drilled at sowing.

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 of grain in lb./ac.</th>
</tr>
</thead>
<tbody>
<tr>
<td>O</td>
<td>1325</td>
</tr>
<tr>
<td>P</td>
<td>1597</td>
</tr>
<tr>
<td>N₁P</td>
<td>1688</td>
</tr>
<tr>
<td>N₂P</td>
<td>1691</td>
</tr>
<tr>
<td>N₁²P</td>
<td>1677</td>
</tr>
<tr>
<td>N₂²P</td>
<td>1716</td>
</tr>
<tr>
<td>G.M.</td>
<td>1600</td>
</tr>
<tr>
<td>S.E./mean</td>
<td>49.12 lb./ac.</td>
</tr>
<tr>
<td>No. of the experiments</td>
<td>34</td>
</tr>
</tbody>
</table>

Centre: Bhadson (Pepsu). Type: 'M'.

Object: (b) (ii) To study the effect of manures (N, P and K).

1. BASAL CONDITIONS:


2. TREATMENTS:

- Control.
- N = A/S at 20 lb./ac. of N.
- NP = A/S at 23 lb./ac. of N + Super at 20 lb./ac. of P₂O₅.
- N₁P = A/S at 20 lb./ac. of N + Super at 20 lb./ac. of P₂O₅.
- N₂P = Urea at 20 lb./ac. of N + Super at 20 lb./ac. of P₂O₅.

Nitrogenous fertilizers broadcast before sowing while phosphatic fertilizers were drilled at sowing.
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. (v) N.A. (vi) and (vii) Nil.

5. **RESULTS:**

<table>
<thead>
<tr>
<th>Treatment</th>
<th>Av. yield of grain in lb./ac.</th>
</tr>
</thead>
<tbody>
<tr>
<td>O</td>
<td>1372</td>
</tr>
<tr>
<td>N</td>
<td>1519</td>
</tr>
<tr>
<td>NP</td>
<td>1662</td>
</tr>
<tr>
<td>N'P</td>
<td>1658</td>
</tr>
<tr>
<td>G.M.</td>
<td>1533</td>
</tr>
<tr>
<td>S.E./mean</td>
<td>=35.87 lb./ac.</td>
</tr>
<tr>
<td>No. of the expts.</td>
<td>50</td>
</tr>
</tbody>
</table>

**Crop:** Wheat. **Ref:** Simple trials on cultivators' fields (T.C.M.), 1953. **Centre:** Bhadson (Pepsu). **Type:** 'M'.

Object: IV (ii) To study the effect of types and levels of P and N.

1. **BASAL CONDITIONS:**

2. **TREATMENTS:**
O =Control.
N =A/S at 40 lb./ac. of N.
NP<sub>1</sub> =A/S at 40 lb./ac. of N+Super at 20 lb./ac. of P<sub>2</sub>O<sub>5</sub>.
NP<sub>2</sub> =A/S at 40 lb./ac. of N+Super at 40 lb./ac. of P<sub>2</sub>O<sub>5</sub>.
NP<sub>1</sub> '* =A/S+Ammo. Phos. at 40 lb./ac. of N + Super at 20 lb./ac. of P<sub>2</sub>O<sub>5</sub>.
NP<sub>2</sub> '* =A/S+Ammo. Phos. at 40 lb./ac. of N + Super at 40 lb./ac. of P<sub>2</sub>O<sub>5</sub>.
Nitrogenous and Potash fertilizers broadcast before sowing while phosphatic fertilizer were drilled at sowing.

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. (v) N.A. (vi) and (vii) Nil.

5. **RESULTS:**

<table>
<thead>
<tr>
<th>Treatments</th>
<th>Av. yield of grain in lb./ac.</th>
</tr>
</thead>
<tbody>
<tr>
<td>O</td>
<td>1584</td>
</tr>
<tr>
<td>N</td>
<td>1697</td>
</tr>
<tr>
<td>NP&lt;sub&gt;1&lt;/sub&gt;</td>
<td>1777</td>
</tr>
<tr>
<td>NP&lt;sub&gt;2&lt;/sub&gt;</td>
<td>1804</td>
</tr>
<tr>
<td>NP&lt;sub&gt;1&lt;/sub&gt; '*</td>
<td>1809</td>
</tr>
<tr>
<td>NP&lt;sub&gt;2&lt;/sub&gt; '*</td>
<td>1874</td>
</tr>
<tr>
<td>G.M.</td>
<td>1758</td>
</tr>
<tr>
<td>S.E./mean</td>
<td>=61.55 lb./ac.</td>
</tr>
<tr>
<td>No. of experiments</td>
<td>16</td>
</tr>
</tbody>
</table>

---


Object:= IV (ii) To study the effect of types and levels of P and N.

1. BASAL CONDITIONS:

2. TREATMENTS:
O =Control.
N =A/S at 40 lb./ac. of N.
NP<sub>1</sub> =A/S at 40 lb./ac. of N+Super at 20 lb./ac. of P<sub>2</sub>O<sub>5</sub>.
NP<sub>2</sub> =A/S at 40 lb./ac. of N+Super at 40 lb./ac. of P<sub>2</sub>O<sub>5</sub>.
NP<sub>1</sub> '* =A/S+Ammo. Phos. at 40 lb./ac. of N + Super at 20 lb./ac. of P<sub>2</sub>O<sub>5</sub>.
NP<sub>2</sub> '* =A/S+Ammo. Phos. at 40 lb./ac. of N + Super at 40 lb./ac. of P<sub>2</sub>O<sub>5</sub>.
Nitrogenous and Potash fertilizers broadcast before sowing while phosphatic fertilizer were drilled at sowing.

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. (v) N.A. (vi) and (vii) Nil.

5. RESULTS:

<table>
<thead>
<tr>
<th>Treatments</th>
<th>Av. yield of grain in lb./ac.</th>
</tr>
</thead>
<tbody>
<tr>
<td>O</td>
<td>1584</td>
</tr>
<tr>
<td>N</td>
<td>1697</td>
</tr>
<tr>
<td>NP&lt;sub&gt;1&lt;/sub&gt;</td>
<td>1777</td>
</tr>
<tr>
<td>NP&lt;sub&gt;2&lt;/sub&gt;</td>
<td>1804</td>
</tr>
<tr>
<td>NP&lt;sub&gt;1&lt;/sub&gt; '*</td>
<td>1809</td>
</tr>
<tr>
<td>NP&lt;sub&gt;2&lt;/sub&gt; '*</td>
<td>1874</td>
</tr>
<tr>
<td>G.M.</td>
<td>1758</td>
</tr>
<tr>
<td>S.E./mean</td>
<td>=61.55 lb./ac.</td>
</tr>
<tr>
<td>No. of experiments</td>
<td>16</td>
</tr>
</tbody>
</table>
Crop: - Wheat. Ref: - Simple trials on cultivators' fields (T.C.M.), 1953.
Centre: - Bhadson (Pepsu). Type: - 'M'.

Object: - IV (i) To study the effects of the types and levels of P and N.

1. BASAL CONDITIONS:

2. TREATMENTS:
O = Control.
N = A/S at 40 lb./ac. of N.
NP_1 = A/S at 40 lb./ac. of N + Super at 20 lb./ac. of P_2O_5.
NP_2 = A/S at 40 lb./ac. of N + Super at 40 lb./ac. of P_2O_5.
NP_1' = A/S + Nitro. Phos. at 40 lb./ac. of N + 20 lb./ac. of P_2O_5.
NP_2' = A/S + Nitro. Phos. at 40 lb./ac. of N + 40 lb./ac. of P_2O_5.
Nitrogenous fertilizers were broadcast before sowing, while phosphatic fertilizers were drilled at sowing.

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 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 of grain in lb./ac.</th>
</tr>
</thead>
<tbody>
<tr>
<td>O</td>
<td>1452</td>
</tr>
<tr>
<td>N</td>
<td>1916</td>
</tr>
<tr>
<td>NP_1</td>
<td>1819</td>
</tr>
<tr>
<td>NP_2</td>
<td>1994</td>
</tr>
<tr>
<td>NP_1'</td>
<td>1811</td>
</tr>
<tr>
<td>NP_2'</td>
<td>1903</td>
</tr>
<tr>
<td>G.M.</td>
<td>1816</td>
</tr>
<tr>
<td>S.E./mean</td>
<td>8.29 lb./ac.</td>
</tr>
<tr>
<td>No. of expt.</td>
<td>16</td>
</tr>
</tbody>
</table>

Crop: - Wheat. Ref: - Simple trials on cultivators' fields (T.C.M.), 1953.
Centre: - Bhadson (Pepsu). Type: - 'M'.

Object: - IV (v) To study the effect of different levels and sources of P and N.
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 of grain in lb./ac.</th>
</tr>
</thead>
<tbody>
<tr>
<td>O</td>
<td>1403</td>
</tr>
<tr>
<td>N</td>
<td>1570</td>
</tr>
<tr>
<td>NP'1</td>
<td>1860</td>
</tr>
<tr>
<td>NP'2</td>
<td>1723</td>
</tr>
<tr>
<td>NP'1</td>
<td>1730</td>
</tr>
<tr>
<td>NP'2</td>
<td>1730</td>
</tr>
<tr>
<td>G.M.</td>
<td>1669</td>
</tr>
<tr>
<td>S.E./mean</td>
<td>73.97 lb./ac.</td>
</tr>
<tr>
<td>No. of experiments</td>
<td>18</td>
</tr>
</tbody>
</table>

Crop: Wheat (Rabi). 
Site: Govt. Agri. Stn., Gurdaspur. Ref: Pb. 49(11). Type: 'MV'.

Object:—To study the effect of N on yield of two Wheat varieties.

1. BASAL CONDITIONS:

(i) (a) Nil. (b) Maize. (c) Nil. (ii) (a) Loam. (b) N.A. (iii) 9 and 10.11.1949. (iv) (a) 1 hindustan, 5 desi ploughing and 5 sakhana. (b) to (e) N.A. (v) Nil. (vi) As per treatments. (vii) Irrigated. (viii) 1 weeding. (ix) 7.52. (x) 8.5.1950.

2. TREATMENTS:

Main-plot treatments:
7 levels of N: Nₙ₀=0, N₁=F.Y.M. at 25 lb./ac. of N, N₂=F.Y.M. at 50 lb./ac. of N, N₃=A/S at 25 lb./ac. of N, N₄=A/S at 50 lb./ac. of N, N₅=Ammo. Phos. at 25 lb./ac. of N and N₆=Ammo. Phos. at 50 lb./ac. of N.

Sub-plot treatments:
2 varieties: V₁=C—591 (medium) and V₂=C—518 (medium).

3. DESIGN:

(i) Split-plot. (ii) (a) 7 main-plots/block; 2 sub-plots/main-plot. (b) N.A. (iii) 4. (iv) (a) and (b) 100-10"×6-9". (v) Nil. (vi) Yes.

4. GENERAL:

(i) Germination satisfactory, growth normal. No lodging. (ii) Nil. (iii) Grain yield. (iv) (a) 1948 to 1951 with modification. (b) No. (c) Nil. (v) (a) No. (b) —. (vi) Nil. (vii) Experiment for the year 1948 purely manurial.

5. RESULTS:

(i) 2152 lb./ac.
(ii) (a) 194.8 lb./ac.
(b) 206.0 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>N_4</th>
<th>N_5</th>
<th>N_6</th>
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<tr>
<td>V_1</td>
<td>2102</td>
<td>2123</td>
<td>1991</td>
<td>2168</td>
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<td>2205</td>
<td>2176</td>
<td>2152</td>
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<td>V_2</td>
<td>2119</td>
<td>2275</td>
<td>2061</td>
<td>2156</td>
<td>2045</td>
<td>2164</td>
<td>2246</td>
<td>2152</td>
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<tr>
<td>Mean</td>
<td>2111</td>
<td>2199</td>
<td>2026</td>
<td>2162</td>
<td>2173</td>
<td>2185</td>
<td>2211</td>
<td>2152</td>
</tr>
</tbody>
</table>

S.E. of difference of two

1. N marginal means = 97.4 lb./ac.
2. V marginal means = 55.1 lb./ac.
3. V means at the same level of N = 145.7 lb./ac.
4. N means at the same level of V = 141.8 lb./ac.

---

Crop: Wheat (Rabi).
Site: Govt. Agri. Stn., Gurdaspur.

Object: To study the effect of N on yield of two Wheat varieties.

1. BASAL CONDITIONS:
   (i) (a) Nil. (b) Maize for fodder. (c) Nil. (ii) (a) Loam. (b) N.A. (iii) 12.11.1950. (iv) (a) 1 raja plough, 5 desh khal and 7 sohaga. (b) N.A. (c) 30 sr./ac. (d) N.A. (e) N.A. (vi) As under treatments. (vii) Irrigated. (viii) One weeding. (ix) 4.86”. (x) 17.5.1951.

2. TREATMENTS:
   Main-plot treatments:
   7 levels of N: N_0 = Control, N_1 = F.Y.M. at 25 lb./ac. of N, N_2 = F.Y.M. at 50 lb./ac. of N, N_3 = A/S at 25 lb./ac. of N, N_4 = A/S at 50 lb./ac. of N, N_5 = Ammo. Phos. at 25 lb./ac. of N and N_6 = Ammo. Phos. at 50 lb./ac. of N
   Sub-plot treatments:
   2 varieties: V_1 = C-591 (medium) and V_2 = C-518 (medium).

3. DESIGN:
   (i) Split-plot design. (ii) (a) 7 main-plots/block; 2 sub-plots/main-plot. (iii) 4. (iv) (a) 15′ x 81′ = 1/35 ac. (b) 6′ x 75′ = 1/96th ac. (v) N.A. (vi) Yes.

4. GENERAL:
   (i) Germination satisfactory, growth normal. No lodging. (ii) Nil. (iii) Grain yield. (iv) (a) 1948—1951. (b) No. (c) Nil. (v) (a) No. (b)—. (vi) and (vii) Nil.

5. RESULTS:
   (i) 2012 lb./ac.
   (ii) (a) 401.4 lb./ac.
   (b) 282.7 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>N_5</th>
<th>N_6</th>
<th>Mean</th>
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<td>1601</td>
<td>1685</td>
<td>2083</td>
<td>2206</td>
<td>2098</td>
<td>2191</td>
<td>1968</td>
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<td>V_2</td>
<td>1691</td>
<td>1867</td>
<td>2138</td>
<td>2277</td>
<td>2154</td>
<td>2061</td>
<td>2194</td>
<td>2055</td>
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<td>1802</td>
<td>1734</td>
<td>1912</td>
<td>2180</td>
<td>2180</td>
<td>2080</td>
<td>2193</td>
<td>2012</td>
</tr>
</tbody>
</table>

S.E. of difference of two

1. N marginal means = 200.7 lb./ac.
2. V marginal means = 75.6 lb./ac.
3. V means at the same level of N = 199.9 lb./ac.
4. N means at the same level of V = 245.5 lb./ac.
Crop : Wheat (Rabi).
Site : Govt. Agri. Stn., Gurdaspur.

Object :— To study the effect of N on yield of two Wheat varieties.

1. BASAL CONDITIONS:
   (i) (a) Nil. (b) Maize. (c) Nil. (ii) (a) Loam. (b) N.A. (iii) 16.11.1951. (iv) (a) 1 raja, 4 desi and 6 sohaga. (b) N.A. (c) N.A. (d) 6' row to row. (e) N.A., (v) Nil., (vi) As., per treatments. (vii) Irrigated. (viii) One weeding. (ix) 8.54". (x) 21 and 22.4.1952.

2. TREATMENTS:
   Main-plot treatments:
   7 levels of N : N₀ = Control (no manure), N₁ = F.Y.M. at 25 lb./ac. of N, N₂ = F.Y.M. at 50 lb./ac. of N, N₃ = A/S at 25 lb./ac. of N, N₄ = A/S at 50 lb./ac. of N, N₅ = Ammo. Phos. at 25 lb./ac. of N and N₆ = Ammo. Phos. at 50 lb./ac. of N.

   Sub-plot treatments:

3. DESIGN:
   (i) Split-plot. (ii) (a) 7 main-plots/block; 2 sub-plots/main-plot. (b) N.A.; (iii) 4. (iv) (a) and(b) 1/80th ac. (v) Nil. (vi) Yes.

4. GENERAL:
   (i) Germination satisfactory. No lodging. (ii) Nil. (iii) Grain yield. (iv) (a) 1948 to 1951. (b) No. (c) Nil. (v) (a) Nil. (b) —. (vi) and (vii) Nil.

5. RESULTS:
   (i) 1876 lb./ac.
   (ii) (a) 481.7 lb./ac.
   (b) 296.8 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>N₅</th>
<th>N₆</th>
<th>Mean</th>
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<tr>
<td>V₁</td>
<td>1738</td>
<td>1743</td>
<td>1692</td>
<td>1941</td>
<td>1815</td>
<td>1959</td>
<td>1913</td>
<td>1829</td>
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<td>V₂</td>
<td>1911</td>
<td>1705</td>
<td>1461</td>
<td>1931</td>
<td>1990</td>
<td>2281</td>
<td>2178</td>
<td>1922</td>
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<tr>
<td>Mean</td>
<td>1825</td>
<td>1724</td>
<td>1577</td>
<td>1936</td>
<td>1903</td>
<td>2120</td>
<td>2046</td>
<td>1876</td>
</tr>
</tbody>
</table>

S.E. of difference of two
1. N marginal means = 240.9 lb./ac.
2. V marginal means = 79.3 lb./ac.
3. V means at the same level of N = 209.8 lb./ac.
4. N means at the same level of V = 282.9 lb./ac.

---

Crop : Wheat.
Site : Distt. and Demonstration Farm, Ambala.

Object :— To study the effect of operations done on Wheat after sowing.

4. BASAL CONDITIONS:
   (i) (a) Nil. (b) N.A. (c) Nil. (ii) (a) Hard clay. (b) N.A. (iii) 30.10.1948. (iv). (a) and (b) N.A. (c) 1 sr. 2 ckh./plot. (d) and (e) N.A. (v) N.A. (vi) C-228 (medium). (vii) Irrigated. (viii) Nil. (ix) 7.68". (x) 18.4.1949.
2. TREATMENTS:
2. Sohaga after pore.
3. Roller after pore.

3. DESIGN:
(i) R.B.D. (ii) (a) 4. (b) N.A. (iii) 8. (iv) (a) and (b) 184'x117.7'. (v) Nil. (vi) Yes.

4. GENERAL:
(i) Fair to normal. No lodging. (ii) Nil. (iii) Grain and straw yield. (iv) (a) 1946-48. (b) and (c) No. (v) (a) and (b) No. (vi) and (vii) Nil.

5. RESULTS:
(i) 742.2 lb./ac.
(ii) 82.2 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>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>781.7</td>
</tr>
<tr>
<td>2.</td>
<td>769.2</td>
</tr>
<tr>
<td>3.</td>
<td>699.8</td>
</tr>
<tr>
<td>4.</td>
<td>718.1</td>
</tr>
<tr>
<td>S.E./mean</td>
<td>29.1 lb./ac.</td>
</tr>
</tbody>
</table>

Crop: Wheat.
Site: Distt. and Demonstration Farm, Ambala.

Object: To study the effect of different intensities of cultivation with local and indigenous implements on Wheat crop.

1. BASAL CONDITIONS:
(i) (a) Nil. (b) N.A. (c) Nil. (ii) (a) Hard clay. (b) N.A. (iii) 6.7.11.1948. (iv) (a) As per treatments. (b) N.A. (c) 13 sr./plot. (d) and (e) N.A. (v) N.A. (vi) C-591 (medium). (vii) Irrigated. (viii) Nil.
(ix) 7.68. (x) 19.4.1949.

2. TREATMENTS:
1. Improved high—1 roja +2 desi +2 horse hoe.
2. Improved low—1 roja +2 desi
3. Improved medium—1 roja +2 desi +1 horse hoe.
4. Local high—5 desi.
5. Local low—2 desi.
6. Local medium—3 desi.

3. DESIGN:
(i) R.B.D. (ii) (a) 6. (b) N.A. (iii) 6. (iv) (a) 1/10th ac. (b) 1/10th ac. (v) Nil. (vi) Yes.

4. GENERAL:
(i) Fair. No lodging. (ii) Nil. (iii) Grain and straw yield. (iv) (a) Not contd. (b) and (c) No. (v) (a) and (b) No. (vi) and (vii) Nil.

5. RESULTS:
(i) 1067 lb./ac.
(ii) 211.7 lb./ac.
(iii) Treatments are not significantly different.
Crop :- Wheat.
Site :- Govt. Agr. Stn., Gurdaspur.

Object :- To study the effect of late and dry sowing on yield of Wheat.

1. BASAL CONDITIONS :
   (i) (a) Wheat—Fodder—Wheat. (b) Sannhemp. (c) Nil. (ii) (a) Loam. (b) N.A. (iii) 6.12.1952 and 26.12.1952
   (iv) (a) 7 ploughings and 10 sohaga. (b) N.A. (c) 35 sr./ac. (d) and (e) N.A. (v) Sannhemp buried for green manuring on 8.8.1952. (vi) C-228 (late). (vii) Irrigated. (viii) 2 hoeings and weedings. (ix) 4.82". (x) 25.4.1953.

2. TREATMENTS :
   2. Irrigated on 6.12.1952 and sown on 26.12.1952 after the soil was ready.

3. DESIGN :
   (i) Paired plot. (ii) (a) 2. (b) N.A. (iii) 8. (iv) (a) and (b) 81'X13.5' (b) Nil. (vi) Yes.

4. GENERAL :
   (i) N.A. (ii) N.A. (iii) Grain yield. (iv) (a) Not contd. (b) and (c) Nil. (v) (a) 'and (b) Nil. (vi) and (vii) Nil.

5. RESULTS :
   (i) 1400 lb./ac.
   (ii) 131.2 lb./ac.
   (iii) Treatments are highly significantly different.
   (iv) Av. yield of grain in lb./ac.
   Treatment                  Av. yield
   1.                         1542
   2.                         1259
   S.E./mean                 46.4 lb./ac.

---

Crop :- Wheat.
Site :- Govt. Agr. Stn., Gurdaspur.

Object :- To find out a suitable seed rate for C-518 variety of Wheat.

4. BASAL CONDITIONS :
   (i) (a) Nil. (b) Sannhemp. (c) Nil. (ii) (a) Heavy loam. (b) N.A. (iii) 19.11.1953. (iv) (a) 1 hindustan plough, 5 desi plough and 7 sohaga. (b) Broadcast. (c) As per treatments. (d) and (e) N.A. (v) Sannhemp buried in the area for green manuring on 28.8.1953. (vi) C-518 (medium). (vii) Irrigated. (viii) One hoeing. (ix) 10.33". (x) 23.4.1954.
2. TREATMENTS:
   4 seed rates:
   1. 24 sr./ac.
   2. 32 sr./ac.
   3. 40 sr./ac.
   4. 48 sr./ac.

3. DESIGN:
   (i) R.B.D. (ii) (a) 4. (b) N.A. (iii) 8. (iv) (a) and (b) 9'x75'-74". (v) Nil. (vi) Yes.

4. GENERAL:
   (i) Normal except for attack of rust. No lodging. (ii) Badly attacked by all kinds of rust. (iii) Grain yield
   (iv) (a) Not contd. (b)—. (c)—. (v) (a) No. (b) No. (vi) and (vii) Nil.

5. RESULTS:
   (i) 653.9 lb./ac.
   (ii) 91.93 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>656.2</td>
</tr>
<tr>
<td>2.</td>
<td>605.8</td>
</tr>
<tr>
<td>3.</td>
<td>715.9</td>
</tr>
<tr>
<td>4.</td>
<td>637.7</td>
</tr>
<tr>
<td>S.E./mean</td>
<td>32.50 lb./ac.</td>
</tr>
</tbody>
</table>

Crop :- Wheat.  
Ref :- Pb. 52 (49).  
Site :- Govt. Agri. Stn., Gurdaspur.  
Type :- 'C'.

Object :- To find out the best spacing for Wheat crop under irrigated conditions.

1. BASAL CONDITIONS:
   (i) (a) Nil. (b) Maize. (c) 1 C.L. of F.Y.M. on 16.6.1952. (ii) (a) Heavy loam. (b) N.A. (iii) 29.11.1952.
   (iv) (a) 8 ploughings and 10 sohoga. (b) N.A. (c) Approx. one md./ac. (d) As per treatments. (e) N.A.
   (v) N.A. (vi) C-228 (late). (vii) Irrigated. (viii) 3 weedings and 1 hoeing. (ix) 4.82". (x) 28.4.1953.

2. TREATMENTS:
   1. Spacing between rows 7".
   2. Spacing between rows 8".
   3. Spacing between rows 9".

3. DESIGN:
   (i) R.B.D. (ii) (a) 3. (b) N.A. (iii) 4. (iv) (a) 6'x44'. (b) 6'x33'. (v) N.A. (vi) Yes.

4. GENERAL:
   (i) N.A. (ii) N.A. (iii) Grain yield. (iv) (a) 1952 to 1955 (continued with modification till 1955),
   (b) No. (c) Nil. (v) (a) No. (b)—. (vi) and (vii) Nil.

5. RESULTS:
   (i) 2138 lb./ac.
   (ii) 326.6 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>
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<tbody>
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<td>1.</td>
<td>2008</td>
</tr>
<tr>
<td>2.</td>
<td>2376</td>
</tr>
<tr>
<td>3.</td>
<td>2029</td>
</tr>
<tr>
<td>S.E./mean</td>
<td>163.3 lb./ac.</td>
</tr>
</tbody>
</table>
Crop: Wheat.
Site: Govt. Agri. Stn., Gurdaspur.

Object: To study the effect of spacing on yield of Wheat crop.

1. BASAL CONDITIONS:
   (i) (a) Nil. (b) Sannhemp for green manuring. (c) Nil. (ii) (a) Heavy loam. (b) N.A. (iii) 19.11.1953.
   (iv) (a) 1 hindustan plough, 4 desi plough, 5 sohaga and 2 roller (b) to (d) As per treatments. (e) (v)
   Sannhemp buried on 15.8.1953; 30 lb./ac. of N as A/S + 15 lb./ac. of P2O5 as Super broadcast just before

2. TREATMENTS:
   1. Spacing 6" from row to row with 48 sr./ac. as seed rate.
   2. Spacing 9" from row to row with 32 sr./ac. as seed rate.
   3. Spacing 9" from row to row and plant to plant with 48 sr./ac. as seed rate.
      Seeds sown in lines behind plough by kera in treatments 1 and 2 while sown by dibbling in treatment 3.

3. DESIGN:
   (i) R.B.D. (ii) (a) 3. (b) N.A. (iii) 6. (iv) (a) and (b) 12' x 75'-71" (v) Nil. (vi) Yes.

4. GENERAL:
   (i) Normal! No lodging. (ii) Nil. (iii) Grain yield. (iv) (a) 1952—1955. (b) Nil. (v) (a).No. (b)...
   (vi) and (vii) Nil.

5. RESULTS:
   (i) 656.3 lb./ac.
   (ii) 94.37 lb./ac.
   (iii) Treatments are not significantly different.
   (iv) Av. yield of grain in lb./ac.
      Treatment  Av. yield
      1.      672.7
      2.      608.9
      3.      27.4
      S.E./mean = 38.52 lb./ac.

Crop: Wheat.
Site: Jullundur Agri. Stn., Jullundur.

Object: To study the effect of cultivation on yield of Wheat.

1. BASAL CONDITIONS:
   (i) (a) Nil. (b) N.A. (c) N.A. (ii) (a) Loam to sandy loam. (b) Refer soil analysis, Jullundur. (iii) 8.11.1948,
   (iv) (a) As pertreatments. (b) N.A. (c) 35 sr./ac. (d) and (e) N.A. (v) 250 lb. of A/S added on 1.12.1948,
   (vi) N.A. (vii) Irrigated. (viii) One hoeing and 1 topping on 11.1.1949. (ix) 6.29". (x) 17,18.4.1949.

2. TREATMENTS:
   1. 1 hindustan, 4 desi and 5 horse hoe.
   2. 2 hindustan, 5 desi and 8 horse hoe.
   3. 10 desi ploughings.
   4. 15 desi ploughings.

3. DESIGN:
   (i) R.B.D. (ii) (a) 4. (b) N.A. (iii) 5. (iv) (a) and (b) 36'x80'-8". (v) Nil. (vi) Yes.

4. GENERAL:
   (i) Germination and growth good. Lodging occurred. (ii) Nil. (iii) Grain yield. (iv) (a) 1946—1948. (b) No.
   (c) Nil. (v) (a) No. (b)—. (vi) and (vii) Nil.
5. RESULTS:
(i) 2323 lb./ac.
(ii) 219.0 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>
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<tbody>
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<tr>
<td>2.</td>
<td>2331</td>
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<tr>
<td>3.</td>
<td>2424</td>
</tr>
<tr>
<td>4.</td>
<td>2276</td>
</tr>
</tbody>
</table>

S.E./mean = 98.0 lb./ac.

Crop :- Wheat.
Site :- Distt. and Demonstration Farm, Kangra.

Object :- To compare the different methods of sowing Wheat.

Ref :- Pb. 53(49).
Type :- 'C'.

1. BASAL CONDITIONS:
(i) (a) Nil. (b) Maize. (c) Nil. (ii) (a) Clay loam. (b) N.A. (iii) 12.11.1953. (iv) (a) 3 ploughings and 2 plankings. (b) and (c) As per treatments. (d) 9" x 41". (e) N.A. (v) 60 lb./ac. of N as A/S broadcast. (vi) C-250 (medium). (vii) Irrigated. (viii) 2 weedings. (ix) 21.60". (x) 4.5.1954.

2. TREATMENTS:
1. Local method of sowing seed by kera (seed rate 1 md./ac.).
2. 4 seeds sown together at one place (approx seed rate 30 sr./ac.).

3. DESIGN:
(i) R.B.D. (ii) (a) 2. (b) N.A. (iii) 3. (iv) (a) N.A. (b) 11'x66". (v) N.A. (vi) Yes.

4. GENERAL:
(i) Normal. (ii) No. (iii) Grain and bhusa yield. (iv) (a) Not contd. (b)—. (c)—. (v) (a) No. (b)—. (vi) and (vii) Nil.

5. RESULTS:
(i) 678.9 lb./ac.
(ii) 180.26 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>756.0</td>
</tr>
<tr>
<td>2.</td>
<td>601.7</td>
</tr>
</tbody>
</table>

S.E./mean = 104.07 lb./ac.

Crop :- Wheat.
Site :- Cereal Breeding Sub-Stn., Kulu.

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

Ref :- Pb. 52(26).
Type :- 'C'.

1. BASAL CONDITIONS:
(i) (a) Wheat-Maize. (b) Maize. (c) N.A. (ii) (a) Loam. (b) N.A. (iii) 15.11.1952. (iv) (a) and (b) N.A. (c) As per treatments. (d) and (e) N.A. (v) N.A. (vi) C-224 (early improved). (vii) Unirrigated. (viii) N.A. (ix) 14.44". (x) N.A.
2. TREATMENTS:
3 seed rates:
1. 40 sr./ac.
2. 50 sr./ac.
3. 60 sr./ac.

3. DESIGN:
(i) R.B.D. (ii) (a) 3. (b) N.A. (iii) 4. (iv) (a) 30'r x 12'. (b) 30'r x 12'. (v) Nil. (vi) Yes.

4. GENERAL:
(i) No lodging. (ii) N.A. (iii) Grain yield. (iv) (a) 1952-1953 (modified in 1953). (b) No. (c) Nil. (v) (a) No. (b)—. (vi) and (vii) Nil.

5. RESULTS:
(i) 1656 lb./ac.
(ii) 499.7 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>1693</td>
</tr>
<tr>
<td>2.</td>
<td>1601</td>
</tr>
<tr>
<td>3.</td>
<td>1674</td>
</tr>
<tr>
<td>S.E./mean</td>
<td>= 249.9 lb./ac.</td>
</tr>
</tbody>
</table>

Crop:- Wheat.

Site:—Cereal Breeding Sub-Strn., Kulu.

Object:—To find out the optimum seed rate for Wheat crop.

1. BASAL CONDITIONS:
(i) (a) Wheat-Maize. (b) Maize. (c) F.Y.M. applied; time and amount N.A. (ii) (a) Loam. (b) N.A. (iii) 6.10.1953. (iv) (a) 3 ploughings and 3 plankings. (b) Broadcast. (c) As per treatments. (d) and (e)—. (v) No. (vi) C-224 (early improved). (vii) Unirrigated. (viii) N.A. (ix) 20.71°. (x) 2.6.1954.

2. TREATMENTS:
4 seed rate:
1. 30 sr./ac.
2. 35 sr./ac.
3. 40 sr./ac.
4. 45 sr./ac.

3. DESIGN:
(i) R.B.D. (ii) (a) 4. (b) N.A. (iii) 4. (iv) (a) and (b) 22'r x 5r'. (v) No. (vi) Yes.

4. GENERAL:
(i) N.A. (ii) N.A. (iii) Grain yield. (iv) (a) 1952 to 1953 (modified in 1953) (b) No. (c) Nil. (v) (a) No. (b)—. (vi) and (vii) Nil.

5. RESULTS:
(i) 1617 lb./ac.
(ii) 1209 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>1527</td>
</tr>
<tr>
<td>2.</td>
<td>1678</td>
</tr>
<tr>
<td>3.</td>
<td>1666</td>
</tr>
<tr>
<td>4.</td>
<td>1597</td>
</tr>
<tr>
<td>S.E./mean</td>
<td>= 90.5 lb./ac.</td>
</tr>
</tbody>
</table>
Crop: Wheat.
Site: Agri. Farm, Rohtak.

Object: To study the optimum date of sowing for Wheat crop.

1. BASAL CONDITIONS:
   (i) (a) Nil. (b) Fallow. (c) Nil. (ii) (a) Loamy. (b) Refer soil analysis, Rohtak. (iii) As per treatments.
   (iv) (a) and (b) N.A. (c) 40 sr./ac. (d) and (e) N.A. (v) N.A. (vi) D—9 (medium). (vii) Unirrigated.
   (viii) Nil. (ix) 0.25°. (x) 11.4.1949.

2. TREATMENTS:
   5 sowing dates: D1 = 10.10.1948, D2 = 18.10.1948, D3 = 25.11.1948, D4 = 3.11.1948 and D5 = 11.11.1948.

3. DESIGN:
   (i) R.B.D. (ii) (a) 5. (b) N.A. (iii) 6. (iv) (a) 65°x23°. (b) 62.5°x18°. (v) N.A. (vi) Yes.

4. GENERAL:
   (i) Germination good, stand and condition poor. No lodging. (ii) Nil. (iii) Grain yield. (iv) (a) 1942 to 1948. (b) No. (c) —. (v) (a) Nil. (b) —. (vi) and (vii) Nil.

5. RESULTS:
   (i) 281.9 lb./ac.
   (ii) 72.9 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>D1</td>
<td>226.3</td>
</tr>
<tr>
<td>D2</td>
<td>277.7</td>
</tr>
<tr>
<td>D3</td>
<td>277.7</td>
</tr>
<tr>
<td>D4</td>
<td>313.7</td>
</tr>
<tr>
<td>D5</td>
<td>329.1</td>
</tr>
</tbody>
</table>
   | S.E./mean | =29.7 lb./ac.

---

Crop: Wheat.
Site: Govt. Agri. Stn., Gurdaspur.

Object: To study the effect of different seed rates with various varieties on yield of Wheat.

1. BASAL CONDITIONS:
   (i) (a) Nil. (b) Fallow. (c) Nil. (ii) (a) Sandy loam. (b) N.A. (iii) 11.11.1952. (iv) (a) 3 ploughings
   and 4 sowing. (b) Keria behind the plough. (c) As per treatments. (d) 9° row to row. (e) —. (v) 8
   C.L. of F.Y.M. given to the whole experimental area one month before sowing by broadcast. (vi) As
   per treatments. (vii) Irrigated. (viii) N.A. (ix) 4.82°. (x) 19.4.1953.

2. TREATMENTS:
   All combinations of (1) and (2)
   (1) 3 varieties: V1 = C-518 (medium), V2 = C-591 (medium) and V3 = C-250 (medium).
   (2) 3 seed rates: R1 = 24 sr./ac., R2 = 28 sr./ac. and R3 = 32 sr./ac.

3. DESIGN:
   (i) Fact. in R.B.D. (ii) (a) 9. (b) N.A. (iii) 6. (iv) (a) 81°x92°. (b) 73.3°x81°. (v) 1° along the
   breadth and approx. 4° along the length including channel. (vi) Yes.

4. GENERAL:
   (i) N.A. (ii) N.A. (iii) Grain yield. (iv) (a) 1952 to 1953. (b) No. (c) Nil. (v) (a) No. (b) —.
   (vi) Nil. (vii) Nil.
5. RESULTS

(i) 2630 lb./ac.
(ii) 209.6 lb./ac.
(iii) Only V 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>Mean</th>
</tr>
</thead>
<tbody>
<tr>
<td>V₁</td>
<td>2985</td>
<td>2818</td>
<td>2854</td>
<td>2866</td>
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<td>V₂</td>
<td>2582</td>
<td>2522</td>
<td>2473</td>
<td>2526</td>
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<td>2409</td>
<td>2473</td>
<td>2550</td>
<td>2477</td>
</tr>
<tr>
<td>Mean</td>
<td>2659</td>
<td>2604</td>
<td>2606</td>
<td>2630</td>
</tr>
</tbody>
</table>

S.E. of any marginal mean = 69.4 lb./ac.
S.E. of body of table = 85.6 lb./ac.

Crop : Wheat.
Site : Govt. Agri. Stn., Gurdaspur.
Ref : Pb. 53(70).
Type : 'CV'.

Object : To study the effect of different seed rates and varieties on yield of Wheat.

1. BASAL CONDITIONS:
(i) (a) Nil. (b) Cotton and fallow. (Nearly half portion was fallow and half cotton). (c) 10 sr./ac. of A/S to cotton portion. (ii) (a) Light loam. (b) N.A. (iii) 27.11.1953. (iv) (a) 6 ploughings by desi plough, and 10 sohaga. (b) N.A. (c) As per treatments. (d) 9" row to row. (e) N.A. (v) 1 md. and 28 sr. of super by broadcast just before sowing and 25 sr. of A/S on 6.1.1954, by broadcast. (vi) As per treatments. (vii) Irrigated. (viii) One hoeing. (ix) 10.33". (x) 26.4.1954.

2. TREATMENTS:
All combinations of (1) and (2)
(1) 3 seed rates: R₁ = 24 sr./ac., R₂ = 32 sr./ac. and R₃ = 40 sr./ac.
(2) 2 varieties: V₁ = C-591 (medium) and V₂ = C-250 (medium).

3. DESIGN:
(i) Fact. in R.B.D. (ii) (a) 6. (b) N.A. (iii) 6. (iv) (a) 81' × 12'. (b) 75.5' × 12'. (v) N.A. (vi) Yes.

4. GENERAL:
(i) Normal. No lodging. (ii) Nil. (iii) Grain yield. (iv) (a) 1952 to 1953. (b) No. (c) Nil. (v) (a) No. (b) Nil. (vi) and (vii) Nil.

5. RESULTS:
(i) 1416 lb./ac.
(ii) 11.9 lb./ac.
(iii) Only V 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>Mean</th>
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<td>1128</td>
<td>1243</td>
<td>1172</td>
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<tr>
<td>V₂</td>
<td>1657</td>
<td>1710</td>
<td>1613</td>
<td>1660</td>
</tr>
<tr>
<td>Mean</td>
<td>1402</td>
<td>1419</td>
<td>1428</td>
<td>1416</td>
</tr>
</tbody>
</table>

S.E. of marginal mean of R = 61.2 lb./ac.
S.E. of marginal mean of V = 49.9 lb./ac.
S.E. of body of table = 86.3 lb./ac.
Crop: Wheat.  
Site: Jullundur Agri. Stn., Jullundur. 
Object: To find out best sowing date for different varieties of Wheat.

1. BASAL CONDITIONS:
   (i) (a) Nil. (b) Water-melon. (c) N.A. (ii) (a) Sandy loam. (b) Refer soil analysis, Jullundur. (iii) As per treatments. (iv) (a) 7 desi ploughings, 2 horse hoe, 8 ashaga and 1 barharrow. (b) N.A. (c) 32 sr./ac. (d) and (e) N.A. (v) A/S at 3 md./ac. applied to D1, D2 and D3 plots on 18.12.1948 and to D4 plots on 12.1.1949. (vi) As per treatments. (vii) Irrigated. (viii) One hoeing. (ix) 6.29". (v) D1 and D2 10, 12.9.1949; D3 14.4.1949 and D4 20, 21.4.1949.

2. TREATMENTS:
   Main-plot treatments:
   4 dates of sowing: D1 = 15.10.1948, D2 = 30.10.1948, D3 = 15.11.1948 and D4 = 1.12.1948.
   Sub-plot treatments:
   2 varieties: V1 = C-591 and V2 = C-228.

3. DESIGN:
   (i) Split-plot. (ii) (a) 4 main-plots/block and 2 sub-plots/main-plot. (b) N.A. (iii) 6. (iv) (a) and (b) 12.75' x 43.80'. (v) Nil. (vi) Yes.

4. GENERAL:
   (i) Very good germination. Crop lodged. (ii) Attack of yellow rust was very severe. (iii) Grain and straw yield. (iv) (a) 1946 to 1948. (b) No. (c) Nil. (v) (a) No. (b) Nil. (vi) and (vii) Nil.

5. RESULTS:
   (i) 2087 lb./ac. 
   (ii) (a) 364.1 lb./ac. 
   (b) 199.9 lb./ac. 
   (iii) Both D and V effects are highly significant. Interaction D x V is not significant. (iv) Av. yield of grain in lb./ac.

<table>
<thead>
<tr>
<th></th>
<th>D1</th>
<th>D2</th>
<th>D3</th>
<th>D4</th>
<th>Mean</th>
</tr>
</thead>
<tbody>
<tr>
<td>V1</td>
<td>2071</td>
<td>2243</td>
<td>2068</td>
<td>1402</td>
<td>1946</td>
</tr>
<tr>
<td>V2</td>
<td>2305</td>
<td>2322</td>
<td>2205</td>
<td>1678</td>
<td>2227</td>
</tr>
<tr>
<td>Mean</td>
<td>2288</td>
<td>2283</td>
<td>2137</td>
<td>1539</td>
<td>2087</td>
</tr>
</tbody>
</table>

S.E. of difference of two
1. D marginal means = 148.6 lb./ac.
2. V marginal means = 57.7 lb./ac.
3. V means at the same level of D = 115.4 lb./ac.
4. D means at the same level of V = 169.6 lb./ac.

Crop: Wheat.
Site: Distt. and Demonstration Farm, Ambala. 
Object: To study the effect of different intensities of cultivation in presence of different hoeings and at two levels of N.

2. BASAL CONDITIONS:
   (i) (a) Nil. (b) N.A. (c) Nil. (ii) (a) Hard clay. (b) N.A. (iii) 9.11.1948. (iv) (a) As per treatments. (b) N.A. (c) 35 sr./ac. (d) N.A. (e) N.A. (v) N.A. (vi) C-591 (medium). (vii) Irrigated. (viii) As per treatments. (ix) 7.65". (x) 15.4.1949.
2. TREATMENTS

Main-plot treatments:
Ploughings: R₁ = 2 raja and 10 desi ploughings and R₂ = 2 raja and 16 desi ploughings.

Sub-plot treatments:
All combinations of (1) and (2)
(1) Hoeings: H₁ = 1 and H₂ = 3 hoeings.
(2) Levels of N as A/S: N₁ = 40 and N₂ = 80 lb./ac.

3. DESIGN:
(i) Split-plot.
(ii) (a) 2 main-plots/block; 4 sub-plots/main-plot. (b) N.A. 
(iii) 4. (iv) (a) 60.5'x18'. (b) 60.5'x18'. (v) Nil. (vi) Yes.

4. GENERAL:
(i) Fair to good. No lodging. (ii) Nil. (iii) Grain and straw yield. (iv) (a) Not contd. (b) No. (c)—. (v) (a) No. (b)—. (vi) and (vii) Nil.

5. RESULTS:
(i) 1903 lb./ac.
(ii) (a) 983.8 lb./ac.
(b) 180.5 lb./ac.
(iii) None of the effects is significant.
(iv) Av. yield of grain in lb./ac.

<table>
<thead>
<tr>
<th></th>
<th>H₁</th>
<th>H₂</th>
<th>Mean</th>
<th>N₁</th>
<th>N₂</th>
</tr>
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<tr>
<td>R₁</td>
<td>1893</td>
<td>1869</td>
<td>1881</td>
<td>1857</td>
<td>1905</td>
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<td>R₂</td>
<td>1934</td>
<td>1915</td>
<td>1925</td>
<td>1929</td>
<td>1921</td>
</tr>
<tr>
<td>Mean</td>
<td>1914</td>
<td>1892</td>
<td>1903</td>
<td>1903</td>
<td>1913</td>
</tr>
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<td>N₁</td>
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<td>1844</td>
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</tr>
<tr>
<td>N₂</td>
<td>1885</td>
<td>1941</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

S.E. of marginal mean of N or H = 45.1 lb./ac.
S.E. of body of N×H table = 63.8 lb./ac.
S.E. of difference of two
1. P marginal means =241.7 lb./ac.
2. N or H means at the same level of P = 90.3 lb./ac.
3. P means at the same level of N or H = 250.0 lb./ac.

Crop:– Wheat.
Ref:– Pb. 49(72).
Site:– Distt. and Demonstration Farm, Ambala.
Type:– 'CM'.

Object:– To study the effect of manure and hoeings on yield of Wheat.

1. BASAL CONDITIONS:
(i) (a) Nil. (b) Fallow. (c) Nil. (ii) (a) Clayey. (b) N.A. (iii) 14.11.1949. (iv) (a) and (b) N.A. (c) 36 sr./ac. (d) N.A. (e) N.A. (v) Nil. (vi) C-591 (medium). (vii) Irrigated. (viii) As per treatments.
(ix) 5.33'. (x) 21.4.1950.

2. TREATMENTS:
All combinations of (1) and (2)
(1) 2 levels of hoeing: H₁ = One hoeing and H₂ = 3 hoeings.
(2) 2 levels of N as A/S: N₁ = 40 lb. and N₂ = 80 lb./ac.
A/S applied on 11.11.1949 and on 22.1.1950.
3. DESIGN:
(i) R.B.D. (ii) (a) 4. (b) N.A. (iii) 6. (iv) (a) N.A. (b) 14'×103'-3". (v) N.A. (vi) Yes.

4. GENERAL:
(i) Fair to good. No lodging. (ii) Nil. (iii) Grain and straw yield. (iv) (a) 1949—1952. (b) No. (c)—. (v) (a) No. (b)—. (vi) and (vii) Nil.

5. RESULTS:
(i) 1412 lb./ac.
(ii) 115.9 lb./ac.
(iii) Only N effect is highly significant.
(iv) Av. yield of grain in lb./ac.

<table>
<thead>
<tr>
<th></th>
<th>N₁</th>
<th>N₂</th>
<th>Mean</th>
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<tbody>
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<td>1396</td>
</tr>
<tr>
<td>Mean</td>
<td>1296</td>
<td>1528</td>
<td>1412</td>
</tr>
</tbody>
</table>

S.E. of any marginal mean = 33.4 lb./ac.
S.E. of body of table = 47.3 lb./ac.

Crop :- Wheat.
Site :- Distt. and Demonstration Farm, Ambala.

Object :- To study the effect of manures and hoeings on yield of Wheat.

1. BASAL CONDITIONS:
(i) (a) Nil. (b) Maize. (c) Nil. (ii) (a) Clay. (b) N.A. (iii) 6.11.1950. (iv) (a) to (e) N.A. (v) Nil. (vi) C-691 (medium). (vii) Irrigated. (viii) As per treatments. (ix) 2.88". (x) 19.4.1951.

2. TREATMENTS:
All combinations of (1) and (2)
(1) 2 levels of hoeing : H₁ = One hoeing and H₂ = 3 hoeings.
(2) 2 levels of N as A/S : N₁ = 40 and N₂ = 80 lb./ac.

3. DESIGN:
(i) Fact. in R.B.D. (ii) (a) 4. (b) N.A. (iii) 8. (iv) (a) 13'×69.8'. (b) 13'×69.8'. (v) Nil. (vi) Yes.

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

5. RESULTS:
(i) 1143 lb./ac.
(ii) 130.8 lb./ac.
(iii) Only N effect is highly significant.
(iv) Av. yield of grain in lb./ac.

<table>
<thead>
<tr>
<th></th>
<th>N₁</th>
<th>N₂</th>
<th>Mean</th>
</tr>
</thead>
<tbody>
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<td>1110</td>
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<tr>
<td>H₂</td>
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<tr>
<td>Mean</td>
<td>1034</td>
<td>1252</td>
<td>1143</td>
</tr>
</tbody>
</table>

S.E. of any marginal mean = 32.7 lb./ac.
S.E. of body of table = 46.2 lb./ac.
Object: To study the effect of manures and hoeings on yield of Wheat.

1. BASAL CONDITIONS:
(i) (a) Nil. (b) Fallow. (c) Nil. (ii) (a) Heavy clay. (b) N.A. (iii) 7.11.1951. (iv) (a) to (e) N.A. (v) Nil. (vi) C—591 (medium). (vii) Irrigated. (viii) As per treatments. (ix) 10.20". (x) N.A.

2. TREATMENTS:
All combinations of (1) and (2)
(1) 2 levels of hoeing: H₁—one hoeing and H₂=3 hoeings.
(2) 2 levels of N as A/S: N₁=40 and N₂=80 lb./ac.

3. DESIGN:
(i) Fact in R.B.D. (ii) (a) 4. (b) N.A. (iii) 8. (iv) (a) and (b) 1/48 ac. (v) Nil. (vi) Yes.

4. GENERAL:
(i) Fair. No lodging. (ii) Nil. (iii) Grain yield. (iv) (a) 1949 to 1952. (b) No. (c) → (v) (a) No. (b) Nil. (vi) and (vii) Nil.

5. RESULTS:
(i) 1828 lb./ac.
(ii) 151.0 lb./ac.
(iii) None of the effects is significant.
(iv) Av. yield of grain in lb./ac:

<table>
<thead>
<tr>
<th></th>
<th>N₁</th>
<th>N₂</th>
<th>Mean</th>
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<td>1828</td>
</tr>
<tr>
<td>Mean</td>
<td>1854</td>
<td>1803</td>
<td></td>
</tr>
</tbody>
</table>

S.E. of any marginal mean =37.8 lb./ac.
S.E. of body of table =53.4 lb./ac.

Crop:—Wheat.
Site:—Distt. and Demonstration Farm, Ambala.

Ref:—Pb. 51 (119).
Type:—‘CM’.

Object:—To study the effect of manures and hoeings on yield of Wheat.

1. BASAL CONDITIONS:
(i) (a) Nil. (b) Fallow. (c) Nil. (ii) (a) Heavy clayey loam. (b) N.A. (iii) 26.10.1952. (iv) (a) 4 ploughings and 5 sowing. (b) N.A. (c) 36 sr./ac. (d) and (e) N.A. (v) Nil. (vi) C—591 (medium). (vii) Irrigated. (viii) As per treatments. (ix) 14.20". (x) 26.10.1952.

2. TREATMENTS:
All combinations of (1) and (2).
(1) 2 levels of hoeing: H₁—one and H₂=3 hoeings.
(2) 2 levels of N as A/S: N₁=40 and N₂=80 lb./ac.
N applied on 26.10.52 and applied on 24.12.1952.

3. DESIGN:
(i) Fact in R.B.D. (ii) (a) 4. (b) N.A. (iii) 6. (iv) (a) 13'×69.8". (b) 13'×69.8". (v) Nil. (vi) Yes.

4. GENERAL:
(i) Fair. No lodging. (ii) Nil. (iii) Straw and grain yield. (iv) (a) 1949 to 1952. (b) No. (c) → (v) (a) No. (b) Nil. (vi) and (vii) Nil.
5. RESULTS:
(i) 989 lb./ac.
(ii) 171.6 lb./ac.
(iii) None of the effects is significant.
(iv) Av. yield of grain in lb./ac.

<table>
<thead>
<tr>
<th></th>
<th>N₁</th>
<th>N₂</th>
<th>Mean</th>
</tr>
</thead>
<tbody>
<tr>
<td>H₁</td>
<td>881</td>
<td>947</td>
<td>914</td>
</tr>
<tr>
<td>H₂</td>
<td>1038</td>
<td>1089</td>
<td>1064</td>
</tr>
</tbody>
</table>

S.E. of any marginal mean = 49.5 lb./ac.
S.E. of body of table = 70.1 lb./ac.

Crop : Wheat
Site : Jullundur Agri. Stn., Jullundur.
Ref : Pb. 53(93).
Type :-‘CM’.

Object :- To study the effect of seed rate, spacings and levels of N on yield of Wheat.

1. BASAL CONDITIONS:
(i) (a) Nil. (b) Guara (Green manuring). (c) Nil.
(ii) (a) Medium to heavy loam. (b) Refer soil analysis, Jullundur.
(iii) 13.11.1953.
(iv) (a) Raja plough, 4 desi hal and 2 sohaga. (b) N.A.
(c) and (d) As per treatments. (e) N.A.
(v) Guara buried on 5.9.1953. (vi) C-518 (medium).
(vii) Irrigated.
(viii) 1 weeding. (ix) 10.33'.
(x) 25.4.1954.

2. TREATMENTS:
All possible combinations of (1), (2), (3), (4) and one extra treatment.
1. 2 spacings : S₁ = 6’ and S₂ = 9’.
2. 2 seed rates: R₁ = 32 sr./ac. and R₂ = 40 sr./ac.
3. 2 levels of N as A/S: N₁ = 40 lb./ac. and N₂ = 60 lb./ac.
4. 2 levels of P₂O₅ as Super: P₁ = 25 lb./ac. and P₂ = 40 lb./ac.
A/S and Super applied before sowing on 12.11.1953 by broadcast.
Extra treatment : S₂R₂ = Spacing 9’ with 40 sr./ac. of seed rate and no manure applied.

3. DESIGN:
(i) R.B.D. (ii) (a) 17. (b) N.A. (iii) 4. (iv) (a) 53’×10’.
(b) 45.4’×8’. (v) One foot from breadth side and 3.8’ from length side as non-experimental. (vi) Yes.

4. GENERAL:
(i) Fair to good. Crop slightly lodged. (ii) Rust attack. (iii) Grain yield.
(iv) (a) 1953 to 1954. (b) No. (c) Nil. (v) (a) No. (b) Nil. (vi) and (vii) Nil.

5. RESULTS:
(i) 897.3 lb./ac.
(ii) 184.5 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>S₁R₁P₁</td>
<td>1164</td>
<td>S₁R₁N₂P₂</td>
<td>763</td>
</tr>
<tr>
<td>S₁R₁N₁P₂</td>
<td>756</td>
<td>S₁R₁P₂N₃</td>
<td>852</td>
</tr>
<tr>
<td>S₂R₁N₁P₂</td>
<td>964</td>
<td>S₂R₁P₂N₃</td>
<td>987</td>
</tr>
<tr>
<td>S₂R₁N₂P₁</td>
<td>756</td>
<td>S₂R₁P₂N₃</td>
<td>848</td>
</tr>
<tr>
<td>S₁R₂N₁P₂</td>
<td>960</td>
<td>S₁R₂P₂N₃</td>
<td>887</td>
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<tr>
<td>S₂R₂N₁P₂</td>
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<td>S₂R₂P₂N₃</td>
<td>887</td>
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<tr>
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<td>S₂R₁P₂N₃</td>
<td>910</td>
</tr>
<tr>
<td>S₂R₁N₂P₁</td>
<td>771</td>
<td>S₂R₁N₃P₂</td>
<td>968</td>
</tr>
<tr>
<td>S₂R₂N₂P₁</td>
<td>844</td>
<td>S.E/mean  = 92.3 lb./ac.</td>
<td></td>
</tr>
</tbody>
</table>
Crop: Wheat.  
Site: Jullundur Agri. Stn., Jullundur.  
Ref.: Pb. 50(16).  
Type:- 'CM'.

Object: To study the residual effect of manures applied to previous Maize crop on following Wheat crop with varying spacing.

1. BASAL CONDITIONS:
   (i) (a) Nil. (b) Maize. (c) As per treatments. (ii) (a) Loam. (b) Refer soil analysis, Jullundur. (iii) 7.11.1950. (iv) (a) 1 raja, 4 desi hal and 5 sohaga. (b) N.A. (c) 36 sr./ac. (d) and (e) N.A. (v) Nil. (vi) C-591 (medium). (vii) Irrigated. (viii) 1 weeding. (ix) 5.19'. (x) 22.4.1951.

2. TREATMENTS:
   Main-plot treatments:
   All combinations of (1) and (2):
   (1) 3 plant to row spacings: \( S_1 = 9'' \), \( S_2 = 12'' \) and \( S_3 = 15'' \).
   (2) 2 row to row spacings: \( R_1 = 1' \) and \( R_2 = 1' \).
   Sub-plot treatments:
   4 levels of N as A/S: \( N_1 = 0 \), \( N_2 = 50 \), \( N_3 = 100 \) and \( N_4 = 150 \) lb./ac.
   N applied to previous Maize crop.

3. DESIGN:
   (i) Split-plot. (ii) (a) 6 main-plots/block; 4 sub-plots/main-plot. (b) N.A. (iii) 4. (iv) (a) 8' x 63'. (b) 8' x 56.72'. (v) N.A. (vi) Yes.

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

5. RESULTS:
   (i) 2514 lb./ac.
   (ii) 301.1 lb./ac.
   (iii) Only N effect is highly significant.
   (iv) Av. yield of grain in lb./ac.

<table>
<thead>
<tr>
<th></th>
<th>( N_1 )</th>
<th>( N_2 )</th>
<th>( N_3 )</th>
<th>( N_4 )</th>
<th>Mean</th>
<th>( R_1 )</th>
<th>( R_2 )</th>
</tr>
</thead>
<tbody>
<tr>
<td>( S_1 )</td>
<td>2305</td>
<td>2450</td>
<td>2512</td>
<td>2925</td>
<td>2548</td>
<td>2513</td>
<td>2583</td>
</tr>
<tr>
<td>( S_2 )</td>
<td>2239</td>
<td>2297</td>
<td>2510</td>
<td>2953</td>
<td>2500</td>
<td>2492</td>
<td>2508</td>
</tr>
<tr>
<td>( S_3 )</td>
<td>2338</td>
<td>2484</td>
<td>2496</td>
<td>2989</td>
<td>2584</td>
<td>2599</td>
<td>2570</td>
</tr>
<tr>
<td>Mean</td>
<td>2304</td>
<td>2410</td>
<td>2506</td>
<td>2956</td>
<td>2544</td>
<td></td>
<td></td>
</tr>
<tr>
<td>( R_1 )</td>
<td>2299</td>
<td>2432</td>
<td>2498</td>
<td>2980</td>
<td>2535</td>
<td></td>
<td></td>
</tr>
<tr>
<td>( R_2 )</td>
<td>2309</td>
<td>2419</td>
<td>2554</td>
<td>2931</td>
<td>2553</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

S.E. of marginal mean of \( S \) = 53.2 lb./ac.
S.E. of marginal mean of \( R \) = 43.5 lb./ac.
S E. of body of table \( S \times R \) = 75.3 lb./ac.
S E. of difference of two
1. N marginal means = 43.1 lb./ac.
2. N means at the same level of \( S \) = 74.7 lb./ac.
3. S means at the same level of N = 59.2 lb./ac.
4. N means at the same level of \( R \) = 61.0 lb./ac.
5. \( R \) means at the same level of N = 81.0 lb./ac.
Crop :- Wheat.

Site :- Jullundur Agri. Stn., Jullundur

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

1. BASAL CONDITIONS:
   (i) (a) Nil. (b) Guara (G.M.). (c) Nil. (ii) (a) Sandy loam. (b) Refer soil analysis, Jullundur. (iii) 3.11.1948. (iv) (a) 1 roja, 6 desi, 2 horse hoe, 7 sohaga and bar-harrow. (b) N.A. (c) 32 sr./ac. (d) and (e) N.A. (vi) N.A. (vi) C-591 (medium) (vi) Irrigated. (viii) Nil. (ix) 6.29". (x) 13.4.1949.

2. TREATMENTS:
   1. 2 irrigation.
   2. 3 irrigation.
   3. 4 irrigation.

3. DESIGN:
   (i) R.B.D. (ii) (a) 3. (b) N.A. (iii) 6. (iv) (a) and (b) 19.5' x 46.51'. (v) No. (vi) Yes.

4. GENERAL:
   (i) Good. No lodging. (ii) Slight attack of yellow rust. (iii) Grain and straw yield. (iv) (a) 1946—49 (b) and (c) No. (v) (a) and (b) No. (vi) and (vii) Nil.

5. RESULTS:
   (i) 1975 lb./ac.
   (ii) 138.2 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>1907</td>
</tr>
<tr>
<td>2.</td>
<td>1953</td>
</tr>
<tr>
<td>3.</td>
<td>2066</td>
</tr>
<tr>
<td>S.E./mean</td>
<td>=56.4 lb./ac.</td>
</tr>
</tbody>
</table>

---

Crop :- Wheat (Rabi).

Site :- Jullundur Agri. Stn., Jullundur.

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

1. BASAL CONDITIONS:
   (i) (a) Nil. (b) Guara (G.M.). (c) Nil. (ii) (a) Loam. (b) Refer soil analysis, Jullundur. (iii) 8.11.1949. (iv) (a) 4 desi hal, 6 sohaga and 1 roller. (b) N.A. (c) 30 sr./ac. (d) and (e) N.A. (vi) Previous crop guara was green manured by burying in the field. (vii) C-591 (medium). (vii) Irrigated. (viii) One weeding (x) 6.14". (x) 23.4.1950.

2. TREATMENTS:
   1. 2 irrigations.
   2. 3 irrigations.
   3. 4 irrigations.

3. DESIGN:
   (i) R.B.D. (ii) (a) 3. (b) N.A. (iii) 6. (iv) (a) and (b) 1/48 ac. (b) Nil. (v) Nil. (vi) Yes.

4. GENERAL:
   (i) Germination and condition good. (ii) Nil. (iii) Grain and straw yield. (iv) (a) 1946—49. (b) and (c) Nil. (v) (a) and (b) Nil. (vi) and (vii) Nil.
5. RESULTS:
(i) 2477 lb./ac.
(ii) 138.8 lb./ac.
(iii) Treatments are significantly different.
(iv) Av. yield of grain in lb./ac.

<table>
<thead>
<tr>
<th>Treatment</th>
<th>Av. yield</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>2363</td>
</tr>
<tr>
<td>2.</td>
<td>2448</td>
</tr>
<tr>
<td>3.</td>
<td>2620</td>
</tr>
<tr>
<td>S.E./mean</td>
<td>56.6 lb./ac.</td>
</tr>
</tbody>
</table>

Crop: Wheat.  
Site: Govt. Agri. Stn., Gurdaspur.  
Object: To study the effect of different insecticides on the germination, growth and yield of Wheat.

5. BASAL CONDITIONS:
(i) (a) Not followed. (b) Fallow. (c) Nil. (ii) (a) Loam. (b) N.A. (iii) 6.11.1953. (iv) (a) 1
Hindustan plough, 7 desi ploughs, 12 soughs, 1 roller. (b) N.A. (c) 32 ss/ac. (d) and (e) N.A. (v) Nil.  

2. TREATMENTS:
1. Control.
2. Anhydrous copper sulphate at 4 oz. per mound of seed.
3. Ceresan at 4 oz. per mound of seed.
4. Agrosan G.N. at 3 oz. per mound of seed.

Seeds were treated just before sowing with these treatments.

3. DESIGN:
(i) R.B.D. (ii) (a) 4. (b) N.A. (iii) 6. (iv) (a) 80'×12'. (b) 55'×12'. (v) 10' and 15' left out on two 
sides of the plots. (vi) Yes.

4. GENERAL:
(i) Condition satisfactory and growth normal. No lodging. (ii) Nil. (iii) Grain yield. (iv) (a) Not contd.  
(b) No. (c) Nil. (v) (a) No (b) Nil. (vi) and (vii) Nil.

5. RESULTS:
(i) 1375 lb./ac.
(ii) 46.7 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>1358</td>
</tr>
<tr>
<td>2.</td>
<td>1345</td>
</tr>
<tr>
<td>3.</td>
<td>1389</td>
</tr>
<tr>
<td>4.</td>
<td>1407</td>
</tr>
<tr>
<td>S.E./mean</td>
<td>19.1 lb./ac.</td>
</tr>
</tbody>
</table>

Crop: Barley.  
Site: Barley Res. Farm, Gurgaon.  
Object: To assess the value of N and P₂O₅ fertilizers in relation to grain yield.

1. BASAL CONDITIONS:
(i) (a) Nil. (b) Guara (Green manure). (c) No. (ii) (a) Sandy loam. (b) N.A. (iii) 1.11.1951. (iv) (a) 
Hindustan ploughing and 4 desi ploughings, (b) to (e) N.A. (vi) Type 4—(early). (vii) Irrigated.  
(viii) 2 hoeings and one weeding. (ix) 1.66'. (x) 31.3.1952.
2. TREATMENTS:
   All combinations of (1) and (2).
   (1) 3 levels of N as A/S: \( N_0 = 0, N_1 = 50 \) and \( N_2 = 100 \) lb./ac.
   (2) 3 levels of \( \text{P}_2O_5 \) as Super: \( P_0 = 0, P_1 = 50 \) and \( P_2 = 100 \) lb./ac.

3. DESIGN:
   (i) \( 3 \times 3 \) Fact. in R.B.D. (ii) 11' \times 66'. (b) 10' \times 66'. (v) 2 rows one on each side of the plot kept as border. (vi) Yes.

4. GENERAL:
   (i) Good condition. No lodging. (ii) Nil. (iii) Height, ear length, no. of grains per ear head, grain weight. (iv) (a) 1951 to 1953. (b) Nil. (v) Nil. (vi) Yes. (vii) Nil.

5. RESULTS:
   (i) 2438 lb./ac.
   (ii) 262.4 lb./ac.
   (iii) \( N \) effect is highly significant while \( P \) effect is significant.
Object: To assess the value of N and P2O5 fertilizers in relation to grain yield.

1. BASAL CONDITIONS:
   (i) (a) Nil, (b) Mong, (c) Nil. (ii) (a) Sandy loam. (b) N.A. (iii) 11.12.1953. (iv) (a) 1 Hinduastan hal ploughings. 4 dest hal ploughings. (b) to (e) N.A. (v) Nil. (vi) Barley type 4 (improved and early) (vii) Irrigated. (viii) 1 weeding and 2 hoeings. (ix) 1951-1953. (x) Nil.

2. TREATMENTS:
   All combinations of (1) and (2)
   (1) 3 levels of N as A/S: N0 = 0, N1 = 50 and N2 = 100 lb./ac.
   (2) 3 levels of P2O5 as Super: P0 = 0, P1 = 50 and P2 = 100 lb./ac.

3. DESIGN:
   (i) 3x3 Factorial in R.B.D. (ii) (a) 9. (b) N.A. (iii) 4. (iv) (a) 1/99 ac. (b) 40 ft x 9'. (v) 2 rows, one on each side of the plot kept as border. (vi) Yes.

4. GENERAL:
   (i) Stand of crop good. No lodging. (ii) No incidence of diseases or pests was observed. (iii) Height, ear length, no. of grains per ear, and grain weight. (iv) (a) 1951-1953. (b) No. (c) Nil. (v) (a) Nil. (b) -. (vi) Heavy rain fall was received on 5th, 20th and 21st February 1954. (vii) Nil.

5. RESULTS:
   (i) 1442 lb./ac.
   (ii) 134.7 lb./ac.
   (iii) Only N effect is highly significant.
   (iv) Av. yield of grain in lb./ac.

<table>
<thead>
<tr>
<th>P0</th>
<th>P1</th>
<th>P2</th>
<th>Mean</th>
</tr>
</thead>
<tbody>
<tr>
<td>N0</td>
<td>1080</td>
<td>1072</td>
<td>1018</td>
</tr>
<tr>
<td>N1</td>
<td>1647</td>
<td>1566</td>
<td>1639</td>
</tr>
<tr>
<td>N2</td>
<td>1527</td>
<td>1744</td>
<td>1682</td>
</tr>
<tr>
<td>Mean</td>
<td>1418</td>
<td>1461</td>
<td>1446</td>
</tr>
</tbody>
</table>

S.E. of marginal means = 38.9 lb./ac.
S.E. of body of table = 67.4 lb./ac.

Crop: Barley.
Site: Barley Res. Farm, Gurgaon.
Ref: Pb. 53(9).
Type: 'M'.
Crop: Barley.
Site: Barley Res. Farm, Gurgaon.
Object: To compare the effect of A/S and C/N on the yield of Barley.

1. BASAL CONDITIONS:
   (i) (a) Barley—Mung. (b) Mung. (c) Nil. (ii) (a) Sandy loam. (b) N.A. (iii) 12.11.1953. (iv) (a) Preparatory tillage: 1 Hindustan hal ploughings and 4 desi hal ploughings. (b) N.A. (c) 1 md./ac. (d) and (e) N.A. (v) Nil. (vi) Barley type 4 (early). (vii) Irrigated. (viii) 1 weeding and 2 hoeings. (ix) 6.35". (x) 3.4.1954.

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) 4. (iv) (a) 1/99 ac. (b) 40'x9'. (v) 2 rows: 1 on each side of the plot kept as border. (vi) Yes.

4. GENERAL:
   (i) Stand of crop good. No lodging. (ii) Nil. (iii) Height, ear length, number of grains per ear and grain weight. (iv) in 1953-54. (b) and (c) Nil. (v) (a) and (b) No. (vi) Heavy of rainfall was received on 5th, 20th and 21 February, 1954. (vii) Nil.

5. RESULTS:
   (i) 1567 lb./ac.
   (ii) 204.1 lb./ac.
   (iii) N and "control vs. others" effects are significant while 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>
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<tbody>
<tr>
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<td>1493</td>
<td>1491</td>
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<tr>
<td>N$_2$</td>
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<td>1728</td>
<td>1757</td>
</tr>
<tr>
<td>Mean</td>
<td>1638</td>
<td>[1661]</td>
<td>1624</td>
</tr>
</tbody>
</table>

S.E. of marginal means = 72.1 lb./ac.
S.E. of body of table = 102.0 lb./ac.

Crop: Barley.
Site: Agri. Farm, Rohtak.
Object: To find suitable dose of F.Y.M. to Barley crop.

1. BASAL CONDITIONS:
   (i) (a) Nil. (b) Char. (c) Nil. (ii) (a) Loamy. (b) Refer soil analysis, Rohtak. (iii) 4.11.1948. (iv) (a) and (b) N.A. (c) 40 st./ac. (d) and (e) N.A. (v) Nil. (vi) T-4 (medium). (vii) Unirrigated. (viii) Nil. (ix) 0.26". (x) 22 and 23.3.49.

2. TREATMENTS:
   1. F.Y.M. 2½ ton/ac.
   2. F.Y.M. 5 ton/ac.
   3. F.Y.M. 7½ ton/ac.
   4. Control.
3. DESIGN:
(i) R.B.D. (ii) (a) Nil. (b) N.A. (iii) 6. (iv) (a) 66' × 24'. (b) 54.5' × 20'. (v) N.A. (vi) Yes.

4. GENERAL:
(i) Fair. No lodging. (ii) Nil. (iii) Grain yield. (iv) (a) 1943–48. (b) and (c) No. (v) (a) and (b) Nil. (vi) and (vii) Nil.

5. RESULTS:
(i) 544.6 lb./ac.
(ii) 123.0 lb./ac.
(iii) Treatments are significantly different.
(iv) Av. yield of grain in lb./ac.

<table>
<thead>
<tr>
<th>Treatment</th>
<th>Av. yield</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
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</tr>
<tr>
<td>2.</td>
<td>524.1</td>
</tr>
<tr>
<td>3.</td>
<td>657.6</td>
</tr>
<tr>
<td>4.</td>
<td>524.1</td>
</tr>
<tr>
<td>S.E./mean</td>
<td>50.2 lb./ac.</td>
</tr>
</tbody>
</table>

Crop: Barley.
Site: Agri. Farm, Rohtak.

Object: To study the optimum date of sowing for Barley.

1. BASAL CONDITIONS:
(i) (a) Nil. (b) Fallow. (c) Nil. (ii) (a) Loamy. (b) Reinf soil analysis, Rohtak. (iii) As per treatments. (iv) (a) to (e) N.A. (v) N.A. (vi) T.4 (medium). (vii) Unirrigated. (viii) Nil. (ix) 0.26". (x) 21.3.1949.

2. TREATMENTS:
5 sowing dates: D1 = 2.10.1948, D2 = 10.10.1948, D3 = 18.10.1948, D4 = 26.10.1948, and D5 = 3.11.1948.

3. DESIGN:
(i) R.B.D. (ii) (a) 5. (b) N.A. (iii) 6. (iv) (a) 66' × 20'. (b) 1/40 ac. (v) N.A. (vi) Yes.

4. GENERAL:
(i) Fair to poor. No lodging. (ii) Nil. (iii) Grain yield. (iv) (a) 1943 to 1948. (b) No. (c) —. (v) (a) No. (b) —. (vi) and (vii) Nil.

5. RESULTS:
(i) 389.8 lb./ac.
(ii) 77.80 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>D1</td>
<td>349.7</td>
</tr>
<tr>
<td>D2</td>
<td>349.7</td>
</tr>
<tr>
<td>D3</td>
<td>452.6</td>
</tr>
<tr>
<td>D4</td>
<td>411.2</td>
</tr>
<tr>
<td>D5</td>
<td>385.7</td>
</tr>
<tr>
<td>S.E./mean</td>
<td>31.76 lb./ac.</td>
</tr>
</tbody>
</table>

Crop: Bajra (Kharif).
Site: Jullundur Agri. Stn., Jullundur.

Object: To study the effect of different doses of A/S on yield of Bajra.

1. BASAL CONDITIONS:
(i) (a) Nil. (b) Tobacco. (c) N.A. (ii) (a) Loam. (b) N.A. (iii) 27.7.1949. (iv) (a) 2 desi hal and 1 sohag. (b) N.A. (c) 6 sr./ac. (d) and (e) N.A. (v) Nil. (vi) Local. (vii) Unirrigated. (viii) Nil. (ix) 12.56". (x) 3.11.1949.
2. TREATMENTS:
   1. Control (no manure)
   2. 50 lb./ac. of N as A/S
   3. 100 lb./ac. of N as A/S

   A/S broadcast on 18.8.49 and 23.8.49

3. DESIGN:
   (i) R.B.D.  (ii) (a) 3.  (b) N.A.  (iii) 3.  (iv) (a) and (b) 22.25' × 95'.  (v) Nil.  (vi) Yes.

4. GENERAL:
   (i) Fair to good. No lodging.  (ii) Nil.  (iii) Grain and straw yield.  (iv) (a) Not contd.  (b) —.  (c) —.
   (v) (a) No.  (b) —.  (vi) Nil.  (vii) Crop was first sown on 16.7.1949, but germination was too poor,
   so it was resown on 27.7.1949.

5. RESULTS:
   (i) 585.9 lb./ac.
   (ii) 111.47 lb./ac.
   (iii) Treatments are not significantly different.
   (iv) Av. yield of grain in lb./ac.

   Treatment        Av. yield
   1.               560.0
   2.               546.8
   3.               651.0
   S./E. mean       =64.36 lb./ac.

----------

Crop :-Bajra.

Site :-Soil Sub-Stn., Agri. Farm, Rohtak.

Ref :-Pb. 53(165).

Type :-'M'.

Object :-To find the best manurial formula for yield of Bajra.

1. BASAL CONDITIONS:
   (i) (a) Nil.  (b) Wheat.  (c) Nil.  (ii) (a) Loam.  (b) Refer soil analysis, Rohtak.  (iii) 19.7.1953.  (iv)
   (a) to (e) N.A.  (v) Nil.  (vi) T-55 (medium).  (vii) Unirrigated.  (viii) Nil.  (ix) 15.27'.  (x) 25.11.1953.

2. TREATMENTS:
   1. Control (no manure).
   2. 25 lb./ac. of N as A/S (direct).
   3. 25 lb./ac. of N as A/S + 12 lb./ac. of P_{2}O_{5} as Super (direct).
   4. 25 lb./ac. of N as A/S by spraying.
   5. 25 lb./ac. of N as A/S + 12 lb./ac. of P_{2}O_{5} as Ammo. Phos. (direct).
   6. 25 lb./ac. of N as A/S + 12 lb./ac. of P_{2}O_{5} as Ammo. Phos. spray.


3. DESIGN:
   (i) R.B.D.  (ii) (a) 6.  (b) N.A.  (iii) 2.  (iv) (a) N.A.  (b) 1/16 ac.  (v) N.A.  (vi) Yes.

4. GENERAL:
   (i) Satisfactory.  (ii) Nil.  (iii) Forage yield.  (iv) (a) Not contd.  (b) No.  (c) —.  (v) (a) No.
   (b) —.  (vi) and (vii) Nil.

5. RESULTS:
   (i) 7.22 ton/ac.
   (ii) 1.46 ton/ac.
   (iii) Treatments are not significantly different.
   (iv) Av. yield of forage in ton/ac.

   Treatment        Av. yield.
   1.               7.35
   2.               7.01
   3.               8.72
   4.               6.22
   5.               7.25
   6.               6.77
   S.E./mean       1.03 ton/ac.
Crop : Bajra.  
Site : Agri. Farm, Rohtak.  
Ref : Pb. 49(90).  
Type : 'M'.

Object : To study the effect of application of A/S on the yield of Bajra.

1. BASAL CONDITIONS:
   (i) (a) Nil. (b) Gram. (c) Nil.  (ii) (a) Loamy. (b) Refer soil analysis, Rohtak.  (iii) 3.8.1949.  (iv) (a) 4 ploughings and 5 sodage. (b) N.A. (c) 2 s./a. (d) and (e) N.A. (v) Nil. (vi) T-55 (medium). (vii) Unirrigated. (viii) Nil.  (ix) 7.86”. (x) 24.10.1949.

2. TREATMENTS:
   1. Control (no manure).
   2. 16 lb./ac. of N as A/S.
   3. 32 lb./ac. of N as A/S.
   4. 48 lb./ac. of N as A/S.

A/S applied on 29.8.1949.

3. DESIGN:
   (i) R.B.D. (ii) (a) 4. (b) N.A. (iii) 6. (iv) (a) N.A. (b) 1/50 ac. (v) N.A. (vi) Yes.

4. GENERAL:
   (i) Fair to normal. No lodging. (ii) Nil. (iii) Grain yield. (iv) (a) 1949—1950. (b) No. (c) —. (v) (a) No. (b) —. (vi) and (vii) Nil.

5. RESULTS:
   (i) 1234 lb./ac.
   (ii) 338.8 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>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>919</td>
</tr>
<tr>
<td>2.</td>
<td>1214</td>
</tr>
<tr>
<td>3.</td>
<td>1382</td>
</tr>
<tr>
<td>4.</td>
<td>1399</td>
</tr>
<tr>
<td>S.E./mean</td>
<td>=138.3 lb./ac.</td>
</tr>
</tbody>
</table>

---

Crop : Bajra.  
Site : Agri. Farm, Rohtak.  
Ref : Pb. 50 (97).  
Type : 'M'.

Object : To study the effect of application of A/S on the yield of Bajra.

1. BASAL CONDITIONS:
   (i) (a) Nil. (b) Wheat. (c) Nil.  (ii) (a) Loamy. (b) Refer soil analysis, Rohtak.  (iii) 25.7.1950.  (iv) (a) and (b) N.A. (c) 2 s./f., for the entire experimental area. (d) and (e) N.A. (v) Nil. (vi) T-55 (medium). (vii) Unirrigated. (viii) Nil.  (ix) 13.59”. (x) 12.10.1950.

2. TREATMENTS:
   1. Control (no manure).
   2. 16 lb./ac. of N as A/S.
   3. 32 lb./ac. of N as A/S.
   4. 48 lb./ac. of N as A/S.

A/S applied on 10.8.1950.

3. DESIGN:
   (i) R.B.D. (ii) (a) 4. (b) N.A. (iii) 6. (iv) (a) 65’x24’. (b) 54.5’x20’. (v) N.A. (vi) Yes
4. GENERAL:
   (i) Fair to good. No lodging. (ii) Nil. (iii) Grain and forage yield. (iv) (a) 1945 to 1950. (b) No. (c) Nil. (v) (a) No. (b)—. (vi) and (vii) Nil.

5. RESULTS
   (i) 474.2 lb./ac.
   (ii) 59.48 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>313.4</td>
</tr>
<tr>
<td>2.</td>
<td>335.0</td>
</tr>
<tr>
<td>3.</td>
<td>514.6</td>
</tr>
<tr>
<td>4.</td>
<td>633.7</td>
</tr>
<tr>
<td>S.E./mean</td>
<td>24.28 lb./ac.</td>
</tr>
</tbody>
</table>

Crop :- Bajra.
Site :- Agri. Stn., Ferozepur.
Object :- To test the maximum potentiality of selection of T-55 variety of Bajra under unirrigated conditions.

1. BASAL CONDITIONS:
   (i) (a) Gram-Bajra-Fallow-Gram. (b) Gram. (c) Nil. (ii) (a) Sandy loam. (b) N.A. (iii) 18.7.1953. (iv) (a) 1 raja plough, 4 desi plough and 4 plankings. (b) Kera behind the plough. (d) N.A. (e)—. (v) Nil. (vi) T-55 (early). (vii) Unirrigated. (viii) 1 hoeing including weeding. (ix) 18.91°. (x) 14.10.1953.

2. TREATMENTS:
   Main-plot treatments:
   2 row to row spacings : S1=1’ and S2=1.5’.
   Sub-plot treatments:
   4 levels of N : N0=0, N1=20, N2=40 and N3=60 lb./ac.
   Sub-sub-plot treatments:
   3 seed rates : R1=2, R2=2.5 and R3=3 s.r./ac.
   N as A1/S broadcast at the time of sowing.

3. DESIGN:
   (i) Split-plot. (ii) (a) 2 main-plots/block ; 4 sub-plots/main-plot and 3 sub-sub-plots/sub-plot. (b) N.A. (iii) 4. (iv) (a) N.A. (b) 27’x9’. (v) N.A. (vi) Yes.

4. GENERAL:
   (i) Fair to satisfactory. No lodging. (ii) Minor attack of cotton weevil. Spraying. (iii) Height, date of earing, germination count, and grain yield. (iv) (a) 1953 contd. (b) No. (c) Nil. (v) (a) No.(b)—. (vi) and (vii) Nil.

5. RESULTS:
   (i) 615.9 lb./ac.
   (ii) (a) 263.2 lb./ac.
   (b) 391.3 lb./ac.
   (c) 217.0 lb./ac.
   (iii) None of the effects is significant.
Av. yield of grain in lb./ac.

<table>
<thead>
<tr>
<th></th>
<th>S₁</th>
<th>S₂</th>
<th>Mean</th>
<th>R₁</th>
<th>R₂</th>
<th>R₃</th>
</tr>
</thead>
<tbody>
<tr>
<td>N₀</td>
<td>587.6</td>
<td>505.1</td>
<td>547.4</td>
<td>481.1</td>
<td>566.1</td>
<td>595.2</td>
</tr>
<tr>
<td>N₁</td>
<td>560.8</td>
<td>509.0</td>
<td>534.9</td>
<td>551.7</td>
<td>491.2</td>
<td>561.8</td>
</tr>
<tr>
<td>N₂</td>
<td>664.5</td>
<td>630.9</td>
<td>647.7</td>
<td>580.5</td>
<td>744.7</td>
<td>618.0</td>
</tr>
<tr>
<td>N₃</td>
<td>787.5</td>
<td>679.9</td>
<td>733.7</td>
<td>751.9</td>
<td>757.7</td>
<td>691.4</td>
</tr>
</tbody>
</table>

Mean = 650.6, 581.2, 615.9

S.E. of difference of two
1. S marginal means = 51.11 lb./ac.
2. N marginal means = 113.00 lb./ac.
3. R marginal means = 54.25 lb./ac.
4. N means at the same level of S = 159.75 lb./ac.
5. S means at the same level of N = 148.19 lb./ac.
6. R means at the same level of S = 76.72 lb./ac.
7. S means at the same level of R = 82.14 lb./ac.
8. R means at the same levels of N = 108.50 lb./ac.
9. N means at the same level of R = 143.56 lb./ac.

---

Crop :- Bajra.
Site :- Agri. Stn., Ferozpur.
Object :- To find out maximum potentiality of A-1/3 variety of Bajra.

1. BASAL CONDITIONS :
   (i) (a) Gram-Bajra-Wheat-Fallow. (b) N.A. (c) No. (ii) (a) Sandy loam. (b) N.A. (iii) 17.7.1953.
   (iv) (a) 1 rajja plough 4 desf plough and 4 plankings (b) sowing with kera. (c) 2/l. (d) N.A. (e) --.

2. TREATMENTS :
   Main-plot treatments:
   3 levels of irrigation : I₁ = 1, I₂ = 2 and I₃ = 3 irrigations.
   Sub-plot treatments:
   4 levels of N as A/S : N₀ = 0, N₁ = 20, N₂ = 40 and N₃ = 60 lb./ac.

3. DESIGN :
   (i) Split-plot. (ii) (a) 3 main-plots/block ; 4 sub-plots/main-plot. (b) N.A. (iii) 6. (iv) (a) and (b) 18'x10'.
   (v) No. (vi) Yes.

4. GENERAL :
   (i) Normal. No lodging. (ii) Nil. (iii) Germination count, growth, height, and grain yield and data of
earing. (iv) (a) 1953—still continuing. (b) No. (c) Nil. (v) (a) No. (b) —. (vi) and (vii) Nil.

5. RESULTS :
   (i) 1668 lb./ac.
   (ii) (a) 220.1 lb./ac.
   (b) 221.2 lb./ac.
   (iii) Only N effect is highly 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>Mean</th>
</tr>
</thead>
<tbody>
<tr>
<td>I₁</td>
<td>1439</td>
<td>1600</td>
<td>1779</td>
<td>1963</td>
<td>1695</td>
</tr>
<tr>
<td>I₂</td>
<td>1346</td>
<td>1395</td>
<td>1742</td>
<td>1965</td>
<td>1612</td>
</tr>
<tr>
<td>I₃</td>
<td>1418</td>
<td>1608</td>
<td>1748</td>
<td>2009</td>
<td>1696</td>
</tr>
</tbody>
</table>

Mean : 1401 1534 1756 1979 = 1668

S.E. of difference of two
1. I marginal means = 63.5 lb./ac.
2. N marginal means = 73.7 lb./ac.
3. N means at the same level of I = 127.7 lb./ac.
3. I means at the same level of N = 127.6 lb./ac.

Crop : Jowar.
Site : Distt. and Demonstration Farm, Ambala.
Object : To study the effect of different sources of N on Jowar crop.

1. BASAL CONDITIONS :
   (i) (a) Nil. (b) Wheat. (c) Nil. (ii) (a) Clayey. (b) N.A. (iii) 18.7.1948. (iv) (a) to (c) N.A. (v) Nil.

2. TREATMENTS :
   1. Control (no manure).
   2. 50 lb./ac. of N as F.Y.M.
   3. 50 lb./ac. of N as A/S.
   4. 50 lb./ac. of N as Ammo. Phos.
   5. 25 lb./ac. of N as A/S.
   6. 25 lb./ac. of N as Ammo. Phos.

3. DESIGN :
   (i) R.B.D. (ii) (a) 6. (b) N.A. (iii) 6. (iv) (a) 11' x 88'. (b) 11' x 88'. (v) Nil. (vi) Yes.

4. GENERAL :
   (i) Fair to good. No lodging. (ii) Nil. (iii) Grain and stalk yield. (iv) (a) 1947-1948. (b) No. (c)—,
      (v) (a) No. (b)—. (vii) and (vii) Nil.

5. RESULTS :
   (i) 665.4 lb./ac.
   (ii) 119.14 lb./ac.
   (iii) Treatments are significantly different.
   (iv) Av. yield of grain in lb./ac.

<table>
<thead>
<tr>
<th>Treatment</th>
<th>Av. yield</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>578.6</td>
</tr>
<tr>
<td>2.</td>
<td>646.1</td>
</tr>
<tr>
<td>3.</td>
<td>665.4</td>
</tr>
<tr>
<td>4.</td>
<td>713.6</td>
</tr>
<tr>
<td>5.</td>
<td>578.6</td>
</tr>
<tr>
<td>6.</td>
<td>810.0</td>
</tr>
</tbody>
</table>

S.E./mean = 48.6 lb./ac.
Crop : Jowar.  
Site :- Distt. and Demonstration Farm, Ambala.  
Object : To find the best source of N for Jowar.  

1. BASAL CONDITIONS:

2. TREATMENTS:
   All combinations of (1) and (2) + a control.
   (1) 3 sources of N : S₁ = A/S, S₂ = Ammon Phos. and S₃ = F.Y.M.
   (2) 2 levels of N : N₁ = 50 and N₂ = 75 lb./ac.

3. DESIGN:
   (i) R.B.D. (ii) (a) 7. (b) N.A. (iii) 4. (iv) (a) 1/40 ac. (b) 1/40 ac. (v) Nil. (vi) Yes.

4. GENERAL:
   (i) Fair. No lodging. (ii) Nil. (iii) Green forage yield. (iv) (a) 1950 to 1952. (b) No. (c) Nil. (v) (a) No. (b) Nil. (vi) and (vii) Nil.

5. RESULTS:
   (i) 2070 lb./ac.
   (ii) 1255 lb./ac.
   (iii) None of the effects is significant.
   (iv) Av. yield of fodder in lb./ac.

<table>
<thead>
<tr>
<th>Control</th>
<th>Mean</th>
</tr>
</thead>
<tbody>
<tr>
<td>S₁</td>
<td>S₂</td>
</tr>
<tr>
<td>N₁</td>
<td>20242</td>
</tr>
<tr>
<td>N₂</td>
<td>21600</td>
</tr>
<tr>
<td>Mean</td>
<td>20921</td>
</tr>
</tbody>
</table>

S.E. of marginal mean of S = 444.1 lb./ac.
S.E. of marginal mean of N = 362.6 lb./ac.
S.E. of body of table = 628.0 lb./ac.
5. RESULTS:

(i) 5440 lb./ac.
(ii) 1441.8 lb./ac.
(iii) None of the effects is significant.
(iv) Av. yield of fodder in lb./ac.

\[ \text{Control} = 5925 \text{ lb./ac.} \]

<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>N_1</td>
<td>4619</td>
<td>5657</td>
<td>5472</td>
<td>5259</td>
</tr>
<tr>
<td>N_2</td>
<td>4598</td>
<td>5215</td>
<td>6562</td>
<td>5458</td>
</tr>
<tr>
<td>Mean</td>
<td>4623</td>
<td>5436</td>
<td>6017</td>
<td>5359</td>
</tr>
</tbody>
</table>

S.E. of marginal mean of S = 509.8 lb./ac.
S.E. of marginal mean of N = 416.2 lb./ac.
S.E. of body of table = 720.9 lb./ac.

Crop: Jowar.
Site: Distt. and Demonstration Farm, Ambala.
Ref: Pb. 52(155).
Type: ‘M’.

Object: To find the best source of N for Jowar crop.

1. BASAL CONDITIONS:


2. TREATMENTS:

All combinations of (1) and (2) + a control.
(1) 3 sources of N: S_1 = A/S, S_2 = Ammo. Phos. and S_3 = F.Y.M.
(2) 2 levels of N: N_1 = 50 and N_2 = 75 lb./ac.

3. DESIGN:

(i) R.B.D. (ii) (a) 7. (b) N.A. (iii) 4. (iv) (a) and (b) 76.5’ x 15’. (v) Nil. (vi) Yes.

4. GENERAL:

(i) Fair. No lodging. (ii) Nil. (iii) Forage yield: (iv) (a) 1950–52. (b) and (c) No. (v) (a) and (b) No. (vi) and (vii) Nil.

5. RESULTS:

(i) 6075 lb./ac.
(ii) 1352.2 lb./ac.
(iii) Only S effect is highly significant.
(iv) Av. yield of grain in lb./ac.

\[ \text{Control} = 5222 \text{ lb./ac.} \]

<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>N_1</td>
<td>4617</td>
<td>7789</td>
<td>4812</td>
<td>5739</td>
</tr>
<tr>
<td>N_2</td>
<td>6013</td>
<td>9019</td>
<td>5056</td>
<td>6696</td>
</tr>
<tr>
<td>Mean</td>
<td>5315</td>
<td>8404</td>
<td>4934</td>
<td>6218</td>
</tr>
</tbody>
</table>

S.E. of marginal mean of S = 478.1 lb./ac.
S.E. of marginal mean of N = 390.1 lb./ac.
S.E. of body of table = 676.1 lb./ac.
Crop :- Jowar (Kharif).
Site :- Agri. Farm, Rohtak.

Object :- To find out a suitable dose of manure for Jowar fodder.

1. BASAL CONDITIONS:
(i) (a) Nil. (b) Nil. (c) Nil. (ii) (a) Loam. (b) Refer soil analysis, Rohtak. (iii) 22.7.1953. (iv) (a) to (e) N.A. (v) Nil. (vi) Jowar-263 (medium). (vii) Unirrigated. (viii) Nil. (ix) 15.27. (x) 28.10.53. to 23.11.1953.

2. TREATMENTS:
1. Control (no manure).
2. 25 lb./ac. of N as A/S.
3. 25 lb./ac. of N as A/S + 12 lb./ac. of P₂O₅ as Super.
4. 25 lb./ac. of N as A/S spray.
5. 25 lb./ac. of N as A/S + 12 lb./ac. of P₂O₅ as Ammo. Phos. spray.
6. 25 lb./ac. of N as A/S + 12 lb./ac. of P₂O₅ as Ammo. Phos. (spray).

3. DESIGN:
(i) R.B.D. (ii) (a) 6. (b) N.A. (iii) 2. (iv) (a) N.A. (b) 1/12 ac. (v) N.A. (vi) Yes.

4. GENERAL:
(i) Normal. No lodging. (ii) Nil. (iii) Forage yield. (iv) (a) Not contd. (b) and (c) No. (v) (a) and (b) No. (vi) and (vii) Nil.

5. RESULTS:
(i) 7.61 ton/ac.
(ii) 1.03 ton/ac.
(iii) Treatments are not significantly different.
(iv) Av. yield of fodder in ton/ac.

<table>
<thead>
<tr>
<th>Treatment</th>
<th>Av. yield</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>7.91</td>
</tr>
<tr>
<td>2.</td>
<td>8.27</td>
</tr>
<tr>
<td>3.</td>
<td>7.55</td>
</tr>
<tr>
<td>4.</td>
<td>6.94</td>
</tr>
<tr>
<td>5.</td>
<td>8.35</td>
</tr>
<tr>
<td>6.</td>
<td>6.61</td>
</tr>
<tr>
<td>S.E./mean</td>
<td>0.75 ton/ac</td>
</tr>
</tbody>
</table>

---

Crop :- Jowar.
Site :- Agri. Farm, Rohtak.

Object :- To study the effect of organic manure prepared by different methods.

1. BASAL CONDITIONS:
(i) (a) Nil. (b) Wheat. (c) Nil. (ii) (a) Loamy. (b) Refer soil analysis, Rohtak. (iii) 19.7.1950. (iv) (a) 1 rajja, 2 desi and 4 sohaga. (b) N.A. (c) 20 sr./ac. (d) and (e) N.A. (v) Nil. (vi) Js. 20 (medium). (vii) Irrigated. (viii) Nil. (ix) 6.14". (x) 4.9.1950.

2. TREATMENTS:
1. Control (no manure).
2. Heaped manure 200 md./ac.
3. Manure prepared by zimindara method at 200 md./ac.
4. Manure prepared by improved method at 200 md./ac.

3. DESIGN:
(i) R.B.D. (ii) (a) 4. (b) N.A. (iii) 6. (iv)-(a) N.A. (b) 18'x48'. (v) N.A. (vi) Yes.

4. GENERAL:
(i) Fair to good. No lodging. (ii) Nil. (iii) Forage yield. (i) (a) Not contd. (b) No. (c) Nil. (v) (a) No. (b) Nil. (vi) and (vii) Nil.
5. RESULTS:

(i) 16219 lb./ac.
(ii) 2298.2 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>14474</td>
</tr>
<tr>
<td>2.</td>
<td>15398</td>
</tr>
<tr>
<td>3.</td>
<td>17451</td>
</tr>
<tr>
<td>4.</td>
<td>17554</td>
</tr>
<tr>
<td>S.E./mean</td>
<td>939.7 lb./ac.</td>
</tr>
</tbody>
</table>

Crop: Jowar.
Site: Agri. Farm, Rohtak.

Ref: Pb. 50(101).
Type: 'M'.

Object: To study the effect of Ammon. Phos. applied to previous crop Berseem on succeeding crop of Jowar for fodder.

1. BASAL CONDITIONS:

(i) (a) Nil. (b) Berseem. (c) As per treatments. (ii) (a) Loamy. (b) Refer soil analysis, Rohtak. (iii) 19.7.1950. (iv) (a) to (e) N.A. (v) Nil. (vi) Js-20 (medium). (vii) Unirrigated. (viii) Nil. (ix) 6.14'. (x) 29.9.1950.

2. TREATMENTS:

1. Control (no manure).
2. 40 lb./ac. of N as Ammon. Phos. Manure applied to previous crop Berseem.

3. DESIGN:

(i) Paired-plot. (ii) (a) 2. (b) N.A. (iii) 5. (iv) (a) N.A. (b) 1/10 ac. (v) N.A. (vi) Yes.

4. GENERAL:

(i) Fair. No lodging. (ii) Nil. (iii) Green fodder yield. (iv) (a) Not continued. (b) No. (c) Nil. (v) Nil. (vi) and (vii) Nil.

5. RESULTS:

(i) 17939 lb./ac.
(ii) 2937.8 lb./ac.
(iii) Treatments are not significantly different.
(iv) Av. yield of fodder in lb./ac.

<table>
<thead>
<tr>
<th>Treatment</th>
<th>Av. yield</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>15963</td>
</tr>
<tr>
<td>2.</td>
<td>19914</td>
</tr>
<tr>
<td>S.E./mean</td>
<td>1313.8 lb./ac.</td>
</tr>
</tbody>
</table>

Crop: Jowar (Kharif).

Ref: Pb. 51 (98).
Type: 'MV'.

Object: To study the suitability of D.C.M. fertilizers for Jowar fodder.

1. BASAL CONDITIONS:

(i) (a) Nil. (b) Fallow. (c) Nil. (ii) (a) Loam. (b) Refer soil analysis, Sirsa. (iii) 5.7.1951. (iv) (a) 1 raja, 5 daisi and 6 sohaga. (b) N.A. (c) 3 ch 1 tola to 3 ch 3 1/2 tolas. (d) and (e) N.A. (v) 3 C.L. of F.Y.M. on 30.6.1951. (vi) As per treatments. (vii) Irrigated. (viii) Nil. (iv) 9.52'. (x) 17.9.1951 to 2.10.1951.
2. TREATMENTS:
All combinations of (1) and (2)
(1) 2 varieties: \( V_1 = J s. - 20 \) (medium) and \( V_2 = J s. - 263 \) (medium).
(2) 6 manures: \( M_0 = 0 \), \( M_1 = 60 \) lb./ac. of N as A/S, \( M_2 = 60 \) lb./ac. of N as growth mixture, \( M_3 = 60 \) lb./ac. of N as general fertilizer, \( M_4 = 60 \) lb./ac. of N as irrigated sugarcane and \( M_5 = 60 \) lb./ac. of N as F.Y.M.

Half dose of \( M_1 \) to \( M_4 \) applied on 5.7.1951 and other half on 22.7.1951. F.Y.M. applied on 5.7.1951.

3. DESIGN:
(i) 2 \( \times \) 6 Fact. in R.B.D. (ii) (a) 12. (b) N.A. (iii) 6. (iv) (a) N.A. (b) 62.5' \( \times \) 6.75'. (v) N.A. (vi) Yes.

4. GENERAL:
(i) Growth good. No lodging. (ii) Nil. (iii) Grain and fodder yield. (iv) (a) 1951 to 1953. (b) No. (c) Nil. (v) (a) Nil. (b) Nil. (vi) and (vii) Nil.

5. RESULTS:
(i) 12.29 ton/ac.
(ii) 1.88 ton/ac.
(iii) None of the effects is significant.
(iv) Av. yield of fodder in ton/ac.

<table>
<thead>
<tr>
<th></th>
<th>( M_0 )</th>
<th>( M_1 )</th>
<th>( M_2 )</th>
<th>( M_3 )</th>
<th>( M_4 )</th>
<th>Mean</th>
</tr>
</thead>
<tbody>
<tr>
<td>( V_1 )</td>
<td>11.65</td>
<td>12.94</td>
<td>12.53</td>
<td>11.39</td>
<td>12.72</td>
<td>12.48</td>
</tr>
<tr>
<td>( V_2 )</td>
<td>12.77</td>
<td>12.85</td>
<td>12.39</td>
<td>12.99</td>
<td>12.26</td>
<td>10.51</td>
</tr>
<tr>
<td>Mean</td>
<td>12.21</td>
<td>12.90</td>
<td>12.46</td>
<td>12.19</td>
<td>12.49</td>
<td>11.50</td>
</tr>
</tbody>
</table>

S.E. of marginal means of \( M \) = 0.54 ton/ac.
S.E. of marginal means of \( V \) = 0.31 ton/ac.
S.E. of body of table = 0.77 ton/ac.

Crop : Jowar.

Object: To find the suitability of D.C.M. fertilizers for Jowar fodder.

1. BASAL CONDITIONS:
(i) (a) Nil. (b) Sarson. (c) F.Y.M. at 200 md./ac. (ii) (a) Light loamy. (b) Refer soil analysis, Sirsa. (iii) 10.6.1952. (iv) (a) 1 raja plough and 5 desi plough. (c) 24 to 30 sr./ac. (d) and (e) --. (v) No. (vi) As per treatments. (vii) Irrigated. (viii) One hoeing and weeding on 22.7.1952. (ix) 8.25". (x) \( V_1 \) : 26.8.1952 to 14.9.1952; \( V_2 \) : 15.9.1952 to 22.9.1952.

2. TREATMENTS:
All combinations of (1) and (2)
(1) 2 varieties: \( V_1 = J s. - 20 \) (medium) and \( V_2 = J s. - 263 \) (medium).
(2) 6 manures: \( M_0 = 0 \), \( M_1 = 60 \) lb./ac. of N as A/S, \( M_2 = 60 \) lb./ac. of N as growth mixture, \( M_3 = 60 \) lb./ac. of N as general fertilizer, \( M_4 = 60 \) lb./ac. of N as irrigated sugarcane and \( M_5 = 60 \) lb./ac. of N as F.Y.M.


3. DESIGN:
(i) 2 \( \times \) 6 Fact. in R.B.D. (ii) (a) 12. (b) N.A. (iii) 6. (iv) (a) and (b) 6' \( \times \) 64'. (v) N.A. (vi) Yes.

4. GENERAL:
Satisfactory. Js-20 lodged. (ii) No. (iii) Fodder yield. (iv) (a) 1951 to 1953. (b) No. (c) Nil. (v) (a) No. (b) Nil. (vi) Nil. (vii) Variety Js-20 harvested early due to lodging.
5. RESULTS:
(i) 19.62 ton/ac.
(ii) 1.95 ton/ac.
(iii) V and M effects are highly significant.
(iv) Av. yield of fodder in ton/ac.

<table>
<thead>
<tr>
<th></th>
<th>M₀</th>
<th>M₁</th>
<th>M₂</th>
<th>M₃</th>
<th>M₄</th>
<th>M₅</th>
<th>Mean</th>
</tr>
</thead>
<tbody>
<tr>
<td>V₁</td>
<td>17.47</td>
<td>19.10</td>
<td>17.83</td>
<td>19.59</td>
<td>18.84</td>
<td>16.76</td>
<td>18.26</td>
</tr>
<tr>
<td>Mean</td>
<td>17.84</td>
<td>19.73</td>
<td>20.98</td>
<td>21.54</td>
<td>19.92</td>
<td>18.97</td>
<td>19.62</td>
</tr>
</tbody>
</table>

S.E. of marginal mean of M = 0.56 ton/ac.
S.E. of marginal mean of V = 0.32 ton/ac.
S.E. of body of table = 0.80 ton/ac.

Crop: Jowar. Ref: Pb. 53(51).
Site: Fodder Res. Stn., Sirsa. Type: 'MV'.
Object: To find out the suitability of D.C.M. fertilizers for Jowar fodder.

1. BASAL CONDITIONS:
(i) (a) No. (b) Gram. (c) Nil. (ii) (a) Loamy soil. (b) Refer soil analysis, Sirsa. (iii) 20.6.1953. (iv) (a) 5 desi plough, 1 punchdanta (horse hoe) and 2 sohaga. (b) N.A. (c) 24 to 30 sr./ac. (d) and (e) N.A. (v) Nil. (vi) As per treatments. (vii) Irrigated. (viii) Nil. (ix) 16.07. (x) 14.9.1953 to 25.9.1953.

2. TREATMENTS:
All combinations of (1) and (2)
(1) 2 varieties: V₁ = Jc-20 (medium) and V₂ = Jc-263. (medium).
(2) 6 manures: M₀ = 0, M₁ = 60 lb./ac. of N as A/S, M₂ = 60 lb./ac. of N as growth mixture, M₃ = 60 lb./ac. of N as general fertilizer, M₄ = 60 lb./ac. of N as irrigated sugarcane and M₅ = 60 lb./ac. of N as F.Y.M.
F.Y.M. broadcast at sowing time while half of other fertilizers applied on 20.6.1953 at sowing and other half on 30.7.1953.

3. DESIGN:
(i) 2 x 6 Fact. in R.B.D. (ii) (a) 12. (b) N.A. (iii) 6. (iv) (a) 9' x 64'. (b) 7' x 64'. (v) N.A. (vi) Yes.

4. GENERAL:
(i) Satisfactory. (ii) Nil. (iii) Nil. (iv) (a) 1951—1953. (b) No. (c) Nil. (v) (a) No. (b) —. (vi) and (vii) Nil.

5. RESULTS:
(i) 14.48 ton/ac.
(ii) 2.99 ton/ac.
(iii) None of the effects is significant.
(iv) Av. yield of fodder in ton/ac.

<table>
<thead>
<tr>
<th></th>
<th>M₀</th>
<th>M₁</th>
<th>M₂</th>
<th>M₃</th>
<th>M₄</th>
<th>M₅</th>
<th>Mean</th>
</tr>
</thead>
<tbody>
<tr>
<td>V₁</td>
<td>11.16</td>
<td>13.60</td>
<td>14.72</td>
<td>16.52</td>
<td>14.30</td>
<td>12.63</td>
<td>13.82</td>
</tr>
<tr>
<td>Mean</td>
<td>12.84</td>
<td>13.37</td>
<td>15.08</td>
<td>16.33</td>
<td>15.32</td>
<td>13.91</td>
<td>14.48</td>
</tr>
</tbody>
</table>

S.E. of marginal mean of V = 0.50 ton/ac.
S.E. of marginal mean of M = 0.86 ton/ac.
S.E. of body of table = 1.22 ton/ac.
Crop :- Jowar.

Site :- Distt. and Demonstration Farm, Ambala.

Object :- To find out the effect of different intensities of cultivation with local and improved implements.

1. BASAL CONDITIONS :
   (i) (a) No. (b) N.A. (c) Nil. (ii) (a) Clay. (b) N.A. (iii) N.A. (iv) (a) As per treatments. (b) to (e) N.A. (v) N.A. (vi) Js-20. (vii) Irrigated. (viii) Nil. (ix) 19.77. (x) N.A.

2. TREATMENTS :
   1. Improved high : 1 raja and 2 desi plough and 2 horse hoe.
   2. Improved low : 1 raja and 1 desi plough.
   3. Improved medium : 1 raja, 1 desi plough and 1 horse hoe.
   4. Local high : 5 desi plough.
   5. Local low : 2 desi plough.
   6. Local medium : 3 desi plough.

3. DESIGN :
   (i) R.B.D. (ii) (a) 6. (b) N.A. (iii) 6. (iv) (a) and (b) 28'x158'. (v) Nil. (vi) Yes.

4. GENERAL :
   (i) Fair to good. No lodging. (ii) Nil. (iii) Fodder yield. (iv) (a) 1947-1948. (b), No. (c) —. (v) (a) No. (b) Nil. (vi) and (vii) Nil.

5. RESULTS :
   (i) 8481 lb./ac.
   (ii) 3268.2 lb./ac.
   (iii) The treatments are not significantly different.
   (iv) Av. yield of fodder in lb./ac.

   Treatment       Av. yield
   1.              8176
   2.              9807
   3.              7872
   4.              7926
   5.              8770
   6.              8335

   S.E./mean = 1334.3 lb./ac.

Crop :- Jowar.

Site :- Fodder Res. Stn., Sirsa.

Object :- To study the effect of seed rate on forage yield of Jowar.

1. BASAL CONDITIONS :
   (i) (a) Nil. (b) N.A. (c) Nil. (ii) (a) Loamy. (b) Refer soil analysis, Sirsa. (iii) 317.1948. (iv) (a) and (b) N.A. (c) As per treatments. (d) and (e) N.A. (v) N.A. (vi) As per treatments. (vii) Irrigated. (viii) N.A. (ix) 15.43. (x) 29.9.1948 to 24.10.1948.

2. TREATMENTS :
   All combinations of (1) and (2).
   (1) varieties : V₁ = Js, 20. V₂ = Js-100 and V₃ = Js-263.
   (2) seed rates : S₁ = 20, S₂ = 30, S₃ = 40 and S₄ = 50 sr./ac.

3. DESIGN :
   (i) 3 x 4 Fact. in R.B.D. (ii) (a) 12. (b) N.A. (iii) 4. (iv) (a) N.A. (b) 1/60 ac. (v) N.A. (vi) Yes.

4. GENERAL :
   (i) Fair to good. No lodging. (ii) Nil. (iii) Fodder yield. (iv) (a) 1948 to 1949. (b) [No. (c) Nil. (v) (a) No. (b) Nil. (vi) Nil. (vii) Design adopted in 1949 is split-plot, and has been conducted twice, see experiments No. 1949 (32, 36).
5. RESULTS:

(i) 14.37 ton/ac.
(ii) 1.21 ton/ac.
(iii) Only V effect is highly significant.
(iv) Av. yield of fodder in ton/ac.

<table>
<thead>
<tr>
<th></th>
<th>S₁</th>
<th>S₂</th>
<th>S₃</th>
<th>S₄</th>
<th>Mean</th>
</tr>
</thead>
<tbody>
<tr>
<td>V₁</td>
<td>13.53</td>
<td>12.60</td>
<td>13.90</td>
<td>14.51</td>
<td>13.63</td>
</tr>
<tr>
<td>V₂</td>
<td>15.10</td>
<td>14.35</td>
<td>14.74</td>
<td>15.64</td>
<td>14.96</td>
</tr>
</tbody>
</table>

S.E. of marginal mean of S = 0.35 ton/ac.
S.E. of marginal mean of V = 0.30 ton/ac.
S.E. of body of table = 0.61 ton/ac.

Crop: Jowar (Kharif).
Object: To study the effect of different seed rates on yield of different varieties of Jowar when sown early.

1. BASAL CONDITIONS:
   (i) (a) Nil. (b) Rape. (c) Nil. (ii) (a) Loam. (b) Refer soil analysis, Sirsa. (iii) 12.3.1949. (iv) (a) to (e) N.A. (v) 15 C.L./ac. of F.Y.M. applied from 14.2.1949 to 16.2.1949. (vi) As per treatments. (vii) Irrigated. (viii) Nil. (ix) 3.23'. (x) 18.5.49 to 25.6.1949 and 30.7.49 to 22.8.1949.

2. TREATMENTS:
   Main-plot treatments:
   3 varieties: V₁ = Js-20, V₂ = Js-100 and V₃ = Js-263.
   Sub-plot treatments:
   4 seed rates: S₁ = 20, S₂ = 30, S₃ = 40 and S₄ = 50 sr./ac.

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

4. GENERAL:
   (i) Satisfactory. ' No lodging. (ii) Nil. (iii) Forage yield. (iv) (a) 1948 to 1949. (b) No. (c) Nil. (v) (a) Nil. (b) Nil. (vi) and (vii) Nil.

5. RESULTS:

(i) 22.34 ton/ac.
(ii) (a) 4.01 ton/ac.
   (b) 1.65 ton/ac.
(iii) Only interaction V x S is significant.
(iv) Av. yield of grain in ton/ac.

<table>
<thead>
<tr>
<th></th>
<th>S₁</th>
<th>S₂</th>
<th>S₃</th>
<th>S₄</th>
<th>Mean</th>
</tr>
</thead>
<tbody>
<tr>
<td>V₁</td>
<td>20.73</td>
<td>21.10</td>
<td>20.59</td>
<td>20.02</td>
<td>20.61</td>
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<tr>
<td>V₂</td>
<td>20.33</td>
<td>23.78</td>
<td>22.52</td>
<td>20.71</td>
<td>21.83</td>
</tr>
<tr>
<td>V₃</td>
<td>24.23</td>
<td>23.25</td>
<td>24.03</td>
<td>26.76</td>
<td>24.57</td>
</tr>
<tr>
<td>Mean</td>
<td>21.76</td>
<td>22.71</td>
<td>22.38</td>
<td>22.50</td>
<td>22.34</td>
</tr>
</tbody>
</table>

S.E. of difference of two
1. V marginal means = 1.41 ton/ac.
2. S marginal means = 0.68 ton/ac.
3. S means at the same level of V = 1.17 ton/ac.
4. V means at the same level of S = 1.74 ton/ac.
Object:—To study the effect of different seed rates on yield of different varieties of Jowar when sown late.

1. BASAL CONDITIONS:
   (i) (a) Nil. (b) Rape. (c) N.A. (ii) (a) Loam. (b) Refer soil analysis, Sirsa. (iii) 6.8.1949. (iv) (a) and (b) N.A. (c) As per treatments. (d) and (e) N.A. (v) 30 C.L. of F.Y.M. applied from 13.2.1949 to 28.2.1949. (vi) As per treatments. (vii) Irrigated. (viii) Nil. (ix) 4.06”. (x) 10.10.1949 to 27.2.1949.

2. TREATMENTS:
   Main-plot treatments: —
   3 varieties: V1 = Js-20, V2 = Js-100 and V3 = Js-263
   Sub-plot treatments: —
   4 seed rates: S1 = 20, S2 = 30, S3 = 40 and S4 = 50 sr./ac.

3. DESIGN
   (i) Split-plot. (ii) (a) 3 main-plots/block; 4 sub-plots/main-plot. (b) N.A. (iii) 4. (iv) (a) and (b) 6’9” x 64’. (v) Nil. (vi) Yes.

4. GENERAL:
   (i) Germination good but growth restricted by continuous dry weather. No lodging. (ii) Nil. (iii) Forage yield. (iv) (a) 1948-49. (b) and (c) Nil. (v) (a) and (b) No. (vi) and (vii) Nil.

5. RESULTS:
   (i) 12.66 ton/ac.
   (ii) (a) 1.52 ton/ac.
   (b) 1.26 ton/ac.
   (iii) None of the effects significant.
   (iv) Av. yield of fodder in ton/ac.

<table>
<thead>
<tr>
<th></th>
<th>S1</th>
<th>S2</th>
<th>S3</th>
<th>S4</th>
<th>Mean</th>
</tr>
</thead>
<tbody>
<tr>
<td>V1</td>
<td>12.45</td>
<td>12.41</td>
<td>11.71</td>
<td>12.13</td>
<td>12.18</td>
</tr>
<tr>
<td>V2</td>
<td>13.06</td>
<td>13.20</td>
<td>12.50</td>
<td>13.45</td>
<td>13.05</td>
</tr>
<tr>
<td>V3</td>
<td>12.78</td>
<td>12.32</td>
<td>12.39</td>
<td>13.52</td>
<td>12.75</td>
</tr>
<tr>
<td>Mean</td>
<td>12.76</td>
<td>12.64</td>
<td>12.20</td>
<td>13.03</td>
<td>12.66</td>
</tr>
</tbody>
</table>

S.E. of difference of two
1. V marginal means =0.54 ton/ac.
2. S marginal means =0.51 ton/ac.
3. S means at the same level of V =0.89 ton/ac.
4. V means at the same level of S =0.94 ton/ac.

Object:—To study the effect of varying applications of manure and irrigation on two varieties of Jowar when sown early.

1. BASAL CONDITIONS:
   (i) (a) Nil. (b) Berseem. (c) Nil. (ii) (a) Loam. (b) Refer soil analysis, Sirsa. (iii) 9.4.1950. (iv) (a) 1 raja, 5 desi ploughings and 7 sobaiga. (b) to (e) N.A. (v) Nil. (vi) As per treatments. (vii) Irrigated. (viii) Nil. (ix) 7.12”. (x) 6 to 15.7.1950.
2. TREATMENTS:
Main-plot treatments:
3 levels of irrigation: \( I_1 = 3 \) (low), \( I_2 = 5 \) (medium) and \( I_3 = 7 \) (high) irrigations.

Sub-plot treatments:
All combinations of (1) and (2)
(1) 2 varieties: \( V_1 = \text{Js.-20} \) (medium) and \( V_2 = \text{Js.-263} \) (medium).
(2) 3 doses of \( N \): \( N_0 = 0 \), \( N_1 = 50 \) lb./ac. of N as A/S and \( N_2 = 100 \) lb./ac. of N as F.Y.M.
F.Y.M. applied on 29.3.50 and A/S applied on 6.5.1950.

3. DESIGN:
(i) Split-plot. (ii) (a) 3 main-plots/block; 6 sub-plots/main-plot. (b) N.A. (iii) 4. (iv) (a) and (b) 1/90 ac. (v) Nil. (vi) Yes.

4. GENERAL:
(i) Germination and growth normal. No lodging. (ii) Nil. (iii) Forage yield. (iv) (a) 1950-to 1951. (b) and (c) Nil. (v) (a) and (b) No. (vi) and (vii) Nil.

5. RESULTS:
(i) 10.19 ton/ac.
(ii) (a) 1.89 ton/ac.
(b) 1.65 ton/ac.
(iii) \( V \) effect is significant, \( M \) effect is highly significant. Other effects are not significant.
(iv) Av. yield of fodder in ton/ac.

<table>
<thead>
<tr>
<th></th>
<th>N_0</th>
<th>N_1</th>
<th>N_2</th>
<th>Mean</th>
<th>V_1</th>
<th>V_2</th>
</tr>
</thead>
<tbody>
<tr>
<td>I_1</td>
<td>6.37</td>
<td>11.20</td>
<td>9.40</td>
<td>8.99</td>
<td>8.49</td>
<td>9.49</td>
</tr>
<tr>
<td>I_2</td>
<td>7.03</td>
<td>14.19</td>
<td>9.90</td>
<td>10.37</td>
<td>9.59</td>
<td>11.16</td>
</tr>
<tr>
<td>I_3</td>
<td>8.04</td>
<td>14.80</td>
<td>10.31</td>
<td>11.22</td>
<td>10.45</td>
<td>11.98</td>
</tr>
<tr>
<td>Mean</td>
<td>7.15</td>
<td>13.40</td>
<td>10.04</td>
<td>10.19</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

\( V_1 \) and \( V_2 \):

<table>
<thead>
<tr>
<th></th>
<th>N_0</th>
<th>N_1</th>
<th>N_2</th>
<th>Mean</th>
<th>V_1</th>
<th>V_2</th>
</tr>
</thead>
<tbody>
<tr>
<td>V_1</td>
<td>6.79</td>
<td>12.31</td>
<td>9.44</td>
<td>9.51</td>
<td></td>
<td></td>
</tr>
<tr>
<td>V_2</td>
<td>7.51</td>
<td>14.49</td>
<td>10.64</td>
<td>10.88</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

S.E. of marginal mean of \( N \) = 0.479 ton/ac.
S.E. of marginal mean of \( V \) = 0.391 ton/ac.
S.E. of body of table \( N \times V \) = 0.675 ton/ac.
S.E. of difference of two
1. I marginal means = 0.788 ton/ac.
2. \( V \) means at the same level of I = 0.958 ton/ac.
3. I means at the same level of \( V \) = 1.028 ton/ac.
4. \( N \) means at the same level of I = 1.173 ton/ac.
5. I means at the same level of \( N \) = 1.231 ton/ac.

Crop :- Jowar (Kharif).
Site :- Fodder Res. Stn., Sirsa.

Object :- To study the effect of varying applications of manure and irrigation on two varieties of Jowar when sown early.

1. BASAL CONDITIONS:
(i) (a) Nil. (b) Berseem (c) Nil. (ii) (a) Loam. (b) Refer soil analysis, Sirsa. (iii) 1.4.1951. (iv) (a) to (e) N.A. (v) Nil. (vi) As per treatments. (vii) Irrigated. (viii) Nil. (ix) 5.48°. (x) 21,22.6,1951.
2. TREATMENTS:

Main-plot treatments:
- 3 levels of irrigation: \( I_1 = 2 \) (low), \( I_2 = 4 \) (medium), \( I_3 = 6 \) (high) irrigations.

Sub-plot treatments:
- All combinations of (1) and (2)
  - (1) 2 varieties: \( V_1 = \text{Js-20} \) (medium) and \( V_2 = \text{Js-263} \) (medium).
  - (2) 3 doses of \( N \): \( N_0 = 0 \), \( N_1 = 50 \text{ lb./ac. of N as A/S} \), and \( N_2 = 100 \text{ lb./ac. of N as F.Y.M.} \).

3. DESIGN:
- (i) Split-plot. (ii) (a) 3 main-plots/block; 6 sub-plots/main-plot. (b) N.A. (iii) 2. (iv) (a) N.A. (b) 1/90 ac. (v) N.A. (vi) Yes.

4. RESULTS:

<table>
<thead>
<tr>
<th>( N_0 )</th>
<th>( N_1 )</th>
<th>( N_2 )</th>
<th>Mean</th>
<th>( V_1 )</th>
<th>( V_2 )</th>
</tr>
</thead>
<tbody>
<tr>
<td>( I_1 )</td>
<td>2.67</td>
<td>5.36</td>
<td>4.48</td>
<td>4.17</td>
<td>3.71</td>
</tr>
<tr>
<td>( I_2 )</td>
<td>3.75</td>
<td>7.24</td>
<td>6.20</td>
<td>5.73</td>
<td>5.30</td>
</tr>
<tr>
<td>( I_3 )</td>
<td>4.62</td>
<td>8.98</td>
<td>6.66</td>
<td>6.75</td>
<td>6.18</td>
</tr>
</tbody>
</table>

Mean

| \( V_1 \) | 3.68    | 7.19    | 5.78 | 5.55 |
| \( V_2 \) | 4.13    | 7.72    | 6.26 | 6.04 |

S.E. of marginal mean of \( N \) = 0.142 ton/ac.
S.E. of marginal mean of \( V \) = 0.116 ton/ac.
S.E. of body of table \( N \times V \) = 0.200 ton/ac.

Object: To study the effect of varying applications of manure and irrigations on two varieties of jowar when sown at normal time.

1. BASAL CONDITIONS:
   - (i) Nil. (b) Rape. (c) Nil. (ii) (a) Loam. (b) Refer soil analysis, Sirsa. (iii) 23.6.1950. (iv) (a) to (e) N.A. (v) Nil. (vi) As per treatments. (vii) Irrigated. (viii) Nil. (ix) 8.47". (x) 25 to 28.8.1950.

2. TREATMENTS:

Main-plot treatments:
- 3 levels of irrigation: \( I_1 = 3 \) (low), \( I_2 = 5 \) (medium) and \( I_3 = 7 \) (high) irrigations.

Sub-plot treatments:
- All combinations of (1) and (2)
  - (1) 2 varieties: \( V_1 = \text{Js-20} \) (medium) and \( V_2 = \text{Js-263} \) (medium).
  - (2) 3 doses of \( N \): \( N_0 = 0 \), \( N_1 = 50 \text{ lb./ac. of N as F.Y.M.} \) and \( N_2 = 100 \text{ lb./ac. of N as F.Y.M.} \).
3. DESIGN:
(i) Split-plot. (ii) (a) 3 main-plots/block; 6 sub-plots/main-plot. (iii) 2. (iv) (a) and (b) 12’x62’
(v) Nil. (vi) Yes.

4. GENERAL:
(i) Normal. No lodging. (ii) Nil. (iii) Forage yield. (iv) (a) 1950 to 1951. (b) No. (c) Nil. (v) (a) Nil.
(b) Nil. (vi) and (vii) Nil.

5. RESULTS:
(i) 12.16 ton/ac.
(ii) (a) 0.30 ton/ac.
(b) 0.50 ton/ac.
(i-i) Only I, V and M effects are highly significant.
(iv) Av. yield of fodder in ton/ac.

<table>
<thead>
<tr>
<th></th>
<th>N₀</th>
<th>N₁</th>
<th>N₂</th>
<th>Mean</th>
<th>V₁</th>
<th>V₂</th>
</tr>
</thead>
<tbody>
<tr>
<td>I₁</td>
<td>9.42</td>
<td>12.73</td>
<td>11.18</td>
<td>11.11</td>
<td>9.88</td>
<td>12.34</td>
</tr>
<tr>
<td>I₃</td>
<td>11.25</td>
<td>14.20</td>
<td>13.54</td>
<td>13.00</td>
<td>12.20</td>
<td>13.80</td>
</tr>
<tr>
<td>V₁</td>
<td>9.31</td>
<td>12.51</td>
<td>11.70</td>
<td>11.19</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

S.E. of marginal mean of M =0.144 ton/ac.
S.E. of marginal mean of V =0.117 ton/ac.
S.E. of body of table N x V =0.205 ton/ac.
S.E. of difference of two
1. I marginal means =0.124 ton/ac.
2. V means at the same level of I =0.287 ton/ac.
3. I means at the same level of V =0.238 ton/ac.
4. N means at the same level of I =0.353 ton/ac.
5. I means at the same level of N =0.314 ton/ac.

Crop: - Jowar (Kharij).
Site: - Fodder Res. Stn., Sirsa.
Ref: - Pb. 51(97).
Type: - 'IMV'.

Object: - To study the effect of varying applications of manures and irrigations on two varieties when
sown at normal time.

1. BASAL CONDITIONS:
(i) (a) Nil. (b) Fallow. (c) Nil. (ii) (a) Loam. (b) Refer soil analysis, Sirsa. (iii) 3.7.1951. (iv) (a) 1
raja, 5 desi and 6 sohaga. (b) N.A. (c) 5 lb. ch./plot. (d) and (e) N.A. (v) Nil. (vi) As per treatments.
(vii) Irrigated. (viii) Nil. (ix) 5.48”. (x) 6, 13.9.1951.

2. TREATMENTS:
Main-plot treatments:
3 levels of irrigation : I₀=0 (no), I₁=2 (medium) and I₂=3 (high) irrigations.
Sub-plot treatments:
All combinations of (1) and (2)
(1) 2 varieties : V₁=Js-20 (medium) and V₂=Js-263 (medium).
(2) 3 doses of N : N₀=0, N₁=50 lb/ac. of N as A/S and N₂=100 lb/ac. of N as F.Y.M.
3. DESIGN:
(i) Split plot. (ii) (a) 3 main-plots/block ; 6 sub-plot/main-plots. (iv) (a) N.A. (b) 62'x12'. (v) N.A. (vi) Yes.

4. GENERAL:
(i) Normal. No lodging. (ii) Nil. (iii) Forage yield. (iv) (a) 1950-1951: (b) No. (c) Nil. (v) (a) No. (b) Nil. (vi) and (vii) Nil.

5. RESULTS:
(i) 9.78 ton/ac.
(ii) (a) 0.237 ton/ac.
(b) 0.704 ton/ac.
(iii) I effect is significant and V and N effects are highly significant.
(iv) Av. yield of fodder in ton/ac.

<table>
<thead>
<tr>
<th>I A</th>
<th>N 0</th>
<th>N 1</th>
<th>N 2</th>
<th>Mean</th>
</tr>
</thead>
<tbody>
<tr>
<td>I A</td>
<td>7.88</td>
<td>10.35</td>
<td>9.55</td>
<td>9.26</td>
</tr>
<tr>
<td>I I</td>
<td>8.30</td>
<td>11.56</td>
<td>9.69</td>
<td>9.82</td>
</tr>
<tr>
<td>I 2</td>
<td>8.14</td>
<td>11.90</td>
<td>10.77</td>
<td>10.37</td>
</tr>
<tr>
<td>Mean</td>
<td>8.11</td>
<td>11.27</td>
<td>9.98</td>
<td>9.75</td>
</tr>
<tr>
<td>V 1</td>
<td>7.48</td>
<td>10.89</td>
<td>9.70</td>
<td>9.36</td>
</tr>
<tr>
<td>V 2</td>
<td>8.73</td>
<td>11.65</td>
<td>10.24</td>
<td>10.21</td>
</tr>
</tbody>
</table>

S.E. of marginal mean of N =0.203 ton/ac.
S.E. of marginal mean of V =0.166 ton/ac.
S.E. of body of table N x V =0.287 ton/ac.
S.E. of difference of two
1. I marginal means =0.096 ton/ac.
2. V means at the same level of I =0.406 ton/ac.
3. I means at the same level of V =0.303 ton/ac.
4. N means at the same level of I =0.498 ton/ac.
5. I means at the same level of N =0.418 ton/ac.

Crop :- Maize.
Site :- Distt. and Demonstration Farm. Ambala.
Object :- To find the best source of N for Maize.

1. BASAL CONDITIONS:
(i) (a) Nil. (b) Fallow. (c) Nil. (ii) (a) Clayey. (b) N.A. (iii) 29.7.1950. (iv) (a) and (b) N.A. (c) 3 ch /plot. (d) and (e) N.A. (v) Nil. (vi) Local. (vii) Irrigated. (viii) One hoeing on 22.8.1959.
(ix) 28.3.1.

2. TREATMENTS:
All combinations of (1) and (2) + a control (no manure).
(1) 3 forms of N : S 1 =F.Y.M., S 2 =Ammo. Phos. and S 3 =A/S.
(2) 2 levels of N : N 1 =40 and N 2 =60 lb./ac.

3. DESIGN:
(i) R.B.D. (ii) (a) 7. (b) N.A. (iii) 6. (iv) (a) 13'x62.04'. (b) 13x62.04 (v) Nil. (vi) Yes.

4. GENERAL:
(i) Good. No lodging. (ii) Nil. (iii) Grain yield. (iv) (a) Not contd. (b) and (c) No. (v) (a) and (b) Nil. (vi) and (vii) Nil.
5. RESULTS:

(i) 1769 lb./ac.
(ii) 451.8 lb./ac.
(iii) "Control vs. others" e.Text and interaction N x S are significant.
(iv) Av. yield of grain in lb./ac.

Control = 2182 lb./ac.

<table>
<thead>
<tr>
<th></th>
<th>S1</th>
<th>S2</th>
<th>S3</th>
<th>Mean</th>
</tr>
</thead>
<tbody>
<tr>
<td>N1</td>
<td>1722</td>
<td>2062</td>
<td>1754</td>
<td>1846</td>
</tr>
<tr>
<td>N2</td>
<td>1886</td>
<td>1176</td>
<td>1604</td>
<td>1555</td>
</tr>
<tr>
<td>Mean</td>
<td>1804</td>
<td>1619</td>
<td>1679</td>
<td>1701</td>
</tr>
</tbody>
</table>

S.E. of marginal mean of S = 120.8 lb./ac.
S.E. of marginal mean of N = 106.5 lb./ac.
S.E. of body of table = 184.5 lb./ac.

Crop: - Maize.
Site: - Distt. and Demonstration Farm, Ambala.
Object: - To find a suitable dose of A/S for Maize crop.
Type: - 'M'.

Ref: - Pb. 52(156).

1. BASAL CONDITIONS:
   (i) (a) Nil. (b) Peas. (c) Nil. (ii) (a) Clayey. (b) N.A. (iii) 18.7.1952. (iv) (a) to (e) N.A. (v) 12 C.L./ac. of city compost; date N.A. (vi) Local. (vii) Irrigated. (viii) N.A. (ix) 19.78'. (x) 9.10.1952.

2. TREATMENTS:
   1. Control (no manure).
   2. 40 lb./ac. of N as A/S.
   3. 60 lb./ac. of N as A/S.

3. DESIGN:
   (i) R.B.D. (ii) (a) 3. (b) N.A. (iii) 6. (iv) (a) and (b) 11' x 65'. (v) Nil. (vi) Yes.

4. GENERAL:
   (i) Fair. No lodging. (ii) Nil. (iii) Grain yield. (iv) (a) 1952-53. (b) and (c) No. (v) (a) No. (b) Nil. (vi) and (vii) Nil.

5. RESULTS:
   (i) 2192 lb./ac.
   (ii) 388.9 lb./ac.
   (iii) Treatments are significantly different.
   (iv) Av. yield of grain in lb./ac.

<table>
<thead>
<tr>
<th>Treatment</th>
<th>Av. yield</th>
<th>S.E./mean</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>1922</td>
<td>150.6 lb./ac.</td>
</tr>
<tr>
<td>2.</td>
<td>2119</td>
<td></td>
</tr>
<tr>
<td>3.</td>
<td>2534</td>
<td></td>
</tr>
</tbody>
</table>
Crop :- Maize.  
Site :- Distt. and Demonstration Farm, Ambala.  
Object :- To find a suitable dose of A/S for Maize.

1. BASAL CONDITIONS:
   (i) (a) Nil. (b) Wheat. (c) Nil. (ii) (a) Clayey. (b) N.A. (iii) 1.7.1953. (iv) (a) to (e) N.A. (v) Nil. (vi) Local. (vii) Irrigated. (viii) N.A. (ix) 25.61°. (x) 29.9.1953.

2. TREATMENTS:
   1. Control (no manure).
   2. 40 lb./ac. of N as A/S.
   3. 60 lb./ac. of N as A/S.
   Half dose applied on 1.7.1953 while the other half on 17.7.1953.

3. DESIGN:
   (i) R.B.D. (ii) (a) 3. (b) N.A. (iii) 6. (iv) (a) N.A. (b) 72.6' x 10'. (v) N.A. (vi) Yes.

4. GENERAL:
   (i) Good. No lodging. (ii) Nil. (iii) Grain and straw yield. (iv) (a) Not continued. (b) No. (c) Nil. (v) (a) No. (b) Nil. (vi) and (vii) Nil.

5. RESULTS:
   (i) 1094 lb./ac.
   (ii) 1306 lb./ac.
   (iii) Treatments are highly significantly different.
   (iv) Av. yield of grain in lb./ac.
   Treatment         | Av. yield |
   -------------      |----------|
   1.               | 688      |
   2.               | 1092     |
   3.               | 1233     |
   S.E./mean       = 53.3 lb./ac.

---

Crop :- Maize.
Site :- Distt. and Demonstration Farm, Ambala.
Object :- To find out a suitable manural formula for Maize crop.

1. BASAL CONDITIONS:
   (i) (a) Nil. (b) Wheat. (c) Clayey. (b) N.A. (iii) 1.7.1953. (iv) (a) to (e) N.A. (v) Nil. (vi) Local. (vii) Irrigated. (viii) N.A. (ix) 25.61°. (x) 29.9.1953.

2. TREATMENTS:
   1. Control.
   2. 50 lb./ac. of N as A/S.
   3. 100 lb./ac. of N as A/S.
   4. 50 lb./ac. of N as A/S+25 lb./ac. of P₂O₅ as Super.
   5. 100 lb./ac. of N as A/S+25 lb./ac. of P₂O₅ as Super.
   6. 100 lb./ac. of N as A/S+25 lb./ac. of P₂O₅ as Super+25 lb./ac. of K₂O as Pot. Nitrate.

3. DESIGN:
   (i) R.B.D. (ii) (a) 6. (b) N.A. (iii) 3. (iv) (a) N.A. (b) 72.6' x 10'. (v) N.A. (vi) Yes.

4. GENERAL:
   (i) Good. No lodging. (ii) Nil. (iii) Grain yield. (iv) (a) Not continued. (b) No. (c) Nil. (v) (a) No. (b) Nil. (vi) and (vii) Nil.
5. RESULTS:
(i) 1348 lb./ac.
(ii) 175.1 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>982</td>
</tr>
<tr>
<td>2.</td>
<td>1185</td>
</tr>
<tr>
<td>3.</td>
<td>1476</td>
</tr>
<tr>
<td>4.</td>
<td>1126</td>
</tr>
<tr>
<td>5.</td>
<td>1823</td>
</tr>
<tr>
<td>6.</td>
<td>1497</td>
</tr>
</tbody>
</table>

S.E./mean = 101.1 lb./ac.

Crop: Maize (Kharij).
Site: Oilseed Sub-Stn., Gummar.

Object: To study the effect of A/S and Super on the yield of Maize.

1. BASAL CONDITIONS:
(i) (a) Nil. (b) Wheat. (c) Nil. (ii) (a) Clayey loam. (b) N.A. (iii) 1.7.1951. (iv) (a) N.A. (b) Broadcast. (c) 5 sr. of seed for all plots. (d) and (e) —. (v) Nil. (vi) Local (medium). (vii) Rainfed. (viii) 3 hoeings and weedings. (ix) 40.8'/ approx. (x) 17.11.1951.

2. TREATMENTS:
All combinations of (1) and (2)
(1) 3 levels of N as A/S: \(N_0=0, N_1=50\) and \(N_2=100\) lb./ac.
(2) 2 levels of \(P_2O_5\) as Super: \(P_0=0\) and \(P_1=50\) lb./ac.

3. DESIGN:
(i) 3x2 Fact. in R.B.D. (ii) (a) 6. (b) N.A. (iii) 4. (iv) (a) and (b) 1/80.5 ac. (v) Nil. (vi) Yes.

4. GENERAL:
(i) Germination and condition normal. No lodging. (ii) Nil. (iii) Grain yield. (iv) (a) Not contd. (b) —. (c) —. (v) (a) No. (b) Nil. (vi) and (vii) Nil.

5. RESULTS:
(i) 1123 lb./ac.
(ii) 119.6 lb./ac.
(iii) Only N effect is highly significant.
(iv) Av. yield of grain in lb./ac.

<table>
<thead>
<tr>
<th></th>
<th>(P_0)</th>
<th>(P_1)</th>
<th>Mean</th>
</tr>
</thead>
<tbody>
<tr>
<td>(N_0)</td>
<td>756</td>
<td>756</td>
<td>756</td>
</tr>
<tr>
<td>(N_1)</td>
<td>1270</td>
<td>1395</td>
<td>1333</td>
</tr>
<tr>
<td>(N_2)</td>
<td>1245</td>
<td>1317</td>
<td>1281</td>
</tr>
<tr>
<td>Mean</td>
<td>1030</td>
<td>1156</td>
<td>1123</td>
</tr>
</tbody>
</table>

S.E. of marginal mean of N = 42.3 lb./ac.
S.E. of marginal mean of P = 34.5 lb./ac.
S.E. of body of table = 59.8 lb./ac.
Crop: Maize (Kharif).  
Site: Govt. Agri. Stn., Gurdaspur.  
Ref: Pb. 49 (9).  
Type: 'M'.

Object: To study the effect of A/S on fodder yield of Maize crop.

1. BASAL CONDITIONS:
   (i) (a) N.A. (b) Wheat. (c) Nil.  
   (ii) (a) Loam. (b) N.A.  
   (iii) 6.7.1949.  
   (iv) (a) 1 Hindustan, 2 desi hal and 2 sohaga. (b) to (c) N.A.  
   (v) 13 C.L. of F.Y.M./ac. as basal dose on 19, 20.6.1949.  
   (vi) Local.  
   (vii) Irrigated. (viii) One bund making, one hoening and one panjdanti. (ix) 18.11°. (x) 17 to 27.9.1949.

2. TREATMENTS:
   1. Control.  
   2. 100 lb./ac. of N as A/S.  
   3. 200 lb./ac. of N as A/S.  
   Half dose of A/S was applied on 13.8.1949. while the other half was applied on 18.8.1949.

3. DESIGN:
   (i) R.B.D.  
   (ii) (a) 3. (b) N.A.  
   (iii) 5.  
   (iv) (a) and (b) 16'x68'.  
   (v) Nil.  
   (vi) Yes.

4. GENERAL:
   (i) Germination and growth satisfactory. No lodging.  
   (ii) Nil.  
   (iii) Forage yield. (iv) (a) Not contd. (b) No. (c) Nil. (v) (a) No. (b) No. (vi) and (vii) Nil.

5. RESULTS:
   (i) 1802.9 lb./ac.  
   (ii) 1371.4 lb./ac.  
   (iii) Treatments are highly significantly different.  
   (iv) Av. yield of fodder in lb./ac.  
   Treatment | Av. yield  
   1. | 14707  
   2. | 19747  
   3. | 19632  
   S.E./mean = 613.3 lb./ac.

Crop: Maize (Kharif).  
Site: Govt. Agri. Stn., Gurdaspur.  
Ref: Pb. 49(8).  
Type: 'M'.

Object: To compare the effect of different doses of Ammo. Phos. and A/S on the yield of Maize.

1. BASAL CONDITIONS:
   (i) (a) Nil. (b) Wheat. (c) Nil.  
   (ii) (a) Loam. (b) N.A.  
   (iii) 15.7.1949.  
   (iv) (a) 1 Hindustan, 5 desi ploughings, 3 sohaga, and 1 horse hoe. (b) to (e) N.A.  

2. TREATMENTS:
   1. Control.  
   2. 75 lb./ac. of N as A/S  
   3. 150 lb./ac. of N as A/S  
   4. 75 lb./ac. of N as Ammo. Phos.  
   5. 150 lb./ac. of N as Ammo. Phos.  
   6. 75 lb./ac. of N as A/S+95 lb./ac. of P2O5 as Super.  
   7. 150 lb./ac. of N as A/S+190 lb./ac. of P2O5 as Super.

3. DESIGN:
   (i) R.B.D.  
   (ii) (a) 7. (b) N.A.  
   (iii) 5.  
   (iv) (a) 16'x70'. (b) 14'x62'. 2.7°.  
   (v) N.A.  
   (vi) Yes.

4. GENERAL:
   (i) Germination satisfactory; growth fair. No lodging.  
   (ii) Nil.  
   (iii) Grain yield. (iv) (a) 1949 to 1951.  
   (b) No. (c) Nil. (v) (a) No. (b) Nil. (vi) and (vii) Nil.
5. RESULTS:

(i) 1665 lb./ac.
(ii) 263.7 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>1435</td>
</tr>
<tr>
<td>2.</td>
<td>1810</td>
</tr>
<tr>
<td>3.</td>
<td>1782</td>
</tr>
<tr>
<td>4.</td>
<td>1666</td>
</tr>
<tr>
<td>5.</td>
<td>1702</td>
</tr>
<tr>
<td>6.</td>
<td>1623</td>
</tr>
<tr>
<td>7.</td>
<td>1638</td>
</tr>
<tr>
<td>S.E./mean</td>
<td>=117.9 lb./ac.</td>
</tr>
</tbody>
</table>

Crop : Maize (Kharif).

Site : Govt. Agri. Stn., Gurdaspur.

Ref: - Pb. 50(9).

Type : 'M'.

Object : To compare the effect of different doses of Ammonia Phos. and A/S on the yield of Maize crop.

1. BASAL CONDITIONS:

(i) (a) Nil. (b) Wheat. (c) Nil. (ii) (a) Loam. (b) N.A. (iii) 26.6.1950. (iv) (a) 4 ploughings, and 5 sowing. (b) and (c) N.A. (d) 1' row to row. (e) N.A. (v) Nil. (vi) Local. (vii) Irrigated. (viii) 2 hoeings cum weeding. (ix) 53.2'. (x) 15.10.1950.

2. TREATMENTS:

1. Control.
2. 75 lb./ac. of N as A/S.
3. 150 lb./ac. of N as A/S.
4. 75 lb./ac. of N as Ammonia Phos.
5. 150 lb./ac. of N as Ammonia Phos.
6. 75 lb./ac. of N as A/S+85 lb./ac. of P2O5 as Super.
7. 153 lb./ac. of N as A/S+160 lb./ac. of P2O5 as Super.

3. DESIGN:

(i) R.B.D. (ii) (a) 7. (b) N.A. (iii) 4. (iv) (a) and (b) 12'X82'. (v) Nil. (vi) Yes.

4. GENERAL:

(i) Normal. No lodging. (ii) Nil. (iii) Grain yield. (iv) (a) 1949 to 1951. (b) No. (c) Nil. (v) (a) No. (b) -. (vi) and (vii) Nil.

5. RESULTS:

(i) 1338 lb./ac.
(ii) 218.5 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>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>897</td>
</tr>
<tr>
<td>2.</td>
<td>1406</td>
</tr>
<tr>
<td>3.</td>
<td>1748</td>
</tr>
<tr>
<td>4.</td>
<td>1160</td>
</tr>
<tr>
<td>5.</td>
<td>1309</td>
</tr>
<tr>
<td>6.</td>
<td>1358</td>
</tr>
<tr>
<td>7.</td>
<td>1406</td>
</tr>
<tr>
<td>S.E./mean</td>
<td>=109.2 lb./ac.</td>
</tr>
</tbody>
</table>
Crop :- Maize (Kharif).
Site :- Govt. Agri. Stn., Gurdaspur.

Object :- To compare the effect of different doses of Ammo. Phos. and A/S on the yield of Maize.

1. BASAL CONDITIONS:
(i) (a) Nil. (b) Berseem. (c) Nil. (ii) (a) Loam. (b) N.A. (iii) 26.6.1951. (iv) (a) 7 desi hal. and 6 sohaga, (b) to (e) N.A. (v) Nil. (vi) Local. (vii) Irrigated. (viii) Once gap filling and 2 hoeings. (ix) 11.59". (x) 21.9.1951.

2. TREATMENTS:
1. Control.
2. 75 lb./ac. of N as A/S.
3. 150 lb./ac. of N as A/S.
4. 75 lb./ac. of N as Ammon. Phos.
5. 150 lb./ac. of N as Ammon. Phos.
6. 75 lb./ac. of N as A/S + 95 lb./ac. of P₂O₅ as Super.
7. 150 lb./ac. of N as A/S + 190 lb./ac. of P₂O₅ as Super.

A/S and Ammon. Phos. were applied on 2.8.1951 while Super was applied on 25.6.1951.

3. DESIGN:
(i) R.B.D. (ii) (a) 7. (b) N.A. (iii) 4. (iv) (a) and (b) 12'x75'x7'. (v) Nil. (vi) Yes.

4. GENERAL:
(i) Germination satisfactory. Growth fair. No lodging. (ii) Nil. (iii) Grain yield. (iv) (a) 1949 to 1951. (b) No. (c) Nil. (v) (a) No. (b) —. (vi) and (vii) Nil.

5. RESULTS:
(i) 1237 lb./ac.
(ii) 291.5 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>1.</td>
<td>895</td>
</tr>
<tr>
<td>2.</td>
<td>1137</td>
</tr>
<tr>
<td>3.</td>
<td>1361</td>
</tr>
<tr>
<td>4.</td>
<td>1151</td>
</tr>
<tr>
<td>5.</td>
<td>1233</td>
</tr>
<tr>
<td>6.</td>
<td>1568</td>
</tr>
<tr>
<td>7.</td>
<td>1296</td>
</tr>
<tr>
<td>S.E./mean</td>
<td>145.7 lb./ac.</td>
</tr>
</tbody>
</table>

Crop :- Maize (Kharif).
Site :- Govt. Agri. Stn., Gurdaspur.

Object :- To study the effect of different doses of N as A/S and Ammo. Phos. on the yield of Maize.

1. BASAL CONDITIONS:
(i) (a) Nil. (b) Wheat. (c) Nil. (ii) (a) Loam. (b) N.A. (iii) 3.7.1949. (iv) (a) 1 Hindustan, 5 desi ploughings, 3 sohaga, and 1 horse hoe. (b) to (e) N.A. (v) 13 C.L./ac. of F.Y.M. on 19.6.1949 to 20.6.1949. (vi) Local. (vii) Irrigated. (viii) 2 hoeings and 2 weedings. (ix) 18.11". (x) 19.10.1949.

2. TREATMENTS:
All combinations of (1) and (2)+a control.
(1) 3 levels of N : N₁=50, N₂=100 and N₃=150 lb./ac.
(2) 2 sources of N : S₁=A/S and S₂=Ammo. Phos.
3. DESIGN.
(i) R.B.D. (ii) (a) 7. (b) N.A. (iii) 5. (iv) (a) 16'×70' (b) 14'×62'-2.7'. (v) N.A. (vi) Yes.

4. GENERAL:
(i) Germination satisfactory. Growth fair. No lodging. (ii) Nil. (iii) Grain yield. (iv) (a) 1949 to 1950. (b) No. (c) Nil. (v) (a) No. (b) Nil. (vi) and (vii) Nil.

5. RESULTS:
(i) 1365 lb./ac. (ii) 213.3 lb./ac. (iii) Only “control vs. others” effect is significant. (iv) Avg. yield of grain in lb./ac.

<table>
<thead>
<tr>
<th>Control</th>
<th>N1</th>
<th>N2</th>
<th>N3</th>
<th>Mean</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>1363</td>
<td>1338</td>
<td>1509</td>
<td>1403</td>
</tr>
<tr>
<td>S1</td>
<td>1377</td>
<td>1476</td>
<td>1497</td>
<td>1450</td>
</tr>
<tr>
<td>Mean</td>
<td>1370</td>
<td>1407</td>
<td>1503</td>
<td>1427</td>
</tr>
</tbody>
</table>

S.E. of marginal mean of N = 67.4 lb./ac.
S.E. of marginal mean of S = 55.1 lb./ac.
S.E. of body of table = 95.4 lb./ac.

Object: To study the effect of different doses of N as A/S and Ammo. Phos. on the yield of Maize.

1. BASAL CONDITIONS:
(i) (a) Nil. (b) Wheat. (c) N.A. (ii) (a) Loam. (b) N.A. (iii) 20.6.1950. (iv) (a) 4 ploughings, and 5 sowing. (b) and (c) N.A. (d) 1' row to row. (e) N.A. (v) Nil. (vi) Local. (vii) Irrigated. (viii) 2 hoeings cum weeding. (ix) 54.24°. (x) 15.10.1950.

2. TREATMENTS:
All combinations of (1) and (2)+a control.
(1) 3 levels of N: N1=50, N2=190 and N3=150 lb./ac.
(2) 2 sources of N: S1=A/S and S2=Ammo. Phos.

3. DESIGN:
(i) R.B.D. (ii) (a) 7. (b) N.A. (iii) 4. (iv) (a) 16'×60'. (b) 12'×60'. (v) N.A. (vi) Yes.

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

5. RESULTS:
(i) 1278 lb./ac. (ii) 237.8 lb./ac. (iii) Only “control vs. others” effect is highly significant.
Object:—To study the effect of graded doses of N as F.Y.M, A/S and Ammo: Phos. on the yield of Maize crop.

1. BASAL CONDITIONS:
   (i) (a) Nil. (b) Berseem. (c) N.A. (ii) (a) Loam. (b) N.A. (iii) 23.6.1951. (iv) (a) 4 desi hal, 4 sohaga and 1 roller. (b) N.A. (c) 9 to 11 sr./ac. (d) 1’ row to row. (e) N.A. (v) Nil. (vi) Local. (vii) Irrigated. (viii) 2 hoeings and 1 gap filling. (ix) 11.59”. (x) 20.10.1951.

2. TREATMENTS:
   All combinations of (1) and (2)+a control.
   (1) 3 doses of N: N1=50, N2=75 and N3=100 lb./ac.

3. DESIGN:
   (i) R.B.D. (ii) (a) 10. (b) N.A. (iii) 6. (iv) (a) and (b) 12’x60’. (v) Nil. (vi) Yes.

4. GENERAL:
   (i) Growth normal but crop received setback during the month of Sept. due to long draught. No lodging. (ii) Nil. (iii) Grain yield. (iv) (a) Not contd. (b)—. (c)—. (v) (a) Nil. (b)Nil. (vi) and (vii) Nil.

5. RESULTS:
   (i) 1701 lb./ac.
   (ii) 332.9 lb./ac.
   (iii) “Control vs. others effect” is highly significant and S effect is significant.
   (iv) Av. yield of grain in lb./ac.

### Results Table 1

<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>1619</td>
<td>1563</td>
<td>1592</td>
<td>1591</td>
</tr>
<tr>
<td>S2</td>
<td>1772</td>
<td>1666</td>
<td>1657</td>
<td>1698</td>
</tr>
<tr>
<td>S3</td>
<td>1972</td>
<td>2019</td>
<td>1813</td>
<td>1935</td>
</tr>
<tr>
<td>Mean</td>
<td>1788</td>
<td>1749</td>
<td>1687</td>
<td>1741</td>
</tr>
</tbody>
</table>

S.E. of any marginal mean = 78.5 lb./ac.
S.E. of body of table = 135.9 lb./ac.
Object: To study the effect of different doses of A/S on the yield of Maize.

1. BASAL CONDITIONS
(i) (a) Maize—Berseem. (b) Berseem. (c) Nil. (ii) (a) Heavy loam. (b) N.A. (iii) 20.6.1952. (iv) (a) 4 ploughings and 6 sohaga. (b) N.A. (c) 22⅔ sr./ac. + 3 sr./ac. for filling up gaps. (d) and (e) N.A (v) Nil. (vi) Local (medium). (vii) Irrigated. (viii) 2 hoeings. (ix) 22.19°. (x) 16.9.1952.

2. TREATMENTS:
(a) Control. 
(b) 50 lb./ac. of N as A/S. 
(c) 100 lb./ac. of N as A/S. 
Fertilizers applied on 4.7.1952 by broadcast.

3. DESIGN:
(i) R.B.D. (ii) (a) 4. (b) N.A. (iii) 6. (iv) (a) and (b) 18°×77°-74°. (v) Nil. (vi) Yes.

4. GENERAL:
(i) Germination satisfactory; growth normal. (ii) Nil. (iii) Grain yield. (iv) (a) Not contd. (b)—. (c)—. (v) (a) No. (b) Nil. (vi) and (vii) Nil.

5. RESULTS:
(i) 2074 lb./ac. 
(ii) 299.5 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>1.</td>
<td>1909</td>
</tr>
<tr>
<td>2.</td>
<td>2117</td>
</tr>
<tr>
<td>3.</td>
<td>2060</td>
</tr>
<tr>
<td>4.</td>
<td>2210</td>
</tr>
<tr>
<td>S.E./mean</td>
<td>118.2 lb./ac.</td>
</tr>
</tbody>
</table>

Object: To study the effect of different doses of A/S and Ammo. Phos. on the yield of Maize crop.

1. BASAL CONDITIONS:
(i) (a) Not followed. (b) Wheat. (c) Nil. (ii) (a) Heavy loam. (b) N.A. (iii) 7.7.1952. (iv) (a) 9 ploughings and 10 sohaga. (b) N.A. (c) 18 sr./ac. (d) and (e) N.A. (v) Nil. (vi) Local (medium). (vii) Irrigated. (viii) 1 hoeing, 1 weeding, 2 thinnings and 1 horse hoe. (ix) 22.19°. (x) 24.9.1952.

2. TREATMENTS:
All combinations of (1) and (2) + a control. 
(1) 2 levels of N: N₁=75 and N₂=100 lb./ac. 

3. DESIGN:
(i) R.B.D. (ii) (a) 5. (b) N.A. (iii) 6. (iv) (a) and (b) 12'×66'. (v) No. (vi) Yes.

4. GENERAL:
(i) Germination satisfactory. (ii) Nil. (iii) Grain yield. (iv) (a) Not contd. (b) and (c) No. (v) (a) No. (b) Nil. (vi) and (vii) Nil.
5. RESULTS:
   (i) 2314 lb./ac.
   (ii) 477.5 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>Mean</th>
</tr>
</thead>
<tbody>
<tr>
<td>N$_1$</td>
<td>2349</td>
<td>2146</td>
<td>2248</td>
</tr>
<tr>
<td>N$_2$</td>
<td>2625</td>
<td>2428</td>
<td>2527</td>
</tr>
</tbody>
</table>

S.E. of any marginal mean = 137.8 lb./ac.
S.E. of body of table = 194.9 lb./ac.

Crop: Maize.
Site: Govt. Agri. Stn., Gurdaspur.
Object: To study the effect of A/S and Super on the yield of Maize crop.

1. BASAL CONDITIONS:
   (i) (a) Not followed. (b) Wheat. (c) Nil. (ii) (a) Loan. (b) N.A. (iii) 22.6.1953. (iv) (a) 4 ploughings and 8 sohaga, (b) Kera. (c) 16 sr./ac. (d) 1' row to row. (e)--. (v) Nil. (vi) Local (medium). (vii) Irrigated. (viii) 2 hoeings, one horse hoe and one hoeing with Khurpa. (ix) 3~.12". (x) 27.9.1953.

2. TREATMENTS:
   1. Control.
   2. 60 lb./ac. of N as A/S.
   3. 60 lb./ac. of P$_2$O$_5$ as Super.
   A/S applied by kera on 31.7.1953 and Super drilled before sowing on 22.6.1953.

3. DESIGN:
   (i) R.B.D. (ii) (a) 3. (b) N.A. (iii) 6. (iv) (a) 81'×24'. (b) 72'-7½'×20'. (v) Two rows left on breadth side each and nearly 4' left on both sides of the length of each plot including bunds. (vi) Yes.

4. GENERAL:
   (i) Normal. No lodging. (ii) Nil. (iii) Grain yield only. (iv) (a) 1953-1954 (conducted in 1954 with one more treatment). (b) No. (c) Nil. (v) (a) No. (b)Nil. (vi) and (vii) Nil.

5. RESULTS:
   (i) 91.65 lb./ac.
   (ii) 20.31 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>91.29</td>
<td>8.29</td>
</tr>
<tr>
<td>2.</td>
<td>89.36</td>
<td></td>
</tr>
<tr>
<td>3.</td>
<td>100.29</td>
<td></td>
</tr>
</tbody>
</table>

Ref: Pb. 53(64). Type: 'M'.

Local (medium).
Crop :- Maize.  
Ref :- Pb. 53(75).

Site :- Govt. Agri. Stn., Gurdaspur.  
Type :- ‘M’.

Object — To study the effect of different methods of application of A/S to irrigated Maize crop.

1. BASAL CONDITIONS:
   (i) (a) Not followed. (b) Berseem. (c) 20 sr. of A/S on 28.11.1952. (ii) (a) Heavy loam. (b) N.A. (iii) 16.7.1953. (iv) ‘a’ 4 ploughings, 6 sehaga and 1 horse hoe. (b) N.A. (c) 10-12 sr./ac. (d) and (e) N.A. (v) Nil. (vi) Local (medium). (vii) Irrigated. (viii) 2 hoeings. (ix) 34.12°. (x) 20.10.1953.

2. TREATMENTS:
1. Control.
2. 60 lb./ac. of N as A/S in contact.
3. 60 lb./ac. of N as A/S drilled below seed at sowing.
4. 60 lb./ac. of N as A/S broadcast just before sowing.
5. 60 lb./ac. of N as A/S with 2nd irrigation.
6. 60 lb./ac. of N as A/S lateral application of 6' on both sides with 2nd irrigation.
7. 60 lb./ac. of N as A/S lateral application of 6' on both sides at sowing. A/S applied on 18.7.1953 but in treatments 5 and 6 applied on 15.8.1953.

3. DESIGN:
   (i) R.B.D. (ii) (a) 7. (b) N.A. (iii) 6. (iv) (a) N.A. (b) 12'x75'-71'. (v) N.A. (vi) Yes.

4. GENERAL:
   (i) Germination of crop satisfactory. No lodging. (ii) Nil. (iii) Grain yield. (iv) (a) 1953—1955. (b) No. (c) Nil. (v) (a) No. (b) —. (vi) and (vii) Nil.

5. RESULTS:
   (i) 1807 lb./ac.
   (ii) 253.1 lb./ac.
   (iii) Treatments are significantly different.
   (iv) Av. yield of grain in lb./ac.

<table>
<thead>
<tr>
<th>Treatment</th>
<th>Av. yield</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>1563</td>
</tr>
<tr>
<td>2.</td>
<td>2090</td>
</tr>
<tr>
<td>3.</td>
<td>1901</td>
</tr>
<tr>
<td>4.</td>
<td>1893</td>
</tr>
<tr>
<td>5.</td>
<td>1670</td>
</tr>
<tr>
<td>6.</td>
<td>1728</td>
</tr>
<tr>
<td>7.</td>
<td>1802</td>
</tr>
<tr>
<td>S.E./mean</td>
<td>103.3 lb./ac.</td>
</tr>
</tbody>
</table>

Crop :- Maize.  
Ref :- Pb. 53 (125).

Site :- Govt. Agri. Stn., Hansi.  
Type :- ‘M’.

Object — To study the effect of different doses of A/S and Super on yield of Maize.

1. BASAL CONDITIONS:
   (i) (a) Nil. (b) Wheat. (c) Nil. (ii) (a) Heavy loam. (b) N.A. (iii) 22.7.1953. (iv) (a) 5 desi ploughings, 6 sehaga and 1 roller. (b) N.A. (c) 10 sr./ac. (d) and (e) N.A. (v) Nil. (vi) Local (medium). (vii) Nil. (viii) One hoeing. (ix) 11.62°. (x) 6.10.1953.

2. TREATMENTS:
1. Control.
2. 50 lb./ac. of N as A/S.
3. 100 lb./ac. of N as A/S.
4. 50 lb./ac. of N as A/S + 25 lb./ac. of P₂O₅ as Super.
5. 100 lb./ac. of N as A/S + 50 lb./ac. of P₂O₅ as Super.
6. 100 lb. ac. of N as A/S + 50 lb./ac. of P₂O₅ as Super + 25 lb./ac. of K₂O. Super applied on 22.6.1953 before sowing and A/S applied on 3.9.1953 by broadcast.
3. DESIGN:
(i) R.B.D.  (ii) 6.  (b) N.A.  (iii) 4.  (iv) (a) 18' x 71'.  (b) 18' x 67'2.7".  (v) N.A..  (vi) Yes.

4. GENERAL:
(i) Normal. No lodging.  (ii) Nil.  (iii) Cob weight.  (iv) (a) Not continued.  (b) No.  (c) —.  (v) (a) No.  (b) —.  (vi) and (vii) Nil.

5. RESULTS:
(i) 3174 lb./ac.
(ii) 361.6 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>3018</td>
</tr>
<tr>
<td>2.</td>
<td>3110</td>
</tr>
<tr>
<td>3.</td>
<td>3374</td>
</tr>
<tr>
<td>4.</td>
<td>3110</td>
</tr>
<tr>
<td>5.</td>
<td>2981</td>
</tr>
<tr>
<td>6.</td>
<td>3448</td>
</tr>
<tr>
<td>S.E./mean</td>
<td>= 180.8 lb./ac.</td>
</tr>
</tbody>
</table>

Crop: - Maize.
Type: - 'M'.

Object: - To study the effect of different fertilizers on forage yield of Maize.

1. BASAL CONDITIONS:
(i) (a) Nil.  (b) N.A.  (c) Nil.  (ii) (a) Loam.  (b) Refer soil analysis, Jullundur.  (iii) 25.7.1948.
(iv) (a) 1 raja, 3 desi ploughs and 1 horse hoe.  (b) N.A.  (c) 18 sr. 12 ch/ac.  (d) and (e) N.A.  (v) Nil.  

2. TREATMENTS:
1. Control.
2. 100 lb./ac. of N as A/S.
3. 100 lb./ac. of N as A/N.
4. 100 lb./ac. of N as Ammo. Phos.
5. 125 lb./ac. of P2O5 as Super.

3. DESIGN:
(i) R.B.D.  (ii) 5.  (b) N.A.  (iii) 10.  (iv) (a) 12' x 52'.  (b) 12' x 45' x 46".  (v) N.A..  (vi) Yes.

4. GENERAL:
(i) Normal. No lodging.  (ii) Nil.  (iii) Forage yield only.  (iv) (a) 1948 to 1951, (contd. with modification.)  
(b) No.  (c) Nil.  (v) (a) No.  (b) —.  (vi) and (vii) Nil.

5. RESULTS:
(i) 11.16 ton/ac.
(ii) 0.67 ton/ac.
(iii) Treatments are not significantly different.
(iv) Av. yield of fodder in ton/ac.

<table>
<thead>
<tr>
<th>Treatment</th>
<th>Av. yield</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>10.79</td>
</tr>
<tr>
<td>2.</td>
<td>11.42</td>
</tr>
<tr>
<td>3.</td>
<td>11.21</td>
</tr>
<tr>
<td>4.</td>
<td>11.42</td>
</tr>
<tr>
<td>5.</td>
<td>10.97</td>
</tr>
<tr>
<td>S.E./mean</td>
<td>= 0.21 ton/ac.</td>
</tr>
</tbody>
</table>
Crop : - Maize (*Kharif*).


Ref : - Pb. 49(21).

Type : - 'M'.

Object : — To study the effect of different fertilizers on forage yield of Maize.

1. **BASAL CONDITIONS** :
   
   (i) (a) Nil. (b) Wheat. (c) Nil. (ii) (a) Loam. (b) Refer soil analysis, Jullundur. (iii) 16.7.1949. (iv) (a) 1 *raja* ploughing, 5 *desi* ploughings, 4 *sohaga* and 1 roller. (b) to (e) N.A. (v) Nil. (vi) Local (medium). (vii) Irrigated. (viii) One hoeing cum weeding. (ix) 12.56'. (x) 5.9.1949 to 14.9.1949.

2. **TREATMENTS** :

   1. Control.
   2. 100 lb./ac. of N as A/S.
   3. 100 lb./ac. of N as A/N.
   4. 100 lb./ac. of N as Ammo. Phos.
   5. 125 lb./ac. of P<sub>2</sub>O<sub>5</sub> as Super.

3. **DESIGN** :

   (i) R.B.D. (ii) (a) 5. (b) N.A. (iii) 10. (iv) (a) and (b) 12'×52'. (v) Nil. (vi) Yes.

4. **GENERAL** :

   (i) Germination good but condition poor. No lodging. (ii) Nil. (iii) Green fodder yield. (iv) (a) 1948 to 1951 (contd. with modification.) (b) No. (c) —. (v) (a) Nil. (b) —. (vi) and (vii) Nil.

5. **RESULTS** :

   (i) 6.33 ton/ac.
   (ii) 0.62 ton/ac.
   (iii) Treatments are not significantly different.
   (iv) Av. yield of fodder in ton/ac.

<table>
<thead>
<tr>
<th>Treatments</th>
<th>Av. yield</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>6.32</td>
</tr>
<tr>
<td>2.</td>
<td>6.39</td>
</tr>
<tr>
<td>3.</td>
<td>5.99</td>
</tr>
<tr>
<td>4.</td>
<td>6.66</td>
</tr>
<tr>
<td>5.</td>
<td>6.30</td>
</tr>
<tr>
<td>S.E./mean</td>
<td>=0.19 ton/ac.</td>
</tr>
</tbody>
</table>

---

Crop : - Maize (*Kharif*).


Ref : - Pb. 50(21).

Type : - 'M'.

Object : — To study the effect of different fertilizers on grain yield of Maize.

1. **BASAL CONDITIONS** :

   (i) (a) Nil. (b) Berseem. (c) Nil. (ii) (a) Loam. (b) Refer soil analysis, Jullundur. (iii) 16.7.1950, (iv) (a) one *raja*, 3 *desi hal* and one horse hoe. (b) and (c) N.A. (d) 1½' row to row. (e) N.A. (v) 5 ton/ac. of compost applied on 28 and 30.6.1950. (vi) Local (medium). (vii) Irrigated. (viii) 2 hoeings and weeding. (ix) 47.04'. (x) 15.10.1950.

2. **TREATMENTS** :

   1. Control.
   2. 100 lb./ac. of N as F.Y.M.
   3. 100 lb./ac. of N as A/S.
   4. 100 lb./ac. of N as Ammo. Phos.
   5. 100 lb./ac. of N as G.N.C.
   6. 100 lb./ac. of P<sub>2</sub>O<sub>5</sub> as Super.

3. DESIGN:
(i) R.B.D. (ii) (a) 6. (b) N.A. (iii) 4. (iv) (a) and (b) 8' x 85.07'. (v) Nil. (vi) Nil.

4. GENERAL:
(i) Germination very poor. Excessive rain damaged the germination of the crop. Some gap filling was done where necessary. Severe lodging on 7.9.1950 and 19.9.1950 due to winds. (ii) Attack of borer specially in G.N.C. plots. (iii) Grain yield and stalk length. (iv) (a) 1948 to 1951 (contd. with modifications.) (b) No. (c) Nil. (v) (a) Nil. (b) —. (vi) Excessive rains. (vii) Nil.

5. RESULTS:
(i) 597.6 lb./ac.
(ii) 117.2 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>349.7</td>
</tr>
<tr>
<td>2.</td>
<td>386.7</td>
</tr>
<tr>
<td>3.</td>
<td>1025.5</td>
</tr>
<tr>
<td>4.</td>
<td>949.4</td>
</tr>
<tr>
<td>5.</td>
<td>513.3</td>
</tr>
<tr>
<td>6.</td>
<td>361.0</td>
</tr>
<tr>
<td>S.E./mean</td>
<td>=58.62 lb./ac.</td>
</tr>
</tbody>
</table>

Crop: Maize (Rabi). 
Site: Jullundur Agri. Stn., Jullundur.
Ref: Pb. 51(80).
Type: ‘M’.

Object: To study the effect of different fertilizers on grain yield of Maize.

1. BASAL CONDITIONS:
(i) (a) Wheat—Maize—Wheat. (b) Wheat. (c) Nil. (ii) (a) Sandy loam. (b) Refer soil analysis, Jullundur. (iii) 11.7.1951. (iv) (a) 5 dest hal, 5 sokaha and 1’ roller. (b) N.A. (c) 8 sr./ac. (d) 1’ row to row. (e) N.A. (f) Nil. (vi) Local (medium). (vii) Irrigated. (viii) One gap filling and one thinning. (ix) 11.63". (x) 8,9,10.1951.

2. TREATMENTS:
1. Control.
2. 100 lb./ac. of N as F.Y.M.
3. 100 lb./ac. of N as A/S.
4. 100 lb./ac. of N as Ammo. Phos.
5. 100 lb./ac. of N as G.N.C.
6. 125 lb./ac. of P2O5 as Super.

F.Y.M. was applied on 1.7.1951 while Super, A/S, Ammo, Phos, and G.N.C. were applied on 7.8.1951.

3. DESIGN:
(i) R.B.D. (ii) (a) 6. (b) N.A. (iii) 4. (iv) (a) and (b) 8’ x 85.07’. (v) Nil. (vi) Yes.

4. GENERAL:
(i) Germination good. No lodging. (ii) Attack of borer observed. (iii) Grain and straw yield. (iv) (a) 1948—51 (contd. with modifications.) (b) and (c) Nil. (v) (a) and (b) No. (vi) and (vii) Nil.

5. RESULTS:
(i) 1768 lb./ac.
(ii) 249.7 lb./ac.
(iii) Treatments are highly significantly different.
Crop :- Maize.
Site :- Jullundur Agri. Stn., Jullundur.

Object :- To find the best manurial formula for Maize crop.

1. BASAL CONDITIONS:
   (i) (a) Maize—Wheat—Guara (G.M.)—Wheat. (b) Berseem. (c) N.A. (ii) (a) Loam. (b) Refer soil analysis, Jullundur. (iii) 20.7.1948. (iv) (a) 1 raja and 3 desi plough. (b) N.A. (c) 12 sr. /ac. (d) and (e) N.A. (v) Nil. (vi) Local (medium). (vii) Irrigated. (viii) 3 hoeings. (ix) 17.35'. (x) 5.10.1948.

2. TREATMENTS:
   1. Control.
   2. 100 lb./ac. of N as F.Y.M.
   3. 150 lb./ac. of N as F.Y.M.
   4. 100 lb./ac. of N as A/S.
   5. 150 lb./ac. of N as A/S.
   6. 50 lb./ac. of N as F.Y.M. + 50 lb./ac. of N as A/S.
   7. 75 lb./ac. of N as F.Y.M. + 75 lb./ac. of N as A/S.
   A/S applied on 8.8.1948.

3. DESIGN:
   (i) R.B.D. (ii) (a) 7. (b) N.A. (iii) 6. (iv) (a) 7' × 47'. (b) 7' × 43' 2.57'. (v) N.A. (vi) Yes.

4. GENERAL:
   (i) Normal. No lodging. (ii) Nil. (iii) Grain yield and green weight of stalks. (iv) (a) Not contd. (b) and (c) No. (v) (a) and (b) No. (vi) and (vii) Nil.

5. RESULTS:
   (i) 304 lb./ac.
   (ii) 226.8 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>1296</td>
</tr>
<tr>
<td>2.</td>
<td>1648</td>
</tr>
<tr>
<td>3.</td>
<td>2156</td>
</tr>
<tr>
<td>4.</td>
<td>2351</td>
</tr>
<tr>
<td>5.</td>
<td>1851</td>
</tr>
<tr>
<td>6.</td>
<td>1304</td>
</tr>
<tr>
<td>S.E/mean</td>
<td>124.8 lb./ac.</td>
</tr>
</tbody>
</table>
Crop: Maize.
Site: Jullundur Agri. Stn., Jullundur.

Object: To find the best source of N for Maize crop.

1. BASAL CONDITIONS:
   (i) (a) Maize-Senji-Sugarcane-Wheat. (b) Fallow. (c) Nil. (ii) (a) Loam. (b) Refer soil analysis, Jullundur. (iii) 17.7.1948 and 31.7.1948. (iv) (a) For first five replications: 1 raja plough, 2 horse hoes and 6 desi ploughs. For next five replications: 4 desi ploughs. (b) N.A. (c) 12 sr./ac. (d) and (e) N.A. (v) Nil (vi) Local. (vii) Irrigated. (viii) One hoeing for first five replications and 3 hoeing for next five replications. (ix) 17.36°. (x) 4.10.1951and 21.10.1948.

2. TREATMENTS:
   All combinations of (i) and (2) + a control
   (1) 2 doses of N: N1 = 100 and N2 = 150 lb./ac.

3. DESIGN:
   (i) R.B.D. (ii) (a) 5. (b) N.A. (iii) 10. (iv) (a) 110' x 12'. (b) 90°-9° x 12'. (v) N.A. (vi) Yes.

4. GENERAL:
   (i) Good. No lodging. (ii) Nil. (iii) Grain yield and green stalk weight. (iv) (a) Not contd. (b) No. (c) —. (v) (a) No. (b) —. (vi) and (vii) Nil.

5. RESULTS:
   (i) 2803 lb./ac.
   (ii) 197.6 lb./ac.
   (iii) Only "control vs others" effect is highly significant.
   (iv) Av. yield of grain in lb./ac.

<table>
<thead>
<tr>
<th>Control</th>
<th>N1</th>
<th>N2</th>
<th>Mean</th>
</tr>
</thead>
<tbody>
<tr>
<td>S1</td>
<td>2886</td>
<td>3035</td>
<td>2960</td>
</tr>
<tr>
<td>S2</td>
<td>3018</td>
<td>3029</td>
<td>3024</td>
</tr>
<tr>
<td>Mean</td>
<td>2952</td>
<td>3032</td>
<td>2992</td>
</tr>
</tbody>
</table>

S.E. of any marginal mean = 44.2 lb./ac.
S.E. of body of table = 62.5 lb./ac.

Crop: Maize (Kharij).
Site: Jullundur Agri. Stn., Jullundur.

Object: To find the best dose of A/S for Maize crop.

1. BASAL CONDITIONS:
   (i) Nil. (b) Wheat. (c) Nil. (ii) (a) Loam. (b) Refer soil analysis, Jullundur. (iii) 27.7.1949. (iv) (a) One raja ploughing, 4 desi ploughings, 5 sohage and 1 roller. (b) to (e) N.A. (v) Nil. (vi) Local. (vii) Irrigated. (viii) 2 hoeings and weedicings. (ix) 12.56°. (x) 9 to 12.10.1949.

2. TREATMENTS:
   1. Control.
   2. 50 lb./ac. of N as A/S.
   3. 100 lb./ac. of N as A/S.
   4. 150 lb./ac. of N as A/S.
   Treatment No. 2 applied in full on 15.8.1949 while treatments 3 and 4 applied half on 15.8.1949 and half on 24.8.1949.
3. DESIGN:
(i) R.B.D. (ii) (a) 4. (b) N.A. (iii) 6. (iv) (a) 43' x 103'. (b) 1/10 th of an ac. (v) Nil (vi) Yes.

4. GENERAL:
(i) Germination good. No lodging. (ii) Nil. (iii) Grain and stalk yield. (iv) (a) 1949—1952. (b) No. (c) Nil. (v) (a) Nil. (b)—. (vi) Nil. (vii) Experiment during 1950 was not conducted.

5. RESULTS:
(i) 2011 lb./ac.
(ii) 77.1 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>1918</td>
</tr>
<tr>
<td>2.</td>
<td>1997</td>
</tr>
<tr>
<td>3.</td>
<td>1986</td>
</tr>
<tr>
<td>4.</td>
<td>2149</td>
</tr>
<tr>
<td>S.E./mean</td>
<td>31.5 lb./ac.</td>
</tr>
</tbody>
</table>

Crop :- Maize.

Site :- Jullundur Agri. Stn., Jullundur.

Object :- To find the best dose of A/S for Maize crop.

Ref :- Pb. 51(89).

Type :- ‘M’.

1. BASAL CONDITIONS:
(i) (a) Nil. (b) Wheat. (c) Nil. (ii) (a) Loam. (b) Refer soil analysis, Jullundur. (iii) 15, 16.7.1951. (iv) (a) 5 desi hal, 4 sohaga and one roller. (b) N.A. (c) 10—12 sr./ac. (d) and (e) N.A. (v) Nil. (vi) Local. (vii) Irrigated. (viii) One gap filling and 2 hoeings. (ix) 11.63°. (x) 11, 12,10,1951.

2. TREATMENTS:
1. Control.
2. 50 lb./ac. of N as A/S.
3. 100 lb./ac. of N as A/S.
4. 150 lb./ac. of N as A/S.

3. DESIGN:
(i) R.B.D. (ii) (a) 4. (b) N.A. (iii) 4. (iv) (a) 110' x 53'. (b) 101.3' x 43'. (v) N.A. (vi) Yes.

4. GENERAL:
(i) Germination satisfactory; growth good. No lodging. (ii) Nil. (iii) Grain and cob yield. (iv) (a) 1949—1952. (b) No. (c) Nil. (v) (a) Nil. (b)—. (vi) and (vii) Nil.

5. RESULTS:
(i) 1722 lb./ac.
(ii) 282.9 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>1190</td>
</tr>
<tr>
<td>2.</td>
<td>1649</td>
</tr>
<tr>
<td>3.</td>
<td>1830</td>
</tr>
<tr>
<td>4.</td>
<td>2212</td>
</tr>
<tr>
<td>S.E./mean</td>
<td>141.5 lb./ac.</td>
</tr>
</tbody>
</table>
Crop: Maize.
Site: Jullundur Agri. Stn., Jullundur.

Object: To find the best dose of A/S for Maize crop.

1. BASAL CONDITIONS:
   (i) (a) Nil, (b) Wheat. (c) Nil. (ii) (a) Loam. (b) Refer soil analysis, Jullundur. (iii) 18.7.1952. (iv)
   (a) 6 desi plough, 4 sohaga and one horse hoe. (b) N.A. (c) 20 sr.ac. (d) and (e) N.A. (f) Nil. (vi)
   Local (medium). (vii) Irrigated. (viii) One thinning, 2 weedings and 2 hoeings. (ix) 26 21". (x) 6.10.1252.

2. TREATMENTS:
   1. Control.
   2. 50 lb./ac. of N as A/S.
   3. 100 lb./ac. of N as A/S.
   4. 150 lb./ac. of N as A/S.

3. DESIGN:
   (i) R.B.D. (ii) (a) 6. (b) N.A. (iii) 5. (iv) (a) 106' X 10'. (b) 59' X 8' (v) 1' along the breadth and 3'-6" 
   (vi) along the length. (vi) Yes.

4. GENERAL:
   (i) Normal. No lodging. (ii) Nil. (iii) Grain yield and stalk length. (iv) (a) 1949-1952. (b) No.
   (c) Nil. (v) (a) No. (b) Nil. (vi) and (vii) Nil.

5. RESULTS:
   (i) 2773 lb./ac.
   (ii) 389.4 lb./ac.
   (iii) Treatments are highly significantly different.
   (iv) Av. yield of grain in lb./ac.
      Treatment Av. yield
      1. 1513
      2. 2984
      3. 3394
      4. 3200
      S.E./mean = 194.7 lb./ac.

Crop: Maize.
Site: Jullundur Agri. Stn., Jullundur.

Object: To study the effect of N, P and K on yield of Maize.

1. BASAL CONDITIONS:
   (i) (a) Nil. (b) Fallow. (c) Nil. (ii) (a) Heavy loam. (b) Refer soil analysis, Jullundur. (iii) 14.8.1953. (iv)
   (a) Raja hal, 6 desi hal, 5 sohaga and 2 horse hoe. (b) N.A. (c) 20 sr.ac. (d) and (e) N.A. (v) Nil. (vi)

2. TREATMENTS:
   1. Control.
   2. 50 lb./ac. of N as A/S.
   3. 100 lb./ac. of N as A/S.
   4. 50 lb./ac. of N as A/S+25 lb./ac. of P2O5 as Super.
   5. 100 lb./ac. of N as A/S+50 lb./ac. of P2O5 as Super.
   6. 100 lb./ac. of N as A/S+50 lb./ac. of P2O5 as Super. +25 lb./ac. of K2O as Pot. Sul.

3. DESIGN:
   (i) R.B.D. (ii) 6. (b) N.A. (iii) 5. (iv) (a) 106' X 10'. (b) 59' X 8' (v) 1' along the breadth and 3'-6" 
   (vi) along the length. (vi) Yes.
4. GENERAL:
(i) Germination and condition good. No lodging. (ii) Spraying with Agrocide on 28.8.1953. No incidence of pest or disease available in records. (iii) Grain yield. (iv) (a) 1953-1954. (b) No. (c) Nil. (v) (a) No. (b)—. (vi) Nil. (vii) Expt. was originally planned with 6 replications but conducted with 5 replications only.

5. RESULTS:
(i) 3042 lb./ac.
(ii) 404.5 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>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>1990</td>
</tr>
<tr>
<td>2.</td>
<td>3068</td>
</tr>
<tr>
<td>3.</td>
<td>3292</td>
</tr>
<tr>
<td>4.</td>
<td>3196</td>
</tr>
<tr>
<td>5.</td>
<td>3295</td>
</tr>
<tr>
<td>6.</td>
<td>3408</td>
</tr>
<tr>
<td>S.E./mean</td>
<td>= 180.9 lb./ac.</td>
</tr>
</tbody>
</table>

Crop :- Maize.
Site :- Distt. and Demonstration Farm, Kangra.
Object :- To study the effect of A/S on yield of Maize.

Ref :- Pb. 48(1).
Type :- 'M'.

1. BASAL CONDITIONS:
(i) (a) Nil. (b) Wheat. (c) Nil. (ii) (a) Loamy. (b) N.A. (iii) 20.5.1948. (iv) (a) and (b) N.A. (c) 10 sr./ac. (d) a d (e) N.A. (v) Nil. (vi) Local. (vii) Irrigated. (viii) 2 hoeings and 2 weedings. (ix) 28.79°. (x) 16.10.1948.

2. TREATMENTS:
1. Control.
2. 50 lb./ac. of N as A/S.

3. DESIGN:
(i) Paired plot. (ii) (a) 2. (b) N.A. (iii) 12. (iv) (a) and (b) 15'×37'-2.8". (v) Nil. (vi) Yes.

4. GENERAL:
(i) Satisfactory. No lodging. (ii) Nil. (iii) Grain yield. (iv) Not continued. (b) No. (c)—. (v) (a) No.(b)—. (vi) and (vii) Nil.

5. RESULTS:
(i) 1986 lb./ac.
(ii) 436.8 lb./ac.
(iii) Treatments are significantly different.
(iv) Av. yield of grain in lb./ac.

<table>
<thead>
<tr>
<th>Treatment</th>
<th>Av. yield</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>1762</td>
</tr>
<tr>
<td>2.</td>
<td>2210</td>
</tr>
<tr>
<td>S.E./mean</td>
<td>= 126.1 lb./ac.</td>
</tr>
</tbody>
</table>
Crop :- Maize.  
Site :- Distt. and Demonstration Farm, Kangra.  

Object :- To study the effect of A/S on yield of Maize when cobs have appeared and grain is setting in.

1. BASAL CONDITIONS:
   (i) (a) Nil. (b) Wheat. (c) Nil. (ii) (a) Clay loam. (b) N.A. (iii) 16.6.1953. (iv) (a) 2 ploughings and 3 plankings. (b) Broadcast. (c) N.A. (d) and (e) —. (v) No. (vi) Local (medium). (vii) Irrigated. (viii) N.A. (ix) 69.98”. (x) 13.9.1953.

2. TREATMENTS:
   1. Control.  
   2. 20 lb/ac. of N as A/S. A/S applied on 29.8.1950 with irrigation.

3. DESIGN:
   (i) (a) Paired plot. (ii) (a) 2. (b) N.A. (iii) 2. (iv) (a) N.A. (b) 13'×81'. (v) N.A. (vi) Yes.

4. GENERAL:
   (i) Normal. (ii) N.A; (iii) Grain yield. (iv) (a) Not contd. (b) No. (c) —. (v) (a) No. (b) —. (vi) Nil. (vii) Nil.

5. RESULTS:
   (i) 850.3 lb/ac.  
   (ii) 61.47 lb/ac.  
   (iii) Treatments are not significantly different.  
   (iv) Av. yield of grain in lb/ac.
   Treatment | Av. yield
   --- | ---
   1. | 860.5
   2. | 840.1
   S.E./mean = 43.46 lb/ac.

---

Crop :- Maize.  
Site :- Distt. and Demonstration Farm, Kangra.  

Object :- To find out whether fertilizer alone or in combination gives economic yield over the control.

1. BASAL CONDITIONS:
   (i) (a) Nil. (b) Fallow. (c) Nil. (ii) (a) Clay loam. (b) N.A. (iii) 24/6.1953. (iv) (a) 3 ploughings and 2 plankings. (b) N.A. (c) 20-25 s.r./ac. (d) and (e) —. (v) 54 md./ac. of F.Y.M. supplied. (vi) Local. (vii) Irrigated. (viii) N.A. (ix) 69.98”. (x) 16, 17.9.1953.

2. TREATMENTS:
   1. Control (no manure).  
   2. 50 lb/ac. of P₂O₅ as B.M.  
   3. 100 lb/ac. of N as A/S+50 lb/ac. of P₂O₅ as B.M.  
   4. 100 lb/ac. of N as A/S.  
   5. 100 lb/ac. of N as A/S+50 lb/ac. of P₂O₅ as Super. Fertilizers broadcast on 24.6.1953.

3. DESIGN:
   (i) R.B.D. (ii) (a) 5. (b) N.A. (iii) 4. (iv) (a) N.A. (b) 10'×62.2'. (v) N.A. (vi) Yes.

4. GENERAL:
   (i) Below normal. High winds coupled with rainfall resulted in lodging of crop. (ii) Nil. (iii) Grain yield only. (iv) (a) Not contd. (b) —. (c) —. (v) (a) No. (b) —. (vi) Nil. (vii) Maize was sown comparatively late in the season. There were heavy and continuous rains in the season which affected the yield of crop.
5. RESULTS:
(i) 745.5 lb./ac.
(ii) 37.77 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>450.2</td>
</tr>
<tr>
<td>2.</td>
<td>522.2</td>
</tr>
<tr>
<td>3.</td>
<td>1242.5</td>
</tr>
<tr>
<td>4.</td>
<td>648.3</td>
</tr>
<tr>
<td>5.</td>
<td>864.4</td>
</tr>
</tbody>
</table>
S.E./mean  = 18.89 lb./ac.

---

Crop: Maize (Kharif).
Site: Cereal Breeding Sub. Stn., Katrain.
Object: To ascertain the optimum manurial requirement of Maize.

1. BASAL CONDITIONS:
(i) (a) Nil. (b) N.A. (c) Nil. (ii) (a) Sandy loam. (b) N.A. (iii) 13. 6. 1952. (iv) (a) 2 ploughings and 2
sohaga. (b) and (c) N.A. (d) 18" x 6". (e) N. v. (v) Nil. (vi) Sweet corn (Golden cross bantan).
(vii) Irrigate. (viii) Once earthing up and 2 hoeings. (ix) 24.65'. (x) 27. 9. 1952.

2. TREATMENTS:
1. Control.
2. 50 lb./ac. of N as A/S.
3. 100 lb./ac. of N as A/S.

3. DESIGN:
(i) R.B.D. (ii) (a) 3. (b) N.A. (iii) 4. (iv) (a) and (b) 15' x 7.5'. (v) Nil. (vi) Yes.

4. GENERAL:
(i) Normal. (No lodging. (ii) Nil. (iii) Grain yield. (iv) (a) 1952-53. (b) and (c) No. (v) (a) and (b) No. (vi) and (vii) Nil.

5. RESULTS:
(i) 3178 lb./ac.
(ii) 356.2 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>1920</td>
</tr>
<tr>
<td>2.</td>
<td>3374</td>
</tr>
<tr>
<td>3.</td>
<td>4240</td>
</tr>
</tbody>
</table>
S.E./mean  = 183.1 lb./ac.

---

Crop: Maize (Kharif).
Site: Cereal Breeding Sub-Stn., Katrain.
Object: To ascertain the optimum manurial requirement of Maize.

1. BASAL CONDITIONS:
(i) (a) Nil. (b) Fallow. (c) Nil. (ii) (a) Sandy loam. (b) N.A. (iii) 4. 6. 1953. (iv) (a) 3 ploughings and
3 sohaga. (b) and (c) N.A. (d) 18" x 6". (e) N. v. (v) Nil. (vi) Golden cross bantan. (vii) Unirrigated. (viii) Once earthing up and 2 hoeings. (ix) 25. 88'. (x) End of Sept. 1953.
2. TREATMENTS:
1. Control.
2. 50 lb./ac. of N as A/S.
3. 100 lb./ac. of N as A/S.

3. DESIGN:
(i) R.B.D. (ii) (a) 3. (b) N.A. (iii) 4. (iv) (a) 18' x 7.5'. (b) 16' x 4.5'. (v) 1' x 1.5'. (vi) Yes.

4. GENERAL:
(i) Good. No lodging. (ii) Nil. (iii) Lasseling, no. of (plants/plot, plant height, cob height, cob length, cob, circumference and grain yield. (iv) (a) 1952 to 1953. (b) No. (c) N.A. (v) (a) and (b) No. (vi) and (vii) Nil.

5. RESULTS:
(i) 3202 lb./ac.
(ii) 243.2 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>1245</td>
</tr>
<tr>
<td>2.</td>
<td>3656</td>
</tr>
<tr>
<td>3.</td>
<td>4706</td>
</tr>
<tr>
<td>S.E./mean</td>
<td>121.6 lb./ac.</td>
</tr>
</tbody>
</table>

Crop: Maize (Kharif).
Site: Agri. Stn., Karnal.
Ref: Ph. 52(133).
Type: 'M'.

Object: To study the residual effect of manures applied to previous Wheat crop on subsequent Maize fodder.

1. BASAL CONDITIONS:
(i) (a) Nil. (b) Wheat. (c) As per treatments. (ii) (a) Loam. (b) N.A. (iii) 25.6.1952. (iv) (a) 4 ploughings and 4 toshaga. (b) N.A. (c) 32 sr./ac. (d) and (e) N.A. (v) Nil. (vi) Local. (vii) Irrigated. (viii) Nil.

2. TREATMENTS:
1. Control (no manure).
2. 100 lb./ac. of N as A/S applied to previous wheat crop.
3. 100 lb./ac. of N as Ammon. Phos. applied to previous wheat crop.
4. 125 lb./ac. of P2O5 as Super applied to previous wheat crop.
Manures applied to previous wheat crop, experiment no: 51(37).

3. DESIGN:
(i) R.B.D. (ii) (a) 4. (b) N.A. (iii) 12. (iv) (a) 12' x 80'. (b) 11' x 80'. (v) 1' left on one side of the plots. (vi) Yes. Same randomisation of wheat crop adopted.

4. GENERAL:
(i) Satisfactory to normal. No lodging. (ii) Nil. (iii) Fodder yield (iv) (a) Not confd. (b) No. (c) —. (v) (a) No. (b) Nil. (vi) and (vii) Nil.

5. RESULTS:
(i) 9.85 ton/ac.
(ii) 1.49 ton/ac.
(iii) Treatments are significantly different.
(iv) Av. yield of fodder in ton/ac.
<table>
<thead>
<tr>
<th>Treatment</th>
<th>Av. yield</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>8.61</td>
</tr>
<tr>
<td>2.</td>
<td>10.04</td>
</tr>
<tr>
<td>3.</td>
<td>10.69</td>
</tr>
<tr>
<td>4.</td>
<td>10.04</td>
</tr>
<tr>
<td>S.E./mean</td>
<td>0.43 ton/ac.</td>
</tr>
</tbody>
</table>
Crop :- Maize.
Site :- Chemical Section. B.A. Farm, Rauni.

Object :- To study the effect of A/S on yield of Maize when applied with F.Y.M. over control.

1. BASAL CONDITIONS :
(i) (a) Nil. (b) Wheat. (c) Nil. (ii) (a) Heavy loam. (b) Refer soil analysis, Rauni (iii) 7.7.1952.
(iv) (a) and (b) N.A. (c) 10—12 sr./ac. (d) and (e) N.A. (v) Nil. (vi) Local (medium). (vii) Irrigated.

2. TREATMENTS :
1. Control.
2. 10 ton/ac. of F.Y.M. +30 lb./ac. of N as A/S.
3. 10 ton/ac. of F.Y.M. +40 lb./ac. of N as A/S.
4. 10 ton/ac. of F.Y.M. +50 lb./ac. of N as A/S.

3. DESIGN :
(i) R.B.D. (ii) (a) 4. (b) N.A. (iii) 4. (iv) (a) 80.7' x 27'. (b) 75.15' x 23'. (v) N.A. (vi) Yes.

4. GENERAL :
(i) Germination normal. Crop lodged partially due to heavy rains and winds on 22.8.1952. (ii) Attack of short borer. (iii) Grain yield. (iv) (a) Not contd. (b) -. (c) -. (v) (a) No. (b) Nil. (vi) and (vii) Nil.

5. RESULTS :
(i) 1928 lb./ac.
(ii) 1667 lb./ac.
(iii) Treatments are highly significantly different.
(iv) Av. yield of grain in lb./ac.
Treatment   Av. yield
1. 1570
2. 1974
3. 2162
4. 2006
S.E./mean = 83.3 lb./ac.

Object :- To study the effect of F.Y.M. when applied alone and together with A/S on Maize crop.

1. BASAL CONDITIONS :
(i) (a) Nil. (b) Cotton. (c) A/S, F.Y.M. and G.N.C. applied. Amount of each and time of application N.A.
(ii) (a) Heavy loam. (b) Refer soil analysis, Rauni. (iii) 23.7.1953. (iv) (a) 4 ploughings, 2 subaga and 1 roller. (b) to (e) N.A. (v) Nil. (vi) Local. (vii) Irrigated. (viii) 2 hoeings and one earthing up. (ix) 23.69'. (x) 26.10.1953.

2. TREATMENTS :
1. Control.
2. 10 ton/ac. of F.Y.M.
3. 10 ton/ac. of F.Y.M. +30 lb./ac. of N as A/S
4. 10 ton/ac. of F.Y.M. +40 lb./ac. of N as A/S
5. 10 ton/ac. of F.Y.M. +50 lb./ac. of N as A/S
F.Y.M. broadcast on 8.7.1953 while A/S on 23.7.1953.

3. DESIGN :
(i) R.B.D. (ii) (a) 5. (b) N.A. (iii) 4. (iv) (a) 15' x 50'. (b) 12' x 80.66'. (v) N.A. (vi) Yes.
4. GENERAL:

(i) Normal. Some plants were broken due to high winds. (ii) Nil. (iii) Grain yield. (iv) (a) Not contd. (b) Nil. (c) Nil. (v) (a) Nil. (b) Nil. (vi) and (vii) Nil.

5. RESULTS:

(i) 1944 lb./ac.
(ii) 286.6 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>1682</td>
</tr>
<tr>
<td>2</td>
<td>1684</td>
</tr>
<tr>
<td>3</td>
<td>2162</td>
</tr>
<tr>
<td>4</td>
<td>2080</td>
</tr>
<tr>
<td>5</td>
<td>2112</td>
</tr>
</tbody>
</table>

S.E./mean = 143.3 lb./ac.

Crop: Maize.
Site: Jullundur Agri. Stn., Jullundur.

Obje: To find the best spacing for Maize crop.

1. BASAL CONDITIONS:

(i) (a) Nil. (b) Wheat. (c) Nil. (ii) (a) Loam. (b) Refer soil analysis, Jullundur. (iii) 19.7.1951. (iv) (a) 5 ploughing and 5 sohaga. (b) N.A. (c) 6-8 sr./ac. (d) As per treatments. (e) N.A. (v) 5 tons/ac. of F.Y.M. (vi) Local. (vii) Irrigated. (viii) 1 gap filling one hoeing cum' weeding. (ix) 11.63'. (x) 13.10.1951.

2. TREATMENTS:

All combinations of (1) and (2)
(1) 3 row to row spacings: R1 = 1', R2 = 1.5' and R3 = 2'.
(2) 3 plant to plant spacings: S1 = 9', S2 = 12' and S3 = 15'.

3. DESIGN:

(i) R.B.D. (ii) 9. (b) N.A. (iii) 4. (iv) (a) and (b) 12' x 37.81'. (v) Nil. (vi) Yes.

4. GENERAL:

(i) Germination and growth good. No lodging. (ii) Slight borer attack. (iii) Grain and stalk yield.
(iv) (a) Not contd. (b) Nil. (c) Nil. (v) (a) Nil. (b) Nil. (vi) and (vii) Nil.

5. RESULTS:

(i) 1351 lb./ac.
(ii) 315.1 lb./ac.
(iii) None of the effects is significant.
(iv) Av. yield of grain in lb./ac.

<table>
<thead>
<tr>
<th></th>
<th>S1</th>
<th>S2</th>
<th>S3</th>
<th>Mean</th>
</tr>
</thead>
<tbody>
<tr>
<td>R1</td>
<td>1497</td>
<td>1163</td>
<td>1555</td>
<td>1405</td>
</tr>
<tr>
<td>R2</td>
<td>1675</td>
<td>1358</td>
<td>1240</td>
<td>1401</td>
</tr>
<tr>
<td>R3</td>
<td>1253</td>
<td>1441</td>
<td>1046</td>
<td>1247</td>
</tr>
</tbody>
</table>

Mean 1452 1321 1280 1351

S.E. of any marginal mean = 90.9 lb./ac.
S.E. of body of table = 157.5 lb./ac.

Ref: Pb. 51(82).
Type: "C".
Crop :-Maize (Kharif).
Site :-Jullundur Agri. Stn., Jullundur.
Object :- To find out the best date of sowing for Maize crop.

1. BASAL CONDITIONS:
   (i) Nil. (b) Gram. (c) Nil. (ii) (a) Loam. (b) Refer soil analysis, Jullundur. (iii) As per treatments.
   (iv) (a) 4 desi ploughing, 6 sohaga and 1 roller. (b) N.A. (c) 12 sr./ac. (d) and (e) N.A. (v) Nil.

2. TREATMENTS:

3. DESIGN:
   (i) R.B.D. (ii) (a) 5. (b) N.A. (iii) 6. (iv) (a) 11'x104'. (b) 11'x99'. (v) N.A. (vi) Yes.

4. GENERAL:
   (i) Germination and condition good. No lodging. (ii) N.A. Gammaxene dusted on 30.9.1949. (iii) Grain and stalk yield. (iv) (a) 1949 to 1951. (b) No. (c) Nil. (v) (a) Nil. (b) Nil. (vi) and (vii) Nil.

5. RESULTS:
   (i) 1023 lb./ac.
   (ii) 169.0 lb./ac.
   (iii) Treatments are highly significantly different.
   (iv) Av. yield of grain in lb./ac.
   Treatment | Av. yield
   --- | ---
   D1 | 1689
   D2 | 1645
   D3 | 1033
   D4 | 543
   D5 | 206
   S.E./mean | =69.0 lb./ac.

Crop :- Maize (Kharif).
Site :- Jullundur Agri. Stn., Jullundur.
Object :- To find best time of sowing for Maize crop.

1. BASAL CONDITIONS:
   (i) (a) Nil. (b) Wheat. (c) Nil. (ii) (a) Loam. (b) Refer soil analysis, Jullundur. (iii) As per treatments.
   (iv) (a) One raja, 5 desi hal, and 7 sohaga. (b) to (e) N.A. (v) Compost 6 ton/ac. on 28.6.1950. (vi) Local. (vii) Irrigated. (viii) 2 hoeings, 2 weedings and one gap filling. (ix) 47.04°. (x) D1 = 30.9.1950, D2 = 16.10.1950, D3 = 22.10.1950 and D4 = 30.10.1950.

2. TREATMENTS:

3. DESIGN:
   (i) R.B.D. (ii) (a) 4. (b) N.A. (iii) 4. (iv) (a) and (b) 12'x30.75'. (v) Nil. (vi) Yes.

4. GENERAL:
   (i) Germination good in D1, D2 but poor in D3, D4 due to rain. Severe lodging occurred due to wind storm on 7.9.1950 and 19.9.1950. (ii) There was attack of borer on the crop. (iii) Grain and stalk yield. (iv) (a) 1949 to 1951. (b) No. (c) Nil. (v) (a) Nil. (b) Nil. (vi) and (vii) Nil.
5. RESULTS:

(i) 695 lb./ac.
(ii) 148.2 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>D₁</td>
<td>922</td>
</tr>
<tr>
<td>D₂</td>
<td>1013</td>
</tr>
<tr>
<td>D₃</td>
<td>735</td>
</tr>
<tr>
<td>D₄</td>
<td>111</td>
</tr>
<tr>
<td>S.E./mean</td>
<td>74.1 lb./ac.</td>
</tr>
</tbody>
</table>

Crop: Maize (Kharif).
Site: Jullundur Agri. Stn., Jullundur.

Object: To find out the best date of sowing for Maize crop.

1. BASAL CONDITIONS:

(i) (a) Nil. (b) Wheat. (c) —
(ii) (a) Sandy loam. (b) Refer soil analysis, Jullundur.
(iii) As per treatments.
(iv) (a) 5 dest hal, 6 sohaga, and 1 roller. (b) N.A. (c) N.A. (d) 1' row to row. (e) N.A. (v) 5 ton/ac. of F.Y.M, and A/S at 50 lb./ac. of N to all plots (vi) Local. (vii) Irrigated. (viii) 2 hoings and 3 weedings. (ix) 11.63'. (x) D₁ : 7.10.1951, D₂ : 15.10.1951, D₃ : 17.10.1951 and D₄ : 22.10.1951.

2. TREATMENTS:

4 dates of sowing: D₁ = 5.7.1951, D₂ = 15.7.1951, D₃ = 25.7.1951 and D₄ = 4.8.1951.

3. DESIGN:

(i) R.B.D. (ii) (a) 4. (b) N.A. (iii) 4. (iv) (a) 12' x 82.5'. (b) 12' x 75.62'. (v) 3 rows left out on each side. (vi) Yes.

4. GENERAL:

(i) Germination good. Growth good in D₁ and D₂ and satisfactory in D₃ and D₄. No lodging. (ii) Borer attack. (iii) Grain and stalk yield. (iv) (a) 1949 to 1951. (b) No. (c) Nil. (v) (a) Nil. (b) Nil. (vi) and (vii) Nil.

5. RESULTS:

(i) 1136 lb./ac.
(ii) 165.0 lb./ac.
(iii) Treatments are highly significantly different.
(iv) Av. yield of grain in lb./ac.

<table>
<thead>
<tr>
<th>Treatment</th>
<th>Av. yield</th>
</tr>
</thead>
<tbody>
<tr>
<td>D₁</td>
<td>1265</td>
</tr>
<tr>
<td>D₂</td>
<td>1529</td>
</tr>
<tr>
<td>D₃</td>
<td>970</td>
</tr>
<tr>
<td>D₄</td>
<td>778</td>
</tr>
<tr>
<td>S.E./mean</td>
<td>82.5 lb./ac.</td>
</tr>
</tbody>
</table>

Crop: Maize (Kharif).
Site: Cereal Breeding Sub-Stn., Katrain.

Object: To find the best date of sowing for the Maize crop.

1. BASAL CONDITIONS:

(i) (a) Nil. (b) N.A. (c) Nil. (ii) (a) Sandy loam. (b) N.A. (iii) As per treatments. (iv) (a) 2 ploughings and 2 sohaga. (b) N.A. (c) 10 to 15 st./ac. (d) and (e) N.A. (v) Nil. (vi) Local. (vii) Unirrigated. (viii) One earthing up and 2 hoeings. (ix) 24.66'. (x) 27.9.1952.
2. **TREATMENTS**:
   

3. **DESIGN**:
   
   (i) R.B.D. (ii) (a) 3. (b) N.A. (iii) 4. (iv) (a) N.A. (b) 16' x 4'. (v) N.A. (vi) Yes.

4. **GENERAL**:
   
   (i) Normal. No lodging. (ii) Nil. (iii) Grain yield (iv) (a) Not continued. (b) No. (c) Nil. (v) (a) No. (b) Nil. (vi) and (vii) Nil.

5. **RESULTS**:
   
   (i) 2528 lb./ac.
   (ii) 866.3 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>D₁</td>
<td>1672</td>
</tr>
<tr>
<td>D₂</td>
<td>3520</td>
</tr>
<tr>
<td>D₃</td>
<td>2392</td>
</tr>
<tr>
<td>S.E./mean</td>
<td>433.1 lb./ac.</td>
</tr>
</tbody>
</table>

---

**Crop** - Maize (*Khajf*).

**Site** - Cereal Breeding Sub-Stn., Katrain.

**Object** - To study the effect of plant to plant spacing on yield of Maize.

1. **BASAL CONDITIONS**:
   
   (i) (a) Nil. (b) N.A. (c) Nil. (ii) (a) Sandy loam. (b) N.A. (iii) N.A. (iv) (a) 3 ploughings. 3 *sohaga*. (b) and (c) N.A. (d) Row to row 1'; plant to plant: as per treatments. (e) N.A. (vi) Local. (vii) Unirrigated. (viii) One earthing up and 2 hoeings. (ix) 24.66'. (x) Sept. 1952.

2. **TREATMENTS**:
   
   1. Spacing between plants = 9'.
   2. Spacing between plants = 12'.
   3. Spacing between plants = 15'.
   4. Spacing between plants = 18'.

3. **DESIGN**:
   
   (i) R.B.D. (ii) (a) 4. (b) N.A. (iii) 4. (iv) (a) 30' x 8'. (b) 29' x 6'. (v) N.A. (vi) Yes.

4. **GENERAL**:
   
   (i) Normal. No lodging. (ii) Attacked by stem borer in July. (iii) Grain yield (iv) (a) Not continued. (b) No. (c) Nil. (v) (a) No. (b) Nil. (vi) and (vii) Nil.

5. **RESULTS**:
   
   (i) 2724 lb./ac.
   (ii) 535.2 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>S₁</td>
<td>2897</td>
</tr>
<tr>
<td>S₂</td>
<td>2728</td>
</tr>
<tr>
<td>S₃</td>
<td>2631</td>
</tr>
<tr>
<td>S₄</td>
<td>2639</td>
</tr>
<tr>
<td>S.E./mean</td>
<td>267.6 lb./ac.</td>
</tr>
</tbody>
</table>
Crop : Maize (Kharif).

Site :- Cereal Breeding Sub-Stn., Katrain.

Object :—To study the effect of sowing date and spacing on Maize yield.

1. BASAL CONDITIONS :
   (i) (a) Nil. (b) Fallow. (c) Nil. (ii) (a) Sandy loam. (b) N.A. (iii) As per treatments. (iv) (a) 3 ploughings and 3 sittings. (b) and (c) N.A. (d) Row to row 1' and plant to plant as per treatments. (e) N.A. (v) Nil. (vi) Golden cross bantam (medium). (vii) Unirrigated. (viii) 2 hoeings and one earthing up. (ix) 25.89°. (x) End of Sept. 1953.

2. TREATMENTS :

   Main-plot treatments :

   Sub-plot treatments :
   4 plant to plant spacings : S1=6", S2=8" S3=10° and S4=12".

3. DESIGN :
   (i) Split-plot. (ii) (a) 3 main-plots/block ; 4 sub-plots/main-plot. (b) N.A. (iii) 4. (iv) (a) N.A. (b) Main 25'x18' sub 25'x4'1" (v) N.A. (vi) Yes.

4. GENERAL :
   (i) Normal. No lodging. (ii) Nil. (iii) No. of plants, plant height, cob weight and grain yield. (iv) (a) 1953 to 1954. (b) No. (c)---. (v) (a) No. (b)---. (vi) and (vii) Nil.

5. RESULTS :

   (i) 1046 lb./ac.
   (ii) (a) 345.0 lb./ac.
   (b) 274.1 lb./ac.
   (iii) D effect is highly significant, while S effect is significant.
   (iv) Av. yield of grain in lb./ac.

   \[
   \begin{array}{cccccc}
   & S_1 & S_2 & S_3 & S_4 & \text{Mean} \\
   D_1 & 809 & 846 & 685 & 647 & 747 \\
   D_2 & 933 & 1307 & 1531 & 1643 & 1554 \\
   D_3 & 846 & 933 & 1070 & 1294 & 1036 \\
   \text{Mean} & 863 & 1029 & 1095 & 1195 & 1046 \\
   \end{array}
   \]

   S.E. of difference of two
   1. D marginal means = 122.0 lb./ac.
   2. S marginal means = 111.9 lb./ac.
   3. S means at the same level of D = 193.8 lb./ac.
   4. D means at the same level of S = 207.5 lb./ac.

Crop : Maize.

Site :- Distt. and Demonstration Farm, Ambala.

Object :—To study the effect of N and cultural practices on yield of Maize.

1. BASAL CONDITIONS :
   (i) (a) Nil. (b) N.A. (c) Nil. (ii) (a) Clayey loam. (b) N.A. (iii) 17.7.1948. (iv) (a) As per treatments. (b) to (e) N.A. (v) Nil. (vi) Local. (vii) Irrigated. (viii) As per treatments. (ix) 19.65°. (x) 29.8.1948.
2. TREATMENTS:

Main-plot treatments:
2 levels of ploughing. C₁ = 1 raja plough and 2 desi hal and C₂ = 1 raja plough and 4 desi hal.

Sub-plot treatments:
All combinations of (1) and (2)
(1) 2 hoeings: H₁ = 3 and H₂ = 5 hoeings.
(2) 2 doses of N as A/S and Ammo. Pots: N₁ = 50 and N₂ = 100 lb./ac.

3. DESIGN:
(i) Split-plot. (ii) (a) 2 main-plots/block; 4 sub-plots/main-plot. (b) N.A. (iii) 4. (iv) (a) and (b) 14' x 77'-9/4". (v) Nil. (vi) Yes.

4. GENERAL:
(i) Fair to good. No lodging. (ii) Nil. (iii) Grain and stalk yield. (iv) (a) 1952-1953. (b) and (c) No. (v) (a) and (b) No. (vi) and (vii) Nil.

5. RESULTS:
(i) 1594 lb./ac.
(ii) (a) 340.6 lb./ac.
(b) 211.9 lb./ac.
(iii) H effect is highly significant, N effect is significant while other effects are not significant.
(iv) Av. yield of grain in lb./ac.

<table>
<thead>
<tr>
<th></th>
<th>H₁</th>
<th>H₂</th>
<th>Mean</th>
<th>N₁</th>
<th>N₂</th>
</tr>
</thead>
<tbody>
<tr>
<td>C₁</td>
<td>1463</td>
<td>1792</td>
<td>1627</td>
<td>1625</td>
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<td>1717</td>
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<td>1735</td>
<td>1594</td>
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<td></td>
</tr>
<tr>
<td>N₁</td>
<td>1359</td>
<td>1669</td>
<td>1514</td>
<td></td>
<td></td>
</tr>
<tr>
<td>N₂</td>
<td>1546</td>
<td>1801</td>
<td>1673</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

S.E. of marginal mean of H or N = 53.0 lb./ac.
S.E. of body of table H × N = 74.9 lb./ac.
S.E. of difference of two
1. C marginal means = 120.5 lb./ac.
2. H or N means at the same level of C = 105.9 lb./ac.
3. C means at the same level of H or N = 141.8 lb./ac.

Crop :- Maize (Kharif).
Site :- Jullundur Agri. Stn., Jullundur.

Object :- To study the effect of A/S and spacings on yield of Maize crop.

1. BASAL CONDITIONS:
(i) (a) Nil. (b) Wheat. (c) Nil. (ii) (a) Loam. (b) Refer soil analysis, Jullundur. (iii) 20.7.1949.
(iv) (a) 7 desi hal and 4 cohaga. (b) N.A. (c) 17 sr./ac. (d) Row to row 1" and plant to plant. As per treatments. (e) N.A. (v) Nil. (vi) Local. (vii) Irrigated. (viii) One gap filling, 1 thinning and 2 hoeings
(ix) 12.56". (x) 13,14,10.1949.

2. TREATMENTS:

Main-plot treatments:
5 levels of N: N₀ = 0, N₁ = 50, N₂ = 100, N₃ = 150 and N₄ = 200 lb./ac.

Sub-plot treatments:
5 plant to plant spacings: S₁ = 6", S₂ = 9", S₃ = 12", S₄ = 15" and S₅ = 18".
3. DESIGN:
(i) Split-plot. (ii) (a) 5 main-plots/block ; 5 sub-plots/main-plot. (b) N.A. (iii) 6. (iv) (a) and (b) $7 \times 64.82'$. (v) Nil. (vi) Yes.

4. GENERAL
(i) Poor to fair. (ii) Grain and stalk yield. (iv) (a) Not contd. (b) and (c) No. (v) (a) and (b) No. (vi) and (vii) Nil.

5. RESULTS:
(i) 1532 lb./ac.
(ii) (a) 469.6 lb./ac.
(b) 279.7 lb./ac.
(iii) Only N effect is highly significant.
(iv) Av. yield of grain in lb./ac.

<table>
<thead>
<tr>
<th></th>
<th>S1</th>
<th>S2</th>
<th>S3</th>
<th>S4</th>
<th>S5</th>
<th>Mean</th>
</tr>
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<tbody>
<tr>
<td>N0</td>
<td>806</td>
<td>827</td>
<td>839</td>
<td>734</td>
<td>969</td>
<td>835</td>
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<tr>
<td>N1</td>
<td>1282</td>
<td>1479</td>
<td>1426</td>
<td>1201</td>
<td>1432</td>
<td>1364</td>
</tr>
<tr>
<td>N2</td>
<td>1876</td>
<td>1773</td>
<td>1728</td>
<td>1843</td>
<td>1730</td>
<td>1790</td>
</tr>
<tr>
<td>N3</td>
<td>1856</td>
<td>2088</td>
<td>2049</td>
<td>1889</td>
<td>1685</td>
<td>1913</td>
</tr>
<tr>
<td>N4</td>
<td>1753</td>
<td>1837</td>
<td>1670</td>
<td>1882</td>
<td>1656</td>
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<td>1515</td>
<td>1601</td>
<td>1542</td>
<td>1510</td>
<td>1494</td>
<td>1532</td>
</tr>
</tbody>
</table>

S.E. of difference of two
1. N marginal means =121.3 lb./ac.
2. S marginal means = 72.1 lb./ac.
3. S means at the same level of N =161.5 lb./ac.
4. N means at the same level of S =188.6 lb./ac.

Crop: Maize (Kharif).
Site: Jullundur Agri. Stn., Jullundur.
Ref: Pb. 50(22).
Type: 'C M'.

Object: To study the effect of A/S and spacing on yield of Maize crop.

1. BASAL CONDITIONS:
(i) (a) Nil. (b) Fallow. (c) Nil. (ii) (a) Loam. (b) Refer soil analysis, Jullundur. (iii) 8.7.1950. (iv) (a) one roja, 6 desl hal, 6 sohaga and one horse hoe. (b) N.A. (c) 16 sr./ac. (d) and (e) N.A. (v) 5 ton/ac. of F.Y.M. on 30.6.1950. (vi) Local. (vii) Irrigated. (viii) 2-3 hoeings; one thinning. (ix) 47.04'. (x) 12.10.1950.

2. TREATMENTS:
Main-plot treatments:
All combinations of (1) and (2)
(1) 3 plant to plant spacings: $S_1=9'$, $S_2=12$' and $S_3=15$'.
(2) 2 row to row spacings: $R_1=1'$ and $R_2=2'$.

Sub-plot treatments:
4 levels of N: $N_0=0$, $N_1=50$, $N_2=100$ and $N_3=150$ lb./ac.
N as A/S applied half on 25.8.1950 and half on 2.9.1950.

3. DESIGN:
(i) Split-plot. (ii) (a) 6 main-plots/block ; 4 sub-plots/main-plot. (b) N.A. (iii) 4. (iv) (a) and (b) $8'\times 56.72'$. (v) Nil. (vi) Yes.

4. GENERAL:
(i) Germinated by heavy rain; gap filling was done where necessary; lodging due to wind storm. (ii) Severe attack of boler. (iii) Grain and straw yield. (iv) (a) 1950 to 1951. (b) No.' (c) Nil. (v) (a) Nil. (b) Nil. (vi) and (vii) Nil.
5. RESULTS:

(i) 992 lb./ac.
(ii) 266.3 lb./ac.
(iii) 136 lb./ac.
(iv) 234 lb./ac.

(iii) N and R effects and interaction R x S x N are highly significant. Others are not significant.

(vi) 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>1016</td>
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<td>507</td>
<td>9.8</td>
<td>1122</td>
<td>1059</td>
<td>921</td>
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</table>

Mean 512 977 1175 1284 992

<table>
<thead>
<tr>
<th></th>
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<th>R2</th>
<th>R3</th>
<th>R4</th>
<th>Mean</th>
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</thead>
<tbody>
<tr>
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<td>1064</td>
<td>1322</td>
<td>1425</td>
<td>1081</td>
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<tr>
<td>S2</td>
<td>569</td>
<td>931</td>
<td>1028</td>
<td>1144</td>
<td>903</td>
</tr>
</tbody>
</table>

S.E. of marginal mean of S = 47.1 lb./ac.
S.E. of marginal mean of N = 38.4 lb./ac.
S.E. of body of table S x R = 72.7 lb./ac.
S.E. of difference of two
1. N marginal means = 39.4 lb./ac.
2. N means at the same level of S = 68.2 lb./ac.
3. S means at the same level of N = 89.0 lb./ac.
4. N means at the same level of R = 55.6 lb./ac.
5. R means at the same level of N = 72.7 lb./ac.

Crop: Maize (Kharif).
Site: Jullundur Agri. Stn., Jullundur.
Ref: Pb. 51(81).
Type: 'C M'.

Object: To study the effect of doses of A/S and spacings on yield of Maize crop.

1. BASAL CONDITIONS:
(i) (a) Wheat-Maize-Wheat. (b) Wheat. (c) N.A. (ii) (a) Sandy loam. (b) Refer soil analysis, Jullundur.
(iii) 16.7.1951. (iv) (a) one raja plough, 5 desli hal, 4 sohaga and one roller. (b) N.A. (c) 6—8 sr./ac. (d) As under treatments. (e) N.A. (v) 5 ton/ac. of F.Y.M. (vi) Local. (vii) Irrigated. (viii) One gap filling, one hoeing and weeding. (ix) 11.63°. (x) 11.10.1951.

2. TREATMENTS:
Main-plot treatments:
All combinations of (1) and (2).
(1) 3 plant to plant spacings : S1 = 9*, S2 = 12* and S3 = 15*.
(2) 2 row to row spacings : R1 = 1’ and R2 = 2’.
Sub-plot treatments:
4 levels of N: N0 = 0, N1 = 50, N2 = 100 and N3 = 150 lb./ac.
N as A/S broadcast along the rows on 16.8.1951.

3. DESIGN:
(i) Split-plot. (ii) (a) 6*main-plots/block; 4 sub-plots/main-plot. (b) N.A. (iii) 4. (iv) (a) and (b) 8’x 36.72’. (v) Nil. (vi) Yes.

4. GENERAL:
(i) Good. No lodging. (ii) Borer attack in some plots in the beginning of August. (iii) Grain and stalk yield.
(iv) 1950 to 1951. (b) No. (c) Nil. (v) (a) Nil. (b) Nil. (vi) and (vii) Nil.
5. RESULTS:
(i) 1892 lb./ac.
(ii) (a) 714.5 lb./ac.
   (b) 270.1 lb./ac.
(iii) Only N and R effects are highly significant.
(iv) Av. yield of grain in lb./ac.

\[\begin{array}{cccc|cc}
N_0 & N_1 & N_2 & N_3 & Mean & R_1 \\
\hline
S_1 & 1335 & 2112 & 2125 & 2374 & 1987 & 2240 \\
S_2 & 1293 & 1921 & 2101 & 2166 & 1870 & 2147 \\
S_3 & 1197 & 1649 & 2214 & 2217 & 1819 & 2194 \\
\hline
\text{Mean} & 1275 & 1894 & 2147 & 2252 & 1982 & 2194 \\
R_1 & 1462 & 2203 & 2465 & 2644 & 2194 & 1590 \\
R_2 & 1088 & 1585 & 1828 & 1861 & 174.3 & 110.3 \\
\end{array}\]

- S.E. of marginal mean of S
- S.E. of marginal mean of R
- S.E. of body of table S x R
- S.E. of difference of two
1. N marginal means
2. N means at the same level of S
3. S means at the same level of N
4. N means at the same level of R
5. R means at the same level of N

Crop: Soyabean (Kharif).
Site: Demonstration farm, Kangra.
Object: To study the effect of seed rate on yield of Soyabean.

1. BASAL CONDITIONS:
(i) (a) Nil.
   (b) Fallow.
   (c) Nil.
(ii) (a) Loamy.
   (b) N.A.
(iii) 23.5.1949.
(iv) (a) 4 ploughings and 5
   sowings.
   (b) N.A.
   (c) As per treatments.
   (d) and (e) N.A.
   (v) N.A.
   (vi) N-373 (medium).
   (vii) Irrigated.
   (viii) 1 weeding.
   (ix) 42.70°.
   (x) 19.10.1949.

2. TREATMENTS:
4 seed rates.
1. 15 sr./ac.
2. 20 sr./ac.
3. 25 sr./ac.
4. 30 sr./ac.

3. DESIGN:
(i) BBD.
(ii) (a) 4.
   (b) N.A.
(iii) 4.
   (iv) (a) and (b) 48.4° x 9°.
   (v) Nil.
   (vi) Yes.

4. GENERAL:
(i) Good.
   No lodging.
   (ii) Nil.
   (iii) Yield.
   (iv) (a) Not continued.
   (b) and (c) Nil.
   (v) (a) Nil.
   (b) Nil.
   (vi) and (vii) Nil.

5. RESULTS:
(i) 1906 lb./ac.
(ii) 1107.7 lb./ac.
(iii) Treatments are highly significantly different.
(ix) Av. yield of soyabean in lb./ac.

<table>
<thead>
<tr>
<th>Treatment</th>
<th>Av. yield</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>1620</td>
</tr>
<tr>
<td>2.</td>
<td>1864</td>
</tr>
<tr>
<td>3.</td>
<td>1954</td>
</tr>
<tr>
<td>4.</td>
<td>2186</td>
</tr>
<tr>
<td>S.E./mean</td>
<td>55.3 lb./ac.</td>
</tr>
</tbody>
</table>

Ref: Pb. 49(1).
Type: 'C'.
Crop :-Soyabean (Kharif).
Ref :- Pb. 49(2).
Site :- Demonstration farm, Kangra.
Type :- 'C'.

Object :- To study the effect of spacing on yield of Soyabean.

1. BASAL CONDITIONS :
   (i) (a) Nil. (b) Fallow. (c) Nil. (ii) (a) Loamy. (b) N.A. (iii) 22.5.1949. (iv) (a) 4 ploughings and 5 sowings. (b) and (c) N.A. (d) As per treatments. (e) N.A. (f) N-373 (medium). (v) Irrigated. (vi) One weeding and hoeing. (ix) 42.70'. (x) 20.24.10.1949.

2. TREATMENTS :
   All combinations of (1) and (2)
   (1) 3 row spacings : R1=1', R2=1½' and R3=2'.
   (2) 3 plant spacings : S1=2", S2=4" and S3=6".

3. DESIGN :
   (i) 3x3 Fact. in R.B.D. (ii) (a) 9. (b) N.A. (iii) 4. (iv) (a) and (b) 40.4'x6'. (v) Nil. (vi) Yes.

4. GENERAL :
   (i) Good. No lodging. (ii) Nil. (iii) Yield. (iv) (a) Not continued. (b) and (c) -. (v) (a) Nil. (b) -. (vi) and (vii) Nil.

5. RESULTS :
   (i) 2034 lb./ac.
   (ii) 181.5 lb./ac.
   (iii) Overall treatments effect is significant. Effects of S and R x S are significant, while effect of R is not significant.
   (iv) Av. yield of soyabean in lb./ac.

<table>
<thead>
<tr>
<th></th>
<th>R1</th>
<th>R2</th>
<th>R3</th>
<th>Mean</th>
</tr>
</thead>
<tbody>
<tr>
<td>S1</td>
<td>2149</td>
<td>2172</td>
<td>1918</td>
<td>2080</td>
</tr>
<tr>
<td>S2</td>
<td>2241</td>
<td>2102</td>
<td>2016</td>
<td>2120</td>
</tr>
<tr>
<td>S3</td>
<td>2056</td>
<td>1710</td>
<td>1941</td>
<td>1902</td>
</tr>
<tr>
<td>Mean</td>
<td>2149</td>
<td>1995</td>
<td>1958</td>
<td>2034</td>
</tr>
</tbody>
</table>

S.E. of any marginal mean = 52.4 lb./ac.
S.E. of body of table = 90.7 lb./ac.

---

Crop :- Soyabean.
Site :- Demonstration Farm, Kangra.
Type :- 'CV'.

Object :– To study the effect of seed rate on yield of different varieties of Soyabean.

1. BASAL CONDITIONS :
   (i) (a) Nil. (b) Wheat. (c) Nil. (ii) (a) Loamy. (b) N.A. (iii) 22.5.1948. (iv) (a) and (b) N.A. (c) As per treatments. (d) and (e) N.A. (v) Nil. (vi) As per treatments. (vii) Irrigated. (viii) One weeding. (ix) 28.79'. (x) 17.10.1948.

2. TREATMENTS:
   Main-plot treatments:
   2 varieties: V1=N-373 and V2=Mix-91.
   Sub-plot treatments:
   4 seed rates: R1=15, R2=20, R3=25 and R4=30 sb.plot.

3. DESIGN:
   (i) (a) Split-plot. (ii) (a) 2 main-plots/block; 4 sub-plots/main-plot. (b) N.A. (iii) 4. (iv) (a) and (b) 4'x38'. (v) Nil. (vi) Yes.
4. GENERAL:

(i) Normal. No lodging. (ii) Nil. (iii) Yield. (iv) (a) Not continued. (b)—. (c)—. (v) (a) No. (b)—. (vi) and (vii) Nil.

5. RESULTS:

(i) 2009 lb./ac.
(ii) (a) 289.4 lb./ac.

(iii) (a) 271.4 lb./ac.
(iv) (a) Not continued. (b). (c). 
(v) (a) No. (b)... 
(vi) and (vii) Nil.

5. RESULTS:

(i) 2009 lb./ac.
(ii) (a) 289.4 lb./ac.

(iii) (a) 271.4 lb./ac.
(iv) (a) Not continued. (b). (c).
(v) (a) No. (b)... 
(vi) and (vii) Nil.

<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>1999</td>
<td>2321</td>
<td>2616</td>
<td>2837</td>
<td>2443</td>
</tr>
<tr>
<td>V₂</td>
<td>1474</td>
<td>1326</td>
<td>1769</td>
<td>1732</td>
<td>1575</td>
</tr>
</tbody>
</table>

|     | 1737 | 1824 | 2192 | 2285 | 2009 |

S.E. of difference of two
1. V marginal means = 102.4 lb./ac.
2. R marginal means = 135.8 lb./ac.
3. V means at the same level of R = 195.2 lb./ac.
4. R means at the same level of V = 191.9 lb./ac.

Crop: Gram. 
Site: Agri. Stn., Ferozepur. 
Type: 'M'.

Object: To study the effect of applications of Super to Gram crop.

1. BASAL CONDITIONS:

(i) (a) Gram-Bajra-Wheat-Fallow. (b) Fallow. (c) Nil. (ii) (a) Loam. (b) N.A. (iii) 19.10.1953. (iv) (a) 1 raja plough, 4 desi plough, 8 plankings. (b) Kera behind the plough. (c) 1 md. 5 sr/ac. (d) N.A. (e)—. (v) 20 C.L. of F.Y.M. (160 lb. N approx. or 400 mds. of F.Y.M. approx.) applied by method of broadcast. (vi) Kabuli gram C-104 (medium). (vii) Irrigated. (viii) One hoeing. (ix) 2.47. (x) 10.4.1954.

2. TREATMENTS:

1. Control.
2. 50 lb./ac. of P₂O₅ as Super.
3. 75 lb./ac. of P₂O₅ as Super.
4. 100 lb./ac. of P₂O₅ as Super.

Super applied behind the plough before sowing.

3. DESIGN:

(i) R.B.D. (ii) (a) 4. (b) N.A. (iii) 6. (iv) (a) N.A. (b) 80°66'×9°. (v) N.A. (vi) Yes.

4. GENERAL:

(i) Normal. No lodging. (ii) Nil. (iii) Germination count, height, dates of flowering and grain yield. (iv) (a) 1953—continued. (b) No. (c) Nil. (v) (a) Rohtak. (b) Nil. (vi) and (vii) Nil.

5. RESULTS:

(i) 1421 lb./ac.
(ii) 119.4 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>1184</td>
</tr>
<tr>
<td>2.</td>
<td>1515</td>
</tr>
<tr>
<td>3.</td>
<td>1476</td>
</tr>
<tr>
<td>4.</td>
<td>1508</td>
</tr>
</tbody>
</table>

S.E./mean = 48.7 lb./ac.
Crop: Gram
Site: Agri. Farm, Rohtak.

Object: To study the effect of A/S on the yield of Gram.

1. BASAL CONDITIONS:
   (i) (a) Nil. (b) Jowar. (c) N.A. (ii) (a) Loamy. (b) Refer soil analysis, Rohtak. (iii) 3.13.1948.
   (iv) (a) to (e) N.A. (v) Nil. (vi) Pb. I.P-58 (medium). (vii) Unirrigated. (viii) Nil. (ix) 0.26.” (x) 23.3.1949.

2. TREATMENTS:
   1. Control (no manure).
   2. 1 l/acre of A/S.
   3. 15 lb./acre of A/S
   A/S applied on 15.1.1949.

3. DESIGN:
   (i) R.B.D. (ii) (a) 3. (b) N.A. (iii) 8. (iv) (a) 65'×24' (b) 54'×20'. (v) N.A. (vi) Yes.

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

5. RESULTS:
   (i) 1283 lb./acre.
   (ii) 126.9 lb./acre.
   (iii) Treatments are not significantly different.
   (iv) Av. yield of grain in lb./acre.

<table>
<thead>
<tr>
<th>Treatment</th>
<th>Av. yield</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>1295</td>
</tr>
<tr>
<td>2.</td>
<td>1213</td>
</tr>
<tr>
<td>3.</td>
<td>1341</td>
</tr>
<tr>
<td>S.E./mean</td>
<td>44.9 lb./ac.</td>
</tr>
</tbody>
</table>

Crop: Gram (Rabi).
Site: Agri. Farm (Soil Sub-Stn.), Rohtak.

Object: To find the suitable manural treatments for Gram.

1. BASAL CONDITIONS:
   (i) (a) Nil. (b) Fallow. (c) Nil. (ii) (a) Loam. (b) Refer soil analysis, Rohtak. (iii) 7.10.1953. (iv)
   (a) 4 ploughings and 4 sakaga. (b) N.A. (c) 25 str./ac. (d) and (e) N.A. (v) Nil. (vi) I.P-58 (medium).
   (vii) Irrigated. (vi) One weeding. (ix) 8.10’. (x) 17.4.1954.

2. TREATMENTS:
   1. 25 lb./acre of P₂O₅ as B.M. (uncomposted).
   2. 25 lb./acre of P₂O₅ as B.M. (compost).
   3. 25 lb./acre of P₂O₅ as compost manure.
   4. 25 lb. of P₂O₅ as B.M. (uncomposted)+25 lb./acre of N as A/S.
   5. 25 lb./acre of P₂O₅ as B.M. compost+25 lb./acre of N as A/S.
   6. 25 lb./acre of P₂O₅ as Super.
   7. 25 lb./acre of P₂O₅ as Super+25 lb./acre of N as A/S.
   8. 50 lb./acre of P₂O₅ as Super+25 lb./acre of N as A/S.
   9. Control.
   Super applied by pore while other manures by broadcast. A/S applied with 1st irrigation.

3. DESIGN:
   (i) R.B.D. (ii) (a) 9. (b) N.A. (iii) 4. (iv) (a) N.A. (b) 1/40 ac. (v) N.A. (vi) Yes.
4. GENERAL:
(i) Crop damaged due to hail storm. Slight lodging. (ii) Nil. (iii) Grain yield. (iv) (a) to (c) No. (v) (a) and (b) No. (vi) and (vii) Nil.

5. RESULTS:
(i) 2719 lb./ac.
(ii) 437.3 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>2917</td>
</tr>
<tr>
<td>2.</td>
<td>2666</td>
</tr>
<tr>
<td>3.</td>
<td>2480</td>
</tr>
<tr>
<td>4.</td>
<td>2831</td>
</tr>
<tr>
<td>5.</td>
<td>2708</td>
</tr>
<tr>
<td>6.</td>
<td>2657</td>
</tr>
<tr>
<td>7.</td>
<td>2891</td>
</tr>
<tr>
<td>8.</td>
<td>3034</td>
</tr>
<tr>
<td>9.</td>
<td>2283</td>
</tr>
</tbody>
</table>

S.E./mean = 218.7 lb./ac.

Crop: Kabuli Gram.
Site: Agri. Farm, Soil Sub-Stn., Rohtak.

Object: To find the best manure for Kabuli Gram.

1. BASAL CONDITIONS:
(i) (a) Nil. (b) Fallow. (c) Nil. (ii) (a) Loam. (b) Refer soil analysis, Rohtak. (iii) Sept. 1953. (iv) (a) 4-5 ploughings and 5 sohaga. (b) Kern. (c) 40 ac./ac. (d) N.A. (e) N.A. (v) Nil. (vi) No. 104 (medium). (vii) Irrigated. (viii) One weeding. (ix) 8.10". (x) 10.4.1954.

2. TREATMENTS:
All combinations of (1) and (2).
(1) 2 levels of N: N₀ = 0 and N₁ = 25 lb./ac.
(2) 2 levels of P₂O₅: P₀ = 0 and P₁ = 25 lb./ac.
N as A/S and P₂O₅ as Super. Super was drilled before sowing. A/S added in December.

3. DESIGN:
(i) 2 x 2 Fact. in R.B.D. (ii) (a) 4. (b) N.A. (iii) 4. (iv) (a) N.A. (b) 1/16 ac. (v) N.A. (vi) Yes.

4. GENERAL:
(i) Hail storm in January 1954 damaged the crop, slight lodging. (ii) Crop severely attacked by white ants. (iii) Grain yield. (iv) (a) No. (b) No. (c) → (v) (a) No. (b) → (vi) and (vii) Nil.

5. RESULTS:
(i) 1095 lb./ac.
(ii) 163.7 lb./ac.
(iii) Effect of N alone is significant.
(iv) Av. yield of grain in lb./ac.

<table>
<thead>
<tr>
<th>N₀</th>
<th>N₁</th>
<th>Mean</th>
</tr>
</thead>
<tbody>
<tr>
<td>P₀</td>
<td>887</td>
<td>1152</td>
</tr>
<tr>
<td>P₁</td>
<td>1081</td>
<td>1260</td>
</tr>
<tr>
<td>Mean</td>
<td>984</td>
<td>1206</td>
</tr>
</tbody>
</table>

S.E. of any marginal mean = 57.9 lb./ac.
S.E. of body of table = 81.9 lb./ac.

Ref.: Pb. 53(161).
Type: 'M',
Crop :- Gram (Kabuli).
Ref :- Pb. 53(166).
Site :- Govt. Agri. Farm, Millet Sub, Stn., Rohtak. Type :- 'M'.
Object :- To study the effect of \( \text{P}_2\text{O}_5 \) on Gram (Kabuli).

1. **BASAL CONDITION**:
   
   (i) (a) Nil. (b) Cotton. (c) 203 lb. A/S applied on 7.8.1953.  
   (ii) (a) Loam. (b) Refer soil analysis, Rohtak.  
   (iii) 4.11.1953.  
   (iv) (a) 1 raja, 1 desi hal, 1 cultivator, and 3 plantings. (b) Pore. (c) 40 sr./ac. (d) Row to row 1' ; plant to plant 3"—6". (e) N.A. (v) Nil. (vi) C-104 (medium). (vii) Irrigated. (viii) One weeding. (ix) 8 10". (x) 14.4.1954.

2. **TREATMENTS**:
   
   1. Control.
   2. 50 lb./ac. of \( \text{P}_2\text{O}_5 \) as Super.
   3. 75 lb./ac. of \( \text{P}_2\text{O}_5 \) as Super.
   4. 100 lb./ac. of \( \text{P}_2\text{O}_5 \) as Super.

   Seed mixed with Super was sown by pore on 4.11.1953.

3. **DESIGN**:
   
   (i) R.B.D. (ii) (a) 4. (b) N.A. (iii) 6.  
   (iv) (a) 60.5'x15'. (b) 60.5'x15'. (v) Nil. (vi) Y.s.

4. **GENERAL**:
   
   (i) Good. No lodging. (ii) Nil. (iii) Germination, growth and grain yield. (iv) (a) 1953-1954. (b) No.  
   (c) —. (v) (a) Millet Stn. Ferozepur. (b) N.A. (vi) and (vii) Nil.

5. **RESULTS**:
   
   (i) 1623 lb./ac.  
   (ii) 281.5 lb./ac.  
   (iii) Treatments are not significantly different.  
   (iv) Av. yield of grain in lb./ac.  

   Treatment   Av. yield
   1. 1626
   2. 1650
   3. 1699
   4. 1518
   S.E./mean = 114.9 lb./ac.

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Crop :- Gram.
Ref :- Pb. 48 (52).
Site :- Govt. Agri. Stn., Hansi. Type :- 'C'.
Object :- To study the effect of date of sowing on yield of Gram.

1. **BASAL CONDITIONS**:
   
   (i) (a) Nil. (b) Maize. (c) Nil. (ii) (a) Loam. (b) N.A. (iii) As per treatments (iv) (a) N.A. (b) N.A. (c) 6 chktplot. (d) and (e) N.A. (v) Nil. (vi) T-7 (m/dium). (vii) Unirrigated. (viii) Nil. (ix) 0.71". (x) 19.4.1949.

2. **TREATMENTS**:
   
   1. Date of sowing 11.10.1948.
   2. Date of sowing 22.10.1948.
   3. Date of sowing 30.10.1948.

3. **DESIGN**:
   
   (i) R.B.D. (ii) (a) 3. (b) N.A. (iii) 3. (iv) (a) 7.5'x13'. (b) 7.5'-4"x11 (v) N.A. (vi) Yes.
4. GENERAL:
(i) Fair. No lodging. (ii) N.A. (iii) Grain yield. (iv) (a) No. (b) No. (c) —. (v) (a) No. (b) —. (vi) Nil. (vii) Expt. was planned with 6 replications but data available only for 3 replications.

5. RESULTS:
(i) 1634 lb./ac.
(ii) 245.7 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>1858</td>
</tr>
<tr>
<td>2.</td>
<td>1685</td>
</tr>
<tr>
<td>3.</td>
<td>1358</td>
</tr>
<tr>
<td>S.E./mean</td>
<td>141.9 lb./ac.</td>
</tr>
</tbody>
</table>

Crop: Gram.  
Site: Jullundur Agri. Stn., Jullundur.  
Ref: Pb. 48 (24).  
Type: 'C'.

Object: To study the effect of cultivation practices on yield of Gram.

1. BASAL CONDITIONS:
(i) (a) Nil. (b) N.A. (c) N.A. (ii) (a) Sandy. (b) Refer soil analysis, Jullundur. (iii) 1.11.1948  
(iv) (a) and (b) N.A. (c) 16 sr./ac. (d) and (e) N.A. (v) N.A. (vi) Pb. 7 (medium). (vii) Rainfed. (viii) Nil. (ix) 6.29". (x) 11.4.1949.  

2. TREATMENTS:
1. Control (ordinary cultivation with country plough).  
2. Sub-soiling with spade (sub-soiling was done up to 1' with spade).

3. DESIGN:  
(i) Paired plot.  
(ii) (a) 2. (b) N.A.  
(iii) 6. (iv) (a) and (b) 11'×49.5'. (v) Nil. (vi) Yes.

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

5. RESULTS:
(i) 824.6 lb./ac.  
(ii) 192.68 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>421.7</td>
</tr>
<tr>
<td>2.</td>
<td>1227.4</td>
</tr>
<tr>
<td>S.E./mean</td>
<td>73.66 lb./ac.</td>
</tr>
</tbody>
</table>

Crop: Gram.  
Site: Jullundur Agri. Stn., Jullundur.  
Ref: Pb. 48 (25).  
Type: 'C'.

Object: To study the effect of cultivation practices on yield of Gram.

4. BASAL CONDITIONS:
(i) (a) Nil. (b) Fallow. (c) Nil. (ii) (a) Sandy. (b) Refer soil analysis, Jullundur. (iii) 1.11.1948. (iv) (a) and (b) N.A. (c) 16 sr./ac. (d) and (e) N.A. (v) N.A. (vi) Pb. 7 (medium). (vii) Unirrigated. (viii) Nil. (ix) 6.29". (x) 22.4.1949.
2. TREATMENTS:
1. Control (ordinary cultivation with country plough).
2. Sub-soiling up 1' with soil inverting plough.

3. DESIGN:
(i) Paired plot. (ii) (a) 2. (b) 6. (iii) 6. (iv) (a) and (b) 11'×99'. (v) Nil. (vi) Yes.

4. GENERAL:
(i) Fair to normal. No lodging. (ii) Slight attack of wilt. (iii) Grain and straw yield. (iv) (a) No (b) No. (c) —. (v) (a) No. (b) —. (vi) and (vii) Nil.

5. RESULTS:
(i) 552.9 lb./ac.
(ii) 110.58 lb./ac.
(iii) Treatments are significantly different.
(iv) Av. yield of grain in lb./ac.

<table>
<thead>
<tr>
<th>Treatment</th>
<th>Av. yield</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>306.9</td>
</tr>
<tr>
<td>2.</td>
<td>798.9</td>
</tr>
<tr>
<td>S.E./mean</td>
<td>=55.14 lb./ac.</td>
</tr>
</tbody>
</table>

Crop :-Gram (Rabi).
Site :-Jullundur Agri. Stn., Jullundur.
Object :-To find the best date of sowing Gram.

1. BASAL CONDITIONS:
(i) (a) N.A. (b) Fallow. (c) Nil. (ii) (a) Loam. (b) Refer soil analysis, Jullundur. (iii) As per treatments. (iv) (a) 4 desil hal and 4 sohaga. (b) to (e) N.A. (v) Nil. (vi) Pb. 7 (medium). (vii) Unirrigated. (viii) One hoeing cum weeding. (ix) 6.14'. (x) 24.4.1950.

2. TREATMENTS:
Dates of sowing :
1. 5.10.1949.
2. 15.10.1949.
3. 25.10.1949.
4. 4.11.1949.

3. DESIGN:
(i) R.B.D. (ii) (a) 4. (b) N.A. (iii) 4. (iv) (a) and (b) 45'×12'. (v) Nil. (vi) Yes.

4. GENERAL:
(i) Germination satisfactory. No lodging. (ii) Slight attack of wilt. (iii) Grain and straw yield. (iv) (a) No. (b) —. (c) —. (v) (a) Nil. (b) —. (vi) Nil. (vii) Experiment was laid out in 6 replications; yield available for 4 replications.

5. RESULTS:
(i) 948.9 lb./ac.
(ii) 186.8 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>1332.6</td>
</tr>
<tr>
<td>2.</td>
<td>951.5</td>
</tr>
<tr>
<td>3.</td>
<td>692.2</td>
</tr>
<tr>
<td>4.</td>
<td>819.3</td>
</tr>
<tr>
<td>S.E./mean</td>
<td>=93.40 lb./ac.</td>
</tr>
</tbody>
</table>
Object:—To study the effect of cultivation practices on yield of Gram.

1. BASAL CONDITIONS:
   (i) (a) Nil. (b) Fallow. (c) Nil. (ii) (a) Loam. (b) N.A. (iii) 21.9.1952. (iv) (a) As per treatments. (b) to (e) N.A. (v) F.Y.M. applied at 50 lb./ac. of N one month before sowing. (vi) G—24 (medium). (vii) Irrigated. (viii) Only in plots receiving treatment 2 weeding was done. (ix) 3.20". (x) 1.4.1953.

2. TREATMENTS:
   1. Control (/2 ploughings only).
   2. A number of deep ploughings and weedicings.

3. DESIGN:
   (i) Paired plot. (ii) 2. (b) N.A. (iii) 10. (iv) (a) and (b) 73'—4"×9'. (v) Nil. (vi) Yes.

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

5. RESULTS:
   (i) 494.3 lb./ac.
   (ii) 127.08 lb./ac.
   (iii) Treatments are highly significantly different.
   (iv) Av. yield of grain in lb./ac.

   Treatment | Av. yield
   1. | 340.7
   2. | 647.9
   S.E./mean | =40.19 lb./ac.

Crop:—Gram. Site:—Agri. Farm, Rohtak. Object:—To study optimum date of sowing.

1. BASAL CONDITIONS:
   (i) (a) Nil. (b) N.A. (c) N.A. (ii) (a) Loam. (b) Refer soil analysis, Rohtak. (iii) As per treatments. (iv) (a) and (b) N.A. (c) 20 sr./ac. (d) and (e) N.A. (v) N.A. (vi) Pb. 58. (medium). (vii) Unirrigated. (viii) 1 weeding cum hoeing. (ix) 0.26". (x) 26.3.1949.

2. TREATMENTS:
   Sowing dates.
   1. 2.10.1948
   2. 10.10.1948
   3. 18.10.1948
   4. 26.10.1948
   5. 3.11.1948

3. DESIGN:
   (i) R.B.D. (ii) (a) 5. (b) N.A. (iii) 6. (iv) (a) 66'×20'. (b) 60'×18'. (v) N.A. (vi) Yes.

4. GENERAL:
   (i) Germination and growth good. No lodging. (ii) Nil. (iii) Grain yield. (iv) (a) 1943 to 1948. (b) No. (c) —. (v) (a) No. (b) —. (vi) and (vii) Nil.
5. RESULTS:
(i) 1680 lb./ac.
(ii) 227.3 lb./ac.
(iii) Treatments are highly significantly different.
(iv) Av. yield of grain in lb./ac.

<table>
<thead>
<tr>
<th>Treatment</th>
<th>Av. yield</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>1831</td>
</tr>
<tr>
<td>2.</td>
<td>1841</td>
</tr>
<tr>
<td>3.</td>
<td>1882</td>
</tr>
<tr>
<td>4.</td>
<td>1558</td>
</tr>
<tr>
<td>5.</td>
<td>1286</td>
</tr>
<tr>
<td>S.E./mean</td>
<td>92.8 lb./ac.</td>
</tr>
</tbody>
</table>

Crop :- Gram.
Site :- Agri. Farm, Rohtak,

Object :- To study effect of sub-soiling due to bullock labour on yield of Gram.

1. BASAL CONDITIONS :
(i) (a) Nil. (b) Fallow. (c) Nil. (ii) (a) Loamy. (b) Refer soil analysis, Rohtak. (iii) 23.10.1948.
(iv) (a) and (b) N.A. (c) 20 sr./ac. (d) and (e) N.A. (v) N.A. (vi) Pb. P-58 (medium). (vii) Unirrigated.
(viii) 1 weeding cum hoeing. (ix) 0.26'. (x) 26.3.1949.

2. TREATMENTS :
1. Control.
2. Sub-soiling (by bullock labour).

3. DESIGN :
(i) Paired plot. (ii) (a) 2. (b) N.A. (iii) 6. (iv) (a) and (b) 1/20 ac. (v) Nil. (vi) Yes.

4. GENERAL :
(i) Good. Nil lodging. (ii) Nil. (iii) Grain yield. (iv) (a) 1948 to 1949. (b) Nil (c) Nil (v) and (b) Nil.
(vi) and (vii) Nil.

5. RESULTS :
(i) 1240 lb./ac.
(ii) 150.7 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>1219</td>
</tr>
<tr>
<td>2.</td>
<td>1260</td>
</tr>
<tr>
<td>S.E./mean</td>
<td>61.5 lb./ac.</td>
</tr>
</tbody>
</table>

Crop :- Gram.
Site :- Agri. Farm, Rohtak.

Object :- To study the effect of sub-soiling due to bullock labour on yield of Gram.
2. TREATMENTS:
1. Control.
2. Sub-soiling (done by bullock labour).

3. DESIGN:
(i) Paired plot. (ii) (a) 2. (b) N.A. (iii) 6. (iv) (a) and (b) 18'×121'. (v) Nil. (vi) Yes.

4. GENERAL:
(i) Good. No lodging. (ii) Nil. (iii) Grain yield. (iv) 1948 to 1949. (b) No (c) Nil (v) (a) and (b) No. (vi) and (vii) Nil.

5. RESULTS:
(i) 1444 lb./ac.
(ii) 38.7 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>1447</td>
<td>15.8 lb./ac.</td>
</tr>
<tr>
<td>2.</td>
<td>1440</td>
<td></td>
</tr>
</tbody>
</table>

Object: To study the effect of sub-soiling by manual labour (with spade) on yield of Gram.

1. BASAL CONDITIONS:
(i) (a) Nil. (b) Fallow. (c) Nil. (ii) (a) Loamy. (b) Refer soil analysis, Rohtak. (iii) 23-10.1948. (iv) (a) and (b) N.A. (c) 20 ar. (d) N.A. (e) N.A. (f) N.A. (g) N.A. (h) Pb. 1.P. 58 (medium). (vii) Unirrigated. (viii) 1 weeding cum hoeing. (ix) 0.26. (x) 26.3.1949.

2. TREATMENTS:
1. Control.
2. Sub-soiling by manual labour (with spade).

3. DESIGN:
(i) Paired plot. (ii) (a) 2. (b) N.A. (iii) 6. (iv) (a) 11'×49.5'. (b) 11'×49.5'. (v) Nil. (vi) Yes.

4. GENERAL:
(i) Fair to good. No lodging. (ii) Nil. (iii) Grain yield. (iv) 1948 to 1949. (b) No. (c) Nil. (v) (a) Nil. (b) —. (vi) and (vii) Nil.

5. RESULTS:
(i) 1193 lb./ac.
(ii) 202.6 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>
<th>S.E./mean</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>1234</td>
<td>82.7 lb./ac.</td>
</tr>
<tr>
<td>2.</td>
<td>1152</td>
<td></td>
</tr>
</tbody>
</table>
Crop :- Gram.  
Site :- Agri. Farm, Rohtak.

Object :—To study the effect of Sub-soiling due to manual labour (by spade) on yield of Gram.

1. BASAL CONDITIONS:
   (i) (a) Nil. (b) N.A. (c) N.A. (ii) (a) Loamy. (b) Refer soil analysis, Rohtak. (iii) 17.10.1949. (iv) (a) and (b) N.A. (c) 20 sr./ac. (d) and (e) N.A. (v) N.A. (vi) Pb. 1-P.58. (vii) Unirrigated. (viii) One weeding cum hoeing (ix) 2:15". (x) 5.4.1950.

2. TREATMENTS:
   1. Control.
   2. Sub-soiling (manual labour by spade).

3. DESIGN:
   (i) Paired plot. (ii) (a) 2. (b) N.A. (iii) 6. (iv) (a) 11' x 49". (b) 11' x 49". (v) Nil. (vi) Yes.

4. GENERAL:
   (i) Normal. No lodging. (ii) Nil. (iii) Grain yield. (iv) (a) 1948 to 1949. (b) No. (c) Nil. (v) (a) No. (b) Nil. (vi) and (vii) Nil.

5. RESULTS:
   (i) 1529 lb./ac.
   (ii) 123.0 lb./ac.
   (iii) Treatments are not significantly different.
   (iv) Av. yield of grain in lb./ac.
   Treatment     Av. yield
   1.            1618
   2.            1440
   S.E./mean    = 50.2 lb./ac.

Crop :- Gram.  
Site :- Agri. Farm, Rohtak.

Object :—To study the effect of cultivation practices on the yield of Gram.

1. BASAL CONDITIONS:
   (i) (a) Nil. (b) Fallow. (c) Nil. (ii) (a) Loamy. (b) Refer soil analysis, Rohtak. (iii) 12.10.1950. (iv) (a) to (e) N.A. (v) N.A. (vi) Pb. I. P.58 (medium). (vii) Unirrigated. (viii) Nil. (ix) 1.83". (x) 13.3.1951.

2. TREATMENTS:
   1. Control.
   2. Desi hal after desi hal.
   3. Rajah plough after ridger.

3. DESIGN:
   (i) R.B.D. (ii) (a) 3. (b) N.A. (iii) 6. (iv) (a) N.A. (b) 60' x 18' (v) N.A. (vi) Yes.

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

5. RESULTS:
   (i) 1248 lb./ac.
   (ii) 150.2 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>1262</td>
</tr>
<tr>
<td>2.</td>
<td>1296</td>
</tr>
<tr>
<td>3.</td>
<td>1186</td>
</tr>
<tr>
<td>S.E./mean</td>
<td>61.3 lb./ac.</td>
</tr>
</tbody>
</table>

**Crop:** Gram.  
**Site:** Govt. Agri. Stn., Hansi.  
**Ref:** Pb. 52(105).  
**Type:** 'CV'.

Object:—To study the effect of dates of sowing different varieties on the yield of Gram.

1. **BASAL CONDITIONS:**
   (i) (a) Nil. (b) Fallow. (c) Nil.  
   (ii) (a) Loam. (b) N.A.  
   (iii) As per treatments.  
   (iv) (a) 11 desi plough, 6 sougha, 4 roller, 2 bar harrow. (b) N.A.  
   (c) 20 sr./ac.  
   (d) and (e) N.A.  
   (v) Nil.  
   (vi) As per treatments.  
   (vii) Irrigated.  
   (viii) Nil.  
   (ix) 1.86'. (x) 24.3.1953 to 30.3.1953.

2. **TREATMENTS:**
   **Main-plot treatments:**
   2 varieties: \( V_1 = \text{Pb. 7 (medium)} \), \( V_2 = \text{G 24 (medium)} \).
   **Sub-plot treatments:**
   3 dates of sowing: \( D_1 = 26.9.1952 \), \( D_2 = 26.10.1952 \), and \( D_3 = 10.11.1952 \).

3. **DESIGN:**
   (i) Split-plot.  
   (ii) (a) 2 main-plots/block; 3 sub-plots/main-plot. (b) N.A.  
   (iii) 4.  
   (iv) (a) 54'-5"x 10'. (b) 54'-5"x 10'. (v) Nil.  
   (vi) Yes.

4. **GENERAL:**
   (i) Normal. No lodging.  
   (ii) Nil.  
   (iii) Grain yield.  
   (iv) (a) 1952 to 1953. (b) No. (c) Nil.  
   (v) (a) No.  
   (b) Nil.  
   (vi) and (vii) Nil.

5. **RESULTS:**
   (i) 1579 lb./ac.  
   (ii) (a) 529.9 lb./ac.  
   (b) 347.9 lb./ac.  
   (iii) Only dates of sowing are significantly different.  
   (iv) Av. yield of grain in lb./ac.

<table>
<thead>
<tr>
<th></th>
<th>( V_1 )</th>
<th>( V_2 )</th>
<th>Mean</th>
</tr>
</thead>
<tbody>
<tr>
<td>( D_1 )</td>
<td>2097</td>
<td>1359</td>
<td>1728</td>
</tr>
<tr>
<td>( D_2 )</td>
<td>1737</td>
<td>1783</td>
<td>1760</td>
</tr>
<tr>
<td>( D_3 )</td>
<td>1271</td>
<td>1227</td>
<td>2249</td>
</tr>
<tr>
<td>Mean</td>
<td>1702</td>
<td>1456</td>
<td>1579</td>
</tr>
</tbody>
</table>

S.E. of difference of two
1. V marginal means \( = 216.3 \) lb./ac.  
2. D marginal means \( = 173.8 \) lb./ac.  
3. D means at a level of V \( = 247.0 \) lb./ac.  
4. V means at a level of D \( = 295.2 \) lb./ac.
Crop :- Gram.  
Site :- Govt. Agri. Stn., Hansi.  

Object :- To study the effect of dates of sowing different varieties on the yield of Gram.

1. BASAL CONDITIONS:
   (i) (a) Nil. (b) Guara (c) Nil. (ii) (a) Loam. (b) N.A. (iii) As under treatments. (iv) (a) 1 rain, 4 to 5 desi plough and 6 to 9 sohaga. (b) N.A. (c) 20 sr/ac. (d) and (e) N.A. (v) Nil. (vi) As per treatments. (vii) Nil. (viii) Nil. (ix) 4.50'. (x) 15, 18.4.1954.

2. TREATMENTS:
   Main-plot treatments:
   2 varieties : V₁ = Punjab 7 (medium) and V₂ = G-24 (medium).
   Sub-plot treatments:
   3 dates of sowing : D₁ = 25.9.1953, D₂ = 12.10.1953 and D₃ = 27.10.1953.

3. DESIGN:
   (i) Split-plot. (ii) (a) 2 main-plots/block; 3 sub-plots/main-plot. (b) N.A. (iii) 4. (iv) (a) 54'-6'X 10'. (b) 54'-6'X 10'. (v) Nil. (vi) Yes.

4. GENERAL:
   (i) Good. No lodging. (ii) Nil. (iii) Grain yield. (iv) (a) 1952 to 1953. (b) No. (c) Nil. (v) (a) No. (b)—. (vi) and (vii) Nil.

5. RESULTS
   (i) 2623 lb./ac.
   (ii) (a) 267.3 lb./ac.
   (b) 226.0 lb./ac.
   (iii) Main-plot treatments are highly significantly different. Sub-plot treatments are significantly different while interaction is not significant.
   (iv) Av. yield of grain in lb./ac.

<table>
<thead>
<tr>
<th></th>
<th>V₁</th>
<th>V₂</th>
<th>Mean</th>
</tr>
</thead>
<tbody>
<tr>
<td>D₁</td>
<td>2114</td>
<td>2554</td>
<td>2334</td>
</tr>
<tr>
<td>D₂</td>
<td>2659</td>
<td>2913</td>
<td>2786</td>
</tr>
<tr>
<td>D₃</td>
<td>2515</td>
<td>2985</td>
<td>2750</td>
</tr>
<tr>
<td>Mean</td>
<td>2429</td>
<td>2817</td>
<td>2623</td>
</tr>
</tbody>
</table>

S.E. of difference of two
1. V marginal means =109.2 lb./ac.
2. D marginal means =113.0 lb./ac.
3. D means at a level of V =159.8 lb./ac.
4. V means at a level of D =170.1 lb./ac.

Crop :- Gram.  
Site :- Govt. Agri. Stn., Hansi.  

Object :- To find the best time of irrigation for Gram crop.

1. BASAL CONDITIONS:
   (i) (a) Nil. (b) Fallow. (c) Nil. (ii) (a) Loam. (b) N.A. (iii) 6.10.1952. (iv) (a) 5 desi plough, 4 roller, 5 sohaga and 2 bar harrow. (b) N.A. (c) 20 sr/ac. (d) and (e) N.A. (v) Nil. (vi) Punjab 7 (medium). (vii) Irrigated. (viii) Nil. (ix) 1.86'. (x) 24.3.1953.
2. TREATMENTS:
1. No irrigation.
2. 3\textsuperscript{rd} Rauni (presowing).
3. 3\textsuperscript{rd} irrigation in December, 1952.
4. 3\textsuperscript{rd} irrigation in February, 1953.

3. DESIGN:
(i) R.B.D. (ii) (a) 4. (b) N.A. (iii) 6. (iv) (a) $5'\times 5'$ (b) $5'\times 11'$ (v) Nil. (vi) Yes.

4. GENERAL:
(i) Normal. No lodging. (ii) Nil. (iii) Grain yield. (iv) (a) No. (b) No. (c) --- (v) (a) No. (b) Nil. (vii) and (viii) Nil.

5. RESULTS:
(i) 249 lb./ac.
(ii) 261.8 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>2664</td>
</tr>
<tr>
<td>2.</td>
<td>2506</td>
</tr>
<tr>
<td>3.</td>
<td>2208</td>
</tr>
<tr>
<td>4.</td>
<td>2585</td>
</tr>
<tr>
<td>S.E./mean</td>
<td>82.4 lb./ac.</td>
</tr>
</tbody>
</table>

Crop: Mash.

Site: Govt. Agri. Stn., Gurdaspur.

Object: To study the effect of application of Super on yield of Mash.

1. BASAL CONDITIONS:
(i) (a) Not followed. (b) Maize-Bajra-Fodder. (c) Nil. (ii) (a) Loamy. (b) N.A. (iii) 27.7.1953. (iv) (a) 2 ploughings and 2 sowings. (b) N.A. (c) 10 sr./ac. (d) 1'X 1'. (e) N.A. (v) Nil. (vi) Mash 48 (medium). (vii) Unirrigated. (viii) Nil. (ix) 21.43. (x) 13.11.1953.

2. TREATMENTS:
1. Control.
2. 50 lb./ac. of $P_2O_5$ as Super.
3. 100 lb./ac. of $P_2O_5$ as Super.
Super applied on 27.7.1953 by broadcast before sowing.

3. DESIGN:
(i) R.B.D. (ii) (a) 3. (b) N.A. (iii) 6. (iv) (a) 72'X 14'. (b) 60'X 14'. (v) Approximately 3' left as non experimental area on two sides. (vi) Yes.

4. GENERAL:
(i) Fair. No lodging. (ii) Nil. (iii) Grain yield only. (iv) (a) 1953—1954. (b) No. (c) Nil. (v) (a) No. (b) ---. (vi) and (vii) Nil.

5. RESULTS:
(i) 242.1 lb./ac.
(ii) 57.14 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>245.0</td>
</tr>
<tr>
<td>2.</td>
<td>219.4</td>
</tr>
<tr>
<td>3.</td>
<td>231.9</td>
</tr>
<tr>
<td>S.E./mean</td>
<td>23.3 lb./ac.</td>
</tr>
</tbody>
</table>

Object: — To study the response of Cowpeas, for seed, to phosphatic fertilizer.

1. BASAL CONDITIONS:
   (i) (a) Nil. (b) Sudan grass. (c) Nil. (ii) (a) Heavy loam. (b) Refer soil analysis, Sirsa. (iii) 18.7.1953.
   (iv) (a) 2 rajah ploughing, 1 desi ploughing, 1 planking and 3 horse hoe. (b) N.A. (c) 41 sr./ac. (d) 3°
   apart. (e) N.A. (v) F.Y.M. at 8 C.L. applied by method of broadcast on 8.6.1953. (vi) Cowpeas Fos. No. 1

2. TREATMENTS:
   1. No fertilizer.
   2. 30 lb./ac. of P₂O₅ as Super.
   3. 60 lb./ac. of P₂O₅ as Super.
   Fertilizers applied by method of broadcast on 18.7.1953 before sowing.

3. DESIGN:
   (i) R.B.D. (ii) (a) 3. (b) N.A. (iii) 3. (iv) (a) and (b) 27' x 132'. (v) Nil. (vi) Yes.

4. GENERAL:
   plot yield. (iv) (a) 1953—1954. (b) and (c) Nil. (v) (a) No. (b) —. (vi) Nil. (vii) Germination good; good vegetation growth but seed setting poor.

5. RESULTS:
   (i) 597.6 lb./ac.
   (ii) 78.6 lb./ac.
   (iii) Treatments are not significantly different.
   (iv) Av. yield of cowpeas in lb./ac.
   
   Treatment      Av. yield
   
   1.            582.4
   2.            576.6
   3.            633.7
   
   S.E./mean = 55.80 lb./ac.


Object: — To find the effect of A/S and F.Y.M. on the yield of Potato crop.

1. BASAL CONDITIONS:
   (i) (a) Nil. (b) Fallow. (c) Nil. (ii) (a) Loam. (b) Refer soil analysis, Jullundur. (iii) 30.9.1949. (iv)
   (a) 6 desi hal and 8 sohaga. (b) to (e) N.A. (v) Nil. (vi) Surkha. (vii) Irrigated. (viii) One covering, 2
   hoeing and one weeding. (ix) 3.97'. (x) 15.2.1950.

2. TREATMENTS:
   1. No manure.
   2. 100 lb./ac. of N as F.Y.M.
   3. 100 lb./ac. of N as A/S.
   A/S applied on 16.10.1949 in between the lines.

3. DESIGN:
   (i) R.B.D. (ii) (a) 3. (b) N.A. (iii) 10. (iv) (a) and (b) 16' x 8.5'. (v) Nil. (vi) Yes.

4. GENERAL:
   (i) Condition good. No lodging. (ii) Nil. (iii) Potato yield. (iv) (a) 1949 to 1952. (b) No. (c) Nil. (v) (a)
   No. (b) —. (vi) Nil. (vii) Experiment during 1950 was not conducted.
5. RESULTS:
(i) 2423 lb./ac.
(ii) 268.8 lb./ac.
(iii) Treatments are highly significantly different.
(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>2264</td>
</tr>
<tr>
<td>2.</td>
<td>2253</td>
</tr>
<tr>
<td>3.</td>
<td>2753</td>
</tr>
<tr>
<td>S.E./mean</td>
<td>85.0 lb./ac.</td>
</tr>
</tbody>
</table>

Crop: Potato (Rabi).
Site: Jullundur Agri. Stn., Jullundur.

Object: To study the effect of A/S and F.Y.M. on the yield of Potato crop.

1. BASAL CONDITIONS:
(i) (a) Nil. (b) Maize (fodder). (c) Nil. (ii) (a) Loamy. (b) Refer soil analysis, Jullundur. (iii) 1, 2.10.1951. (iv) (a) 1 raja plough, 5 desi hal, 6 sohaga and 1 roller. (b) to (e) N.A. (vi) Patna surkha (medium). (vii) Irrigated. (viii) 2 hoeings. (ix) 2.31°. (x) 10 to 15.2.1952.

2. TREATMENTS:
1. Control.
2. F.Y.M. at 100 lb./ac. of N.
3. A/S at 100 lb./ac. of N.
   Date of application N.A.

3. DESIGN:
   (i) R.B.D. (ii) (a) 3. (b) N.A. (iii) 5. (iv) (a) and (b) 16' × 8.5'. (v) Nil. (vi) Yes.

4. GENERAL:
   (i) Germination and condition good. No lodging. (ii) Nil. (iii) Potato yield. (iv) (a) 1949 to 1952. (b) No.
   (c) Nil. (v) (a) Nil. (b) —. (vi) Nil. (vii) Experiment during 1950 not conducted.

5. RESULTS:
(i) 13164 lb./ac.
(ii) 1136.6 lb./ac.
(iii) Treatments are highly significantly different.
(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>11497</td>
</tr>
<tr>
<td>2.</td>
<td>11769</td>
</tr>
<tr>
<td>3.</td>
<td>16225</td>
</tr>
<tr>
<td>S.E./mean</td>
<td>308.3 lb./ac.</td>
</tr>
</tbody>
</table>

Crop: Potato.
Site: Jullundur Agri. Stn., Jullundur.

Object: To study the effect of N as A/S and F.Y.M. on Potato crop.

1. BASAL CONDITIONS:
   (i) (a) Not followed. (b) Wheat. (c) Nil. (ii) (a) Loamy. (b) Refer soil analysis, Jullundur. (iii) 30.9.1952.
   (iv) (a) 2 desi hal and 4 sohaga. (b) N.A. (c) 10 md. (d) N.A. (v) Patna red (medium). (vi) Irrigated. (vii) One hoeing and one earthing up. (ix) 3.1°. (x) 16.2.1953.
2. TREATMENTS:
   1. Control.
   2. 100 lb./ac. of N as F.Y.M.
   3. 100 lb./ac. of N as A/S.

3. DESIGN:
   (i) R.B.D. (ii) (a) 3. (b) N.A. (iii) 6. (iv) (a) 51' x 9'. (b) 42' x 9'. (v) Two rows on each side of length as non-experimental area. (vi) Yes.

4. GENERAL:
   (i) Germination and stand good. Poor yield because of Virus attack. No lodging. (ii) Virus attack about 3% damage on 2.11.1952, spraying with Borodix. (iii) Potato yield. (iv) (a) 1949 to 1952. (b) No. (c) Nil. (v) (a) Nil. (b) —. (vi) Nil. (vii) Experiment during the year 1952 not conducted.

5. RESULTS:
   (i) 5722 lb./ac.
   (ii) 631.0 lb./ac.
   (iii) Treatments are highly significantly different.

<table>
<thead>
<tr>
<th>Treatment</th>
<th>Av. yield</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>3746</td>
</tr>
<tr>
<td>2.</td>
<td>4124</td>
</tr>
<tr>
<td>3.</td>
<td>9297</td>
</tr>
</tbody>
</table>

S.E./mean = 257.6 lb./ac.

Object: — To study the effect of balanced doses of N, P₂O₅ and K₂O on the yield of Potato.

1. BASAL CONDITIONS:
   (i) (a) Nil. (b) Maize (fodder). (c) Nil. (ii) (a) Loam. (b) Refer soil analysis, Jullundur. (iii) 2.10.1951.
   (iv) (a) One roja, 5 desi hal, 6 sohaga and one roller. (b) to (e) N.A. (v) Nil. (vi) Patna Surkh a (medium), (vii) Irrigated. (viii) 2 hoeings. (ix) 2.31'. (x) N.A.

2. TREATMENTS:
   1. Control.
   2. A/S at 55.25 lb./ac. of N+Super at 11.25 lb./ac. of P₂O₅+Pot. Sul. at 20.50 lb./ac. of K₂O.
   3. A/S at 54.375 lb./ac. of N+Super at 16.875 lb./ac. of P₂O₅+Pot. Sul. at 30.75 lb./ac. of K₂O.
   4. A/S at 112.50 lb./ac. of N+Super at 22.50 lb./ac. of P₂O₅+Pot. Sul. at 41.00 lb./ac. of K₂O.
   5. A/S at 140.625 lb./ac. of N+Super at 28.125 lb./ac. of P₂O₅+Pot. Sul. at 51.25 lb./ac. of K₂O.
   6. A/S at 168.75 lb./ac. of N+Super at 33.75 lb./ac. of P₂O₅+Pot. Sul. at 61.50 lb./ac. of K₂O.
   7. A/S at 196.875 lb./ac. of N+Super at 39.375 lb./ac. of P₂O₅+Pot. Sul. at 71.75 lb./ac. of K₂O.
   8. A/S at 225.00 lb./ac. of N+Super at 45.00 lb./ac. of P₂O₅+Pot. Sul. at 82.00 lb./ac. of K₂O.
   Time and method of application N.A.

3. DESIGN:
   (i) R.B.D. (ii) (a) 8. (b) N.A. (iii) 6. (iv) (a) and (b) 18.1' x 12'. (v) Nil. (vi) Yes.

4. GENERAL:
   (i) N.A. (ii) Nil. (iii) Potato yield. (iv) (a) 1951-1952. (b) No. (c) Nil. (v) (a) Nil. (b) Nil. (vi) and (vii) Nil.

5. RESULTS:
   (i) 11025 lb./ac.
   (ii) 1430.6 lb./ac.
   (iii) Treatments are highly significantly different.
Crop :- Potato.  
Site :- Jullundur Agri. Stn., Jullundur.  
Ref :- Pb. 52(60).  
Type :- ‘M’.

Object :- To study the effect of balanced doses of N, P$_2$O$_5$ and K$_2$O on the yield of Potato crop.

1. BASAL CONDITIONS:
   (i) (a) Not followed. (b) Wheat. (c) 40 lb./ac. of N as A/S. (ii) (a) Loam. (b) Refer soil analysis, Jullundur. (iii) 6.2.1952. (iv) (a) 1 paha plough, 6 desi plough, 4 plankings and 1 sohaga. (b) N.A. (c) 12 md./ac. (d) 2' approximately. (e) N.A. (v) Nil. (vi) Gola (medium). (vii) Irrigated. (viii) 2 hoeings, 1 weeding and 1 earthing up. (ix) 6.67”. (x) 18 and 19.5.1952.

2. TREATMENTS:
   1. Control.  
   2. 56.25 lb./ac. of N+11.25 lb./ac. of P$_2$O$_5$+20.50 lb./ac. of K$_2$O. 
   3. 84.375 lb./ac. of N+16.875 lb./ac. of P$_2$O$_5$+30.75 lb./ac. of K$_2$O. 
   4. 112.50 lb./ac. of N+22.50 lb./ac. of P$_2$O$_5$+41.00 lb./ac. of K$_2$O. 
   5. 140.625 lb./ac. of N+28.125 lb./ac. of P$_2$O$_5$+51.25 lb./ac. of K$_2$O. 
   6. 168.75 lb./ac. of N+33.75 lb./ac. of P$_2$O$_5$+61.50 lb./ac. of K$_2$O. 
   7. 196.875 lb./ac. of N+39.375 lb./ac. of P$_2$O$_5$+71.75 lb./ac. of K$_2$O. 
   8. 225.00 lb./ac. of N+45.00 lb./ac. of P$_2$O$_5$+82.00 lb./ac. of K$_2$O. 

N as A/S applied on 29.2.1953 by broadcast in rows. P$_2$O$_5$ as Super applied before sowing. K$_2$O as Pot. Sul. applied by broadcast in rows.

3. DESIGN:
   (i) R.B.D. (ii) (a) 8. (b) N.A. (iii) 5. (iv) (a) N.A. (b) 18.15’×12’. (v) N.A. (vi) Yes.

4. GENERAL:
   (i) Germination ‘good’. No lodging. (ii) Disease N.A. Dusting with B.H.C. on 20.2.1953. Gambexene dusting. (iii) Yield of potato (iv) (a) 1951 to 1952. (b) No. (c) Nil. (v) (a) No. (b) Nil. (vi) and (vii) Nil.

5. RESULTS:
   (i) 1347 lb./ac. 
   (ii) 567.4 lb./ac. 
   (iii) Treatments are not significantly different. 
   (iv) Av. yield of potato 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>1666</td>
<td>253.8</td>
</tr>
<tr>
<td>2.</td>
<td>1255</td>
<td></td>
</tr>
<tr>
<td>3.</td>
<td>1173</td>
<td></td>
</tr>
<tr>
<td>4.</td>
<td>1286</td>
<td></td>
</tr>
<tr>
<td>5.</td>
<td>1250</td>
<td></td>
</tr>
<tr>
<td>6.</td>
<td>1121</td>
<td></td>
</tr>
<tr>
<td>7.</td>
<td>1275</td>
<td></td>
</tr>
<tr>
<td>8.</td>
<td>1749</td>
<td></td>
</tr>
</tbody>
</table>

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

S.E./mean = 584.0 lb./ac.
Crop :- Potato (Rabi).

Ref :- Pb. 53(90).

Type :- 'M'.

Object :- To study the effect of balanced doses of N, P₂O₅ and K₂O on the yield of Potato.

1. BASAL CONDITIONS :

(i) (a) Not followed. (b) Berseem. (c) A/S at 50 lb./ac. of N+Super at 30 lb./ac. of P₂O₅.
(ii) (a) Heavy loam. (b) Refer soil analysis, Jullundur. (iii) 7.11.1953. (iv) (a) 10 desi plough, I horse hoe and 2 solaga
(v) Nil. (vi) Patna Red (medium).
(vii) Irrigate. (viii) 2 earthing up and 1 hoeing. (ix) 10.33". (x) N.A.

2. TREATMENTS :

Main-plot treatments :
All combinations of (1) and (2)
(1) 4 levels of N : N₀=0, N₁=100, N₂=150 and N₃=200 lb./ac.
(2) 3 levels of K₂O : K₀=0, K₁=40 and K₂=80 lb./ac.

Sub-plot treatments :
3 levels of P₂O₅ : P₀=0, P₁=40 and P₂=80 lb./ac.
N as A/S, P₂O₅ as Super and K₂O as Pot. Sui. half A/S applied on 6.10.1953 while other half on 19.11.1953.
Pot. Sui. on 19.11.1953 and Super on 6.10.1953 by broadcast.

3. DESIGN :

(i) Split-plot. (ii) (a) 12 main-plots/block; 3 sub-plots/main-plot. (b) N.A. (iv) (a) Main : 40' x 17½'.
Sub : 40' x 5½'. (b) Sub : 36' x 5½'. (v) Two rows 9" apart on each side as non experimental. (vi) Yes.

4. GENERAL :

(i) Germination fair, condition satisfactory. No lodging. (ii) D.D.T. sprayed on 28.11.1953. Record does
not show any attack of pest or disease. (iii) Yield of potato. (iv) (a) No. (b) and (c) Nil. (v) Nil. (vi) (a) and (b) No.
(vii) and (vii) Nil.

5. RESULTS :

(i) 5852 lb./ac.
(ii) (a) 1326.6 lb./ac. (b) 633.1 lb./ac.
(iii) N and K₂O effects are highly significant. Main × Sub-plot interaction is not significant. P₂O₅ effect is
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>
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<tbody>
<tr>
<td>N₀</td>
<td>4962</td>
<td>5028</td>
<td>5167</td>
<td>5052</td>
<td>4761</td>
<td>4863</td>
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<tr>
<td>N₁</td>
<td>6039</td>
<td>5954</td>
<td>6586</td>
<td>6193</td>
<td>6037</td>
<td>5989</td>
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<tr>
<td>N₂</td>
<td>6317</td>
<td>6324</td>
<td>6569</td>
<td>6404</td>
<td>5810</td>
<td>6374</td>
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<tr>
<td>N₃</td>
<td>6048</td>
<td>5476</td>
<td>5758</td>
<td>5761</td>
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<td>5358</td>
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<td>6020</td>
<td>5852</td>
<td>5490</td>
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<table>
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<tr>
<th>K₀</th>
<th>K₁</th>
<th>K₂</th>
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</thead>
<tbody>
<tr>
<td>5528</td>
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<td>5532</td>
<td>5811</td>
</tr>
<tr>
<td>6401</td>
<td>6311</td>
<td>6550</td>
</tr>
</tbody>
</table>

S.E. of difference of two
1. N marginal means = 312.6 lb./ac.
2. K marginal means = 279.8 lb./ac.
3. P marginal means = 129.2 lb./ac.
4. P means at the same level of N = 258.5 lb./ac.
5. N means at the same level of P = 377.2 lb./ac.
6. P means at the same level of K = 223.8 lb./ac.
7. K means at the same level of P = 326.7 lb./ac.
S.E. of body of N × K table = 383.0 lb./ac.
Crop :- Potato.
Site :- Chemical Section, B.A. Farm, Rauni.

Object :- To study the effect of different doses of A/S on yield of Potato crop.

1. BASAL CONDITIONS :
   (i) (a) Nil. (b) Fallow. (c) Nil.  
   (ii) (a) Heavy loam. (b) N.A.  
   (iii) 29.10.1952. (iv) (a) 2 ploughings.  
   (b) to (c) N.A.  
   (v) Compost at 10 ton/ac. on 18.9.1952.  
   (vi) Local (medium).  
   (vii) Irrigated.  
   (viii) One hoeing.  
   (ix) 2 15".  
   (x) 21.2.1953.

2. TREATMENTS :
   1. Control.
   2. 3 md./ac. of A/S.
   3. 4 md./ac. of A/S.
   4. 5 md./ac. of A/S.
   A/S applied on 5.1.1952.

3. DESIGN :
   (i) R.B.D. (ii) (a) 4. (b) N.A.  
   (iii) 4. (iv) (a) and (b) 16.5' x 44'.  
   (v) Nil.  
   (vi) Yes.

4. GENERAL :
   (i) Germination poor to fair. No lodging.  
   (ii) Nil.  
   (iii) Yield of potato.  
   (iv) (a) No. (b) - .  
   (v) Nil.  
   (vi) and (vii) Nil.

5. RESULTS :
   (i) 2654 lb./ac.
   (ii) 109.7 lb./ac.
   (iii) Treatments are not significantly different.
   (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>2114</td>
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<tr>
<td>2.</td>
<td>2864</td>
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<td>3.</td>
<td>2191</td>
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<td>4.</td>
<td>3448</td>
</tr>
<tr>
<td>S.E./mean</td>
<td>504.8 lb./ac.</td>
</tr>
</tbody>
</table>

Crop :- Potato (Rabi).
Site :- Jullundur Agri. Stn., Jullundur.

Object :- To study the best seed size with suitable spacing for Potato crop.

1. BASAL CONDITIONS :
   (i) (a) Nil. (b) Fallow. (c) Nil.  
   (ii) (a) Heavy loam. (b) Refer soil analysis, Jullundur.  
   (iii) 9.10.1953.  
   (iv) (a) One raia plough, 6 desi plough and 4 sohaga. (b) N.A.  
   (c) 5 to 12 md./ac.  
   (d) As per treatments.  
   (e) N.A.  
   (f) 16 C.L. of F.Y.M. on 7 and 8.9.53 to the experimental area.  
   (vi) Patna red (medium).  
   (vii) Irrigated.  
   (viii) 4 hoeings and 2 earthing up.  
   (ix) 10.33".  
   (x) 12.2.1954.

2. TREATMENTS :
   Main-plot treatments :  
   4 spacings between plants : \( R_1=4", R_2=6", R_3=8" \) and \( R_4=10" \).
   Sub-plot treatments :  
   4 seed sizes : \( S_1=0.5", S_2=0.75", S_3=1.0" \) and \( S_4=1.25" \).

3. DESIGN :
   (i) Split-plot.  
   (ii) (a) 4 main-plots/block ; 4 sub-plots/main-plot.  
   (b) N.A.  
   (iii) 4. (iv) (a) and (b) Main : 12' x 44'. Sub : 12' x 11'.  
   (v) No. (vi) Yes.
4. GENERAL:
   (i) Germiation fair. Condition satisfactory except in 51 plots. No lodging. (ii) Sprayed with D.D.T. on 26.11.1953. Records do not show any disease etc. (iii) Yield of Potato. (iv) (a) No. (b) Nil. (v) (a) No. (b) Nil. (vi) and (vii) Nil.

5. RESULTS:
   (i) 13328 lb./ac.
   (ii) 2423.8 lb./ac.
   (b) 2300.3 lb./ac.
   (iii) Main effects are highly significant while interaction is not significant.
   (iv) Av. yield of potato in lb./ac.

<table>
<thead>
<tr>
<th>R</th>
<th>S1</th>
<th>S2</th>
<th>S3</th>
<th>S4</th>
<th>Mean</th>
</tr>
</thead>
<tbody>
<tr>
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<td>15486</td>
<td>18138</td>
<td>21129</td>
<td>15685</td>
</tr>
<tr>
<td>R2</td>
<td>6535</td>
<td>13683</td>
<td>14913</td>
<td>17120</td>
<td>13068</td>
</tr>
<tr>
<td>R3</td>
<td>7934</td>
<td>12050</td>
<td>13397</td>
<td>15518</td>
<td>12225</td>
</tr>
<tr>
<td>R4</td>
<td>8125</td>
<td>10289</td>
<td>10480</td>
<td>15546</td>
<td>11135</td>
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<tr>
<td>Mean</td>
<td>7650</td>
<td>12877</td>
<td>14232</td>
<td>17353</td>
<td>13028</td>
</tr>
</tbody>
</table>

S.E. of difference of two
1. R marginal means = 856.9 lb./ac.
2. S marginal means = 813.2 lb./ac.
3. S means at the same level of R = 1626.6 lb./ac.
4. R means at the same level of S = 1648.8 lb./ac.

Crop : Sweet Potato.
Site: Jullundur Agri. Stn., Jullundur.
Object : To find the manurial requirements of Sweet Potato.
Ref : Pb. 51(116).
Type : 'M'.

1. BASAL CONDITIONS:
   (i) (a) Nil. (b) Fallow. (c) Nil. (ii) (a) Sandy. (b) Refer soil analysis, Jullundur. (iii) 26.6.1951. (iv) (a) 3 desi ploughings and 2 sohaga. (b) to (e) N.A. (v) Nil. (vi) V-3 (medium). (vii) Irrigated. (viii) 5 hoeings. (ix) 12.13". (x) 24 to 31.11.1951 and 1.12.1951.

2. TREATMENTS:
   1. Control
   2. 50 lb./ac of N as A/S.
   3. 50 lb./ac of N as A/S+62.5 lb./ac. of P₂O₅ as Super.
   4. 100 lb./ac. of N as A/S.
   5. 100 lb./ac. of N as A/S+125 lb./ac. of P₂O₅ as Super.
   Time and method of application N.A.

3. DESIGN:
   (i) R B.D. (ii) (a) S. (b) N.A. (iii) 4. (iv) (a) N.A. (b) 24×11'. (v) N.A. (vi) Yes.

4. GENERAL:
   (i) Normal. (ii) Nil. (iii) Yield of sweet potato. (iv) (a) No. (b) Nil. (c) Nil. (v) (a) No. (b) Nil. (vi) and (vii) Nil.

5. RESULTS:
   (i) 5813 lb./ac.
   (ii) 273.2 lb./ac.
   (iii) Treatments are highly significantly different.
   (iv) Av. yield of sweet potato in lb./ac.

<table>
<thead>
<tr>
<th>Treatment</th>
<th>Av. yield</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>3309</td>
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<td>2.</td>
<td>5346</td>
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<td>3.</td>
<td>65376</td>
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<tr>
<td>4.</td>
<td>7255</td>
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<tr>
<td>5.</td>
<td>6789</td>
</tr>
<tr>
<td>S.E. mean</td>
<td>136.6 lb./ac.</td>
</tr>
</tbody>
</table>
Crop: Sweet Potato.
Site: Jullundur Agri. Sta., Jullundur.
Object: To find the manural requirements of Sweet Potato.

1. BASAL CONDITIONS:
   (i) (a) Nil. (b) Wheat. (c) Nil. (ii) (a) Sandy loam. (b) Refer soil analysis, Jullundur. (iii) 31.6.1952 and 25.6.1952. (iv) (a) 2 desi ploughings 1 cultivator and 3 sowing. (b) and (c) N.A. (d) 3' row to row; 1' plant to plant. (e) N.A. (v) 10' ton/acre. of F.Y.M. applied in 2 replications only. Date N.A. (vi) V=2 (medium). (vii) Irrigated. (viii) 3 hoeings. (ix) 26, 27, 28. (x) 26.11.1952 and 18.11.1952.

2. TREATMENTS:
   Main-plot treatments:
   All combinations of (1) and (2)
   (1) 3 levels of N: N₀ = 0, N₁ = 50 and N₂ = 100 lb./ac. of N.
   (2) 3 levels of K₂O: K₀ = 0, K₁ = 80, and K₂ = 160 lb./ac. K₂O.
   Sub-plot treatments:
   2 levels of P₂O₅: P₀ = 0, P₁ = 80 lb./ac. P₂O₅.
   N as A/S, P₂O₅ as Super and K₂O as Pot. sul.

3. DESIGN:
   (i) Split-plot. (ii) (a) 9 main-plots/block ; 2 sub-plots/main-plot. (b) N.A. (iii) 4, (iv) (a) 24' x 15'. (b) 22' x 9'. (v) One row on either side of plot and one plant on either end of row discarded. (vi) Yes.

4. GENERAL:
   (i) Fair. (ii) Nil. (iii) Yield of sweet potato. (iv) (a) No. (b) —. (c) —. (v) (a) No. (b) —. (vi) and (vii) Nil.

5. RESULTS:
   (i) 13997 lb./ac.
   (ii) (a) 1673.1 lb./ac.
   (b) 1639.6 lb./ac.
   (iii) N and K₂O effects are highly significant while other effects and interactions are not significant.
   (iv) Av. yield of sweet potato in lb./ac.

<table>
<thead>
<tr>
<th>P₀</th>
<th>P₁</th>
<th>Mean</th>
<th>K₀</th>
<th>K₁</th>
<th>K₂</th>
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<tbody>
<tr>
<td>N₀</td>
<td>12182</td>
<td>13294</td>
<td>12738</td>
<td>11993</td>
<td>12927</td>
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<tr>
<td>N₁</td>
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<td>14746</td>
<td>14482</td>
<td>13379</td>
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<tr>
<td>N₂</td>
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<td>15138</td>
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<td>13602</td>
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<tr>
<td>K₀</td>
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<tr>
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<td>14143</td>
<td>15100</td>
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<tr>
<td>K₂</td>
<td>13766</td>
<td>15048</td>
<td>14407</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

S.E. of difference of two
1. N or K marginal means = 482.9 lb./ac.
2. P marginal means = 386.4 lb./ac.
3. P means at the same level of N or K = 669.4 lb./ac.
4. N or K means at the same level of P = 672.2 lb./ac.
5. S.E. of body of N x K table = 591.6 lb./ac.
Crop : Sweet Potato.  
Ref : Pb. 51(117).
Site : Jullundur Agri. Stn., Jullundur.  
Type : 'C'.

Object :— To study the effect of spacings on the yield of Sweet Potato.

1. BASAL CONDITIONS:
   (i) (a) Nil. (b) Wheat. (c) Nil. (ii) (a) Sandy (Poor field). (b) Refer soil analysis, Jullundur. (iii) 25.6.1951.
   (iv) (a) 1 desi ploughing, 2 desid and 3 sohaga. (b) to (c) N.A. (v) 10 ton/ac. of F.Y.M. Super at 62\frac{1}{2} lb./ac. of P₂O₅ and A/S at 50 lb./ac. cf N. (vi) B-4306 (V-J) (medium). (vii) Irrigated. (viii) 5 hoeings. (ix) 12.10'. (x) 4 to 7.12.1951.

2. TREATMENTS:
   All combinations of (1) and (2)
   (1) 3 levels of row spacings : R₁=2', R₂=3' and R₃=4'.
   (2) 3 levels of plant spacings : S₁=1', S₂=1\frac{1}{2}' and S₃=2'.

3. DESIGN:
   (i) 3 x 3. Fact in R.B.D. (ii) (a) 9. (b) N.A. (iii) 12'. (iv) (a) N.A. (b) 12' x 12'. (v) N.A. (vi) Yes.

4. GENERAL:
   (i) Normal. (ii) Nil. (iii) Yield of sweet potato. (iv) (a) No. (b)—. (c)—. (v) (a) No. (b)—. (vi) and (vii) Nil.

5. RESULTS:
   (i) 2895 lb./ac.
   (ii) 383.3 lb./ac.
   (iii) Main effects of R and S are highly significant while interaction is not significant.
   (iv) Av. yield of sweet potato in lb./ac.

<table>
<thead>
<tr>
<th></th>
<th>S₁</th>
<th>S₂</th>
<th>S₃</th>
<th>Mean</th>
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<td>R₁</td>
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<td>R₂</td>
<td>3967</td>
<td>2800</td>
<td>2411</td>
<td>3059</td>
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<tr>
<td>R₃</td>
<td>2528</td>
<td>2334</td>
<td>1867</td>
<td>2243</td>
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<tr>
<td>Mean</td>
<td>3397</td>
<td>2904</td>
<td>2385</td>
<td>2895</td>
</tr>
</tbody>
</table>

S.E. of any marginal mean =110.7 lb./ac.
S.E. of body of table =191.7 lb./ac.

Crop : Sweet Potato.  
Ref : Pb. 52(145).
Site : Jullundur Agri. Stn., Jullundur.  
Type : 'C'.

Object :— To study the effect of methods of planting and spacings on the yield of Sweet Potato.

1. BASAL CONDITIONS:
   (i) (a) Nil. (b) Wheat (for two reps. and fallow (for other two replications). (c) Nil. (ii) (a) Loam in 2 reps. and Sandy loam in other 2 reps. (b) Refer soil analysis, Jullundur. (iii) 30.6.1952 to 7.7.1952. (iv) (a) 2 desi plough 2 cultivators and 3 sohaga. (b) to (e) N.A. (v) Super at 62\frac{1}{2} lb./ac. of P₂O₅ applied before sowing. Date N.A. (vi) V—2 (medium). (vii) Irrigated. (viii) 3 hoeings. (ix) 26.27'. (x) 25-28.11.1952.

2. TREATMENTS:
   Main-plot treatments :
   All combinations of (1) and (2)
   (1) 3 levels of row spacings : R₁=1', R₂=2' and R₃=3'.
   (2) 2 methods of plantings : M₁—planted on beds and M₂—planted in furrows.
   Sub-plot treatments :
   3 levels of plant spacings : S₁=6', S₂=9' and S₃=12'.
3. DESIGN:
(i) Split-plot. (ii) (a) 6 main-plots/replicas; 3 sub-plots/main-plot. (b) N.A. (iii) 4... (iv) (a) N.A. (b) Main: 36' x 22'. Sub: 12' x 22' = 1/165th acre. (v) One row on either side of main-plot and one plant of each row was planted as non-experimental. (vi) Yes.

4. GENERAL:
(i) Good. (ii) Nil. (iii) Yield of sweet potato. (iv) (a) No. (b) —. (c) —. (v) (a) No. (b) —. (vi) and (vii) Nil.

5. RESULTS:
(i) 14030 lb./ac.
(ii) (a) 3130.1 lb./ac.
   (b) 1823.8 lb./ac.
(iii) Overall main-plot treatment effect is not significant but row spacing effect is significant. Other effects are not significant.
(iv) Av. yield of sweet potato in lb./ac.

<table>
<thead>
<tr>
<th></th>
<th>R1</th>
<th>R2</th>
<th>R3</th>
<th>Mean</th>
<th>M1</th>
<th>M2</th>
<th>Mean</th>
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</thead>
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<tr>
<td>S1</td>
<td>14892</td>
<td>14829</td>
<td>13450</td>
<td>14390</td>
<td>14412</td>
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<td>S2</td>
<td>16208</td>
<td>14086</td>
<td>12326</td>
<td>14207</td>
<td>14680</td>
<td>13733</td>
<td>14207</td>
</tr>
<tr>
<td>S3</td>
<td>15041</td>
<td>13535</td>
<td>11901</td>
<td>13492</td>
<td>13747</td>
<td>13238</td>
<td>13492</td>
</tr>
<tr>
<td>Mean</td>
<td>15380</td>
<td>14150</td>
<td>12559</td>
<td>14030</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>M1</td>
<td>16095</td>
<td>14072</td>
<td>12672</td>
<td>14280</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>M2</td>
<td>14666</td>
<td>14228</td>
<td>12446</td>
<td>13780</td>
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<td></td>
<td></td>
</tr>
<tr>
<td>Mean</td>
<td>15380</td>
<td>14150</td>
<td>12559</td>
<td>14030</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

S.E. of difference of two
1. R marginal means = 903.4 lb./ac.
2. M marginal means = 737.7 lb./ac.
3. S marginal means = 526.4 lb./ac.
4. S means at the same level of M = 744.5 lb./ac.
5. M means at the same level S = 956.0 lb./ac.
6. S means at the same level of R = 911.9 lb./ac.
7. R means at the same level of S = 1170.8 lb./ac.
S.E. of body of R x M table = 903.6 lb./ac.

Crop: Sweet Potato.
Site: Jullundur Agri. Stn., Jullundur.
Ref: Pb. 52(150).
Type: 'C'.
Object: To study the effect of methods of sowing on the yield of Sweet Potato.

1. BASAL CONDITIONS:
(i) (a) Nil. (b) Wheat. (c) Nil. (ii) (a) Sandy. (b) Refer soil analysis, Jullundur. (iii) 26.7.1952. (iv) (a) 2 desi, 1 cultivator and 2 sohaga. (b) to (e) N.A. (v) Super at 62½ lb./ac. of P₂O₅. (vi) N.A. (vii) Irrigated. (viii) 2 hoeings. (ix) 26.27°. (x) 5.1.1953.

2. TREATMENTS:
1. Crop sown flat.
2. Crop sown on ridges.
3. DESIGN
(i) Paired plot. (ii) (a) 2. (b) N.A. (iii) 4. (iv) (a) N.A. (b) 22' x 12'. (v) N.A. (vi) Yes.

4. GENERAL:
(i) Fair to normal. (ii) No. (iii) Yield of sweet potato. (iv) (a) and (b) No. (c) —. (v) (a) No. (b) —. (vi) and (vii) Nil.

5. RESULTS:
(i) 5707 lb./ac.
(ii) 748.6 lb./ac.
(iii) Treatments are significantly different.
(iv) Av. yield of sweet potato in lb./ac.

<table>
<thead>
<tr>
<th>Treatment</th>
<th>Av. yield</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>5855</td>
</tr>
<tr>
<td>2.</td>
<td>5558</td>
</tr>
<tr>
<td>S.E./mean</td>
<td>374.3 lb./ac.</td>
</tr>
</tbody>
</table>

Crop : Sweet Potato.  
Site : Jullundur Agri. Stn., Jullundur.  
Ref : Pb. 53(222).  
Type : 'C'.

Object : To study the effect of methods of planting on the yield of Sweet Potato.

1. BASAL CONDITIONS:
(i) (a) Nil. (b) Sweet Potato. (c) Nil.  (e) Sandy loam. (b) Refer soil analysis, Jullundur. (iv) (a) 3 desi plough and 2 sohag. (b) to (e) N.A. (v) Nil. (vi) V-2 (medium). (vii) Irrigated. (viii) 2 hoeings and weedings. (ix) 24.96'. (x) 18.2.1954.

2. TREATMENTS:
1. Planting in vertical position.
2. Planting in horizontal position.

3. DESIGN:
(i) Paired plots. (ii) (a) 2. (b) N.A. (iii) 6. (iv) (a) N.A. (b) 1/12th ac. (v) N.A. (vi) Yes.

4. GENERAL:
(i) Good. (ii) Nil. (iii) Yield of sweet potato. (iv) (a) and (b) No. (c) —. (v) (a) No. (b) —. (vi) and (vii) Nil.

5. RESULTS:
(i) 17943 lb./ac.
(ii) 3993.0 lb./ac.
(iii) Treatments are not significantly different.
(iv) Av. yield of sweet potato in lb./ac.

<table>
<thead>
<tr>
<th>Treatment</th>
<th>Av. yield</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>18731</td>
</tr>
<tr>
<td>2.</td>
<td>17154</td>
</tr>
<tr>
<td>S.E./mean</td>
<td>1630.1 lb./ac.</td>
</tr>
</tbody>
</table>
Crop : Sweet Potato.
Site : Jullundur Agri. Stn., Jullundur.
Ref : Pb. 53(223).
Type : ‘M’.

Object :- To study the effect of different portions of vines used as seed on the yield of Sweet Potato.

1. BASAL CONDITIONS :
(i) (a) Nil. (b) Wheat (c) Nil. (ii) (a) Sandy. (b) Refer soil analysis, Jullundur. (iii) 22.7.1953,
(iv) (a) 3 desi plough and 2 sohaga. (b) to (e) N.A. (v) 70 lb./ac. of N as A/S. (vi) V-2 (medium).
(vii) Irrigated. (viii) 2 hoeings and weedings. (ix) 24.90°. (x) 7.2.1954.

2. TREATMENTS :
1. Planting upper portion of vine.
2. Planting middle portion of vine.
3. Planting lower portion of vine.

3. DESIGN :
(i) R.B.D. (ii) 3. (b) N.A. (iii) 6. (iv) (a) 1/16th ac. (v) N.A. (vi) Yes.

4. GENERAL :
(i) Satisfactory. (ii) Nil. (iii) Yield of sweet potato. (iv) (a) No. (b) No. (c) Nil. (v) No. (b)–
(vi) and (vii) N.A.

5. RESULTS :
(i) 12534 lb./ac.
(ii) 2027.5 lb./ac.
(iii) Treatments are highly significantly different.
(iv) 'Av. yield of sweet potato in lb./ac.

<table>
<thead>
<tr>
<th>Treatment</th>
<th>Av. yield (lb./ac.)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>14115</td>
</tr>
<tr>
<td>2.</td>
<td>12502</td>
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<tr>
<td>3.</td>
<td>11286</td>
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<tr>
<td>S.E./mean</td>
<td>827.7 lb./ac.</td>
</tr>
</tbody>
</table>

Crop : Sweet Potato.
Site : Jullundur Agri. Stn., Jullundur.
Ref : Pb. 51(112).
Type : ‘C’.

Object :- To find the optimum date of sowing Sweet Potato.

1. BASAL CONDITIONS :
(i) (a) Nil. (b) Radish and Turnip seed crop. (c) Nil. (ii) (a) Sandy. (b) Refer soil analysis, Jullundur.
(iii) As per treatments. (iv) (a) 2 desi ploughings and 2 sohaga. (b) to (e) N.A. (v) Super at 62 lb./ac. of P2O5 before sowing. A/S at 25 lb./ac. of N. (vi) Local. (vii) Irrigated. (viii) 4 hoeings. (ix) 12.13°.
(x) 22, 24, 26 and 27.11.1951.

2. TREATMENTS :
Crop sown on : D1 = 15.5.1951, D2 = 30.5.1951, D3 = 15.6.1951, D4 = 30.6.1951, D5 = 15.7.1951 and
D6 = 30.7.1951.

3. DESIGN :
(i) R.B.D. (ii) 6. (b) N.A. (iii) 4. (iv) (a) N.A. (b) 18’×10’. (v) N.A. (vi) Yes.

4. GENERAL :
(i) Satisfactory. (ii) Nil. (iii) Yield of sweet potato. (iv) (a) 1951-1952. (b) No. (c) Nil. (v) (a)
No. (b)– (vi) and (vii) Nil.
5. RESULTS:

(i) 7574 lb./ac.
(ii) 1580.8 lb./ac.
(iii) Treatments are highly significantly different.
(iv) Av. yield of sweet potato in lb./ac.

<table>
<thead>
<tr>
<th>Treatment</th>
<th>Av. yield</th>
</tr>
</thead>
<tbody>
<tr>
<td>D₁</td>
<td>13379</td>
</tr>
<tr>
<td>D₂</td>
<td>9459</td>
</tr>
<tr>
<td>D₃</td>
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<td>D₄</td>
<td>6161</td>
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<td>D₅</td>
<td>4543</td>
</tr>
<tr>
<td>D₆</td>
<td>3936</td>
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<tr>
<td>S.E./mean</td>
<td>790.4 lb./ac.</td>
</tr>
</tbody>
</table>

Crop: Sweet Potato.
Site: Jullundur Agri. Stn., Jullundur.

Object: To find the optimum date of sowing Sweet Potato.

1. BASAL CONDITIONS:

(i) (a) Nil. (b) Sorghum (Jowar). (c) N.A. (ii) (a) Sandy loam. (b) Refer soil analysis, Jullundur.
(iii) As per treatments. (iv) (a) 3 desi plough and 3 sohaga. (b) to (e) N.A. (v) N.A. (vi) V-3 (medium).
(vii) Irrigated. (viii) 3 to 7 hoeings. (ix) 26.27'. (x) 22 and 21.4.1952.

2. TREATMENTS:

crop sown on: D₁ = 30.3.1952, D₂ = 15.4.1952, D₃ = 30.4.1952, D₄ = 15.5.1952, D₅ = 30.5.1952 and D₆ = 15.6.1952.

3. DESIGN:

(i) R.B.D. (ii) (a) 6. (b) N.A. (iii) 4. (iv) (a) N.A. (b) 27' x 12'. (v) N.A. (vi) Yes.

4. GENERAL:

(i) Fair to normal. (ii) Nil. (iii) Yield of sweet potato. (iv) (a) 1951 to 1952. (b) No. (c) Nil. (v) (a) No. (b) -. (vi) and (vii) Nil.

5. RESULTS:

(i) 5877 lb./ac.
(ii) 613.2 lb./ac.
(iii) Treatments are highly significantly different.
(iv) Av. yield of sweet potato in lb./ac.

<table>
<thead>
<tr>
<th>Treatment</th>
<th>Av. yield</th>
</tr>
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<tbody>
<tr>
<td>D₁</td>
<td>8937</td>
</tr>
<tr>
<td>D₂</td>
<td>7744</td>
</tr>
<tr>
<td>D₃</td>
<td>6914</td>
</tr>
<tr>
<td>D₄</td>
<td>5047</td>
</tr>
<tr>
<td>D₅</td>
<td>3872</td>
</tr>
<tr>
<td>D₆</td>
<td>3388</td>
</tr>
<tr>
<td>S.E./mean</td>
<td>306.6 lb./ac.</td>
</tr>
</tbody>
</table>

Crop: Sweet Potato.
Site: Jullundur Agri. Stn., Jullundur.

Object: To find the effect of pruning vines on yield Sweet Potato.

1. BASAL CONDITIONS:

(i) (a) Nil. (b) Wheat. (c) Nil. (ii) (a) Sandy. (b) Refer soil analysis, Jullundur. (iii) 26.7.1952.
(iv) (a) 2 desi, 1 cultivator and 2 sohaga. (b) to (e) N.A. (v) Super at 62.4 lb./ac. in P₂O₅. Date N.A.
(vi) V-3 (medium). (vii) Irrigated. (viii) 2 hoeings. A/S at 50 lb./ac. of N applied on 6.8.1952. (ix) 26.27'.
(x) 8 and 9.1.1953.
2. TREATMENTS:
1. Vines not prunned.
2. Vines prunned and length of vines kept 1'.
3. Vines prunned and length of vines kept 2'.
4. Vines prunned and length of vines kept 3'.

3. DESIGN:
(i) R.B.D. (ii) 3. (b) N.A. (iii) 4. (iv) (a) N.A. (b) 22'x12'. (v) N.A. (vi) Yes.

4. GENERAL:
(i) Germination good, condition fair. (ii) Nil. (iii) Yield of sweet potato. (iv) (a) 1952 to 1953. 
(b) No. (c) Nil. (v) (a) No. (b) — . (vi) and (vii) Nil.

5. RESULTS:
(i) 5240 lb./ac.
(ii) 776.2 lb./ac.
(iii) Treatments are highly significantly different.
(iv) Av. yield of sweet potato in lb./ac.

<table>
<thead>
<tr>
<th>Treatment</th>
<th>Av. yield</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>6958</td>
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<tr>
<td>2.</td>
<td>3225</td>
</tr>
<tr>
<td>3.</td>
<td>4837</td>
</tr>
<tr>
<td>4.</td>
<td>5940</td>
</tr>
<tr>
<td>S.E./mean</td>
<td>388.1 lb./ac.</td>
</tr>
</tbody>
</table>

Crop : Sweet Potato.  
Site : Jullundur Agri. Stn., Jullundur.  
Object : To find the effect of pruning vines on yield of Sweet Potato.

5. RESULTS:
(i) 11740 lb./ac.
(ii) 5236.5 lb./ac.
(iii) Treatments are not significantly different.
(iv) Av. yield of sweet potato in lb./ac.

<table>
<thead>
<tr>
<th>Treatment</th>
<th>Av. yield</th>
</tr>
</thead>
<tbody>
<tr>
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</tr>
<tr>
<td>2.</td>
<td>9670</td>
</tr>
<tr>
<td>3.</td>
<td>7318</td>
</tr>
<tr>
<td>S.E./mean</td>
<td>2618.3 lb./ac.</td>
</tr>
</tbody>
</table>
Crop :- Sweet Potato.  
Site :- Jullundur Agri. Stn., Jullundur.  
Object :- To study the effect on yield of Sweet Potato when the vines are disturbed.

1. BASAL CONDITIONS:
   (i) (a) Nil. (b) Wheat. (c) Nil.  
   (ii) (a) Sandy. (b) Refer soil analysis, Jullundur.  
   (iii) 26.7.1952.  
   (iv) 2 desi, 1 cultivator and 2 sohaga.  
   (v) Super at 62 lb./ac. of P2O5.  
   (vi) V-3 (medium).  
   (vii) Irrigated.  
   (viii) 2 hoeings (ix) 26.27'. (x) 7.1.1953.

2. TREATMENTS:
   1. Vines disturbed.
   2. Vines not disturbed.

3. DESIGN:
   (i) Paired plot.  
   (ii) (a) 2. (b) N.A.  
   (iii) 4. (iv) (a) N.A. (b) 22'x12'. (v) N.A. (vi) Yes.

4. GENERAL:
   (i) Germination good, condition fair.  
   (ii) Nil. (iii) Yield of sweet potato.  
   (iv) (a) 1952—1953.  
   (b) Nil. (c) —. (v) (a) Nil. (b) —. (vi) and (vii) Nil.

5. RESULTS:
   (i) 4222 lb./ac.  
   (ii) 151.0 lb./ac.  
   (iii) Treatments are highly significantly different.  
   (iv) Av. yield of sweet potato in lb./ac.  

<table>
<thead>
<tr>
<th>Treatment</th>
<th>Av. yield</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>3861</td>
</tr>
<tr>
<td>2</td>
<td>4582</td>
</tr>
<tr>
<td>S E./mean</td>
<td>$=75.5$</td>
</tr>
</tbody>
</table>


Crop :- Sweet Potato.  
Site :- Jullundur Agri. Stn., Jullundur.  
Object :- To study the effect on yield of Sweet Potato when the vines are disturbed.

1. BASAL CONDITIONS:
   (i) (a) Nil. (b) Sweet Potato. (c) Nil.  
   (ii) (a) Sandy loam. (b) Refer soil analysis, Jullundur.  
   (iii) 8.7.1953.  
   (iv) (a) 3 desi plough and 2 sohaga.  
   (v) Super at 62 lb./ac. of P2O5.  
   (vi) V-2 (medium).  
   (vii) Irrigated.  
   (viii) 2 hoeings and weeding. (ix) 24.96'. (x) 22.2.1954.

2. TREATMENTS:
   1. Vines disturbed (not allowed to fix roots at aerial nodes).  
   2. Vines not disturbed.

3. DESIGN:
   (i) Paired plot.  
   (ii) (a) 2. (b) N.A.  
   (iii) 6. (iv) (a) N.A. (b) 1/121th ac. (v) N.A. (vi) Yes.

4. GENERAL:
   (i) Fair to normal. (ii) Nil. (iii) Yield of sweet potato.  
   (iv) (a) 1952 to 1953.  
   (b) No. (c) Nil.  
   (v) (a) No. (b) —. (vi) and (vii) Nil.

5. RESULTS:
   (i) 15059 lb./ac.  
   (ii) 2485.8 lb./ac.  
   (iii) Treatments are not significantly different.

Object: To find the best sowing and harvesting dates.

1. BASAL CONDITIONS:
   (i) (a) Nil. (b) Sweet Potato. (c) Nil. (ii) (a) Sandy loam. (b) Refer soil analysis, Jullundur. (iii) As per treatments. (iv) (a) 4 ploughings and 3 sub-plots. (b) to (e) N.A. (v) Nil. (vi) V-2 (medium). (vii) Irrigated. (viii) N.A. (ix) 24.96". (x) As per treatments.

2. TREATMENTS:
   Main-plot treatments:
   6 dates of sowing: D1 = 30th April; D2 = 15th May, D3 = 30th May, D4 = 15th June, D5 = 30th June and D6 = 15th July 1953.
   Sub-plot treatments:

3. DESIGN:
   (i) Split-plot. (ii) (a) 6 main-plots/block; 3 sub-plots/main-plot. (b) N.A. (iii) 4. (iv) (a) N.A. (b) Main-plot: 1/80.6 ac. and Sub-plot: 1/241.8th ac. (v) N.A. (vi) Yes.

4. GENERAL:
   (i) Fair to normal. (ii) Nil. (iii) Yield of sweet potato. (iv) (a) No. (b) Nil. (c) -. (v) (a) No. (b) -. (vi) and (vii) Nil.

5. RESULTS:
   (i) 6063 lb./ac.
   (ii) (a) 2694.7 lb./ac. (b) 2440.5 lb./ac.
   (iii) S effect is highly significant, D effect is significant while their interaction is not significant.
   (iv) Ay: yield of tubers in lb./ac.

<table>
<thead>
<tr>
<th></th>
<th>S1</th>
<th>S2</th>
<th>S3</th>
<th>Mean</th>
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<td>D6</td>
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<td>3595</td>
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<tr>
<td>Mean</td>
<td>6077</td>
<td>5003</td>
<td>7109</td>
<td>6063</td>
</tr>
</tbody>
</table>

S.E. of difference of two
1. D marginal means = 1099.9 lb./ac.
2. S marginal means = 704.4 lb./ac.
3. S means at a level of D = 1725.7 lb./ac.
4. D means at a level of S = 1787.6 lb./ac.
Crop : - Sweet Potato. 
Ref : - Pb. 52(149). 
Type : - 'T'.

Object : - To find the irrigational requirements of Sweet Potato.

1. BASAL CONDITIONS :
   (i) (a) Nil. (b) Sarson. (c) Nil. (ii) (a) Sandy loam. (b) Refer soil analysis, Jullundur. (iii) 30 and 31.5.1952.
   (iv) (a) 3 desi plough and 3 sohaga. (b) to (e) N.A. (v) N.A. (vi) Local. (vii) Irrigated. (viii) 3 hoeings.
   (ix) 26°. (x) 22 and 23.11.1952.

2. TREATMENTS :
   1. Irrigation after one week.
   2. Irrigation after two weeks.
   3. Irrigation after three weeks.
   4. Irrigation after four weeks.
   Three basal irrigations were given to all plots to get plants established.

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

4. GENERAL :
   (i) Normal. (ii) Nil. (iii) Sweet potato yield. (iv) (a) Nil. (b) and (c) Nil. (v) (a') and (b) Nil. (vi) and (vii) Nil.

5. RESULTS :
   (i) 5126 lb./ac.
   (ii) 611.2 lb./ac.
   (iii) Treatments are not significantly different.
   (iv) Av. yield of sweet potato 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>5196</td>
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<tr>
<td>3</td>
<td>4885</td>
</tr>
<tr>
<td>4</td>
<td>4854</td>
</tr>
<tr>
<td>S.E./mean</td>
<td>303.6 lb./ac.</td>
</tr>
</tbody>
</table>

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Crop : - Colocasia. 
Ref : - Pb. 50(61). 
Type : - 'M'.

Object : - To find the manurial requirements of Colocasia.

1. BASAL CONDITIONS :
   (i) (a) Nil. (b) Potato. (c) Nil. (ii) (a) Loam. (b) Refer soil analysis, Jullundur. (iii) 22.2.1950.
   (iv) (a) 4 desi ploughings, 2 sohaga and 2 ridges. (b) and (c) N.A. (d) Plant to plant I'. (e) N.A. (v) Nil.

2. TREATMENTS :
   1. A/S at 50 lb./ac. of N.
   2. A/S at 100 lb./ac. of N.
   3. A/S at 50 lb./ac. of N + Super at 62½ lb./ac. of P2O5.
   4. A/S at 100 lb./ac. of N + Super at 125 lb./ac. of P2O5.
   5. Control.
   Time and method of application N.A.

3. DESIGN :
   (i) R.B.D. (ii) (a) 5. (b) N.A. (iii) 4. (iv) (a) N.A. (b) 30' × 7'4". (v) N.A. (vi) Yes.

4. GENERAL :
   (i) Good. (ii) Lime sulphur sprayed against mite on 26.5.1952 (iii) Tuber yield. (iv) (a) 1950-51. (b) and (c) No. (v) 'a' and (b) No. (vi) and (vii) Nil.
5. RESULTS:
   (i) 27249 lb./ac.
   (ii) 1631.0 lb./ac.
   (iii) Treatments are highly significantly different.
   (iv) Av. yield of colocasia in lb./ac.

   Treatment | Av. yield
   1. | 26227
   2. | 28410
   3. | 28264
   4. | 28970
   5. | 24375
   S.E./mean = 815.5 lb./ac.

Crop: Colocasia.
Site: Jullundur Agri Stn., Jullundur.

Object: To find the manural requirements of Colocasia.

1. BASAL CONDITION:
   (i) (a) Nil. (b) Potato. (c) Nil. (ii) (a) Sandy loam. (b) Refer soil analysis, Jullundur. (iii) 26.6.1951. (iv) (a) 4 desi ploughing and 2 sowing. (b) to (e) N.A. (v) 20 ton/ac. of F.Y.M. Date: N.A. (vi) Local.
   (vii) Irrigated. (viii) 9 hoeings. (ix) 17.40' (x) 26.9.1951.

2. TREATMENTS:
   1. A/S at 50 lb./ac. of N.
   2. A/S at 100 lb./ac. of N.
   3. A/S at 50 lb./ac. of N + Super at 62½ lb./ac. of P₂O₅.
   4. A/S at 100 lb./ac. of N + Super at 125 lb./ac. of P₂O₅.
   5. Control.
   Time and method of application N.A.

3. DESIGN:
   (i) R.B.D. (ii) 5. (b) N.A. (iii) 4. (iv) (a) N.A. (b) 30' x 7' - 4'. (v) N.A. (vi) Yes.

4. GENERAL:
   (i) Satisfactory. (ii) Nil. (iii) Yield of tubers. (iv) (a) 1950-1951. (b) No. (c) Nil. (v) (a) No. (b) —.
   (vi) and (vii) Nil.

5. RESULTS:
   (i) 5886 lb./ac.
   (ii) 334.6 lb./ac.
   (iii) Treatments are highly significantly different.
   (iv) Av. yield of colocasia in lb./ac.

   Treatment | Av. yield
   1. | 5142
   2. | 6797
   3. | 6441
   4. | 7235
   5. | 3793
   S.E./mean = 167.3 lb./ac.
Crop :- Colocasia.  
Site :- Jullundur Agri. Stn., Jullundur.  
Object :- To study the effect of hoeing and intercropping on the yield of Colocasia.

1. BASAL CONDITIONS:
   (i) (a) Nil. (b) Sweet Potato. (c) Nil. (ii) (a) Sandy loam. (b) Refer soil analysis, Jullundur. (iii) 23.2.1951.
   (iv) (a) 4 desi ploughing and 2 zohaga. (b) to (c) N.A. (v) 10 ton/ac. of F.Y.M. Super at 63 lb./ac. of P_2O_5, A.S at 50 lb./ac. of N. (vi) Local. (vii) Irrigated. (viii) 7 hoeings for treatments 1 and 3 and 3 hoeings for treatment 2. (ix) 17.40°. (x) 21.9.1951.

2. TREATMENTS:
   1. Hoeing regularly (2 extra hoeings in May and June).
   2. No hoeing in May and June.
   3. Intercropping Colocasia with Karaila (2 extra hoeings in May and June).

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

4. GENERAL:
   (i) Nil. (ii) Nil. (iii) Yield of tubers. (iv) (a) No. (b) No. (c) Nil. (v) (a) No. (b) Nil. (vi) and (vii) Nil.

5. RESULTS:
   (i) 6319 lb./ac.
   (ii) 675.4 lb./ac.
   (iii) Treatment differences are highly significant.
   (iv) Av. yield of colocasia in lb./ac.
<table>
<thead>
<tr>
<th>Treatment</th>
<th>Av. yield</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>8289</td>
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<tr>
<td>2.</td>
<td>5892</td>
</tr>
<tr>
<td>3.</td>
<td>5377</td>
</tr>
<tr>
<td>S.E./mean</td>
<td>=337.7 lb./ac.</td>
</tr>
</tbody>
</table>

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Crop :- Colocasia.  
Site :- Jullundur Agri. Stn., Jullundur.  
Object :- To study the effect of spacing on the yield of Colocasia.

1. BASAL CONDITIONS:
   (i) (a) Nil. (b) Potato. (c) Nil. (ii) (a) Loam. (b) Refer soil analysis, Jullundur. (iii) 23 and 24.2.1950.
   (iv) (a) 4 desi plough and 2 zohaga. (b) and (c) N.A. (d) As per treatments. (e) N.A. (v) Nil. (vi) Local. (vii) Irrigated. (viii) N.A. (ix) 49.71°. (x) 7 to 9.10.1950.

2. TREATMENTS:
   All combinations of (1) x (2)
   (1) 3 spacings between ridges: D_1=12', D_2=7' and D_3=3'.
   (2) 3 spacings between plants: S_1=6', S_2=9' and S_3=12'.

3. DESIGN:
   (i) 3 x 3 Fact. in R.B.D. (ii) (a) 9. (b) N.A. (iii) 4. (iv) (a) N.A. (b) 30' x 7'-4". (v) N.A. (vi) Yes.

4. GENERAL:
   (i) Good. (ii) Sprayed with lime sulphur against mite on 9th and 10th June, 1950. (iii) Yield of tubers.
   (iv) (a) 1950-1951. (b) No. (c) Nil. (v) (a) No. (b) Nil. (vi) and (vii) Nil.

5. RESULTS:
   (i) 20655 lb./ac.
   (ii) 773.2 lb./ac.
   (iii) Spacing between ridges effect is highly significant while spacing between plants effect and interaction is not significant.
Crop: Colocasia.
Site: Jullundur Agri. Stn., Jullundur.
Object: To study the effect of spacing on the yield of Colocasia.

1. BASAL CONDITIONS:
   (i) (a) Nil. (b) Potato. (c) Nil. (ii) (a) Sandy loam. (b) Refer soil analysis, Jullundur. (iii) 23 to 24.2.1951.
   (iv) (a) 4 desh ploughing and 2 hoeings. (b) to (e) N.A. (v) 20 ton/ac. of F.Y.M. A/S at 40 lb./ac. of N.

2. TREATMENTS:
   All combinations of (1) and (2):
   (1) 3 levels of row spacings: \( S_1 = 1\frac{1}{2}\)", \( S_2 = 2\)" and \( S_3 = 2\frac{1}{2}\)".
   (2) 3 levels of plant spacings: \( D_1 = 6\)", \( D_2 = 9\)" and \( D_3 = 12\)".

3. DESIGN:
   (i) 3x3 Fact. in R.B.D. (ii) (a) 9. (b) N.A. (iii) 4. (iv) (a) N.A. (b) 30°x7°-4°. (v) N.A. (vi) Yes.

4. GENERAL:
   (i) Normal. (ii) Nil. (iii) Yield of tuber. (iv) (a) 1950-1951. (b) No. (c)—. (v) (a) No. (b)—.
   (vi) and (vii) Nil.

5. RESULTS:
   (i) 5086 lb./ac.
   (ii) 392.7 lb./ac.
   (iii) Spacing between rows effect and interaction are highly significant.
   (iv) Av. yield of colocasia in lb./ac.

<table>
<thead>
<tr>
<th></th>
<th>( D_1 )</th>
<th>( D_2 )</th>
<th>( D_3 )</th>
<th>Mean</th>
</tr>
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<tr>
<td>( S_1 )</td>
<td>5130</td>
<td>5270</td>
<td>5970</td>
<td>5457</td>
</tr>
<tr>
<td>( S_2 )</td>
<td>5397</td>
<td>5893</td>
<td>5021</td>
<td>5437</td>
</tr>
<tr>
<td>( S_3 )</td>
<td>4735</td>
<td>4493</td>
<td>3869</td>
<td>4366</td>
</tr>
<tr>
<td>Mean</td>
<td>5087</td>
<td>5219</td>
<td>4953</td>
<td>5086</td>
</tr>
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</table>

S.E. of any marginal mean = 113.4 lb./ac.
S.E. of body of table = 196.3 lb./ac.

Ref: Pb. 51(144).
Type: 'C'.
Crop : Colocasia.  
Site : Jullundur Agri. Stn., Jullundur.  
Reference : Pb. 50(62).  
Type : ‘C’.

Object :— To find the optimum date of sowing of Colocasia.

1. BASAL CONDITIONS:
   (i) Nil (b) Potato. (c) Nil. (ii) (a) Loam. (b) Refer soil analysis, Jullundur. (iii) As per treatments. 
   (iv) (a) 4 desi ploughings and 2 sohaga. (b) and (c) N.A. (d) 2’ x 1’. (e) N.A. (v) Nil. (vi) Local. 
   (vii) Irrigated. (viii) N.A. (ix) 49.71”. (x) 3 to 4.10.1950.

2. TREATMENTS:
   4 dates of sowing: D1 = 20.2.1550, D2 = 7.3.1550, D3 = 26.3.1550 and D4 = 6.4.1950.

3. DESIGN:
   (i) R.B.D. (ii) (a) 4. (b) N.A. (iii) 4. (iv) (a) N.A. (b) 30’ x 7’ - 4”. (v) N.A. (vi) Yes.

4. GENERAL:
   (i) Germunation fair. (ii) Sprayed with lime sulphur against mite on 25.5.1950. (iii) Yield of tuber. 
   (iv) (a) 1950—1951. (b) No. (c) N.A. (v) (a) No. (b) —. (vi) and (vii) Nil.

5. RESULTS:
   (i) 23936 lb./ac.
   (ii) 1073.7 lb./ac.
   (iii) Treatments are highly significantly different.
   (iv) Av. yield of colocasia in lb./ac.
   Treatment | Av. yield  
-------------|------------
D1          | 29588      
D2          | 26998      
D3          | 23815      
D4          | 15613      
S.E./mean  | =536.8 lb./ac.

---

Crop : Colocasia.  
Site : Jullundur Agri. Stn., Jullundur.  
Reference : Pb. 51(111).  
Type : ‘C’.

Object :— To find the optimum date of sowing for Colocasia.

1. BASAL CONDITIONS:
   (i) (a) Nil. (b) Potato. (c) Nil. (ii) (a) Sandy loam. (b) Refer soil analysis, Jullundur. (iii) As per treatments. 
   (iv) 4 desi ploughing and 2 sohaga. (b) to (c) N.A. (v) F.Y.M. 20 ton./ac. A/S at 40 lb./ac. of N. Dates N.A. (vi) Local. (vii) Irrigated. (viii) 7 hoeings. (ix) 17.40”. (x) 17.10.1951.

2. TREATMENTS:
   4 dates of sowing : D1 = 20.2.1951, D2 = 7.3.1951, D3 = 22.3.1951 and D4 = 6.4.1951.

3. DESIGN:
   (i) R.B.D. (ii) (a) 4. (b) N.A. (iii) 4. (iv) (a) N.A. (b) 30’ x 7’ - 4”. (v) N.A. (vi) Yes.

4. GENERAL:
   (i) Good. (ii) Nil. (iii) Yield of tuber. (iv) (a) 1950—1951. (b) No. (c) Nil. (v) (a) No. (b) —. (vi) and (vii) Nil.

5. RESULTS:
   (i) 5122 lb./ac.
   (ii) 495.1 lb./ac.
   (iii) Treatments are highly significantly different.
   (iv) Av. yield of colocasia in lb./ac.
   Treatment | Av. yield  
-------------|------------
D1          | 6097       
D2          | 5548       
D3          | 5123       
D4          | 3819       
S.E./mean  | =202.7 lb./ac.
Crop :- Sugarcane.  
Site :- Distt. and Demon. Farm, Ambala.  
Object :- To study the effect of different sources of N on the yield of Sugarcane crop.

1. BASAL CONDITIONS:
(i) (a) Nil. (b) N.A. (c) Nil.  
(ii) (a) Hard clay loam. (b) N.A.  
(iii) 14.2.1948.  
(iv) (a) and (b) N.A.  
(v) 40,000 setts./ac. (d) and (e) N.A.  
(vi) Guara ploughed in. Dates N.A.  
(vii) Irrigated.  
(viii) 2 hoeings and one weeding.  
(ix) 21.59".  
(x) 19 to 22.3.1949.

2. TREATMENTS:
1. Control.  
2. F.Y.M. at 50 lb./ac. of N.  
3. A/S at 50 lb./ac. of N.  
4. Ammo. Phos. at 50 lb./ac. of N.  
5. F.Y.M. at 100 lb./ac. of N.  
6. A/S at 100 lb./ac. of N.  
7. Ammo. Phos. at 100 lb./ac. of N.  
8. Ammo. Phos. at 50 lb./ac. of N+F.Y.M. at 50 lb./ac. of N.  
9. A/S 50 lb./ac. of N+F.Y.M. at 50 lb./ac. of N.

3. DESIGN:
(i) R.B.D. (ii) (a) 9. (b) N.A. (iii) 4. (iv) (a) 88'×11'. (b) 88'×11'. (v) No. (vi) Yes.

4. GENERAL:
(i) Fair to good. No lodging. (ii) No. (iii) Yield of sugarcane and gur.  
(iv) (a) 1946 to 1948. (b) No.  
(c)—. (v) (a) Karnal. (b) N.A. (vi) and (vii) Nil.

5. RESULTS:
(i) 13.39 ton/ac.  
(ii) 2.92 ton/ac.  
(iii) Treatments are significantly different.  
(iv) Av. yield of sugarcane in ton/ac.  
Treatment | Av. yield  
---|---  
1. | 12.97  
2. | 15.67  
3. | 9.76  
4. | 10.72  
5. | 14.76  
6. | 15.26  
7. | 13.08  
8. | 14.93  
9. | 13.33  
S.E /mean = 1.46 ton/ac.
3. DESIGN:
(i) R.B.D.  (ii) (a) 4.  (b) N.A.  (iii) 4.  (iv) (a) N.A.  (b) 1/40th ac.  (v) N.A.  (vi) Yes.

4. GENERAL:
(i) Fair to good. No lodging.  (ii) Nil.  (iii) Yield of sugarcane.  (iv) (a) No.  (b) No.  (c) —.  (v) (a) Nil.  (b) —.  (vi) and (vii) Nil.

5. RESULTS:
(i) 34.43 ton/ac.
(ii) 4.07 ton/ac.
(iii) Treatments are not significantly different.
(iv) Av. yield of sugarcane in ton/ac.

<table>
<thead>
<tr>
<th>Treatment</th>
<th>Av. yield</th>
</tr>
</thead>
<tbody>
<tr>
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</tr>
<tr>
<td>2.</td>
<td>39.21</td>
</tr>
<tr>
<td>3.</td>
<td>34.99</td>
</tr>
<tr>
<td>4.</td>
<td>30.20</td>
</tr>
<tr>
<td>S.E./mean</td>
<td>= 2.04 ton/ac.</td>
</tr>
</tbody>
</table>

Crop :- Sugarcane.  
Site :- Distt. and Demon. Farm, Ambala.  
Ref :- Pb. 49(70).  
Type :- ‘M’.

Object :- To study the effect of different sources of N on yield of sugarcane with and without trash.

1. BASAL CONDITIONS:
(i) (a) Nil.  (b) Fallow.  (c) Nil.  (ii) (a) Hard-clay.  (b) N.A.  (iii) 10.3.1949.  (iv) (a) N.A.  (b) N.A.  (c) 1000 sets/plot.  (d) N.A.  (e) N.A.  (v) Nil.  (vi) CO.312 (medium).  (vii) Irrigated.  (viii) N.A.  (ix) 30.70’.  (x) 2.3.1950 to 9.4.1920.

2. TREATMENTS:
All combinations of (1) and (2)
(1) 3 applications of N : N₀ = Control, N₁ = 75 lb./ac. of N as Ammo. Phos. and N₂ = 75 lb./ac. of N as A/S.
(2) 2 levels of trash : T₀ = No trashing and T₁ = Trashing.
Manures applied on 28.7.1949.

3. DESIGN:
(i) Fact. in R.B.D.  (ii) (a) 6.  (b) N.A.  (iii) 4.  (iv) (a) 14’x78’.  (b) 14’x78’.  (v) Nil.  (vi) Yes.

4. GENERAL:
(i) Fair. No lodging.  (ii) Nil.  (iii) Sugarcane and gur yield.  (iv) (a) No.  (b) No.  (c) —.  (v) (a) No.  (b) —.  (vi) and (vii) Nil.

5. RESULTS:
(i) 32.65 ton/ac.
(ii) 4.31 ton/ac.
(iii) Only trash effect is highly significant.
(iv) Av. yield of sugarcane in ton/ac.

<table>
<thead>
<tr>
<th></th>
<th>N₀</th>
<th>N₁</th>
<th>N₂</th>
<th>Mean</th>
</tr>
</thead>
<tbody>
<tr>
<td>T₀</td>
<td>30.09</td>
<td>28.18</td>
<td>26.30</td>
<td>28.19</td>
</tr>
<tr>
<td>T₁</td>
<td>38.20</td>
<td>36.69</td>
<td>36.40</td>
<td>37.10</td>
</tr>
<tr>
<td>Mean</td>
<td>34.15</td>
<td>32.44</td>
<td>31.35</td>
<td>32.65</td>
</tr>
</tbody>
</table>

S.E. of marginal mean of N = 1.76 ton/ac.
S.E. of marginal mean of T = 1.44 ton/ac.
S.E. of body of table = 2.49 ton/ac.
Crop : Sugarcane.  
Site : Distt. and Demo. Farm, Ambala. 

Object : To study the effect of N on yield of Sugarcane with and without trash.

1. BASAL CONDITIONS:
   (i) (a) Nil. (b) Fallow. (c) Nil. (ii) (a) Hard clay. (b) N.A. (iii) 22.2.1950. (iv) (a) to (e) N.A. (v) Nil. (vi) CO. 312 (medium). (vii) Irrigated. (viii) N.A. (ix) 36.69. (x) 12.3.1951, 3.4.1951 and 6.4.1951.

2. TREATMENTS:
   All combinations of (1) and (2)
   (1) 5 applications of N : N₃ = Control, N₁ = 50 lb./ac. of N as Ammo. Phos., N₂ = 75 lb./ac. of N as Ammo. Phos., N₃ = 50 lb./ac. of N as A/S and N₄ = 75 lb./ac. of N as A/S.
   (2) 2 levels of trash : T₀ = No trashing and T₁ = trashing.

3. DESIGN:
   (i) Fact. in R.B.D. (ii) (a) 10. (b) N.A. (iii) 3. (iv) (a) 14'x78'. (b) 14'x78'. (v) Nil. (vi) Yes.

4. GENERAL:
   (i) Fair. No lodging. (ii) N.A. (iii) Yield of sugarcane. (iv) (a) No. (b) No. (c) —. (v) (a) No. (b) —. (vi) and (vii) Nil.

5. RESULTS:
   (i) 9.70 ton/ac.
   (ii) 3.04 ton/ac.
   (iii) Effect of trash is highly significant and effect of manures is also significant Interaction N x T is not significant.
   (iv) Av. yield of sugarcane in ton/ac.

<table>
<thead>
<tr>
<th></th>
<th>T₁</th>
<th>T₂</th>
<th>Mean</th>
</tr>
</thead>
<tbody>
<tr>
<td>N₀</td>
<td>5.17</td>
<td>11.15</td>
<td>8.16</td>
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<tr>
<td>N₁</td>
<td>5.25</td>
<td>12.08</td>
<td>8.67</td>
</tr>
<tr>
<td>N₂</td>
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<td>13.76</td>
<td>10.09</td>
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<td>N₃</td>
<td>7.52</td>
<td>12.54</td>
<td>10.03</td>
</tr>
<tr>
<td>N₄</td>
<td>8.62</td>
<td>14.52</td>
<td>11.57</td>
</tr>
<tr>
<td>Mean</td>
<td>6.59</td>
<td>12.81</td>
<td>9.70</td>
</tr>
</tbody>
</table>

S.E. of marginal means of T = 0.78 ton/ac.
S.E. of marginal means of N = 1.23 ton/ac.
S.E. of body of table = 1.73 ton/ac.

Crop : Sugarcane.  
Site :Govt. Agri. Stn., Gurdaspur. 

Object : To find out the manurial requirements of Sugarcane.

1. BASAL CONDITIONS:
   (i) (a) Nil. (b) Wheat. (c) Nil. (ii) (a) Loamy. (b) N.A. (iii) 28.3.1948. (iv) (a) Ploughing once by roja, 4 times by desti plough and 5 times levelling by zohapa. (b) N.A. (c) 40,000 setts/ac. (d) and (e) N.A. (v) Nil. (vi) CO. 312 (medium). (vii) N.A. (viii) 1 hoeing. (ix) 27.27. (x) 24.12.1948.

2. TREATMENTS:
   1. Control.
   2. A/S at 75 lb./ac. of N.
   3. A/S at 150 lb./ac. of N.
   4. Ammo. Phos. at 75 lb./ac. of N.
   5. Ammo. Phot at 150 lb./ac. of N.
   6. Super at 100 lb./ac. of P₂O₅.
   7. Super at 200 lb./ac. of P₂O₅.
3. DESIGN:
   (i) R.B.D. (ii) (a) 7. (b) N.A. (iii) 6. (iv) (a) and (b) 66’x11’. (v) Nil. (vi) Yes.

4. GENERAL:
   (i) Germination good, condition deteriorated due to failure of rains. (ii) N.A. (iii) Yield of sugarcane and gur. (iv) (a) to (c) Nil. (v) (a) and (b) Nil. (vi) and (vii) Nil.

5. RESULTS:
   (i) 11.15 ton/ac.
   (ii) 2.42 ton/ac.
   (iii) Treatments are highly significantly different.
   (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>9.25</td>
</tr>
<tr>
<td>2.</td>
<td>11.64</td>
</tr>
<tr>
<td>3.</td>
<td>12.49</td>
</tr>
<tr>
<td>4.</td>
<td>13.10</td>
</tr>
<tr>
<td>5.</td>
<td>13.58</td>
</tr>
<tr>
<td>6.</td>
<td>9.23</td>
</tr>
<tr>
<td>7.</td>
<td>8.59</td>
</tr>
<tr>
<td>S.E./mean</td>
<td>0.99 ton/ac.</td>
</tr>
</tbody>
</table>

Crop :- Sugarcane.
Site :- Govt. Agri. Stn., Gurdaspur.
Ref :- Pb. 48(8).
Type :- ‘M’.

Object :- To find out the manural requirements of Sugarcane.

1. BASAL CONDITIONS:
   (i) (a) Nil. (b) Fallow. (c) Nil. (ii) (a) Loam. (b) N.A. (iii) 1st to 2nd April, 1948. (iv) (a) 1 raja, 3 desi, 1 punjatana and 3 ploughings. (b) [to (e) N.A. (v) Nil. (vi) CO. 312 (medium). (vii) Irrigated. (viii) 3 hoeings, 1 ridging and one tying up. (ix) 27.27’. (x) 27 to 31.1.1949.

2. TREATMENTS:
   1. Control.
   2. A/S at 75 lb./ac. of N.
   3. A/S at 150 lb./ac. of N.
   4. Ammo. Phos. at 75 lb./ac. of N.
   5. Ammo. Phos. at 150 lb./ac. of N.
   6. Super at 100 lb./ac. of P2O5.
   7. Super at 200 lb./ac. of P2O5.

3. DESIGN:
   (i) R.B.D. (ii) (a) 7. (b) N.A. (iii) 6. (iv) (a) 21’x72’. (b) 17’x64’. (v) N.A. (vi) Yes.

4. GENERAL:
   (i) Growth and germination satisfactory. No lodging. (ii) Nil. (iii) Yield of sugarcane and gur. (iv) (a) Nil. (b) No. (c) Nil. (v) (a) No. (b) Nil. (vi) and (vii) Nil.

5. RESULTS:
   (i) 18.11 ton/ac.
   (ii) 2.23 ton/ac.
   (iii) Treatments differ highly significantly.
   (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>15.12</td>
</tr>
<tr>
<td>2.</td>
<td>19.06</td>
</tr>
<tr>
<td>3.</td>
<td>19.69</td>
</tr>
<tr>
<td>4.</td>
<td>20.76</td>
</tr>
<tr>
<td>5.</td>
<td>20.29</td>
</tr>
<tr>
<td>6.</td>
<td>15.31</td>
</tr>
<tr>
<td>7.</td>
<td>16.31</td>
</tr>
<tr>
<td>S.E./mean</td>
<td>0.91 ton/ac.</td>
</tr>
</tbody>
</table>
Crop : Sugarcane.

Object : To find out the manurial requirements of Sugarcane.

1. BASAL CONDITIONS :
   (i) (a) Nil. (b) N.A. (c) N.A. (ii) (a) Loam. (b) N.A. (iii) 31.3.1948. (iv) (a) 4 ploughings and 5 sowing.
   (b) N.A. (c) 2' row to row. (d) 40000 sets/ac. (e) N.A. (v) Nil. (vi) CO. 312 (medium). (vii) Irrigated.
   (viii) N.A. (ix) 27.27°. (x) 22 to 25.12.1948.

2. TREATMENTS :
   1. Control.
   2. A/S at 75 lb./ac. of N.
   3. A/S at 150 lb./ac. of N.
   4. Ammo. Phos. at 75 lb./ac. of N.
   5. Ammo. Phos. at 150 lb./ac. of N.
   6. Super at 100 lb./ac. of P2O5.
   7. Super at 200 lb./ac. of P2O5.

A/S, Ammo. Phos. and Super applied in two equal doses on 28.4.1948, and 17.7.1948.

DESIGN :
   (i) R.B.D. (ii) (a) 7. (b) N.A. (iii) 6. (iv) (a) 77' X 14'. (b) 72.5' X 10'. (v) N.A. (vi) Yes.

4. GENERAL :
   (i) Germination satisfactory; condition fair. No lodging. (ii) N.A. (iii) Yield of sugarcane. (iv) (a) No.
   (b) No. (c)—. (v) (a) No. (b) —. (vi) and (vii) Nil.

5. RESULTS :
   (i) 13.55 ton/ac.
   (ii) 2.56 ton/ac.
   (iii) Treatments are highly significantly different.
   (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>10.55</td>
</tr>
<tr>
<td>2.</td>
<td>15.18</td>
</tr>
<tr>
<td>3.</td>
<td>13.80</td>
</tr>
<tr>
<td>4.</td>
<td>14.10</td>
</tr>
<tr>
<td>5.</td>
<td>16.68</td>
</tr>
<tr>
<td>6.</td>
<td>11.17</td>
</tr>
<tr>
<td>7.</td>
<td>13.39</td>
</tr>
<tr>
<td>S.E./mean</td>
<td>1.04 ton/ac</td>
</tr>
</tbody>
</table>

Crop : Sugarcane.
Site : Sugarcane Sub-Stn., Gurdaspur.

Object : To study the effect of different manures on Sugarcane crop.

1. BASAL CONDITIONS :
   (i) (a) Nil. (b) N.A. (c) Nil. (ii) (a) Loamy (b) N.A. (iii) 18.3.1949. (iv) (a) to (e) N.A. (v) Nil. (vi) CO. 312 (medium). (vii) Irrigated. (viii) N.A. (ix) 27.78°. (x) 5 to 18.4.1950.

2. TREATMENTS :
   1. Control.
   2. 10 C.L./ac. of F.Y.M.
   3. Mohua cake at 12.5 md./ac.
   4. A/S at 3 md./ac.
   5. Ammo. Phos. at 4 md./ac.
   6. 5 C.L./ac. of F.Y.M + A/S at 1.5 md./ac.
   7. 5 C.L./ac. of F.Y.M. + Ammo. Phos. at 2 md./ac.
   8. Mohua cake at 6.25 md./ac. + A/S at 1.5 md./ac.

3. **DESIGN:**
   (i) R.B.D.  (ii) (a) 9, (b) N.A.  (iii) 4.  (iv) (a) 13' x 72'. (b) 13 x 69'-10''. (v) N.A.  (vi) Yes.

4. **GENERAL:**
   (i) Satisfactory. No lodging.  (ii) Nil.  (iii) Yield of sugarcane.  (iv) (a) No. (b) No. (c)—.  (v) (a) No. (b) —.  (vi) and (vii) Nil.

5. **RESULTS:**
   (i) 33.16 ton/ac.
   (ii) 3.399 ton/ac.
   (iii) Treatments are not significantly different.
   (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>34.84</td>
</tr>
<tr>
<td>2.</td>
<td>33.08</td>
</tr>
<tr>
<td>3.</td>
<td>34.31</td>
</tr>
<tr>
<td>4.</td>
<td>33.53</td>
</tr>
<tr>
<td>5.</td>
<td>34.76</td>
</tr>
<tr>
<td>6.</td>
<td>32.94</td>
</tr>
<tr>
<td>7.</td>
<td>30.17</td>
</tr>
<tr>
<td>8.</td>
<td>32.41</td>
</tr>
<tr>
<td>9.</td>
<td>32.41</td>
</tr>
<tr>
<td>S.E./mean</td>
<td>1.70 ton/ac.</td>
</tr>
</tbody>
</table>

Object:—To study the effect of different manures on Sugarcane crop.

---

**Crop:** Sugarcane.  
**Site:** Sugarcane Sub-Stn., Gurdaspur.  
**Ref:** Pb. 49(56).  
**Type:** ‘M’.
A~·.
yield of sugarcane in ton/ac.
Treatment Av. yield
1. 19.30
2. 17.80
3. 20.21
4. 14.16
5. 18.85
6. 16.51
7. 18.93
8. 18.81
9. 17.90
S E./mean = 1.32 ton/ac.

Crop: - Sugarcane.
Site: - Sugarcane Sub-Stn., Gurdaspur.
Ref: - Pb. 51(110).
Type: - 'M'.
Object: - To study the effect of Super on yield of Sugarcane.

1. BASAL CONDITIONS:
   (i) (a) Nil. (b) N.A. (c) Nil. (ii) (a) Loamy. (b) N.A. (iii) 23.4.1951. (iv) (a) to (c) N.A. (v) 7 C.L./ac. of F.Y.M. (vi) CO. 312 (medium). (vii) Irrigated. (viii) N.A. (ix) 25.67°. (x) 11.5.1952.

2. TREATMENTS:
P₀ = No P₂O₅ (control).
P₁ = Super at 100 lb./ac. of P₂O₅.

3. DESIGN:
   (i) Paired plot. (ii) (a) 2. (b) N.A. (iii) 6. (iv) (a) N.A. (b) 1/60 ac. (v) N.A. (vi) Yes.

4. GENERAL:
   (i) Fair. No lodging. (ii) Nil. (iii) Yield of sugarcane. (iv) (a) No. (b) No. (c) - (v) (a) No. (b) — (vi) and (vii) Nil.

5. RESULTS:
   (i) 23.88 ton/ac.
   (ii) 1.154 ton/ac.
   (iii) Treatments are not significantly different.
   (iv) Av. yield of sugarcane in ton/ac.

   Treatment  Av. yield
   P₀  23.92
   P₁  23.83
   S.E./mean = 0.471 ton./ac.

Crop: - Sugarcane.
Site: - Sugarcane Sub-Stn., Gurdaspur.
Ref: - Pb. 50 (58).
Type: - 'M'.
Object: - To study the effect of N, P₂O₅ and K₂O on yield of Sugarcane.

1. BASAL CONDITIONS:
   (i) (a) Nil. (b) N.A. (c) Nil. (ii) (a) Loamy. (b) N.A. (iii) 20.3.1950. (iv) (a) 4 ploughings and 4 əhəɡə. (b) to (c) N.A. (v) Nil. (vi) CO. 312 (medium). (vii) Irrigated. (viii) 1 earthing up, 1 tying and 2 hoeings. (ix) 55.35°. (x) 5.2.1951 to 17.3.1951.
2. TREATMENTS:
All combinations of (1), (2) and (3)
(1) 3 levels of N: \(N_0=0, N_1=100\) and \(N_2=200\) lb./ac.
(2) 3 levels of \(P_2\): \(P_0=0, P_1=100\) and \(P_2=200\) lb./ac.
(3) 3 levels of \(K_2\): \(K_0=0, K_1=100\) and \(K_2=200\) lb./ac.
\(N\) as A/S applied on 23.5.1950, \(P_2\) as Super on 19.3.1950 and \(K_2\) as Pot. Sul. on 19.3.1950.

3. DESIGN:
(i) 3\(^{rd}\) Fact. in R.B.D. (ii) (a) 27 (b) N.A. (iii) 4. (iv) (a) N.A. (b) 1/50 ac. (v) N.A. (vi) Yes.

4. GENERAL:
(i) Germination and condition good. No lodging. (ii) Nil. (iii) Yield of sugarcane. (iv) (a) 1950 to 1953 (b) No. (c) Nil. (v) (a) No. (b) —. (vi) and (vii) Nil.

5. RESULTS:
(i) 28.61 ton/ac.
(ii) 2.755 ton/ac.
(iii) Effect of \(N\) is highly significant while all others are not significant.
(iv) Av. yield of sugarcane in ton/ac.

<table>
<thead>
<tr>
<th>(P_0)</th>
<th>(P_1)</th>
<th>(P_2)</th>
<th>Mean</th>
<th>(K_0)</th>
<th>(K_1)</th>
<th>(K_2)</th>
</tr>
</thead>
<tbody>
<tr>
<td>(N_0)</td>
<td>24.98</td>
<td>25.73</td>
<td>24.73</td>
<td>25.15</td>
<td>23.96</td>
<td>25.39</td>
</tr>
<tr>
<td>(N_1)</td>
<td>29.88</td>
<td>30.47</td>
<td>29.66</td>
<td>30.00</td>
<td>30.19</td>
<td>29.03</td>
</tr>
<tr>
<td>(N_2)</td>
<td>31.65</td>
<td>30.46</td>
<td>29.97</td>
<td>30.69</td>
<td>30.78</td>
<td>30.87</td>
</tr>
<tr>
<td>Mean</td>
<td>28.84</td>
<td>28.89</td>
<td>28.12</td>
<td>28.61</td>
<td>28.31</td>
<td>28.40</td>
</tr>
</tbody>
</table>

S.E. of any marginal mean = 0.459 ton/ac.
S.E. of body of table = 0.795 ton/ac.

Crop : Sugarcane.
Site : Sugarcane Sub-Stn., Gurdaspur.
Ref : Ph. 51 (108).
Type : ‘M’.

Object : To study the effect of \(N, P_2\) and \(K_2\) on yield of Sugarcane.

1. BASAL CONDITIONS:
(i) (a) Nil. (b) N.A. (c) Nil. (ii) (a) Loamy. (b) N.A. (iii) 5.3.1951. (iv) (a) 4 ploughings and 5 sougha. (b) N.A. (c) 40,000 sets/ac. (d) and (e) N.A. (v) 44 C.L./ac. of F.Y.M. (vi) CO.312 (medium) (vii) Irrigated. (viii) N.A. (ix) 25.67”. (x) 18 and 19.3.1952.

2. TREATMENTS:
All combinations of (1), (2) and (3)
(1) 3 levels of \(N\): \(N_0=0, N_1=100\) and \(N_2=200\) lb./ac.
(2) 3 levels of \(P_2\): \(P_0=0, P_1=100\) and \(P_2=200\) lb./ac.
(3) 3 levels of \(K_2\): \(K_0=0, K_1=100\) and \(K_2=200\) lb./ac.
\(N\) as A/S applied on 21.5.1951, \(P_2\) as Super on 5.3.1951 and \(K_2\) as Pot. Sul. on 3.3.1951.

3. DESIGN:
(i) 3\(^{rd}\) Fact. in R.B.D. (ii) (a) 27 (b) N.A. (iii) 4. (iv) (a) N.A. (b) 1/50 ac. (v) N.A. (vi) Yes.
4. GENERAL:
   (i) Satisfactory. No lodging. (ii) Nil. (iii) Yield of sugarcane. (iv) (a) 1950 to 1953. (b) No. (c) Nil. (v) (a) No. (b) —. (vi) and (vii) Nil.

5. RESULTS:
   (i) 26.30 ton/ac.
   (ii) 3.426 ton/ac.
   (iii) N effect is highly significant while all other effects are not significant.
   (iv) Av. yield of sugarcane in ton/ac.

<table>
<thead>
<tr>
<th></th>
<th>P₀</th>
<th>P₁</th>
<th>P₂</th>
<th>Mean</th>
<th>K₀</th>
<th>K₁</th>
<th>K₂</th>
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<tbody>
<tr>
<td>N₀</td>
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<td>20.65</td>
<td>19.01</td>
<td>19.36</td>
<td>21.88</td>
<td>17.60</td>
<td>18.61</td>
</tr>
<tr>
<td>N₁</td>
<td>28.82</td>
<td>29.58</td>
<td>30.66</td>
<td>29.69</td>
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<td>30.34</td>
<td>30.44</td>
<td>29.70</td>
<td>30.58</td>
<td>31.03</td>
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<tr>
<td>Mean</td>
<td>25.74</td>
<td>27.08</td>
<td>26.67</td>
<td>26.50</td>
<td>27.13</td>
<td>25.84</td>
<td>26.52</td>
</tr>
</tbody>
</table>

S.E. of any marginal mean = 0.571 ton/ac.
S.E. of body of table = 0.989 ton/ac.

Crop: Sugarcane.
Site: Sugarcane Sub-Strn., Gurdaspur.

Object: To study the effect of N, P₂O₅ and K₂O on yield of Sugarcane.

1. BASAL CONDITIONS:
   (i) (a) Nil. (b) Maize for fodder. (c) Nil. (ii) Loamy. (b) N.A. (iii) 14.3.1952. (iv) (a) 3 ploughings and 3 chhaya. (b) N.A. (c) 35,000 setts/ac. (d) and (e) N.A. (v) Nil. (vi) CO.312 (late). (vii) Irrigated.
   (viii) 5 hoeings, 1 ridging and 2 tying up. (ix) 28.50°. (x) 18.1.1953 to 1.3.1953.

2. TREATMENTS:
   All combinations of (1), (2) and (3)
   (1) 3 levels of N: N₀ = 0, N₁ = 100 and N₂ = 200 lb/ac.
   (2) 3 levels of P₂O₅: P₀ = 0, P₁ = 100 and P₂ = 200 lb/ac.
   (3) 3 levels of K₂O: K₀ = 0, K₁ = 100 and K₂ = 200 lb/ac.

P₂O₅ as Super applied in furrows 4" deep, K₂O as Pot. Sul. by broadcasting a day before planting and N as A/S in two equal doses in May and June 1952.

3. DESIGN:
   (i) 3³ Fact. in R.B.D. (ii) (a) 27. (b) N.A. (iii) 4. (iv) (a) 72'×14'. (b) 62'×12.75'. (v) N.A. (vi) Yes.

4. GENERAL:
   (i) Germination good. No lodging. (ii) N.A. (iii) Yield of sugarcane. (iv) (a) 1950—1953. (b) No. (c) Nil. (v) (a) No. (b) —. (vi) and (vii) Nil.

Ref: Pb. 52(50).
Type: 'M'.
5. RESULTS:

(i) 31.34 ton/ac.
(ii) 3.18 ton/ac.
(iii) Only N effect is highly significant while all others are not significant.
(iv) Av. yield of sugarcane in ton/ac.

<table>
<thead>
<tr>
<th></th>
<th>P₀</th>
<th>P₁</th>
<th>P₂</th>
<th>Mean</th>
<th>K₀</th>
<th>K₁</th>
<th>K₂</th>
</tr>
</thead>
<tbody>
<tr>
<td>N₀</td>
<td>25.46</td>
<td>26.49</td>
<td>24.36</td>
<td>25.44</td>
<td>25.68</td>
<td>24.71</td>
<td>25.93</td>
</tr>
<tr>
<td>N₁</td>
<td>34.13</td>
<td>33.79</td>
<td>33.52</td>
<td>33.81</td>
<td>33.12</td>
<td>34.36</td>
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<tr>
<td>N₂</td>
<td>35.73</td>
<td>33.19</td>
<td>35.41</td>
<td>34.77</td>
<td>33.35</td>
<td>35.46</td>
<td>36.41</td>
</tr>
<tr>
<td>Mean</td>
<td>31.77</td>
<td>31.15</td>
<td>31.10</td>
<td>31.34</td>
<td>30.71</td>
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<td>K₀</td>
<td>31.50</td>
<td>30.01</td>
<td>30.63</td>
<td>30.71</td>
<td></td>
<td></td>
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</tr>
<tr>
<td>K₁</td>
<td>31.15</td>
<td>31.55</td>
<td>30.92</td>
<td>31.21</td>
<td></td>
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<td></td>
</tr>
<tr>
<td>K₂</td>
<td>32.67</td>
<td>31.90</td>
<td>31.74</td>
<td>32.10</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

S.E. of any marginal mean = 0.53 ton/ac.
S.E. of body of table = 0.918 ton/ac.

Crop : Sugarcane.
Site : Sugarcane Sub-Stn., Gurdaspur.

Object : To study the effect of N, P₂O₅ and K₂O on yield of Sugarcane.

1. BASAL CONDITIONS:

(i) (a) Wheat—Chari—Sugarcane. (b) Chari. (ii) Loam. (b) N.A. (iii) 23.3.1953 and 24.3.1953. (iv) (a) 10 desi hal and 13 sohaga. (b) N.A. (c) 35,000 sets/ac. (d) and (e) N.A. (v) 100 lb/ac. of N as F.Y.M. (vi) CO. 312 (late). (vii) Irrigated. (viii) 4 hoeings, 1 ridging and 1 tying up. (ix) 34.46'. (x) 26.12.1933 to 6.1.1954.

2. TREATMENTS:

All combinations of (1), (2) and (3)
(1) 3 levels of N : N₀=0, N₁=100 and N₂=200 lb/ac.
(2) 3 levels of P₂O₅ : P₀=0, P₁=100 and P₂=200 lb/ac.
(2) 3 levels of K₂O : K₀=0, K₁=100 and K₂=200 lb/ac.

3. DESIGN:

(i) 3rd partially confounded. (ii) (a) 9 plots/block ; 3 blocks/replication. (b) N.A. (iii) 4. (iv) (a) 14'x72'. (b) 14'x62.75'. (v) N.A. (vi) Yes.

4. GENERAL:

(i) Normal. No lodging. (ii) Nil. (iii) Yield of sugarcane. (iv) (a) 1950—1953. (b) No. (c) Nil. (v) (a) Jullundur. (b) Nil. (vi) and (vii) Nil.

5. RESULTS:

(i) 32.35 ton/ac.
(ii) 2.45 ton/ac.
(iii) None of the effects is significant.
(iv) Av. yield of sugarcane in ton/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>N1</td>
<td>35.01</td>
<td>33.95</td>
<td>35.04</td>
<td>34.67</td>
<td>34.84</td>
<td>33.90</td>
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<tr>
<td>N2</td>
<td>34.25</td>
<td>36.49</td>
<td>35.66</td>
<td>35.47</td>
<td>35.54</td>
<td>35.41</td>
</tr>
<tr>
<td>Mean</td>
<td>31.79</td>
<td>32.60</td>
<td>32.65</td>
<td>32.35</td>
<td>32.41</td>
<td>32.18</td>
</tr>
</tbody>
</table>

S.E. of any marginal mean = 0.41 ton/ac.
S.E. of body of table = 0.71 ton/ac.

Crop :- Sugarcane.
Site :- Sugarcane Sub-Stn., Gurdaspur.
Ref :- Pb. 53(85).
Type :- 'M'.

Object :- To study the effect of different doses of N in combination with P2O5 on irrigated Sugarcane crop.

1. BASAL CONDITIONS:
(i) (a) Wheat-Senji-Sugarcane. (b) Senji. (c) Nil. (ii) (a) Loam. (b) N.A. (iii) 3 4.1953. (iv) (a) 5 ploughings and 9 subaga. (b) N.A. (c) 35009 setts/ac. (d) 2'x2'. (e) N.A. (v) Nil. (vi) CO.312 (late). (vii) Irrigated. (viii) 1 bar harrow, 3 hoeings and one earthing up. (ix) 34.46'. (x) 20.12.1953.

2. TREATMENTS:
All combinations of (1) and (2).
(1) 4 applications of N : N0 =0 lb./ac., N1 =140 lb./ac. of N as G.N.C, N2 =140 lb./ac. cf N as A/S and N3 =140 lb./ac. of N as F.Y.M.
(2) 2 levels of P2O5 : P0 =0 and P1 =100 lb./ac. of P2O5 as Super. G.N.C. and A/S applied after planting on 12.5.1953 and F.Y.M. before sowing on 23.2.1953.

3. DESIGN:
(i) 4 x 2 Fact. in R.B.D. (ii) (a) 8. (b) N.A. (iii) 4. (iv) (a) 14'x72'. (b) 14'x62'-3'. (v) 3' on either side. (vi) Yes.

4. GENERAL:
(i) Normal. No lodging. (ii) Nil. (iii) Yield of sugarcane. (iv) (a) 1952 to 1954. (b) No. (c) Nil. (v) (a) No. (b) -. (vi) Nil. (vii) Tube well went out of order and so adequate irrigation could not be given during hot weather. But due to good rain during monsoon period the crop condition came almost to normal growth. In 1952 experiment with two varieties was conducted. See Pb. 52(52) under category 'VM'.

5. RESULTS:
(i) 27.56 ton/ac.
(ii) 2.01 ton/ac.
(iii) No effect is significant.
(iv) Av. yield of sugarcane in ton/ac.

<table>
<thead>
<tr>
<th></th>
<th>( N_0 )</th>
<th>( N_1 )</th>
<th>( N_2 )</th>
<th>( N_3 )</th>
<th>Mean</th>
</tr>
</thead>
<tbody>
<tr>
<td>( P_0 )</td>
<td>26.10</td>
<td>28.10</td>
<td>27.42</td>
<td>27.99</td>
<td>27.60</td>
</tr>
<tr>
<td>( P_1 )</td>
<td>25.91</td>
<td>27.76</td>
<td>29.93</td>
<td>27.25</td>
<td>27.71</td>
</tr>
<tr>
<td>Mean</td>
<td>26.00</td>
<td>27.93</td>
<td>28.72</td>
<td>27.62</td>
<td>27.56</td>
</tr>
</tbody>
</table>

S.E. of marginal mean of \( N \) \( = 0.71 \) ton/ac.

S.E. of marginal mean of \( P_{2O_5} \) \( = 0.58 \) ton/ac.

S.E. of body of table \( = 1.01 \) ton/ac.

Crop : Sugarcane.

Site : Govt. Agri. Stn., Hansi.

Object : To find out the manurial requirements of Sugarcane.

1. BASAL CONDITIONS:
   (i) (a) Nil. (b) Fallow. (c) Nil. (ii) (a) Heavy loam. (b) N.A. (iii) 9.3.1949. (iv) (a) 3 disc harrow, one roller and 3 desi hal. (b) to (e) N.A. (v) Nil. (vi) CO. 421 (medium). (vii) Irrigated. (viii) 1 blind hoeing, 2 hoeings, 1 sahaga and one roller. (ix) 27.70°. (x) N.A.

2. TREATMENTS:
   1. Control.
   2. Mohua cake at 12.5 md./ac.
   3. F.Y.M. at 10 C.L./ac.
   4. A/S at 3 md./ac.
   5. Ammo. Phos. at 4 md./ac.
   6. F.Y.M. at 5 C.L./ac.+A/S at 1.5 md./ac.
   8. Mohua cake at 6.25 md./ac.+A/S at 1.5 md./ac.

3. DESIGN:
   (i) R.B.D. (ii) (a) 9. (b) N.A. (iii) 4. (iv) (a) N.A. (b) 1/80 ac. (v) N.A. (vi) Yes.

4. GENERAL:
   (i) Fair. No lodging. (ii) N.A. (iii) Yield of sugarcane. (iv) (a) 1949 to 1950. (b) No. (c) Nil. (v) (a) No. (b) —. (vi) Nil. (vii) Since Mohua cake was not applied for analysis treatments 1 and 2 both were taken as control.

5. RESULTS:
   (i) 3.82 ton/ac.
   (ii) 0.48 ton/ac.
   (iii) Treatments are not significantly different.
   (iv) Av. yield of sugarcane in ton/ac.

   Treatment               | Av. yield
   ------------------------|-----------
   1 and 2.                | 3.52      |
   3.                      | 3.82      |
   4.                      | 3.84      |
   5.                      | 4.38      |
   6.                      | 3.87      |
   7.                      | 3.84      |
   8.                      | 3.97      |
   9.                      | 3.63      |
   S.E./mean other than control \( = 0.24 \) ton/ac.
   S.E. of control mean \( = 0.17 \) ton/ac.
Crop : Sugarcane.  
Site : Jullundur Agri. Stn., Jullundur.  
Object : To study the effect of A/S on Sugarcane yield.

1. BASAL CONDITIONS:
   (i) (a) Nil. (b) N.A. (c) Nil. (ii) (a) Loam. (b) Refer. soil analysis, Jullundur. (iii) 25/3.1948. (iv) (a) 1 raju, 1 horse hoe, 5 desi and 3 sohaga. (b) N.A. (c) 75 md./ac. (d) and (e) N.A. (v) Nil. (vi) CO.312 (medium). (vii) Irrigated. (viii) 4 hoeings. (ix) 26.44°. (x) 10 to 25/2.1949.
2. TREATMENTS:
1. Control.
2. A/S at 75 lb./ac. of N.
3. A/S at 100 lb./ac. of N.
4. A/S at 125 lb./ac. of N.
5. A/S as 150 lb./ac. of N. 
A/S applied on 3.7.1949.

3. DESIGN:
(i) R.B.D. (ii) (a) 5. (b) N.A. (iii) 5. (iv) (a) 10'×12'. (b) 90.75'×12'. (v) N.A. (vi) Yes.

4. GENERAL:
(i) Satisfactory. No lodging. (ii) Severe attack of Pyrilla but it was controlled by dusting gammaxene at 56 lb./ac. (iii) Yield of sugarcane. (iv) (a) No. (b) No. (c) - . (v) (a) No. (b) - . (vi) and (vii) N A.

5. RESULTS:
(i) 41.69 ton/ac.
(ii) 3.77 ton/ac.
(iii) Treatments are not significantly different.
(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>40.24</td>
</tr>
<tr>
<td>2.</td>
<td>41.29</td>
</tr>
<tr>
<td>3.</td>
<td>42.49</td>
</tr>
<tr>
<td>4.</td>
<td>42.12</td>
</tr>
<tr>
<td>5.</td>
<td>42.30</td>
</tr>
<tr>
<td>S.E./mean</td>
<td>0.79 ton/ac.</td>
</tr>
</tbody>
</table>

Crop :- Sugarcane.
Site :- Jullundur Agri. Stn., Jullundur.

Object :- To study the effect of compost along with artificial manures on Sugarcane.

1. BASAL CONDITIONS:
(i) Nil. (b) Senji. (c) Nil. (ii) (a) Loam. (b) Refer soil analysis, Jullundur. (iii) 19.3.1953. (iv) (a) 1 roja plough, 3 desi plough and 8 sabha. (b) N.A. (c) 60,000 setts./ac. (d) 2' row to row. (e) N.A. (ix) Nil. (vi) CO-312 (medium). (vii) Irrigated. (viii) One hoeing, 2 weedings, 1 ridging and tying up.

2. TREATMENTS:
All possible combinations of (1) and (2)
1. 3 levels of compost: C₀ = Control, C₁ = 8 and C₂ = 16 ton/ac. Compost applied on 19.3.1953 by broadcast.
2. 4 doses of inorganic manures: M₀ = Control, M₁ = 50 lb./ac. of N as A/S, M₂ = 100 lb./ac. of N as A/S and M₃ = 40 lb./ac. of P₂O₅ as Super. A/S and Super applied on 6.5.1953 by broadcast.

3. DESIGN:
(i) Fact. in R.B.D. (ii) (a) 12. (b) N.A. (iii) 4. (iv) (a) 52'×14'. (b) 47.14'×14'. (v) N.A. (vi) Yes.

4. GENERAL:
(i) Germination and condition good. No lodging. (ii) Nil. (iii) Yield of sugarcane. (iv) (a) No. (b) No. (c) - . (v) and (vi) Nil.

5. RESULTS:
(i) 45.81 ton/ac.
(ii) 35.24 ton/ac.
(iii) Main effect of compost is significant while other effects are not significant.
(iv) Av. yield of sugarcane in ton/ac.

<table>
<thead>
<tr>
<th></th>
<th>C₀</th>
<th>C₁</th>
<th>C₂</th>
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</tr>
</thead>
<tbody>
<tr>
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<td>43.85</td>
<td>47.88</td>
<td>45.43</td>
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<td>48.94</td>
<td>46.65</td>
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<tr>
<td>M₃</td>
<td>44.10</td>
<td>46.97</td>
<td>45.31</td>
<td>45.46</td>
</tr>
<tr>
<td>Mean</td>
<td>44.27</td>
<td>45.43</td>
<td>47.72</td>
<td>45.81</td>
</tr>
</tbody>
</table>

S.E. of marginal mean of M = 0.83 ton/ac.
S.E. of marginal mean of C = 0.96 ton/ac.
S.E. of body of table = 1.67 ton/ac.

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**Crop:** Sugarcane (*Kharij*).

**Site:** Jullundur Agri. Stn., Jullundur.

**Ref.** Pb. 49(19).

**Object:** To study the effect of different fertilizers on Sugarcane yield.

---

**1. BASAL CONDITIONS:**

(i) (a) Nil. (b) Fallow. (c) Nil. (ii) (a) Loam. (b) Refer soil analysis, Jullundur. (iii) 29.3.1949. (iv) (a) 6 desi hal and 7 sohaga. (b) to (e) N.A. (v) Nil. (vi) CO.312 (medium). (vii) Irrigated. (viii) Tying up and one horse hoe. (ix) 21.07. (x) 2.2.1950 to 25.4.1950.

---

**2. TREATMENTS:**

1. 100 lb./ac. of N as A/S.
2. 100 lb./ac. of N as Ammon. Phos.
3. 100 lb./ac. of N as A/S + 125 lb./ac. of P₂O₅ as Super.
4. 100 lb./ac. of N as F.Y.M.
5. 100 lb./ac. of N as Mohua Cake.
6. Control.

---

**3. DESIGN:**

(i) R.B.D. (ii) 6. (b) N.A. (iii) 6. (iv) (a) 50" x 16". (b) 45'-4" x 16". (v) N.A. (vi) Yes.

---

**4. GENERAL:**

(i) Germination and condition good. No lodging. (ii) Nil. (iii) Yield of sugarcane. (iv) (a) 1949—1952. (b) No. (c) Nil. (v) (a) No. (b)—. (vi) Nil. (vii) No. of treatments changed after 1949. Experiment not conducted in 1950.

---

**5. RESULTS:**

(i) 56.06 ton/ac.
(ii) 8.28 ton/ac.
(iii) Treatments are not significantly different.
(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>49.16</td>
</tr>
<tr>
<td>2</td>
<td>51.32</td>
</tr>
<tr>
<td>3</td>
<td>49.33</td>
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<td>4</td>
<td>44.63</td>
</tr>
<tr>
<td>5</td>
<td>49.42</td>
</tr>
<tr>
<td>6</td>
<td>50.47</td>
</tr>
</tbody>
</table>

S.E./mean = 3.38 ton/ac.
Crop :— Sugarcane.  
Site :- Jullundur Agri. Stn., Jullundur.  
Ref :- Pb. 51(85).  
Type :- 'M'.

Object :- To study the effect of different fertilizers on Sugarcane yield.

1. BASAL CONDITIONS:
(i) (a) Nil. (b) Senji. (c) Nil.  
(ii) (a) Loam. (b) Refer soil analysis, Jullundur.  
(iii) 14.3.1951.  
(iv) (a) One raja, 15 desi hal and 8 sohaga. (b) N.A. (c) 54,000 setts/ac. (d) and (e) N.A.  
(v) Nil. (vi) CO. 312 (medium).  
(vii) Irrigated.  
(viii) 2 hoeings with Bagoori and 2 hoeings with horse hoe.  
(ix) 21.25'.  
(x) 31.1.1952 to 6.2.1952.

2. TREATMENTS:
1. 100 lb./ac. of N as A/S.
2. 100 lb./ac. of N as A/S+125 lb./ac. of P₂O₅ as Super.
3. 100 lb./ac. of N as G.N.C.
4. 100 lb./ac. of N as F.Y.M.
5. Control.

3. DESIGN:
(i) R.B.D.  
(ii) (a) 5. (b) N.A.  
(iii) 6.  
(iv) (a) and (b) 50' x 14'.  
(v) Nil.  
(vi) Yes.

4. GENERAL:
(i) Germination good. No lodging.  
(ii) Attack of borer.  
(iii) Yield of sugarcane.  
(iv) (a) 1949—1952. (b) No. (c) Nil. (v) (a) Nil. (b)—. (vi) and (vii) Nil.

5. RESULTS:
(i) 42.67 ton/ac.  
(ii) 3.31 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>45.70</td>
</tr>
<tr>
<td>2.</td>
<td>44.81</td>
</tr>
<tr>
<td>3.</td>
<td>45.84</td>
</tr>
<tr>
<td>4.</td>
<td>41.61</td>
</tr>
<tr>
<td>5.</td>
<td>35.41</td>
</tr>
<tr>
<td>S.E./mean</td>
<td>1.35 ton/ac.</td>
</tr>
</tbody>
</table>

Crop :— Sugarcane.  
Site :- Jullundur Agri. Stn., Jullundur.  
Ref :-Pb. 52(61).  
Type :- ‘M’.

Object :- To study the effect of different fertilizers on Sugarcane yield.

1. BASAL CONDITIONS:
(i) (a) Nil. (b) Maize (fodder). (c) Nil.  
(ii) (a) Loam. (b) Refer soil analysis, Jullundur.  
(iii) 12.3.1952.  
(iv) (a) One raja plough, 6 desi hal, 4 sohaga and 1 roller. (b) N.A. (c) 60,000 setts/ac. (d) and (e) N.A.  
(v) Nil. (vi) CO. 312 (medium). (vii) Irrigated. (viii) One ridging, one tying up and one earthing up.  
(ix) 29.52'.  
(x) 13.2.1953 to 3.3.1953.

2. TREATMENTS:
1. 103 lb./ac. of N as A/S.  
2. 100 lb./ac. of N as A/S+125 lb./ac. of P₂O₅ as Super.  
3. 100 lb./ac. of N as G.N.C.  
4. 100 lb./ac. of N as F.Y.M.  
5. Control.

3. DESIGN:
(i) R.B.D.  
(ii) (a) 5. (b) N.A.  
(iii) 6.  
(iv) (a) 52' x 15'. (b) 52' x 14'. (v) One foot left on one side. (vi) Yes.
4. GENERAL:
(i) Good. No lodging. (ii) Nil. (iii) Yield of sugarcane and gur yield for replications 5 and 6. (iv) (a) 1949-1952. (b) No. (c) Nil. (v) (a) No. (b) Nil. (vi) and (vii) Nil.

5. RESULTS:
(i) 38.98 ton/ac.
(ii) 2.51 ton/ac.
(iii) Treatments are not significantly different.
(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>39.27</td>
</tr>
<tr>
<td>2.</td>
<td>41.12</td>
</tr>
<tr>
<td>3.</td>
<td>36.37</td>
</tr>
<tr>
<td>4.</td>
<td>39.23</td>
</tr>
<tr>
<td>5.</td>
<td>38.89</td>
</tr>
<tr>
<td>S.E./mean</td>
<td>1.02 ton/ac</td>
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</table>

Crop :- Sugarcane.

Site :- Sugarcane Res. Stn., Jullundur Cantt.

Object :- To study the effect of N, P2O5 and K2O on Sugarcane crop.

1. BASAL CONDITIONS:
(i) (a) Nil. (b) N.A. (c) Nil. (ii) (a) Loamy. (b) Reference soil analysis, Jullundur. (iii) N.A. (iv) (a) to (e) N.A. (v) Nil. (vi) CO. 312 (medium). (vii) Irrigated. (viii) N.A. (ix) 50.12". (x) N.A.

2. TREATMENTS:
All combinations of (1), (2) and (3)
(1) 3 levels of N : N0 =0, N1 =100 and N2 =200 lb./ac. as A/S.
(2) 3 levels of P2O5 : P0 =0, P1 =100 and P2 =200 lb./ac. as Super.
(3) 3 levels of K2O : K0 =0, K1 =100 and K2 =200 lb./ac. as Pot. Sul.
A/S applied in two equal doses 95 and 115 days after planting. Super applied in furrows at a depth of 4" and Pot. Sul. by broadcasting at the time of planting.

3. DESIGN:
(i) 3 rep in R.B.D. (ii) (a) 27. (b) N.A. (iii) 5. (iv) (a) N.A. (b) 1/40. ac. (v) N.A. (vi) Yes.

4. GENERAL:
(i) Fair to satisfactory. No lodging. (ii) Nil. (iii) Yield of sugarcane. (iv) (a) 1950 to 1953. (b) No. (c) Nil. (v) (a) No. (b) Nil. (vi) Nil. (vii) Experiment modified after 1950.

5. RESULTS:
(i) 27.26 ton/ac.
(ii) N.A.
(iii) N.A.
(iv) Av. yield of sugarcane in ton/ac.

<table>
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S.E. for any marginal mean N.A,
S.E. of body of tables N.A.
Crop: Sugarcane.  
Site: Sugarcane Res. Stn., Jullundur Cantt.  
Object: To study the effect of N, P₂O₅ and K₂O on Sugarcane yield.

1. BASAL CONDITIONS:
(i) [a]: Nil.  (b) Fallow.  (c) Nil.  (ii) (a) Loam.  (b) Refer soil analysis, Jullundur.  (iii) 22.4.1951.

2. TREATMENTS:
All combinations of (1), (2) and (3)
(1) 3 levels of N: N₀=0, N₁=100 and N₂=200 lb/ac. as A/S.
(2) 3 levels of P₂O₅: P₀=0, P₁=100 and P₂=200 lb/ac. as Super.
(3) 3 levels of K₂O: K₀=0, K₁=100 and K₂=200 lb/ac. as Pot. Sul.
Half A/S applied on 16.6.51, half on 6.7.51, Pot. Sul. applied on 19,20.4.51 and Super on 21,22.4.51.

3. DESIGN:
(i) 3³ Fact. confd. Confounding W, X, Y and Z components of NPK.  (ii) (a) 9 plots per block and 3 blocks per replication.  (b) N.A.  (iii) 4.  (iv) (a) and (b) 12’x90’-9”.  (v) N.A.  (vi) Yes.

4. GENERAL:
(i) Fair. No lodging.  (ii) Nil.  (iii) Yield of sugarcane.  (iv) (a) 1950 to 1953.  (b) No.  (c) Nil.  (v) [a]; [b].  (vi) and (vii) Nil.

5. RESULTS:
(i) 10.06 ton/ac.
(ii) 1.44 ton/ac.

(iii) Main effect of N is highly significant while others are not significant.
(iv) Av. yield of sugarcane in ton/ac.

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S.E. of marginal mean of N, P or K = 0.24 ton/ac.
S.E. of body of tables = 0.42 ton/ac.
Crop :- Sugarcane.  
Site :- Sugarcane Res. Strn., Jullundur Cantt.  
Object :- To study the effect of N, P2O5 and K2O on Sugarcane yield.

1. BASAL CONDITIONS :
(i) (a) Wheat—Khari/ fodder—Fallow—Sugarcane. (b) Fallow. (c) No.  
(ii) (a) Loam. (b) Refer soil analysis, Jullundur. (iii) 19.3.1953.  
(iv) (a) 4 desi hal, 4 sohaga and 2 tractor ploughings. (b) to (e) N.A.  
(v) 70 lb./ac. of N as F.Y.M. on 18.3.1952. (vi) C.O.L.—9 (medium). (vii) Irrigated. (viii) 6 hoeings  

2. TREATMENTS :
All combinations of (1), (2) and (3)  
(1) 3 levels of N : N0=0, N1=100 and N2=200 lb./ac. as A/S.  
(2) 3 levels of P2O5 : P0=0, P1=100 and P2=200 lb./ac. as Super.  
(3) 3 levels of K2O : K0=0, K1=100 and K2=200 lb./ac. as Pot. Sul.

3. DESIGN :
(i) 3° Fact. confd. partially confounding W, X, Y and Z components of NPK.  
(ii) (a) 9 plots/block ; 3 blocks/replication. (b) N.A. (iii) 4. (iv) (a) 12°×105°. (b) 12°×90°×96. (v) N.A. (vi) Yes.

4. GENERAL :
(i) Fair. No lodging; (ii) Nil. (iii) Yield of sugarcane. (iv) (a) 1950—contd. (b) and (c) No. (v) (a)  
and (b) No. (vi) and (vii) Nil.

5. RESULTS :
(i) 13.13 ton/ac.  
(ii) 2.76 ton/ac.  
(iii) Only N effect is highly significant.  
(iv) Av. yield of sugarcane in ton/ac.

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<th>P2</th>
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Crop :- Sugarcane.  
Site :- Sugarcane Res. Strn., Jullundur.  
Object :- To study the effect of N, P2O5 and K2O on Sugarcane yield.
2. TREATMENTS:
All combinations of (1), (2) and (3)
(1) 3 levels of N: N₀ = 0, N₁ = 100 and N₂ = 200 lb./ac. as A/S.
(2) 3 levels of P₂O₅: P₀ = 0, P₁ = 100 and P₂ = 200 lb./ac. as Super.
(3) 3 levels of K₂O: K₀ = 0, K₁ = 100 and K₂ = 200 lb./ac. as Pot. Sul.
Half A/S applied on 23.5.53 and the other half on 29.6.1953. Pot. Sul. applied on 18,19.5.53. Super applied at 19.3.53.

3. DESIGN:
(i) 3² Fact. confounding W, X, Y and Z components of NPK. (ii) (a) 9 plots/block; 3 blocks/replications. (b) N.A. (iii) 4. (iv) (a) 12'×105'. (b) 12'×90'-9'. (v) N.A. (vi) Yes.

4. GENERAL:
(i) Fair. No lodging. (ii) Nil. (iii) Yield of sugarcane. (iv) 1950—contd. (b) and (c) No. (v) (a) and (b) No. (vi) and (vii) Nil.

5. RESULTS:
(i) 20.61 ton/ac.
(ii) 1.74 ton/ac.
(iii) N effect highly significant, NP significant, PK highly significant, while others are not significant.
(iv) Av. yield of sugarcane in ton/ac.

<table>
<thead>
<tr>
<th></th>
<th>P₀</th>
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<th>P₂</th>
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Mean 20.91 19.96 20.94 20.61 20.70 20.55 20.57

S.E. of marginal means of N, P or K = 0.29 ton/ac.
S.E. of body of tables = 0.50 ton/ac.

Crop :- Sugarcane.
Site :- Sugarcane Res. Stn., Jullundur Cantt.
Object :- To study the effect of N, P₂O₅ and K₂O on Sugarcane yield.
3. DESIGN:
   (i) Fact. in R.B.D. (ii) (a) 27. (b) N.A. (iii) 4. (iv) (a) and (b) 121’x9’'. (v) Nil. (vi) Yes.

4. GENERAL:
   (i) Good. No lodging. (ii) Pyrrila attack; spraying by Hexaclame on 11.9.1952. (iii) Yield of sugarcane.
   (iv) (a) 1951—1953. (b) No. (c) Nil. (v) (a) No. (b). (vi) and (vii) Nil.

5. RESULTS:
   (i) 17.26 ton/ac.
   (ii) 1.79 ton/ac.
   (iii) N effect is highly significant, P effect is significant while all other effects are not significant.
   (iv) Av. yield of sugarcane in ton/ac.

<table>
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S.E. of any marginal mean = 0.30 ton/ac.
S.E. of body of table = 0.52 ton/ac.

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Crop : Sugarcane.
Site : Sugarcane Res. Stn., Jullundur Cantt.
Object : To study the effect of N, P<sub>2</sub>O<sub>5</sub> and K<sub>2</sub>O on Sugarcane yield.

1. BASAL CONDITIONS:
   (i) (a) Wheat—Khūrīf fodder—Fallow—Sugarcane. (b) Fallow, (c) Nil. (ii) (a) Loam. (b) Refer soil analysis, Jullundur. (iii) 9.3.1953. (iv) (a) 4 desī hal, 2 xōhaga and 2 tractor ploughings. (b) N.A. (c) 30,000 setts/ac. (d) and (e) N.A. (v) Nil, (vi) 1/2 CO-L-9 (medium). (vii) Irrigated. (viii) 6 hoeings and one earthing up. (ix) 32.8°. (x) 30.12.1953 to 2.1.1954.

2. TREATMENTS:
   All combinations of (1), (2) and (3)
   (1) 3 levels of N : N<sub>0</sub>=0, N<sub>1</sub>=100 and N<sub>2</sub>=200 lb/ac. as A/S.
   (2) 3 levels of P<sub>2</sub>O<sub>5</sub> : P<sub>0</sub>=0, P<sub>1</sub>=100 and P<sub>2</sub>=200 lb/ac. as Super.
   (3) 3 levels of K<sub>2</sub>O : K<sub>0</sub>=0, K<sub>1</sub>=100 and K<sub>2</sub>=200 lb/ac. as Pot. Sul.
   One half A/S applied a 23.5.1953 and the other half on 13.7.1953. Supper applied an 7.3.1953 and Pot. Sul. on 9.3.1953.

3. DESIGN:
   (i) 3<sup>rd</sup> fact. confd. confounding W, X, Y and Z components of NPK. (ii) (a) 9 plots/block ; 3 blocks/replication
   (b) N.A. (iii) 4. (iv) (a) N.A. (b) 12’x90’-9”. (v) N.A. (vi) Yes.

4. GENERAL:
   (i) Good. No lodging. (ii) Nil. (iii) Yield of sugarcane. (iv) (a) 1951—1953. (b) No. (c) Nil. (v) (a) Nil. (b) —. (vi) and (vii) Nil.
5. RESULTS:
(i) 24.35 ton/ac.
(ii) 2.75 ton/ac.
(iii) Only N effect is highly significant while others are not significant.
(iv) Av. yield of sugarcane in ton/ac.

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<th>P₂</th>
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S.E. of marginal means of N, P and K = 0.46 ton/ac.
S.E. of body of tables = 0.79 ton/ac.

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Crop : Sugarcane.
Site : Sugarcane Res. Stn., Jullundur Cantt.
Object : To test the efficacy of Mohua cake on Sugarcane yield.

Ref : Ph. 51(40).
Type : 'M'.

1. BASAL CONDITIONS:
(i) (a) Wheat-Kharif fodder-Fallow-Sugarcane. (b) Fallow. (c) Nil. (ii) (a) Loam. (b) Refer soil analysis, Jullundur (iii) 26.4.1951. (iv) (a) to (e) N.A. (v) Nil. (vi) CO.312 (medium). (vii) Irrigated. (viii) 2 hoeings, 2 tying and 3 earthing up. (ix) 17.98". (x) 30.11.1951 to 5.12.1951.

2. TREATMENTS:
Main-plot treatments:
2 levels of F.Y.M. : F₀=Control and F₁=F.Y.M. at 50 lb./ac. of N.
Sub-plot treatments:
All combinations of (1) and (2)+a control.
(1) 3 levels of N : N₁=50, N₂=100 and N₃=125 lb./ac.
(2) 2 sources of N : S₁=Mohua cake composted and S₂=Mohua cake uncomposted.
F.Y.M. applied on 24.4.1951 and mohua cake on 25.4.1951.

3. DESIGN:
(i) Split-plot. (ii) (a) 2 main-plots/block ; 7 sub-plots/main-plot. (b) N.A. (iii) 4. (iv) (a) and (b) 12"x90'-9". (v) Nil. (vi) Yes.

4. GENERAL:
(i) Fair. No lodging. (ii) Nil. (iii) Yield of sugarcane. (iv) (a) 1951 to 1953. (b) No. (c) Nil. (v) (a) No. (b) —. (vi) and (vii) Nil.

5. RESULTS:
(i) 11.19 ton/ac.
(ii) (a) 2.59 ton/ac.
(b) 1.25 ton/ac.
(iii) None of the effects is significant.
(iv) Av. yield of sugarcane in ton/ac.

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<td>11.19</td>
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</tbody>
</table>

S.E. of difference of two
1. main-plot treatment means = 0.69 ton/ac.
2. sub-plot treatment means = 0.62 ton/ac.
3. sub-plot treatment means at the same level of main-plot treatment = 0.89 ton/ac.
4. main-plot treatment means at the same level of sub-plot treatment = 1.07 ton/ac.

Crop :- Sugarcane.  
Site :- Sugarcane Res. Str., Jullundur Cantt.  
Ref :- Pb. 52(112)  
Type :- 'M'.

Object :- To test the efficacy of Mohua cake on Sugarcane yield.

1. BASAL CONDITIONS:
   (i) (a) Wheat-Fallow-Sugarcane.  (b) Fallow.  (c) No.  (ii) (a) Loam.  (b) Refer soil analysis, Jullundur Cantt.  (iii) 10.4.1952.  (iv) (a) 3 desi hal, 3 tractor, 4 sahaga and levelling.  (b) N.A.  (c) 37000 setts/ac.  (d) and (e) N.A.  (v) No.  (vi) CO-312 (medium).  (vii) Irrigated.  (viii) 9 hoeings.  (ix) 36.61'.  (x) 4.12.1952, 8.12.1952 and 29.1.1953.

2. TREATMENTS:
   Main-plot treatments:
   2 levels of F.Y.M: F0 = No F.Y.M. and F1 = F.Y.M. at 50 lb/ac of N.
   Sub-plot treatments:
   All combinations of (1) and (2) + a control.
   (1) 3 levels of N: N1 = 50, N2 = 100 and N3 = 150 lb/ac.
   (2) 2 sources: S1 = Mohua cake composted and S2 = Mohua cake uncomposted.

3. DESIGN:
   (i) Split-plot.  (ii) (a) 2 main-plots/block; 7 sub-plots/main-plot.  (b) N.A.  (iii) 4.  (iv) (a) and (b) sub-plot: 90°-9°x12°.  (v) Nil.  (vi) Yes.

4. GENERAL:
   (i) Normal. No lodging.  (ii) Nil.  (iii) Yield of sugarcane.  (iv) (a) 1951 to 1953.  (b) No.  (c) Nil.  (v) (a) No.  (b) Nil.  (vi) and (vii) Nil.

5. RESULTS:
   (i) 17.92 ton/ac.
   (ii) (a) 2.80 ton/ac.
   (b) 1.67 ton/ac.
   (iii) Only interaction main x sub is significant.
   (iv) Av. yield of sugarcane in ton/ac.

<table>
<thead>
<tr>
<th></th>
<th>N1S1</th>
<th>N2S1</th>
<th>N3S1</th>
<th>N4S1</th>
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S.E. of difference of two
1. main-plot treatment means = 0.75 ton/ac.
2. sub-plot treatment means = 0.83 ton/ac.
3. sub-plot treatment means at the same level of main-plot treatment = 1.18 ton/ac.
4. main-plot treatment means at the same level of sub-plot treatment = 1.32 ton/ac.
Crop :- Sugarcane.
Site :- Sugarcane Res. Stn., Jullundur Cantt.

Object :- To test the efficacy of *Mohua* cake on Sugarcane yield.

1. BASAL CONDITIONS:
   (i) (a) Wheat-Kharif fodder-Fallow-Sugarcane. (b) Fallow. (c) Nil. (ii) (a) Loam. (b) Refer soil analysis, Jullundur. (iii) 10.4.1953. (iv) (a) *3 desi hal*, 2 sohaga and one horse hoe. (b) N.A. (c) 35000 sets/ac. (d) and (e) N.A. (v) Nil. (vi) CO.312 (medium). (vii) Irrigated. (viii) 4 hoeings. (ix) 32.8°. (x) 25,26,12 1953.

2. TREATMENTS:
   Main-plot treatments:
   2 levels of F.Y.M.: F_0 = NO F.Y.M. and F_1 = F.Y.M. at 50 lb/ac. of N.
   Sub-plot treatments:
   All combinations of (1) and (2) + a control.
   (1) 3 levels of N: N_1 = 50, N_2 = 100 and N_3 = 150 lb/ac.
   (2) 2 sources: S_1 = *Mohua* cake composted and S_2 = *Mohua* cake uncomposted.

3. DESIGN:
   (i) Split-plot. (ii) (a) 2 main-plots/block; 7 sub-plots/main-plot. (b) N.A. (iii) 4. (iv) (a) and (b) 99.75' x 8'. (v) Nil. (vi) Yes.

4. RESULTS:
   (i) 15.62 ton/ac.
   (ii) (a) 4.93 ton/ac.
   (e) 4.15 ton/ac.
   (iii) None of the effects is significant.
   (iv) Av. yield of sugarcane m ton/ac.

<table>
<thead>
<tr>
<th>N_1S_1</th>
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<th>N_3S_1</th>
<th>N_1S_2</th>
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S.E. of difference of two
1. main-plot treatment means = 1.32 ton/ac.
2. sub-plot treatment means = 1.07 ton/ac.
3. sub-plot treatment means at the same level of main-plot treatment = 1.52 ton/ac.
4. main-plot treatment means at the same level of sub-plot treatment = 1.93 ton/ac.

---

Crop :- Sugarcane.
Site :- Sugarcane Res. Stn., Jullundur.

Object :- To compare the effect of inorganic and organic manures.

1. BASAL CONDITIONS:
   (i) (a) Wheat-Fallow-Sugarcane. (b) Fallow. (c) Nil. (ii) (a) Loam. (b) Refer soil analysis, Jullundur. (iii) 10.3.1952. (iv) (a) *4 desi hal* and 5 sohaga. (b) N.A. (c) 35000 sets/ac. (d) and (e) N.A. (v) No. (vi) CO. 312 (medium). (vii) Irrigated. (viii) 8 hoeings, 1 earthing up and tying. (ix) 36.61°. (x) 3.12.1952, 19.1.1953 1.2.1953, 5.2.1953, and 21.3.1953.
2. TREATMENTS:
All combinations of (1) and (2) + a control.
(1) 3 sources of N: S1=G.N.C., S2=A/S and S3=C/N.
(2) 2 levels of N: N1=100 and N2=200 lb/ac.

3. DESIGN:
(i) R.B.D. (ii) (a) 7. (b) N.A. (iii) 4. (iv) (a) and (b) 90°×9°×12°. (v) Nil. (vi) Yes.

4. GENERAL:
(i) Good. No lodging. (ii) Nil. (iii) Yield of sugarcane. (iv) (a) 1952—contd. (b) No. (c) Nil. (v) (a) No. (b) —. (vi) and (vii) Nil.

5. RESULTS:
(i) 28.54 ton/ac.
(ii) 1.38 ton/ac.
(iii) None of the effects is significant.
(iv) Av. yield of sugarcane in ton/ac.

<table>
<thead>
<tr>
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<th>S2</th>
<th>S3</th>
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<td>29.60</td>
<td>28.70</td>
<td>28.03</td>
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S.E. of marginal means of S =0.66 ton/ac.
S.E. of marginal means of N =0.54 ton/ac.
S.E. of body of table =0.94 ton/ac.

Crop:— Sugarcane.
Site:— Sugarcane Res. Stn., Jullundur Cantt.
Object:—To compare the effect of in organic and inorganic manures.

1. BASAL CONDITIONS:
(i) (a) Wheat-Kharif fodder-Fallow-Sugarcane. (b) Fallow. (c) No. (ii) (a) Loam. (b) Refer soil analysis, Jullundur. (iii) 22.3.1953. (iv) (a) 2 'desi hal', 6 'sohapa', 1 'khusu hal', 1 'karki', 1 horse hoe and 5 tractor ploughings. (b) N.A. (c) 35,000 setts/ac. (d) and (e) N.A. (v) Nil. (vi) CO.312 (medium). (vii) Irrigated. (viii) 4 hoeings, twice earthing up and twice tying up. (ix) 32.8°. (x) 14.15.2.1954.

2. TREATMENTS:
All combinations of (1) and (2)+a control.
(1) 3 sources of N: S1=G.N.C., S2=A/S and S3=C/N.
(2) 2 levels of N: N1=100 and N2=200 lb/ac.

3. DESIGN:
(i) R.B.D. (ii) (a) 7. (b) N.A. (iii) 4. (iv) (a) and (b) 12°×90.75°. (v) Nil. (vi) Yes.

4. GENERAL:
(i) Fair. No lodging. (ii) Nil. (iii) Yield of sugarcane. (iv) (a) 1952—contd. (b) No. (c) Nil. (v) (a)—. (b)—. (vi) and (vii) Nil.

5. RESULTS:
(i) 33.30 ton/ac.
(ii) 2.72 ton/ac.
(iii) Only 'control vs. others' effect is highly significant.
(iv) Av. yield of sugarcane in ton/ac.

<table>
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<tr>
<th></th>
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<td>S₃</td>
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<tr>
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</table>

S.E. of marginal means of S = 0.96 ton/ac.
S.E. of marginal means of N = 0.79 ton/ac.
S.E. of body of table = 1.36 ton/ac.

Crop :- Sugarcane.
Site :- Sugarcane Res. Stn., Jullundur Cantt.
Object :- To compare the effect of inorganic and organic manures.

1. BASAL CONDITIONS :
   (i) (a) Wheat-Kharif fodder-Fallow-Sugarcane. (b) Fallow. (c) No. (ii) (a) Loam. (b) Refer soil analysis, Jullundur. (iii) 25.3.1953. (iv) (a) 3 desi hal, 4 sohaya and 2 hindustan plough. (b) N.A. (c) 35,000 setts/ac. (v) Nil. (vi) CO.312 (medium). (vii) Irrigated. (viii) 6 hoeings. (ix) 32.8°. (x) 20.2.1954.

2. TREATMENTS :
   1. G.N.C. and A/S at 40 lb./ac. of N both at planting.
   2. G.N.C. and A/S at 40 lb./ac. of N, G.N.C. at planting while A/S applied in May and June.
   3. G.N.C. 100 lb./ac. of N at planting.
   4. A/S 100 lb./ac. of N in May and June.
   5. Control.

3. DESIGN :
   (i) R.B.D. (ii) (a) 5. (b) N.A. (iii) 4. (iv) (a) and (b) 45°-45°x12°. (v) Nil. (vi) Yes.

4. GENERAL :
   (i) Germination and condition satisfactory. No lodging. (ii) Nil. (iii) Yield of sugarcane. (iv) (a) 1952 to 1953. (b) No. (c) Nil. (v) (a) No. (b)---. (vi) and (vii) Nil.

5. RESULTS :
   (i) 27.25 ton/ac.
   (ii) 2.37 ton/ac.
   (iii) Treatment differences are highly significant.
   (iv) Av. yield of sugarcane in ton/ac.

<table>
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<tr>
<th>Treatment</th>
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<th>S.E./mean</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
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<td>1.18</td>
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<tr>
<td>2.</td>
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<td>4.</td>
<td>29.41</td>
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<td>5.</td>
<td>21.78</td>
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Ref :- Ph. 53 (130).
Type :- 'M'.
Crop: Sugarcane.
Site: Sugarcane Res. Stn., Jullundur Cantt.

Object: To find out the best manurial combination for Sugarcane.

1. BASAL CONDITIONS:
   (i) (a) Wheat—Rice/Tur—Fallow—Sugarcane. (b) Fallow. (c) Nil. (ii) (a) Loam. (b) Loam. (c) Nil. (iii) 29.3.1952. (iv) (a) 4 desi hal, 5 sohaga and 2 tractors. (b) to (e) N.A. (v) As per treatments. (vi) CO-312 (medium). (vii) Irrigated. (viii) 4 hoeings. (ix) 36.61°. (x) 13.1.1953 to 16.1.1953.

2. TREATMENTS:
   Main-plot treatments:
   - 3 doses of basal dressings: B_0 = No basal dressing, B_1 = Lime at 50 lb./ac. and B_2 = F.Y.M. at 50 lb./ac. of N.
   Sub-plot treatments:
   - 5 doses of N: N_0 = Control, N_1 = A/S at 100 lb./ac. of N, N_2 = C/N at 100 lb./ac. of N, N_3 = A/S at 200 lb./ac. of N and N_4 = C/N at 200 lb./ac. of N.

3. DESIGN:
   (i) Split-plot. (ii) (a) 3 main-plots/block; 5 sub-plots/main-plot. (b) N.A. (iii) 4. (iv) (a) and (b) 12° × 9°. (v) Nil. (vi) Yes.

4. GENERAL:
   (i) Fair. No lodging. (ii) N.A. (iii) Yield of sugarcane. (iv) (a) 1952—contd. (b) and (c) No. (v) (a) and (b) No, (vi) and (vii) Nil.

5. RESULTS:
   (i) 12.31 ton/ac.
   (ii) (a) 2.24 ton/ac.
   (b) 1.31 ton/ac.
   (iii) Main-plot treatments are significantly different, sub-plot treatments are highly significant, while interaction is not significant.
   (iv) Av. yield of sugarcane in ton/ac.

<table>
<thead>
<tr>
<th></th>
<th>N_0</th>
<th>N_1</th>
<th>N_2</th>
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</table>

S.E. of difference of two
1. B marginal means = 0.71 ton/ac.
2. N marginal means = 0.54 ton/ac.
3. N means at the same level of B = 0.93 ton/ac.
4. B means at the same level of N = 1.09 ton/ac.

---

Crop: Sugarcane.
Site: Sugarcane Res. Stn., Jullundur.

Object: To find out the best manurial combination for Sugarcane.

1. BASAL CONDITIONS:
   (i) (a) No. (b) Fallow. (c) Nil. (ii) (a) Loam. (b) Loam. (c) Nil. (iii) 13.3.1953. (iv) (a) 4 desi hal, 5 sohaga, 2 tractors and 3 horse hoe. (b) to (e) N.A. (v) As per treatments. (vi) CO-312 (medium). (vii) Irrigated. (viii) 4 hoeings. (ix) 32.8°. (x) 14,15.2.1954.
2. TREATMENTS:

Main-plot treatments:
3 basal dressings:  
B₄ = No basal dose,  
B₁ = A/S at 50 lb./ac. of N and  
B₂ = F.Y.M. at 50 lb./ac. of N.

Sub-plot treatments:
5 doses of N:  
N₀ = 0,  
N₁ = A/S at 100 lb./ac. of N,  
N₂ = A/S at 200 lb./ac. of N,  
N₃ = C/N at 100 lb./ac. of N and  
N₄ = C/N at 200 lb./ac. of N.


3. DESIGN:
(i) Split-plot. (ii) (a) 3 main-plots/block; 5 sub-plots/main-plot. (b) N.A. (iii) 4. (iv) (a) and (b) 12"×90'-9'.
(v) No. (vi) Yes.

4. GENERAL:
(i) Fair. No lodging. (ii) Nil. (iii) Yield of sugarcane. (iv) (a) 1952—contd. (b) and (c) No. (v) (a) and (b) No. (vi) and (vii) Nil.

5. RESULTS:
(i) 31.28 ton/ac.
(ii) (a) 4.25 ton/ac.
(b) 2.20 ton/ac.

(iii) Sub-plot treatment differences are highly significant, others are not significant.
(iv) Av. yield of sugarcane in ton/ac.

<table>
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<tr>
<th></th>
<th>N₀</th>
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<th>N₂</th>
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</tbody>
</table>

Mean 23.39 30.81 32.00 34.95 35.25 31.28

S.E. of difference of two
1. B marginal means = 1.34 ton/ac.
2. N marginal means = 0.91 ton/ac.
3. N means at the same level of B = 1.56 ton/ac.
4. B means at the same level of N = 1.93 ton/ac.

Crop : Sugarcane.
Site : Sugarcane Res. Stn., Jullundur Cantt.
Object : To test the efficacy of manures received from D.C.M.

Ref : Pb. 51(37).
Type : 'M'.

1. BASAL CONDITIONS:
(i) (a) Nil. (b) Fallow. (c) Nil. (ii) (a) Loam. (b) Refer soil analysis, Jullundur Cantt. (iii) 23.3.1951.
(iv) (a) to (e) N.A. (v) 5 ton/ac. as F.Y.M. broadcast on 11.3.1951. (vi) CO-312 (medium). (vii) Irrigated. (viii) 3 weedings cum hoeings and twice tying. (ix) 17.98". (x) 25.11.1951 to 28.11.1951.

2. TREATMENTS:
All combinations of (1) and (2)
(1) 3 levels of N:  
N₀ = 0,  
N₁ = 75 and  
N₂ = 150 lb./ac.
(2) 3 levels of P₂O₅:  
P₃ = 0,  
P₁ = 50 and  
P₂ = 100 lb./ac.
N supplied through A/S and P₂O₅ through Super.

3. DESIGN:
(i) 3×3 Fact. in R.B.D. (ii) (a) 9. (b) N.A. (iii) 4. (iv) (a) and (b) 90'-9"×12'. (v) Nil. (vi) Yes.

4. GENERAL:
(i) Fair. No lodging. (ii) Nil. (iii) Yield of sugarcane. (iv) (a) 1951—1952. (b) No. (c) Nil. (v) (a) No. (b) Nil. (vi) and (vii) Nil.
5. RESULTS:
(i) 16.83 ton/ac.
(ii) 1.96 ton/ac.
(iii) Only N effect is highly significant.
(iv) Av. yield of sugarcane in ton/ac.

<table>
<thead>
<tr>
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<th>N₂</th>
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<td>18.33</td>
<td>20.10</td>
<td>17.59</td>
</tr>
<tr>
<td>P₂</td>
<td>14.53</td>
<td>17.09</td>
<td>18.13</td>
<td>16.58</td>
</tr>
<tr>
<td>Mean</td>
<td>14.25</td>
<td>17.26</td>
<td>18.98</td>
<td>16.83</td>
</tr>
</tbody>
</table>

S.E. of any marginal mean = 0.65 ton/ac.
S.E. of body of table = 1.12 ton/ac.

Crop : Sugarcane.
Site : Sugarcane Res. Stn., Jullundur Cantt.

Object :—To test the efficacy of manures received from D.C.M.

1. BASAL CONDITIONS:
   (i) (a) Wheat—G.M.—Fallow—Sugarcane. (b) Fallow. (c) No
   (ii) (a) Loam. (b) Refer soil analysis, Jullundur Cantt. (iii) 31.3.1952.
   (iv) (a) 3 desi hal, 5 sohaga, 1 raja hal and 3 tractor ploughings. (b) to
   (c) N.A. (v) 3 trucks of F.Y.M. (vi) CO-312 (medium). (vii) Irrigated. (viii) 5 hoeings, once earthing
   up and tying. (ix) 36.61". (x) 17.18.1.1953.

2. TREATMENTS:
   All combinations of (1) and (2)
   (1) 3 levels of N: N₀ =0, N₁ =75 and N₂ =150 lb./ac.
   (2) 3 levels of P₂₀₅ P₀ =0, P₁ =50 and P₂ =100 lb./ac.
   N supplied through A/S and P₂₀₅ through Super.

3. DESIGN:
   (i) 3 x 3 Fact. in R.B.D. (ii) (a) 9. (b) N.A. (iii) 4. (iv) (a) and (b) 12' x 96'-9". (v) Nil. (vi) Yes.

4. GENERAL:
   (i) Fair. No lodging. (ii) Nil. (iii) Yield of sugarcane. (iv) (a) 1951—1952. (b) No. (c) Nil. (v)
   (a) No. (b) —. (vi) and (vii) Nil.

5. RESULTS:
   (i) 17.42 ton/ac.
   (ii) 2.24 ton/ac.
   (iii) None of the effects is significant.
   (iv) Av. yield of sugarcane in ton/ac.

<table>
<thead>
<tr>
<th></th>
<th>N₀</th>
<th>N₁</th>
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<td>16.60</td>
<td>17.71</td>
<td>17.96</td>
<td>17.42</td>
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</table>

S.E. for any marginal mean = 0.65 ton/ac.
S.E. of body of table = 1.12 ton/ac.
Crop : Sugarcane.  
Site : Sugarcane Res. Stn., Jullundur.  
Object : To find out the effect of application of $P_2O_5$ at various depths.

1. BASAL CONDITIONS :

(i) (a) Nil.  (b) Fallow.  (c) Nil.  (ii) (a) Loam.  (b) Refer soil analysis, Jullundur.  (iii) 15.3.1951.  
(iv) (a) 6 ploughings, 4 *sohaga* and 1 roller.  (b) N.A.  (c) 40,000 sett/ac.  (d) 2' row to row.  (e) N.A.  (v) No.  (vi) CO.312 (medium).  
(vii) Irrigated.  

2. TREATMENTS :

**Main-plot treatments :**  
2 doses of N : $N_0 =$0, and $N_1 =$F.Y.M. at 50 lb./ac. of N.  

**Sub-plot treatments :**  
7 doses of P : $P_0 =$Control, $P_1 =$Super at 50 lb./ac. of $P_2O_5$ by broadcast, $P_2 =$Super at 50 lb./ac. of $P_2O_5$ applied 4" deep, $P_3 =$Super at 100 lb./ac. of $P_2O_5$ by broadcast, $P_4 =$Super at 100 lb./ac. of $P_2O_5$ applied 4" deep, $P_5 =$Super at 100 lb./ac. of $P_2O_5$ applied 6" deep.  

3. DESIGN :

(i) Split-plot.  
(ii) (a) 2 main-plots/block; 7 sub-plots/main-plot.  (b) N.A.  
(iii) 4.  
(iv) (a) and (b) 90°9'×12'.  
(v) Nil.  
(vi) Yes.  

4. GENERAL :

(i) Fair to satisfactory. No lodging.  
(ii) Nil.  
(iii) Yield of sugarcane and no. of canes per plot.  
(iv) (a) 1951 to 1953.  
(v) (a) No.  
(vi) and (vii) Nil.  

5. RESULTS :

(i) 16.64 ton/ac.  
(ii) (a) 1.30 ton/ac.  
(b) 1.22 ton/ac.  

(iii) Only main-plot treatments are significantly different.  

(iv) Av. yield of sugarcane in ton/ac.

<table>
<thead>
<tr>
<th></th>
<th>$P_0$</th>
<th>$P_1$</th>
<th>$P_2$</th>
<th>$P_3$</th>
<th>$P_4$</th>
<th>$P_5$</th>
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<tr>
<td>$N_0$</td>
<td>15.90</td>
<td>16.82</td>
<td>15.79</td>
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<td>15.39</td>
<td>16.19</td>
<td>16.02</td>
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<tr>
<td>$N_1$</td>
<td>16.81</td>
<td>17.02</td>
<td>17.85</td>
<td>16.74</td>
<td>18.73</td>
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<tr>
<td>Mean</td>
<td>16.31</td>
<td>16.92</td>
<td>16.82</td>
<td>16.56</td>
<td>17.20</td>
<td>15.71</td>
<td>16.94</td>
<td>16.64</td>
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</table>

S.E. of difference of two

1. N marginal means =0.35 ton/ac.  
2. P marginal means =0.61 ton/ac.  
3. P means at the same level of N =0.86 ton/ac.  
4. N means at the same level of P =0.87 ton/ac.  

Crop : Sugarcane.  
Site : Sugarcane Res. Stn., Jullundur.  
Object : To find out the effect of application of $P_2O_5$ at various depths.

1. BASAL CONDITIONS :

(i) (a) Wheat—*khari* fodder—sugarcane.  
(b) Fallow.  
(c) Nil.  
(ii) (a) Loam.  
(b) Refer soil analysis, Jullundur.  
(iii) 26.2.1952.  
(iv) (a) 1 tractor ploughing, 3 *desi hal* and 3 *sohaga*.  
(b) N.A.  
(c) 35,000 sett/ac.  
(d) and (e) N.A.  
(v) No.  
(vi) CO.312 (medium).  
(vii) Irrigated.  
(viii) 3 hoeings.  
2. TREATMENTS:
Main-plot treatments:
2 doses of N: \(N_0=0\) and \(N_1=\text{F.Y.M. at 50 lb./ac. of N}\).
Sub-plot treatments:
7 doses of P: \(P_0=\text{Control}\), \(P_1=\text{Super at 50 lb./ac. of P}_2\text{O}_5\) by broadcast, \(P_2=\text{Super at 50 lb./ac. of P}_2\text{O}_5\) applied 4" deep, \(P_3=\text{Super at 100 lb./ac. of P}_2\text{O}_5\) applied 4" deep, \(P_4=\text{Super at 100 lb./ac. of P}_2\text{O}_5\) applied 6" deep, \(P_5=\text{Super at 100 lb./ac. of P}_2\text{O}_5\) applied 6" deep, \(P_6=\text{F.Y.M.}\) on 19.2.1952 and \(P_7=\text{Super on 25.2.1952}\).

F.Y.M. on 19.2.1952 and \(P_2\text{O}_5\) as \(\text{Super on 25.2.1952}\).

3. DESIGN:
(i) Split-plot. (ii) (a) 2 main-plots/block; 7 sub-plots/main-plot. (b) N.A. (iii) 99' x 10', (iv) (a) and (b) 99' x 10'. (v) Nil. (vi) Yes.

4. GENERAL:
(i) Good. No lodging. (ii) Pyrilla attack. Hexalam sprayed on 17.9.1952. (iii) Yield of sugarcane. (iv) (a) 1951 to 1953. (b) No. (c) Nil. (v) (a) No. (b) —. (vi) and (vii) Nil.

5. RESULTS:
(i) 23.92 ton/ac.
(ii) (a) 2.38 ton/ac.
(b) 2.18 ton/ac.
(iii) None of the effects is significant.
(iv) Av. yield of sugarcane in ton/ac.

<table>
<thead>
<tr>
<th></th>
<th>(P_0)</th>
<th>(P_1)</th>
<th>(P_2)</th>
<th>(P_3)</th>
<th>(P_4)</th>
<th>(P_5)</th>
<th>(P_6)</th>
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<tr>
<td>(N_0)</td>
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<td>23.01</td>
<td>25.58</td>
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<td>25.46</td>
<td>24.78</td>
</tr>
<tr>
<td>(N_1)</td>
<td>22.65</td>
<td>24.10</td>
<td>22.86</td>
<td>24.35</td>
<td>22.79</td>
<td>23.14</td>
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<tr>
<td>Mean</td>
<td>23.73</td>
<td>23.56</td>
<td>24.22</td>
<td>24.58</td>
<td>23.48</td>
<td>23.37</td>
<td>23.51</td>
<td>23.92</td>
</tr>
</tbody>
</table>

S.E. of difference of two
1. N marginal means = 0.64 ton/ac.
2. P marginal means = 1.09 ton/ac.
3. P means at the same level of N = 1.54 ton/ac.
4. N means at the same level of P. = 1.56 ton/ac.

Crop :- Sugarcane.
Site :- Sugarcane Res. Stn., Jullundur.
Ref :- Pb. 53 (129).
Type :- 'M'.

Object :- To find out the effect of application of \(P_2\text{O}_5\) at various depths.

1. BASAL CONDITIONS:
(i) (a) Wheat-\text{Kharif} fodder-Fallow-Sugarcane. (b) Fallow. (c) Loam. (d) \text{Refer soil analysis, Jullundur. (ii) 23.3.1953. (iii) 1 tractor, 3 desi hal and 4 sohaga. (iv) 5 C.L. of F.Y.M. (v) CO-312 (medium). (vi) Irrigated. (vii) 6 hoeings. (viii) 32.8°. (x) 29.12.1953.}

2. TREATMENTS:
Main-plot treatments:
2 doses of N: \(N_0=0\) and \(N_1=\text{F.Y.M. at 50 lb./ac. of N}\).
Sub-plot treatments:
7 doses of P: \(P_0=0\), \(P_1=\text{Super at 50 lb./ac. of P}_2\text{O}_5\) by broadcast, \(P_2=\text{Super at 50 lb./ac. of P}_2\text{O}_5\) applied 4" deep, \(P_3=\text{Super at 100 lb./ac. of P}_2\text{O}_5\) applied 4" deep, \(P_4=\text{Super at 100 lb./ac. of P}_2\text{O}_5\) applied 6" deep, \(P_5=\text{Super at 100 lb./ac. of P}_2\text{O}_5\) applied 6" deep, \(P_6=\text{Super at 100 lb./ac. of P}_2\text{O}_5\) applied 6" deep.
3. DESIGN:
(i) Split-plot. (ii) (a) 2 main-plots/block; 7 sub-plots/main-plot. (b) N.A. (iii) 4. (iv) (a) and (b) 99'x10'. (v) Nil. (vi) Yes.

4. GENERAL:
(i) Germination and condition satisfactory. No lodging. (ii) Nil. (iii) Yield of sugarcane. (iv) (a) 1951 to 1953. (b) No. (c) Nil. (v) (a) No. (b)—. (vi) and (vii) Nil.

5. RESULTS:
(i) 24.97 ton/ac.
(ii) (a) 5.82 ton/ac.
(b) 1.78 ton/ac.
(iii) None of the effects is significant.
(iv) Av. yield of sugarcane in ton/ac.

<table>
<thead>
<tr>
<th></th>
<th>P₀</th>
<th>P₁</th>
<th>P₂</th>
<th>P₃</th>
<th>P₄</th>
<th>P₅</th>
<th>P₆</th>
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<td>25.66</td>
<td>25.73</td>
<td>23.65</td>
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<td>24.76</td>
<td>23.63</td>
<td>25.85</td>
<td>26.06</td>
<td>24.66</td>
</tr>
<tr>
<td>Mean</td>
<td>23.84</td>
<td>24.46</td>
<td>25.38</td>
<td>24.21</td>
<td>24.95</td>
<td>26.38</td>
<td>25.55</td>
<td>24.97</td>
</tr>
</tbody>
</table>

S.E. of difference of two
1. N marginal means = 1.56 ton/ac.
2. P marginal means = 0.89 ton/ac.
3. P means at the same level of N = 1.26 ton/ac.
4. N means at the same level of P = 1.94 ton/ac.

Crop :- Sugarcane.
Site :- Sugarcane Res. Stn., Jullundur.
Object :- To study the response of Sugarcane to different forms of N.

Ref :- Pb. 50 (66).
Type :- 'M'.

1. BASAL CONDITIONS:
   (i) (a) Nil. (b) Fallow. (c) Nil. (ii) Loam. (b) Refer soil analysis, Jullundur. (iii) N.A. (iv) (a) to (e) N.A. (v) N.A. (vi) N.A. (vii) Irrigated. (viii) N.A. (ix) 50.12". (x) N.A.

2. TREATMENTS:
   1. 100 lb./ac. of N as G.N.C.
   2. 100 lb./ac. of N as A/S.
   3. 100 lb./ac. of N as C/N.
   4. Control (no manure).

3. DESIGN:
   (i) R.B.D. (ii) (a) 4. (b) N.A. (iii) 5. (iv) (a) N.A. (b) 1/40 ac. (v) N.A. (vi) Yes.

4. GENERAL:
   (i) Satisfactory. No lodging. (ii) Nil. (iii) Sugarcane count and yield and juice analysis. (iv) (a) 1950 to 1951. (b) No. (c) Nil. (v) (a) No. (b)—. (vi) and (vii) Nil.

5. RESULTS:
   (i) 31.67 ton/ac.
   (ii) N.A.
   (iii) Treatment differences are not significant.
Object:--To study the response of Sugarcane to different forms of N.

1. BASAL CONDITIONS:
   (i) (a) Wheat-Kharif fodder-Fallow-Sugarcane. (b) Fallow. (c) Nil. (ii) (a) Loam. (b) Refer soil analysis, Jullundur. (iii) 12.4.1951. (iv) (a) 7 plough, 6 sohaga and 2 rollers. (b) N.A. (c) 37,000 setts./ac. (d) 2' row to row. (e) N.A. (v) No. (vi) CO-312 (medium). (vii) Irrigated. (viii) N.A. (ix) 17.98°. (x) 18.2.1952

2. TREATMENTS:
   1. 100 lb./ac. of N as G.N.C.
   2. 100 lb./ac. of N as A/S.
   3. 100 lb./ac. of N as C/N.
   4. Control.

3. DESIGN:
   (i) R.B.D. (ii) (a) 4. (b) N.A. (iii) 5. (iv) (a) and (b) 90°X12°. (v) Nil. (vi) Yes.

4. GENERAL:
   (i) Normal. No lodging (ii) N.A. (iii) Yield of sugarcane. (iv) (a) and (b) 90°-9°X12°. (v) Nil. (vi) Yes. (vii) Nil.

5. RESULTS:
   (i) 17.36 ton/ac.
   (ii) 1.35 ton/ac.
   (iii) Treatment differences are highly significant.
   (iv) Av. yield of sugarcane in ton/ac.
   Treatment     Av. yield
   1.            17.97
   2.            18.76
   3.            18.43
   4.            14.30
   S.E./mean    = 0.60 ton/ac.
2. TREATMENTS:
1. Full dose at planting.
2. Full dose 50 days after planting.
3. Full dose 80 days after planting.
4. Full dose 110 days after planting.
5. Half dose at planting + half 50 days after planting.
6. Half dose at planting + half 80 days after planting.
7. Half dose at planting + half 110 days after planting.
8. Half 50 days after planting + half 80 days after planting.
9. Half 50 days after planting + half 110 days after planting.
10. Control (no manure).

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

4. GENERAL:
(i) Fair to satisfactory, stand of the crop was not uniform. No lodging. (ii) Nil. (iii) Percentage increase or decrease over full dose at planting and control, juice analysis and sugarcane yield. (iv) (a) No. (b) —. (c) —. (v) (a) No. (b) —. (vi) Nil. (vii) As the farm tube well went out of order the crop had to be sown late.

5. RESULTS:
(i) 25.39 ton/ac.
(ii) N.A.
(iii) N.A.
(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>25.10</td>
</tr>
<tr>
<td>2.</td>
<td>29.14</td>
</tr>
<tr>
<td>3.</td>
<td>25.37</td>
</tr>
<tr>
<td>4.</td>
<td>23.88</td>
</tr>
<tr>
<td>5.</td>
<td>28.06</td>
</tr>
<tr>
<td>6.</td>
<td>24.59</td>
</tr>
<tr>
<td>7.</td>
<td>24.29</td>
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<td>8.</td>
<td>25.64</td>
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<td>9.</td>
<td>27.06</td>
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<tr>
<td>10.</td>
<td>20.77</td>
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<tr>
<td>S.E./mean</td>
<td>N.A.</td>
</tr>
</tbody>
</table>

Crop:— Sugarcane.
Site:— Sugarcane Res. Stn., Jullundur.
Object:— To find the optimum dose of toria cake and A/S with F.Y.M.

1. BASAL CONDITIONS:
(i) (a) Nil. (b) N.A. (c) Nil. (ii) (a) Loamy. (b) Refer soil analysis, Jullundur (iii) N.A. (iv) (a) to (e) N.A. (v) Nil. (vi) N.A. (vii) Irrigated. (viii) N.A. (ix) 26.44". (x) N.A.

2. TREATMENTS:
1. Control (no manure).
2. F.Y.M. alone
5. F.Y.M. + A/S in 1 : 2 ratio.
7. F.Y.M. + toria cake in 2 : 1 ratio.
8. F.Y.M. + toria cake in 1 : 1 ratio.
10. Toria cake alone.
3. DESIGN:
(i) R.B.D. (ii) (a) 10. (b) N.A. (iii) N.A. (iv) (a) and (b) N.A. (v) N.A. (v) Yes.

4. GENERAL:
(i) Good. No lodging. (ii) Nil. (iii) Yield of sugarcane. (iv) (a) 1946—48. (b) and (c) No. (v) (a) and
(b) No. (vi) and (vii) Nil.

5. RESULTS:
(i) 31.49 ton/ac.
(ii) N.A.
(iii) N.A.
(iv) Av. yield of sugarcane in ton/ac.

<table>
<thead>
<tr>
<th>Treatment</th>
<th>Av. yield</th>
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</thead>
<tbody>
<tr>
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<tr>
<td>3.</td>
<td>31.88</td>
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<tr>
<td>4.</td>
<td>31.24</td>
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<tr>
<td>5.</td>
<td>32.78</td>
</tr>
<tr>
<td>6.</td>
<td>31.83</td>
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<td>7.</td>
<td>31.61</td>
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<td>8.</td>
<td>32.72</td>
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<td>9.</td>
<td>31.78</td>
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<tr>
<td>10.</td>
<td>32.45</td>
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<tr>
<td>S.E./mean</td>
<td>N.A.</td>
</tr>
</tbody>
</table>

Crop :- Sugarcane.
Site :- Sugarcane Res. Stn., Jullundur.

Object :- To study the efficacy of different oil cakes.

1. BASAL CONDITIONS:
(i) (a) Nil. (b) Fallow. (c) Nil. (ii) (a) Loam. (b) Refer soil analysis, Jullundur (iii) 7.4.1953.
(iv) (a) 1 tractor ploughing, 4 desi hal, 1 hindustan hal and 4 sohaga. (b) N.A. (c) 37,000 sett/ac.
(d) and (e) N.A. (v) Nil. (vi) CQ-312 (medium). (vii) Irrigated. (viii) 4 hoeings. (ix) 32.8°.

2. TREATMENTS:
1. Castor cake at 100 lb./ac. of N.
2. Neem cake at 100 lb./ac. of N.
3. G.N.C. at 100 lb./ac. of N.
4. A/S at 100 lb./ac. of N.
5. Mohwa cake uncomposted at 100 lb./ac. of N.
6. Mohwa cake composted at 100 lb./ac. of N.
7. Fish manure at 100 lb./ac. of N.
8. Control.
A/S applied half on 26.5.1953 and half on 14.7.1953 while other manures were applied on 7.4.1953.

3. DESIGN:
(i) R.B.D. (ii) (a) 8. (b) N.A. (iii) 4. (iv) (a) and (b) 12' × 90.75'. (v) Nil. (vi) Yes.

4. GENERAL:
(i) Fair. (ii) Nil. (iii) Yield of sugarcane. (iv) (a) No. (b) and (c) Nil. (v) (a) and (b) No. (vi) and (vii) Nil.

5. RESULTS:
(i) 28.56 ton/ac.
(ii) 2.49 ton/ac.
(iii) Treatments are not significantly different.
Av. yield of sugarcane in ton/ac.

<table>
<thead>
<tr>
<th>Treatment</th>
<th>Av. yield</th>
</tr>
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<tr>
<td>2.</td>
<td>28.76</td>
</tr>
<tr>
<td>3.</td>
<td>28.89</td>
</tr>
<tr>
<td>4.</td>
<td>30.21</td>
</tr>
<tr>
<td>5.</td>
<td>28.26</td>
</tr>
<tr>
<td>6.</td>
<td>26.43</td>
</tr>
<tr>
<td>7.</td>
<td>29.41</td>
</tr>
<tr>
<td>8.</td>
<td>25.43</td>
</tr>
<tr>
<td>S.E./mean</td>
<td>1.244 ton/ac.</td>
</tr>
</tbody>
</table>

Crop: Sugarcane.

Site: Sugarcane Res. Stn., Jullundur.

Object: To compare the manural value of different parts of Sannhemp at different ages, with and without P2O5 at sowing of Sannhemp.

1. BASAL CONDITIONS:
(i) (a) Nil. (b) Sannhemp. (c) As per treatments. (ii) (a) Loam. (b) Refer soil analysis, Jullundur (iii) 26.2.1953. (iv) (a) 3 desi hal, 4 sohaga and 3 horse hoe. (b) N.A. (c) 35,000 sett/ac. (d) and (e) N.A. (v) Nil. (vi) CO-312 (medium). (vii) Irrigated. (viii) 5 hoeings. (ix) 32.6°. (x) 25.2.1954.

2. TREATMENTS:
1. Sannhemp buried after 70 days.
2. Sannhemp buried after 90 days.
3. Only roots of sannhemp buried after 70 days.
4. Roots and the top part of the plant buried after 90 days.
5. Only roots of sannhemp buried after 90 days.
6. Treatment (1)+100 lb./ac. of P2O5 at sowing of sannhemp.
7. Treatment (1)+200 lb./ac. of P2O5 at sowing of sannhemp.
8. Sannhemp plant (excluding roots) buried after 70 days.
9. Control.

3. DESIGN:
(i) R.B.D. (ii) (a) 9. (b) N.A. (iii) 5. (iv) (a) and (b) 12' x 90'-9". (v) Nil. (vi) Yes.

4. GENERAL:
(i) Fair. No lodging. (ii) Nil. (iii) Yield of sugarcane. (iv) (a) 1953-contd. (b) No. (c) Nil. (v) (a) No. (b) —. (vi) and (vii) Nil.

5. RESULTS:
(i) 29.68 ton/ac.
(ii) 1.66 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>32.91</td>
</tr>
<tr>
<td>2.</td>
<td>31.35</td>
</tr>
<tr>
<td>3.</td>
<td>27.05</td>
</tr>
<tr>
<td>4.</td>
<td>30.20</td>
</tr>
<tr>
<td>5.</td>
<td>27.15</td>
</tr>
<tr>
<td>6.</td>
<td>30.84</td>
</tr>
<tr>
<td>7.</td>
<td>31.89</td>
</tr>
<tr>
<td>8.</td>
<td>30.45</td>
</tr>
<tr>
<td>9.</td>
<td>25.29</td>
</tr>
<tr>
<td>S.E./mean</td>
<td>0.74 ton/ac.</td>
</tr>
</tbody>
</table>
Crop: Sugarcane.  

Object: To study the effect of organic and inorganic manures on the yield of Sugarcane.

1. BASAL CONDITIONS:
   (i) (a) Wheat—Fallow—Sugarcane. (b) Fallow. (c) No.  
   (ii) (a) Loam. (b) Refer soil analysis, Jullundur.  
   (iii) 12.4.1952. (iv) (a) 5 desi hal and 5 sohaga. (b) to (e) N.A.  
   (v) 2 trucks of F.Y.M. on 25.3.1952.  
   (vi) CO-312 (medium). (vii) Irrigated. (viii) 5 hoeings. (ix) 36.61".  

2. TREATMENTS:
   1. G.N.C and A/S mixed in the ratio 1:1 at 100 lb./ac. of N at planting.  
   2. G.N.C at 50 lb./ac. of N at planting + A/S at 50 lb./ac. of N in May and June.  
   3. G.N.C. 100 lb./ac. of N at planting.  
   4. A/S at 100 lb./ac. of N half in May, June and half in September.  
   5. Control.  

3. DESIGN:
   (i) R.B.D.  
   (ii) (a) 5. (b) N.A. (iii) 4. (iv) (a) and (b) 12' x 33'. (v) Nil. (vi) Yes.

4. GENERAL:
   (i) Normal. No lodging. (ii) Nil. (iii) Yield of sugarcane. (iv) (a) 1952—1953. (b) No. (c) Nil. (v) (a) No. (b) —. (vi) and (vii) Nil.

5. RESULTS:
   (i) 19.78 ton/acre.  
   (ii) 3.10 ton/acre.  
   (iii) Treatments are not significantly different.  
   (iv) Av. yield of sugarcane in ton/acre.  

<table>
<thead>
<tr>
<th>Treatment</th>
<th>Av. yield</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>17.93</td>
</tr>
<tr>
<td>2.</td>
<td>21.64</td>
</tr>
<tr>
<td>3.</td>
<td>18.69</td>
</tr>
<tr>
<td>4.</td>
<td>21.47</td>
</tr>
<tr>
<td>5.</td>
<td>19.19</td>
</tr>
<tr>
<td>S.E./mean</td>
<td>1.55 ton/acre</td>
</tr>
</tbody>
</table>

Crop: Sugarcane.  

Object: To determine the optimum depth for application of P₂O₅.

BASAL CONDITIONS:
   (i) (a) Nil. (b) N.A. (c) Nil. (ii) (a) Loamy. (b) Refer soil analysis, Jullundur.  
   (iii) N.A. (iv) (a) to (e) N.A. (v) N.A. (vi) N.A. (vii) Irrigated. (viii) N.A. (ix) 50.12". (x) N.A.

2. TREATMENTS:
   1. 100 lb./ac. of P₂O₅ as Super applied by broadcast.  
   2. 100 lb./ac. of P₂O₅ as Super applied 6" deep in furrows.  
   3. 100 lb./ac. of P₂O₅ as Super applied 12" deep in furrows.  
      Manure was applied one day before planting.

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

4. GENERAL:
   (i) Satisfactory. No lodging. (ii) Nil. (iii) Yield of sugarcane. (iv) (a) No. (b) No. (c) Nil. (v) (a) No. (b) —. (vi) and (vii) Nil.
5. RESULTS:
(i) 29.30 ton/ac.
(ii) N.A.
(iii) Treatments are not significantly different.
(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>29.38</td>
</tr>
<tr>
<td>2.</td>
<td>29.46</td>
</tr>
<tr>
<td>3.</td>
<td>29.07</td>
</tr>
<tr>
<td>S.E/mean</td>
<td>N.A.</td>
</tr>
</tbody>
</table>

Crop: Sugarcane.
Site: Sugarcane Res. Stn., Jullundur.
Object: To study the response of Sugarcane to N, P and K fertilizers.

Ref: Pb. 51(41).
Type: 'M'.

1. BASAL CONDITIONS:

(i) (a) Nil. (b) Wheat. (c) Nil. (ii) (a) Loam. (b) Refer soil analysis, Jullundur. (iii) 27.4.1951.
(iv) (a) One tractor ploughing, 2 hindustan plough, 4 dest hal and 6 sohaga. (b) N.A. (c) N.A. (d) 2' row to row. (v) Nil. (vi) CO.L. 9 (early). (vii) Irrigated. (viii) 2 hoeings, twice tying up and once earthing up (ix) 17.98°. (x) 22.11.1951 to 21.11.1951.

2. TREATMENTS:
1. No manure (control).
2. A/S at 50 lb./ac. of N + Super at 75 lb./ac. of P₂O₅ + Pot. Sul. at 31.25 lb./ac. of K₂O.
3. A/S at 100 lb./ac. of N + Super at 150 lb./ac. of P₂O₅ + Pot. Sul. at 62.5 lb./ac. of K₂O.
4. A/S at 50 lb./ac. of N.
5. A/S at 100 lb./ac. of N.
6. A/S at 50 lb./ac. of N + treatment (2).
7. A/S at 100 lb./ac. of N + treatment (3).

3. DESIGN:
(i) R.B.D. (ii) (a) 7. (b) N.A. (iii) 4. (iv) (a) and (b) 8′x90′-9°. (v) Nil. (vi) Yes.

4. GENERAL:
(i) Fair. No lodging. (ii) Nil. (iii) Yield of sugarcane. (iv) (a) 1950—1952. (b) No. (c) Nil. (v) (a) No. (b)-. (vi) and (vii) Nil.

5. RESULTS:
(i) 14.80 ton/ac.
(ii) 2.04 ton/ac.
(iii) Treatments are not significantly different.
(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>12.30</td>
</tr>
<tr>
<td>2.</td>
<td>14.04</td>
</tr>
<tr>
<td>3.</td>
<td>15.39</td>
</tr>
<tr>
<td>4.</td>
<td>15.19</td>
</tr>
<tr>
<td>5.</td>
<td>15.55</td>
</tr>
<tr>
<td>6.</td>
<td>14.91</td>
</tr>
<tr>
<td>7.</td>
<td>16.21</td>
</tr>
<tr>
<td>S.E./mean</td>
<td>1.02 ton/ac.</td>
</tr>
</tbody>
</table>
Crop :- Sugarcane.
Site :- Sugarcane Res. Stn., Jullundur.

Object:—To study the response of Sugarcane to N, P and K fertilizers.

1. BASAL CONDITIONS:

(i) (a) Wheat-G.M.-Fallow-Sugarcane. (b) Fallow. (c) Nil. (ii) (a) Loam. (b) Refer soil analysis, Jullundur. (iii) 2.4.1952. (iv) (a) 3 desi hal, 1 raja hal, 5 sohaga and 3 tractor ploughings. (b) to (e) N.A. (v) Nil. (vi) CO.L.9 (medium). (vii) Irrigated. (viii) 5 hoing, twice tying up and once earthing up. (ix) 36.61". (x) 18.1.1953.

2. TREATMENTS:

1. No manure (control).
2. A/S at 50 lb./ac. of N+Super-75 at lb./ac. of P₂O₅+Pot. Sul. at 31.25 lb./ac. of K₂O.
3. A/S at 100 lb./ac. of N+Super 150 at lb./ac. of P₂O₅+Pot. Sul. at 62.50 lb./ac. of K₂O.
4. A/S at 50 lb./ac. of N.
5. A/S at 100 lb./ac. of N.
6. A/S at 50 lb./ac. of N+treatment 2.
7. A/S at 100 lb./ac. of N+treatment 3.

3. DESIGN:

(i) R.B.D. (ii) (a) 7. (b) N.A. (iii) 3. (iv) (a) and (b) 8'×90'-9°, (v) Nil. (vi) Yes.

4. GENERAL:

(i) Fair. No lodging. (ii) Nil. (iii) Yield of sugarcane. (iv) (a) 1950 to 1952. (b) No. (c) Nil. (v) (a) No. (b) . (vi) Nil. (vii) Originally 4 replications but one replication was ploughed up because of poor growth.

5. RESULTS:

(i) 13.27 ton/ac.
(ii) 0.91 ton/ac.
(iii) Treatments are significantly different.
(iv) Av. yield of sugarcane in lb./ac.

<table>
<thead>
<tr>
<th>Treatment</th>
<th>Av. yield</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>10.23</td>
</tr>
<tr>
<td>2.</td>
<td>15.65</td>
</tr>
<tr>
<td>3.</td>
<td>12.89</td>
</tr>
<tr>
<td>4.</td>
<td>13.68</td>
</tr>
<tr>
<td>5.</td>
<td>12.62</td>
</tr>
<tr>
<td>6.</td>
<td>14.14</td>
</tr>
<tr>
<td>7.</td>
<td>13.70</td>
</tr>
</tbody>
</table>

S.E./mean = 0.52 ton/ac.

Crop :- Sugarcane.
Site :- Sugarcane Res. Stn., Jullundur.

Object:—To compare the effect of different organic manures.

1. BASAL CONDITIONS:

(i) (a) Nil. (b) N.A. (c) Nil. (ii) (a) Loamy. (b) Refer soil analysis, Jullundur. (iii) N.A. (iv) (a) to (e) N.A. (v) Nil. (vi) N.A. (vii) Irrigated. (viii) N.A. (ix) 30.12°. (x) N.A.
2. TREATMENTS:
1. Mohwa cake.
2. Mohwa cake composted with soil.
3. Mohwa cake composted with lime.
4. Mohwa cake composted with A/S.
5. Mohwa cake composted with F.Y.M.
7. F.Y.M. alone.
9. G.N.C. alone
10. Control (no manure).

Total N dose 100 lb/acre, Mohwa cake was composted for about 50 days before its application at the time of planting.

3. DESIGN:
(i) R.B.D.  (ii) (a) 10.  (b) N.A.  (iii) 4.  (iv) (a) N.A.  (b) 1/40 ac.  (v) N.A.  (vi) Yes.

4. GENERAL:
(i) Good. No lodging.  (ii) Nil.  (iii) No. of matured canes/acre, juice analysis and sugarcane yield.
(iv) (a) 1950 to 1952.  (b) No.  (c) Nil.  (v) (a) No.  (b)—.  (vi) and (vii) Nil.

5. RESULTS:
(i) 39.22 ton/ac.
(ii) N.A.
(iii) Treatments are not significantly different.
(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>38.73</td>
</tr>
<tr>
<td>2.</td>
<td>40.17</td>
</tr>
<tr>
<td>3.</td>
<td>41.11</td>
</tr>
<tr>
<td>4.</td>
<td>39.40</td>
</tr>
<tr>
<td>5.</td>
<td>38.93</td>
</tr>
<tr>
<td>6.</td>
<td>40.13</td>
</tr>
<tr>
<td>7.</td>
<td>38.85</td>
</tr>
<tr>
<td>8.</td>
<td>38.42</td>
</tr>
<tr>
<td>9.</td>
<td>39.14</td>
</tr>
<tr>
<td>10.</td>
<td>37.27</td>
</tr>
<tr>
<td>S.E./mean</td>
<td>= N.A.</td>
</tr>
</tbody>
</table>

Crop :- Sugarcane.
Site :- Sugarcane Res. Stn., Jullundur.
Object :- To test the efficacy of different oil cakes as manure for Sugarcane.

Ref :- Pb. 51(35).
Type :- ‘M’.

1. BASAL CONDITIONS:
(i) (a) Nil.  (b) Fallow.  (c) Nil.  (ii) (a) Loam.  (b) Refer soil analysis, Jullundur.  (iii) 19.4.1951.
(iv) (a) 1 tractor, 1 hindustan, 5 desi ploughings and 6 sahaga.  (b) N.A.  (c) 15,000 sett/ac.  (d) and (e) N.A.  (v) Nil.  (vi) CO-312 (medium).  (vii) Irrigated.  (viii) N.A.  (ix) 17.98.  (x) 9.1.1952 to 11.1.1952.

2. TREATMENTS:
1. Mohwa cake.
2. Mohwa cake composted with earth.
3. Mohwa cake composted with lime.
4. Mohwa cake composted with A/S.
5. Mohwa cake composted with F.Y.M.
7. F.Y.M.
9. G.N.C.
10. Control.

N dose was 100 lb/acre. Mohwa cake composted and uncomposted was applied on 16.4.1951, F.Y.M. and G.N.C. was applied on 16.4.1951. Half of A/S applied on 16.6.1951 and other half applied on 3.7.1951.
3. DESIGN:
(i) R.B.D. (ii) (a) 10, (b) N.A. (iii) 4. (iv) (a) and (b) 90'-9°x12'. (v) Nil. (vi) Yes.

4. GENERAL:
(i) N.A. (ii) N.A. (iii) Yield of sugarcane. (iv) (a) 1950—1952. (b) No. (c) Nil. (v) (a) No. (b) —. (vi) and (vii) Nil.

5. RESULTS:
(i) 1.631 ton/ac. 
(ii) 1.34 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>17.28</td>
</tr>
<tr>
<td>2.</td>
<td>15.13</td>
</tr>
<tr>
<td>3.</td>
<td>17.31</td>
</tr>
<tr>
<td>4.</td>
<td>18.17</td>
</tr>
<tr>
<td>5.</td>
<td>16.05</td>
</tr>
<tr>
<td>6.</td>
<td>16.00</td>
</tr>
<tr>
<td>7.</td>
<td>16.49</td>
</tr>
<tr>
<td>8.</td>
<td>16.10</td>
</tr>
<tr>
<td>9.</td>
<td>17.81</td>
</tr>
<tr>
<td>10.</td>
<td>12.76</td>
</tr>
<tr>
<td>S.E./mean</td>
<td>0.57 ton/ac.</td>
</tr>
</tbody>
</table>

Crop:— Sugarcane. 
Site:— Sugarcane Res. Stn., Jullundur Cantt. 
Object:— To study the effect of different manures on the yield of Sugarcane.

1. BASAL CONDITIONS:
(i) (a) Wheat-Kharif fodder-Fallow-Sugarcane. (b) Fallow. (c) No. (ii) (a) Leam. (b) Refer soil analysis, Jullundur (iii) 11.3.1952. (iv) (a) 3 desi hal, 5 sohaga and 2 tractor. (b) to (e) N.A. (v) 2 truck loads of F.Y.M. (vi) CO-312 (medium). (vii) Irrigated. (viii) 6 hoeings. (ix) 36.61°. (x) 22.1.1953.

2. TREATMENTS:
1. Mohwa cake.
2. Mohwa cake composted with earth.
3. Mohwa cake composted with lime.
4. Mohwa cake composted with A/S.
5. Mohwa cake composted with F.Y.M.
6. F.Y.M.+Mohwa cake uncomposted mixed in 1 : 1 ratio. 
7. F.Y.M.
9. G.N.C.
10. Control.
Total dose was 100 lb./ac. All treatments were applied on 12.3.1952 while A/S was applied on 12.7.1952.

3. DESIGN:
(i) R.B.D. (ii) (a) 10. (b) N.A. (iii) 4. (iv) (a) and (b) 12' x 90'-9°. (v) Nil. (vi) Yes.

GENERAL:
(i) Fair. No lodging. (ii) Nil. (iii) Yield of sugarcane. (iv) (a) 1950—1952. (b) No. (c) Nil. (v) (a) No. (b) —. (vi) and (vii) Nil.

RESULTS:
(i) 25.78 ton/ac. 
(ii) 2.59 ton/ac. 
(iii) Treatments are not significantly different.
(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>28.07</td>
</tr>
<tr>
<td>2.</td>
<td>24.39</td>
</tr>
<tr>
<td>3.</td>
<td>25.03</td>
</tr>
<tr>
<td>4.</td>
<td>25.67</td>
</tr>
<tr>
<td>5.</td>
<td>27.51</td>
</tr>
<tr>
<td>6.</td>
<td>24.75</td>
</tr>
<tr>
<td>7.</td>
<td>25.49</td>
</tr>
<tr>
<td>8.</td>
<td>25.42</td>
</tr>
<tr>
<td>9.</td>
<td>26.35</td>
</tr>
<tr>
<td>10.</td>
<td>25.12</td>
</tr>
</tbody>
</table>

S.E./mean = 12.97 ton/ac.

Crop :- Sugarcane.  
Site :- Agri. Stn., Karnal.  
Object :- To study the effect of different sources of non-sugarcane crop.

1. BASAL CONDITIONS:

2. TREATMENTS:
   1. F.Y.M. at 50 lb/ac. of N.
   2. F.Y.M. at 100 lb/ac. of N.
   3. A/S at 50 lb/ac. of N.
   4. A/S at 100 lb/ac. of N.
   5. Ammo. Phos. at 50 lb/ac. of N.
   6. Ammo. Phos. at 100 lb/ac. of N.
   7. F.Y.M. at 50 lb/ac. of N+A/S at 50 lb/ac. of N.
   8. F.Y.M. at 50 lb/ac. of N+Ammo. Phos. 50 lb/ac. of N.
   9. Control.

3. DESIGN:
   (i) R.B.D. (ii) 9. (b) N.A. (iii) 4. (iv) 4. (a) N.A. (b) 10' x 80'. (v) N.A. (vi) Yes.

4. GENERAL:
   (i) Normal. No lodging. (ii) Nil. (iii) Gur yield. (iv) (a) 1946—1948. (b) No. (c) N.A. (v) (a) Ambala. (b) N.A. (vi) and (vii) Nil.

5. RESULTS:
   (i) 3.60 ton/ac.
   (ii) 0.38 ton/ac.
   (iii) Treatments are not significantly different.
   (iv) Av. yield of gur in ton/ac.

<table>
<thead>
<tr>
<th>Treatment</th>
<th>Av. yield</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>3.75</td>
</tr>
<tr>
<td>2.</td>
<td>3.69</td>
</tr>
<tr>
<td>3.</td>
<td>3.46</td>
</tr>
<tr>
<td>4.</td>
<td>3.76</td>
</tr>
<tr>
<td>5.</td>
<td>3.46</td>
</tr>
<tr>
<td>6.</td>
<td>3.80</td>
</tr>
<tr>
<td>7.</td>
<td>3.46</td>
</tr>
<tr>
<td>8.</td>
<td>3.51</td>
</tr>
<tr>
<td>9.</td>
<td>3.53</td>
</tr>
</tbody>
</table>

S.E./mean = 0.19 ton/ac.
Crop : Sugarcane.

Object : To find out a suitable manure for Sugarcane crop.

1. BASAL CONDITIONS :
   (i) (a) to (c) N.A. (ii) (a) Clay loam. (b) N.A. (iii) 22,23.3.1949. (iv) (a) to (e) N.A. (v) Nil. (vi) CO-312 (medium). (vii) Irrigated. (viii) N.A. (ix) 25.52°. (x) 24.2.1950, 27.2.1950 and 5.3.1950.

2. TREATMENTS :
   1. Control.
   2. F.Y.M. at 10 C.L./ac.
   3. Mohwa cake at 12.5 md./ac
   4. A/S at 3 md./ac.
   5. Ammo. Phos. at 4 md./ac.
   6. F.Y.M. at 5 C.L./ac.+A/S at 1.5 md./ac.
   8. Mohwa cake at 6.25 md./ac.+A/S at 1.5 md./ac.


3. DESIGN :
   (i) R.B.D. (ii) (a) 9. (b) N.A. (iii) 4. (iv) (a) N.A. (b) 11' x 76'. (v) N.A. (vi) Yrs.

4. GENERAL :
   (i) and (ii) N.A. (iii) Juice, gur and sugarcane yield. (iv) (a) and (b) No. (c) —. (v) (a) No. (v) —. (vi) and (vii) Nil.

5. RESULTS :
   (i) 29.12 ton/ac.
   (ii) 3.49 ton/ac.
   (iii) Treatments are significantly different.
   (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>23.41</td>
</tr>
<tr>
<td>2.</td>
<td>30.13</td>
</tr>
<tr>
<td>3.</td>
<td>25.63</td>
</tr>
<tr>
<td>4.</td>
<td>34.03</td>
</tr>
<tr>
<td>5.</td>
<td>30.38</td>
</tr>
<tr>
<td>6.</td>
<td>28.32</td>
</tr>
<tr>
<td>7.</td>
<td>31.16</td>
</tr>
<tr>
<td>8.</td>
<td>29.77</td>
</tr>
<tr>
<td>9.</td>
<td>29.22</td>
</tr>
<tr>
<td>S.E./mean</td>
<td>=1.75 ton./ac.</td>
</tr>
</tbody>
</table>

Crop : Sugarcane.

Object : To study the effect of A/S and Super on the yield of Sugarcane.

1. BASAL CONDITIONS :
   (i) (a) Nil. (b) Fallow. (c) Nil. (ii) (a) Loam. (b) N.A. (iii) 9,10.3.1951. (iv) (a) 6 ploughings and 4 soughage. (b) N.A. (c) 40,000 sett./ac. (d) and (e) N.A. (v) Nil. (vi) CO-312 (medium). (vii) Irrigated. (viii) 1 weeding, 2 hoeings and twice tying up. (ix) 16.86°. (x) 1.1.1952, 12.1.1952, 18.1.1952 and 22.2.1952.

2. TREATMENTS :
   All combinations of (1) and (2)
   (1) 3 levels of P₂O₅ as Super : P₁ = 0, P₂ = 50 and P₃ = 100 lb./ac.
   (2) 3 levels of N as A/S : N₁ = 50, N₂ = 100 and N₃ = 150 lb./ac.

A/S and Super applied on 8.6.1951.
3. DESIGN:
(i) Fact. in R.B.D. (ii) (a) 9. (b) N.A. (iii) 5. (iv) (a) $8' \times 76'$. (b) $8' \times 63.8'$. (v) N.A. (vi) Yes.

4. GENERAL:
(i) Very good. No lodging. (ii) Nil. (iii) Yield of sugarcane. (iv) (a) to (c) No. (v) (a) and (b) No. (vi) No. (vii) Originally conducted with 6 replications, but data for only 5 replications was available.

5. RESULTS:
(i) 3.33 ton/ac.
(ii) 0.39 ton/ac.
(iii) None of the effects is significant.
(iv) Av. yield of sugarcane in ton/ac.

\[
\begin{array}{ccc|c}
 & P_0 & P_1 & P_2 & \text{Mean} \\
N_1 & 2.89 & 3.13 & 2.97 & 3.00 \\
N_2 & 2.99 & 3.20 & 3.14 & 3.11 \\
N_3 & 2.88 & 3.01 & 3.05 & 2.98 \\
\hline
\text{Mean} & 2.92 & 3.11 & 3.05 & 3.03 \\
\end{array}
\]

S.E. of marginal mean of $N$ or $P$ = 0.10 ton/ac.
S.E. of body of table = 0.175 ton/ac.

Crop: - Sugarcane.
Site: - Chemical Section, B.A. Farm, Rauni.
Object: - To find out the best dose of N for Sugarcane.

1. BASAL CONDITIONS:
(i) (a) No. (b) Metha (fodder). (c) Nil. (ii) (a) Heavy loam. (b) N.A. (iii) 29.3.1952. (iv) (a) to (e) N.A. (v) Nil. (vi) N.A. (vii) Irrigated. (viii) 1 sohaga for facilitating germination and 2 hoeings. (ix) 23.05°. (x) N.A.

2. TREATMENTS:
1. Control.
2. 400 lb./ac. of A/S.
3. 600 lb./ac. of A/S.
4. 800 lb./ac. of A/S.

3. DESIGN:
(i) R.B.D. (ii) (a) 4. (b) N.A. (iii) 4. (iv) (a) $67' \times 20.3'$. (b) $1/45$ ac. (v) N.A. (vi) Yes.

4. GENERAL:
(i) Germination poor. No lodging. (ii) Affected plants were treated by removing central shoots and spiking it. (iii) Yield of sugarcane and gur yield for 2nd replication only. (iv) (a) to (c) No. (v) No. (vi) and (vii) Nil.

5. RESULTS:
(i) 26.04 ton/ac.
(ii) 1.43 ton/ac.
(iii) Treatments are not significantly different.
(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>26.35</td>
</tr>
<tr>
<td>2.</td>
<td>22.82</td>
</tr>
<tr>
<td>3.</td>
<td>25.67</td>
</tr>
<tr>
<td>4.</td>
<td>28.31</td>
</tr>
<tr>
<td>S.E./mean</td>
<td>1.72 ton/ac.</td>
</tr>
</tbody>
</table>
Crop :- Sugarcane.

Site :- Chemical Section, B.A. Farm, Rauni.

Object :- To find out the best dose of N for Sugarcane.

1. BASAL CONDITIONS :
   (i) (a) Nil. (b) Wheat. (c) Nil. (ii) (a) Heavy loam. (b) N.A. (iii) 20.3.1953. (iv) (a) 6 ploughings and 5 sohaga. (b) to (c) N.A. (v) Nil. (vi) N.A. (vii) Irrigated. (viii) N.A. (ix) 30.50°.(x) 18.3.1954.

2. TREATMENTS :
   1. Control.
   2. 80 lb./ac. of N as A/S.
   3. 120 lb./ac. of N as A/S.
   4. 160 lb./ac. of N as A/S.

Fertilizers were applied in 3 equal doses.

3. DESIGN :
   (i) R.B.D. (ii) (a) 4. (b) N.A. (iii) 4. (iv) (a) 67'×20.35'. (b) 1/45 ac. (v) N.A. (vi) Yes.

4. GENERAL :
   (i) Normal. No lodging. (ii) Nil. (iii) Yield of sugarcane. (iv) (a) No. (b) —. (c) —. (v) (a) No. (b) —. (vi) and (vii) Nil.

5. RESULTS :
   (i) 15.83 ton/ac.
   (ii) 2.13 ton/ac.
   (iii) Treatment differences are highly significant.
   (iv) Av. yield of sugarcane in ton/ac.
      Treatment  | Av. yield
      1.         | 12.07
      2.         | 15.06
      3.         | 17.81
      4.         | 18.37
      S.E./mean  | —1.07 ton/ac.

Crop :- Sugarcane.

Site :- Agri. Farm, Rohtak.

Object :- To study the effect of N on yield of Sugarcane.

1. BASAL CONDITIONS :
   (i) (a) Nil. (b) Charli. (c) Nil. (ii) (a) Loam. (b) Refer soil analysis, Rohtak. (iii) 18.3.1948. (iv) (a) (af) and (b) N.A. (c) 40,000 sett/ac. (d) and (e) N.A. (v) F.Y.M. at 10 C.L./ac. (vi) CO. 312 (medium). (vii) Irrigated. (viii) N.A. (ix) 23.6°. (x) 6.1.1949 to 16.1.1949.

2. TREATMENTS :
   1. A/S at 50 lb./ac. of N.
   2. A/S at 100 lb./ac. of N.
   3. F.Y.M. at 10 C.L./ac.
   4. Control.

A/S applied on 2.7.1948 and F.Y.M. before sowing.

3. DESIGN :
   (i) R.B.D. (ii) (a) 4. (b) N.A. (iii) 5. (iv) (a) 12'×132'. (b) 12'×90'-9°. (v) N.A. (vi) Yes.

4. GENERAL :
   (i) Germination and growth good. No lodging. (ii) Nil. (iii) Yield of gur. (iv) (a) No. (b) No. (c) —. (v) (a) No. (b) —. (vi) Nil. (vii) Germination in plots having treatments 1, 2, and 3 was poor as compared to plot 4 and hence control is giving higher yield.
5. RESULTS:
(i) 4.22 ton/ac.
(ii) 1.72 ton/ac.
(iii) Treatment differences are highly significant.
(iv) Av. yield of gur in ton/ac.

<table>
<thead>
<tr>
<th>Treatment</th>
<th>Av. yield</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>3.91</td>
</tr>
<tr>
<td>2.</td>
<td>3.93</td>
</tr>
<tr>
<td>3.</td>
<td>4.50</td>
</tr>
<tr>
<td>4.</td>
<td>4.52</td>
</tr>
</tbody>
</table>

S.E./mean = 0.77 ton/ac

Crop: Sugarcane.  
Site: Agri. Farm, Rohtak.  
Object: To find out the best manure for Sugarcane.

1. BASAL CONDITIONS:
(i) (a) Nil. (b) Fallow. (c) Nil. (ii) (a) Loamy. (b) Refer soil analysis, Rohtak. (iii) 19.3.1949.
(iv) (a) One raja, 4 dasi plough and 8 sohaga. (b) N.A. (c) 40,000 sett/ac. (d) and (e) N.A. (v) Nil.
(vi) CO-312 (medium). (vii) Irrigated. (viii) N.A. (ix) 27.89°. (x) 11.2.1950 to 25.2.1950.

2. TREATMENTS:
1. No manure.
2. F.Y.M. at 10 C.L./ac.
3. Mohwa cake at 12.5 md./ac.
4. A/S at 3 md./ac.
5. Ammo. Phos. at 4 md./ac.
6. F.Y.M. at 5 C.L.+A/S at 1½ md./ac.
7. F.Y.M. at 5 C.L.+Ammo. Phos. at 2 md./ac.
8. Mohwa cake at 6.25 md./ac.+A/S at 1½ md./ac.

3. DESIGN:
(i) R.B.D. (ii) 9. (b) N.A. (iii) 4. (iv) (a) N.A. (b) 15'×72'×7". (v) N.A. (vi) Yes.

4. GENERAL:
(i) Good. No lodging. (ii) Nil. (iii) Yield of gur. (iv) (a) 1949—1952. (b) No. (c) Nil. (v) (a) No.
(b) —. (vi) and (vii) Nil.

5. RESULTS:
(i) 3.49 ton/ac.
(ii) 0.34 ton/ac.
(iii) Treatment differences are significant.
(iv) Av. yield of gur in ton/ac.

<table>
<thead>
<tr>
<th>Treatment</th>
<th>Av. yield</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>3.18</td>
</tr>
<tr>
<td>2.</td>
<td>3.30</td>
</tr>
<tr>
<td>3.</td>
<td>2.99</td>
</tr>
<tr>
<td>4.</td>
<td>3.75</td>
</tr>
<tr>
<td>5.</td>
<td>3.78</td>
</tr>
<tr>
<td>6.</td>
<td>3.80</td>
</tr>
<tr>
<td>7.</td>
<td>3.46</td>
</tr>
<tr>
<td>8.</td>
<td>3.55</td>
</tr>
<tr>
<td>9.</td>
<td>3.58</td>
</tr>
</tbody>
</table>

S.E./mean = 0.17 ton/ac.
Crop: Sugarcane.
Site: Agri. Farm, Rohtak.

Object: To find out the best manure for Sugarcane.

1. BASAL CONDITIONS:
   (i) (a) Nil. (b) Fodder. (c) Nil. (ii) (a) Loamy. (b) Refer soil analysis, Rohtak. (iii) 31.3.1950. (iv) (a) 1 rajah, 4 desi and 6 sohaga. (b) N.A. (c) 40,000 setts/ac. (d) N.A. (e) N.A. (v) Nil. (vi) CO-312 (medium). (vii) Irrigated. (viii) 2 hoeings, once ridging and tying up. (ix) 2.1.1951 to 29.1.1951.

2. TREATMENTS:
   1. No manure.
   2. F.Y.M. at 10 C.L./ac.
   3. Mohwa cake at 12.5 md./ac.
   4. A/S at 3 md./ac.
   5. Ammo. Phos. at 4 md./ac.
   8. Mohwa cake at 6.25 md./ac.+A/S at 1½ md./ac.
   9. Mohwa cake at 6.25 md./ac.+Amm. Phos at 2 md./ac.

3. DESIGN:
   (i) R.B.D. (ii) (a) 9. (b) N.A. (iii) 4. (iv) (a) 15’x77’. (b) 15’x72’.7’. (v) N.A. (vi) Yes.

4. GENERAL:
   (i) Good. No lodging. (ii) Nil. (iii) Yield of gur. (iv) (a) 1949-1952. (b) No. (c) Nil. (v) (a) Nil. (b)—. (vi) and (vii) Nil.

5. RESULTS:
   (i) 3.48 ton/ac.
   (ii) 0.32 ton/ac.
   (iii) Treatments are not significantly different.
   (iv) Av. yield of gur in ton/ac.
   Treatment | Av. yield
   1.         | 3.20
   2.         | 3.18
   3.         | 3.27
   4.         | 3.74
   5.         | 3.76
   6.         | 3.62
   7.         | 3.58
   8.         | 3.51
   9.         | 3.47
   S.E./mean = 0.16 ton/ac.

Crop: Sugarcane.
Site: Agri. Farm, Rohtak.

Object: To find out the best manure for Sugarcane.

1. BASAL CONDITIONS:
   (i) (a) Nil. (b) Wheat. (c) Nil. (ii) (a) Loamy. (b) Refer soil analysis, Rohtak. (iii) 10.3.1951. (iv) (a) 4 ploughings and 5 sohaga. (b) N.A. (a) 40,000 setts/ac. (d) and (e) N.A. (v) Nil. (vi) CO-312 (medium). (vii) Irrigated. (viii) twice tying up and 2 hoeings. (ix) 8.72'. (x) 19.1.1952 to 24.1.1952.
2. TREATMENTS:
1. No manure.
2. F.Y.M. at 10 C.L./ac.
3. Mohwa cake at 12.5 md./ac.
4. A/S at 3 md./ac.
5. Ammo. Phos. at 4 md./ac.
8. Mohwa cake at 6.25 md./ac. + A/S at 1½ md./ac.
F.Y.M. and Mohwa cake applied on 16.2.1951 by broadcast.

3. DESIGN:
(i) R.B.D. (ii) (a) 9. (b) N.A. (iii) 4. (iv) (a) 6' x 88'. (b) 6' x 18'. (v) Nil (vi) Yes.

4. GENERAL:
(i) Satisfactory. No lodging. (ii) Nil. (iii) Yield of sugarcane and g gr. (iv) (a) 1919-1952. (b) No. (c) Nil. (v) (a) No (b)— (vi) and (vii) Nil.

5. RESULTS:
(i) 39.13 ton/ac.
(ii) 2.40 ton/ac.
(iii) Treatments 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>1.</td>
<td>38.58</td>
</tr>
<tr>
<td>2.</td>
<td>36.58</td>
</tr>
<tr>
<td>3.</td>
<td>39.81</td>
</tr>
<tr>
<td>4.</td>
<td>39.15</td>
</tr>
<tr>
<td>5.</td>
<td>39.91</td>
</tr>
<tr>
<td>6.</td>
<td>40.10</td>
</tr>
<tr>
<td>7.</td>
<td>38.98</td>
</tr>
<tr>
<td>8.</td>
<td>39.49</td>
</tr>
<tr>
<td>9.</td>
<td>39.25</td>
</tr>
</tbody>
</table>

S.E./mean = 1.20 ton/ac.

Crop: Sugarcane  
Site: Agri. Farm, Rohtak.

Ref: Pb. 52(129).  
Type: 'M'.

Object: To study the best manural combination for Sugarcane.

1. BASAL CONDITIONS:
(i) (a) Nil. (b) Fallow. (c) Nil. (ii) (a) Loam. (b) Refer soil analysis, Rohtak. (iii) 27.3.1952. (iv) (a) to (e) N.A. (v) Nil. (vi) CO-312 (late). (vii) Irrigated. (viii) Yes. (ix) 22.63°. (x) 8.1.1953 to 2.2.1953.

2. TREATMENTS:
1. No manure.
2. F.Y.M. at 10 C.L./ac.
3. Mohwa cake at 12.5 md./ac.
4. A/S at 3 md./ac.
5. Ammo. Phos. at 4 md./ac.
6. F.Y.M. at 5 C.L./ac. + A/S at 1 ½ md./ac.
8. Mohwa cake at 6.25 md./ac. + A/S at 1 ½ md./ac.
F.Y.M. and Mohwa cake applied in middle of Feb.

3. DESIGN:
(i) R.B.D. (ii) (a) 9. (b) N.A. (iii) 4. (iv) (a) and (b) 60' x 14'. (v) 2' le on both sides of length. (vi) Yes.
4. GENERAL:
(i) Satisfactory. No lodging. (ii) Attack of white ant, stem borer, top borer and pyrilla. Control measures nil. (iii) Yield of sugarcane. (iv) (a) 1949—1952. (b) and (c) No. (v) (a) and (b) Nil. (vi) and (vii) Nil.

5. RESULTS:
(i) 1.81 ton/ac.
(ii) 0.20 ton/ac.
(iii) Treatments are not significantly different.
(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>1.75</td>
</tr>
<tr>
<td>2</td>
<td>1.76</td>
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<td>3</td>
<td>1.75</td>
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<td>4</td>
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<td>1.91</td>
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<td>7</td>
<td>1.82</td>
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<tr>
<td>8</td>
<td>2.02</td>
</tr>
<tr>
<td>9</td>
<td>2.01</td>
</tr>
</tbody>
</table>

S.E/mean = 0.10 ton/ac.


Object: To find the effect of N, P and K on Sugarcane yield.

1. BASAL CONDITIONS:

2. TREATMENTS:
All combinations of (1), (2) and (3)
(1) 2 levels of N as A/S: \( N_0 = 0 \) and \( N_1 = 50 \) lb./ac.
(2) 2 levels of \( P_2O_5 \) as Super: \( P_0 = 0 \) and \( P_1 = 50 \) lb./ac.
(3) 2 levels of \( K_2O \) as Pot. Sul.: \( K_0 = 0 \) and \( K_1 = 50 \) lb./ac.
Manures applied at the time of planting.

3. DESIGN:
(i) and (ii) 4 fields were selected in each of the 10 villages according to the soil type. Each field is taken as a replication having 8 plots. (iii) (a) N.A. (b) 1/48 ac. (iv) Yes.

4. GENERAL:

5. RESULTS:
(i) 16.451 ton/ac.
(ii) 2.1236 ton/ac.
(iii) Only N effect is highly significant.
(iv) Av. yield of sugarcane in ton/ac.

<table>
<thead>
<tr>
<th></th>
<th>( P_0 )</th>
<th>( P_1 )</th>
<th>Mean 1</th>
<th>( K_0 )</th>
<th>( K_1 )</th>
</tr>
</thead>
<tbody>
<tr>
<td>( N_0 )</td>
<td>14.785</td>
<td>15.264</td>
<td>15.034</td>
<td>15.154</td>
<td>14.895</td>
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<tr>
<td>( N_1 )</td>
<td>17.722</td>
<td>18.034</td>
<td>17.878</td>
<td>17.848</td>
<td>17.908</td>
</tr>
<tr>
<td>( K_0 )</td>
<td>16.206</td>
<td>16.796</td>
<td>16.501</td>
<td></td>
<td></td>
</tr>
<tr>
<td>( K_1 )</td>
<td>16.301</td>
<td>16.402</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

S.E. of marginal means of N, P or K = 0.168 ton/ac.
S.E. of body of table = 0.237 ton/ac.
Crop : Sugarcane. Site : Jagadhri. Object : To find out the effect of N, P and K fertilizers on Sugarcane crop.

1. BASAL CONDITIONS:

2. TREATMENTS:
   All combinations of (1), (2) and (3):
   (1) 2 levels of N as A/S: N₀ = 0 and N₁ = 50 lb./ac.
   (2) 2 levels of P₂O₅ as Super: P₀ = 0 and P₁ = 50 lb./ac.
   (3) 2 levels of K₂O as Pot. Sul.: K₀ = 0 and K₁ = 50 lb./ac.
   Manures applied along with planting.

3. DESIGN:
   (i) and (ii) R.B.D. Replications—2. Fields were selected according to soil type. (iii) (a) N.A. (b) 1/55 th ac. (iv) N.A.

4. GENERAL:
   (i) Normal. (ii) N.A. (iii) Germination, growth and yield of sugarcane. (iv) —. (v) and (vi) Nil.

5. RESULTS:
   (i) 16.42 ton/ac.
   (ii) 2.615 ton/ac.
   (iii) None of the effects is significant.
   (iv) Av. yield of sugarcane in ton/ac.

<table>
<thead>
<tr>
<th>P₀</th>
<th>P₁</th>
<th>Mean</th>
<th>K₀</th>
<th>K₁</th>
</tr>
</thead>
<tbody>
<tr>
<td>17.17</td>
<td>15.13</td>
<td>16.15</td>
<td>16.15</td>
<td>16.14</td>
</tr>
<tr>
<td>16.70</td>
<td>16.69</td>
<td>16.69</td>
<td>17.05</td>
<td>16.34</td>
</tr>
<tr>
<td>Mean</td>
<td>16.93</td>
<td>15.91</td>
<td>16.42</td>
<td>16.60</td>
</tr>
<tr>
<td>17.90</td>
<td>15.30</td>
<td>16.60</td>
<td></td>
<td></td>
</tr>
<tr>
<td>15.97</td>
<td>16.52</td>
<td>16.24</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

S.E. of marginal mean of N, P or K = 0.925 ton/ac.
S.E. of body of table = 1.308 ton/ac.

Crop : Sugarcane. Site : Sugarcane Sub-Stn., Gurdaspur. Object : To study the effect of different forms of N in presence and absence of P₂O₅ on different varieties of Sugarcane.

1. BASAL CONDITIONS:
   (i) a) Nil. (b) Fallow. (c) Nil. (ii) (a) Loam. (b) N.A. (iii) 4.4.1952. (iv) (a) 15 desı hat, 12 sahaga. (b) and (c) N.A. (d) 2' row to row. (e) N.A. (v) Nil. (vi) As per treatments. (vii) Irrigated. (viii) 5 hoeings and 1 ridging. (ix) 23.50°. (x) 2.2.1953 to 9.2.1953.
2. TREATMENTS:

Main plot treatments:
- 2 varieties: \( V_1 = 0.312 \) (early) and \( V_2 = 0.19 \) (early).

Sub-plot treatments:
- All combinations of (1) and (2).
  - (1) 2 levels of \( P_2 \): \( P_2 = 0 \) and \( P_2 = 100 \) lb./ac.
  - (2) 4 doses of \( N \): \( N_0 = 0 \) and \( N = 140 \) lb./ac. as A/S., \( N_2 = 140 \) lb./ac. as G.N.C., and \( N_3 = 140 \) lb./ac. as F.Y.M.


3. DESIGN:

(i) Split-plot. (ii) (a) 2 main-plots/block; 8 sub-plots/main-plot. (b) N.A. (iii) 4. (iv) (a) 16"x77". (b) 16"x63'. (v) N.A. (vi) Yes.

4. GENERAL:

(i) Stand and condition of \( V_1 \) was good while that of \( V_2 \) was poor to fair. No lodging. (ii) Nil. (iii) Stripped cane yield. (iv) (a) Yes 1952 to 1954 (conducted with one variety only after 1952). (b) No. (c) Nil. (v) (a) Nil. (b) —. (vi) Nil. (vii) Nil.

5. RESULTS:

(i) 17.27 ton/ac.
(ii) (a) 14.48 ton/ac.
(b) 3.31 ton/ac.

(iii) Sub-plot treatment effect is highly significant, while main-plot treatment effect and interaction between main-plots x sub-plots are not significant.

(iv) Av. yield of stripped cane in ton/ac.

<table>
<thead>
<tr>
<th></th>
<th>( P_0 )</th>
<th>( P_1 )</th>
<th>Mean</th>
<th>( V_1 )</th>
<th>( V_2 )</th>
</tr>
</thead>
<tbody>
<tr>
<td>( N_0 )</td>
<td>15.77</td>
<td>13.80</td>
<td>14.79</td>
<td>15.76</td>
<td>13.81</td>
</tr>
<tr>
<td>( N_1 )</td>
<td>19.13</td>
<td>19.36</td>
<td>19.25</td>
<td>20.29</td>
<td>18.21</td>
</tr>
<tr>
<td>( N_2 )</td>
<td>16.36</td>
<td>19.77</td>
<td>18.07</td>
<td>18.41</td>
<td>17.72</td>
</tr>
<tr>
<td>( N_3 )</td>
<td>18.49</td>
<td>15.43</td>
<td>16.96</td>
<td>18.47</td>
<td>15.45</td>
</tr>
<tr>
<td>Mean</td>
<td>17.44</td>
<td>17.09</td>
<td>17.27</td>
<td>18.23</td>
<td>16.30</td>
</tr>
<tr>
<td>( V_1 )</td>
<td>18.23</td>
<td>18.26</td>
<td>18.23</td>
<td></td>
<td></td>
</tr>
<tr>
<td>( V_2 )</td>
<td>16.68</td>
<td>15.92</td>
<td>16.30</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

S.E. of difference of two
- \( V \) marginal means = 3.62 ton/ac.
- \( N \) marginal means = 1.17 ton/ac.
- \( P \) marginal means = 0.83 ton/ac.
- \( N \) means at the same level of \( V \) = 1.66 ton/ac.
- \( V \) means at the same level of \( N \) = 3.71 ton/ac.
- \( P \) means at the same level of \( V \) = 1.17 ton/ac.
- \( V \) means at the same level of \( P \) = 3.89 ton/ac.
- means in body of N x P table = 1.65 ton/ac.

---

Crop -> Sugarcane.
Object -> To find out suitable spacing and seed rate for Sugarcane crop.

1. BASAL CONDITIONS:

(i) (a) Nil. (b) N.A. (c) N.A. (ii) (a) Loam. (b) N.A. (iii) 29.9.1948. (iv) (a) 1 raja plough, 4 desi and 5 sohaga. (b) N.A. (c) and (d) As per treatments. (e) N.A. (v) N.A. (vi) CO.313 (medium). (vii) Irrigated. (viii) 2-3 hoeings and 1 ridging. (ix) 27.27'. (x) 18.2.1949, 23.3.1949 and 1.4.1949.
2. **TREATMENTS:**

All combinations of (1) and (2)

(1) 3 seed rates: R<sub>1</sub> = 20,000, R<sub>2</sub> = 30,000 and R<sub>3</sub> = 40,000 set/t ha.

(2) 2 spacings: S<sub>1</sub> = 1' and S<sub>2</sub> = 2' row to row.

3. **DESIGN:**

(i) 3 x 2 Fact. in R.B.D. 
(ii) (a) 6. 
(b) N.A. 
(iii) 6. 
(iv) (a) 82.5' x 12'. 
(b) 72.6' x 12'. 
(v) N.A. 
(vi) Yes.

4. **GENERAL:**

(i) Germination satisfactory and growth normal. No lodging. 
(ii) Slight attack of stem borer. No control measures taken. 
(iii) Stripped cane yield. 
(iv) (a) Not contd. (b) —. 
(c) —. 
(v) (a) No. (b) —. 
(vi) and (vii) Nil.

5. **RESULTS:**

(i) 9.66 ton/ac. 
(ii) 1.19 ton/ac. 
(iii) None of the effects is significant. 
(iv) Av. yield of stripped cane in ton/ac.

<table>
<thead>
<tr>
<th></th>
<th>S&lt;sub&gt;1&lt;/sub&gt;</th>
<th>S&lt;sub&gt;2&lt;/sub&gt;</th>
<th>Mean</th>
</tr>
</thead>
<tbody>
<tr>
<td>R&lt;sub&gt;1&lt;/sub&gt;</td>
<td>9.28</td>
<td>9.33</td>
<td>9.31</td>
</tr>
<tr>
<td>R&lt;sub&gt;2&lt;/sub&gt;</td>
<td>9.08</td>
<td>9.94</td>
<td>9.51</td>
</tr>
<tr>
<td>R&lt;sub&gt;3&lt;/sub&gt;</td>
<td>9.83</td>
<td>10.48</td>
<td>10.16</td>
</tr>
<tr>
<td>Mean</td>
<td>9.40</td>
<td>9.92</td>
<td>9.66</td>
</tr>
</tbody>
</table>

S.E. of marginal mean of R = 0.34 ton/ac.
S.E. of marginal mean of S = 0.28 ton/ac.
S.E. of body of table = 0.49 ton/ac.

---

**Crop:** Sugarcane.  
**Site:** Sugarcane Sub. Strn. Gurdaspur.  
**Ref:** Pb. 49(53).  
**Type:** ‘C’.

Object — To find out the optimum depth of sowing Sugarcane.

1. **BASAL CONDITIONS:**

(i) (a) Nil. (b) N.A. (c) Nil. 
(ii) (a) Loamy. (b) N.A. 
(iii) 24.3.1949. 
(iv) (a) 4 ploughings and 5 sodhaga. 
(b) to (e) N.A. 
(v) 30 C.L./ac. of F.Y.M. (vi) CO.K. 30 (medium). 
(vii) Irrigated. 
(viii) N.A. (ix) 27.78. 
(x) 14.1.1950.

2. **TREATMENTS:**

4 depths of sowing: 
S<sub>1</sub> = 2.5', S<sub>2</sub> = 3', S<sub>3</sub> = 3.5' and S<sub>4</sub> = 4' depth.

3. **DESIGN:**

(i) R.B.D. 
(ii) (a) 4. 
(b) N A. 
(iii) 2. 
(iv) (a) N.A. 
(b) 16' x 70.5'. 
(v) N.A. 
(vi) Yes.

4. **GENERAL:**

(i) Satisfactory. No lodging. 
(ii) Nil. 
(iii) Stripped cane yield. 
(iv) (a) Not contd. (b) —. 
(c) —. 
(v) (a) No. (b) —. 
(vi) and (vii) Nil.

5. **RESULTS:**

(i) 34.39 ton/ac.  
(ii) 1.33 ton/ac.  
(iii) Treatment differences are not significant.
Av. yield of stripped cane in ton/ac.

<table>
<thead>
<tr>
<th>Treatment</th>
<th>Av. yield</th>
</tr>
</thead>
<tbody>
<tr>
<td>S₁</td>
<td>34.53</td>
</tr>
<tr>
<td>S₂</td>
<td>33.18</td>
</tr>
<tr>
<td>S₃</td>
<td>34.14</td>
</tr>
<tr>
<td>S₄</td>
<td>35.72</td>
</tr>
<tr>
<td>S.E./mean</td>
<td>= 0.94 ton/ac.</td>
</tr>
</tbody>
</table>

Crop: Sugarcane.
Site: Sugarcane Sub-Stn., Gurdaspur.

Ref: Pb. 49 (55).
Type: 'C'.

Object: To study the effect of different seed rates and spacing on Sugarcane yield.

1. BASAL CONDITIONS:

2. TREATMENTS:
   All combinations of (1) and (2)
   (1) 3 seed rates: R₁ = 20,000, R₂ = 30,000 and R₃ = 40,000 setts/ac.
   (2) 2 spacings: S₁ = 1' and S₂ = 2' apart.

3. DESIGN:
   (i) 3 × 2 Fact. in R.B.D. (ii) (a) 6. (b) N.A. (iii) 6. (iv) (a) 16' × 30'. (b) 16' × 68.06'. (v) N.A. (vi) Yes.

4. GENERAL:
   (i) Satisfactory. (ii) Nil. (iii) Stripped sugarcane. (iv) (a) Not contd. (b) and (c) No. (v) (a) and (b) No. (vi) and (vii) Nil.

5. RESULTS:
   (i) 23.60 ton/ac.
   (ii) 1.812 ton/ac.
   (iii) None of the effects is significant.
   (iv) Av. yield of stripped cane in ton/ac.

<table>
<thead>
<tr>
<th></th>
<th>R₁</th>
<th>R₂</th>
<th>R₃</th>
<th>Mean</th>
</tr>
</thead>
<tbody>
<tr>
<td>S₁</td>
<td>22.89</td>
<td>23.94</td>
<td>23.60</td>
<td>23.48</td>
</tr>
<tr>
<td>S₂</td>
<td>23.42</td>
<td>23.25</td>
<td>24.50</td>
<td>23.72</td>
</tr>
<tr>
<td>Mean</td>
<td>23.16</td>
<td>23.60</td>
<td>24.05</td>
<td>23.60</td>
</tr>
</tbody>
</table>

S.E. of marginal mean of R = 0.523 ton/ac,
S.E. of marginal mean of S = 0.427 ton/ac,
S.E. of body of table = 0.740 ton/ac.

Crop: Sugarcane.
Site: Sugarcane Sub-Stn., Gurdaspur.

Ref: Pb. 53(274).
Type: 'C'.

Object: To find the optimum time for planting Sugarcane crop.

1. BASAL CONDITIONS:
   (i) (a) Kharif fodder—Senji—Sugarcane. (b) Senji. (c) Nil. (ii) (a) Loam. (b) N.A. (iii) As per treatments. (iv) (a) 4 desi hal, 1 bar harrow and 5 sohaga. (b) By hand. (c) 32,000 setts/ac. (d) Row to row 2'. (e) One sett of two buds. (v) F.Y.M. at 10 C.L./ac. on 26.2.1953 and A/S at 80 lb/ac. of N on 13.18.6.1954. (vi) CO.312. (vii) Irrigated. (viii) 3 hoeings. (ix) 37.46°. (x) 1st and 2nd treatments harvested in 3rd and 4th week of December 1954, 3rd in last week of November 1954 and 4th in 1st week of January 1955.
2. TREATMENTS:
1. October planting after fallow with masser 24, 25.10.1953.
2. October planting after fallow without masser 24, 25.10.1953.
4. April planting after fallow 30.4.1954.
5. April planting after masser 30.4.1954.
6. April planting after wheat 30.4.1954.

3. DESIGN:
(i) R.B.D. (ii) (a) 6. (b) N.A. (iii) 4. (iv) (a) 20' x 78' (b) 20' x 62'. (v) N.A. (vi) Yes.

4. GENERAL:
(i) Normal. (ii) N.A. (iii) Sugarcane yield. (iv) (a) 1953-54. (b) and (c) No. (v) (a) and (b) No. (vi) and (vii) Nil.

5. RESULTS:
(i) 29.59 ton/ac.
(ii) 2.71 ton/ac.
(iii) Treatment differences are highly significant.
(iv) Average yield of sugarcane in ton/ac.

<table>
<thead>
<tr>
<th>Treatment</th>
<th>Av. yield</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>29.59</td>
</tr>
<tr>
<td>2.</td>
<td>33.22</td>
</tr>
<tr>
<td>3.</td>
<td>34.07</td>
</tr>
<tr>
<td>4.</td>
<td>28.97</td>
</tr>
<tr>
<td>5.</td>
<td>27.47</td>
</tr>
<tr>
<td>6.</td>
<td>24.24</td>
</tr>
</tbody>
</table>

S.E./mean = 1.36 ton/ac.

Crop :- Sugarcane.
Site :- Sugarcane Res. Stn., Jullundur.
Ref :- Pb. 48(30).
Type :- 'C'.

Object :- To study the effect of different spacings and depths of sowing on yield of Sugarcane.

1. BASAL CONDITIONS:
(i) (a) Nil. (b) N.A. (c) Nil. (d) Loamy. (e) Refer soil analysis, Jullundur. (iii) N.A. (iv) (a) to (c) N.A. (d) As per treatments. (e) N.A. (v) N.A. (vi) N.A. (vii) Irrigated. (viii) N.A. (ix) 26.44°. (x) N.A.

2. TREATMENTS:
1. Sowing 1' apart on flat.
2. Sowing 2' apart on flat and ridge.
3. Sowing 2' apart in 6' deep trenches.
4. Sowing 2' apart in 1' deep trenches.
5. Sowing 3' apart on flat and ridge.
6. Sowing 3' apart in 6' deep trenches.
7. Sowing 3' apart in 1' deep trenches.

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

4. GENERAL:
(i) Satisfactory. Slight lodging. (ii) Attack of white-ants. (iii) Sugarcane yield. (iv) (a) 1948 to 1949. (b) No. (c) Nil. (v) a) No. (b) --. (vii) and (viii) Nil.

5. RESULTS:
(i) 30.40 ton/ac.
(ii) N.A.
(iii) N.A.
(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>30.83</td>
</tr>
<tr>
<td>2.</td>
<td>32.85</td>
</tr>
<tr>
<td>3.</td>
<td>28.88</td>
</tr>
<tr>
<td>4.</td>
<td>31.37</td>
</tr>
<tr>
<td>5.</td>
<td>29.09</td>
</tr>
<tr>
<td>6.</td>
<td>30.24</td>
</tr>
<tr>
<td>7.</td>
<td>29.83</td>
</tr>
</tbody>
</table>

S.E./mean = N.A.

Crop: - Sugarcane.

Site: - Sugarcane Res. Stn., Jullundur.

Object: - To study the effect of different spacings and depths of sowing on yield of Sugarcane.

1. BASAL CONDITIONS:
   (i) (a) Nil. (b) N.A. (c) Nil. (ii) (a) Loamy. (b) Refer soil analysis, Jullundur. (iii) N.A. (iv) (a) to (e) N.A. (v) N.A. (vi) N.A. (vii) Irrigated. (viii) N.A. (ix) 18.57°. (x) N.A.

2. TREATMENTS:
   1. Sowing 1' apart on flat.
   2. Sowing 2' apart on flat and ridge.
   3. Sowing 2' apart ordinary trenches.
   4. Sowing 2' apart 1' deep trenches.
   5. Sowing 3' apart on flat and ridge.
   6. Sowing 3' apart ordinary trenches.
   7. Sowing 3' apart 1' deep trenches.

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

4. GENERAL:
   (i) Fair. Slight lodging. (ii) Nil. (iii) Sugarcane yield. (iv) (a) 1948 to 1949. (b) No. (c) Nil. (v) (a) No. (b) — (vi) and (vii) Nil.

5. RESULTS:
   (i) 27.96 ton/ac.
   (ii) N.A.
   (iii) N.A.
   (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>30.00</td>
</tr>
<tr>
<td>2.</td>
<td>30.64</td>
</tr>
<tr>
<td>3.</td>
<td>29.87</td>
</tr>
<tr>
<td>4.</td>
<td>25.04</td>
</tr>
<tr>
<td>5.</td>
<td>28.47</td>
</tr>
<tr>
<td>6.</td>
<td>28.88</td>
</tr>
<tr>
<td>7.</td>
<td>22.83</td>
</tr>
</tbody>
</table>

S.E./mean = N.A.
Crop : Sugarcane.  
Site : Sugarcane Res. Stn., Jullundur.  
Object : To study the effect of different cultural practices on yield of Sugarcane.

1. BASAL CONDITIONS:
   (i) (a) Nil.  (b) N.A.  (c) Nil.  (ii) (a) Loamy.  (b) Refer soil analysis, Jullundur.  (iii) N.A.  (iv) (a) to (e) N.A.  (v) N.A.  (vi) N.A.  (vii) Irrigated.  (viii) As per treatments.  (ix) 50.12°.  (x) N.A.

2. TREATMENTS:
   1. Control.
   2. Weeding alone.
   3. 5 hand hoeings.
   4. 5 bullock hoeings.

3. DESIGN:
   (i) R.B.D.  (ii) (a) 4.  (b) N.A.  (iii) 5.  (iv) (a) N.A.  (b) 1/40th ac.  (v) N.A.  (vi) Yes.

4. GENERAL:
   (i) Good. No lodging.  (ii) Nil.  (iii) Sugarcane yield, germination and no. of matured canef.  (iv) (a) 1950-1951.  (b) -.  (c) -.  (v) (a) No.  (b) -.  (vi) and (vii) Nil.

5. RESULTS:
   (i) 34.81 ton/ac.
   (ii) 4.74 ton/ac.
   (iii) Treatments are not significantly different.
   (iv) A v. yield of sugarcane in ton/ac.
<table>
<thead>
<tr>
<th>Treatment</th>
<th>Av. yield</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>20.28</td>
</tr>
<tr>
<td>2.</td>
<td>38.73</td>
</tr>
<tr>
<td>3.</td>
<td>40.33</td>
</tr>
<tr>
<td>4.</td>
<td>39.91</td>
</tr>
<tr>
<td>S.E./mean</td>
<td>2.12 ton/ac.</td>
</tr>
</tbody>
</table>

Crop : Sugarcane.  
Site : Sugarcane Res. Stn., Jullundur.  
Object : To study the effect of planting two-budded and three-budded setts on yield of Sugarcane.

1. BASAL CONDITIONS:
   (i) (a) Nil.  (b) N.A.  (c) Nil.  (ii) (a) Loamy.  (b) Refer soil analysis, Jullundur.  (iii) N.A.  (iv) (a) to (e) N.A.  (v) N.A.  (vi) CO. L. 9 (medium).  (vii) Irrigated.  (viii) N.A.  (ix) 50.12°.  (x) N.A.

2. TREATMENTS:
   1. Planing two budded setts.
   2. Planing three budded setts.

3. DESIGN:
   (i) Paired. plot.  (ii) (a) 2.  (b) N.A.  (iii) 6.  (iv) (a) N.A.  (b) 1/40th ac.  (v) Nil.  (vi) Yes.

4. GENERAL:
   (i) Normal. No lodging.  (ii) Nil.  (iii) Sugarcane yield, germination and sugarcane count.  (iv) (a) 1950-1951.  (b) -.  (c) -.  (v) (a) No.  (b) -.  (vi) and (vii) Nil.

5. RESULTS:
   (i) 25.69 ton/ac.
   (ii) N.A.
   (iii) Treatments are not significantly different.
Crop :- Sugarcane.  
Site :- Sugarcane Res. Stn., Jullundur.  
Ref :- Pb. 51(38).  
Type :- 'C'.

Object :- To study the effect of planting two-budded and three-budded setts on yield of Sugarcane.

1. BASAL CONDITIONS:
   (i) (a) Nil. (b) Fallow. (c) Nil. (ii) (a) Loam, (b) Refer soil analysis, Jullundur. (iii) 21.4.1951. (iv) (a) 6 ploughings and 8 sohaga. (b) N.A. (c) (1) 40,000 setts/ac. (d) and (e) N.A. (v) Two doses each of 70 lb./ac. of N as A/S applied on 18.6.1951 and 13.7.1951. (vi) CO.L.9 (medium). (vii) Irrigated. (viii) 4 hoeings and 2 tying ups. (ix) 17.98'. (x) 19.2.1952 and 7.3.1952.

2. TREATMENTS:
   Crop sown with
   1. Two-budded setts.  
   2. Three-budded setts.

3. DESIGN:
   (i) Paired-pilot. (ii) (a) 2. (b) N.A. (iii) 5. (iv) (a) and (b) 90'-12' x 12'. (v) Nil. (vi) Yes.

4. GENERAL:
   (i) Satisfactory. No lodging. (ii) Nil. (iii) Sugarcane yield. (iv) (a) 1950-1951. (b)-. (c)-. (v) (a) No. (b)-. (vi) and (vii) Nil.

5. RESULTS:
   (i) 16.08 ton/ac.  
   (ii) 1.45 ton/ac.  
   (iii) Treatments are not significantly different.  
   (iv) Av. yield of sugarcane in ton/ac.

<table>
<thead>
<tr>
<th>Treatment</th>
<th>Av. yield</th>
<th>S.E./mean</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>16.41</td>
<td>0.65</td>
</tr>
<tr>
<td>2.</td>
<td>15.75</td>
<td></td>
</tr>
</tbody>
</table>

Crop :- Sugarcane.  
Site :- Sugarcane Res. Stn., Jullundur.  
Ref :- Pb. 51(48).  
Type :- 'C'.

Object :- To study the effect of burying cane before frost (end of Nov.) on germination and yield of Sugarcane.

1. BASAL CONDITIONS:
   (i) (a) Nil. (b) Fallow. (c) Nil. (ii) (a) Sandy loam. (b) Refer soil analysis, Jullundur. (iii) 20.4.1951. (iv) (a) 8 desh hal and 6 sohaga. (b) N.A. (c) 40,000 setts/ac. (d) 2' row to row. (e) N.A. (v) N.A. (vi) CO.L.9 (medium). (vii) Irrigated. (viii) N.A. (ix) 17.98'. (x) 20,22.12.1951.

2. TREATMENTS:
   All possible combinations of (1) and (2)
   (1) Portions planted : C1 = Top, C2 = Middle and C3 = Bottom.  
   (2) Methods : S1 = Buried, S2 = Fresh and S3 = Fresh soaked.
3. DESIGN:
(i) 3 x 3 Fact. in R.B.D. (ii) (a) 9. (b) N.A. (iii) 4. (iv) (a) and (b) 8' x 24'. (v) Nil. (vi) Yes.

4. GENERAL:
(i) N.A. (ii) N.A. (iii) Stripped cane yield. (iv) (a) 1950 to 1952. (b) No. (c) Nil. (v) (a) No. (b)—. (vi) and (vii) Nil.

5. RESULTS:
(i) 8.62 ton/ac. (ii) 2.05 ton/ac. (iii) Main effect of S is highly significant. Interaction C x S is significant. (iv) Av. yield of sugarcane in ton/ac.

<table>
<thead>
<tr>
<th></th>
<th>C₁</th>
<th>C₂</th>
<th>C₃</th>
<th>Mean</th>
</tr>
</thead>
<tbody>
<tr>
<td>S₁</td>
<td>8.48</td>
<td>12.08</td>
<td>9.79</td>
<td>10.12</td>
</tr>
<tr>
<td>S₂</td>
<td>6.25</td>
<td>7.61</td>
<td>7.03</td>
<td>6.96</td>
</tr>
<tr>
<td>S₃</td>
<td>8.18</td>
<td>6.88</td>
<td>11.25</td>
<td>8.77</td>
</tr>
</tbody>
</table>

S.E. of any marginal mean = 0.59 ton/ac.
S.E. of body of table = 1.03 ton/ac.

Object: To study the effect of burying cane before frost (end of Nov.) on germination and yield of Sugarcane.

1. BASAL CONDITIONS:
(i) (a) Nil. (b) 'Fallow. (c) Nil. (ii) (a) Loam. (b) Refer soil analysis, Jullundur. (iii) 4.4.1952. (iv) (a) 3 dest hal, 6 sohaga and 1 roller. (b) to (e) N.A. (v) 8 ton/ac. of F.Y.M. on 13.3.1952. (vi) CO.L.9 (medium). (vii) Irrigated. (viii) 2 hoeings, 1 earthing up and twice tying up. (ix) 36.61'. (x) 11.1.1953.

2. TREATMENTS:
All combinations of (1) and (2)
(1) Portions planted: C₁ = Top, C₂ = Middle and C₃ = Bottom.
(2) 3 methods: S₁ = Buried, S₂ = Fresh and S₃ = Fresh soaked.

3. DESIGN:
(i) 3 x 3 Fact. in R.B.D. (ii) (a) 9. (b) N.A. (iii) 3. (iv) (a) and (b) 8' x 24'. (v) Nil. (vi) Yes.

4. GENERAL:
(i) Normal. No lodging. (ii) Nil. (iii) Stripped cane yield. (iv) (a) 1950 to 1952. (b) and (c) No. (v) (a) and (b) No. (vi) and (vii) Nil.

5. RESULTS:
(i) 14.92 ton/ac. (ii) 3.60 ton/ac. (iii) Treatments are not significantly different. (iv) Av. yield of stripped cane in ton/ac.

<table>
<thead>
<tr>
<th></th>
<th>C₁</th>
<th>C₂</th>
<th>C₃</th>
<th>Mean</th>
</tr>
</thead>
<tbody>
<tr>
<td>S₁</td>
<td>13.89</td>
<td>20.49</td>
<td>14.79</td>
<td>16.39</td>
</tr>
<tr>
<td>S₂</td>
<td>14.38</td>
<td>12.02</td>
<td>14.79</td>
<td>13.73</td>
</tr>
<tr>
<td>S₃</td>
<td>13.54</td>
<td>10.70</td>
<td>19.72</td>
<td>14.65</td>
</tr>
</tbody>
</table>

Mean 13.94 14.40 16.43 14.92
S.E. of any marginal mean = 1.20 ton/ac.
S.E. of body of table = 2.08 ton/ac.

Ref: Pb. 52(121). Type: 'C'.

Crop: Sugarcane.  
Site: Sugarcane Res. Stn., Jullundur

Object: To study the effect of seasonal planting of Sugarcane on its yield.

1. BASAL CONDITIONS:
   (i) (a) Nil. (b) N.A. (c) Nil. (ii) (a) Loamy. (b) Refer soil analysis, Jullundur. (iii) As per treatments. (iv) (a) to (e) N.A. (v) N.A. (vi) CO-312 (medium). (vii) Irrigated. (viii) N.A. (ix) 50.12". (x) N.A.

2. TREATMENTS:
   1. Planted in October 1949.
   2. Planted in December 1949.

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

4. GENERAL:
   (i) Satisfactory. No lodging. (ii) Nil. (iii) No. of matured canes/ac., juice analysis and yield of sugarcane. (iv) (a) 1950—1953 (continued with modifications after 1950). (b) and (c) N.O. (v) (a) and (b) No. (vi) and (vii) Nil.

5. RESULTS:
   (i) 37.91 ton/ac.
   (ii) N.A.
   (iii) Treatments are not significantly different.
   (iv) Av. yield of stripped cane in ton/ac:

<table>
<thead>
<tr>
<th>Treatment</th>
<th>Av. yield</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>37.66</td>
</tr>
<tr>
<td>2.</td>
<td>38.56</td>
</tr>
<tr>
<td>3.</td>
<td>37.50</td>
</tr>
<tr>
<td>S.E./mean</td>
<td>N.A.</td>
</tr>
</tbody>
</table>

Crop: Sugarcane.  
Site: Sugarcane Res. Stn., Jullundur

Object: To study the effect of different dates of planting of Sugarcane on its yield.

1. BASAL CONDITIONS:
   (i) (a) Nil. (b) Fallow. (c) Nil. (ii) (a) Loam. (b) Refer soil analysis, Jullundur. (iii) As per treatments. (iv) (a) to (e) N.A. (v) 18 trucks of F.Y.M. to supply 200 lb./ac. of N. (vi) CO. 312 (medium). (vii) Irrigated. (viii) N.A. (ix) 17.98". (v) N.A.

2. TREATMENTS:
   8 dates of planting:
   1. 12th March 1951.
   2. 22nd March 1951.
   3. 20th April 1951.
   4. 28th April 1951.
   5. 23rd Sept. 1951.
   6. 28th Sept. 1951.
   7. 16th Dec. 1951.
   8. 26th Dec. 1951.

3. DESIGN:
   (i) R.B.D. (ii) (a) 8. (b) N.A. (iii) 5. (iv) (a) and (b) 12'×9'—9". (v) Nil. (vi) Yes.

4. GENERAL:
   (i) Fair. No lodging. (ii) N.A. (iii) Yield of sugarcane. (iv) (a) 1950—1953. (b) No. (c) Nil. (v) (a) No. (b)—. (vi) and (vii) Nil.
RESULTS:
(i) 20.66 ton/ac.
(ii) 2.35 ton/ac.
(iii) Treatments differ highly significantly.
(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>19.69</td>
</tr>
<tr>
<td>2.</td>
<td>18.84</td>
</tr>
<tr>
<td>3.</td>
<td>17.02</td>
</tr>
<tr>
<td>4.</td>
<td>14.28</td>
</tr>
<tr>
<td>5.</td>
<td>27.62</td>
</tr>
<tr>
<td>6.</td>
<td>24.91</td>
</tr>
<tr>
<td>7.</td>
<td>26.46</td>
</tr>
<tr>
<td>8.</td>
<td>16.48</td>
</tr>
</tbody>
</table>

S.E./mean = 1.05 ton/ac.

Crop :- Sugarcane.
Site :- Sugarcane Res. Stn., Jullundur.
Ref :- Pb. 52(124).
Type :- 'C'.

Object :- To study the effect of different dates of planting of Sugarcane on its yield.

1. BASAL CONDITIONS:
   (i) (a) Wheat-Kharif fodder-Sugarcane. (b) Kharif fodder. (c) No. (ii) (a) Loam. (b) Refer soil analysis, Jullundur. (iii) As per treatments. (iv) (a) 4 desi hal, 1 hindustan hal and 4 sohaga. (b) to (e) N.A.
   (v) 35 C.L. of F.Y.M. as basal dressing. (vi) CO. 312 (medium). (vii) Irrigated. (viii) 4 hoeings, 2 to 3 tying up and 1 earthing up. (ix) 69.01' (from March 1952 to Jan. 1954). (x) 17.2.1954.

2. TREATMENTS:
   8 dates of planting :
   1. 10th March 1952.
   2. 18th March 1952.
   3. 12th April 1952.
   4. 22nd April 1952.
   5. 15th Sept. 1952.
   6. 22nd Sept. 1952.
   7. 10th Dec. 1952.
   8. 22nd Dec. 1952.

3. DESIGN:
   (i) R.B.D. (ii) (a) 8. (b) N.A. (iii) 5. (iv) (a) N.A. (b) 1/40th ac. (v) N.A. (vi) Yes.

4. GENERAL:
   (i) Good. No lodging. (ii) Nil. (iii) Yield of sugarcane. (iv) (a) 1950—1953. (b) No. (c) Nil. (v) (a) Nil. (b) Nil. (vi) and (vii) Nil.

5. RESULTS:
   (i) 30.13 ton/ac.
   (ii) 2.18 ton/ac.
   (iii) Treatments differ highly significantly.
   (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>33.22</td>
</tr>
<tr>
<td>2.</td>
<td>30.94</td>
</tr>
<tr>
<td>3.</td>
<td>25.08</td>
</tr>
<tr>
<td>4.</td>
<td>19.15</td>
</tr>
<tr>
<td>5.</td>
<td>36.98</td>
</tr>
<tr>
<td>6.</td>
<td>29.49</td>
</tr>
<tr>
<td>7.</td>
<td>35.22</td>
</tr>
<tr>
<td>8.</td>
<td>30.94</td>
</tr>
</tbody>
</table>

S.E./mean = 0.97 ton/ac.
Crop: Sugarcane.
Site: Sugarcane Res. Stn., Jullundur.
Object: To study the effect of different dates of planting of Sugarcane on its yield.

1. BASAL CONDITIONS:
   (i) (a) Wheat-kharif fodder-Sugarcane. (b) Kharif fodder. (c) Nil. (ii) (a) Loam. (b) Refer soil analysis, Jullundur. (iii) As per treatments. (iv) (a) 5 desi hal, 6 sohaga, 1 hindustan plough and 2 horse hoe. (b) N.A. (c) 37,000 sett/ac. (d) and (e) N.A. (v) 32 C.L. of F.Y.M. on 14.9.1953. (vi) CO.312 (medium). (vii) Irrigated. (viii) 5 hoeings. (ix) 32.8°. (x) 8.4.1955.

2. TREATMENTS:
   8 dates of planting:—
   1. 8th March 1953.
   2. 25th March 1953.
   3. 10th April 1953.
   4. 26th April 1953.
   5. 14th Sept. 1953.
   7. 8th Dec. 1953.
   8. 23rd Dec. 1953.

3. DESIGN:
   (i) R.B.D. (ii) 8. (iii) 5. (iv) (a) and (b) 99.75'x12'. (v) Nil. (vi) Yes.

4. GENERAL:
   (i) Germination satisfactory. No lodging. (ii) 14 lb. B.H.C. used for Sept. planted canes against white ants on 28.9.1953. (iii) Yield of sugarcane. (iv) (a) 1950 to 1953. (b) No. (c) Nil. (v) (a) No. (b) —. (vi) and (vii). Nil.

5. RESULTS:
   (i) 25.42 ton/ac.
   (ii) 2.79 ton/ac.
   (iii) Treatments differ highly significantly.
   (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>28.21</td>
</tr>
<tr>
<td>2.</td>
<td>27.53</td>
</tr>
<tr>
<td>3.</td>
<td>19.72</td>
</tr>
<tr>
<td>4.</td>
<td>17.22</td>
</tr>
<tr>
<td>5.</td>
<td>28.01</td>
</tr>
<tr>
<td>6.</td>
<td>29.69</td>
</tr>
<tr>
<td>7.</td>
<td>27.61</td>
</tr>
<tr>
<td>8.</td>
<td>25.33</td>
</tr>
<tr>
<td>S.E./mean</td>
<td>~1.25 ton/ac.</td>
</tr>
</tbody>
</table>

Crop: Sugarcane.
Site: Sugarcane Res. Stn., Jullundur.
Object: To find out the optimum seed rate for planting Sugarcane.

1. BASAL CONDITIONS:
   (i) (a) Wheat-kharif fodder-Fallow-Sugarcane. (b) Fallow. (c) Nil. (ii) (a) Loam. (b) Refer soil analysis, Jullundur. (iii) 8.3.1953. (iv) (a) 4 desi hal, 2 sohaga and 2 tractor. (b) N.A. (c) As per treatments. (d) and (e) N.A. (v) 200 md/ac. of F.Y.M. (vi) CO.L.9 (medium). (vii) Irrigated. (viii) 6 hoeings and 1 earthing up. (ix) 32.8°. (x) 17/1.1954.

2. TREATMENTS:
   3 seed rates:—
   1. 20,000 sett/ac.
   2. 30,000 sett/ac.
   3. 40,000 sett/ac.
3. DESIGN:
(i) R.B.D. (ii) 3. (b) N.A. (iii) 3. (iv) (a) and (b) 1/40th ac. (v) No. (vi) Yes.

4. GENERAL:
(i) Good. No lodging. (ii) Nil. (iii) Yield of sugarcane. (iv) (a) 1953—contd. (b) No. (c) Nil. (v) (a) No. (b) —. (vi) and (vii) Nil.

5. RESULTS:
(i) 22.00 ton/ac.
(ii) 1.19 ton/ac.
(iii) Treatments are significantly different.
(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>20.39</td>
</tr>
<tr>
<td>2.</td>
<td>22.57</td>
</tr>
<tr>
<td>3.</td>
<td>23.03</td>
</tr>
<tr>
<td>S.E./mean</td>
<td>0.60 ton/ac.</td>
</tr>
</tbody>
</table>

---

Crop: Sugarcane. Ref: Pb. 50(59).
Site: Sugarcane Sub-Stn., Gurdaspur. Type: ‘CV’.

Object:—To study the effect of variation in number of buds/sett on yield of Sugarcane.

1. BASAL CONDITIONS:
(i) (a) Nil. (b) N.A. (c) Nil. (ii) (a) Loam. (b) N.A. (iii) 3.4.1950. (iv) (a) to (e) N.A. (v) 10 C.L./ac. of F.Y.M. and 2 md. and 4 sr. of A/S on 30.5.1950. (vi) As per treatments. (vii) Irrigated. (viii) N.A. (ix) 55.33°. (x) 13.3.1951.

2. TREATMENTS:
All combinations of (1) and (2)
(1) 2 kinds of setts: \( S_1 = 1\)-budded and \( S_2 = 2\)-budded.
(2) 2 varieties: \( V_1 = \text{CO. 312 (medium)} \) and \( V_2 = \text{CO.K. 30 (medium)} \).

3. DESIGN:
(i) 2×2 Fact. in R.B.D. (ii) 4. (b) N.A. (iii) 6. (iv) (a) and (b) 24′x46′. (v) Nil. (vi) Yes.

4. GENERAL:
(i) No lodging. (ii) N.A. (iii) Yield of sugarcane. (iv) (a) No. (b) —. (c) —. (v) (a) Nil. (b) —. (vi) and (vii) Nil.

5. RESULTS:
(i) 30.21 ton/ac.
(ii) 3.57 ton/ac.
(iii) Treatments are not significantly different.
(iv) Av. yield of sugarcane in ton/ac.

<table>
<thead>
<tr>
<th></th>
<th>( S_1 )</th>
<th>( S_2 )</th>
<th>Mean</th>
</tr>
</thead>
<tbody>
<tr>
<td>( V_1 )</td>
<td>29.69</td>
<td>33.22</td>
<td>31.46</td>
</tr>
<tr>
<td>( V_2 )</td>
<td>28.57</td>
<td>29.35</td>
<td>28.96</td>
</tr>
</tbody>
</table>

Mean 29.13 31.29 30.21

S.E. of any marginal mean = 1.03 ton/ac.
S.E. of body of table = 1.46 ton/ac.
Crop : Sugarcane.
Site : Sugarcane Sub-Stn., Gurdaspur.
Ref :— Pb. 51(109).
Type :— 'CV'.

Object :—To study the effect of variation in number of buds/sett on yield of Sugarcane.

1. BASAL CONDITIONS :
   (i) (a) Nil. (b) N.A. (c) Nil. (ii) (a) Loamy. (b) N.A. (iii) 2.4.1951. (iv) (a) 4 ploughings and 5 sowing of F.Y.M. 
   (b) N.A. (c) 3600 sets/ac. (2-budded) ; 24000 sett/ac. (3-budded), (d) and (e) N.A. (v) 44 C.L./ac. of F.Y.M. ; A/S at 40 lb./ac. of N on 28.5.1951 and at 30 lb./ac. of N on 5.7.1951. (vi) As per treatments. 

2. TREATMENTS :
   All combinations of (1) and (2) 
   (1) 2 kinds of setts : S1=2-budded and S2=3-budded. 
   (2) 2 varieties : V1=CO. 312 (medium) and V2=CO.K. 30 (medium).

3. DESIGN :
   (i) 2x2 Fact. in R.B.D. (ii) (a) 4, (b) N.A. (iii) 10. (iv) (a) 16'x63', (b) 1/50 ac. (v) N.A. (vi) Yes.

4. GENERAL :
   (i) Satisfactory. No lodging. (ii) Nil. (iii) Yield of sugarcane. (iv) (a) No. (b)—, (c)—. (v) (a) No. (b)—, (vi) and (vii) Nil.

5. RESULTS :
   (i) 23.03 ton/ac.
   (ii) 2.077 ton/ac.
   (iii) None of the effects is significant.
   (iv) Av. yield of sugarcane in ton/ac.

<table>
<thead>
<tr>
<th></th>
<th>S1</th>
<th>S2</th>
<th>Mean</th>
</tr>
</thead>
<tbody>
<tr>
<td>V1</td>
<td>22.75</td>
<td>23.46</td>
<td>23.11</td>
</tr>
<tr>
<td>V2</td>
<td>22.71</td>
<td>23.18</td>
<td>22.95</td>
</tr>
<tr>
<td>Mean</td>
<td>22.73</td>
<td>23.32</td>
<td>23.03</td>
</tr>
</tbody>
</table>

S.E. of any marginal mean =0.465 ton/ac. 
S.E. of body of table =0.657 ton/ac.

---

Crop : Sugarcane.
Site : Sugarcane Res. Stn., Jullundur.
Ref :- Pb. 51 (45).
Type :- 'CV'.

Object :—To study the effect of sowing setts with and without trash and some cultural treatments on germination and yield of Sugarcane.

1. BASAL CONDITIONS :
   (i) (a) Wheat-<i>Kharif</i> fodder-Fallow-Sugarcane. (b) Fallow. (c) Nil. (ii) (a) Sandy loam. (b) Refer soil analysis, Jullundur. (iii) 8.4.1951. (iv) (a) and (b) N.A.; (c) 100 setts/plot. (d) and (e) N.A. (v) 43 lb./ac. of A/S on 13.6.1951 and 154 lb./ac. of A/S on 29.6.1951. (vi) As per treatments. (vii) Irrigated. (viii) 2 hoeings and 2 tying up. (ix) 17.98'. (x) N.A.

2. TREATMENTS :
   All combinations of (1), (2) and (3) 
   (1) 2 varieties : V1=CO. 312 and V2=CO.L. 9. 
   (2) 2 hoeings : H1=Blind hoeing and H2=No blind hoeing. 
   (3) 4 kinds of setts : T1=Stripped cane fresh, T2=sets with trash, T3=Stripped cane soaked in water for 24 hours and T4=Stripped cane soaked in 1% D.D.T. solution.
3. DESIGN 
(i) 2 x 2 x 4 Fact. in R.B.D. (ii) (a) 16. (b) N.A. (iii) 4. (iv) (a) and (b) 8' x 24'. (v) Nil. (vi) Yes.

4. GENERAL:
(i) Below normal. No lodging. (ii) N.A. (iii) Yield of sugarcane. (iv) (a) 1951 to 1955. (b) No. (c) Nil. (v) (a) Nil. (b) Nil. (vi) and (vii) Nil.

5. RESULTS:
(i) 17.84 ton/ac.
(ii) 6.30 ton/ac.
(iii) Only varieties are significantly different.
(iv) Av. yield of sugarcane in ton/ac.

<table>
<thead>
<tr>
<th>V&lt;sub&gt;1&lt;/sub&gt;</th>
<th>V&lt;sub&gt;2&lt;/sub&gt;</th>
<th>Mean</th>
<th>H&lt;sub&gt;1&lt;/sub&gt;</th>
<th>H&lt;sub&gt;2&lt;/sub&gt;</th>
</tr>
</thead>
<tbody>
<tr>
<td>T&lt;sub&gt;1&lt;/sub&gt;</td>
<td>16.02</td>
<td>14.12</td>
<td>15.67</td>
<td>13.31</td>
</tr>
<tr>
<td>T&lt;sub&gt;2&lt;/sub&gt;</td>
<td>21.59</td>
<td>15.16</td>
<td>18.37</td>
<td>17.58</td>
</tr>
<tr>
<td>T&lt;sub&gt;3&lt;/sub&gt;</td>
<td>21.30</td>
<td>17.74</td>
<td>19.52</td>
<td>20.84</td>
</tr>
<tr>
<td>T&lt;sub&gt;4&lt;/sub&gt;</td>
<td>19.53</td>
<td>17.29</td>
<td>18.41</td>
<td>20.08</td>
</tr>
<tr>
<td>Mean</td>
<td>19.61</td>
<td>16.08</td>
<td>17.84</td>
<td>17.95</td>
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</tbody>
</table>

S.E. of marginal mean of T = 1.57 ton/ac.
S.E. of marginal mean of V or H = 1.11 ton/ac.
S.E. of body of tables V x T and H x T = 2.23 ton/ac.
S.E. of body of table V x H = 1.57 ton/ac.

Crop: Sugarcane.  
Site: Sugarcan Res. Stn., Jullundur.  
Ref: Pb. 53 (139).  
Type 'CV'.

Object: To study the effect of sowing sugarcane with and without trash and some cultural treatments on germination and yield of Sugarcane.

1. BASAL CONDITIONS:
(i) (a) Wheat-kharif fodder-Fallow-Sugarcane. (b) Fallow. (c) Nil. (ii) (a) Sandy loam. (b) Refer soil analysis, Jullundur. (iii) 26.3.1953. (iv) (a) to (e) N.A. (v) 5 trucks of F.Y.M. on 9.2.1953; 50 lb./ac. of N as A/S on 17.5.1953 and 50 lb./ac. of N as A/S on 23.7.1953. (vi) As per treatments. (vii) Irrigated. (viii) 2 hoeings and twice earthing up. (ix) 32.8 w. (x) 4.2.1954.

2. TREATMENTS:
All combinations of (1), (2) and (3)
(1) 2 varieties: V<sub>1</sub> = CO. 312 and V<sub>2</sub> = CO.L. 9.
(2) 2 hoeings: H<sub>1</sub> = Blind hoeing and H<sub>2</sub> = No blind hoeing.
(3) 4 kinds of sets: T<sub>1</sub> = Stripped cane fresh, T<sub>2</sub> = Sets with trash, T<sub>3</sub> = Stripped cane soaked in water for 24 hours and T<sub>4</sub> = Stripped cane soaked in 1% D.D.T. solution.

3. DESIGN:
(i) 2 x 2 x 4 Fact. in R.B.D. (ii) (a) 16. (b) N.A. (iii) 4. (iv) (a) and (b) 8' x 24'. (v) Nil. (vi) Yes.

4. GENERAL:
(i) Below normal. No lodging. (ii) N.A. (iii) Yield of sugarcane. (iv) (a) 1951 to 1955. (b) No. (c) Nil. (v) (a) Nil. (b) Nil. (vi) and (vii) Nil.
5. RESULTS:
   (i) 19.30 ton/ac.
   (ii) 5.82 ton/ac.
   (iii) Varieties as well as hoeings are highly significantly different, while others are not significant.
   (iv) Av. yield of sugarcane in ton/ac.

<table>
<thead>
<tr>
<th></th>
<th>T1</th>
<th>T2</th>
<th>T3</th>
<th>T4</th>
<th>Mean</th>
<th>H1</th>
<th>H2</th>
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<tr>
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<td>18.91</td>
<td>18.00</td>
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<tr>
<td>Mean</td>
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<td>19.30</td>
<td>21.95</td>
<td>16.65</td>
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S.E. of marginal mean of T
S.E. of marginal mean of V and H
S.E. of body of tables V×T and H×T
S.E. of body of table V×H

Crop: Sugarcane.
Site: Sugarcane Res. Stn., Jullundur.
Object: To study the effect of sowing setts with and without trash and some cultural treatments, on germinatio n and yield of Sugar cane.

1. BASAL CONDITIONS:
   (i) (a) Nil. (b) Fallow. (c) Nil. (ii) (a) Sandy loam. (b) Refer soil analysis, Jullundur. (iii) 11.4.1953.
   (iv) (a) to (e) N.A. (v) 5 trucks of F.Y.M. on 9.2.1953, 50 lb/ac., of N as A/S on 17.5.1953 and 50 lb/ac. of N as A/S on 23.7.1953. (vi) As per treatments. (vii) Irrigated. (viii) 2 hoeings.
   (ix) 32.8°. (x) 25.12.1953.

2. TREATMENTS:
   All combinations of (1), (2) and (3)
   (1) 2 varieties: V1=CO.312 and V2=CO.1.9.
   (2) 2 hoeings: H1=Blind hoeing and H2=No blind hoeing.
   (3) 4 kinds of setts: T1=Stripped cane-fresh, T2=Setts with trash, T3=Stripped cane soaked in water for 24 hours and T4=Stripped cane soaked in D.D.T. 1% solution.

3. DESIGN:
   (i) Fact. in R.B.D. (ii) (a) 16. (b) N.A. (iii) 4. (iv) (a) and (b) 8’x24’.

4. GENERAL:
   (i) Below normal. No lodging. (ii) Nil. (iii) Yield of sugarcane. (iv) (a) Not contd. (b) No. (c) —.
   (v) (a) Nil. (b) ——. (vi) and (vii) Nil.

5. RESULTS:
   (i) 21.11 ton/ac.
   (ii) 4.31 ton/ac.
   (iii) Varieties and hoeings are highly significantly different while others are not significant.
(iv) Av. yield of sugarcane in ton/ac.

<table>
<thead>
<tr>
<th></th>
<th>$V_1$</th>
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<td>21.76</td>
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</tr>
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<td>15.89</td>
<td>21.44</td>
<td>23.00</td>
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Mean  

<table>
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<th>16.31</th>
<th>21.11</th>
<th>24.13</th>
<th>18.09</th>
</tr>
</thead>
<tbody>
<tr>
<td>$H_2$</td>
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<td></td>
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</table>

S.E. of marginal mean of $T$  
S.E. of marginal mean of $V$ or $H$  
S.E. of body of table $V \times H$  
S.E. of body of tables $V \times T$ and $H \times T$  

Crop :- Sugarcane.  
Site :- Distt. and Demonstration Farm, Ambala.  
Ref :- Pb. 48(36).  
Type :- 'CM'.

Object :- To study the effect of $N$ and cultural practices on Sugarcane.

1. BASAL CONDITIONS:
(i) (a) Nil. (b) N.A. (c) Nil.  
(ii) (a) Hard clay loam. (b) N.A.  
(iii) 16,17.2.1948.  
(iv) (a) As per treatments. (b) N.A.  
(v) Nil. (vi) CO.312 (medium).  
(vi) Irrigated. (viii) As per treatments. (ix) 21.59°. (x) 24.3.1949.

2. TREATMENTS:
Main-plot treatments :
- $C_1$ = Ploughing once by raja and 4 times by desi hal and 2 hoeings and $C_2$ = Ploughing once by raja, 7 times by desi hal and 4 hoeings.

Sub-plot treatments:
- All combinations of (1) and (2)
  (1) 2 levels of $N$ as A/S: $N_1=50$ and $N_2=100$ lb./ac.  
  (2) 2 types of mulch : $M_1$ = Soil mulch and $M_2$ = Artificial mulch.

3. DESIGN:
(i) Split-plot. (ii) (a) 2 main-plots/block; 4 sub-plots/main-plot. (b) N.A. (iii) 4.  
(iv) (a) 61'x17'. (b) 1/40 ac. (v) Nil. (vi) Yes.

4. GENERAL:
(i) Fair to good. No lodging. (ii) Nil. (iii) Sugarcane and gur yield. (iv) (a) 1947 to 1948. (b) No. (c) ---.  
(v) (a) Nil. (b) ---. (vi) and (vii) Nil.

5. RESULTS:
(i) 11.99 ton/ac.  
(ii) (a) 4.33 ton/ac.  
(b) 1.70 ton/ac.  
(iii) Only $M$ effect is highly significant.
(iv) Av. yield of sugarcane in ton/ac.

<table>
<thead>
<tr>
<th></th>
<th>$M_1$</th>
<th>$M_2$</th>
<th>Mean</th>
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<th>$N_2$</th>
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<tr>
<td>$C_1$</td>
<td>12.16</td>
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<td>14.21</td>
<td>13.95</td>
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<td>13.77</td>
<td>13.61</td>
<td>13.93</td>
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<tr>
<td>Mean</td>
<td>11.48</td>
<td>16.50</td>
<td>13.99</td>
<td>13.78</td>
<td>14.20</td>
</tr>
</tbody>
</table>

S.E. of difference of two
1. C marginal means = 1.53 ton/ac.
2. M or N marginal means = 0.61 ton/ac.
3. sub-plot treatment means at the same level of main-plot treatment = 0.85 ton/ac.
4. main-plot treatment means at the same level of sub-plot treatment = 1.65 ton/ac.
5. S.E. of body of $M \times N$ table = 0.60 ton/ac.

Crop :- Sugarcane.
Site :- Govt. Agri. Stn., Hansi.

Object :- To study the effect of spacing and manures on yield of sugarcane.

1. BASAL CONDITIONS:
   (i) (a) Nil. (b) Maize. (c) Nil. (ii) (a) Heavy loam. (b) N.A. (iii) 15.3.1949. (iv) (a) to (c) N.A. (d) As per treatments. (e) N.A. (v) N.A. (vi) CO. 312 (medium). (vii) Irrigated. (viii) N.A. (ix) 27.70°. (x) 15.2.1950 to 22.2.1950.

2. TREATMENTS:
   All combinations of (1) and (2)
   (1) 2 levels of N: $N_0$ = 0 and $N_1$ = 70 lb/ac. of N as A/S.
   (2) 3 spacings: $S_1$ = 1', $S_2$ = 2' and $S_3$ = 3' between rows.

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

4. GENERAL:
   (i) Fair. No lodging. (ii) N.A. (iii) Yield of sugarcane. (iv) (a) 1949-1950. (b) No. (c) Nil. (v) (a) No. (b) —. (vi) and (vii) Nil.

5. RESULTS:
   (i) 4.25 ton/ac.
   (ii) 0.41 ton/ac.
   (iii) None of the effects is significant.
   (iv) Av. yield of sugarcane in ton/ac.

<table>
<thead>
<tr>
<th>$S_1$</th>
<th>$S_2$</th>
<th>$S_3$</th>
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</tr>
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<td>4.41</td>
</tr>
<tr>
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<td>4.20</td>
<td>4.36</td>
<td>4.19</td>
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</table>

S.E. of marginal mean of N = 0.10 ton/ac.
S.E. of marginal mean of S = 0.12 ton/ac.
S.E. of body of table = 0.17 ton/ac.
Crop :- Sugarcane.
Site :- Govt. Agri. Stn., Hansi.

Object :- To study the effect of spacing and manures on yield of sugarcane.

1. BASAL CONDITIONS :
   (i) (a) Nil. (b) Fallow. (c) Nil. (ii) (a) Loam. (b) N.A. (iii) 27.2.1950. (iv) (a) to (c) N.A. (d) As per treatments. (e) N.A. (v) Nil. (vi) CO. 312 (medium). (vii) Irrigated. (viii) 2 hoeings, 1 tying up and 1 ridging. (ix) 16.61". (x) 22.1.1951 to 24.1.1951, 27.1.1951 to 3.2.1951 and 10.2.1951 to 16.2.1951.

2. TREATMENTS :
   All combinations of (1) and (2)
   (1) 2 levels of N : N₀=0 and N₁=70 lb./ac. of N as A/S.
   (2) 3 spacings : S₁=1', S₂=2' and S₃=3' between rows.

3. DESIGN :
   (i) Fact. in R.B.D. (ii) (a) 6. (b) N.A. (iii) 5. (iv) (a) N.A. (b) 1/40 ac. (v) N.A. (vi) Yes.

4. GENERAL :
   (i) Fair. No lodging. (ii) No. (iii) Yield of gur. (iv) (a) 1949-1950. (b) No. (c) Nil. (v) (a) No. (b) -. (vi) and (vii) Nil.

5. RESULTS :
   (i) 3.48 ton/ac.
   (ii) 0.43 ton/ac.
   (iii) None of the effects is significant.
   (iv) Av. yield of gur in ton/ac.

<table>
<thead>
<tr>
<th></th>
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<th>S₂</th>
<th>S₃</th>
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<td>3.46</td>
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<td>3.36</td>
</tr>
<tr>
<td>N₁</td>
<td>3.52</td>
<td>3.68</td>
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<tr>
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<td>3.49</td>
<td>3.57</td>
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<td>3.48</td>
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</table>

S.E. of marginal mean of N =0.11 ton/ac.
S.E. of marginal mean of S =0.14 ton/ac.
S.E. of body of table =0.19 ton/ac.

Crop :- Sugarcane.
Site :- Sugarcane Res. Stn., Jullundur.

Object :- To study the effect of spacing, manuring and intercultures on Sugarcane yield.

1. BASAL CONDITIONS
   (i) (a) Nil. (b) Fallow. (for two out of the four replications). (c) Nil. (ii) (a) Loamy. (b) Refer soil analysis, Jullundur. (iii) N.A. (iv) (a) to (c) N.A. (d) 2' and 3' apart. (e) N.A. (v) Nil. (vi) CO.312 (medium). (vii) Irrigated. (viii) Hoeings. (ix) 26.44". (x) N.A.

2. TREATMENTS :
   All combinations of (1), (2) and (3)
   (1) 2 spacings : S₁=Planting in rows 2' apart and S₂=Planting in rows 3' apart.
   (2) 2 levels of N as A/S : N₁=100 and N₂=200 lb./ac.
   (3) 4 post sowing operations : H₁=Hoeing by bullocks only, H₂=Hoeing by bullocks and by hand, H₃=Hoeing by hand only and H₄=Weeding only.

3. DESIGN :
   (i) Fact. in R.B.D. (ii) (a) 16 . (b) N.A. (iii) 4. (iv) (a) and (b) 1/40 ac. (v) Nil. (vi) Yes.
4. GENERAL:
   (b) No. (c) Nil. (v) (a) No. (b) —. (vi) and (vii) Nil.

5. RESULTS:
   (i) 31.67 ton/ac.
   (ii) N.A.
   (iii) N.A.
   (iv) Av. yield of sugarcane in ton/ac.

<table>
<thead>
<tr>
<th></th>
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Crop :- Sugarcane.
Site :- Sugarcane Res. Stn., Jullundur.

Objec-:To study the effect of spacing, manuring and interculture on Sugarcane yield.

1. BASAL CONDITIONS:
   (i) (a) Nil. (b) N.A. (c) Nil. (ii) (a) Loamy. (b) Refer soil analysis, Jullundur. (iii) N.A. (iv) (a) to (e)
      N.A. (v) N.A. (vi) CO,312 (medium). (vii) Irrigated. (viii) N.A. (ix) 18.67 . (x) N.A.

2. TREATMENTS:
   All combinations of (1), (2) and (3)
   (1) 2 spacings: S1=Planting in rows 2' apart and S2=Planting in rows 3' apart.
   (2) 2 levels of N as A/S: N1=100 and N2=200 lb./ac.
   (3) 4 post-sowing operations: H1=Hoeing by bullocks only, H2=Hoeing by bullocks and by hand,
      H3=Hoeing by hand only and H4=Weeding only.

3. DESIGN:
   (i) Fact. in R.B.D. (ii) (a) 16. (b) N.A. (iii) N.A. (iv) (a) and (b) N.A. (v) N.A. (vi) Yes.

4. GENERAL:
   (i) Good. No lodging. (ii) Nil. (iii) Cane counts and sugarcane yield. (iv) (a) 1948-1949. (b) No. (c) Nil.
   (v) (a) No. (b) —. (vi) and (vii) Nil.

5. RESULTS:
   (i) 38.19 ton/ac.
   (ii) N.A.
   (iii) N.A.

Ref:- Pb. 48(61).
Type:- 'CM'.
(iv) Av. yield of sugarcane in ton/ac.

<table>
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<th>( N_2 )</th>
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</tr>
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</tr>
<tr>
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<td>38.34</td>
</tr>
<tr>
<td>( N_2 )</td>
<td>39.10</td>
<td>37.58</td>
<td>38.34</td>
<td>38.19</td>
<td>38.34</td>
</tr>
</tbody>
</table>

Crop :- Sugarcane.

Site :- Sugarcane Res. Stn., Jullundur

Ref :- Pb. 48(27).

Type :- 'T'.

Object :- To find the best time of irrigation for Sugarcane crop.

1. BASAL CONDITIONS:

(i) (a) No. (b) N.A. (c) Nil. (ii) (a) Loamy. (b) Refer soil analysis, Jullundur. (iii) N.A. (iv) (a) to (c) N.A. (v) N.A. (vi) N.A. (vii) Irrigated. (viii) N.A. (ix) 26.44°. (x) N.A.

2. TREATMENTS:

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

(1) 2 pre-monsoon irrigations : \( A_1 = 10 \) days and \( A_2 = 15 \) days interval.
(2) 2 irrigations-during monsoon : \( B_1 = 10 \) days and \( B_2 = 15 \) days interval.
(3) 2 post-monsoon irrigations : \( C_1 = 10 \) days and \( C_2 = 15 \) days interval.

3. DESIGN:

(i) 2^2 Fact. in R.B.D. (ii) (a) 8. (b) N.A. (iii) N.A. (iv) (a) and (b) N.A. (v) N.A. (vi) Yes.

4. GENERAL:

(i) Fair. No lodging. (ii) Nil. (iii) Sugarcane yield. (iv) (a) 1946 to 1948. (b) No. (c) Nil. (v) (a) No. (b) —. (vi) and (vii) Nil.

5. RESULTS:

(i) 23.43 ton/ac.
(ii) N.A.
(iii) N.A.
(iv) Av. yield of sugarcane in ton/ac
Crop :— Sugarcane.
Site :— Sugarcane Res. Stn., Jullundur.

Object :— To study the effect of hot weather and post-monsoon irrigation intervals on growth and yield of some important Sugarcane varieties.

1. BASAL CONDITIONS:
   (i) (a) Wheat-kharif-fodder-Fallow-Sugarcane. (b) Fallow. (c) Nil. (ii) (a) Loam. (b) Refer soil analysis, Jullundur. (iii) 1.4.1951. (iv) (a) 4 tractor, 2 hindustan hal, 5 desi hal, and 7 sahagin. (b) N.A. (c) 40,000 sett/ac. (d) 2' row to row. (e) N.A. (v) 8.5 md/ac. of G.N.C. applied on 31.3.1951. (vi) As per treatments. (vii) Irrigated. (viii) 100 lb./ac. of A/S applied on 13.6.1951 and 150 lb./ac. on 29.6.1951 (ix) 17.98°. (x) 20,21.5.1952.

2. TREATMENTS:
   Main-plot treatments:
   6 times of Irrigation:   I₁ = pre 7th day and post 15th day, I₂ = pre 14th day and post 15th day, I₃ = pre 14th day and post 30th day, I₄ = pre 21st day and post 15th day and I₅ = pre 21st day and post 30th day.
   Sub-plot treatments:
   6 varieties: V₁ = CO. 312 (medium), V₂ = CO. L. 9 (medium), V₃ = CO. K. 30 (medium), V₄ = CO. 617 (late), V₅ = CO.L. 29 (early) and V₆ = CO. 453 (late).

3. DESIGN:
   (i) Split-plot. (ii) (a) 6 main-plots/block; 6 sub-plots/main-plot. (b) N.A. (iii) 3. (iv) (a) 10'x61', (b) 10'x58.08'. (v) N.A. (vi) Yes.

4. GENERAL:
   (i) Germination and stand fair. No lodging. (ii) N.A. (iii) Yield of stripped cane. (iv) (a) 1951 to 1955. (b) No. (c) Nil. (v) (a) No. (b) —. (vi) and (vii) Nil.

5. RESULTS:
   (i) 160.7 ton/ac.
   (ii) (a) 4.49 ton/ac.
   (b) 2.41 ton/ac.
   (iii) Main-plot and sub-plot treatments are highly significantly different. Interaction is not significant.
   (iv) Av. yield of stripped cane in ton/ac.

<table>
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<tr>
<th></th>
<th>V₁</th>
<th>V₂</th>
<th>V₃</th>
<th>V₄</th>
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S.E. of difference of two
1. If marginal means = 1.50 ton/ac.
2. V marginal means = 0.82 ton/ac.
3. I means at the same level of V = 2.37 ton/ac.
4. V means at the same level of I = 2.01 ton/ac.
Crop : Sugarcane.
Site : Sugarcane Res. Stn., Jullundur

Object: - To study the effect of hot weather and post-monsoon irrigation intervals on the growth and yield of some important Sugarcane varieties.

1. BASAL CONDITIONS:
   (i) (a) Wheat-kharif fodder-Fallow-Sugarcane. (b) Fallow. (c) Nil. (ii) (a) Sandy loam. (b) Refer soil analysis, Jullundur. (iii) 25, 26, 3, 1952. (iv) (a) 1 tractor, 5 desi hal and 8 sohaga. (b) N.A. (c) 40,000 setts. (d) 2' row to row. (e) N.A. (v) 16 trucks of F.Y.M. applied on 12, 3, 1952. (vi) As under treatments. (vii) Irrigated. (viii) 50 lb./ac. of N as A/S applied on 3, 6, 1952. (ix) 36.61°. (x) 3, 2, 1953.

2. TREATMENTS:
   Main-plot treatments:
   Intervals of Irrigations:
   All combinations of (1) and (2)
   (1) 3 pre-monsoon irrigations: M₁=7, M₂=14 and M₃=21 days interval.
   (2) 2 post-monsoon irrigations: N₁=15 and N₂=30 days interval.
   Sub-plot treatments:
   6 varieties: V₁=CO.312, V₂=CO.L. 9, V₃=CO.K. 30 (late), V₄=CO.L. 617 (early), V₅=CO.L. 29 (late) and V₆=CO.453 (medium).

3. DESIGN:
   (i) Split-plot. (ii) (a) 6 main-plots/block; 6 sub-plots/main-plot. (b) N.A. (iii) 3. (iv) (a) 10'×61'.
   (b) 10'×54' (v) N.A. (vi) Yes.

4. GENERAL:
   (i) Normal. No lodging. (ii) Nil. (iii) Cane yield. (iv) (a) 1951 to 1955. (b) No. (c) Nil. (v) (a) No.
   (b) - (vi) and (vii) Nil.

5. RESULTS:
   (i) 16.96 ton/ac.
   (ii) 13.31 ton/ac.
   (b) 2.46 ton/ac.
   (iii) Sub-plot treatment effect is highly significant, while all others are not significant.
   (iv) Av. yield of stripped cane in ton/ac.

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<tr>
<th></th>
<th>V₁</th>
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S.E. of difference of two:
1. marginal means of M = 3.11 ton/ac.
2. marginal means of N = 2.55 ton/ac.
3. marginal means of V = 0.82 ton/ac.
4. means in the body of M×N table = 4.40 ton/ac.
5. V means at the same level of M = 1.43 ton/ac.
6. V means at the same level of N = 1.17 ton/ac.
7. M means at the same level of V = 3.38 ton/ac.
8. N means at the same level of V = 2.76 ton/ac.
Crop:— Sugarcane.
Site:— Sugarcane Res. Sta., Jullundur.
Object:— To study the effect of hot weather and post-monsoon irrigation intervals on the growth and yield of some important Sugarcane varieties.

1. BASAL CONDITIONS:
   (i) (a) Wheat-kharif fodder-Fallow-Sugarcane. (b) Fallow. (c) Nil. (ii) (a) Loam. (b) Refer soil analysis, Jullundur. (iii) 9, 10, 4, 1953. (iv) (a) to (e) N.A. (v) Ten trucks of compost. Date N.A. (vi) As under treatments. (vii) Irrigated. (viii) N.A. (ix) 32.8°. (x) 27.4, 1954.'

2. TREATMENTS:
   Main-plot treatments:
   Intervals of irrigation.
   All combinations of (1) and (2).
   (1) 3 pre-monsoon irrigations: \( M_1 = 7 \), \( M_2 = 14 \) and \( M_3 = 21 \) days interval.
   (2) 2 post-monsoon irrigations: \( N_1 = 15 \) days and \( N_2 = 30 \) days interval.
   Sub-plot treatments:
   6. varieties: \( V_1 = C. 312 \), \( V_2 = C. 32 \), \( V_3 = C. 30 \), \( V_4 = C. 341 \), \( V_5 = C. 30 \) and \( V_6 = C. 453 \).

3. DESIGN:
   (i) Split-plot. (ii) (a) 6 main-plots/block; 6 sub-plots/main-plot. (b) N.A. (iii) 3. (iv) (a) \( 12' \times 47' \). (b) \( 12' \times 42' \). (v) N.A. (vi) Yes.

4. GENERAL:
   (i) Germination satisfactory except for \( C. 30 \). No lodging. (ii) Nil. (iii) Stripped cane yield. (iv) (a) 1951 to 1955. (b) No. (c) Nil. (v) (a) No. (b)—, (vii) and (vii) Nil.

5. RESULTS:
   (i) 20.01 ton/ac.
   (ii) (a) 1.69 ton/ac.
   (b) 3.64 ton/ac.
   (iii) Overall main-plot effect, \( M \) effect and \( M \times N \) interaction are highly significant; \( N \) effect and varieties effect are significant. All others are not significant.
   (iv) Av. yield of stripped cane in ton/ac.

<table>
<thead>
<tr>
<th></th>
<th>( V_1 )</th>
<th>( V_2 )</th>
<th>( V_3 )</th>
<th>( V_4 )</th>
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<td>( M_3 )</td>
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<td>18.66</td>
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</table>

S.E. of difference of two
1. \( M \) marginal means = 0.40 ton/ac.
2. \( N \) marginal means = 0.33 ton/ac.
3. \( V \) marginal means = 1.22 ton/ac.
4. means in the body of \( M \times N \) table = 0.56 ton/ac.
5. \( V \) means at the same level of \( M \) = 2.10 ton/ac.
6. \( V \) means at the same level of \( N \) = 1.72 ton/ac.
7. \( M \) means at the same level of \( V \) = 1.96 ton/ac.
8. \( N \) means at the same level of \( V \) = 1.60 ton/ac.
Object:—To study the effect of irrigation and A/S on yield of Sugarcane.

1. BASAL CONDITIONS:
   (i) (a) Nil. (b) Wheat. (c) Nil. (ii) (a) Loam. (b) N.A. (iii) 9.4.1948. (iv) (a) 1 raja, 5 desi plough and 5 sohaga. (b) N.A. (c) 25,000 setts/ac. (d) and (e) N.A. (v) Nil. (vi) CO.312 (medium). (vii) Irrigated. (viii) 3 hoeings, 1 ridging and 1 tying up. (ix) 27.27°. (x) 3.12.1948, 28.12.1948 and 7.1.1949.

2. TREATMENTS:
   All combinations of (1) and (2)
   (1) 2 levels of total irrigation: \( I_1 = 40^\circ, I_2 = 60^\circ \) and \( I_3 = 80^\circ \).
   (2) 3 levels of N as A/S: \( N_0 = 0, N_1 = 75 \text{ lb./ac.} \) and \( N_2 = 150 \text{ lb./ac.} \).
   A/S applied in three equal doses on 9.4.1948, 22.5.1948 and 24.6.1948 respectively.

3. DESIGN:
   (i) \( 3 \times 3 \) Fact. in R.B.D. (ii) (a) 9. (b) N.A. (iii) 4. (iv) (a) and (b) Nil. (v) Nil. (vi) Yes.

4. GENERAL:
   (i) Germination and growth satisfactory. (ii) Nil. (iii) Gur and stripped cane yield. (iv) (a) to (c) No. (v) (a) and (b) Nil. (vi) and (vii) Nil.

5. RESULTS:
   (i) 19.45 ton/ac.
   (ii) 3.56 ton/ac.
   (iii) N effect is highly significant while others are not significant.
   (iv) Av. yield of stripped cane in ton/ac.

   \[
   \begin{array}{cccc|c}
   & N_0 & N_1 & N_2 & \text{Mean} \\
   I_1 & 12.51 & 19.73 & 22.20 & 18.15 \\
   I_2 & 14.13 & 22.06 & 25.04 & 20.41 \\
   I_3 & 16.42 & 20.13 & 22.88 & 19.81 \\
   \text{Mean} & 14.35 & 20.64 & 23.37 & 19.45 \\
   \end{array}
   \]

   S.E. of marginal mean any = 1.03 ton/ac.
   S.E. of body of table = 1.78 ton/ac.

---

Object:—To study the effect of irrigation and manure on yield of Sugarcane.

1. BASAL CONDITIONS:
   (i) (a) Nil. (b) N.A. (c) Nil. (ii) (a) Loam. (b) N.A. (iii) 7.3.1949. (iv) (a) 5 ploughings and 6 sohaga. (b) N.A. (c) 40,000 setts/ac. (d) and (e) N.A. (v) 30 C.L. of F.Y.M. (vi) CO.312 (medium). (vii) Irrigated. (viii) N.A. (ix) 27.8°. (x) 5 to 9.1.1950.

2. TREATMENTS:
   All combinations of (1) and (2)
   (1) 3 levels of total irrigation: \( I_1 = 40^\circ, I_2 = 60^\circ \) and \( I_3 = 80^\circ \).
   (2) 3 levels of N as A/S: \( N_0 = 0, N_1 = 75 \text{ lb./ac.} \) and \( N_2 = 150 \text{ lb./ac.} \).
3. DESIGN:
(i) 3 x 3 Fact. in R.B.D. (ii) (a) 9, (b) N.A. (iii) 4.
(iv) (a) 12' x 109'. (b) 12' x 90' 
(v) N.A. (vi) Yes.

4. GENERAL:
(i) Satisfactory. No lodging. (ii) N.A. 
(iii) Stripped cane yield. (iv) (a) 1949—1951. (b) and (c) Nil.
(v) (a) and (b) No. (vi) and (vii) Nil.

5. RESULTS:
(i) 35.84 ton/ac.
(ii) 2.958 ton/ac.
(iii) Main effect of I is highly significant, main effect of N is significant while interaction is not significant.
(iv) Av. yield of stripped cane in ton/ac.

\[
\begin{array}{|c|ccc|}
\hline
& N_0 & N_1 & N_2 & \text{Mean} \\
\hline
I_1 & 34.17 & 34.11 & 31.92 & 33.40 \\
I_2 & 31.51 & 38.33 & 34.63 & 34.82 \\
I_3 & 37.97 & 41.34 & 38.59 & 39.30 \\
\hline
\text{Mean} & 34.55 & 37.93 & 35.05 & 35.84 \\
\hline
\end{array}
\]

S.E. of any marginal mean = 0.854 ton/ac.
S.E. of body of table = 1.419 ton/ac.

---

Crop :- Sugarcane.
Site :- Sugarcane Sub-Stn., Gurdaspur.
Obj. :- To study the effect of irrigation and manure on yield of Sugarcane.

1. BASAL CONDITIONS:
(i) (a) Nil. (b) N.A. (c) Nil. (ii) (a) Loamy, (b) N.A. 
(iii) 4.3.1950. (iv) (a) 5 ploughings and 7
sowings. (b) N.A. (c) 40,000 sett/ac. (d) and (e) N.A. 
(v) 22 C.L./ac. of F.Y.M. (vi) CO.312 (medium),
(vii) Irrigated. (viii) 1 earthing up, 1 tying up and 3 hoeings. (ix) 55.35'. 

2. TREATMENTS:

All combination of (1) and (2)
(1) 3 levels of total irrigation: 
\[ I_1 = 40', I_2 = 60' \text{ and } I_3 = 80'. \]
(2) 3 levels of N as A/S: 
\[ N_0 = 0, N_1 = 75 \text{ and } N_2 = 150 \text{ lb.}/ac. \]

Half dose of N applied on 22.5.1950 while the other half applied on 12.6.1950.

1. DESIGN:
(i) 3 x 3 Fact. in R.B.D. (ii) (a) 9, (b) N.A. (iii) 4.
(iv) (a) N.A. (b) 71' x 18'. (v) N.A. (vi) Yes.

4. GENERAL:
(i) Good. No lodging. (ii) Nil. (iii) Stripped cane yield. (iv) (a) 1949—1951. (b) No. (c) Nil. 
(v) (a) No. (b) — . (vi) and (vii) Nil.

5. RESULTS:
(i) 30.60 ton/ac.
(ii) 1.466 ton/ac.
(iii) Main effects of I and N are highly significant while interaction is not significant.
(iv) Av. yield of stripped cane in ton/ac.

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<td>26.72</td>
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S.E. of marginal means of I or N = 0.423 ton/ac.
S.E. of body of table = 0.733 ton/ac.

Crop :- Sugarcane.
Site :- Sugarcane Sub-Stn., Gurdaspur.
Ref :- Pb. 51(107).
Type :- 'IM'.

Object :- To study the effect of irrigation and manure on yield of Sugarcane.

1. BASAL CONDITIONS:
   (i) (a) Nil. (b) N.A. (c) Nil. (ii) (a) Loamy. (b) N.A. (iii) 2.3.1951. (iv) (a) 6 ploughings and 5 sohaga. (b) to (e) N.A. (v) 44 C.I./ac. of F.Y.M. (vi) CO. 312 (medium). (vii) Irrigated. (viii) N.A. (ix) 25.67°. (x) 13 to 15.3.1952.

2. TREATMENTS:
   All combinations of (1) and (2)
   (1) 3 levels of total irrigation: I₁ = 60°, I₂ = 80°, and I₃ = 100°.
   (2) 3 levels of N as A/S: N₀ = 0, N₁ = 75 and N₂ = 150 lb./ac.
   A/S applied on 21.5.1951 and 3.7.1951.

3. DESIGN:
   (i) 3x3 Fact. in R.B.D. (ii) (a) 9. (b) N.A. (iii) 4. (iv) (a) 16'x72'. (b) 1/40, ac. (v) N.A. (vi) Yes.

4. GENERAL:
   (i) Germination good. No Lodging. (ii) Nil. (iii) Stripped cane yield. (iv) (a) 1949 - 1951. (b) No. (c) Nil. (v) (a) No. (b) —. (vi) and (vii) Nil.

5. RESULTS:
   (i) 28.89 ton/ac.
   (ii) 2.539 ton/ac.
   (iii) Main effect of N is highly significant. Others are not significant.
   (iv) Av. yield of stripped cane in ton/ac.

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<th>N₂</th>
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S.E. of any marginal mean = 0.733 ton/ac.
S.E. of body of table = 1.269 ton/ac.
Crop: Sugarcane.
Type: 'IM'.

Site: Sugarcane Res. Stn., Jullundur.

Object: To study the effect of application of manure on yield of Sugarcane.

1. BASAL CONDITIONS:
   (i) (a) Nil. (b) Cotton. (c) Nil. (ii) (a) Sandy loam. (b) Refer soil analysis, Jullundur. (iii) (a) 12.4.1951. (iv) (a) 10 desti plough and 12 sehaga. (b) N.A. (c) 40,000 setts/ac. (d) 2' row to row. (e) N.A. (v) Nil. (vi) CO. 312 (medium). (vii) Irrigated. (viii) N.A. (ix) 17.98°. (x) 13.12.1951.

2. TREATMENTS:
   Main-plot treatments:
   2 times of irrigation: \( I_1 = \text{Irrigation before sowing} \) and \( I_2 = \text{Irrigation after sowing} \).
   Sub-plot treatments:
   All combinations of (1) and (2)
   (i) 4 sources of N: \( N_0 = \text{Control (no manure)} \), \( N_1 = \text{A/S at 100 lb./ac. of N} \), \( N_2 = \text{G.N.C. at 100 lb./ac. of N} \), \( N_3 = \text{Mohwa cake at 100 lb./ac. of N} \).
   (2) 2 methods of application of N: \( M_1 = \text{Broadcast} \) and \( M_2 = \text{In furrows} \).

3. DESIGN:
   (i) Split-plot. (ii) (a) 2 main-plots/block; 8 sub-plots/main-plot. (b) N.A. (iii) 3. (iv) (a) 12' x 50'. (b) 12' x 48' 5". (v) 1' 7" left across the rows only. (vi) Yes.

4. GENERAL:
   (i) Germination fair, growth stunted. Below average crop. No lodging. (ii) Fairly high incidence of top borer. (iii) Germination, tillering, linear growth, G.L. number, juice analysis, no. of matured setts and yield of sugarcane (iv) (a) 1951—1955. (b) No. (c) Nil. (v) (a) No. (b) No. (vi) and (vii) Nil.

5. RESULTS:
   (i) 12.27 ton/ac.
   (ii) 0.343 ton/ac.
   (b) 3.276 ton/ac.
   (iii) Main-plot treatments are highly significant, sub-plot treatments are significant while their interaction is not significant.
   (iv) Av. yield of sugarcane in ton/ac.

<table>
<thead>
<tr>
<th></th>
<th>( I_1 )</th>
<th>( I_2 )</th>
<th>Mean</th>
<th>( M_1 )</th>
<th>( M_2 )</th>
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<tr>
<td>( M_2 )</td>
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S.E. of difference of two
1. I marginal means = 0.059 ton/ac.
3. M marginal means in I x M table = 0.946 ton/ac.
5. N means at the same level of I = 1.891 ton/ac.
6. I means at the same level of N = 1.641 ton/ac.
7. M means at the same level of I = 1.337 ton/ac.
8. I means at the same level of M = 0.931 ton/ac.
9. means in body of N x M table = 1.891 ton/ac.
Crop: Sugarcane. Site: Sugarcane Res. Stn., Jullundur. Object: To study the effect of certain organic and inorganic manures when applied under varying soil moisture levels and methods of application on yield of Sugarcane.

1. BASAL CONDITIONS:
(i) (a) Nil. (b) Fallow. (c) Nil. (ii) (a) Loam. (b) Refer soil analysis, Jullundur. (iii) 23.3.1952. (iv) (a) to (e) N.A. (v) Nil. (vi) CO.312 (medium). (vii) Irrigated. (viii) 2 hoeings and 2 earthing up. (ix) 35.61°. (x) 10.1.1953.

2. TREATMENTS:
Main-plot treatments:
- 2 times of irrigation: I₁ = Irrigation before sowing and I₂ = Irrigation after sowing.

Sub-plot treatments:
- All combinations of (1) and (2)
  - (1) 2 methods of application of N: M₁ = Broadcast and M₂ = In furrows.
  - (2) 4 sources of N: N₀ = Control, N₁ = A/S at 102 lb./ac. of N, N₂ = G.N.C. at 103 lb./ac. of N and N₃ = Mokwa cake at 100 lb./ac. of N.

All I₁ plots were ploughed up because of poor germination and hence the exp. analysed as ordinary R.B.D. (Fact.) with the sub-plot treatments only.

3. DESIGN:
(i) R.B.D. (ii) (a) 8. (b) N.A. (iii) 3. (iv) 'a) 12' x 50'. (b) /80 ac. (v) N.A. (vi) Yes.

4. GENERAL:
(i) Satisfactory. No lodging. (iii) Stripped cane yield. (iv) (a) 1951 to 1955. (b) No. (c) Nil. (v) N.A. (b) - . (vi) and (vii) Nil.

5. RESULTS:
(i) 24.52 ton/ac.
(ii) 2.101 ton/ac.
(iii) "Control vs. others" effect is highly significant while other effects are not significant.
(iv) Av. yield of stripped cane in ton/ac.

<table>
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<tr>
<th></th>
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<tr>
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</table>

S.E. of marginal mean of M = 0.70 ton/ac.
S.E. of marginal mean of N = 0.86 ton/ac.
S.E. of body of table = 1.21 ton/ac.
2. TREATMENTS:

Main-plot treatments:
2 times of irrigation: I₁ = Irrigation before sowing and I₂ = Irrigation after sowing.

Sub-plot treatments:
All combinations of (1) and (2)
(1) 2 methods of application of manure: M₁ = Broadcast and M₂ = In furrows.
(2) 4 sources of N: N₀ = Control, N₁ = A/S at 100 lb./ac. of N, N₂ = G.N.C. at 100 lb./ac. of N and N₃ = Mohwa Cake at 100 lb./ac. of N.

3. DESIGN:
(i) Split-plot. (ii) (a) 2 main-plots/block; 8 sub-plots/main-plot. (b) N.A. (iii) 3. (iv) (a) 12' x 47' (b) 1/85 ac. (v) N.A. (vi) Yes.

4. GENERAL:
(i) Normal. No lodging. (ii) Nil. (iii) Stripped sugarcane yield. (iv) (a) 1951 to 1955. (b) No. (c) Nil. (v) (a) No. (b) No. (vi) and (vii) Nil.

5. RESULTS:
(i) 31.35 ton/ac.
(ii) (a) 9.82 ton/ac. (b) 2.76 ton/ac.
(iii) Main-plot effects are not significant. Overall sub-plot treatments are highly significant and N effect is also highly significantly different. I x N is significant while all other effects are not significant.
(iv) Av. yield of sugarcane in ton/ac.

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<th>N₂</th>
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S.E. of difference of two
1. I marginal means = 2.84 ton/ac.
2. M marginal means = 0.79 ton/ac.
4. M means at the same level of I = 1.13 ton/ac.
5. I means at the same level of M = 2.94 ton/ac.
6. N means at the same level of I = 1.59 ton/ac.
7. 1 means at the same level of N = 3.15 ton/ac.
8. means of M x N table = 1.59 ton/ac.

Crop :- Sugarcane.
Site :- Sugarcane Sub-Stn., Gurdaspur.

Object :- To study the effect of irrigation and manure on yield of different varieties of Sugarcane.

Ref :- Pb. 52(51).
Type :- 'IMV'.

1. BASAL CONDITIONS:
(i) (a) Wheat-Kharif Fodder-Sugarcane. (b) Fodder. (c) No. (ii) (a) Loamy. (b) N.A. (iii) 27.3.1952 and 28.3.1952. (iv) (a) 2 hindustan plough, 6 desi and 6 sohaga. (b) to (e) N.A. (v) 15 C.L. of F.Y.M. by broadcast. (vi) As per treatments. (vii) Irrigated. (viii) One bar, harrow, one hoeing with cultural Kasuala, one ridging and tying. (ix) 28.50'. (x) 2.1.1953 to 15.1.1953.
2. TREATMENTS:

Main plot treatments:
All combinations of (1) and (2)
(1) 3 levels of N as F.Y.M. and A/S: N₀ = 0, N₁ = 100 and N₂ = 200 lb./ac.
(2) 2 intensities of irrigation: I₁ = Restricted (15-18 days interval) and I₂ = Liberal (10-12 days interval).

Sub-plot treatments:
4 varieties: V₁ = CO. 312 (late), V₂ = CO. K. 30 (medium), V₃ = CO. L. 9 (medium) and V₄ = CO. L. 29 (early).
F.Y.M. is applied at planting and A/S on 3.6.1952 by broadcast in equal doses.

3. DESIGN:
(i) Split-plot. (ii) (a) 6 main-plots/block and 4 sub-plots/main-plot. (b) N.A. (iii) 4. (iv) (a) 12' × 72'.
(b) 12' × 60'-6". (v) N.A. (vi) Yes.

4. GENERAL:
(i) Germination of CO. K. 30 and CO. L. 29 is good while that of CO. L. 9 is fair. Stand of CO. K. 30, CO. 312 and CO. L. 29 is good and that of CO. L. 9 is poor to fair. No lodging. (ii) Pyrilla attack. Dusted with BHC powder. (iii) Stripped sugarcane yield. (iv) (a) 1952 to 1954. (b) No. (c) Nil. (v) (a) Nil.
(b) Yes. (vi) and (vii) Nil.

5. RESULTS:
(i) 21.76 ton/ac.
(ii) (a) 3.449 ton/ac.
(b) 3.053 ton/ac.
(iii) V and N effects are highly significant. I effect and interaction I × M are not significant.
(iv) Av. yield of stripped sugarcane in ton/ac.

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<th>V₃</th>
<th>V₄</th>
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<td>21.76</td>
<td>22.46</td>
<td>21.07</td>
</tr>
</tbody>
</table>

S.E. of difference of two
1. N marginal means = 0.76 ton/ac.
2. I marginal means = 0.70 ton/ac.
3. V marginal means = 0.85 ton/ac.
4. V means at the same level of N = 1.33 ton/ac.
5. N means at the same level of V = 1.58 ton/ac.
6. V means at the same level of I = 2.45 ton/ac.
7. I means at the same level of V = 1.29 ton/ac.
8. means in body of N × I table = 1.22 ton/ac.

Crop: Sugarcane.
Site: Sugarcane Sub-Stn., Gurdaspur.

Object: To study the effect of irrigation and manure on different varieties of Sugarcane.

1. BASAL CONDITIONS:
(i) (a) Nil. (b) Charf. (c) Nil. (ii) (a) Clay loam. (b) N.A. (iii) 19.3.1953. (iv) (a) 1 hindustan plough-10 desi hat and 11 sohaga. (b) N.A. (c) 35000 setts/ac. (d) 2' × 2'. (c) N.A. (v) Nil. (vi) As per treatments. (vii) Irrigated. (viii) 1 bar harrow, 5 hoeings, 1 ridging and tying up. (ix) 34.46". (x) 30.12.1953 to 16.1.1954.
2. TREATMENTS:

Main-plot treatments:
All combination of (1) and (2).
(1) 3 levels of N as F.Y.M. and A/S: \( N_0 = 0 \), \( N_1 = 100 \) and \( N_2 = 200 \) lb/ac.
(2) 2 intensities of irrigation: \( I_1 = \text{Restricted} \) (15-18 days interval) and \( I_2 = \text{Liberal} \) (10-12 days interval).

Sub-plot treatments:
4 varieties: \( V_1 = \text{CO. 312 (late)} \), \( V_2 = \text{CO. K. 30 (medium)} \), \( V_3 = \text{CO. L. 9 (medium)} \) and \( V_4 = \text{CO. L. 29 (early)} \).

Half dose of N as F.Y.M. applied at planting on 19.3.1953 and the other half-dose applied as A/S in two equal doses on 2.6.1953 and 23.6.1953.
As tube well got out of order, irrigation could not be followed as planned. For \( I_1 = 4 \) irrigations were given while for \( I_2 = 5 \) irrigations were given.

3. DESIGN:
(i) Split-plot. (ii) 6 main-plots/block and 4 sub-plots/main-plot. (b) N.A. (iii) 4. (iv) (a) 12'x72', (b) 12'x60'. (v) 6' border rows kept along breadth side. (vi) Yes.

4. GENERAL:
(i) In \( N_1 \) plots germination of CO.312, CO. K. 30 is good while satisfactory for CO. L. 29 and poor for others. In \( N_1 \) plots germination of CO.312, CO. K. 30, CO. L. 29 is normal and of CO. L. 9 is poor. No lodging. (ii) Nil. (iii) Growth, tillering, yield of stripped cane. (iv) (a) 1952 to 1954. (b) No. (c) Nil. (v) (a) No. (b) —. (vi) and (vii) Nil.

5. RESULTS:
(i) 22.41 ton/ac.
(ii) (a) 5.415 ton/ac.
(b) 2.200 ton/ac.
(iii) N and effects and interactions N\times I, V\times I are not significant. V effect is highly significant while I\times N is significant.
(iv) Av. yield of stripped cane in ton/ac.

<table>
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<th>( V_2 )</th>
<th>( V_3 )</th>
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</table>

S.E. of difference of two
1. N marginal means =1.35 ton/ac.
2. I marginal means =0.82 ton/ac.
3. V marginal means =0.63 ton/ac.
4. V means as the same level of N =1.10 ton/ac.
5. N means at the same level of V =1.65 ton/ac.
6. V means as the same level of I =0.90 ton/ac.
7. I means at the same level of V =1.35 ton/ac.
8. means of the table M\times I =0.78 ton/ac.
Object: To study the effect of irrigation and manure on yield of different varieties of Sugarcane.

1. BASAL CONDITIONS:
   (i) (a) Nil. (b) Fallow. (c) Nil. (ii) (a) Heavy loam. (b) N.A. Hansi. (iii) 15.1.1952. (iv) (a) 8 desi plough, 6 sahage and 2 roller. (b) N.A. (c) 100 md/ac. (d) and (e) N.A. (v) Nil. (vi) As per treatments. (vii) Irrigated. (viii) 3 hoeings. (ix) 14.91°. (x) 3.56 to 18.2.1953.

2. TREATMENTS:
   Main-plot treatments:
   All combinations of (1) and (2).
   (1) 3 levels of manure: M₀=no manure, M₁=100 lb/ac. of N as A/S and M₂=200 lb/ac. of N as A/S and F.Y.M.
   (2) 2 levels of irrigation: I₁=normal irrigation. I₂=2 extra irrigation than I₁.

   Sub-plot treatments:
   (3) 3 varieties: V₁=CO.K. 30, V₂=CO.312 (late) and V₃=CO.L-9 (early).

3. DESIGN:
   (i) Split-plot. (ii) (a) 6 main-plots/block and 3 sub-plots/main-plot. (b) N.A. (iii) 4. (iv) (a) and (b) 60.5°×9°. (v) Nil. (vi) Yes.

4. GENERAL:
   (i) Normal. No lodging. (ii) Nil. (iii) Gur yield. (iv) (a) 1952 to 1955. (b) No. (c) Nil. (v) (a) No. (b) —. (vi) and (vii) Nil.

5. RESULTS:
   (i) 3.99 ton/ac.
   (ii) (a) 0.76 ton/ac.
   (b) 0.48 ton/ac.
   (iii) Only V effect is highly significant. No other effect is significant.
   (iv) Av. yield of gur in ton/ac.

<table>
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<th>I₂</th>
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S.E. of difference of two
1. M marginal means = 0.21 ton/ac.
2. I marginal means = 0.18 ton/ac.
3. V marginal means = 0.14 ton/ac.
4. means in the body of M×I table = 0.31 ton/ac.
5. V means at the same level of M = 0.38 ton/ac.
6. M means at the same level of V = 0.39 ton/ac.
7. V means at the same level of I = 0.24 ton/ac.
8. I means at the same level of V = 0.19 ton/ac.
Crop: Sugarcane.
Site: Govt. Agri. Stn., Hansi.

Object: To study the effect of irrigation and manure on yield of different varieties of Sugarcane.

1. BASAL CONDITIONS:
   (i) (a) Nil. (b) Fallow. (c) Nil (ii) (a) Heavy loam. (b) N.A. (iii) 9.3.1953. (iv) (a) 1 raja plough, 10 desi plough, 20 sohaga, 2 roller and 1 disc harrow. (b) N.A. (c) 100 lb./ac. (d) and (e) N.A. (v) Nil. (vi) As per treatments. (vii) Irrigated. (viii) 1 blind hoeing, 2 hoeings and 5 tyings. (ix) 12.76°. (x) 23 to 27.12.1953.

2. TREATMENTS:
   Main-plot treatments:
   All combinations of (1) and (2)
   (1) 3 levels of manure: M₀ = No manure, M₁ = 100 lb./ac. of N as A/S and F.Y.M. and M₂ = 200 lb./ac. of N as A/S and F.Y.M.
   (2) 2 levels of irrigations: I₁ = Normal irrigation and I₂ = Two extra irrigations than I₁.
   Sub-plot treatments:
   3 varieties: V₁ = CO-312 (late), V₂ = CO.L-9 (early) and V₃ = CO.K. 30 (late).
   F.Y.M. applied on 23.5.1953 by broadcast.

3. DESIGN:
   (i) Split-plot. (ii) (a) 6 main-plots/replication and 3 sub-plots/main-plot. (b) N.A. (iii) 3. (iv) (a) and (b) 60.5° × 9°. (v) Nil. (vi) Yes.

4. GENERAL:
   (i) Good. In plots of 200 lb./ac. of N there was lodging of the crop. No lodging else where. (ii) Nil. (iii) Gur yield. (iv) (a) 1952 to 1956. (b) and (c) No. (v) (a) and (b) No. (vi) and (vii) Nil.

5. RESULTS:
   (i) 5.60 ton/ac.
   (ii) 0.32 ton/ac.
   (b) 0.49 ton/ac.
   (iii) Main-plot treatments are not significantly different. Varieties are highly significantly different. No interaction is significant.
   (iv) Av. yield of gur in ton/ac.

<table>
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S.E. of difference of two
1. M marginal means =0.10 ton/ac.
2. I marginal means =0.08 ton/ac.
3. V marginal means =0.16 ton/ac.
4. Means in the body of M × I table =0.16 ton/ac.
5. V means at the same level of M =0.28 ton/ac.
6. M means at the same level of V =0.25 ton/ac.
7. V means at the same level of I =0.23 ton/ac.
8. I means at the same level of V =0.21 ton/ac.
Object:—To study the effect of manures and irrigations on the yield of different varieties of Sugarcane.

1. BASAL CONDITIONS:
   (i) (a) No. (b) N.A. (c) Nil. (ii) (a) Loamy. (b) Refer soil analysis, Jullundur. (iii) N.A.
   (iv) (a) to (e) N.A. (v) Nil. (vi) As under treatments. (vii) Irrigated. (viii) N.A. (ix) 26.44°.
   (x) N.A.

2. TREATMENTS:
   All combinations of (1), (2) and (3)
   (1) 3 levels of N as A/S: \( N_0 = \text{No manure (control), } N_1 = 100 \text{ lb./ac. of N, and } N_2 = 200 \text{ lb./ac. of N.} \)
   (2) 3 levels of irrigation: \( I_1 = 5\% \text{ soil moisture level, } I_2 = 10\% \text{ soil moisture level and } I_3 = 15\% \text{ soil moisture level.} \)
   (3) 3 varieties \( V_1 = \text{CO. 312, } V_2 = \text{CO. L. 22, and } V_3 = \text{CO. L. 9.} \)

3. DESIGN:
   (i) 3³ Fact, in R.B.D. (ii) (a) 27. (b) N.A. (iii) N.A. (iv) (a) and (b) N.A. (v) N.A. (vi) Yes.

4. GENERAL:
   (i) Fair. No lodging. (ii) Severe attack of pyrilla. (iii) Cane counts and cane yield. (iv) (a) 1948 to 1953.
   (b) and (c) N.A. (v) (a) and (b) N.A. (vi) and (vii) N.A.

5. RESULTS:
   (i) 28.36 ton/acre.
   (ii) N.A.
   (iii) N.A.
   (iv) Av. yield of sugarcane in ton/acre.

<p>| | | | | | |</p>
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S.E.s are not available.

Object:—To study the effect of manures and irrigations on the yield of different varieties of Sugarcane.

1. BASAL CONDITIONS:
   (i) (a) No. (b) N.A. (c) Nil. (ii) (a) Loamy. (b) Refer soil analysis, Jullundur. (iii) N.A.
   (iv) (a) to (e) N.A. (v) Nil. (vi) As per treatments. (vii) Irrigated. (viii) N.A. (ix) 18.67°. (x) N.A.
4. TREATMENTS:

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

(1) 3 varieties: \( V_1 = \text{Co. 312}, V_2 = \text{Col. 22} \) and \( V_3 = \text{Col. 9} \).

(2) 3 levels of N as \( A/N \): \( N_0 = \text{No manure (control)}, N_1 = 100 \text{ lb./ac. of N} \) and \( N_2 = 200 \text{ lb./ac. of N} \).

(3) 3 levels of irrigation: \( I_1 = 5\% \) soil moisture level, \( I_2 = 8\% \) soil moisture level and \( I_3 = 11\% \) soil moisture level.

3. DESIGN:

(i) 3\(^{3}\) Fact, in R.B.D.  
(ii) (a) 27.  
(b) N.A.  
(iii) N.A.  
(iv) (a), (b) N.A.  
(v) N.A.  
(vi) Yes.

4. GENERAL:

(i) Normal. No lodging.  
(ii) Nil.  
(iii) Cane counts and cane yield.  
(iv) (a) 1948 to 1950.  
(b) No.  
(c) Nil.  
(v) (a) No.  
(b) N.A.  
(vi) N.A.  
(vii) N.A.  
(viii) (vi) and (vii) Nil.

5. RESULTS:

(i) 30.77 ton/ac.  
(ii) N.A.  
(iii) N.A.  
(iv) Av. yield of sugarcane in ton/ac.

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<tr>
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<th>( N_2 )</th>
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S.E.s are not available.

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Crop: Sugarcane.  
Site: Sugarcane Res. Stn., Jullundur.  
Ref.: Pb: 50 (63).  
Type: 'IMV'.

Object:—To study the effect of irrigation and manures on different varieties of Sugarcane.

1. BASAL CONDITIONS:

(i) (a) Nil, (b) N.A.  
(c) Nil.  
(ii) (a) Loamy.  
(b) Refer soil analysis, Jullundur.  
(iii) N.A.  
(iv) (a) to (e) N.A.  
(v) Nil.  
(vi) As per treatments.  
(vii) Irrigated.  
(viii) N.A.  
(ix) 50.12'.  
(x) N.A.

2. TREATMENTS:

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

(1) 3 varieties: \( V_1 = \text{Co. 312}, V_2 = \text{Col. 9} \) and \( V_3 = \text{Col. 22} \).

(2) 3 levels of N as \( A/N \): \( N_0 = \text{No manure (control)}, N_1 = 100 \text{ lb./ac. of N} \) and \( N_2 = 200 \text{ lb./ac. of N} \).

(3) 3 levels of irrigation: \( I_1 = 5\% \) soil moisture level, \( I_2 = 8\% \) soil moisture level and \( I_3 = 11\% \) soil moisture level.

3. DESIGN:

(i) 3\(^{3}\) Fact, R.B.D.  
(ii) (a) 27.  
(b) N.A.  
(iii) N.A.  
(iv) (a), (b) N.A.  
(v) N.A.  
(vi) Yes.
4. GENERAL:
(i) Normal. No lodging. (ii) Nil. (iii) Cane counts and cane yield. (iv) (a) 1948 to 1950. (b) No. (c) Nil. (v) (a) No. (b) —. (vi) and (vii) Nil.

5. RESULTS:
(i) 17.28 ton/ac.
(ii) N.A.
(iii) N.A.
(iv) Av. yield of sugarcane in ton/ac.

<table>
<thead>
<tr>
<th></th>
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<th>V2</th>
<th>V3</th>
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<td>16.16</td>
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S.E.s are not available.

Crop :- Sugarcane.
Site :- Sugarcane Res. Stn., Jullundur.

Ref :- Pb. 49(59).
Type :- 'CIM'.

Object :- To study the effect of irrigation, manure and spacing on Sugarcane yield.

1. BASAL CONDITIONS:
(i) (a) No. (b) N.A. (c) Nil. (ii) (a) Loamy. (b) Refer soil analysis, Jullundur. (iii) N.A. (iv) (a) to (c) N.A. (d) As per treatments. (e) N.A. (v) Nil. (vi) CO, 312 (medium). (vii) Irrigated. (viii) N.A. (ix) 18.67. (x) N.A.

2. TREATMENTS:
All combinations of (1), (2) and (3)
(1) 3 levels of irrigation: I1 = 5% soil moisture, I2 = 8% soil moisture and I3 = 11% soil moisture.
(2) 3 levels of N as A/N: N0 = No manure, N1 = 100 lb./ac. of N and N2 = 200 lb./ac. of N.
(3) 2 spacings: S1 = Planting 2’ apart and S2 = Planting 3’ apart.

3. DESIGN:
(i) 3 x 3 x 2 Fact. in R.B.D. (ii) (a) 18. (b) N.A. (iii) N.A. (iv) (a) and (b) N.A. (v) N.A. (vi) Yes.

4. GENERAL:
(i) Satisfactory. No lodging. (ii) Nil. (iii) Sugarcane yield. (iv) (a) Not contd. (b) —. (c) —.
(v) (a) No. (b) —. (vi) and (vii) Nil.

5. RESULTS:
(i) 28.77 ton/ac.
(ii) N.A.
(iii) N.A.
(iv) Av. yield of sugarcane in ton/ac.

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<th>N2</th>
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Standard errors are not available.

Crop :-Sugarcane.  
Site :-Agri. Stn., Karnal.

Object :-To study the effect of irrigation and manure under different cultural practices.

1. BASAL CONDITIONS:
   (i) (a) No. (b) N.A. (c) Nil. (ii) (a) Clay loam. (b) N.A. (iii) N.A. (iv) (a) As per treatments.  
   (b) and (c) N.A. (d) Row to row 2'. (e) N.A. (v) 10 C.L. of F.Y.M. Date N.A. (vi) CO312 (medium).  
   (vii) Irrigated. (viii) N.A. (ix) 30.48°. (x) N.A.

2. TREATMENTS:
   Main-plot treatments:
   - 2 levels of ploughing: C1 = 1 raja and 15 desi ploughings, and C2 = 1 raja and 22 desi ploughings.
   Sub-plot treatments:
   - All combinations of (1) and (2)
     (1) 2 levels of irrigations: I1 = 16 irrigations and I2 = 24 irrigations.
     (2) 2 levels of manure: M1 = 100 lb/ac. of N and M2 = 150 lb/ac. of N.

3. DESIGN:
   (i) Split-plot. (ii) (a) 2 main-plots/replication and 4 sub-plots/main-plot. (b) N.A. (iii) 2. (iv) (a) 14'x80'. (b) 1.38.89 ac. (v) N.A. (vi) Yes.

4. GENERAL:
   (i) Normal. No lodging. (ii) Nil. (iii) Sugarcane and gur yield. (v) (a) 1946 to 1948. (b) No. (c) —. (v) (a) No. (b) —. (vi) Nil. (vii) Originally the experiment was conducted with 4 replications but yield, data was available for only 2 replications and hence data was analysed accordingly.

5. RESULTS:
   (i) 2.32 ton/ac.
   (ii) (a) 0.21 ton/ac.
   (b) 0.23 ton/ac.
   (iii) None of the effects is significant.
(iv) Av. yield of gur in ton/ac.

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S.E. of difference of two
1. C marginal means = 0.10 ton/ac.
2. I or M marginal means = 0.11 ton/ac.
3. I or M means at the same level of C = 0.15 ton/ac.
4. C means as the same level of I or M = 0.15 ton/ac.
5. means in body of I × M table = 0.23 ton/ac.

---

Crop :- Sugarcane.
Site :- Sugarcane Sub-Stn., Gurdaspur.
Object :- To find the best pre-planting treatment of setts.

1. BASAL CONDITIONS:
   (i) (a) Nil. (b) N.A. (c) Nil. (ii) (a) Loamy. (b) N.A. (iii) 24.3.1949. (iv) (a) 6 ploughings and 6 /\\n   (b) to (e) N.A. (v) 44 C.L./ac. of F.Y.M. (vi) CO.K. 30 (medium). (vii) Irrigated. (viii) N.A. (ix) 27.78°. (x) 14.1.1950

2. TREATMENTS:
   1. Setts soaked in water for 24 hrs. before planting.
   2. Setts soaked in water for 12 hrs. before planting.
   3. Setts soaked in water for 6 hrs. before planting.
   4. Freshly cut setts planted.

3. DESIGN:
   (i) R.B.D. (ii) (a) 4. (b) N.A. (iii) 2. (iv) (a) N.A. (b) 16' × 75.5'. (v) N.A. (vi) Yes.

4. GENERAL:
   (i) Satisfactory. No lodging. (ii) N.A. (iii) Yield of stripped cane. (iv) (a) Not contd. (b)—, (c)—. (v) (a)
   No. (b)—, (vi) and (vii) Nil.

5. RESULTS:
   (i) 30.42 ton/ac.
   (ii) 0.366 ton/ac.
   (iii) Treatments are significantly different.
   (iv) Av. yield of stripped cane in ton/ac.

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<th>Av. yield</th>
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<tr>
<td>3.</td>
<td>31.53</td>
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<tr>
<td>4.</td>
<td>30.43</td>
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<tr>
<td>S.E./mean</td>
<td>0.259 ton/ac.</td>
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</table>

Object :—To study the effect of Fernoxone (Hormone 2, 4) on germination, growth and yield of Sugarcane.

1. BASAL CONDITIONS :
   (i) (a) Nil. (b) Berseem. (c) Nil. (ii) (a) Loam. (b) Refer soil analysis, Jullundur. (iii) 7.4.1951. (iv) (a) 2 hindustan hal, 5 desi hal and 5 sohaga. (b) N.A. (c) 100 sett/plot. (d) 2' row to row. (e) N.A. (v) Nil. (vi) CO.L. 9 (medium). (vii) Irrigated. (viii) N.A. (ix) 17.98”. (x) 10.5.1952.

2. TREATMENTS :
   All combinations of (1) and (2)
   (1) 3 durations of soaking : \( D_1 = 24 \text{ hrs.}, \ D_2 = 12 \text{ hrs. and } D_3 = 6 \text{ hrs.} \)
   (2) Fernoxone per million parts of water : \( F_1 = 40 \), \( F_2 = 620 \), \( F_3 = 10 \).

3. DESIGN :
   (i) \( 3 \times 3 \) Fact. in R.B.D. (ii) (a) 9. (b) N.A. (iii) 3. (iv) (a) and (b) 8' \times 24'. (v) Nil. (vi) Yes.

4. GENERAL :
   (i) Germination patchy ; growth below normal. No lodging. (ii) Nil. (iii) Yield of stripped cane. (iv) (a) Contd. (b) --. (c) --. (v) (a) No. (b) --. (vi) and (vii) Nil.

5. RESULTS :
   (i) 6.90 ton/ac.
   (ii) 3.96 ton/ac.
   (iii) None of the effects is significant.
   (iv) Av. yield of stripped cane in ton/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>( F_1 )</td>
<td>5.33</td>
<td>3.31</td>
<td>3.78</td>
<td>4.14</td>
</tr>
<tr>
<td>( F_2 )</td>
<td>7.39</td>
<td>9.66</td>
<td>9.32</td>
<td>8.79</td>
</tr>
<tr>
<td>( F_3 )</td>
<td>6.72</td>
<td>4.73</td>
<td>11.85</td>
<td>7.77</td>
</tr>
</tbody>
</table>

Mean 6.48 5.90 8.32 6.90

S.E. of marginal mean of F or D \( = 1.32 \) ton/ac.
S.E. of body of table \( = 2.28 \) ton/ac.


1. BASAL CONDITIONS :
   (i) (a) Nil. (b) Samn. (c) Nil. (ii) (a) Loam. (b) Refer soil analysis, Jullundur. (iii) 25.4.1951. (iv) (a) and (b) N.A. (c) 40,000 sett/ac. (d) and (e) N.A. (v) Nil. (vi) CO.313 (medium). (vii) Irrigated. (viii) N.A. (ix) 17.98”. (x) 24.12.1951.

2. TREATMENTS :
   1. Fresh cane planted in soil manured with gromore 1 : 80.
   2. Fresh cane planted in soil manured with gromore 1 : 40.
   3. Cane soaked in gromore 1 : 4 and planted in soil manured with gromore 1 : 80.
   4. Cane soaked in gromore 1 : 4 and planted in soil manured with gromore 1 : 40.
   5. Fresh cane planted in ordinary soil manured with 100 lb/ac. of N in A/S in the end of June and mid July.
   In treatment 5 half of A/S applied on 27.6.1951 and the other half on 13.7.1951.
3. DESIGN:
(i) R.B.D. (ii) 5. (b) N.A. (iii) 3. (iv) (a) 10' x 50'. (b) 10' x 45' - 5'. (v) N.A. (vi) Yes.

4. GENERAL:
(i) N.A. (ii) N.A. (iii) Yield of stripped cane. (iv) (a) Not contd. (b) -. (c) -. (v) (a) No. (b) -. (vi) and (vii) Nil.

5. RESULTS:
(i) 5.90 ton/ac.
(ii) 1.80 ton/ac.
(iii) Treatments are significantly different.
(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>4.48</td>
</tr>
<tr>
<td>2.</td>
<td>3.80</td>
</tr>
<tr>
<td>3.</td>
<td>9.23</td>
</tr>
<tr>
<td>4.</td>
<td>7.41</td>
</tr>
<tr>
<td>5.</td>
<td>4.57</td>
</tr>
</tbody>
</table>
S.E./mean  = 1.04 ton/ac.

Crop: - Sugarcane.  
Ref: - Pb. 51 (49).  
Site: - Sugarcane Res. Stn., Jullundur.  
Type: - 'D'.

Object: - To study the effect of certain harmonic substances on the germination and yield of Sugarcane.

1. BASAL CONDITIONS:

2. TREATMENTS:
1. Fresh cane.  
2. Fresh cane soaked in water for 24 hours.  
3. Fresh cane soaked in water for 48 hours.  
4. Fresh cane soaked in sanitary solution 1 : 10 for an hour.  
5. Fresh cane soaked in sanitary solution 1 : 20 for an hour.  
6. Fresh cane soaked in sanitary solution 1 : 40 for an hour.  
7. Fresh cane soaked in gromore 1 : 8 for one hour.  
8. Fresh cane soaked in agrosan 1% (1 : 100) for 24 hour.

3. DESIGN:
(i) R.B.D. (ii) 8. (b) N.A. (iii) 3. (iv) (a) and (b) 8' x 24'. (v) Nil. (vi) Yes.

4. GENERAL:
(i) N.A. (ii) N.A. (iii) Yield of stripped cane. (iv) (a) 1950 to 1951. (b) No. (c) Nil. (v) (a) No. (b) -. (vi) and (vii) Nil.

5. RESULTS:
(i) 6.59 ton/ac.  
(ii) 2.11 ton/ac.  
(iii) Treatments are not significantly different.  
(iv) Av. yield of stripped cane in ton/ac.

<table>
<thead>
<tr>
<th>Treatment</th>
<th>Av. yield</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>6.23</td>
</tr>
<tr>
<td>2.</td>
<td>8.40</td>
</tr>
<tr>
<td>3.</td>
<td>9.31</td>
</tr>
<tr>
<td>4.</td>
<td>8.96</td>
</tr>
<tr>
<td>5.</td>
<td>9.17</td>
</tr>
<tr>
<td>6.</td>
<td>8.61</td>
</tr>
<tr>
<td>7.</td>
<td>7.59</td>
</tr>
<tr>
<td>8.</td>
<td>10.49</td>
</tr>
</tbody>
</table>
S.E./mean  = 1.22 ton/ac.
Crop: - Sugarcane.  
Site: - Sugarcane Res. Stn., Jullundur.  
Ref: - Pb. 51(50).  
Type: - 'D'.

Object: - To find out the effect of insecticides against top borer on yield of Sugarcane.

1. BASAL CONDITIONS:
   (i) (a) Nil. (b) Fallow. (c) Nil. (ii) (a) Sandy loam. (b) Refer soil analysis, Jullundur. (iii) 9.4.1951. (iv) (a) 5 ploughings and 3 sohaga. (b) to (e) N.A. (v) 10 trucks of compost applied on 23.2.1951 mixed with soil by ploughing. (vi) CO. L. 9 (medium). (vii) Irrigated. (viii) 5 hoeings and once earthing up. (ix) 17°8'. (x) 30.4.1952 to 1.5.1952.

2. TREATMENTS:
   1. DDT (W.P.) 0.3%.
   2. Agro (W.P.) 0.3%.
   3. Liquid Agro 0.25%.
   4. Ovicide 1%.
   5. DDT dust.
   6. BHC dust.
   7. Spike thrust.
   8. Earthing up.
   9. Control.

3. DESIGN:
   (i) R.B.D. (ii) (a) 9. (b) N.A. (iii) 2. (iv) (a) and (b) 1/40 ac. (v) Nil: (vi) Yes.

4. GENERAL:
   (i) Satisfactory. No lodging. (ii) Top borer attack. As per treatments. (iii) Top borer incidence and yield data of stripped sugarcane. (iv) (a) Not contd. (b)=. (c)=. (v) (a) Nil. (b)=. (vi) and (vii) Nil.

5. RESULTS:
   (i) 17.23 ton/ac.
   (ii) 3.94 ton/ac.
   (iii) Treatments are not significantly different.
   (iv) Av. yield of stripped sugarcane in ton/ac.

<table>
<thead>
<tr>
<th>Treatment</th>
<th>Av. yield</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>20.26</td>
</tr>
<tr>
<td>2.</td>
<td>14.40</td>
</tr>
<tr>
<td>3.</td>
<td>17.16</td>
</tr>
<tr>
<td>4.</td>
<td>13.10</td>
</tr>
<tr>
<td>5.</td>
<td>18.26</td>
</tr>
<tr>
<td>6.</td>
<td>14.14</td>
</tr>
<tr>
<td>7.</td>
<td>18.62</td>
</tr>
<tr>
<td>8.</td>
<td>20.00</td>
</tr>
<tr>
<td>9.</td>
<td>19.12</td>
</tr>
<tr>
<td>S E/mean</td>
<td>2.78 ton/ac.</td>
</tr>
</tbody>
</table>

Crop: - Sugarcane.  
Site: - Sugarcane Res. Stn., Jullundur.  
Ref: - Pb. 51(51).  
Type: - 'D'.

Object: - To find out the effect of insecticides against top borer attack on yield of Sugarcane.

1. BASAL CONDITIONS:
   (i) (a) Nil. (b) Fallow. (c) Nil. (ii) (a) Sandy loam. (b) Refer soil analysis, Jullundur. (iii) 9.4.1951. (iv) (a) 5 ploughings and 3 sohaga. (b) to (e) N.A. (v) 10 trucks load of compost on 23.2.1951 which was mixed with soil by ploughing. CO.112 (medium) (vi) Irrigated. (vii) 5 hoeings and once earthing up. (viii) 17°8'. (x) 30.4.1952 to 1.5.1952.
2. TREATMENTS:
1. DDT (W.P.) 0.3%.
2. Agro (W.P.) 0.3%.
3. Liquid agro 0.25%.
4. Ovicide 1.0%.
5. DDT dust.
6. BHC dust.
7. Spike thrust.
8. Earthing up.
9. Control.

3. DESIGN:
(i) R.B.D. (ii) (a) 9. (b) N.A. (iii) 2. (iv) (a) and (b) 1/40 ac. (v) Nil. (vi) Yes.

4. GENERAL:
(i) Satisfactory. No lodging. (ii) Top borer attack. As per treatments. (iii) Top borer incidence and yield data. (iv) (a) Not contd. (b) , (c) --. (v) (a) No. (b) --. (vi) and (vii) Nil.

5. RESULTS:
(i) 10.12 ton/ac.
(ii) 1.09 ton/ac.
(iii) Treatments are significantly different.
(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>10.74</td>
</tr>
<tr>
<td>2.</td>
<td>9.73</td>
</tr>
<tr>
<td>3.</td>
<td>11.74</td>
</tr>
<tr>
<td>4.</td>
<td>10.14</td>
</tr>
<tr>
<td>5.</td>
<td>12.14</td>
</tr>
<tr>
<td>6.</td>
<td>11.52</td>
</tr>
<tr>
<td>7.</td>
<td>7.93</td>
</tr>
<tr>
<td>8.</td>
<td>9.28</td>
</tr>
<tr>
<td>9.</td>
<td>7.90</td>
</tr>
<tr>
<td>S.E./mean</td>
<td>±0.77 ton/ac.</td>
</tr>
</tbody>
</table>

---

Crop :-Sugarcane.
Site :-Sugarcane Res. Stn., Jullundur.
Object :-To find out the effect of control measures to check white ant attack on Sugarcane yield.

1. BASAL CONDITIONS:
(i) (a) Wheat—Fallow—Sugarcane. (b) Fallow. (c) Nil. (ii) (a) Loam. (b) Refer soil analysis, Jullundur. (iii) -0.31.3.1951. (iv) (a) 5 ploughings and 3 rohagas. (b) and (c) N.A. (d) 2' row to row. (e) N.A. (v) 6 truck load of city compost applied on 14.1.1951 mixed with soil by ploughing. (vi) CO.312 (medium). (vii) Irrigated. (viii) 3 hoeings and once earthing up. (ix) 17.98'. (x) 14,15.12.1951.

2. TREATMENTS:
1. Guesarol 550 1%.
2. BHC. Agro (W.P.) 1%.
3. Corrosive Sublimate 0.25%.
4. Lead arsenate DO. 25.
5. Gram dust at 36 lb./ac.
6. Hexycian at 36 lb./ac.
7. DDT. dust at 36 lb./ac.
8. Control.

3. DESIGN:
(i) R.B.D. (ii) (a) 8. (b) N.A. (iii) 4. (iv) 'a' and (b) 1/40 ac. (v) Nil. (vi) Yes.
4. GENERAL:
   (i) Satisfactory. No lodging. (ii) White ant attack. As per treatments. (iii) Germination and stripped cane yield. (iv) (a) Not contd. (b) No. (c) —. (v) (a) No. (b) —. (vi) and (vii) Nil.

5. RESULTS
   (i) 16.96 ton/ac.
   (ii) 2.27 ton/ac.
   (iii) Treatments are not significantly different.
   (iv) Av. yield of stripped cane in ton/ac.

<table>
<thead>
<tr>
<th>Treatment</th>
<th>Av. yield</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>17.31</td>
</tr>
<tr>
<td>2.</td>
<td>14.97</td>
</tr>
<tr>
<td>3.</td>
<td>15.65</td>
</tr>
<tr>
<td>4.</td>
<td>17.46</td>
</tr>
<tr>
<td>5.</td>
<td>16.30</td>
</tr>
<tr>
<td>6.</td>
<td>18.50</td>
</tr>
<tr>
<td>7.</td>
<td>18.64</td>
</tr>
<tr>
<td>8.</td>
<td>16.88</td>
</tr>
<tr>
<td>S.E./mean</td>
<td>1.14 ton/ac</td>
</tr>
</tbody>
</table>

363

Crop :- Sugarcane.

Ref. :- Pb. 52(127).
Type :- 'D'.

Object :- To find out effective and economic control measures to check white ant attack on Sugarcane and its effects on yield.

1. BASAL CONDITIONS:
   (i) (a) Wheat—Khariif fodder—Sugarcane. (b) Kharif fodder (Cheri). (ii) (a) Loam. (b) Refer soil analysis, Jullundur. (iii) 11.10.1952, (iv) 1 hindustan plough, 2 desi hal and 3 sohaga. (b) to (e) N.A. (v) Nil. (vi) CO.312 (medium). (vii) Irrigated. (viii) 1 blind hoeing, 3 hoeings and once earthing up. (ix) 36.61". (x) 18.12.1953 and 11.1.1954.

2. TREATMENTS
   1. 1 % DDT. (Guesarol 550).
   2. 0.5 % DDT. (Guesarol 550).
   3. 0.25% D.D.T. (Guesarol 550).
   4. 0.5 % BHC. (Agro W.P.).
   5. 0.25% BHC. (Agro W.P.).
   6. 0.1 % BHC. (Agro W.P.).
   7. 5.0 % Lead arsenate.
   8. 2.5 % Lead arsenate.
   9. 1.0 % Lead arsenate.
   10. 0.25% Corrosive Sublimate.
   11. 0.1 % Corrosive Sublimate.
   12. 5.0 % Hexidole dust (light).
   13. 5.0 % BHC. dust (gam. DO. 25).
   14. 7.0 % BHC. dust (gam. DO. 25).
   15. 10.0 % BHC. dust (Hexyclan 10%).

3. DESIGN:
   (i) R B.D. (ii) (a) 16. (b) N.A. (iii) 3. (iv) (a) and (b) 12'×24'. (v) Nil. (vi) Yes.

4. GENERAL:
   (i) Poor. No lodging. (ii) White ant attack. Control measures as per treatments. (iii) Germination and Sugarcane yield. (iv) (a) Not contd. (b) No. (c) —. (v) (a) Nil. (b) No. (vi) Nil. (vii) Originally experiment was laid out with 4 replications but yield in respect of one replication was not recorded so it was treated as with 2 replications only.

5. RESULTS:
   (i) 24.13 ton/ac.
   (ii) 5.06 ton/ac.
   (iii) Treatments are not significantly different.
(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>26.25</td>
<td>9</td>
<td>22.83</td>
</tr>
<tr>
<td>2</td>
<td>20.19</td>
<td>10</td>
<td>20.74</td>
</tr>
<tr>
<td>3</td>
<td>23.57</td>
<td>11</td>
<td>20.65</td>
</tr>
<tr>
<td>4</td>
<td>26.53</td>
<td>12</td>
<td>27.53</td>
</tr>
<tr>
<td>5</td>
<td>26.53</td>
<td>13</td>
<td>26.25</td>
</tr>
<tr>
<td>6</td>
<td>25.42</td>
<td>14</td>
<td>22.22</td>
</tr>
<tr>
<td>7</td>
<td>28.98</td>
<td>15</td>
<td>22.41</td>
</tr>
<tr>
<td>8</td>
<td>25.65</td>
<td>16</td>
<td>20.30</td>
</tr>
</tbody>
</table>

S.E./mean = 2.92 ton/ac.

Crop :-Sugarcane.  
Site :-Sugarcane Res. Stn., Jullundur.  
Type :-'D'.  
Ref :-Pb. 52(123).

Object :-To study the effect of ferrooxide on germination and yield of Sugarcane.

1. BASAL CONDITIONS:
   (i) (a) Nil. (b) Maize (fodder.) (c) Nil. (ii) (a) Loam. (b) Refer soil analysis, Jullundur  
   (iii) 15.4.1952. (iv) (a) 5 desi hal and 4 sogaga. (b) to (c) N.A.  
   (v) 8 ton/ac. of F.Y.M. on 13.3.1952.  
   (vi) CO.L.9 (medium), (vii) Irrigated. (viii) 2 hoeings and twice earthing up. (ix) 36.61°. (x) 11.1.1952.

2. TREATMENTS:
   All combinations of (1) and (2)
   (1) 3 durations of soaking : D₁ = 24 hrs, D₂ = 12 hrs and D₃ = 6 hrs.
   (2) Ferrooxide per million parts of water : F₀ = No Ferrooxide (control), F₁ = 40 parts, F₂ = 20 parts, F₃ = 10 parts.

3. DESIGN:
   (i) 3×4 Fact. in R.B.D. (ii) (a) 12. (b) N.A. (iii) 3. (iv) (a) and (b) 8’×24’. (v) Nil. (vi) Yes.

4. GENERAL:
   (i) Normal. No lodging. (ii) Nil. (iii) Yield of stripped cane. (iv) (a) 1952 to 1954. (b) No. (c) Nil. (v) (a) No. (b) —. (vi) and (vii) Nil.

5. RESULTS:
   (i) 17.52 ton/ac.
   (ii) 3.90 ton/ac.
   (iii) Only D effect is significant.
   (iv) Av. yield of stripped cane in ton/ac.

<table>
<thead>
<tr>
<th></th>
<th>D₁</th>
<th>D₂</th>
<th>D₃</th>
<th>Mean</th>
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<tbody>
<tr>
<td>F₀</td>
<td>20.77</td>
<td>20.42</td>
<td>14.10</td>
<td>18.43</td>
</tr>
<tr>
<td>F₁</td>
<td>19.52</td>
<td>18.13</td>
<td>13.40</td>
<td>17.02</td>
</tr>
<tr>
<td>F₂</td>
<td>20.07</td>
<td>15.90</td>
<td>17.29</td>
<td>17.75</td>
</tr>
<tr>
<td>F₃</td>
<td>17.85</td>
<td>16.60</td>
<td>16.25</td>
<td>16.90</td>
</tr>
</tbody>
</table>

Mean | 19.55 | 17.76 | 15.76 | 17.52

S.E. of marginal mean of F = 1.30 ton/ac.
S.E. of marginal mean of D = 1.13 ton/ac.
S.E. of body of table = 2.25 ton/ac.
Crop : Sugarcane.  
Site : Sugarcane Res. Stn., Jullundur.  
Ref : Pb. 52(128).  
Type : 'D'.

Object : To find out effective and economical measures against top borer and its effect on yield.

1. BASAL CONDITIONS:
   (i) (a) Chari-Bajra-Fallow-Sugarcane. (b) Chari, bajra and fallow. (c) Nil. (ii) (a) Sandy loam. (b) Refer soil analysis, Jullundur. (iii) 3.4.1952. (iv) (a) 3 ploughings and 2 sohaga. (b) to (e) N.A; (v) 11 trucks of city compost applied on 12.3.1952 by broadcast method and ploughed in: (vi) CO.L9 (medium) (vii) Irrigated. (viii) 4 hoeings and once earthing up. (ix) 36.61". (x) 6 to 14.12.1952.

2. TREATMENTS:
   1. 0.5% DDT (Gies 350).
   2. 0.5% DDT (Em).
   3. 0.5% BHC (Agro W.P.)
   4. 0.25% Liquid Agro.
   5. 1.0% ovicide.
   6. 10% DDT dust at 20 lb./ac.
   7. Hexyclan 10% at 20 lb./ac.
   8. Control.

3. DESIGN:
   (i) R.B.D. (ii) (a) 8. (b) N.A. (iii) 4. (iv) (a) 16’x70’. (b) 1/40’ ac. (v) N.A. (vi) Yes

4. GENERAL:
   (i) Very poor. (ii) Top borer incidence: control measures as under treatments. (iii) Sugarcane yield data.
   (iv) (a) Not contd. (b) No. (c) --. (v) (a) Nil. (b) --. (vi) and (vii) Nil.

5. RESULTS:
   (i) 5.96 ton/ac.
   (ii) 1.78 ton/ac.
   (iii) Treatments are not significantly different.
   (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>6.21</td>
</tr>
<tr>
<td>2.</td>
<td>6.31</td>
</tr>
<tr>
<td>3.</td>
<td>6.24</td>
</tr>
<tr>
<td>4.</td>
<td>6.83</td>
</tr>
<tr>
<td>5.</td>
<td>5.47</td>
</tr>
<tr>
<td>6.</td>
<td>5.11</td>
</tr>
<tr>
<td>7.</td>
<td>6.16</td>
</tr>
<tr>
<td>8.</td>
<td>5.34</td>
</tr>
<tr>
<td>S.E./mean</td>
<td>0.89 ton/ac</td>
</tr>
</tbody>
</table>

Crop : Sugarcane.  
Site : Sugarcane Res. Stn., Jullundur.  
Ref : Pb. 52(128).  
Type : 'D'.

Object : To find out effective and economical control measures to check white ant attack on Sugarcane crop and its effect on yield.

1. BASAL CONDITIONS:
   (i) (a) Nil. (b) Chari and guara. (c) Nil. (ii) (a) Loam. (b) Refer soil analysis, Jullundur. (iii) 26, 27.3.1952. (iv) (a) 4 ploughings, 2 sohaga and 1 kahat. (b) to (e) N.A. (v) 8 trucks of town refuse compost applied on 13.3.1952 mixed with soil by ploughing. (vi) CO. 312 (medium). (vii) Irrigated. (viii) 4 hoeings and once earthing up. (ix) 36.61". (x) 3 to 5.2.1953.
2. TREATMENTS:
1. 1.0% DDT (Gues 550).
2. 0.5% DDT (Gues 550).
3. 0.5% BHC (Agro W.P.).
4. 0.25% BHC (Agro W.P.).
5. 0.25% Corrosive sublimate.
6. Lead arsenate 5.0%.
7. Lead arsenate 2.5%.
8. BHC dust in furrows, after planting, at 35 lb./ac.
9. BHC dust applied to ends and whole sets.
10. Control.

3. DESIGN:
(i) R.B.D.  (ii) (a) 10. (b) N.A.  (iii) 3. (iv) (a) and (b) 12' x 103'. (v) No.  (vi) Yes.

4. GENERAL:
(i) Satisfactory. (ii) White ant attack; control measures as per treatments. (iii) Germination % and yield sugarcane data. (iv) (a) No.  (b) -. (c) -.  (v) (a) Nil.  (b) -.  (vi) and (vii) Nil.

5. RESULTS:
(i) 19.78 ton/ac.
(ii) 1.50 ton/ac.
(iii) Treatments are not significantly different.
(iv) Av. yield of cane in ton/ac.

<table>
<thead>
<tr>
<th>Treatment</th>
<th>Av. yield</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>20.63</td>
</tr>
<tr>
<td>2.</td>
<td>21.17</td>
</tr>
<tr>
<td>3.</td>
<td>19.22</td>
</tr>
<tr>
<td>4.</td>
<td>20.54</td>
</tr>
<tr>
<td>5.</td>
<td>18.53</td>
</tr>
<tr>
<td>6.</td>
<td>21.26</td>
</tr>
<tr>
<td>7.</td>
<td>20.17</td>
</tr>
<tr>
<td>8.</td>
<td>19.59</td>
</tr>
<tr>
<td>9.</td>
<td>19.43</td>
</tr>
<tr>
<td>10.</td>
<td>17.26</td>
</tr>
</tbody>
</table>

S.E./mean = 0.90 ton/ac.

Crop :- Sugarcane.  
Site :- Sugarcane Res. Stn., Jullundur.  
Ref :- Pb. 52(125).  
Type :- 'D'.

Object :- To find out effective and economical control measures against stem borer and its effect on yield.

1. BASAL CONDITIONS:
(i) (a) No.  (b) Fallow.  (c) Nil.  (ii) (a) Loam.  (b) Refer soil analysis, Jullundur.  (iii) 20.5.1952.  
(iv) (a) 4 ploughings.  (b) to (e) N.A.  (v) 8 trucks/ac. of compost manure on 13.3.1952.  (vi) CO.421 (late).  
(vii) Irrigated.  (viii) 3 hoeings and one ridging.  (ix) 36.61".  (x) 4.1.1953

2. TREATMENTS:
1. 50 lb./ac. of BHC 5% dust.
2. 40 lb./ac. of BHC 5% dust.
3. 30 lb./ac. of BHC 5% dust.
4. Control.

Applied on 23.6.1952 as dust at the base of shoots.

3. DESIGN:
(i) R.B.D.  (ii) (a) 4.  (b) N.A.  (iii) 4.  (iv) (a) 1/48.4 ac.  (b) 1/50 ac.  (v) N.A.  (vi) Yes.

4. GENERAL:
(i) Fair. No lodging.  (ii) Attack of stem borer; control measures as per treatments.  (iii) Stripped cane yield.  
(iv) (a) Not contd.  (b) -.  (c) -.  (v) (a) No.  (b) -.  (vi) and (vii) Nil.
5. RESULTS:
(i) 16.64 ton/ac.
(ii) 2.66 ton/ac.
(iii) Treatments are not significantly different.
(iv) Av. yield of cane in ton/ac.

<table>
<thead>
<tr>
<th>Treatment</th>
<th>Av. yield</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>18.04</td>
</tr>
<tr>
<td>2.</td>
<td>16.46</td>
</tr>
<tr>
<td>3.</td>
<td>16.86</td>
</tr>
<tr>
<td>4.</td>
<td>15.19</td>
</tr>
</tbody>
</table>

S.E./mean = 1.33 ton/ac.

Crop: Sugarcane.
Site: Sugarcane Res. Stn., Jullundur.
Object: To study the effect of Gromore on germination and yield of Sugarcane.

1. BASAL CONDITIONS:
   (i) (a) Wheat-Kharif fodder-Fallow-Sugarcane. (b) Fallow. (c) Nil. (ii) (a) Loamy. (b) Refer soil analysis, Jullundur. (iii) 14.4.1952. (iv) (a) 1 hindustan hal, 4 desi hal and 6 sohaga. (b) N.A. (c) 35,000 setts/ac. (d) and (e) N.A. (v) 8 ton/ac. of F.Y.M. on 13.3.1952. (vi) CO. 312 (medium). (vii) Irrigated. (viii) N.A. (ix) 36.61". (x) 11.1.1953.

2. TREATMENTS:
   1. Fresh cane sown in soil manured with Gromore 1 : 80.
   2. Fresh cane sown in soil manured with Gromore 1 : 40.
   4. Setts soaked in Gromore 1 : 4 and sown in soil manured with Gromore 1 : 40.
   5. Fresh cane sown in soil manured with A/S at 100 lb./ac. of N in June (24.6.1952).
   6. Control (unsoaked fresh setts).

3. DESIGN:
   (i) R.B.D. (ii) (a) 6. (b) N.A. (iii) 3. (iv) (a) and (b) 8' x 24'. (v) Nil. (vi) Yes.

4. GENERAL:
   (i) Normal. No lodging. (ii) Nil. (iii) Yield of stripped cane. (iv) (a) Not continued. (b)---. (c)---. (v) (a) No. (b)---. (vi) and (vii) Nil.

5. RESULTS:
   (i) 18.87 ton/ac.
   (ii) 2.70 ton/ac.
   (iii) Treatments are not significantly different.
   (iv) Av. yield of stripped cane in ton/ac.

<table>
<thead>
<tr>
<th>Treatment</th>
<th>Av. yield</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>17.71</td>
</tr>
<tr>
<td>2.</td>
<td>17.09</td>
</tr>
<tr>
<td>3.</td>
<td>20.63</td>
</tr>
<tr>
<td>4.</td>
<td>21.68</td>
</tr>
<tr>
<td>5.</td>
<td>17.02</td>
</tr>
<tr>
<td>6.</td>
<td>17.09</td>
</tr>
</tbody>
</table>

S.E./mean = 1.56 ton/ac.
Crop :- Sugarcane.  
Site :- Sugarcane Res. Stn., Jullundur.  
Ref :- Pb. 53(146).  
Type :- 'D'.

Object :- To find effective and economical control measures against top borer and its effect on yield.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) Sann for green manuring. (c) Green manuring with sann. Details N.A. (ii) (a) Loam. (b) Refer soil analysis, Jullundur. (iii) 27 and 28.3.1953. (iv) (a) 5 ploughings and 4 sohaga. (b) to (e) N.A. (v) Nil. (vi) C.O.L.9 (medium). (vii) Irrigated. (viii) One blind hoeing, one hand hoeing with kasaula and one ponjdante. (ix) 32.8°. (x) 3 and 6.12.1952 and 27.1.1953.

2. TREATMENTS :

1. 0.5% DDT (Eml).
2. 0.5% DDT (Gues 550).
3. 0.5% BHC (Agro W.P.).
4. 0.5% Chloradane (Eml).
5. 0.5% Chloradane (W.P.).
6. 0.5% Lindane (W.P.).
7. Chloradane 5% dust.
8. DDT 10% dust.
9. BHC 10% dust.
10. Toxaphene 10% dust.
11. Parathion 10% dust.
12. Control.

3. DESIGN :

(i) R B.D. (ii) (a) 12. (b) N.A. (iii) 2. (iv) (a) and (b) 12'×90'×9'. (v) Nil. (vi) Yes.

4. GENERAL :

(i) Poor. No lodging. (ii) Top borer incidence. Control measures as per treatments. (iii) Top borer incidence and sugarcane yield. (iv) (a) Not contd. (b) No. (c) —. (v) (a) Nil. (b) —. (vi) and (vii) Nil.

5. RESULTS :

(i) 21.90 ton/ac.
(ii) 1.70 ton/ac.
(iii) Treatments are significantly different.
(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. 24.10</td>
<td>7. 21.99</td>
<td></td>
<td></td>
</tr>
<tr>
<td>2. 24.10</td>
<td>8. 21.41</td>
<td></td>
<td></td>
</tr>
<tr>
<td>3. 22.48</td>
<td>9. 22.35</td>
<td></td>
<td></td>
</tr>
<tr>
<td>4. 23.48</td>
<td>10. 26.89</td>
<td></td>
<td></td>
</tr>
<tr>
<td>5. 21.40</td>
<td>11. 19.51</td>
<td></td>
<td></td>
</tr>
<tr>
<td>6. 17.54</td>
<td>12. 20.57</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

S.E./mean = 1.20 ton/ac.

---

Crop :- Sugarcane.  
Site :- Sugarcane Res. Stn., Jullundur.  
Ref :- Pb. 53 (145).  
Type :- 'D'.

Object :- To find effective and economical control measures against top borer and its effect on yield.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) Guara for green manuring. (c) Green manured with guara. Details N.A. (ii) (a) Sandy loam. (b) Refer soil analysis, Jullundur. (iii) 27 and 28.3.1953. (iv) (a) 5 ploughings and 3 sohaga. (b) to (e) N.A. (v) Nil. (vi) C.O.L.9 (medium). (vii) Irrigated. (viii) One blind hoeing, one hand hoeing, one hoeing with kasaula and one ponjdante. (ix) 32.8°. (x) 3, 6.12.1953 to 27.1.1954.

2. TREATMENTS :

1. 0.5% DDT (Eml).
2. 0.5% DDT (Gues 550).
3. 0.5% BHC (Agro W.P.).
4. 0.5% Chloradane (Eml).
5. 0.5% Chloradane (W.P.).
6. 0.5% Lindane (W.P.).
7. Chloradane 5% dust.
8. DDT 10% dust.
9. BHC 10% dust.
10. Toxaphene 10% dust.
11. Parathion 10% dust.
12. Control.

3. DESIGN:
(i) R.B.D. (ii) (a) 12. (b) N.A. (iii) 2. (iv) (a) and (b) 12’x90’x9”. (v) Nil. (vi) Yes.

4. GENERAL:
(i) Poor. No lodging. (ii) Top borer incidence ; control measures as per treatments. (iii) Top borer incidence and yield of cane. (iv) (a) Not contd. (b)—. (c)—. (v) (a) Nil. (b)—. (vi) and (vii) Nil.

5. RESULTS:
(i) 17.80 ton/ac.
(ii) 2.24 ton/ac.
(iii) Treatments are not significantly different.
(iv) Av. yield of cane 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>15.08</td>
<td>7.</td>
<td>17.17</td>
</tr>
<tr>
<td>2.</td>
<td>17.61</td>
<td>8.</td>
<td>19.10</td>
</tr>
<tr>
<td>3.</td>
<td>20.19</td>
<td>9.</td>
<td>19.74</td>
</tr>
<tr>
<td>4.</td>
<td>15.41</td>
<td>10.</td>
<td>15.39</td>
</tr>
<tr>
<td>5.</td>
<td>17.63</td>
<td>11.</td>
<td>20.77</td>
</tr>
<tr>
<td>6.</td>
<td>17.45</td>
<td>12.</td>
<td>17.91</td>
</tr>
</tbody>
</table>

S.E./mean = 1.58 ton/ac.

Crop :- Sugarcane.
Site :- Sugarcane Res. Stn., Jullundur.

Ref :- Ph. 53 (144).
Type :- 'D'.
Object :- To find out the effective and economical control measures to check the white ant attack on Sugarcane and its effect on yield.

I. BASAL CONDITIONS:
(i) (a) Nil. (b) Fallow. (c) Nil. (ii) (a) Loam. (b) Refer soil analysis, Jullundur. (iii) 17.3.1953.
(iv) (a) 5 ploughings and 3 tohaga. (b) to (e) N.A. (v) 2 C.L. of F.Y.M. applied on 18, 20.2.1953 mixed with soil by ploughing. (vi) CO. 312 (medium). (vii) Irrigated. (viii) 5 hoeings and one earthing up. (ix) 32.8”. (x) 5 to 9.1.1954.

2. TREATMENTS:

<table>
<thead>
<tr>
<th></th>
<th>Treatment</th>
<th>Av. yield</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>1.0% DDT.</td>
<td>34.96</td>
</tr>
<tr>
<td>2.</td>
<td>0.5% DDT.</td>
<td>33.75</td>
</tr>
<tr>
<td>3.</td>
<td>0.5% BHC.</td>
<td>33.90</td>
</tr>
<tr>
<td>4.</td>
<td>0.25% BHC.</td>
<td>37.06</td>
</tr>
<tr>
<td>5.</td>
<td>0.1% BHC.</td>
<td>33.69</td>
</tr>
<tr>
<td>6.</td>
<td>5.0% Lead arsenate.</td>
<td>35.06</td>
</tr>
<tr>
<td>7.</td>
<td>2.5% Lead arsenate.</td>
<td>34.79</td>
</tr>
<tr>
<td>8.</td>
<td>0.5% Corrosive sublimate.</td>
<td>33.38</td>
</tr>
<tr>
<td>9.</td>
<td>0.25% Corrosive sublimate.</td>
<td>31.58</td>
</tr>
<tr>
<td>10.</td>
<td>5.0% Hexidole.</td>
<td>27.35</td>
</tr>
<tr>
<td>11.</td>
<td>5.0% BHC (Gues D 025).</td>
<td>33.38</td>
</tr>
<tr>
<td>12.</td>
<td>7.0% BHC (Gues D 027).</td>
<td>33.92</td>
</tr>
<tr>
<td>13.</td>
<td>1.0% BHC (Gues D 120).</td>
<td>32.52</td>
</tr>
<tr>
<td>14.</td>
<td>Control.</td>
<td>33.02</td>
</tr>
</tbody>
</table>

S.E./mean = 2.29 ton/ac.
Object: To find out effective and economical control measures to check white ant attack on Sugarcane crop and its effect on yield.

1. BASAL CONDITIONS:
   (i) (a) Wheat-Chari fodder-Sugarcane. (b) Chari fodder. (c) Nil. (ii) (a) Lcam. (b) Refer soil analysis, Jullundur. (iii) 30.9.1953. (iv) (a) to (e) N.A. (v) Nil. (vi) CO. 312 (medium). (vii) Irrigated. (viii) Five hoeings and one earthing up. (ix) 32.8". (x) 15 and 16.5.1954.

2. TREATMENTS:
   1. 1.0% DDT (Gues 550).
   2. 6.5% DDT (Gues 550).
   3. 0.5% BHC (Agro W.P.).
   4. 0.25% BHC (Agro W.P.).
   5. 0.5% Dieldrix.
   6. 0.25% Dieldrix.
   7. 5.0% Hexidole dust at 40 lb./ac.
   Treatments applied at planting.

3. DESIGN:
   (i) R.B.D. (ii) (a) 13. (b) N.A. (iii) 4. (iv) (a) 10' X 24'. (b) 8' X 24'. (v) One foot from each side of length left out. (vi) Yes.

4. GENERAL:
   (i) Satisfactory. (ii) White ant attack; control measures as per treatments. (iii) % white ant attack to buds and yield of stripped cane. (iv) (a) Not contd. (b) —. (c) —. (v) (a) Nil. (b) —. (vi) and (vii) Nil.

5. RESULTS:
   (i) 34.20 ton/ac.
   (ii) 1.54 ton/ac.
   (iii) Treatments are highly significantly different.
   (iv) Av. yield sugarcane in ton/ac.
   Treatment | Av. yield | Treatment | Av. yield
   1. | 38.08 | 8. | 36.84 |
   2. | 26.59 | 9. | 39.68 |
   3. | 33.67 | 10. | 32.61 |
   4. | 34.06 | 11. | 29.50 |
   5. | 41.02 | 12. | 35.25 |
   6. | 41.91 | 13. | 24.06 |
   7. | 31.96 | |
   S.E./mean = 0.77 ton/ac.
3. DESIGN:
(i) Split-plot. (ii) (a) 3 main-plots/block ; 4 sub-plots/main-plot, (b) N.A. (iii) 3. (iv) (a) 1/54.45th ac. (b) 1/60th ac. (v) N.A. (vi) Yes.

4. GENERAL:
(i) Fair. No lodging. (ii) Attacked by stem borer. (iii) Incidence of stem borer after each application of BHC and yield of sugarcane. (iv) (a) 1953 to 1954. (b) No. (c) Nil. (v) (a) No. (b)—. (vi) and (vii) Nil.

5. RESULTS:
(i) 26.24 ton/ac.
(ii) (a) 2.89 ton/ac.
(b) 1.65 ton/ac.
(iii) Main-plot as well as sub-plot treatments are not significantly different while interaction main-plots X sub-plots is highly significant.
(iv) Av. yield of sugarcane in ton/ac.

<table>
<thead>
<tr>
<th>T1</th>
<th>T2</th>
<th>T3</th>
<th>T4</th>
<th>Mean</th>
</tr>
</thead>
<tbody>
<tr>
<td>I1</td>
<td>27.02</td>
<td>25.21</td>
<td>24.84</td>
<td>26.12</td>
</tr>
<tr>
<td>I2</td>
<td>25.10</td>
<td>29.42</td>
<td>25.19</td>
<td>27.18</td>
</tr>
</tbody>
</table>

Mean 25.69
S.E. of difference of two
1. I marginal means = 1.19 ton/ac.
2. T marginal means = 0.78 ton/ac.
3. T means at the same level of I = 1.35 ton/ac.
4. I means at the same level of T = 1.66 ton/ac.

Crop : Cotton.
Site : Cotton Res. Stn., Abohar.
Ref : Pb. 52(161).
Type : 'M'.

Object : To study the effects of G.N.C. and A/S on Cotton crop.

1. BASAL CONDITIONS:
(i) (a) N.A. (b) Wheat. (c) Nil. (ii) (a) Sandy loam. (b) N.A. (iii) 3.6.1952. (iv) (a) to (c) N.A. (d) \(2\times 2\times 2\). (e) N.A. (f) Nil. (v) (a) Jullundur and Hansi. (vi) Irrigated. (vii) 2 gap fillings, 3 hoeings and 2 thinning.

2. TREATMENTS:
All combinations of (1) and (2)
(2) 3 levels of N : \(N_0 = 0, N_1 = 50 and N_2 = 100 \text{ lb./ac.}\)

3. DESIGN:
(i) 3 x 3 Fact. in R.B.D. (ii) (a) 9. (b) N.A. (iii) 6. (iv) (a) 12.5' x 1.25'. (b) 7.5' x 3.75'. (v) N.A. (vi) Yes.

4. GENERAL:
(i) Fair to good. No lodging. (ii) Nil. (iii) Boll weight, height, initiation of buds and kapas yield. (iv) (a) Not contd. (b) No. (c)—. (v) (a) Jullundur and Hansi. (b) N.A. (vi) and (vii) Nil.

5. RESULTS:
(i) 1816 lb./ac.
(ii) 225.0 lb./ac.
(iii) Control vs others effect is highly significant while other effects are not significant.
(iv) Av. yield of kapas in lb./ac.

<table>
<thead>
<tr>
<th></th>
<th>N₀</th>
<th>N₁</th>
<th>N₂</th>
<th>Mean</th>
</tr>
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<tbody>
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<td></td>
<td>1906</td>
<td>2105</td>
<td>2006</td>
</tr>
<tr>
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<td>1924</td>
</tr>
<tr>
<td>S₃</td>
<td></td>
<td>1894</td>
<td>1852</td>
<td>1873</td>
</tr>
<tr>
<td>Mean</td>
<td>1579</td>
<td>1879</td>
<td>1990</td>
<td></td>
</tr>
</tbody>
</table>

S.E. of marginal mean of S = 64.9 lb./ac.
S.E. of marginal mean of N = 53.0 lb./ac.
S.E. of body of table = 91.9 lb./ac.

---

Crop: Cotton.
Site: Cotton Res. Stn., Abahor.
Ref: Pb. 52(162).
Type: 'M'.

Object: To find out the best time and method of application of A/S for Cotton.

1. BASAL CONDITIONS:
(i) (a) N.A. (b) Wheat. (c) Nil.
(ii) (a) Sandy loam. (b) N.A.
(iii) 10.6.1952.
(iv) (a) to (c) N.A.
(d) 2'X1'. (e) N.A. (f) Nil.
(vi) F-320. (vii) Irrigated. (viii) 1 gapfilling, 5 hoeings and one thinning on 11.25 and 29.7.1952.
(ix) 5.45°. (x) 4 pickings from 7.11.1952 to 24.12.1952.

2. TREATMENTS:
50 lb./ac. of N as A/S applied as:
(1) 3 methods of placement: M₁ = Broadcast in the whole plot, M₂ = Surface application along rows and M₃ = Drilled on one side of the row; 2' on the side and 2' deep.
(2) 4 times of application: T₀ = No manure, T₁ = Early (with first irrigation), T₂ = Late (at the outset of flowering) and T₃ = Half early and half late.

3. DESIGN:
(i) Fact. in R.B.D. (ii) (a) 12. (b) N.A. (iii) 8. (iv) (a) 60'X15'. (b) 50'X10'. (v) N.A. (vi) Yes.

4. GENERAL:
(i) Satisfactory. No lodging. (ii) Nil. (iii) Height, initiation of buds, boll weight and kapas yield. (iv) (a) 1952-contd. (b) No. (c) N.A. (v) (a) No. (b) N.A. (vi) and (vii) Nil.

5. RESULTS:
(i) 1729 lb./ac.
(ii) 254.8 lb./ac.
(iii) Control vs others effect is highly significant. Other effects are not significant.
(iv) Av. yield of kapas in lb./ac.

<table>
<thead>
<tr>
<th></th>
<th>T₀</th>
<th>T₁</th>
<th>T₂</th>
<th>T₃</th>
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</tr>
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<tbody>
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<td>1885</td>
<td>1801</td>
<td>1800</td>
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<tr>
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<td>1659</td>
<td>1658</td>
<td>1876</td>
<td>1638</td>
</tr>
<tr>
<td>M₃</td>
<td></td>
<td>1784</td>
<td>1721</td>
<td>1880</td>
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<td>Mean</td>
<td>1552</td>
<td>1738</td>
<td>1755</td>
<td>1852</td>
<td></td>
</tr>
</tbody>
</table>

S.E. of any marginal mean = 52.0 lb./ac.
S.E. of body of table = 90.1 lb./ac.
Crop: Cotton.  
Site: Cotton Res. Stn., Aboliar.  
Ref: Pb. 53(246).  
Type: 'M'.
3. DESIGN:
(i) Split-plot. (ii) (a) 18 main-plots/block; 2 sub-plots/main-plot. (b) N.A. (iii) 4. (iv) (a) 14'×45'. (b) 10'×40'. (v) N.A. (vi) Yes.

4. GENERAL:
(i) Fair to good. No lodging. (ii) Nil. (iii) Initiation of buds, boll weight and kapas yield. (iv) (a) Not contd. (b) No. (c) Yes. (d) Jullundur and Hansi. (b) N.A. (vi) and (vii) Nil.

5. RESULTS:
(i) 1318 lb./ac. (ii) (a) 300.1 lb./ac. (b) 143.3 lb./ac. (iii) N effect is highly significant. Other effects and interactions are not significant. (iv) Av. yield of kapas in lb./ac.

<table>
<thead>
<tr>
<th></th>
<th>P0</th>
<th>P1</th>
<th>Mean</th>
<th>T1</th>
<th>T2</th>
<th>T3</th>
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<tbody>
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<td>N3</td>
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<td>1492</td>
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<td>N4</td>
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<td>1479</td>
<td>1594</td>
<td>1566</td>
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<td>1318</td>
<td>1318</td>
<td>1422</td>
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<td>1371</td>
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</tr>
<tr>
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<td>1246</td>
<td>1244</td>
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</tbody>
</table>

S.E. of difference of two

- marginal means of N = 86.7 lb./ac.
- marginal means of T in P×T table = 61.2 lb./ac.
- marginal means of T in N×T table = 67.1 lb./ac.
- marginal means of P = 23.9 lb./ac.
- means in body of the table N×T = 150.0 lb./ac.
- P means at the same level of N = 58.5 lb./ac.
- P means at the same level of T = 41.4 lb./ac.
- N means at the same level of P = 96.0 lb./ac.
- T means at the same level of P = 67.9 lb./ac.

Crop :- Cotton.  Ref :- Pb. 53(245).
Site :- Cotton Res. Stn., Abohar.  Type :- 'M'.

Object :- To study the effect of F.Y.M. and qualitative and quantitative effects of different nitrogenous fertilizers on Cotton crop.

1. BASAL CONDITIONS:
(i) (a) No. (b) Wheat. (c) Nil. (ii) (a) Sandy loam. (b) N.A. (iii) 13.5.1953. (iv) (a) to (c) N.A. (d) 2'×1'. (e) N.A. (v) N.A. (vi) F-320. (vii) Irrigated. (viii) Gap filling and 1 hoeing. (ix) 7.87". (x) End of Oct. and 30.11.1953.
2. TREATMENTS:
Main-plot treatments:
3 levels of F.Y.M.: F₀ = 0, F₁ = 100 and F₂ = 200 md./ac.
Sub-plot treatments:
All combinations of (1) and (2).
(2) 3 levels of N: N₀ = 0, N₁ = 50 and N₂ = 100 lb./ac.

3. DESIGN:
(i) Split-plot, (ii) (a) 3 main-plots/block; 9 sub-plots/main-plot. (b) N.A. (iii) 4, (iv) (a) 10' × 50', (b) 6' × 44'.
(v) N.A. (vi) Yes.

4. GENERAL:
(i) Fair. No lodging. (ii) Nil. (iii) Boll weight, height, initiation of buds and kapas yield. (iv) (a) Not contd. (b) and (c) No. (v) (a) and (b) Nil. (vi) and (vii) Nil.

5. RESULTS:
(i) 543.4 lb./ac.
(ii) (a) 116.1 lb./ac. (b) 74.9 lb./ac.
(iii) Main effects of S and N are highly significant while other effects and interactions are not significant.
(iv) Av. yield of kapas in lb./ac.

<table>
<thead>
<tr>
<th>F₀</th>
<th>F₁</th>
<th>F₂</th>
<th>Mean</th>
<th>N₀</th>
<th>N₁</th>
<th>N₂</th>
<th>Mean</th>
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<tr>
<td>S₂</td>
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<td></td>
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<td></td>
<td></td>
<td>521.5</td>
</tr>
<tr>
<td>S₃</td>
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<td></td>
<td>523.3</td>
<td></td>
<td></td>
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</tr>
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<td></td>
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<td>543.4</td>
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<table>
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<tr>
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<th>N₁</th>
<th>N₂</th>
<th>Mean</th>
</tr>
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<tr>
<td>417.2</td>
<td>376.6</td>
<td>414.6</td>
<td>402.8</td>
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<td>554.2</td>
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<tr>
<td>672.7</td>
<td>680.6</td>
<td>620.5</td>
<td>657.9</td>
</tr>
</tbody>
</table>

S.E. of difference of two
1. F marginal means = 27.4 lb./ac.
2. S marginal means in F × S table = 17.7 lb./ac.
4. N marginal means = 17.7 lb./ac.
5. S or N means at the same level of F = 30.6 lb./ac.
6. F means at the same level of S or N = 37.0 lb./ac.
7. means in body S × N table = 30.6 lb./ac.

Crop: Cotton.
Site: Cotton Res. Stn., Abohar.
Object: To study the effect of P₂O₅ application in combination with N applied to previous crop on succeeding crop of Cotton.

Ref: Pb. 53(249).
Type: 'M'.

1. BASAL CONDITIONS:
(i) (a) No. (b) and (c) As per treatments. (ii) (a) Sandy loam. (b) N.A. (iii) 14.5.1953. (iv) (a) to (c) N.A. (d) 2' × 1'. (e) N.A. (v) N.A. (vi) F-320. (vii) Irrigated. (viii) 1 gap filling and 1 hoeing, (ix) 7.87'. (x) 13.11.1953 and 30.11.1953.
2. TREATMENTS:

Main-plot treatments:
Previous crops: R₁=Gueno, R₂=Gram, R₃=Berseem, R₄=Wheat and R₅=Fallow.

Sub-plot treatments:
2 levels of P₂O₅ as Super: P₀=0 and P₁=50 lb./ac.

Sub-sub-plot treatments:
3 levels of N: N₀=0, N₁=50 and N₂=100 lb./ac.

3. DESIGN:

(i) Split-plot. (ii) (a) 5 main-plots/block; 2 sub-plots/main-plot and 3 sub-sub-plots/sub-plot. (b) N.A.
(iii) 4. (iv) (a) 45°×16'. (b) 40°×12'. (v) N.A. (vi) Yes.

4. GENERAL:

(i) Fair. No lodging. (ii) Nil. (iii) Initiation of buds, boll weight and kāpas yield. (iv) (a) Not contd. (b) and (c) No. (v) (a) and (b) No. (vi) and (vii) Nil.

5. RESULTS:

(i) 910 lb./ac.
(ii) (a) 246.2 lb./ac.
(b) 196.4 lb./ac.
(c) 130.5 lb./ac.

(iii) Main effect of N and interaction R x N are highly significant. Others are not significant.
(iv) Av. yield of kāpas in lb./ac.

<table>
<thead>
<tr>
<th></th>
<th>R₁</th>
<th>R₂</th>
<th>R₃</th>
<th>R₄</th>
<th>R₅</th>
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<td>915</td>
<td>914</td>
<td>771</td>
<td>888</td>
<td>1083</td>
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<tr>
<td>P₁</td>
<td>926</td>
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<td>1030</td>
<td>905</td>
<td>714</td>
<td>922</td>
<td>1080</td>
</tr>
<tr>
<td>Mean</td>
<td>939</td>
<td>856</td>
<td>896</td>
<td>884</td>
<td>972</td>
<td>910</td>
<td>742</td>
<td>905</td>
<td>1081</td>
</tr>
</tbody>
</table>

S E. of difference of two
1. R marginal means = 71.1 lb./ac.
2. P marginal means = 35.9 lb./ac.
3. N marginal means = 29.2 lb./ac.
4. P means at the same level of R = 80.2 lb./ac.
5. R means at the same level of P = 90.9 lb./ac.
6. N means at the same level of R = 65.3 lb./ac.
7. R means at the same level of N = 88.8 lb./ac.
8. N means at the same level of P = 41.3 lb./ac.
9. P means at the same level of N = 49.2 lb./ac.
2. TREATMENTS:

Main-plot treatments:
All combinations of (1) and (2)
(1) 6 levels of N: \(N_0 = 0, N_1 = 25, N_2 = 50, N_3 = 75, N_4 = 100\) and \(N_5 = 125\) lb./ac.
(2) 3 times of application of N: \(T_1 = \text{Half at sowing + half at initiations of flowering,}\)
\(T_2 = \text{Half at thinning + half at initiations of flowering and}\)
\(T_3 = \text{Full dose at initiations of flowering.}\)

Sub-plot treatments:
2 levels of \(P_2O_5\) as Super: \(P_0 = 0\) and \(P_1 = 50\) lb./ac.

3. DESIGN:
(i) Split-plot. (ii) (a) 18 main-plots/block; 2 sub-plots/main-plot. (b) N.A. (iii) 4. (iv) (a) N.A. (b) \(8 \times 46\). (v) N.A. (vi) Yes.

4. RESULTS:
(i) 1186 lb./ac.
(ii) (a) 286 0 lb./ac.
(b) 128.6 lb./ac.
(iii) Main effect of N and interaction \(P \times T\) are highly significant. Main effect of \(T\) is significant. Others are not significant.
(iv) Av. yield of \(kapas\) in lb./ac.

<table>
<thead>
<tr>
<th>(T_1)</th>
<th>(T_2)</th>
<th>(T_4)</th>
<th>Mean</th>
<th>(P_0)</th>
<th>(P_1)</th>
</tr>
</thead>
<tbody>
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<td>—</td>
<td>—</td>
<td>—</td>
<td>741</td>
<td>707</td>
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<td>(N_1)</td>
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<td>929</td>
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<td>992</td>
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<td>1033</td>
<td>1111</td>
<td>1102</td>
</tr>
<tr>
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<td>1278</td>
<td>1333</td>
<td>1368</td>
<td>1407</td>
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<td>1446</td>
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<td>1074</td>
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<td>1169</td>
<td>1119</td>
<td>1186</td>
<td></td>
</tr>
</tbody>
</table>

S.E. of difference of two
1. N marginal means = 82.6 lb./ac.
2. T marginal means in \(N \times T\) table = 63.9 lb./ac.
3. T marginal means in \(T \times P\) table = 58.4 lb./ac.
4. P marginal means = 21.4 lb./ac.
5. \(P\) means at the same level of \(N\) = 52.5 lb./ac.
6. \(N\) means at the same level of \(P\) = 90.5 lb./ac.
7. \(P\) means at the same level of \(T\) = 37.1 lb./ac.
8. \(T\) means at the same level of \(P\) = 64.0 lb./ac.
9. means in body of \(N \times T\) table = 143.0 lb./ac.

Crop: Cotton
Site: Cotton Res. Sta., Hanzi.

Object: To find an organic substitute for A/S.

1. BASAL CONDITIONS:
(i) (a) Wheat-Cotton. (b) Wheat. (c) Nil. (ii) (a) Clay loam. (b) N.A. (iii) 30.4.1952. (iv) (a) 4 desi plough. (b) Dibbling by hand. (c) 10 sr./ac. (d) \(2 \times 2\). (e) N.A. (v) Nil. (vi) F-216 (medium).
(vii) Irrigated. (viii) 2 hoeings, 1 thinning and 2 weedings. (ix) 12.37. (x) N.A.
2. TREATMENTS:
All combinations of (1) and (2)

(1) 3 levels of N: \( N_0 = 0, N_1 = 50 \) and \( N_2 = 100 \) lb./ac.
(2) 3 sources of N: \( S_1 = \frac{A}{S}, S_2 = G.N.C. \) and \( S_3 = \frac{A}{S} + G.N.C. \) in ratio 1 : 1.
Half \( A/S \) plus half G.N.C. applied one month before sowing. Finely powdered \( \frac{1}{2} \) groundnut cake exterally distributed and thoroughly mixed up in soil just before the first irrigation after sowing. \( \frac{1}{2} A/S \) applied around the plants at the outset of flowering followed by irrigation.

3. DESIGN:
(i) 3 x 3 Fact. in R.B.D. (ii) (a) 9. (b) N.A. (iii) 6. (iv) (a) 10' x 60'. (b) 6' x 60'. (v) 2 rows and 3 feet left out on each side. (vi) Yes.

4. GENERAL:
(i) Satisfactory. No lodging. (ii) Nil. (iii) Height, boll no., pods/plant and kapas yield. (iv) (a) No. (b) —. (c) —. (v) (a) Jullundur and Abohar. (b) Nil. (vi) and (vii) Nil.

5. RESULTS:
(i) 1127 lb./ac.
(ii) 121.1 lb./ac.
(iii) All 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>Mean</th>
</tr>
</thead>
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<td>1259</td>
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<td>( N_2 )</td>
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<tr>
<td>Mean</td>
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<td>1091</td>
<td>1326</td>
<td></td>
</tr>
</tbody>
</table>

S.E. of marginal mean of \( N \) = 28.5 lb./ac.
S.E. of marginal mean of \( S \) = 34.9 lb./ac.
S.E. of body of table = 49.4 lb./ac.

Crop : Cotton.
Site : Cotton Res. Stn., Hansi.

Object : To study the optimum date of application of \( A/S \) and its best mode of placement about the Cotton plant.

1. BASAL CONDITIONS:
(i) (a) Fallow-Cotton. (b) Fallow. (c) Nil. (ii) (a) Light loam. (b) N.A. (iii) 24.4.1953. (iv) (a) 3 desi ploughs and 3 levelling with sohaga. (b) N.A. (c) 12 sr./ac. (d) and (e) N.A. (v) Nil (vi) F-216 (medium). (vii) Irrigated. (viii) 2 weedings and 2 hoeings. (ix) 4.56'. (x) 4 pickings from 21.11.1953 to 8.1.1954.

2. TREATMENTS:
50 lb./ac. of N as A/S applied as:
All combinations of (1) and (2)+3 control plots.

(1) 3 methods of application: \( M_1 = \) Broadcast, \( M_2 = \) Surface application along rows and \( M_3 = \) Drilled on one side of row, 2" on the side and 2" deep.
(2) 3 times of application: \( T_1 = \) Early—with first irrigation, \( T_2 = \) Late—at the time of flowering and \( T_3 = \) Half early-half late.

3. DESIGN:
(i) R.B.D. (ii) (a) 12. (b) N.A. (iii) 4. (iv) (a) N.A. (b) 12' x 44'. (v) N.A. (vi) Yes.

Ref : Pb. 53(5).
Type : 'M'.

Object :—To study the optimum date of application of \( A/S \) and its best mode of placement about the Cotton plant.
4. GENERAL:
(i) Good. No lodging. (ii) Nil. (iii) Height of the plant, no. of pods per plant and yield of kapas. (iv) (a) No. (b)—. (c)—. (v) (a) Jullundur and Abobhar. (vi) and (vii) Nil.

5. RESULTS:
(i) 1145 lb./ac.
(ii) 184.0 lb./ac.
(iii) Control vs others effect is highly significant. All other effects and interaction are not significant.
(iv) Av. yield of kapas in lb./ac.

<table>
<thead>
<tr>
<th>Treatment</th>
<th>M1</th>
<th>M2</th>
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<th>Mean</th>
</tr>
</thead>
<tbody>
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<td>1254</td>
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<td>Mean</td>
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<td>1241</td>
<td>1145</td>
</tr>
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</table>

S.E. of any marginal mean = 53.1 lb./ac.
S.E. of body of table = 92.0 lb./ac.

Crop :- Cotton.
Site :- Govt. Agri. Stn., Hansi.

Object :- To find the best manurial formula for Cotton.

1. BASAL CONDITIONS:
(i) (a) Nil. (b) Berseem. (c) Nil. (ii) (a) Loam. (b) N.A. (iii) 25.4.1948. (iv) (a) to (e) N.A. (v) Nil. (vi) M 60 A 2 (medium). (vii) Irrigated. (viii) One gap filling and 2 hoeings. (ix) 17.45°. (x) 6 pickings from 17.9.1948 to 10.11.1948.

2. TREATMENTS:
1. A/S at 50 lb./ac. of N.
2. Ammo. Phos. at 50 lb./ac. of N.
3. A/S at 100 lb./ac. of N.
4. Ammo. Phos. at 100 lb./ac. of N.
5. F.Y.M. at 50 lb./ac. of N+A/S at 50 lb./ac. of N.
6. F.Y.M. at 50 lb./ac. of N+Ammo. Phos. at 50 lb./ac. of N.
7. Control.

3. DESIGN:
(i) R.B.D. (ii) (a) 7. (b) N.A. (iii) 4. (iv) (a) 11°×79°. (b) 10°×72.6°. (v) N.A. (vi) Yes.

4. GENERAL:
(i) Good. No lodging. (ii) Nil. (iii) Kapas yield. (iv) (a) 1946 to 1948. (b) No. (c) Nil. (v) (a) No, (b)—. (vi) and (vii) Nil.

5. RESULTS:
(i) 1493 lb./ac.
(ii) 196.8 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>
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</thead>
<tbody>
<tr>
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<tr>
<td>2.</td>
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<tr>
<td>3.</td>
<td>1560</td>
</tr>
<tr>
<td>4.</td>
<td>1670</td>
</tr>
<tr>
<td>5.</td>
<td>1471</td>
</tr>
<tr>
<td>6.</td>
<td>1564</td>
</tr>
<tr>
<td>7.</td>
<td>1228</td>
</tr>
</tbody>
</table>

S.E./mean = 98.4 lb./ac.
Crop :– Cotton.  
Site :– Govt. Agri. Stn., Hansi.  
Ref :– Pb. 50 (86).  
Type :– ‘M’.

Object :– To find the best manurial formula for Cotton.

1. BASAL CONDITIONS:
   (i) (a) Nil. (b) Fallow. (c) Nil.  (ii) (a) Loam. (b) N.A. (iii) 16.1.1930. (iv) (a) and (b) N.A. (c) 15 sr./ac. (d) and (e) N.A. (v) Nil. (vi) F-216 (medium). (vii) Irrigated. (viii) 3 hoeings. (ix) 15.25°. (x) 4 pickings from 28.9.1950 to 16.11.1950.

2. TREATMENTS:
   1. A/S at 50 lb./ac. of N.
   2. Ammo. Phos. at 50 lb./ac. of N.
   3. A/S at 100 lb./ac. of N.
   4. Ammo. Phos. at 100 lb./ac.
   5. F.Y.M. at 50 lb./ac. of N+A/S at 50 lb./ac. of N.
   6. F.Y.M. at 50 lb./ac. of N+Ammo. Phos. at 50 lb./ac. of N.
   7. Control.

   A/S and Ammo. Phos. were applied on 31.7.1951 at preflowering stage; F.Y.M. applied before sowing.

3. DESIGN:
   (i) R.B.D. (ii) (a) 7. (b) N.A. (iii) 4. (iv) (a) 12’ x 74’. (b) 8’ x 68’. (v) N.A. (vi) Yes.

4. GENERAL:
   (i) Fair to good. No lodging. (ii) Nil. (iii) K|pas yield. (iv) (a) 1950 to 1953. (b) No. (c) —. (v) (a) No. (b) —. (vi) and (vii) Nil.

5. RESULTS:
   (i) 1418 lb./ac.
   (ii) 142.3 lb./ac.
   (iii) Treatment differences are highly significant.
   (iv) Av. yield of kapas in lb./ac.

   Treatment | A– yield
   1.        | 1322
   2.        | 1466
   3.        | 1448
   4.        | 1774
   5.        | 1497
   6.        | 1427
   7.        | 995
   S.E./mean = 71.1 lb./ac.

Crop :– Cotton.  
Site :– Govt. Agri. Stn., Hansi.  
Ref :– Pb. 51(24).  
Type :– ‘M’.

Object :– To find the best manurial formula for Cotton.

1. BASAL CONDITIONS:
   (i) (a) Nil. (b) Gaura for fodder. (c) Nil. (ii) (a) Loam. (b) N.A. (iii) 20.4.1951. (iv) (a) 1 raja plough, 4 desi ploughs, 3 horse hoe, 7 solaga and 1 roller. (b) N.A. (c) 10 sr./ac. (d) and (e) N.A. (v) Nil. (vi) F-215 (medium). (vii) Irrigated. (viii) 2 times gap filling, 3 hoeings and one thinning. (ix) 2.80°. (x) 6 pickings from 20.9.1951 to 23.11.1951.

2. TREATMENTS:
   1. A/S at 50 lb./ac. of N.
   2. Ammo. Phos. at 50 lb./ac. of N.
   3. A/S at 100 lb./ac. of N.
   4. Ammo. Phos. at 100 lb./ac. of N.
   5. F.Y.M. at 50 lb./ac. of N+A/S at 50 lb./ac. of N.
   6. F.Y.M. at 50 lb./ac. of N+Ammo. Phos. at 50 lb./ac. of N.
   7. Control.

3. **DESIGN:**
   (i) R.B.D. (ii) (a) 7. (b) N.A. (iii) 4. (iv) (a) 10' x 80'. (b) 10' x 80'. (v) Nil. (vi) Yes.

4. **GENERAL:**
   (i) Normal. No lodging. (ii) Nil. (iii) Kapas yield. (iv) (a) 1950—1953. (b) No. (c) Nil. (v) (a) No. (b)—. (vi) and (vii) Nil.

5. **RESULTS:**
   (i) 2048 lb./ac.
   (ii) 325.8 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>2027</td>
</tr>
<tr>
<td>2.</td>
<td>2093</td>
</tr>
<tr>
<td>3.</td>
<td>2156</td>
</tr>
<tr>
<td>4.</td>
<td>2405</td>
</tr>
<tr>
<td>5.</td>
<td>1985</td>
</tr>
<tr>
<td>6.</td>
<td>2048</td>
</tr>
<tr>
<td>7.</td>
<td>1621</td>
</tr>
<tr>
<td>S.E./mean</td>
<td>162.9 lb./ac.</td>
</tr>
</tbody>
</table>

**Crop:** Cotton.  
**Site:** Govt. Agri. Strn., Hansi.  
**Ref:** Pb. 52(100).  
**Type:** 'M'.  

Object: To find the best manurai formula for Cotton.

1. **BASAL CONDITIONS:**
   (i) (a) Nil. (b) Fallow. (c) Nil. (ii) (a) Heavy loam. (b) N.A. (i) 8.4.1952. (iv) (a) 8 desi plough, 3 sohaga and 2 roller. (b) N.A. (c) 12 sr. 2 chh./ac. (d) and (e) N.A. (v) Nil. (vi) F-216. (medium). (vii) Irrigated. (viii) One gap filling, 4 hoeings and one thinning. (ix) 14.66°. (x) 4 pickings from 29.9.1952 to 20.11.1952.

2. **TREATMENTS:**
   1. A/S at 50 lb./ac. of N.
   2. Ammo. Phos. at 50 lb./ac. of N.
   3. A/S at 100 lb./ac. of N.
   4. Ammo. Phos. at 100 lb./ac. of N.
   5. F.Y.M. at 50 lb./ac. of N+A/S at 50 lb./ac. of N.
   6. F.Y.M. at 50 lb./ac. of N+Ammo. Phos. at 50 lb./ac. of N.
   7. Control.


3. **DESIGN:**
   (i) R.B.D. (ii) (a) 7. (b) N.A. (iii) 4. (iv) (a) 10' x 80'. (b) 10' x 72.6'. (v) N.A. (vi) Yes.

4. **GENERAL:**
   (i) Good. No lodging. (ii) Nil. (iii) Kapas yield. (iv) (a) 1950—1953. (b) No. (c) Nil. (v) (a) No. (b)—. (vi) and (vii) Nil.

5. **RESULTS:**
   (i) 2547 lb./ac.
   (ii) 110.6 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>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>2567</td>
</tr>
<tr>
<td>2.</td>
<td>2494</td>
</tr>
<tr>
<td>3.</td>
<td>2847</td>
</tr>
<tr>
<td>4.</td>
<td>2810</td>
</tr>
<tr>
<td>5.</td>
<td>2550</td>
</tr>
<tr>
<td>6.</td>
<td>2665</td>
</tr>
<tr>
<td>7.</td>
<td>1898</td>
</tr>
<tr>
<td>S.E./mean</td>
<td>55.3 lb./ac.</td>
</tr>
</tbody>
</table>
Crop :- Cotton.  
Site :- Govt. Agri. Stn., Hansi.  
Object :- To find the best manurial formula for Cotton.

1. BASAL CONDITIONS:
(i) (a) Nil. (b) Fallow. (c) Nil. (ii) (a) Heavy loam. (b) N.A. (iii) 29.4.1953. (iv) (a) 1 raja, 5 desi ploughs, 2 roller and 4 sohaga. (b) N.A. (c) 12 sr/ac. (d) and (e) N.A. (v) Nil. (vi) F-216 (medium). (vii) Irrigated. (viii) 1 gap filling, 2 dibblings and 2 hoeings. (ix) 12.44". (x) 30.9.1953 to 24.11.1953.

2. TREATMENTS:
1. 50 lb/ac. of N as A/S.
2. 50 lb/ac. of N as Ammo. Phos.
3. 100 lb/ac. of N as A/S.
4. 103 lb/ac. of N as Ammo. Phos.
5. 50 lb/ac. of N as A/S+50 lb/ac. of N as F.Y.M.
6. 50 lb/ac. of N as Ammo. Phos. + 50 lb/ac. of N as F.Y.M.

3. DESIGN:
(i) R.B.D. (ii) (a) 7. (b) N.A. (iii) 4. (iv) (a) 94'X10'. (b) 80'-8'X10'. (v) N.A. (vi) Yes.

4. GENERAL:
(i) Germination good, stand poor. No lodging. (ii) Kisari attack. Dusted with gammaxene on 29.5.1953. (iii) Kapas yield. (iv) (a) 1950-53. (b) and (c) No. (v) (a) and (b) No. (vi) Nil. (vii) In replication I except treatment 1 and 4, young cotton plants destroyed by kisari in their beds. Damage estimated 80%.

5. RESULTS:
(i) 1176 lb/ac.
(ii) 189.7 lb/ac.
(iii) Treatment differences are significant.
(iv) Av. yield of kapas in lb/ac.

<table>
<thead>
<tr>
<th>Treatment</th>
<th>Av. yield</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>1255</td>
</tr>
<tr>
<td>2.</td>
<td>1205</td>
</tr>
<tr>
<td>3.</td>
<td>1061</td>
</tr>
<tr>
<td>4.</td>
<td>1321</td>
</tr>
<tr>
<td>5.</td>
<td>1159</td>
</tr>
<tr>
<td>6.</td>
<td>1364</td>
</tr>
<tr>
<td>7.</td>
<td>866</td>
</tr>
<tr>
<td>S.E./mean</td>
<td>94.8 lb/ac.</td>
</tr>
</tbody>
</table>

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Crop :- Cotton.  
Site :- Govt. Agri. Stn., Hansi.  
Object :- To study the effect of T.C. and Farm compost on yield of Cotton.

1. BASAL CONDITIONS:
(i) (a) Nil. (b) Fallow. (c) Nil. (ii) (a) Loam. (b) N.A. (iii) 24.4.1948. (iv) (a) and (b) N.A. (c) 3 chk./plot. (d) and (e) N.A. (v) Nil. (vi) M.60 A2 (medium). (vii) Irrigated. (viii) 2 hoeings. (ix) 17.46". (x) 5 pickings from 18.9.1948 to 10.11.1948.

2. TREATMENTS:
1. T.C. at 10 ton/ac.
2. Farm compost at 10 ton/ac.

3. DESIGN:
(i) R.B.D. (ii) (a) 3. (b) N.A. (iii) 8. (iv) (a) 12'X74'-1'. (b) 12'X60'-5'. (v) N.A. (vi) Yes.

4. GENERAL:
(i) Fair to normal. No lodging. (ii) Nil. (iii) Kapas yield. (iv) (a) 1948-50. (b) and (c) Nil. (v) (a) (b) No. (vi) and (vii) Nil.
5. RESULTS:
(i) 1628 lb./ac.
(ii) 174.5 lb./ac.
(iii) Treatments are not significantly different.
(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>1598</td>
</tr>
<tr>
<td>2.</td>
<td>1771</td>
</tr>
<tr>
<td>3.</td>
<td>1539</td>
</tr>
<tr>
<td>S.E./mean</td>
<td>$= 61.2$ lb./ac.</td>
</tr>
</tbody>
</table>

Crop :- Cotton.
Site :- Govt. Agri. Stn., Hansi.

Object :- To study the effect of T.C. and Farm compost on yield of Cotton.

1. BASAL CONDITIONS:
(i) (a) Nil. (b) Dhaicha. (c) Nil. (ii) (a) Loam. (b) N.A. (iii) 12.5.1949. (iv) (a) 1 roja plough, 4 desi ploughs, 4 sohaga and 3 cultivators. (b) to (e) N.A. (v) Nil. (vi) M 60 A2 (medium). (vii) Irrigated. (viii) 2 thinnings and 3 hoeings. (ix) 26.99°. (x) 5 pickings from 25.9.1949 to 23.11.1949.

2. TREATMENTS:
1. T.C. at 10 ton/ac.
2. Farm compost at 10 ton/ac.
3. Control.

Manures applied before sowing.

3. DESIGN:
(i) R.B.D. (ii) 1. (b) N.A. (iii) 6. (iv) (a) 12' x 74' - 4". (b) 12' x 60' - 6". (v) N.A. (vi) Yes.

4. GENERAL:
(i) Fair to normal. No lodging. (ii) Nil. (iii) Kapas yield. (iv) (a) 1948—1950. (b) and (c) Nil. (v) (a) and (b) No. (vi) and (vii) Nil.

5. RESULTS:
(i) 1125 lb./ac.
(ii) 83.14 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>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>1409</td>
</tr>
<tr>
<td>2.</td>
<td>1003</td>
</tr>
<tr>
<td>3.</td>
<td>964</td>
</tr>
<tr>
<td>S.E./mean</td>
<td>$= 33.94$ lb./ac.</td>
</tr>
</tbody>
</table>

Crop :- Cotton.
Site :- Govt. Agri. Stn., Hansi.

Object :- To study the effect of T.C. and Farm compost on yield of Cotton.

1. BASAL CONDITIONS:
(i) (a) Nil. (b) Fallow. (c) Nil. (ii) (a) Loam. (b) N.A. (iii) 16.4.1950. (iv) (a) 7 desi bol, 2 horse-hoe and 8 sohaga. (b) N.A. (c) 13 sr./ac. (d) and (e) N.A. (v) Nil. (vi) M 60 A4 (medium). (vii) Irrigated. (viii) 2 to 3 hoeings. (ix) 15.25°. (x) 5 pickings from 21.9.1950 to 16.11.1950.

2. TREATMENTS:
1. T.C. at 10 ton/ac.
2. Farm compost at 10 ton/ac.
3. Control.

Manures applied on 16.4.1950.
3. DESIGN:
   (i) R.B.D. (ii) (a) 3. (b) N.A. (iii) 6. (iv) (a) 10'×74'. (b) 10'×66'. (v) N.A. (vi) Yes.

4. GENERAL:
   (i) Fair to satisfactory. No lodging. (ii) Nil. (iii) Kapas yield. (iv) (a) 1949—1950. (b) and (c) No. (v) (a) and (b) No. (vi) and (vii) Nil.

5. RESULTS:
   (i) 723.6 lb/ac.
   (ii) 61.81 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>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>809.0</td>
</tr>
<tr>
<td>2.</td>
<td>789.1</td>
</tr>
<tr>
<td>3.</td>
<td>572.8</td>
</tr>
<tr>
<td>S.E./mean</td>
<td>25.23 lb/ac.</td>
</tr>
</tbody>
</table>

Crop :- Cotton.  
Site :- Govt. Agri. Stn., Hansi.  
Ref :- Pb. 53(121).  
Type :- 'M'.

Object :- To study the effect of F.Y.M. and compost on yield of Cotton.

1. BASAL CONDITIONS:
   (i) (a) Nil. (b) Guara. (c) Nil. (ii) (a) Heavy loam. (b) N.A. (iii) 25.4.1953. (iv) 1 raja, 6 desi plough, 4 sohaga, 1 horse hoe and 1 roller. (b) Dibbling. (c) 10 str./ac. (d) and (e) N.A. (v) Nil. (vi) F-216 (medium). (vii) Irrigated. (viii) One gap filling. (ix) 12.44". (x) 4 pickings from 29.9.1953 to 14.11.1953.

2. TREATMENTS:
   All possible combinations of (1) and (2)+a control
   (1) 2 sources of N: S1 = Urban compost and S2 = F.Y.M.
   (2) 2 levels of N: L1 = 75 and L2 = 150 lb/ac.
   Manures applied on 25.6.1953 by broadcast

3. DESIGN:
   (i) R.B.D. (ii) (a) 5. (b) N.A. (iii) 6. (iv) (a) 10'×48'. (b) 10'×45°5'. (v) N.A. (vi) Yes.

4. GENERAL:
   (i) Normal. No lodging. (ii) Nil. (iii) Kapas yield. (iv) (a) Not continued. (b) —. (c) —. (v) (a) No. (b) —. (vi) and (vii) Nil.

5. RESULTS:
   (i) 1294 lb/ac.
   (ii) 144.4 lb/ac.
   (iii) Control vs others effect is highly significant while others are not significant.
   (iv) Av. yield of kapas in lb/ac.

<table>
<thead>
<tr>
<th></th>
<th>L1</th>
<th>L2</th>
<th>Mean</th>
</tr>
</thead>
<tbody>
<tr>
<td>S1</td>
<td>1344</td>
<td>1437</td>
<td>1391</td>
</tr>
<tr>
<td>S2</td>
<td>1299</td>
<td>1311</td>
<td>1305</td>
</tr>
<tr>
<td>Mean</td>
<td>1322</td>
<td>1374</td>
<td>1348</td>
</tr>
</tbody>
</table>

S.E. of any marginal mean = 41.7 lb/ac.  
S.E. of body of table = 59.0 lb/ac.
Crop: Cotton.  
Site: Cotton Res. Stn., Hansi.  
Ref: Pb. 53 (4).  
Type: 'M'.

Object: To study the effect of organic manure (G.N.C.) and inorganic manure (A/S) on equal N doses and in combination with F.Y.M.

1. BASAL CONDITIONS:
   (i) (a) Wheat-Cotton. (b) Wheat. (c) Nil. (ii) (a) Light loam. (b) N.A. (iii) 2.4.1953. (iv) (a) 4 desl plough and 3 soleage levelling. (b) Dibbling. (c) 12 sr./ac. (d) and (e) N.A. (v) Nil. (vi) F-216. (medium). (vii) Irrigated. (viii) 2 weedings and 2 hoeings. (ix) 4.56°. (x) 4 pickings from 15.11.1953 to 10.1.1954.

2. TREATMENTS:
Main-plot treatments:
   All combinations of (1) and (2)
   (1) 3 levels of F.Y.M.: F₀=0, F₁=100 and F₂=200 md./ac.
   (2) 3 sources of N: Q₁=A/S, Q₂=1:1 mixture of A/S and G.N.C. on N basis and Q₃=Full dose of G.N.C.

Sub-plot treatments:
   3 doses of N: N₀=0, N₁=50 and N₂=100 lb./ac.

3. DESIGN:
   (i) Split-plot. (ii) (a) 9 main-plots/block; 3 sub-plots/main-plot. (b) N.A. (iii) 4. (iv) (a) N.A. (b) 10'×44'. (v) N.A. (vi) Yes.

4. GENERAL:
   (i) Good. No lodging. (ii) Nil. (iii) Height of plants and kapas yield. (iv) (a) No. (b) and (c)—. (v) (a) Jullundur and Abohar. (b) N.A. (vi) and (vii) Nil.

5. RESULTS:
   (i) 851.2 lb./ac.
   (ii) (a) 176.7 lb./ac. (b) 219.2 lb./ac.
   (iii) None of the effects is significant.
   (iv) Av. yield of kapas in lb./ac.

<table>
<thead>
<tr>
<th></th>
<th>F₀</th>
<th>F₁</th>
<th>F₂</th>
<th>Mean</th>
<th>N₀</th>
<th>N₁</th>
<th>N₂</th>
<th>Mean</th>
</tr>
</thead>
<tbody>
<tr>
<td>Q₁</td>
<td>901.0</td>
<td>771.6</td>
<td>831.6</td>
<td>834.7</td>
<td>785.0</td>
<td>866.1</td>
<td>825.6</td>
<td></td>
</tr>
<tr>
<td>Q₂</td>
<td>814.2</td>
<td>884.4</td>
<td>901.5</td>
<td>866.7</td>
<td>901.9</td>
<td>801.8</td>
<td>851.8</td>
<td></td>
</tr>
<tr>
<td>Q₃</td>
<td>807.4</td>
<td>794.4</td>
<td>955.0</td>
<td>852.3</td>
<td>826.9</td>
<td>868.6</td>
<td>847.7</td>
<td></td>
</tr>
<tr>
<td>Mean</td>
<td>840.9</td>
<td>815.1</td>
<td>896.0</td>
<td>851.2</td>
<td>870.2</td>
<td>838.0</td>
<td>845.5</td>
<td></td>
</tr>
</tbody>
</table>

|     |     |     |     |     |     |     |     |
| N₀  | 815.9 | 907.8 | 907.8 | 870.2 |
| N₁  | 830.6 | 735.7 | 927.6 | 838.0 |
| N₂  | 856.1 | 327.7 | 853.7 | 845.5 |

S.E. of difference of two
1. F or Q marginal means in F×Q table = 41.6 lb./ac.
2. N marginal means = 51.7 lb./ac.
3. N means at the same level of F or Q = 89.5 lb./ac.
4. F or Q means at the same level of N = 84.1 lb./ac.
5. means in the body of F×Q table = 72.1 lb./ac.
6. Q marginal mean in Q×N table = 51.0 lb./ac.
Crop :- Cotton (Kharif).
Site :- Jullundur Agri. Stn., Jullundur.

Object :- To study the effect of different doses of A/S on yield of Cotton.

1. BASAL CONDITIONS:
   (i) (a) Nil. (b) Fallow. (c) Nil. (ii) (a) Loam. (b) Refer soil analysis, Jullundur. (iii) 24.4.1951.
   (iv) (a) 5 desi hal and 3 sohaga. (b) N.A. (c) 2 sr./ac. (d) and (e) N.A. (v) 10 ton/ac. of compost by
   broadcast on 30.3.51. (vi) F-216 (medium). (vii) Irrigated. (viii) 1 gap filling, 2 hoeings and weeding.
   (ix) 14.13". (x) N.A.

2. TREATMENTS:
   1. Control (no manure).
   2. 25 lb./ac. of N as A/S.
   3. 37.5 lb./ac. of N as A/S.
   4. 50 lb./ac. of N as A/S.
   A/S broadcast on 3.7.1951.

3. DESIGN:
   (i) R.B.D. (ii) (a) 4. (b) N.A. (iii) 6. (iv) (a) N.A. (b) 110' x 12'. (v) N.A. (vi) Yes.

4. GENERAL:
   (i) Germination good. No lodging. (ii) Jassid attack; spray with DDT. (iii) Kapas yield. (iv) (a) 1951-
   1952. (b) No. (c) Nil. (v) (a) Nil. (b)—. (vi) and (vii) Nil.

5. RESULTS:
   (i) 1659 lb./ac.
   (ii) 90.3 lb./ac.
   (iii) Treatment differences are highly significant.
   (iv) Av. yield of kapas in lb./ac.
   Treatment | Av. yield
   -----------|--------
   1.         | 1584
   2.         | 1593
   3.         | 1721
   4.         | 1735
   S.E./mean  | 36.9 lb./ac.

Crop :- Cotton.
Site :- Jullundur Agri. Stn., Jullundur.

Object :- To study the effect of different doses of N as A/S on yield of Cotton.

1. BASAL CONDITIONS:
   (i) (a) Nil. (b) Wheat. (c) Nil. (ii) (a) Light loam. (b) Refer soil analysis, Jullundur. (iii) 15.5.1952.
   (iv) (a) 2 raja plough, 3 desi plough and 4 sohaga. (b) N.A. (c) 13 sr./ac. (d) 1' x 1'. (e) N.A. (vi) F-320.
   (medium). (vii) Irrigated. (viii) 2 hoeings and 2 weedings. (ix) 29.82'. (x) 5 pickings from 15.10.1952
to 5.1.1953.

2. TREATMENTS:
   1. Control.
   2. 25 lb./ac. of N as A/S.
   3. 37.5 lb./ac. of N as A/S.
   4. 50 lb./ac. of N as A/S.
   A/S broadcast in two equal doses on 12.7.1952 and 3.8.1952.

3. DESIGN:
   (i) R.B.D. (ii) (a) 4. (b) N.A. (iii) 5. (iv) (a) and (b) 99' x 11'. (v) Nil. (vi) Yes.
4. GENERAL:

(i) Germination and growth good. No lodging. (ii) Nil. (iii) Kapas yield. (iv) (a) 1951-1952. (b) No. (c) Nil. (v) (a) No. (b) —. (vi) and (vii) Nil.

5. RESULTS:

(i) 1938 lb./ac.
(ii) 135.6 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>1829</td>
</tr>
<tr>
<td>2.</td>
<td>2004</td>
</tr>
<tr>
<td>3.</td>
<td>1924</td>
</tr>
<tr>
<td>4.</td>
<td>1996</td>
</tr>
<tr>
<td>S.E./mean</td>
<td>60.6 lb./ac.</td>
</tr>
</tbody>
</table>

---

Crop :- Cotton.  
Site :- Jullundur Agri. Stn., Jullundur.  
Ref :- Pb. 51(88).  
Type :- 'M'.

Object :- To study the effect of different sources of N on the yield of Cotton crop.

4. BASAL CONDITIONS:

(i) (a) Nil. (b) Wheat. (c) Nil. (ii) (a) Loam. (b) Refer soil analysis, Jullundur. (iii) 14.5.1951.
(iv) (a) 3 desi plough and 3 sohaga. (b) N.A. (c) 12 sr./ac. (d) and (e) N.A. (v) Nil. (vi) 2i6-F (medium).
(vii) Irrigated. (viii) 3 hoeings with khurpa and one with horsehoe. (ix) 14.43°. (x) N.A.

2. TREATMENTS:

1. 10 ton/ac. of F.Y.M.
2. 10 ton/ac. of compost.
3. 30 lb./ac. of N as A/S.
4. 45 lb./ac. of N as A/S.
5. 60 lb./ac. of N as A/S.
6. 75 lb./ac. of N as A/S.
7. Control.

F.Y.M. and compost applied on 12.5.1951 i.e., before sowing and A/S on 28.7.1951.

3. DESIGN:

(i) R.B.D. (ii) 7. (b) N.A. (iii) 4. (iv) (a) and (b) 103' x 10'. (v) No. (vi) Yes.

4. GENERAL:

(i) Germination satisfactory. No lodging. (ii) Jassid attack in Sept. and Oct. DDT sprayed. (iii) Kapas yield. (iv) (a) 1951-52. (b) and (c) No. (v) (a) and (b) No. (vi) Nil. (vii) Originally experiment was conducted with five replications, but yield data was available for only 4 replications. Hence analysis is done with 4 replications.

5. RESULTS:

(i) 265.5 lb./ac.
(ii) 50.46 lb./ac.
(iii) Treatment differences are not significant.
(iv) Av. yield of kapas in lb./ac.

<table>
<thead>
<tr>
<th>Treatments</th>
<th>Av. yield</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>259.6</td>
</tr>
<tr>
<td>2.</td>
<td>307.2</td>
</tr>
<tr>
<td>3.</td>
<td>292.3</td>
</tr>
<tr>
<td>4.</td>
<td>271.9</td>
</tr>
<tr>
<td>5.</td>
<td>227.0</td>
</tr>
<tr>
<td>6.</td>
<td>233.8</td>
</tr>
<tr>
<td>7.</td>
<td>266.4</td>
</tr>
<tr>
<td>S.E./mean</td>
<td>25.23 lb./ac.</td>
</tr>
</tbody>
</table>

---
Crop : Cotton.  
Site : Jullundur Agri. Stn., Jullundur.  
Object : To study the effect of different sources of N on the yield of Cotton.

1. BASAL CONDITIONS:
(i) (a) Nil. (b) Wheat. (c) Nil. (ii) (a) Loam. (b) Refer soil analysis, Jullundur. (iii) 14.5.1952. (iv) (a) 1 raja plough, 5 desi and 3 sohaga. (b) N.A. (c) 8 sr./ac. (d) and (e) N.A. (v) Nil. (vi) F-320 (medium). (vii) Irrigated. (viii) 1 thinning, 2 weedings and 3 hoeings. (ix) 29.82°. (x) 4 pickings from 16.10.1952 to 12.12.1952.

2. TREATMENTS:
1. 10 ton/ac. of F.Y.M.
2. 10 ton/ac. of compost.
3. 30 lb./ac. of N as A/S.
4. 45 lb./ac. of N as A/S.
5. 60 lb./ac. of N as A/S.
6. 75 lb./ac. of N as A/S.
7. Control (no manure).


3. DESIGN:
(i) R.B.D. (ii) (a) 7. (b) N.A. (iii) 5. (iv) (a) and (b) 1/41.8th ac. (v) Nil. (vi) Yes.

4. GENERAL:
(i) Good. No lodging. (ii) Nil. (iii) Kapas yield. (iv) (a) 1951-1952. (b) and (c) No. (v) (a) and (b) No. (vi) and (vii) Nil.

5. RESULTS:
(i) 2008 lb./ac.
(ii) 92.05 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>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>1935</td>
</tr>
<tr>
<td>2.</td>
<td>1908</td>
</tr>
<tr>
<td>3.</td>
<td>2030</td>
</tr>
<tr>
<td>4.</td>
<td>2034</td>
</tr>
<tr>
<td>5.</td>
<td>2160</td>
</tr>
<tr>
<td>6.</td>
<td>2167</td>
</tr>
<tr>
<td>7.</td>
<td>1821</td>
</tr>
<tr>
<td>S.E./mean = 41.16 lb./ac.</td>
<td></td>
</tr>
</tbody>
</table>

---

Crop : Cotton.  
Site : Jullundur Agri. Stn., Jullundur.  
Object : To study the effect of different levels of N on the yield of Cotton.

1. BASAL CONDITIONS:
(i) (a) Nil. (b) Berseem. (c) A/S in two equal doses of 20 lb./ac. of N each on 23.11.1952 and 30.12.1952. (ii) (a) Loam. (b) Refer soil analysis, Jullundur. (iii) 10.5.1953. (iv) (a) 2 raja plough, 3 desi hal and 4 sohaga. (b) N.A. (c) 14 sr./ac. (d) and (e) N.A. (v) Nil. (vi) F-320 (medium). (vii) Irrigated. (viii) 2 hoeings, 1 thinning, one hoeing with horse hoe and one weeding. (ix) 25.73°. (x) 2 pickings from 16.10.1953 to 13.12.1953.
2. TREATMENTS:

Main-plot treatments:
3 levels of F.Y.M.: F₀ = 0, F₁ = 100 and F₂ = 200 md./ac.

Sub-plot treatments:
3 levels of N: N₀ = 0, N₁ = 25 and N₂ = 50 lb./ac. of N.

3. DESIGN:
(i) Split-plot.
(ii) (a) 3 main-plots/block ; 3 sub-plots/main-plot.
(b) N.A.
(iii) 5.
(iv) (a) 66' × 10'. (b) Nil.
(v) Yes.

4. GENERAL:
(i) Normal. No lodging. (ii) DDT spray on 8.6.1953 but records do not show any attack of pest or disease. (iii) Kapas yield. (iv) (a) 1953-contd. (b) No. (c) Nil. (v) (a) No. (b) Nil. (vi) Yes.

5. RESULTS:
(i) 1812 lb./ac.
(ii) (a) 237.2 lb./ac.
(b) 139.5 lb./ac.
(iii) None of the effects is significant.
(iv) Av. yield of kapas in lb./ac.

<table>
<thead>
<tr>
<th></th>
<th>N₀</th>
<th>N₁</th>
<th>N₂</th>
<th>Mean</th>
</tr>
</thead>
<tbody>
<tr>
<td>F₀</td>
<td>1734</td>
<td>1770</td>
<td>1736</td>
<td>1747</td>
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<td>F₁</td>
<td>1814</td>
<td>1853</td>
<td>1882</td>
<td>1850</td>
</tr>
<tr>
<td>F₂</td>
<td>1882</td>
<td>1843</td>
<td>1796</td>
<td>1840</td>
</tr>
<tr>
<td>Mean</td>
<td>1810</td>
<td>1822</td>
<td>1805</td>
<td>1812</td>
</tr>
</tbody>
</table>

S.E. of difference of two
1. F marginal means = 86.7 lb./ac.
2. N marginal means = 50.9 lb./ac.
3. N means at the same level of F = 88.2 lb./ac.
4. F means at the same level of N = 112.7 lb./ac.

Crop: Cotton.
Site: Jullundur Agri. Stn., Jullundur.
Ref: Pb. 53 (87).
Type: ‘M’.

Object: To study the effect of N, with respect to its application and P₂O₅ on yield of Cotton.

1. BASAL CONDITIONS:
(i) (a) Nil. (b) Wheat. (c) Nil. (ii) (a) Leam. (b) Refer soil analysis, Jullundur. (iii) 2.5.1953. (iv) (a) one raja plough, 6 desi plough, 2 sohaga and 1 horse hoe. (b) N.A. (c) 12 to 14 ins./ac. (d) and (e) N.A. (v) Nil. (vi) F-320 (medium). (vii) Irrigated. (viii) 1 horse hoe, 1 weeding and 1 thinning. (ix) 25.73°. (x) 6 pickings from 4.10.1953 to 11.12.1953.

2. TREATMENTS:

Main-plot treatments:
All combinations of (1) and (2)
(1) 6 levels of N as A/S: N₀ = 0, N₁ = 25, N₂ = 50, N₃ = 75, N₄ = 100 and N₅ = 125 lb./ac.
(2) 3 times of application of N: T₁ = Half at sowing and half at flowering, T₂ = Half at thinning and half at flowering T₃ = Full dose at flowering.

Sub-plot treatments:
2 levels of P₂O₅ as Super: P₀ = 0 and P₁ = 50 lb./ac.
3. DESIGN:
(i) Split-plot. (ii) (a) 18 main-plots/block; 2 sub-plots/main-plot. (b) N.A. (iii) 2. (iv) (a) and (b) 42'x8'. (v) Nil. (vi) Yes.

4. GENERAL:
(i) Good. No lodging. (ii) Nil. (iii) Kapas yield. (iv) (a) Not contd. (b)—. (c)—. (v) (a) No. (b)—. (vi) and (vii) Nil.

5. RESULTS:
(i) 756.8 lb./ac.
(ii) (a) 179.9 lb./ac.
(b) 96.8 lb./ac.
(iii) No effect is significant.
(iv) Av. yield of kapas in lb./ac.

<table>
<thead>
<tr>
<th>P9</th>
<th>P1</th>
<th>Mean</th>
<th>T1</th>
<th>T2</th>
<th>T3</th>
</tr>
</thead>
<tbody>
<tr>
<td>N0</td>
<td>713.9</td>
<td>722.3</td>
<td>718.1</td>
<td>—</td>
<td>—</td>
</tr>
<tr>
<td>N1</td>
<td>818.1</td>
<td>726.4</td>
<td>772.3</td>
<td>866.7</td>
<td>650.0</td>
</tr>
<tr>
<td>N2</td>
<td>744.5</td>
<td>801.4</td>
<td>773.0</td>
<td>773.0</td>
<td>760.5</td>
</tr>
<tr>
<td>N3</td>
<td>852.8</td>
<td>880.6</td>
<td>866.7</td>
<td>887.5</td>
<td>902.2</td>
</tr>
<tr>
<td>N4</td>
<td>762.6</td>
<td>745.9</td>
<td>754.2</td>
<td>748.0</td>
<td>623.0</td>
</tr>
<tr>
<td>N5</td>
<td>666.7</td>
<td>645.9</td>
<td>656.3</td>
<td>600.0</td>
<td>577.1</td>
</tr>
<tr>
<td>Mean</td>
<td>759.8</td>
<td>753.8</td>
<td>756.8</td>
<td>775.0</td>
<td>702.6</td>
</tr>
<tr>
<td>T1</td>
<td>775.8</td>
<td>752.1</td>
<td>763.9</td>
<td>—</td>
<td>—</td>
</tr>
<tr>
<td>T2</td>
<td>729.9</td>
<td>668.8</td>
<td>699.4</td>
<td>—</td>
<td>—</td>
</tr>
<tr>
<td>T3</td>
<td>773.7</td>
<td>840.3</td>
<td>807.0</td>
<td>—</td>
<td>—</td>
</tr>
</tbody>
</table>

S.E. of difference of two
1. N marginal means = 73.45 lb./ac.
2. T marginal means in N x T table = 56.89 lb./ac.
3. T marginal means in P x T table = 51.94 lb./ac.
4. P marginal means = 22.81 lb./ac.
5. P means at the same level of N = 55.83 lb./ac.
6. N means at the same level of P = 83.41 lb./ac.
7. T means at the same level of N = 39.52 lb./ac.
8. N means at the same level of T = 59.00 lb./ac.
9. means in N x T table = 27.22 lb./ac.

Crop: Cotton (Kharif).
Site: Jullundur Agri. Stn., Jullundur.
Object: To study the effect of A/S, G.N.C. and their mixture on yield of Cotton.
2. TREATMENTS:
All combinations of (1) and (2)
(2) 3 levels of $N$: $N_0 = 0$, $N_1 = 50$ and $N_2 = 100$ lb./ac.
Manures applied on 20.7.1951.

3. DESIGN:
(i) (a) $3 \times 3$ Fact. in R.B.D. (ii) (a) N.A. (iii) S. (iv) (a) 72'-7' $\times 10'$. (b) 66' $\times 6'$. (v) N.A. (vi) Yes.

4. GENERAL:
(iii) Kapas yield. (iv) (a) Not contd. (b) Nil. (c) Nil. (v) (a) Nil. (b) Nil. (vi) and (vii) Nil.

5. RESULTS:
(i) 1121 lb./ac.
(ii) 135.7 lb./ac.
(iii) Main effect of $N$ is highly significant. Others are not 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>Mean</th>
</tr>
</thead>
<tbody>
<tr>
<td>$N_0$</td>
<td>---</td>
<td>---</td>
<td>---</td>
<td>897</td>
</tr>
<tr>
<td>$N_1$</td>
<td>1129</td>
<td>1095</td>
<td>1106</td>
<td>1110</td>
</tr>
<tr>
<td>$N_2$</td>
<td>1355</td>
<td>1276</td>
<td>1427</td>
<td>1355</td>
</tr>
<tr>
<td>Mean</td>
<td>1242</td>
<td>1186</td>
<td>1272</td>
<td>1121</td>
</tr>
</tbody>
</table>

S.E. of marginal mean of $S$ = 42.9 lb./ac.
S.E. of marginal mean of $N$ = 35.0 lb./ac.
S.E. of body of table = 55.4 lb./ac.

Crop :- Cotton.
Site :- Agri. Stn., Karnal.
Object :- To study the best source of $N$ for Cotton crop.

1. BASAL CONDITIONS:
(i) (a) Nil. (b) Fallow. (b) Nil. (ii) (a) Clay loam. (b) N.A. (iii) 29.5.1950. (iv) (a) to (e) N.A. (v) Nil. (vi) M 60 A 2 (medium). (vii) Irrigated. (viii) One weeding cum hoeing. (ix) 32.87'.
(x) 4 pickings from 27.9.1950 to 14.12.1950.

2. TREATMENTS:
All combinations of (1) and (2) + a control.
(1) 4 sources of $N$: $S_1 = A/S$, $S_2 = $Ammo. Phos. and $S_3 = $Mohua Cake and $S_4 = $F.Y.M.
(2) 2 levels of $N$: $N_1 = 75$ and $N_2 = 100$ lb./ac.

3. DESIGN:
(i) R.B.D. (ii) (a) N.A. (iii) 4. (iv) (a) and (b) 12' $\times 80'$. (v) Nil. (vi) Yes.

4. GENERAL:
(i) Satisfactory. No lodging. (ii) N.A. (iii) Kapas yield. (iv) (a) 1950-1951. (b) No. (c) Nil. (v) (a) No. (b) Nil. (vi) and (vii) Nil.
5. RESULTS:

(i) 404.7 lb./ac.
(ii) 60.96 lb./ac.
(iii) None of the effects is significant.
(iv) Av. yield of kapas in lb./ac.

Control = 401.0 lb./ac.

<table>
<thead>
<tr>
<th></th>
<th>N1</th>
<th>N2</th>
<th>Mean</th>
</tr>
</thead>
<tbody>
<tr>
<td>S1</td>
<td>421.5</td>
<td>394.5</td>
<td>408.0</td>
</tr>
<tr>
<td>S2</td>
<td>395.9</td>
<td>390.8</td>
<td>393.3</td>
</tr>
<tr>
<td>S3</td>
<td>343.4</td>
<td>455.7</td>
<td>399.5</td>
</tr>
<tr>
<td>S4</td>
<td>421.5</td>
<td>417.8</td>
<td>419.6</td>
</tr>
<tr>
<td>Mean</td>
<td>395.6</td>
<td>414.7</td>
<td>405.1</td>
</tr>
</tbody>
</table>

S.E. of marginal mean of S = 21.55 lb./ac.
S.E. of marginal mean of N = 15.24 lb./ac.
S.E. of body of table = 30.48 lb./ac.

Crop: Cotton.
Site: Agri. Stn., Karnal.

Object: To study the best source of N for Cotton crop.

1. BASAL CONDITIONS:

(i) (a) Nil. (b) Berseem. (c) Nil. (ii) (a) Loam. (b) N.A. (iii) 31.5.1951. (iv) (a) 3 ploughings and 2 zohera. (b) to (e) N.A. (v) Nil. (vi) F-216. (medium). (vii) Irrigated. (viii) 1 weeding and 1 hoeing. (ix) 14.52'. (x) 3 pickings; dates N.A.

2. TREATMENTS:

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

(1) 4 sources of N: S1 = A/S, S2 = Ammo. Phos., S3 = Mohua cake and S4 = F.Y.M.
(2) 2 levels of N: N1 = 75 and N2 = 100 lb./ac. A/S and Ammo. Phos. applied on 25.8.1951 by broadcast.

3. DESIGN:

(i) R.B.D. (ii) (a) 9. (b) N.A. (iii) 4. (iv) (a) and (b) 12' x 80'. (v) Nil. (vi) Yes.

4. GENERAL:

(i) Fair to satisfactory. No lodging. (ii) Slight attack of bollworm. (iii) Kapas yield. (iv) (a) 1950-1951. (b) No. (c) --. (v) (a) No. (b) --. (vi) and (vii) Nil.

5. RESULTS:

(i) 1469 lb./ac.
(ii) 173.2 lb./ac.
(iii) None of the effects is significant.
(iv) Av. yield of kapas in lb./ac.

Control = 1357 lb./ac.

<table>
<thead>
<tr>
<th></th>
<th>N1</th>
<th>N2</th>
<th>Mean</th>
</tr>
</thead>
<tbody>
<tr>
<td>S1</td>
<td>1412</td>
<td>1493</td>
<td>1452</td>
</tr>
<tr>
<td>S2</td>
<td>1559</td>
<td>1558</td>
<td>1559</td>
</tr>
<tr>
<td>S3</td>
<td>1444</td>
<td>1275</td>
<td>1359</td>
</tr>
<tr>
<td>S4</td>
<td>1565</td>
<td>1561</td>
<td>1563</td>
</tr>
<tr>
<td>Mean</td>
<td>1495</td>
<td>1472</td>
<td>1483</td>
</tr>
</tbody>
</table>

S.E. of marginal means of S = 61.3 lb./ac.
S.E. of marginal means of N = 43.3 lb./ac.
S.E. of body of table = 85.6 lb./ac.
Crop: Cotton.  Ref: Pb. 52(76).
Site: Chemical Section, Bhupendra Agri. Farm, Rauni. Type: ‘M’.  

Object:—To study the suitability of application of F.Y.M. and Toria cake alone and in combination with A/S on yield of Cotton.

1. BASAL CONDITIONS:
   (i) (a) Nil. (b) Wheat. (c) Nil. (ii) (a) Heavy loam. (b) N.A. (iii) 20.5.1952. (iv) (a) and (b) N.A. (c) 10 sr./ac. (d) and (e) N.A. (v) Nil. (vi) N.A. (vii) Irrigated. (viii) 4 hoeings and 1 thinning. (ix) 20.92°. (x) 5 pickings from 30.9.1952 to 22.12.1952.

2. TREATMENTS:
   1. Control.
   2. 25 lb./ac. of N as A/S.
   3. 25 lb./ac. of N as F.Y.M.
   4. 25 lb./ac. of N as Toria cake.
   5. 50 lb./ac. of N as A/S.
   6. 25 lb./ac. of N as A/S+25 lb./ac. of N as F.Y.M.
   7. 25 lb./ac. of N as A/S+25 lb./ac. of N as Toria cake.


3. DESIGN:
   (i) R.B.D. (ii) (a) 7. (b) N.A. (iii) 4. (iv) (a) 20.5’ x 92’. (b) 16.5’ x 88’. (v) 2’ border all round. (vi) Yes.

4. GENERAL:
   (i) Normal. Crop lodged on 22.8.1952 due to high winds and rain. (ii) Bhundi attack (Red Cotton Bug). (iii) Kapas yield. (iv) (a) 1952-1954. (b) No. (c) Nil. (v) (a) No. (b) —. (vi) and (vii) Nil.

5. RESULTS:
   (i) 1124 lb./ac.
   (ii) 118.0 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>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>920</td>
</tr>
<tr>
<td>2.</td>
<td>1188</td>
</tr>
<tr>
<td>3.</td>
<td>1059</td>
</tr>
<tr>
<td>4.</td>
<td>1048</td>
</tr>
<tr>
<td>5.</td>
<td>1204</td>
</tr>
<tr>
<td>6.</td>
<td>1155</td>
</tr>
<tr>
<td>7.</td>
<td>1291</td>
</tr>
<tr>
<td>S.E./mean</td>
<td>59.0 lb.</td>
</tr>
</tbody>
</table>

Site: Chemical Section, Bhupendra Agri. Farm, Rauni. Type: ‘M’.

Object:—To study the suitability of application of F.Y.M. and Toria cake alone and in combination with A/S on yield of Cotton.

1. BASAL CONDITIONS:
   (i) (a) Nil. (b) Wheat. (c) Nil. (ii) (a) Heavy loam. (b) N.A. (iii) 11.5.1953. (iv) (a) to (e) N.A. (v) Nil. (vi) N.A. (vii) Irrigated. (viii) 2 hoeings, 2 triphally and 1 thinning. (ix) 22.73°. (x) 3 pickings on 6.10.1953, 2.11.1953 and 21.12.1953.
2. TREATMENTS:
1. Control.
2. 25 lb./ac. of N as A/S.
3. 25 lb./ac. of N as F.Y.M.
4. 25 lb./ac. of N as Toria cake.
5. 50 lb./ac. of N as A/S.
6. 25 lb./ac. of N as F.Y.M. + 25 lb./ac. of N as A/S.
7. 25 lb./ac. of N as Toria cake + 25 lb./ac. of N as A/S.

3. DESIGN:
(i) R.B.D. (ii) 7. (b) N.A. (iii) 4. (iv) (a) 9.75'x19'. (b) 7.75'x14'. (v) N.A. (vi) Yes.

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

5. RESULTS:
(i) 1021 lb./ac.
(ii) 110.0 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>
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</thead>
<tbody>
<tr>
<td>1.</td>
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<tr>
<td>2.</td>
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<tr>
<td>3.</td>
<td>1041</td>
</tr>
<tr>
<td>4.</td>
<td>892</td>
</tr>
<tr>
<td>5.</td>
<td>1031</td>
</tr>
<tr>
<td>6.</td>
<td>1066</td>
</tr>
<tr>
<td>7.</td>
<td>1088</td>
</tr>
<tr>
<td>S.E./mean</td>
<td>55.0 lb./ac.</td>
</tr>
</tbody>
</table>

Crop: Cotton (Kharif).  
Site: Cotton Res. Stn., Jullundur.  
Ref: Pb. 53(147). Type: 'M'.

Object: To study the effect of early and late application of manure to Cotton crop.

1. BASAL CONDITIONS:

2. TREATMENTS:
All combinations of (1) and (2) +a control
  (1) 2 sources of 50 lb./ac. of N: S₁=A/S and S₂=C/N.
  (2) 2 times of application: T₁=Early at thinning and T₂=Late at flowering.

3. DESIGN:
(i) R.B.D. (ii) (a) 5. (b) N.A. (iii) 3. (iv) (a) N.A. (b) 8'x18'. (v) N.A. (vi) Yes.

4. GENERAL:
(i) Normal No lodging. (ii) Nil. (iii) Kapas yield. (iv) (a) Not contd. (b) and (c) No. (v) (a) and (b) No. (vi) and (vii) Nil.

5. RESULTS:
(i) 14.3 lb./ac.
(ii) 21.7 lb./ac.
(iii) Only control vs. others effect is significant.
Crop: Cotton.
Site: Cotton Res. Stn., Jullundur.

Object: To study the effect of N on yield of Cotton when applied with and without lime.

1. BASAL CONDITIONS:

2. TREATMENTS:
   All combinations of (1) and (2)
   (1) 2 levels of lime: \( L_0 = 0 \) and \( L_1 = 20 \) lb./ac.
   (2) 4 applications of N: \( N_0 = 0 \), \( N_1 = 50 \) lb./ac. of N as A/S, \( N_2 = 50 \) lb./ac. of N as C/N and \( N_3 = 50 \) lb./ac. of N as A/S and C/N.

3. DESIGN:
   (i) 2×4 Fact. in R.B.D. (ii) (a) 8. (b) N.A. (iii) 3. (iv) (a) 8'×36'. (b) 8'×35'. (v) N.A. (vi) Yes.

4. GENERAL:
   (i) Normal. No lodging. (ii) Nil. (iii) Kapas yield. (iv) (a) Not contd. (b) No. (c)—. (v) (a) No. (b)—. (vi) and (vii) Nil.

5. RESULTS:
   (i) 1646 lb./ac.
   (ii) 110.5 lb./ac.
   (iii) Only N effect is highly significant.
   (iv) Av. yield of kapas in lb./ac.

\[
\begin{array}{|c|c|c|c|}
\hline
 & N_0 & N_1 & N_2 & N_3 \\
\hline
L_0 & 1250 & 1660 & 1907 & 1690 \\
L_1 & 1277 & 1647 & 1924 & 1814 \\
\hline
\text{Mean} & 1264 & 1654 & 1916 & 1752 \\
\hline
\end{array}
\]

S.E. of marginal mean of L = 45.2 lb./ac.
S.E. of marginal mean of N = 32.0 lb./ac.
S.E. of body of table = 63.9 lb./ac.
Object: To study the effect of application of $P_2O_5$ with $N$, applied to previous crops, on yield of Cotton.

1. BASAL CONDITIONS:
   (i) (a) Nil. (b) As per treatments. (c) As per treatments. (ii) (a) Sandy loam. (b) Refer soil analysis, Jullundur. (iii) End of April (date N.A.). (iv) (a) to (e) N.A. (v) N.A. (vi) F-320. (vii) Irrigated. (viii) N.A. (ix) 19.30°. (x) 3 pickings on 21.10.1953, 9.11.1953 and 5.12.1953.

2. TREATMENTS:
   Main-plot treatments: 5 previous crops: $R_1=$ Guara, $R_2=$ Gram, $R_3=$ Berseem, $R_4=$ Wheat and $R_5=$ Fallow.
   Sub-plot treatments: 2 levels of $P_2O_5$ as Super: $P_0=0$ and $P_1=50$ lb./ac.
   Sub-sub-plot treatments: 3 levels of $N$ as A/S: $N_0=0$, $N_1=50$ and $N_2=100$ lb./ac.

3. DESIGN:
   (i) Split-plot. (ii) (a) 5 main-plots/block; 2 sub-plots/main-plot and 3 sub-sub-plots/sub-plot. (b) N.A. (iii) 4. (iv) (a) N.A. (b) 8’x55’. (v) N.A. (vi) Yes.

4. GENERAL:
   (i) Above normal. No lodging. (ii) Slight attack of Jassid; no control measures taken. (iii) Kapas yield. (iv) (a) 1953-contd. (b) No. (c). (v) (a) Hansi and Abohar. (b) Nil. (vi) and (vii) Nil.

5. RESULTS:
   (i) 1804 lb./ac.
   (ii) (a) 240.2 lb./ac.
   (b) 150.9 lb./ac.
   (c) 175.0 lb./ac.
   (iii) R effect is significant. N effect and interaction R×N are highly significant while others are not significant.
   (iv) Av. yield of kapas in lb./ac.

<table>
<thead>
<tr>
<th>$P_0$</th>
<th>$P_1$</th>
<th>Mean</th>
<th>$N_0$</th>
<th>$N_1$</th>
<th>$N_2$</th>
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<td>1800</td>
<td>1780</td>
<td>1750</td>
<td>1636</td>
<td>1797</td>
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<tr>
<td>$R_3$</td>
<td>1799</td>
<td>1816</td>
<td>1808</td>
<td>1597</td>
<td>1852</td>
</tr>
<tr>
<td>$R_4$</td>
<td>1618</td>
<td>1708</td>
<td>1663</td>
<td>1236</td>
<td>1798</td>
</tr>
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<td>$R_5$</td>
<td>1833</td>
<td>1889</td>
<td>1861</td>
<td>1706</td>
<td>1918</td>
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<tr>
<td>Mean</td>
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<td>1822</td>
<td>1804</td>
<td>1602</td>
<td>1854</td>
</tr>
<tr>
<td>$N_0$</td>
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<tr>
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<td>1854</td>
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<td></td>
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<tr>
<td>$N_2$</td>
<td>1945</td>
<td>1960</td>
<td>1955</td>
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</table>

S.E. of difference of two
1. $R$ marginal means =69.3 lb./ac.
2. $P$ marginal means =27.6 lb./ac.
3. $N$ marginal means =39.2 lb./ac.
4. $P$ marginal means at the same levels of $R$ =61.6 lb./ac.
5. $R$ marginal means at the same level of $P$ =81.9 lb./ac.
6. $N$ marginal means at the same level of $R$ =87.5 lb./ac.
7. $R$ marginal means at the same level of $N$ =99.6 lb./ac.
8. $N$ marginal means at the same level of $P$ =55.4 lb./ac.
9. $P$ marginal means at the same level of $N$ =52.9 lb./ac.
Object: To find an organic substitute for A/S.

1. BASAL CONDITIONS:
   (i) (a) Nil. (b) N.A. (c) Nil. (ii) (a) Loamy. (b) Refer soil analysis, Jullundur. (iii) 14.5.1952. (iv) (a) to (c) N.A. (v) Nil. (vi) F-320 (medium). (vii) Irrigated. (viii) N.A. (ix) 29.30°. (x) N.A.

2. TREATMENTS:
   All combinations of (1) and (2):
   (1) 3 sources of N: S₁ = A/S, S₂ = G.N.C. and S₃ = 1:1 mixture of A/S and G.N.C.
   (2) 3 levels of N: N₀ = 0, N₁ = 50 and N₂ = 100 lb./ac.

3. DESIGN:
   (i) 3 x 3 Factorial in R.B.D. (ii) (a) 9. (b) N.A. (iii) 6. (iv) (a) N.A. (b) 5'-9' x 40'. (v) N.A. (vi) Yes.

4. GENERAL:
   (i) Normal. No lodging. (ii) Nil. (iii) Kagar yield. (iv) (a) Not contd. (b) No. (c) —. (v) (a) Abohar and Hansi. (b) Nil. (vi) and (vii) Nil.

5. RESULTS:
   (i) 1540 lb./ac.
   (ii) 30.9 lb./ac.
   (iii) None of the effects is significant.
   (iv) Av. yield of kagar in lb./ac.

<table>
<thead>
<tr>
<th></th>
<th>N₀</th>
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<th>N₂</th>
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<td>1564</td>
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<tr>
<td>S₃</td>
<td>—</td>
<td>1676</td>
<td>1653</td>
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</tr>
<tr>
<td>Mean</td>
<td>1449</td>
<td>1552</td>
<td>1620</td>
<td></td>
</tr>
</tbody>
</table>

S.E. of marginal mean of N = 71.2 lb./ac.
S.E. of marginal mean of S = 87.2 lb./ac.
S.E. of body of table = 123.3 lb./ac.

---

Object: To find out the best source of N at varying levels of F.Y.M.

1. BASAL CONDITIONS:

2. TREATMENTS:
   Main-plot treatments:
   3 levels of F.Y.M.: F₀ = 0, F₁ = 100 and F₂ = 200 md./ac.
   Sub-plot treatments:
   All combinations of (1) and (2):
   (1) 3 sources of N: S₁ = A/S, S₂ = G.N.C. and S₃ = 1:1 mixture of A/S and G.N.C.
   (2) 3 levels of N: N₀ = 0, N₁ = 50 and N₂ = 100 lb./ac.
3. DESIGN:

(i) Split-plot. (ii) (a) 3 main-plots/block; 9 sub-plots/main-plot. (b) N.A. (iii) 4. (iv) Sub-plot (a) 8'×35'. (b) 8'×35'. (v) N.A. (vi) Yes.

4. GENERAL:

(i) Normal. No lodging. (ii) Mild attack of Jassid. (iii) Kapas yield. (iv) (a) 1953—contd. (b) No. (c) Nil. (v) (a) No. (b)—. (vi) and (vii) Nil.

5. RESULTS:

(i) 1826 lb./ac.

(ii) (a) 91.43 lb./ac.

(b) 159.57 lb./ac.

(iii) Main effects of F and S are highly significant. Main effect of N is significant while others are not significant.

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

<table>
<thead>
<tr>
<th></th>
<th>S₁</th>
<th>S₂</th>
<th>S₃</th>
<th>Mean</th>
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<td>1902</td>
<td>1847</td>
<td>1669</td>
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<td>2010</td>
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Mean 1904 1742 1834 1826 1656 1838 1985

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<tbody>
<tr>
<td>Mean</td>
<td>1999</td>
<td>1785</td>
<td>1950</td>
</tr>
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</table>

S.E. of difference of two

1. F marginal means = 21.55 lb./ac.

2. S marginal means in F×S table = 37.62 lb./ac.

3. S marginal means in N×S table = 46.06 lb./ac.

4. N marginal means = 37.62 lb./ac.

5. means in the body of N×S table = 65.14 lb./ac.

6. N or S means at the same level of F = 65.14 lb./ac.

7. F means at the same level of N×S = 57.39 lb./ac.

---

Crop: Cotton.

Site: Cotton Res. Stn., Jullundur.

Ref: Pb. 53(171).

Type: 'M'.

Object:—To study the effect of graded doses of N and P₂O₅ and the time of application of N.

1. BASAL CONDITIONS:

(i) (a): Wheat—Cotton. (b) Wheat. (c) Nil. (ii) (a) Sandy loam. (b) Refer soil analysis, Jullundur.

(iii) 1 to 3.5.1953. (iv) (a) to (e) N.A. (v) Nil. (vi) F-320. (vii) Irrigated. (viii) One thinning. (ix) 19.30w.


2. TREATMENTS:

Main-plot treatments:

All combinations of (1) and (2)

(1) 6 levels of N as A/S: N₀=0, N₁=25, N₂=50, N₃=75, N₄=100 and N₅=125 lb./ac.

(2) 2 times of application: T₁=Half at sowing + half at flowering, T₂=Half at thinning + half at flowering and T₃=Full dose at flowering.

Sub-plot treatments:

2 levels of P₂O₅ as Super: P₀=0 and P₁=50 lb./ac.
3. DESIGN:  
(i) Split-plot. (ii) (a) 18 main-plots/block; 2 sub-plots/main-plot. (b) N.A. (iii) 4. (iv) (a) N.A. (b) Sub-plot 8′x41.25′. (v) N.A. (vi) Yes.

4. GENERAL:  
(i) Normal. No lodging. (ii) Nil. (iii) Kapas yield. (iv) (a) N.A. (b) Sub-plot 8′x41.25′. (v) N.A. (vi) and (vii) Nil.

5. RESULTS:  
(i) 1580 lb./ac.  
(ii) (a) 253.8 lb./ac. (b) 151.9 lb./ac.  
(iii) N effect is highly significant, T effect is significant while other effect and interactions are not significant. 
(iv) Av. yield of kapas in lb./ac.

<table>
<thead>
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<th></th>
<th>N0</th>
<th>N1</th>
<th>N2</th>
<th>N3</th>
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<td>1666</td>
<td>1722</td>
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</tbody>
</table>

S.E. of difference of two
1. N marginal means = 73.3 lb./ac.
2. P marginal means = 25.5 lb./ac.
3. T marginal means in P x T table = 51.8 lb./ac.
4. T marginal means in N x T table = 56.8 lb./ac.
5. means in N x T table = 126.9 lb./ac.
6. P means at the same level of N = 62.4 lb./ac.
7. N means at the same level of P = 85.5 lb./ac.
8. P means at the same level of T = 44.1 lb./ac.
9. T means at the same level of P = 60.5 lb./ac.

Crop: Cotton (Kharij).  
Ref: Pb. 52(140).  
Site: Cotton Res. Stn., Jullundur.  
Type: 'CM'.

Object: To study the effect of manuring in relation to sowing dates and spacing.

1. BASAL CONDITIONS:  
(i) (a) Wheat—Cotton. (b) Wheat. (c) Nil. (ii) (a) Sandy loam. (b) Refer soil analysis, Jullundur.  
(iii) As per treatments. (iv) (a) to (e) N.A. (v) Nil. (vi) F-320. (vii) Irrigated. (viii) N.A. (ix) 29.30′.  
(x) N.A.

2. TREATMENTS:  
Main-plot treatments:  
All combinations of (1) and (2)
(1) 2 dates of sowing: D1=26.4.1952 and D2=17.5.1952.  
(2) 2 spacings: S1=2′x1′ and S2=2′x1.5′.
Sub-plot treatments:  
3 levels of N as A/S: N0=0, N1=50 and N2=100 lb./ac.  
Sub-sub-plot treatments:  
2 levels of P2O5 as Super: P0=0 and P1=50 lb./ac.
3. DESIGN:
(i) Split-plot. (ii) (a) 4 main-plots/block; 3 sub-plots/main-plot and 2 sub-sub-plots/sub-plot. (b) N.A. (iii) Sub-plot: 40' x 39'; sub-sub-plot: 20' x 39'. (b) Sub-plot: 24' x 39', sub-sub-plot: 12' x 33'. (v) N.A. (vi) Yes.

4. GENERAL:
(i) Fair to good. No lodging. (ii) Mild attack of Jassid on late sown plots. No control measures. (iii) Kapas yield. (iv) 1952—continued with modifications. (b) No. (c) Nil. (v) (a) Hansi and Abohar. (b) —. (vi) Yes.

5. RESULTS:
(i) 1589 lb./ac.
(ii) (a) 253.5 lb./ac.
(b) 341.6 lb./ac.
(c) 187.9 lb./ac.
(iii) Main effect of D is highly significant. Others are not significant.
(iv) Av. yield of kapas in lb./ac.

<table>
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<tr>
<th></th>
<th>N₀</th>
<th>N₁</th>
<th>N₂</th>
<th>Mean</th>
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<td>1688</td>
<td>1719</td>
<td>1722</td>
<td>1685</td>
</tr>
<tr>
<td>D₂</td>
<td>1373</td>
<td>1496</td>
<td>1547</td>
<td>1474</td>
<td>1493</td>
<td>1455</td>
<td>1496</td>
<td>1452</td>
</tr>
<tr>
<td>Mean</td>
<td>1463</td>
<td>1661</td>
<td>1642</td>
<td>1559</td>
<td>1590</td>
<td>1587</td>
<td>1609</td>
<td>1569</td>
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<tr>
<td>S₁</td>
<td>1494</td>
<td>1649</td>
<td>1683</td>
<td>1609</td>
<td>1620</td>
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</tr>
<tr>
<td>S₂</td>
<td>1432</td>
<td>1673</td>
<td>1600</td>
<td>1568</td>
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<td>P₀</td>
<td>1461</td>
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<td>1654</td>
<td>1590</td>
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<td>P₁</td>
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<td>1630</td>
<td>1587</td>
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</tr>
</tbody>
</table>

S.E. of difference of two
1. D or S marginal means   = 51.8 lb./ac.
2. N marginal means         = 85.4 lb./ac.
3. P marginal means         = 38.3 lb./ac.
4. N means at the same level of D or S = 120.8 lb./ac.
5. D or S means at the same level of N = 111.4 lb./ac.
6. P means at the same level of N = 66.4 lb./ac.
7. N means at the same level of P = 97.5 lb./ac.
8. P means at the same level of D or S = 54.2 lb./ac.
9. D or S means at the same level of P = 64.4 lb./ac.
10. means in body of S X D table = 73.1 lb./ac.

Crop: Cotton.
Object: To study the effect of different doses of A/S on yield of Cotton with variable spacing and sowing dates.

1. BASAL CONDITIONS:
(i) Nil. (b) N.A. (c) Nil. (ii) Sandy loam. (b) Refer soil analysis, Jullundur. (iii) As per treatments.
2. TREATMENTS:

Main-plot treatments:
- Sub-plot treatments:
  1. Wheat-Cotton
  2. Wheat
  3. Nil

SUB-SPLOT TREATMENTS
- Split-plot design
- No. of replications
- S1: 2 x 1', S2: 2 x 1.5', S3: 2 x 2'

3. DESIGN:
- Split-plot design
- 3 main-plots/block
- 3 spacings:
  - S1 = 2 x 1'
  - S2 = 2 x 1.5'
  - S3 = 2 x 2'

4. RESULTS:
- Main effects of S and N are highly significant.
- Interaction S x N is significant. Others are not significant.
- S.E. of difference of two
  1. D or S marginal means
  2. N marginal means
  3. Means at the same level of D or S
  4. Means at the same level of N
  5. Means in body of D x S table

5. ERRATUM:
- Omission of name of author and reference to JUllundur.
2. TREATMENTS:

Main-plot treatments:
All combinations of (1) and (2).
(1) 2 irrigations: \( I_1 \) = Light and \( I_2 \) = Heavy.
(2) 2 spacings: \( S_1 = 2' \times 1.5' \) and \( S_2 = 2' \times 2' \).

Sub-plot treatments:
6 levels of \( N \) as A/S: \( N_0 = 0 \), \( N_1 = 25 \), \( N_2 = 50 \), \( N_3 = 75 \), \( N_4 = 100 \) and \( N_5 = 125 \) lb./ac.

3. DESIGN:

(i) Split-plot. (ii) (a) 4 main-plots/block; 6 sub-plots/main-plot. (b) N.A. (iii) 4. (iv) (a) Sub-plot 14' x 33'. (b) sub-plot 12' x 33'. (v) N.A. (vi) Yes.

4. GENERAL:

(i) Good. No lodging. (ii) Nil. (iii) Kapas yield. (iv) (a) Not continued. (b) No. (c) Nil. (v) (a) Hansi and Abohar. (b) Nil. (vi) and (vii) Nil.

5. RESULTS:

(i) 1532 lb./ac.
(ii) (a) 292.5 lb./ac.
(b) 222.1 lb./ac.
(iii) None of the effects is significant.
(iv) Av. yield of kapas 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>( N_5 )</th>
<th>Mean</th>
<th>( S_1 )</th>
<th>( S_2 )</th>
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<tr>
<td>( I_1 )</td>
<td>1549</td>
<td>1516</td>
<td>1520</td>
<td>1560</td>
<td>1471</td>
<td>1614</td>
<td>1544</td>
<td>1559</td>
<td>1528</td>
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<td>( I_2 )</td>
<td>1535</td>
<td>1653</td>
<td>1679</td>
<td>1477</td>
<td>1478</td>
<td>1482</td>
<td>1559</td>
<td>1597</td>
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<tr>
<td>Mean</td>
<td>1567</td>
<td>1585</td>
<td>1600</td>
<td>1519</td>
<td>1475</td>
<td>1564</td>
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<tr>
<td>( S_1 )</td>
<td>1553</td>
<td>1694</td>
<td>1602</td>
<td>1543</td>
<td>1532</td>
<td>1545</td>
<td>1572</td>
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<td>1597</td>
<td>1495</td>
<td>1417</td>
<td>1584</td>
<td>1525</td>
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<td></td>
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</table>

S.E. of difference of two
1. I or S marginal means = 59.7 lb./ac.
2. N marginal means = 78.5 lb./ac.
3. N means at the same level of I or S = 111.0 lb./ac.
4. I or S means at the same level of N = 117.7 lb./ac.
5. means in the body of I x S table = 84.4 lb./ac.

Crop :- Cotton.
Site :- Govt. Agri. Stn., Gurdaspur.
Ref :- Pb. 53(71).
Type :- 'MV'.

Object :- To study the time and method of application of A/S for Cotton crop.

1. BASAL CONDITIONS:

(i) (a) Nil. (b) Senji. (c) Nil. (ii) (a) Heavy loam. (b) N.A. (iii) 21.4.1953. (iv) (a) 4 ploughings, 6 zohaga and 2 horse hoe. (b) N.A. (c) 6-12 sr./ac. (d) and (e) N.A. (v) Nil. (vi) As per treatments. (vii) Irrigated. (viii) 2 hoeings. (ix) 34.00'. (x) 23.9.1953 to 20.12.1953.

2. TREATMENTS:

Main-plot treatments:
2 varieties: \( V_1 = F-320 \) (medium) and \( V_2 = 231-R \) (medium).

Sub-plot treatments:
7 applications of N: \( N_0 = \) Control, \( N_1 = 30 \) lb./ac. of N in A/S just before flowering (14.7.1953), \( N_2 = 30 \) lb./ac. of N with 2nd irrigation on 2.6.1953, \( N_3 = 10 \) lb./ac. of N drilled at sowing+10 lb./ac. of N just before flowering+10 lb./ac. of N with 2nd irrigation, \( N_4 = 15 \) lb./ac. of N with 2nd irrigation+15 lb./ac. of N just before flowering, \( N_5 = 30 \) lb./ac. of N drilled at sowing time and \( N_6 = 15 \) lb./ac. of N drilled at sowing+15 lb./ac. of N before flowering by broadcast.
3. DESIGN:
(i) Split-plot. (ii) (a) 2 main-plots/block; 7 sub-plots/main-plot. (iii) 4. (iv) (a) 91'x20'. (b) 91'x16'.
(v) 2' on one side and 1½' on the other side of each plot. (vi) Yes.

4. GENERAL:
(i) Normal. No lodging. (ii) Nil. (iii) Kapas yield. (iv) (a) 1953-1954 (b) No. (c) Nil. (v) (a) No,
(b)—. (vi) and (vii) Nil.

5. RESULTS:
(i) 613.6 lb./ac.
(ii) (a) 139.14 lb./ac.
(b) 89.88 lb./ac.
(iii) Main effect of V is highly significant. Others are not significant.
(iv) Av. yield of kapas in lb./ac.

<table>
<thead>
<tr>
<th></th>
<th>V₁</th>
<th>V₂</th>
<th>Mean</th>
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</thead>
<tbody>
<tr>
<td>N₀</td>
<td>766.5</td>
<td>482.8</td>
<td>624.7</td>
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<tr>
<td>N₁</td>
<td>700.1</td>
<td>421.2</td>
<td>560.7</td>
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<td>N₂</td>
<td>750.1</td>
<td>481.8</td>
<td>616.0</td>
</tr>
<tr>
<td>N₃</td>
<td>769.4</td>
<td>540.5</td>
<td>635.0</td>
</tr>
<tr>
<td>N₄</td>
<td>750.1</td>
<td>506.8</td>
<td>628.5</td>
</tr>
<tr>
<td>N₅</td>
<td>694.4</td>
<td>498.2</td>
<td>596.3</td>
</tr>
<tr>
<td>N₆</td>
<td>731.9</td>
<td>496.2</td>
<td>614.1</td>
</tr>
<tr>
<td>Mean</td>
<td>737.5</td>
<td>489.6</td>
<td>613.6</td>
</tr>
</tbody>
</table>

S.E. of difference of two
1. V marginal means =37.19 lb./ac.
2. N marginal means =44.94 lb./ac.
3. N, means at the same level of V =63.55 lb./ac.
4. V means at the same level of N =69.61 lb./ac.

Crop: Cotton.
Site: Cotton Res. Stn., M.A. Farm, Faridkot.
Ref: Pb. 53(102).
Type: 'C'.

Object:—To determine the optimum sowing time and spacing for Cotton crop.

1. BASAL CONDITIONS:
(i) (a) Nil. (b) Fallow. (c) Nil. (ii) (a) Loam. (b) Refer soil analysis, Faridkot. (iii) As per treatments.
(iv) (a) 5 ploughings and 2 solaga. (b) Dibbling. (c) 8—10 sr./plot. (d) As per treatments. (e) N.A.
(v) 7 tons/acre of F.Y.M. on 15, 18.2.1953. 30 lb./acre of N as A/S. (vi) F-320 (medium) (vii) Irrigated.
(viii) One thinning, two hoeings and one weeding. (ix) 21.75°. (x) 28.10.1953 to 16.11.1953 (4 pickings).

2. TREATMENTS:
Main-plot treatments:
6 dates of sowing: D₁=1.4.1953, D₂=12.4.1953, D₃=24.4.1953, D₄=6.5.1953, D₅=18.5.1953 and
D₆=1.6.1953.
Sub-plot treatments:
2 spacings: S₁=2'x1½' and S₂=2½'x1½'.

3. DESIGN:
(i) Split-plot. (ii) (a) 6 main-plots/block; 2 sub-plots/main-plot. (b) N.A. (iii) 4. (iv) (a) Main: 55'x30',
sub: 55'x15'. (b) Main 49.5'x20', sub: 49.5'x10'. (v) One row left on each side. (vi) Yes.
4. GENERAL:
(i) Good. No lodging. (ii) Nil. (iii) Boll no., boll weight, height and kapas yield. (iv) (a) 1952-1954. (b) Nil. (c) Nil. (d) (a) Cotton Res. Stn., B.A. Farm, Faridkot. (b) Nil. (v) and (vi) Nil.

5. RESULTS:
(i) 1555 lb./ac.
(ii) (a) 196.4 lb./ac.
(b) 113.1 lb./ac.
(iii) None of the effects is significant.
(iv) Av. yield of kapas in lb./ac.

<table>
<thead>
<tr>
<th></th>
<th>D1</th>
<th>D2</th>
<th>D3</th>
<th>D4</th>
<th>D5</th>
<th>Mean</th>
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<td>S1</td>
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<td>1543</td>
<td>1645</td>
<td>1495</td>
<td>1509</td>
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<td>1537</td>
<td>1628</td>
<td>1577</td>
<td>1533</td>
<td>1543</td>
<td>1515</td>
</tr>
<tr>
<td>Mean</td>
<td>1523</td>
<td>1586</td>
<td>1611</td>
<td>1514</td>
<td>1585</td>
<td>1512</td>
</tr>
</tbody>
</table>

S.E. of difference of two
1. D marginal means = 95.2 lb./ac.
2. S marginal means = 32.7 lb./ac.
3. S means at the same level of D = 78.0 lb./ac.
4. D means at the same level of S = 110.7 lb./ac.

CROP: Cotton.
SITE: Cotton Res. Stn., M.A. Farm, Faridkot.

Ref: Pb. 52 (68).
Type: 'C'.

Object: To find the optimum sowing time and spacing for Cotton crop.

1. BASAL CONDITIONS:
(i) (a) Nil. (b) Wheat. (c) Nil. (ii) (a) Loam. (b) Refer soil analysis, Faridkot. (iii) As per treatments. (iv) (a) 3 ploughings and 2 zohaga. (b) N.A. (c) 8-10 sr./ac. (d) As per treatments. (e) N.A. (v) 40 lb./ac. of N as A/S on 19.7.1952. (vi) F-216 (early). (vii) Irrigated. (viii) 3 hoeings, 1 weeding and 2 thinnings. (ix) 7.44'. (x) 7.10.1952 to 27.11.1952.

2. TREATMENTS:
Main-plot treatments:
3 dates of sowing: D1=15.5.1952, D2=1.6.1952 and D3=15.6.1952.
Sub-plot treatments:
2 spacings: S1=2'x1' and S2=1'x1'.

3. DESIGN:
(i) Split-plot. (ii) (a) 3 main-plots/block; 2 sub-plots/main-plot. (b) N.A. (iii) 4. (iv) (a) Sub-plot: 99'x10'. (b) Sub-plot: 90'x10'. (v) Approximately 4' left as border on each side along breadth. (vi) Yes.

4. GENERAL:
(i) Normal. No lodging. (ii) Nil. (iii) Kapas yield. (iv) (a) Not continued. (b)—. (c)—. (v) (a) No. (b)—. (vi) and (vii) Nil.

5. RESULTS:
(i) 661.1 lb./ac.
(ii) (a) 84.68 lb./ac.
(b) 69.86 lb./ac.
(iii) Main effect of D is highly significant. Others are not significant.
(iv) Av. yield of kapes in lb./ac.

<table>
<thead>
<tr>
<th>Treatment</th>
<th>S1</th>
<th>S2</th>
<th>Mean</th>
</tr>
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<tbody>
<tr>
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<td>680.4</td>
<td>722.9</td>
</tr>
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<td>D2</td>
<td>735.9</td>
<td>808.5</td>
<td>772.2</td>
</tr>
<tr>
<td>D3</td>
<td>486.0</td>
<td>490.6</td>
<td>488.3</td>
</tr>
<tr>
<td>Mean</td>
<td>662.4</td>
<td>659.8</td>
<td>661.1</td>
</tr>
</tbody>
</table>

S.E. of difference of two
1. D marginal means = 42.34 lb./ac.
2. S marginal means = 28.52 lb./ac.
3. S means at the same level of D = 49.40 lb./ac.
4. D means at the same level of S = 54.89 lb./ac.

Crop: Cotton (Kharif).
Site: Govt. Agri. Stn., Gurdaspur.

Ref: Pb. 51 (75).
Type: ‘C’.

Object: To find out the best time of sowing for Cotton crop.

1. BASAL CONDITIONS:
   (i) (a) Nil. (b) Wheat. (c) Nil. (ii) Loam. (b) N.A. (iii) As per treatments. (iv) (a) 5 desi plough, 6 sikhara and 1 roller. (b) and (c) N.A. (d) row to row 1’ (e) N.A. (v) Nil. (vi) 231-R (medium). (vii) Irrigated. (viii) 1 gap filling and one hoeing cum weeding. (ix) 15.75”. (x) 20.10.1951 to 20.12.1951.

2. TREATMENTS:
   6 dates of sowing: D1 = 5.4.1951, D2 = 18.4.1951, D3 = 16.5.1951, D4 = 31.5.1951, D5 = 5.6.1951 and D6 = 19.6.1951.

3. DESIGN:
   (i) R.B.D. (ii) (a) 6. (b) N.A. (iii) 6. (iv) (a) and (b) 1/45 (v) Nil. (vi) Yes.

4. GENERAL:
   (i) Normal. No lodging. (ii) Nil. (iii) Kapes yield. (iv) 1951 to 1955. (b) No. (c) Nil. (v) (a) Nil. (b) . (vi) and (vii) Nil.

5. RESULTS:
   (i) 623.4 lb./ac.
   (ii) 92.11 lb./ac.
   (iii) Treatment differences are not significant.
   (iv) Av. yield of kapes in lb./ac.

<table>
<thead>
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<th>Treatment</th>
<th>Av. yield</th>
</tr>
</thead>
<tbody>
<tr>
<td>D1</td>
<td>757.9</td>
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<td>D3</td>
<td>572.8</td>
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<td>D4</td>
<td>576.6</td>
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<tr>
<td>D5</td>
<td>568.9</td>
</tr>
<tr>
<td>D6</td>
<td>591.1</td>
</tr>
</tbody>
</table>

S.E./mean = 37.60 lb./ac.
Crop :- Cotton.  
Site :- Govt. Agri. Stn., Gurdaspur.  

Object :- To find out the best time of sowing for Cotton crop.

1. BASAL CONDITIONS :
   (i) (a) Nil. (b) Senji. (c) Nil. (ii) (a) Loam. (b) N.A. (iii) As per treatments. (iv) (a) 4 ploughings and 6 sohaga. (b) N.A. (c) 4 chh./plot. (d) and (e) N.A. (v) 12 C.L. of F.Y.M. on 13.3.1952. (vi) 231-R (medium). (vii) Irrigated. (viii) 2 hoeings and 2 horse hoe. (ix) 22.43... (x) 9.9.1952 to 11.12.1952.

2. TREATMENTS :
   6 dates of sowing:  
   \[ D_1 = 24.3.1952, \quad D_2 = 15.4.1952, \quad D_3 = 29.4.1952, \quad D_4 = 15.5.1952, \quad D_5 = 1.6.1952 \]  and  
   \[ D_6 = 16.6.1952. \]

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

4. GENERAL :
   (i) Normal. No lodging. (ii) Leaf roller attack. Agroicide sprayed on 29.8.1952. (iii) Kapas yield. (iv) (a) 1952-1955. (b) No. (c) Nil. (v) (a) No. (b) -. (vi) and (vii) Nil.

5. RESULTS :
   (i) 894.1 lb/ac.  
   (ii) 101.9 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>
</tr>
</thead>
<tbody>
<tr>
<td>( D_1 )</td>
<td>1220.9</td>
</tr>
<tr>
<td>( D_2 )</td>
<td>1221.0</td>
</tr>
<tr>
<td>( D_3 )</td>
<td>1110.4</td>
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<td>( D_4 )</td>
<td>858.4</td>
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<td>( D_5 )</td>
<td>552.9</td>
</tr>
<tr>
<td>( D_6 )</td>
<td>390.9</td>
</tr>
<tr>
<td>S.E./mean</td>
<td>41.60 lb/ac</td>
</tr>
</tbody>
</table>

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Crop :- Cotton.  
Site :- Govt. Agri. Stn., Gurdaspur.  

Object :- To find out the best time of sowing for Cotton crop.

1. BASAL CONDITIONS :
   (i) (a) Nil. (b) Senji. (c) Nil. (ii) (a) Loam. (b) N.A. (iii) As per treatments. (iv) (a) 4 ploughings and 2 sohaga. (b) N.A. (c) 4 chh./plot. (d) 2 ft. between rows. (e) N.A. (v) 10 C.L. of F.Y.M. on 9.3.1953 by broadcast. (vi) 231-R (medium). (vii) Irrigated. (viii) 2 hoeing, 2 horse hoe and on thinning. (ix) 34.00' x 12'. (x) 25.9.1953 to 24.11.1953.

2. TREATMENTS :
   6 dates of sowing:  
   \[ D_1 = 15.3.1953, \quad D_2 = 1.4.1953, \quad D_3 = 15.4.1953, \quad D_4 = 1.5.1953, \quad D_5 = 15.5.1953 \]  and  
   \[ D_6 = 1.6.1953. \]

3. DESIGN :
   (i) R.B.D. (ii) (a) 6. (b) N.A. (iii) 6. (iv) and (b) 90.15' x 12'. (v) Nil. (vi) Yes.

4. GENERAL :
   (i) Normal. No lodging. (ii) Jassid attack, spraying of DDT on 26.7.1953. (iii) Kapas yield. (iv) (a) 1951-1955. (b) No. (c) Nil. (v) (a) No. (b) -. (vi) and (vii) Nil.
5. RESULTS:

(i) 729.1 lb./ac.
(ii) 62.56 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>
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<tbody>
<tr>
<td>$D_1$</td>
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<tr>
<td>$D_6$</td>
<td>464.6</td>
</tr>
<tr>
<td>S.E./mean</td>
<td>25.54 lb./ac.</td>
</tr>
</tbody>
</table>

Object:— To study the effect of spacing on yield of Cotton.

1. BASAL CONDITIONS:

(i) (a) Nil. (b) *Dhaincha*. (c) Nil. (ii) (a) Loam. (b) N.A. (iii) 6.4.1949. (iv) (a) 1 rajah plough, 1 desi plough and 1 sohaga. (b) and (c) N.A. (d) As per treatments. (e) N.A. (f) N.A. (vi) F-216. (medium). (vii) Irrigated. (viii) 1 gap filling and 3 hoeings. (ix) 26.99°. (x) 6.9.1953 to 25.11.1953.

2. TREATMENTS:

4 spacings: $S_1=9'$ apart, $S_2=1'$ apart, $S_3=11'$ apart and $S_4=2'$ apart.

3. DESIGN:

(i) R.B.D. (ii) (a) 4. (b) N.A. (iii) 6. (iv) (a) $12' \times 75'$, (b) $12' \times 60.5'$. (v) N.A. (vi) Yes.

4. GENERAL:

(i) Fair. No lodging. (ii) Nil. (iii) *Kapas* yield. (iv) (a) Not contd.; (b) and (c) No. (v) (a) and (b) No. (vi) and (vii) Nil.

5. RESULTS:

(i) 651.5 lb./ac.
(ii) 66.5 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>$S_1$</td>
<td>624.9</td>
</tr>
<tr>
<td>$S_2$</td>
<td>685.3</td>
</tr>
<tr>
<td>$S_3$</td>
<td>659.6</td>
</tr>
<tr>
<td>$S_4$</td>
<td>636.4</td>
</tr>
<tr>
<td>S.E./mean</td>
<td>27.14 lb./ac.</td>
</tr>
</tbody>
</table>

Object:— To compare different methods of sowing Cotton.

1. BASAL CONDITIONS:

(i) (a) Nil. (b) N.A. (c) N.A. (ii) (a) Loam. (b) N.A. (iii) 4.4.1949. (iv) (a) N.A. (b) As per treatments. (c) to (e) N.A. (v) N.A. (vi) F-216 (medium). (vii) Irrigated. (viii) 1 gap filling and 1 hoeing. (ix) 26.29°. (x) 27.9.1953 to 25.11.1953.
2. TREATMENTS:
1. Sown in lines.
2. Sown by broadcast.

3. DESIGN:
(i) Paired plot. (ii) (a) 2. (b) N.A. (iii) 8. (iv) (a) 18' x 75'. (b) 18' x 60.5'. (v) N.A. (vi) Yes.

4. GENERAL:
(i) Good. No lodging. (ii) Nil. (iii) Kapas yield. (iv) (a) 1949-1950. (b) and (c) No. (v) (a) and (b) Nil. (vi) Nil. (vii) Due to heavy rain in July plots were damaged as water stagnated. Certain plants died out while in others there was severe shedding of cotton.

5. RESULTS:
(i) 316.0 lb./ac.
(ii) 61.65 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>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>248.1</td>
</tr>
<tr>
<td>2.</td>
<td>383.8</td>
</tr>
<tr>
<td>S.E./mean = 21.80 lb./ac.</td>
<td></td>
</tr>
</tbody>
</table>

Crop :- Cotton.  
Site :- Govt. Agri. Stn., Hansi.  
Object :- To compare the different methods of sowing Cotton.

Ref :- Pb. 50 (90).  
Type :- 'C'.

1. BASAL CONDITIONS:
(i) (a) Guara (G.M.)—Cotton. (b) Guara (G.M.). (c) Nil. (ii) (a) Loamy. (b) N.A. (iii) 9.4.1950.
(iv) (a) N.A. (b) As per treatments. (c) to (e) N.A. (v) N.A. (vi) F-216 (medium). (vii) Irrigated.
(viii) 2 hoeings and 1 weeding. (ix) 15.25'. (x) 9.10.1950 to 30.10.1950.

2. TREATMENTS:
1. Sown in lines.
2. Sown by broadcast.

3. DESIGN:
(i) Paired plot. (ii) (a) 2. (b) N.A. (iii) 8. (iv) (a) N.A. (b) 1/40th ac. (v) N.A. (vi) Yes.

4. GENERAL:
(i) Normal. No lodging. (ii) Nil. (iii) Kapas yield. (iv) (a) 1949 to 1950. (b) No. (c) Nil. (v) (a) No. (b) --. (vi) and (vii) Nil.

5. RESULTS:
(i) 1235 lb./ac.
(ii) 112.0 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>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>1385</td>
</tr>
<tr>
<td>2.</td>
<td>1085</td>
</tr>
<tr>
<td>S.E./mean = 39.6 lb./ac.</td>
<td></td>
</tr>
</tbody>
</table>
Crop: Cotton.
Site: Govt. Agri. Stn., Hansi.

Object: To study the best date of topping for Cotton crop.

1. BASAL CONDITIONS:
   (i) (a) Nil (b) Wheat (c) Nil (ii) (a) Loam (b) N.A. (iii) 7.5.1951. (iv) (a) 6 desi plough and 5 solhaga. (b) N.A. (c) 10 sr./ac. (d) and (e) N.A. (v) 50 lb./ac. of N as F.Y.M. by broadcast. (vi) M 60 A 2 (medium). (vii) Irrigated. (viii) N.A. (ix) 8.02°. (x) 29.9.1951 to 11.11.1951 (4 pickings).

2. TREATMENTS:
   Four dates of topping:
   1. No topping.
   2. 15th June.
   3. 30th June.
   4. 15th July.

3. DESIGN:
   (i) R.B.D. (ii) (a) 4. (b) N.A. (iii) 6. (iv) (a) 12'x75'. (b) 12'x60.5'. (v) N.A. (vi) Yes.

4. GENERAL:
   (i) Normal. No lodging. (ii) Nil. (iii) Kapas yield. (iv) (a) 1949 to 1951. (b) No. (c) Nil. (v) (a) No. (b) Nil. (vi) and (vii) Nil.

5. RESULTS:
   (i) 612.6 lb./ac.
   (ii) 101.1 lb./ac.
   (iii) Treatments are not significantly different.
   (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>600.4</td>
</tr>
<tr>
<td>2.</td>
<td>644.1</td>
</tr>
<tr>
<td>3.</td>
<td>618.4</td>
</tr>
<tr>
<td>4.</td>
<td>587.6</td>
</tr>
<tr>
<td>S.E./mean</td>
<td>41.3 lb./ac.</td>
</tr>
</tbody>
</table>

Crop: Cotton.
Site: Govt. Agri. Stn., Hansi.

Object: To study the best date of topping for Cotton crop.

1. BASAL CONDITIONS:
   (i) (a) Nil (b) Wheat. (c) Nil. (ii) (a) Heavy loam (b) N.A. (iii) 7.5.1951. (iv) (a) 1 raja plough, 1 desi plough, 2 desi harrow and 3 solhaga. (b) N.A. (c) 15 sr./ac. (d) and (e) N.A. (v) 50 lb./ac. of N as F.Y.M. broadcast. (vi) F-216 (medium). (vii) Irrigated. (viii) 5 hoeings and one thinning. (ix) 8.02°. (x) Pickings on 29.9.1951, 16.10.1951 and 10.11.1951.

2. TREATMENTS:
   1. No topping.
   2. Topping on 15th June.
   3. Topping on 30th June.
   4. Topping on 15th July.

3. DESIGN:
   (i) R.B.D. (ii) (a) 4. (b) N.A. (iii) 6. (iv) (a) 12'x75'. (b) 12'x60.5'. (v) N.A. (vi) Yes.

4. GENERAL:
   (i) Satisfactory. No lodging. (ii) Nil. (iii) Kapas yield. (iv) (a) 1949—1951. (b) No. (c) Nil. (v) (a) No. (b) Nil. (vi) and (vii) Nil.
5. RESULTS:
(i) 820.3 lb./ac.
(ii) 151.5 lb./ac.
(iii) Treatments are not significantly different.
(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>736.7</td>
</tr>
<tr>
<td>2.</td>
<td>855.0</td>
</tr>
<tr>
<td>3.</td>
<td>941.1</td>
</tr>
<tr>
<td>4.</td>
<td>748.3</td>
</tr>
</tbody>
</table>

S.E./mean = 61.8 lb./ac.

---

Crop :- Cotton.  
Site :- Cotton Res. Stn., B.A. Farm, Rauni.  
Object :- To determine the optimum sowing time and spacing for Cotton crop.

1. BASAL CONDITIONS:  
(i) (a) Nil.  (b) Toria.  (c) Nil.  (ii) (a) Heavy loam.  (b) N.A.  (iii) As per treatments.  
(iv) (a) 5 plough and 4 sohag.  (b) N.A.  (c) 10 sr./ac.  (d) and (e) N.A.  (v) 10 C.L. as F.Y.M. by broadcast.  
42 lb./ac. of N as A/S applied by broadcast on 19.8.1953.  
(vi) F-216 (medium).  
(vii) Irrigated.  
(viii) 1-2 trip bally.  
(ix) 22.7.53.  
(x) 4.10.1953 to 28.12.1953.

2. TREATMENTS:
Main-plot treatments:
6 dates of sowing : $D_1$ = 1.4.1953, $D_2$ = 12.4.1953, $D_3$ = 24.4.1953, $D_4$ = 8.5.1953, $D_5$ = 24.5.1953 and $D_6$ = 4.6.1953.

Sub-plot treatments:
2 spacings : $S_1$ = 2' x 1.25' and $S_2$ = 2.5' x 1.5'.

3. DESIGN:
(i) Split-plt.  
(ii) (a) 6 main-plots/block ; 2 sub-plots/main-plot.  
(iii) 4.  
(iv) (a) 85' x 15', (b) 77.79' x 10'.  
(v) One row on each side of sub-plot left as non-experimental area at the time of picking, 2' unsown buffer plot kept in between main-plots.  
(vi) Yes.

4. GENERAL:
(i) Germination on the whole good and satisfactory. No lodging.  
(ii) Kota insect of Toria noticed on 9.4.1953. This effected germination of the seed. Effect of insect was 3' deep in soil. Dibbling of seed was also done in vacant spaces or spacing caused by pest attack on 23.4.1953. The effect of insect was severe in $D_1$ and $D_2$ plots.  
(iii) Germination/hill and yield of kapas (iv) (a) 1953-1954.  
(b) No.  
(c) Nil.  
(v) (a) Cotton Res. Stn., Faridkot.  
(b) Nil.  
(vi) and (vii) Nil.

5. RESULTS:
(i) 1357 lb./ac
(ii) (a) 273.8 lb./ac.
(b) 158.7 lb./ac.

(iii) D effect is highly significant. S effect is not significant while interaction D x S is significant.

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

<table>
<thead>
<tr>
<th></th>
<th>$D_1$</th>
<th>$D_2$</th>
<th>$D_3$</th>
<th>$D_4$</th>
<th>$D_5$</th>
<th>Mean</th>
</tr>
</thead>
<tbody>
<tr>
<td>$S_1$</td>
<td>1433</td>
<td>1489</td>
<td>1661</td>
<td>1744</td>
<td>1148</td>
<td>953</td>
</tr>
<tr>
<td>$S_2$</td>
<td>1705</td>
<td>1546</td>
<td>1492</td>
<td>1514</td>
<td>941</td>
<td>664</td>
</tr>
<tr>
<td>Mean</td>
<td>1568</td>
<td>1518</td>
<td>1577</td>
<td>1629</td>
<td>1045</td>
<td>807</td>
</tr>
</tbody>
</table>

S.E. of difference of two
1. D marginal means = 136.9 lb./ac.
2. S marginal means = 45.8 lb./ac.
3. S means at the same level of D = 112.2 lb./ac.
4. D means at the same level of S = 158.3 lb./ac.

Ref: Pb.53 (114).  
Type :- 'C'.

Crop :- Cotton.  
Site: Cotton Res. Stn., B.A. Farm, Rauni.
Crop : Cotton.  
Site : Cotton Res. Stn., M.A. Farm, Faridkot.  
Object : To study the best sowing date for different varieties of Cotton.

1. BASAL CONDITIONS:
   (i) (a) Nil. (b) Wheat. (c) Nil. (ii) (a) Loam. (b) Refer soil analysis, Faridkot. (iii) As under treatments. (iv) (a) 4 ploughings and 1 sohaga levelling. (b) N.A. (c) 10 Sr./ac. (d) 2½'×1½'. (e) N.A. (v) 8 ton/ac. of F.Y.M. before sowing and 40 lb./ac. of N in A/S at flowering stage. (vi) As per treatments. (vii) Irrigated. (viii) 3 hoeings and 1 thinning. (ix) 7.44". (x) 6.10.1952 to 27.11.1952.

2. TREATMENTS:
   Main-plot treatments:
   Sub-plot treatments:
   2 varieties: V1=L.S.S. (late) and V2=F-216 (early).

3. DESIGN:
   (i) Split-plot. (ii) (a) 5 main-plots/block ; 2 sub-plots/main-plot. (b) N.A. (iii) 4. (iv) (a) Main 97' × 30'; Sub 97' × 15'. (b) Main 90' × 20'; Sub 90' × 10'. (v) Approximately 4' left out as non experimental area on both breadth side of the plot. (vi) Yes.

4. GENERAL:
   (i) Fair. No lodging. (ii) Dusted with B.H.C. spray on 7.5.1952. (iii) Height, boll no., boll weight and kapas yield. (iv) (a) No. (b) and (c) No. (v) (a) Cotton Res. Stn., B.A. Farm, Rauni. (b) Nil (vi) and (vii) Nil.

5. RESULTS:
   (i) 865 lb./ac. 
   (ii) (a) 282.5 lb./ac. 
   (b) 127.3 lb./ac. 
   (iii) Main-plot treatments effect is highly significant while others are not significant. 
   (iv) Av. yield of kapas in lb./ac.

<table>
<thead>
<tr>
<th></th>
<th>D1</th>
<th>D2</th>
<th>D3</th>
<th>D4</th>
<th>D5</th>
<th>Mean</th>
</tr>
</thead>
<tbody>
<tr>
<td>V1</td>
<td>1086</td>
<td>1012</td>
<td>832</td>
<td>775</td>
<td>498</td>
<td>841</td>
</tr>
<tr>
<td>V2</td>
<td>1119</td>
<td>1106</td>
<td>873</td>
<td>886</td>
<td>461</td>
<td>889</td>
</tr>
<tr>
<td>Mean</td>
<td>1103</td>
<td>1059</td>
<td>853</td>
<td>831</td>
<td>480</td>
<td>865</td>
</tr>
</tbody>
</table>

S.E. of difference of two 
1. D marginal means = 141.3 lb./ac. 
2. V marginal means = 40.3 lb./ac. 
3. V means at the same level of D = 90.0 lb./ac. 
4. D means at the same level of V = 154.9 lb./ac.
3. DESIGN:
(i) Split-plot. (ii) (a) 4 main-plots/block; 2 sub-plots/main-plot. (b) N.A. (iii) 6. (iv) (a) and (b) 1/54.45th ac. (v) Nil. (vi) Yes.

4. GENERAL:
(i) Germination satisfactory. No lodging. (ii) Nil. (iii) Kapas yield. (iv) (a) 1948-50. (b) No. (c) Nil. (v) (a) and (b) No. (vi) and (vii) Nil.

5. RESULTS:
(i) 604.7 lb./ac.
(ii) (a) 110.8 lb./ac.
(b) 120.4 lb./ac
(iii) All effects are highly significant.
(iv) Av. yield of kapas in lb./ac.

<table>
<thead>
<tr>
<th></th>
<th>D1</th>
<th>D2</th>
<th>D3</th>
<th>D4</th>
<th>Mean</th>
</tr>
</thead>
<tbody>
<tr>
<td>V1</td>
<td>1134</td>
<td>1226</td>
<td>968</td>
<td>496</td>
<td>956</td>
</tr>
<tr>
<td>V2</td>
<td>419</td>
<td>300</td>
<td>168</td>
<td>126</td>
<td>235</td>
</tr>
<tr>
<td>Mean</td>
<td>777</td>
<td>763</td>
<td>568</td>
<td>311</td>
<td>605</td>
</tr>
</tbody>
</table>

S.E. of difference of two
1. D marginal means = 45.2 lb./ac.
2. V marginal means = 34.8 lb./ac.
3. V means at the same level of D = 69.5 lb./ac.
4. D means at the same level of V = 66.8 lb./ac.

Crop :- Cotton (Kharif).
Site :- Govt. Agrl. Stn., Gurdaspur.
Object :- To study the best sowing date for Cotton varieties.

Ref :- Pb. 49(5).
Type :- 'CV'.

1. BASAL CONDITIONS:
(i) (a) Nil. (b) Berseem. (c) Nil. (ii) (a) Loam. (b) N.A. (iii) As per treatments. (iv) (a) 1 raja and 4 desi ploughings, 5 sohaga and 1 roller. (b) and (c) N.A. (d) 1.25' row to row. (e) N.A. (v) 10 C.L. of F.Y.M. on 26, 27.2.1949. (vi) As per treatments. (vii) Irrigated. (viii) One gap filling and 1 hoeing and weeding (ix) 18.55'. (x) 14.9.1949 to 12.12.1949.

2. TREATMENTS:
Main-plot treatments:
Sub-plot treatments:
2 varieties: V1=231-R (medium) and V2=F-347 (medium).

3. DESIGN:
(i) Split-plot. (ii) (a) 4 main-plots/block; 2 sub-plots/main-plot. (b) N.A. (iii) 5. (iv) (a) and (b) 1/45.37th ac. (v) N.A. (vi) Yes.

4. GENERAL:
(i) Satisfactory. No lodging. (ii) Nil. (iii) Kapas yield. (iv) (a) 1948—1930. (b) No. (c) Nil. (v) (a) No. (b)—. (vi) and (vii) Nil.

5. RESULTS:
(i) 688.3 lb./ac.
(ii) (a) 59.3 lb./ac.
(b) 136.5 lb./ac.
(iii) All the effects are highly significant.
(iv) Av. yield of *kapas* in lb./ac.

<table>
<thead>
<tr>
<th></th>
<th>D₁</th>
<th>D₂</th>
<th>D₃</th>
<th>D₄</th>
<th>Mean</th>
</tr>
</thead>
<tbody>
<tr>
<td>V₁</td>
<td>1169</td>
<td>1247</td>
<td>1044</td>
<td>382</td>
<td>960</td>
</tr>
<tr>
<td>V₂</td>
<td>663</td>
<td>599</td>
<td>253</td>
<td>150</td>
<td>416</td>
</tr>
</tbody>
</table>

Mean 916 923 649 266 688

S.E. of difference of two
1. D marginal means = 44.4 lb./ac.
2. V marginal means = 43.2 lb./ac.
3. V means at the same level of D = 86.3 lb./ac.
4. D means at the same level of V = 75.5 lb./ac.

---

**Crop:** Cotton (*Khairf*).
**Site:** Govt. Agri. Stn., Gurdaspur.

**Object:** To study the best date of sowing for Cotton.

1. **BASAL CONDITIONS:**
   (i) (a) Nil. (b) Berseem. (c) Nil. (ii) (a) Loam. (b) N.A. (iii) As per treatments. (iv) (a) 6 ploughings with *desi* plough, 7 *sohaga* and 1 roller. (b) to (e) N.A. (v) 12 C.L. of F.Y.M. applied to whole field. (vi) As per treatments. (vii) Irrigated. (viii) One gapfilling and one weeding cum hoeing. (ix) 54.24". (x) 14.10.1950 to 13.12.1950.

2. **TREATMENTS:**
   Main-plot treatments:
   4 dates of sowing: D₁ = 3.4.1950; D₂ = 8.5.1950, D₃ = 2.6.1950 and D₄ = 11.7.1950.
   Sub-plot treatments:
   2 varieties: V₁ = R-231 and V₂ = F-347.

3. **DESIGN:**
   (i) Split-plot. (ii) (a) 4 main-plots/block; 2 sub-plots/main-plot. (b) N.A. (iii) 5. (iv) (a) and (b) 80°-8" x 12°. (v) Nil. (vi) Yes.

4. **GENERAL:**
   (i) Germination satisfactory, growth normal. No lodging. (ii) Nil. (iii) Kapas yield. (iv) (a) 1948-1950. (b) No. (c) Nil. (v) (a) Nil. (b) —. (vi) Nil. (vii) Yield in D₄ main-plot failed totally and hence only 3 main-plots were considered in place of 4 main-plots.

5. **RESULTS:**
   (i) 431.8 lb./ac.
   (ii) (a) 71.8 lb./ac.
   (b) 132.8 lb./ac.
   (iii) Both main-plot and sub-plot treatment effects are highly significant while interaction is not significant.
   (iv) Av. yield of *kapas* in lb./ac.

<table>
<thead>
<tr>
<th></th>
<th>D₁</th>
<th>D₂</th>
<th>D₃</th>
<th>Mean</th>
</tr>
</thead>
<tbody>
<tr>
<td>V₁</td>
<td>695.4</td>
<td>671.1</td>
<td>468.6</td>
<td>611.7</td>
</tr>
<tr>
<td>V₂</td>
<td>376.1</td>
<td>311.5</td>
<td>68.3</td>
<td>251.9</td>
</tr>
</tbody>
</table>

Mean 535.8 491.2 268.5 431.8

S.E. of difference of two
1. D marginal means = 32.1 lb./ac.
2. V marginal means = 48.5 lb./ac.
3. V means at the same level of D = 84.0 lb./ac.
4. D means at the same level of V = 67.5 lb./ac.
Crop :- Cotton.  
Site :- Govt. Agri. Stn., Hansi.  
Ref :- Pb. 49 (78).  
Type :- 'CV'.

Object :- To find the best date of topping for Cotton crop.

1. BASAL CONDITIONS :
(i) (a) Nil. (b) Maize. (c) Nil. (ii) (a) Loam. (b) N.A. (iii) 4.4.1949. (iv) (a) One ploughing with raja plough, 1 desi plough, 5 sohaga and one horse hoe. (b) to (e) N.A. (v) N.A. (vi) As per treatments. (vii) Irrigated. (viii) 5 hoeings, one thinning and one gapfilling. (ix) 26.99°. x) F-216 :- 8.9.1949 to 23.11.1949 and M 60 A4 : 27.8.1949 to 25.10.1949.

2. TREATMENTS :
Main-plot treatments :
2 varieties: \( V_1 = F-216 \) and \( V_2 = M 60 \) A4.

Sub-plot treatments :
4 dates of topping: \( D_1 = 1.6.1949 \), \( D_2 = 15.6.1949 \), \( D_3 = 30.6.1949 \) and \( D_4 = 15.7.1949 \).

3. DESIGN :
(i) Split-plot. (ii) (a) 2 main-plots/block; 4 sub-plots/main-plot. (b) N.A. (iii) 5. (iv) (a) N.A. (b) \( 10' \times 54'5'' \). (v) N.A. (vi) Yes.

4. GENERAL :
(i) Normal. No lodging. (ii) Nil. (iii) Kapas yield. (iv) (a) 1949 to 1953. (b) No. (c) Nil. (v) (a) No. (b) --. (vi) and (vii) Nil.

5. RESULTS :
(i) 673.5 lb./ac.
(ii) (a) 80.99 lb./ac.
(b) 56.43 lb./ac.
(iii) Main effect of \( V \) is highly significant. Others are not significant.
(iv) Av. yield of kapas in lb./ac.

<table>
<thead>
<tr>
<th></th>
<th>( D_1 )</th>
<th>( D_2 )</th>
<th>( D_3 )</th>
<th>( D_4 )</th>
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<tr>
<td>( V_1 )</td>
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<td>615.1</td>
<td>605.3</td>
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<td>( V_2 )</td>
<td>752.9</td>
<td>755.0</td>
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<td>634.0</td>
<td>674.7</td>
<td>670.7</td>
<td>673.5</td>
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</table>

S.E. of difference of two
1. \( V \) marginal means =25.61 lb./ac.
2. \( D \) marginal means =43.12 lb./ac.
3. \( D \) means at the same level of \( V \) =60.59 lb./ac.
4. \( V \) means at the same level of \( D \) =58.70 lb./ac.

—

Crop :- Cotton.  
Site :- Govt. Agri. Stn., Hansi.  
Ref :- Pb. 50 (81).  
Type :- 'CV'.

Object :- To find the best date of topping for Cotton crop.

1. BASAL CONDITIONS :
(i) (a) Guara (G.M.)--Cotton. (b) Guara (G.M.). (c) Nil. (ii) Loamy. (b) N.A. (iii) 9.4.1950. (iv) (a) to (e) N.A. (v) N.A. (vi) As per treatments. (vii) Irrigated. (viii) 2 hoeings. (ix) 15.25°. (x) 23.9.1950 to 30.10.1950.
2. TREATMENTS:
Main-plot treatments:
2 varieties: \( V_1 = F-216 \) and \( V_2 = M 60 A_2 \).
Sub-plot treatments:
4 dates of topping: \( D_0 = \) No topping, \( D_1 = 15.6.1950 \), \( D_2 = 30.6.1950 \) and \( D_3 = 15.7.1950 \).

3. DESIGN:
(i) Split-plot. (ii) (a) 2 main-plots/block; 4 sub-plots/main-plot. (b) N.A. (iii) 5. (iv) (a) N.A. (b) 1/80 ac. (v) N.A. (vi) Yes.

4. GENERAL:
(i) Fair to normal. No lodging. (ii) Nil. (iii) Kapas yield. (iv) (a) 1949 to 1950. (b) No. (c) No. (d) Nil. (e) Nil. (vii) Nil.

5. RESULTS:
(i) 796.4 lb/ac.
(ii) (a) 170.8 lb/ac.
(b) 133.1 lb/ac.
(iii) Main effect of \( V \) alone is significant.
(iv) Av. yield of kapas in lb/ac.

<table>
<thead>
<tr>
<th></th>
<th>( D_0 )</th>
<th>( D_1 )</th>
<th>( D_2 )</th>
<th>( D_3 )</th>
<th>Mean</th>
</tr>
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<tr>
<td>( V_1 )</td>
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<tr>
<td>( V_2 )</td>
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<td>683.0</td>
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<td>Mean</td>
<td>816.7</td>
<td>814.6</td>
<td>818.8</td>
<td>735.5</td>
<td>796.4</td>
</tr>
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</table>

S.E. of difference of two
1. V marginal means 54.0 lb/ac.
2. D marginal means 59.5 lb/ac.
3. D means at the same level of V 64.2 lb/ac.
4. V means at the same level of D 90.8 lb/ac.

---

Crop :- Cotton.
Site :- Cotton Res. Stn., B.A. Farm, Rauni.

Ref :- Pb. 52(80). Type :- 'CV'.

Object :- To study best sowing date for Cotton varieties.

1. BASAL CONDITIONS:
(i) (a) Nil. (b) Wheat. (c) Nil. (ii) (a) Heavy loam. (b) N.A. (iii) As per treatments. (iv) (a) and (b) N.A. (c) 8-10 sr/ac. (d) 25' x 14'. (e) N.A. (f) 66 lb/ac of N as A/S (vii) As per treatments. (viii) One thinning and one weeding. (ix) 20-22°. (x) 6.11.1952, 25.11.1952, 17.12.1952 and 5.1.1953.

2. TREATMENTS:
Main-plot treatments:
5 dates of sowing: \( D_1 = 15.4.1952 \), \( D_2 = 1.5.1952 \), \( D_3 = 15.5.1952 \), \( D_4 = 1.6.1952 \) and \( D_5 = 15.6.1952 \).
Sub-plot treatments:
2 varieties: \( V_1 = F-216 \) (early) and \( V_2 = L.S.S \) (late).

3. DESIGN:
(i) Split-plot. (ii) (a) 5 main-plots/block; 2 sub-plots/main-plot. (iii) 4. (iv) Sub-plot (a) 90' x 15'. (b) 83' 9'' x 10'. (v) N.A. (vi) Yes.
4. GENERAL:
(i) Poor to Fair. No lodging. (ii) Jassid attack, BHC dusted as a control measure. (iii) Kupas yield.
(iv) (a) No. (b)—. (c)—. (v) (a) Cotton Res. Stn., Faridkot. (b) Nil. (vi) Crop damaged due to heavy rains.
(vii) Nil.

5. RESULTS:
(i) 1445 lb./ac.
(ii) (a) 129.8 lb./ac.
(b) 96.3 lb./ac.
(iii) Main-plot and sub-plot treatment effects are highly significant while interaction is not significant.
(iv) Av. yield of kupas in lb./ac.

<table>
<thead>
<tr>
<th></th>
<th>D1</th>
<th>D2</th>
<th>D3</th>
<th>D4</th>
<th>D5</th>
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<td>1436</td>
<td>1432</td>
<td>1364</td>
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<td>1368</td>
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<tr>
<td>V2</td>
<td>1576</td>
<td>1643</td>
<td>1675</td>
<td>1438</td>
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<td>1534</td>
<td>1539</td>
<td>1554</td>
<td>1431</td>
<td>1167</td>
<td>1445</td>
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</tbody>
</table>

S.E. of difference of two
1. D marginal means = 64.9 lb./ac.
2. V marginal means = 30.4 lb./ac.
3. V means at the same level of D = 68.1 lb./ac.
4. D means at the same level of V = 80.8 lb./ac.

Crop :- Cotton.
Site :- Cotton Res. Stn., Abohar.
Ref :- Pb. 52(163).
Type :- ‘CM’.

Object :- To study the effect of direct application of N and P2O5 to Cotton, with special reference to sowing date and spacing.

1. BASAL CONDITIONS:
(i) (a) Wheat Cotton. (b) Wheat. (c) Nil. (ii) (a) Sandy loam. (b) N.A. (iii) As per treatments. (iv)
(a) to (e) N.A. (v) Nil. (vi) F-320 (medium). (vii) Irrigated. (viii) One gap filling, one hoeing and one thinning. (ix) 5.45°. (x) 5.11.1952 to 22.12.1952 (4 pickings).

2. TREATMENTS:
Main-plot treatments:
All combinations of (1) and (2)
(1) 2 dates of sowing : D1 = 21.5.1952 and D2 = 12.6.1952.
(2) 2 spacings : S1 = 2.5'x1' and S2 = 2.5'x1.5'.
Sub-plot treatments:
3 levels of N : N0 = 0, N1 = 50 and N2 = 100 lb./ac.
Sub-sub-plot treatments:
2 levels of P2O5 : P0 = 0 and P1 = 50 lb./ac.
N applied as A/S and P2O5 as Super.

3. DESIGN:
(i) Split-plot. (ii) (a) 4 main-plots/block ; 3 sub-plots/main-plot and 2 sub-sub-plots/sub-plot (b) N.A.
(iii) 4. (iv) (a) 60'x15'. (b) 51'x10'. (v) N.A. (vi) Yes.

4. GENERAL:
(i) Satisfactory. No lodging. (ii) Nil. (iii) Height, initiation of buds, boll weight and kuperas yield.
(iv) (a) 1952—contd. with modification. (b) No. (c)—. (v) (a) Jullundur and Hansi. (b)—. (vi)
and (vii) Nil.
5. RESULTS:

(i) 1861 lb/acre.
(ii) (a) 361.1 lb/acre.
(b) 423.5 lb/acre.
(c) 223.0 lb/acre.

(iii) Main-effect of N is highly significant. Main effects of D and S and interaction D×P are significant. Others are not significant.

(iv) Av. yield of kapas in lb/acre.

<table>
<thead>
<tr>
<th>N1</th>
<th>N2</th>
<th>Mean</th>
<th>P9</th>
<th>P1</th>
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<th>S2</th>
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<td>1905</td>
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<td>1779</td>
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<td>1703</td>
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<td>1914</td>
<td>2140</td>
<td>1861</td>
<td>1857</td>
<td>1865</td>
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<td>S1</td>
<td>1577</td>
<td>1958</td>
<td>2367</td>
<td>1966</td>
<td>1962</td>
<td>1971</td>
</tr>
<tr>
<td>S2</td>
<td>1482</td>
<td>1874</td>
<td>1912</td>
<td>1756</td>
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<td>2159</td>
<td>1865</td>
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S.E. of difference of two
1. D or S marginal means = 73.7 lb/acre.
2. N marginal means = 105.9 lb/acre.
3. P marginal means = 45.5 lb/acre.
4. N means at the same level of D or S = 149.7 lb/acre.
5. D or S means at the same levels of N = 142.7 lb/acre.
6. P means at the same levels of D or S = 64.4 lb/acre.
7. D or S means at the same level of P = 86.6 lb/acre.
8. P means at the same level of N = 78.8 lb/acre.
9. N means at the same level of P = 119.6 lb/acre.
10. means in the body of D×S table = 104.2 lb/acre.

Crop :- Cotton.
Site :- Cotton Res. Stn., Abohar.

Object :- To study the effect of N on Cotton with special reference to sowing dates and spacing.

1. BASAL CONDITIONS:

(i) (a) No. (b) Wheat. (c) Nil. (ii) (a) Sandy loam. (b) N.A. (iii) As per treatments. (iv) (a) to (e) N.A. (v) N.A. (vi) P-320. (vii) Irrigated. (viii) 1 gap filling and 1 weeding. (ix) 7.87". (x) 5.10". 1952 and early Nov. 1952.

2. TREATMENTS:

Main-plot treatments:
All combination of (1) and (2)
(1) 3 dates of sowing : D1 = 1.5.1953, D2 = 13.5.1953 and D3 = 2.6.1953.
(2) 3 spacings : S1 = 2'x1', S2 = 2'x1.5'' and S3 = 2'x2'.

Sub-plot treatments:
3 levels of N : N0 = 0; N1 = 50 and N2 = 100 lb/acre.
N as A/S applied near flowering-time by spreading round the plant.

3. DESIGN:

(i) Split-plot. (ii) (a) 9 Main-plots/block; 3 sub-plots/main-plot. (b) N.A. (iii) 4. (iv) (a) Main : 45'x56', Sub : 15'x56'. (b) Main : N.A., Sub : 10'x48'. (v) N.A. (vi) Yes.
4. GENERAL:

(i) Fair. No lodging. (ii) Nil. (iii) Initiation of buds, boll weight and kapas yield. (iv) (a) 1952—contd. with modification. (b) and (c) No. (v) (a) Jullundur and Hansi. (b) N.A. (vi) and (vii) Nil.

5. RESULTS:

(i) 657.7 lb/ac.
(ii) (a) 151.98 lb/ac.
(b) 120.63 lb/ac.
(iii) Main effects of D and N are highly significant while others are not significant.
(iv) Av. yield of kapas in lb/ac.

<table>
<thead>
<tr>
<th></th>
<th>N0</th>
<th>N1</th>
<th>N2</th>
<th>Mean</th>
<th>S1</th>
<th>S2</th>
<th>S3</th>
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<tbody>
<tr>
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<td>759.1</td>
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<tr>
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<td>465.7</td>
<td>609.2</td>
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<tr>
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<td>616.5</td>
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<tr>
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<td>684.2</td>
<td>628.6</td>
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S.E. of difference of two
1. D or S marginal means
2. N marginal means
3. N means at the same level of D or S
4. D or S means at the same level of N
5. means in body of D x S table

---

Crop: Cotton.  
Site: Cotton Res. Stn., M.A. Farm, Faridkot.  
Type: 'CM'.

Object: To study the effect of N on Cotton with reference to sowing time and spacing.

1. BASAL CONDITIONS:

(i) (a) Nil. (b) Wheat. (c) Nil. (ii) (a) Loam. (b) Refer soil analysis, Faridkot. (iii) As per treatments. (iv) (a) hindustan plough, 3 desi plough and 1 planking. (b) N.A. (c) 8-10 sr/ac. (d) As per treatments. (e) N.A. (f) Nil. (vi) F-320 (early). (vii) Irrigated. (viii) 2 hoeings, 2 weedings and 1 thinning. (ix) 21.75°. (x) 13.11.1953 to 30.12.1953.

2. TREATMENTS:

Main-plot treatments:
3 dates of sowing: D1=20.4.1953, D2=10.5.1953 and D3=1.6.1953.

Sub-plot treatments:
3 levels of N as A/S: N0=0, N1=50 and N2=100 lb/ac.

Sub-sub-plot treatments:
2 spacings: S1=2'x1.25' and S2=2.5'x1.5'.

3. DESIGN:

(i) Split-plot. (ii) (a) 3 main-plots/block; 3 sub-plots/main-plot and 2 sub-sub-plots/sub-plot (b) N.A. (iii) 4 (iv) (a) Main: 99'x60' sub: 99'x20' sub-sub: 99'x10'. (b) Main: 90'-9'x60' sub: 90'-9'x20' sub-sub: 90'-9'x10'. (v) Approximately 4' on each side of the breadth of each plot. (vi) Yes.

4. GENERAL:

(i) Good. No lodging. (ii) Nil. (ii) No. of bolls, plant height and kapas yield. (iv) (a) Not contd. (b) and (c) No. (v) (a) Cotton Res. Stn., B.A. Farm, Rauni. (b) No. (vi) and (vii) Nil.
5. RESULTS:

(i) 1527 lb./ac.
(ii) (a) 252.9 lb./ac.
(b) 172.4 lb./ac.
(c) 204.8 lb./ac.
(iii) Main effect of S alone is significant.
(iv) Av. yield of kapas in lb./ac.

<table>
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<th>N₂</th>
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S.E. of difference of two
1. D marginal means = 73.0 lb./ac.
2. N marginal means = 49.8 lb./ac.
3. S marginal means = 48.2 lb./ac.
4. N means at the same level of D = 86.2 lb./ac.
5. D means at the same level of N = 101.4 lb./ac.
6. S means at the same level of D = 83.6 lb./ac.
7. D means at the same level of S = 94.0 lb./ac.
8. S means at the same level of N = 83.6 lb./ac.
9. N means at the same level of S = 77.3 lb./ac.

Object:-- To study the effect of application of N and P₂O₅ to Cotton crop with special reference to different dates of sowing and spacing.

1. BASAL CONDITIONS:
   (i) (a) Wheat-Cotton-Wheat. (b) Wheat. (c) Nil. (ii) (a) Clay loam. (b) N.A. (iii) 30.4.1952 and 15.5.1952. (iv) 4 desi plough. (b) Dibbling. (c) 10 to 15 dr./ac. (d) and (e) N.A. (v) Nil. (vi) F-216. (vii) Irrigated. (viii) 2 thinnings, 3 hoeings and 1 weeding. (ix) 12.37°. (x) N.A.

2. TREATMENTS:
   Main-plot treatments:
   All combinations of (1) and (2)
   (1) 2 dates of sowing: D₁=End of April and D₂=Middle of May.
   (2) 2 spacings: S₁=2'×2' and S₂=2'×1.5'.
   Sub-plot treatments:
   3 levels of N: N₀=0, N₁=50 and N₂=100 lb./ac.
   N applied as A/S and P₂O₅ as Super.
   Sub-sub-plot treatments:
   2 levels of P₂O₅: P₀=0 and P₁=50 lb./ac.
   3. DESIGN:
   (i) Split-plot. (ii) (a) 4 main-plots/block; 3 sub-plots/main-plot and 2 sub-sub-plots/sub-plot. (b) 55'×98'. (iii) 4. (iv) (a) 75'×14'. (b) 66'×10'. (v) 2 row and 3 plants left out as border. (vi) Yes.

Crop :- Cotton.
Site :- Cotton Res. Stn., Hansi.
Ref :- Pb. 52(3).
Type :- 'CM'.
4. GENERAL:
(i) Normal. No lodging. (ii) N.A. (iii) Height, distributions of bolls, dry weight of plant, no. of seeds/boll and kapas yield. (iv) (a) 1952—contd. (b) No. (c) Nil. (v) (a) Jullundur and Abohar. (b) Nil. (vi) and (vii) Nil.

5. RESULTS:
(i) 909 lb./ac.
(ii) (a) 343.60 lb./ac.
(b) 154.12 lb./ac.
(c) 72.82 lb./ac.
(iii) Main effect of N is highly significant. Others are not significant.
(iv) Av. yield of kapas in lb./ac.

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</table>

S.E. of difference of two
1. D or S marginal means = 70.13 lb./ac.
2. N marginal means = 38.54 lb./ac.
3. P marginal means = 14.86 lb./ac.
4. N means at the same level of D or S = 54.49 lb./ac.
5. D or S means at the same level of N = 83.06 lb./ac.
6. P means at the same level of D or S = 21.02 lb./ac.
7. D or S means at the same level of P = 71.70 lb./ac.
8. P means at the same level of N = 25.74 lb./ac.
9. N means at the same level of P = 42.62 lb./ac.
10. means in body of table D x S = 99.21 lb./ac.

Crop: Cotton.
Site: Cotton Res. Stn., Hansi.
Object: To study the effect of N on Cotton with special reference to sowing dates and spacing.

Ref: Pb. 53 (2).
Type: ‘CM’.

1. BASAL CONDITIONS:
(i) (a) Wheat-Cotton. (b) Wheat. (c) Nil. (ii) (a) Light loam. (b) N.A. (iii) As per treatments. (iv)
(a) 4 desi plough and 4 sohaga. (b) dibbling. (c) 12 sr./ac. (d) As per treatments. (e) N.A. (vi) F-216.
(vii) Irrigated. (viii) 2 weedings and 2 hoeings. (ix) 4.56*. (x) 10.11.1953 to 18.12.1953.

2. TREATMENTS:
Main-plot treatments:
All combinations of (1) and (2)
(1) 3 dates of sowing: D1 = 20.4.1953, D2 = 10.5.1953 and D3 = 30.5.1953.
(2) 3 spacings: S1 = 2' x 1', S2 = 2' x 1.5' and S3 = 2' x 2'.
Sub-plot treatments:
3 levels of N: N0 = 0, N1 = 50 and N2 = 100 lb./ac.
3. DESIGN:
(i) Split-plot. (ii) (a) 9 main-plots/block; 3 sub-plots/main-plot. (b) N.A. (iii) 4. (iv) (a) N.A. (b) 16'x44" (v) 1 row left cut on each side of the plot. (vi) Yes.

4. GENERAL:
(i) Good. No lodging. (ii) Nil. (iii) Plant height and kapas yield. (iv) (a) 1953—contd. (b) No. (c) Nil. (v) (a) Jullundur and Abohar. (b) Nil. (vi) and (vii) Nil.

5. RESULTS:
(i) 942 lb./ac.
(ii) (a) 49'4.5 lb./ac.
(b) 16'6.9 lb./ac.
(iii) Sub-plot treatment effect is highly significant. Others are not significant
(iv) Av. yield of kapas in lb./ac.

<table>
<thead>
<tr>
<th></th>
<th>S1</th>
<th>S2</th>
<th>S3</th>
<th>Mean</th>
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<td>859</td>
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<td>719</td>
<td>922</td>
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</tbody>
</table>

S.E. of difference of two
1. D or S marginal means =116.5 lb./ac.
2. N marginal means = 39.7 lb./ac.
3. N means at the same level of D or S = 68.9 lb./ac.
4. D or S means at the same level of N = 129.4 lb./ac.
5. means in body of D×S table =201.9 lb./ac.

Crop: Cotton.
Site: Govt. Agri. Stn., Hansi.
Object: To study the effect of spacing and manuring on yield of Cotton.

Ref: Pb. 48(50).
Type: ‘C M’.

1. BASAL CONDITIONS:
(i) (a) Nil. (b) Berseem. (c) Nil. (ii) (a) loam. (b) N.A. (iii) 25-4-1948. (iv) (a) to (c) N.A. (d) As per treatments. (e) N.A. (f) Nil. (v) M 60 A2 (medium). (vi) Irrigated. (vii) One gap filling and 2 hoeings. (ix) 17.46". (x) 6 pickings from 17-9.1948 to 10.11.1948.

2. TREATMENTS:
All combinations of (1) and (2).
(1) 2 spacings: S1=1' and S2=2'.
(2) 3 levels of N: N0=0, N1=50, and N2=100 lb./ac.

3. DESIGN:
(i) 2×3 Fact. in R.B.D. (ii) (a), 6. (b) N.A. (iii) 4. (iv) (a) 14'×79'. (b) 12'×72.6'. (v) N.A. (vi) Yes.
4. GENERAL:
(i) Good. No lodging. (ii) Nil. (iii) Kapas yield. (iv) (a) No. (b) No. (c) — . (v) (a) No. (b) — . (vi) and (vii) Nil.

5. RESULTS:
(i) 1277 lb./ac.
(ii) 134.1 lb./ac.
(iii) Treatment differences are not significant.
(iv) Av. yield of kapas in lb./ac.

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<th>N₁</th>
<th>N₂</th>
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</thead>
<tbody>
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<td>S.E. of marginal mean of S</td>
<td>38.7 lb./ac.</td>
<td></td>
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<td></td>
</tr>
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<td>S.E. of marginal mean of N</td>
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<td>S.E. of body of table</td>
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</table>

Crop: - Cotton.
Site: - Govt. Agri. Stn., Hansi.

Ref: - Pb. 48(51).
Type: - 'CM'.

Object: - To study effect of date of sowing, spacing and manure on yield of Cotton.

1. BASAL CONDITIONS:
(i) (a) Nil. (b) Fallow. (c) Nil. (ii) (a) Loamy. (b) N.A. (iii) As per treatments. (iv) (a) to (e) N.A. (d) As per treatments. (e) N.A. (v) Nil. (vi) F-216 (medium). (vii) Irrigated. (viii) N.A. (ix) 17.46°. (x) 28.9.1948 to 22.11.1948.

2. TREATMENTS:
Main-plot treatments:
Sub-plot treatments:
3 spacings : S₁ = 1.5', S₂ = 2' and S₃ = 2.5'.
Sub-sub-plot treatments:
2 levels of N as A/S: N₀ = 0 and N₁ = 50 lb./ac.

3. DESIGN:
(i) Split-plot. (ii) (a) 3 main-plots/block ; 3 sub-plots/main-plot ; 2 sub-sub-plots/sub-plot. (b) N.A. (iii) 4. (iv) (a) N.A. (b) 1/121 ac. (v) N.A. (vi) Yes.

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

5. RESULTS:
(i) 1019 lb./ac.
(ii) (a) 722.6 lb./ac. (b) 181.6 lb./ac. (c) 250.5 lb./ac.
(iii) Main effect of N is highly significant. Main effect of D is significant. Others are not significant,
(iv) Av. yield of kapas in lb./ac.

<table>
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<tr>
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<th>$S_1$</th>
<th>$S_2$</th>
<th>$S_3$</th>
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<td>896</td>
<td>817</td>
<td>975</td>
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<td>671</td>
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<td>564</td>
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<tr>
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<td>1056</td>
<td>1031</td>
<td>1019</td>
<td>922</td>
<td>1117</td>
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</tbody>
</table>

S.E. of difference of two
1. D marginal means = 208.6 lb./ac.
2. S marginal means = 52.5 lb./ac.
3. N marginal means = 59.0 lb./ac.
4. S means at the same level of D = 90.8 lb./ac.
5. D means at the same level of S = 221.4 lb./ac.
6. N means at the same level of D = 102.3 lb./ac.
7. D means at the same level of N = 220.8 lb./ac.
8. N means at the same level of S = 89.3 lb./ac.
9. S means at the same level of N = 102.3 lb./ac.

**Crop:** Cotton

**Site:** Govt. Agri. Sta., Hansi.

**Type:** 'CM'.

Object:—To study the effect of spacing and manuring on yield of Cotton.

1. **BASAL CONDITIONS:**
   - (i) (a) Nil. (b) N.A. (c) N.A. (ii) (a) Loamy. (b) N.A. (iii) 6.4.1949. (iv) (a) to (c) N.A. (d) As per treatments. (e) N.A. (v) N.A. (vi) F-216 (medium). (vii) Irrigated. (viii) 1 gap filling and 3 hoeings. (ix) 26.99". (x) 6/11.1949 to 27/11.1949 (4 pickings).

2. **TREATMENTS:**
   
   All combinations of (1) and (2)
   
   (1) 2 spacings : $S_1=1.5'$ and $S_2=2'$. 
   (2) 3 levels of N as A/S : $N_0=0$, $N_1=50$ and $N_2=100$ lb./ac.

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

4. **GENERAL:**
   
   (i) Fair to normal. No lodging. (ii) Nil. (iii) Kapas yield. (iv) (a) 1949 to 1952. (b) No. (c) Nil. (v) (a) No. (b) Yes. (vi) and (vii) Nil.

5. **RESULTS:**
   
   (i) 1334 lb./ac.
   (ii) 116.4 lb./ac.
   (iii) Main effect of N is highly significant. Others are not significant.
   (iv) Av. yield of kapas in lb./ac.

<table>
<thead>
<tr>
<th></th>
<th>$N_0$</th>
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<th>$N_2$</th>
<th>Mean</th>
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<tr>
<td>Mean</td>
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<td>1393</td>
<td>1425</td>
<td>1334</td>
</tr>
</tbody>
</table>

S.E. of marginal mean of S = 33.6 lb./ac.
S.E. of marginal mean of N = 41.1 lb./ac.
S.E. of body of table = 58.2 lb./ac.
Crop :- Cotton.
Site :- Govt. Agri. Stn., Hansi.

Object :- To study the effect of spacing and manuring on yield of Cotton.

1. BASAL CONDITIONS:
(i) (a) Nil. (b) Fallow. (c) Nil. (ii) (a) Loam. (b) N.A. (iii) 15.4.1950. (iv) (a) 7 desi plough, 2 horse hoe and 6 sohaga. (b) N.A. (c) 15 to 20 sr./ac. (d) N.A. (e) N.A. (v) Nil. (vi) F-216 (medium). (vii) Irrigated. (viii) 2 hoeings. (ix) 15.25°. (x) 12.79.1950 to 6.11.1950.

2. TREATMENTS:
All combination of (1) and (2)
(1) 2 spacings : S1=1.5' and S2=2'.
(2) 3 levels of N : N0=0, N1=50 and N2=100 lb./ac.
N applied as A/S and Ammon. Phos. in 3 : 2 ratio.

3. DESIGN:
(i) 2 x 3 Fact. in R.B D. (ii) (a) 6. (b) N.A. (iii) 4. (iv) (a) 12'x74'. (b) 1/80 ac. (v) N.A. (vi) Yes.

4. GENERAL:
(i) Good. No lodging. (ii) Nil. (iii) Kapas yield. (iv) (a) 1949 to 1952. (b) No. (c) Nil. (v) (a) No. (b) —. (vi) and (vii) Nil.

5. RESULTS:
(i) 1260 lb./ac.
(ii) 160.9 lb./ac.
(iii) Main effect of N is highly significant. Main effect of S is significant. Interaction NS is not significant.
(iv) Av. yield of kapas in lb./ac.

<table>
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<th>N0</th>
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<th>N2</th>
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</tr>
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<tr>
<td>S2</td>
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<td>1268</td>
<td>1507</td>
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</table>

Mean 854 1327 1600 1260

S.E. of marginal mean of N =11.3 lb./ac.
S.E. of marginal mean of S =33.8 lb./ac.
S.E. of body of table =58.5 lb./ac.

Crop :- Cotton.
Site :- Govt. Agri. Stn., Karnal.

Object :- To study the effect of spacing and manuring on yield of Cotton.

Ref :- Ph. 51(25).
Type :- 'CM'.
3. DESIGN
   (i) 2 x 3 Fact. in R.B.D.  (ii) (a) 6.  (b) N.A.  (iii) 4.  (iv) (a) and (b) 12’ x 70’.  (v) Nil.  (vi) Yéi.

4. GENERAL
   (i) Normal.  No lodging.  (ii) Nil.  (iii) Kapas yield.  (iv) (a) 1949—1952.  (b) No.  (c) Nil.  (v) (a) No.  (b)—.  (vi) and (vii) Nil.

5. RESULTS:
   (i) 1634 lb./ac.
   (ii) 207.3 lb./ac.
   (iii) Main effect of N is highly significant.  Main effect of S is significant while interaction NS is not significant.
   (iv) Av. yield of kapas in lb./ac.

<table>
<thead>
<tr>
<th>N_0</th>
<th>N_1</th>
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<tr>
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<td>1321 1530 2052 1634</td>
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</tbody>
</table>

S.E. of marginal mean of N = 73.3 lb./ac.
S.E. of marginal mean of S = 59.8 lb./ac.
S.E. of body of table = 103.7 lb./ac.

Crop: Cotton.
Site: Govt. Agri. Stn., Hansi.

Ref: Pb. 52(101).
Type: 'CM'.

Object: To study the effect of spacing and manuring on yield of Cotton.

1. BASAL CONDITIONS:
   (i) (a) Nil.  (b) Wheat.  (c) 50 lb./ac. of N as A/S in January, 1952.  (ii) (a) Loam.  (b) N.A.  (iii) 8.4.1952.  (iv) (a) 2 desl plough, 3 sohaga and 2 roller.  (b) N.A.  (c) 12 sr./ac.  (d) As per treatments.  (e) N.A.  (v) Nil.  (vi) F-216 (medium).  (vii) Irrigated.  (viii) 2 gap fillings; 4 hoeings and one thinning.  (ix) 14.66”.  (x) 29.9.1952 to 20.11.1952.

2. TREATMENTS:
   All combinations of (1) and (2)
   (1) 2 spacings: S_2 = 1.5’ and S_3 = 2’.
   (2) 3 levels of N as mixture of A/S and Ammo. Phos.: N_0 = 0, N_1 = 50 and N_2 = 100 lb./ac.

3. DESIGN:
   (i) 2 x 3 Fact. in R.B.D.  (ii) (a) 6.  (b) N.A.  (iii) 4.  (iv) (a) 12’ x 78.5’.  (b) 12’ x 66’.  (v) N.A.  (vi) Yes.

4. GENERAL:
   (i) Normal.  No lodging.  (ii) Nil.  (iii) Kapas yield.  (iv) (a) 1949—1951.  (b) No.  (c) Nil.  (v) (a) No.  (b)—.  (vi) and (vii) Nil.

5. RESULTS:
   (i) 2013 lb./ac.
   (ii) 167.4 lb./ac.
   (iii) None of the effects is significant.
   (iv) Av. yield of kapas in lb./ac.

<table>
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<tr>
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<th>N_2</th>
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S.E. of marginal mean of N = 59.2 lb./ac.
S.E. of marginal mean of S = 48.3 lb./ac.
S.E. of body of table = 83.7 lb./ac.
Obiect:—To study the effect of application of N and \(\text{P}_2\text{O}_5\) to Cotton crop.

1. BASAL CONDITIONS:
   (i) (a) and (b) As per treatments. (c) Nil. (ii) (a) Light loam. (b) N.A. (iii) 24.4.1953. (iv) (a) 4 ploughings with desi plough. (b) Dibbling. (c) 12 sr./ac. (d) and (e) N.A. (v) No. (vi) F-216. (vii) Irrigated. (viii) 2 weedings and 2 hoeings. (ix) 4.56". (x) 2.12.1953 to 1.1.1954.

2. TREATMENTS:
   Main-plot treatments:
   Sub-plot treatments:
   2 levels of \(\text{P}_2\text{O}_5\): \(P_0=0\) and \(P_1=25\) lb./ac.
   Sub-sub-plot treatments:
   3 levels of N: \(N_0=0, N_1=25\) and \(N_2=50\) lb./ac.
   N applied as A/S. \(\text{P}_2\text{O}_5\) as Super applied 5" deep with pore behind the plough.

3. DESIGN:
   (i) Split-plot. (ii) (a) 5 main-plots/block; 2 sub-plots/main-plot and 3 sub-sub-plots/sub-plot. (b) N.A. (iii) 4. (iv) (a) N.A. (b) 8' x 46'. (v) N.A. (vi) Yes.

4. GENERAL:
   (i) Stand of crop good. No lodging. (ii) Nil. (iii) Kapas yield. (iv) (a) 1952—contd. with modifications. (b) and (c) No. (v) (a) Jullundur and Abohar. (b) Nil. (vi) and (vii) Nil.

5. RESULTS:
   (i) 1850 lb./ac.
   (ii) (a) 900.7 lb./ac. (b) 491.6 lb./ac. (c) 589.3 lb./ac.
   (iii) None of the effects is significant. (iv) Av. yield of kapas in lb./ac.

<table>
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<tr>
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<th>(N_0)</th>
<th>(N_1)</th>
<th>(N_2)</th>
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S.E. of difference of two
1. R marginal means = 260.0 lb./ac.
2. P marginal means = 89.6 lb./ac.
3. N marginal means = 131.8 lb./ac.
4. P means at the same level of R = 200.7 lb./ac.
5. R means at the same level of P = 232.2 lb./ac.
6. N means at the same level of R = 294.7 lb./ac.
7. R means at the same level of N = 302.8 lb./ac.
8. N means at the same level of P = 186.4 lb./ac.
9. P means at the same level of N = 164.9 lb./ac.
Crop: Cotton.  
Site: Cotton Res. Stn., B.A. Farm, Rauni.  
Object: To study the effect of N along with spacings and dates of sowing.

1. BASAL CONDITIONS:
   (i) (a) Nil.  (b) Berseem.  (c) Nil.  (ii) (a) Heavy loam.  (b) N.A.  (iii) As per treatments.  (iv) (a) 6 ploughings and 5 sahaga levellings.  (b) N.A.  (c) 8 to 10 sr/ac.  (d) As per treatments.  (e) N.A.  (v) Nil.  (vi) F-320 (early).  (vii) Irrigated.  (viii) N.A.  (ix) 22.73°.  (x) 30, 31, 10.1953 and 4.12.1953.

2. TREATMENTS:
   Main-plot treatments:
   3 dates of sowing: D1 = 20.4.1953, D2 = 10.5.1953 and D3 = 1.6.1953.

   Sub-plot treatments:
   All combinations of (1) and (2)
   (1) 3 levels of N as A/S: N0 = 0, N1 = 50 and N2 = 100 lb/ac.
   (2) 2 spacings: S1 = 2' x 1.25' and S2 = 2.5' x 1.5'.

3. DESIGN:
   (i) Split-plot.  (ii) (a) 3 main-plots/block; 6 sub-plots/main-plot.  (b) N.A.  (iii) 4.  (iv) (a) 1/33 ac.  (b) 1/56 ac.  (v) N.A.  (vi) Yes.

4. GENERAL:
   (i) Good.  No lodging.  (ii) Nil.  (iii) Stick weight and kapas yield.  (iv) (a) 1953-54.  (b) and (c) No (v) (a) Cotton Res. Stn., M.A. Farm, Faridkot.  (b) No.  (vi) and (vii) Nil.

5. RESULTS:
   (i) 1163 lb/ac.
   (ii) (a) 258.2 lb/ac.
   (b) 160.6 lb/ac.
   (iii) Main-plot and sub-plot treatment effects are highly significant while interaction is not significant.
   (iv) Av. yield of kapas in lb/ac.

<table>
<thead>
<tr>
<th></th>
<th>N0</th>
<th>N1</th>
<th>N2</th>
<th>Mean</th>
<th>S1</th>
<th>S2</th>
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<tr>
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<td>1489</td>
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<td>1339</td>
<td>1471</td>
<td>1315</td>
<td>1355</td>
<td>1276</td>
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<tr>
<td>D3</td>
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<td>777</td>
<td>810</td>
<td>761</td>
<td>818</td>
<td>703</td>
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<tr>
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<td>1214</td>
<td>1257</td>
<td>1163</td>
<td>1203</td>
<td>1124</td>
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<td>S1</td>
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<td>1264</td>
<td>1283</td>
<td>1203</td>
<td></td>
<td></td>
</tr>
<tr>
<td>S2</td>
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<td>1165</td>
<td>1231</td>
<td>1124</td>
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<td></td>
</tr>
</tbody>
</table>

S.E. of difference of two
1. D marginal means = 74.5 lb/ac
2. N marginal means = 37.9 lb/ac
3. S marginal means = 46.4 lb/ac
4. N means at the same level of D = 80.2 lb/ac
5. D means at the same level of N = 99.3 lb/ac
6. S means at the same level of D = 65.6 lb/ac
7. D means at the same level of S = 87.8 lb/ac
8. means in body of N X S table = 65.6 lb/ac.
Crop :- Cotton. Ref :- Pb. 52(70).
Site :- Cotton Res. Stn., M.A. Farm, Faridkot. Type :- 'T'.

Object : To study whether late irrigation to L.S.S. variety can be dispensed with or not.

1. BASAL CONDITIONS:
(i) (a) Nil. (b) Fallow. (c) Nil. (ii) (a) Loam. (b) Refer soil analysis, Faridkot. (iii) 3.6.1952. (iv)
(a) to (e) N.A. (v) 8 ton/ac. of F.Y.M. before sowing 50 lb./ac. of N as A/S to replication II, IV and V on
(viii) 1 thinning, 2 hoeings and 1 weeding. (ix) 7.44". (x) 10.11.1952 to 26.12.1952.

2. TREATMENTS:
1. Irrigation upto Sept. (Control).
2. One additional irrigation in Oct.
3. Two additional irrigation, one in Oct, and one in Nov.

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

4. GENERAL:
(i) No lodging. Poor to satisfactory. (ii) Nil. (iii) Plant height and kapas yield. (iv) (a) No. (b) —. (c)
—. (v) a) No. (b) —. (vi) and (vii) Nil.

5. RESULTS:
(i) 840.3 lb./ac.
(ii) 87.30 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>860.9</td>
</tr>
<tr>
<td>2.</td>
<td>819.8</td>
</tr>
<tr>
<td>3.</td>
<td>840.3</td>
</tr>
<tr>
<td>S.E./mean</td>
<td>39.04 lb./ac.</td>
</tr>
</tbody>
</table>

Crop :- Cotton. Ref :- Pb. 52(67).
Site :- Cotton Res. Stn., M.A. Farm, Faridkot. Type :- 'IV'.

Object :—To study the effect of irrigations on different varieties of Cotton.

1. BASAL CONDITIONS:
(i) (a) Nil. (b) Fallow. (c) Nil. (ii) (a) Loam. (b) Refer soil analysis, Faridkot. (iii) 13.14.5.1952. (iv)
(a) 3 ploughings and one solage. (b) N.A. (c) 8-10 sr./ac. (d) 2.5' x 1.25'. (e) N.A. (v) 8 ton/ac. of
F.Y.M. before sowing and 40 lb./ac. of N as A/S on 2.8.1952. (vi) As per treatments. (vii) Irrigated.
(viii) 3 hoeings, 1 weeding and 2 thinnings. (ix) 7.44". (x) 21.10.1952 to 2.1.1953.

2. TREATMENTS:
Main-plot treatments:
3 levels of irrigation: I1 = 3, I2 = 4 and I3 = 5 irrigations.
Sub-plot treatments:
2 varieties : V1 = L.S.S. (late) and V2 = F-216. (early).

3. DESIGN:
(i) Split-plot. (ii) (a) 3 main-plots/block ; 2 sub-plots/main-plot. (b) N.A. (iii) 4. (iv) (a) 99' x 10'.
(b) 90'—5' x 10'. (v) Approx. 4' left as non experimental area on both sides of breadth. (vi) Yes.
4. GENERAL:
(i) Good. No lodging. (ii) Nil. (iii) Boll no., boll weight, plant height and kapas yield. (iv) (a) No. (b) —. (c) —. (v) (a) Cotton Res. Stn., B.A. Farm, Rauni (vi) and (vii) Nil.

5. RESULTS:
(i) 1194 lb./ac.
(ii) (a) 200.8 lb./ac.
(b) 127.3 lb./ac.
(iii) None of the effects is significant.
(iv) A v. yield of kapas in lb./ac.

<table>
<thead>
<tr>
<th></th>
<th>V1</th>
<th>V2</th>
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<td>878</td>
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<td>1265</td>
<td>1254</td>
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<tr>
<td>I3</td>
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<td>1348</td>
<td>1330</td>
</tr>
<tr>
<td>Mean</td>
<td>1228</td>
<td>1160</td>
<td>1194</td>
</tr>
</tbody>
</table>

S.E. of difference of two
1. I marginal means = 130.4 lb./ac.
2. V marginal means = 92.0 lb./ac.
3. V means at the same level of I = 90.0 lb./ac.
4. I means at the same level of V = 145.1 lb./ac.

Crop: Cotton.
Site: Cotton Res. Stn., B.A. Farm, Rauni.

Object: To study the effect of irrigation on different varieties of Cotton.

1. BASAL CONDITIONS:
(i) (a) Nil. (b) Wheat. (c) Nil. (ii) (q) Loam. (b) N.A. (iii) 24.5.1952. (iv) (a) and (b) N.A. (c) 8:10/hr. ac. (d) and (e) N.A. (v) 70 lb./ac. of N as A/S. (vi) As per treatments. (vii) Irrigated—(viii) 1 hoeing, 2 weedings and one thinning. (ix) 20.92°. (x) 15.11.1952 to 3.1.1953.

TREATMENTS:
Main-plot treatments:
3 levels of irrigation: I1=3, I2=4 and I3=5 irrigations.
Sub-plot treatments:
2 varieties: V1=L.S S. and V2=F-216.

3. DESIGN:
(i) Split-plot. (ii) (a) 3 main-plots/block; 3 sub-plots/main-plot. (b) N.A. (iii) 6. (iv) (a) 15'×88'. (b) 10'×80'-8'. (v) N.A. (vi) Yes.

4. GENERAL:
(i) Normal. No lodging. (ii) Nil. (iii) Kapas yield. (iv) (a) No. (b) and (c) —. (v) (a) Cotton Res. Stn., M.A. Farm, Faridkot. (b) —. (vi) Crop damaged due to heavy rains. (vii) Nil.

5. RESULTS:
(i) 1254 lb./ac.
(ii) (a) 244.5 lb./ac.
(b) 204.9 lb./ac.
(iii) Main effect of V is highly significant, interaction I×V is significant while I is not significant.
(iv) Av. yield of kapa in lb./ac.

<table>
<thead>
<tr>
<th></th>
<th>V1</th>
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</tr>
<tr>
<td>Mean</td>
<td>1362</td>
<td>1146</td>
<td>1254</td>
</tr>
</tbody>
</table>

S.E. of difference of two
1. I marginal means = 99.8 lb./ac.
2. V marginal means = 68.3 lb./ac.
3. V means at the same level of I = 118.3 lb./ac.
4. I means at the same level of V = 130.3 lb./ac.

Crop : Cotton.
Site : Cotton Res. Stn., M.A. Farm, Faridkot.
Ref : Pb. 52(69).
Type : 'IM'.

Object :—To study the effect of irrigation and manure on yield of Cotton.

1. BASAL CONDITIONS :
   (i) (a) Nil. (b) Wheat. (c) Nil. (ii) (a) Loam. (b) Refer soil analysis, Faridkot. (iii) 24.5.1952. (iv) (a) 3 ploughings and one solaga. (b) N.A. (c) 8-10 sq./ac. (d) 2.5' x 1.25'. (e) N.A. (v) Nil. (vi) F-216. (early). (vii) Irrigated. (viii) 3 hoeings. (ix) 7.41'. (a) 9.10.1952, 2.11.1952 and 26.11.1952.

2. TREATMENTS :
   All combinations of (1) and (2)
   (1) 3 levels of irrigations : I1 = 3, I2 = 4 and I3 = 5 irrigations.
   (2) 3 levels of N as A/S : N0 = 0, N1 = 40 and N2 = 80 lb./ac.
   Half dose of N applied on 28.7.1952 and the other half on 10.8.1952.

3. DESIGN :
   (i) 3 x 3 Fact. in R.B.D. (ii) (a) 9. (b) N.A. (iii) 4. (iv) (a) 99' x 10'. (b) 90'-9' x 10'. (v) Approx. 4 on both sides of breadth left as border. (vi) Yes.

4. GENERAL :
   (i) Fair. No lodging. (ii) To combat Jassid attack 20 lb. of BHC dusted on 3.8.1952. (iii) Boll no./plant, boll weight, height of plant and kapa yield. (iv) (a) 1952—continued with modification. (b) No. (c) Nil. (v) (a) No. (b) —. (vi) and (vii) Nil.

5. RESULTS :
   (i) 1282 lb./ac.
   (ii) 128.4 lb./ac.
   (iii) Main effect of I is highly significant, interaction I x N is significant while N is not significant.
   (iv) Av. yield of kapa in lb./ac.

<table>
<thead>
<tr>
<th></th>
<th>N0</th>
<th>N1</th>
<th>N2</th>
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</tr>
<tr>
<td>Mean</td>
<td>1229</td>
<td>1304</td>
<td>1313</td>
<td>1282</td>
</tr>
</tbody>
</table>

S.E. of marginal means of I or N = 37.1 lb./ac.
S.E. of body of table = 64.2 lb./ac.
Crop: Cotton.
Ref: Pb. 53(105).
Site: Cotton Res. Stn., M.A. Farm, Faridkot.
Type: 'IM'.

Object: To study the effect of irrigation and manure on yield of Cotton.

1. BASAL CONDITIONS:
   (i) (a) N.A. (b) Wheat. (c) Nil. (ii) (a) Loam. (b) Refer soil analysis, Faridkot. (iii) 28.5.1953 to 31.5.1953. (iv) (a) 1 hindustan plough, 4 desl plough and 1 sohaga. (b) and (c) N.A. (d) 2.5'×1.25'. (e) N.A. (v) Nil. (vi) F-320 (early). (vii) Irrigated. (viii) N.A. (ix) 21.75". (x) 7.11.1953 to 11.2.1954.

2. TREATMENTS:
   All combinations of (1) and (2)
   (1) 3 levels of irrigation: \( I_1=3, I_2=5 \) and \( I_3=7 \) irrigations.
   (2) 3 levels of N as A/S: \( N_0=0, N_1=40 \) and \( N_2=80 \) lb./ac.
   Half the dose of N applied from 4.7.1952 to 10.7.1953 and the other half on 13.8.1953.

3. DESIGN:
   (i) 3×3 Fac. in R.B.D. (ii) (a) 9. (b) N.A. (iii) 4. (iv) (a) 99'×15'. (b) 83-9"×10'. (v) N.A. (vi) Yes.

4. GENERAL:
   (i) Good. No lodging. (ii) Nil. (iii) Height of plant, boll weight, no. of bolls/plant and kapas yield. (iv) (a) 1952—1953, after 1953 continued with modification. (b) No. (c) Nil. (v) (a) No (b)—. (vi) and (vii) Nil.

5. RESULTS:
   (i) 1715 lb./ac.
   (ii) 130.7 lb./ac.
   (iii) Main effect of N is highly significant. Others are not significant.
   (iv) Av. yield of kapas in lb./ac.

<table>
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<tr>
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<th>( N_1 )</th>
<th>( N_2 )</th>
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<td>1714</td>
<td>1698</td>
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<td>( I_2 )</td>
<td>1590</td>
<td>1727</td>
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</tr>
<tr>
<td>( I_3 )</td>
<td>1576</td>
<td>1614</td>
<td>1931</td>
<td>1718</td>
</tr>
</tbody>
</table>

\[ \text{Mean: 1592, 1714, 1838, 1715} \]

S.E. of marginal means = 37.7 lb./ac.
S.E. of body of table = 65.4 lb./ac.

Crop: Cotton (Kharif).
Ref: 52(71). (Expt. on cultivator's field).
Site: Faridkot, Distt. Bhatinda.
Type: 'IM'.

Object: To study the effect of irrigation and manure on yield of Cotton.

1. BASAL CONDITIONS:

2. TREATMENTS:
   Main-plot treatments:
   3 levels of irrigation: \( I_1=3, I_2=4 \) and \( I_3=5 \) irrigations.
   Sub-plot treatments:
   3 levels of N: \( N_0=0, N_1=40 \) and \( N_2=80 \) lb./ac.
   N as A/S applied at flowering stage.
3. DESIGN:
   (i) and (ii) Split-plot. 3 main-plots/block; 3 sub-plots/main-plot. (iii) (a) and (b) 1/63 ac. (iv) Yes.
4. GENERAL:
   (i) Normal. (ii) Nil. (iii) Kapas yield. (iv) (a) No. (b) N.A. (v) N.A. (vi) and (vii) Nil.
5. RESULTS:
   (i) 1164 lb./ac.
   (ii) (a) 146.6 lb./ac.
   (b) 110.5 lb./ac.
   (iii) None of the effects is significant.
   (iv) Av. yield of kapas in lb./ac.

<table>
<thead>
<tr>
<th></th>
<th>N_0</th>
<th>N_1</th>
<th>N_2</th>
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<td>1142</td>
<td>1161</td>
<td>1164</td>
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</tbody>
</table>

S.E. of difference of two:
1. I marginal means = 59.8 lb./ac.
2. N marginal means = 45.1 lb./ac.
3. N means at the same level of I = 78.1 lb./ac.
4. I means at the same level of N = 87.5 lb./ac.

---

Crop: Cotton. Ref: Pb. 53 (104).
Site: Cotton Res. Stn., M.A. Farm, Faridkot. Type: 'I C'.

Object: To study the effect of irrigation and spacing on yield of Cotton.

1. BASAL CONDITIONS:
   (i) (a) Cotton-Oats-Cotton. (b) Oats. (c) Nil. (ii) (a) Loam. (b) Refer soil analysis, Fridkot.
   (iii) 23.4.1953. (iv) (a) 5 plough and 2 sokaga. (b) N.A. (c) 8-10. stir.ac. (d) As per treatments.
   (e) N.A. (v) 16 tons of F.Y.M./ac. from 4.4.1953 to 6.4.1953 by broadcast. 25 lb./ac. of N as A/S in the end of June.

2. TREATMENTS:
   Main-plot treatments:
   5 levels of irrigation: I_1=2, I_2=3, I_3=4, I_4=5 and I_5=6 irrigations.
   Sub-plot treatments:
   2 spacings: S_1=2'x1.25' and S_2=2.5'x1.5'.

3. DESIGN:
   (i) Split-plot. (ii) (a) 5 main-plots/block; 2 sub-plots/main plot (b) N.A. (iii) 4. (iv) (a) 20'x49.5'.
   (b) 20'x45'x4.5'. (v) N.A. (vi) Yes.

4. GENERAL:
   (i) Normal. No lodging. (ii) DDT sprayed on 11.9.1953 against Jassid attack. (iii) Boll weight, boll no., height of plan and kapas yield. (iv) (a) No. (b) — (c) — (v) (a) No. (b) — (vi) and (vii) Nil.
5. RESULTS:

(i) 1668 lb./ac.
(ii) (a) 165.3 lb./ac.
(b) 147.8 lb./ac.
(iii) None of the effects is significant.
(iv) Av. yield of kapas in lb./ac.

\[
\begin{array}{cccccc}
 & I_1 & I_2 & I_3 & I_4 & \text{Mean} \\
S_1 & 1549 & 1612 & 1719 & 1625 & 1697 & 1640 \\
S_2 & 1549 & 1733 & 1679 & 1765 & 1751 & 1695 \\
\text{Mean} & 1549 & 1673 & 1699 & 1695 & 1724 & 1668 \\
\end{array}
\]

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

\[
\begin{align*}
\text{S.E.} &= 82.6 \text{ lb./ac.} \\
\text{S.E.} &= 46.7 \text{ lb./ac.} \\
\text{S.E.} &= 104.5 \text{ lb./ac.} \\
\text{S.E.} &= 110.8 \text{ lb./ac.}
\end{align*}
\]

Crop : Cotton.
Site : Cotton Res. Stn., Abohar.

Object : To study the effect of graded doses of N, with special reference to irrigation and spacing, on Cotton crop.

1. BASAL CONDITIONS:
(i) (a) Wheat-Cotton. (b) Wheat. (c) Nil. (ii) (a) Sandy loam. (b) N.A. (iii) 22.5.1952. (iv) (a) to (e) N.A. (v) Nil. (vi) P-320. (vii) Irrigated. (viii) 2 gap fillings, 4 hoeings and 2 thinning. (ix) 5.45°. 
(x) 31.10.1952 to 18.12.1952.

2. TREATMENTS:
Main-plot treatments:
All combinations of (1) and (2).
(1) 2 levels of irrigation: I_1 = Light and I_2 = Heavy irrigation.
(2) 2 spacings: S_1 = 2.5' x 1.25' and S_2 = 2.5' x 2'.
Sub-plot treatments:
6 levels of N: N_0 = 0, N_1 = 25, N_2 = 50, N_3 = 75, N_4 = 100 and N_5 = 125 lb./ac.
N applied in two equal doses, first before sowing and the second immediately after the outset of flowering.

3. DESIGN:
(i) Split-plot. (ii) (a) 4 main-plots/block; 6 sub-plots/main-plot. (b) N.A. (iii) 4. (iv) (a) main-plot: 60' x 95', sub-plot: 60' x 15'. (b) main-plot: N.A., sub-plot: 50' x 10'. (v) N.A. (vi) Yes

4. GENERAL:
(i) Normal. No lodging. (ii) Nil. (iii) Height, initiation of buds, boll weight and kapas yield. (iv) (a) Not contd. (b) No. (c) -. (v) (a) Jullundur and Hansi. (b) N.A. (vi) and (vii) Nil.

5. RESULTS:
(i) 2332 lb./ac.
(ii) (a) 620.8 lb./ac.
(b) 260.2 lb./ac.
(iii) Main effect of N and interaction I x S x N are highly significant, interaction S x N is significant while others are not significant.
Av. yield of kapan in lb./ac.

<table>
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<th>N2</th>
<th>N3</th>
<th>N4</th>
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<td>2373</td>
<td>2354</td>
<td>2442</td>
<td>2339</td>
<td>2479</td>
<td>2199</td>
</tr>
<tr>
<td>I2</td>
<td>2065</td>
<td>2123</td>
<td>2356</td>
<td>2312</td>
<td>2481</td>
<td>2610</td>
<td>2325</td>
<td>2290</td>
<td>2359</td>
</tr>
<tr>
<td>Mean</td>
<td>2098</td>
<td>2245</td>
<td>2263</td>
<td>2343</td>
<td>2417</td>
<td>2526</td>
<td>2332</td>
<td>2385</td>
<td>2279</td>
</tr>
<tr>
<td>S1</td>
<td>2314</td>
<td>2109</td>
<td>2355</td>
<td>2490</td>
<td>2365</td>
<td>2474</td>
<td>2385</td>
<td></td>
<td></td>
</tr>
<tr>
<td>S2</td>
<td>1882</td>
<td>2180</td>
<td>2370</td>
<td>2195</td>
<td>2470</td>
<td>2578</td>
<td>2279</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

S.E. of difference of two
1. I or S marginal means = 126.7 lb./ac.
2. N marginal means = 92.1 lb./ac.
3. N means at the same level of I or S = 130.1 lb./ac.
4. I or S means at the same level of N = 173.7 lb./ac.
5. means in body of I×S table = 179.2 lb./ac.

Crop: Cotton. Ref: Pb. 52(4).
Site: Cotton Res. Stn., Hansi. Type: 'CIM'.

Object: To study the effect of graded doses of N with special reference to irrigation and spacing.

1. BASAL CONDITIONS:
   (i) (a) Wheat-Cotton-Wheat. (b) Wheat. (c) Nil. (ii) (a) Clay loam. (b) N.A. (iii) 4.5.1952. (iv) (a) 4 ploughings with desi plough. (b) Dibbling by hand. (c) 10 sr./ac. (d) and (e) N.A. (v) Nil. (vi) F-216 (early). (vii) Irrigated. (viii) 1 weeding, 1 hoeing and one thinning. (ix) 12.37°. (x) N.A.

2. TREATMENTS:
   Main-plot treatments:
   All combinations of (1) and (2)
   (1) 2 levels of irrigation: I1=Light and I2=Heavy irrigation.
   (2) 2 spacings: S1=2'×1.5' and S2=2'×2'.
   Sub-plot treatments:
   6 levels of N as A/S: N0=0, N1=25, N2=50, N3=75, N4=100 and N5=125 lb./ac.

3. DESIGN:
   (i) Split-plot. (ii) (a) 4 main-plots/block; 6 sub-plots/main-plot. (b) 198'×105'. (iii) 4. (iv) (a) 14'×50'. (b) 10'×40'. (v) 2 rows left as border. (vi) Yes.

4. GENERAL:
   (i) Normal. No lodging. (ii) Nil. (iii) Height, distribution of bolls, distribution of pods, dry weight of plant, lint index, stand, seed index, no. of seeds/boll and kapan yield. (iv) (a) No. (b)—. (c)—. (v) (a) Jullundur and Abobar. (b) N.A. (vi) and (vii) Nil.

5. RESULTS:
   (i) 1114 lb./ac.
   (ii) (a) 283.1 lb./ac.
   (b) 144.4 lb./ac.
   (iii) Main effect of N is highly significant. Others are not significant.
Crop: Cotton. Site: Cotton Res. Stn. B.A. Farm, Rauni.

Object: To study the effect of presowing treatment of seed on the development and yield of Cotton.

1. BASAL CONDITIONS:
   (i) (a) Nil. (b) Fallow. (c) Nil. (ii) (a) Heavy loam. (b) N.A. (iii) 18.5.1953. (iv) (a) N.A. (b) N.A. (c) 8—10 sr./ac. (d) 2.5’ x 1.25’. (e) N.A. (v) 50 lb./ac. of N as A/S applied on 20.7.1953 by broadcast. (vi) F-216 (medium). (vii) Irrigated. (viii) 2 hoeings. (ix) 22.73”. (x) 6.10.1953, 28.10.1953 and 14.12.1953.

2. TREATMENTS:
   \( T_1 \) = Unsoaked seeds.
   \( T_2 \) = Seeds treated with Perenox.
   \( T_3 \) = Seeds soaked in water for 24 hours.
   \( T_4 \) = Seeds treated with molar solution of A/S for 24 hours.

3. DESIGN:
   (i) R.B.D. (ii) (a) 4. (b) N.A. (iii) 4. (iv) (a) 15’ x 57”, (b) 10’ x 48.5”. (v) N.A. (vi) Yes.

4. GENERAL:
   (i) Germination poor. No lodging. (ii) Nil. (iii) Kapas yield. (iv) (a) 1953-1954. (b) No. (c) Nil. (v) (a) No. (b)—. (vi) and (vii) Nil.

5. RESULTS:
   (i) 1034 lb./ac.
   (ii) 222.0 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>( T_1 )</td>
<td>895</td>
</tr>
<tr>
<td>( T_2 )</td>
<td>1204</td>
</tr>
<tr>
<td>( T_3 )</td>
<td>1106</td>
</tr>
<tr>
<td>( T_4 )</td>
<td>930</td>
</tr>
</tbody>
</table>

S.E./mean = 11.1 lb./ac.

(iv) Av. yield of即将到来 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>N_5</th>
<th>Mean</th>
<th>S_1</th>
<th>S_2</th>
</tr>
</thead>
<tbody>
<tr>
<td>I_1</td>
<td>704</td>
<td>846</td>
<td>1092</td>
<td>1143</td>
<td>1362</td>
<td>1475</td>
<td>1104</td>
<td>1195</td>
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<tr>
<td>I_2</td>
<td>663</td>
<td>822</td>
<td>983</td>
<td>1209</td>
<td>1434</td>
<td>1628</td>
<td>1123</td>
<td>1094</td>
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<tr>
<td>Mean</td>
<td>684</td>
<td>834</td>
<td>1038</td>
<td>1176</td>
<td>1398</td>
<td>1552</td>
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<td>1018</td>
<td>1133</td>
<td>1375</td>
<td>1568</td>
<td>1094</td>
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<tr>
<td>S_2</td>
<td>681</td>
<td>882</td>
<td>1057</td>
<td>1219</td>
<td>1422</td>
<td>1535</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

S.E. of difference of two
1. I or S marginal means = 57.8 lb./ac.
2. N marginal means = 51.1 lb./ac.
3. N means at the same level of I or S = 72.2 lb./ac.
4. I or S means at the same level of N = 87.7 lb./ac.
5. means in the body of I x S table = 81.7 lb./ac.
Object: To study the effect of different forms of N with and without Pot. Sui.

1. BASAL CONDITIONS:
   (i) (a) Nil. (b) Maize (fodder). (c) Nil. (ii) (a) Clay loam. (b) N.A. (iii) 26, 27.3.1949. (iv) (a) 5 ploughings and 7 sohaga. (b) N.A. (c) 3/4 oz./marla. (d) Plant to plant 1'. row to row 2'. (e) N.A. (v) Nil. (vi) T-12 (medium). (vii) Irrigated. (viii) 6 suckering and 4-5 hoeings. (ix) 5.87'. (x) 27.7.1949.

2. TREATMENTS:
   All combinations of (1) and (2)
   (1) 2 levels of K$_2$O: K$_0$=0 and K$_1$=50 lb./ac.
   (2) 4 sources of N : N$_1$=F.Y.M. at 100 lb./ac. of N applied on 25.3.1949, N$_2$=A/S at 100 lb./ac. of N on 2.5.1949 and 15.5.1949, N$_3$=Pot. Nit. at 100 lb./ac. of N applied on 2.5.1949 and 15.5.1949, and N$_4$=Ammo. Phos. at 100 lb./ac. of N applied on 2.5.1949 and 15.5.1949.

3. DESIGN:
   (i) 2 x 4 Fact. in R.B.D. (ii) (a) 8. (b) N.A. (iii) 6. (iv) (a) and (b) 55'x10'. (v) Nil. (vi) Yes.

4. GENERAL:
   (i) Normal. No lodging. (ii) Nil. (iii) Tobacco yield (iv) 1949 to 1951. (b) No. (c) Nil. (v) (a) No. (b)—. (vi) and (vii) Nil.

5. RESULTS:
   (i) 1529 lb./ac. (ii) 146.9 lb./ac. (iii) N effect is highly significant, K is significant while interaction is not significant.
   (iv) Av. yield of tobacco in lb./ac.

<table>
<thead>
<tr>
<th></th>
<th>K0</th>
<th>K1</th>
<th>Mean</th>
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<td>1239</td>
<td>1238</td>
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<tr>
<td>N2</td>
<td>1639</td>
<td>1460</td>
<td>1550</td>
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<tr>
<td>N3</td>
<td>1684</td>
<td>1633</td>
<td>1659</td>
</tr>
<tr>
<td>N4</td>
<td>1775</td>
<td>1561</td>
<td>1668</td>
</tr>
<tr>
<td>Mean</td>
<td>1584</td>
<td>1473</td>
<td>1529</td>
</tr>
</tbody>
</table>

S.E. of marginal mean of N = 42.4 lb./ac.
S.E. of marginal mean of K = 30.0 lb./ac.
S.E. of body of table = 60.0 lb./ac.
3. DESIGN:
   (i) 2 x 4 Fact. in R.B.D.  (ii) 8.  (b) N.A. (iii) 6.  (iv) (a) and (b) 55' x 10'. (v) Nil.  (vi) Yes.

4. GENERAL:
   (i) Normal. No lodging. (ii) Nil. (iii) Growth, height, stand and rope weight  (iv) (a) 1949—1951. (b) No.
   (c) Nil.  (v) (a) Nil, (b)—. (vi) and (vii) Nil.

5. RESULTS:
   (i) 1600 lb./ac.
   (ii) 231.8 lb./ac.
   (iii) N effect is highly significant, while K effect and interaction N x K are not significant.
   (iv) Av. yield of tobacco in lb./ac.

<table>
<thead>
<tr>
<th></th>
<th>K₀</th>
<th>K₁</th>
<th>Mean</th>
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<td>N₂</td>
<td>1567</td>
<td>1611</td>
<td>1589</td>
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<tr>
<td>N₃</td>
<td>1840</td>
<td>1568</td>
<td>1704</td>
</tr>
<tr>
<td>N₄</td>
<td>1808</td>
<td>1736</td>
<td>1772</td>
</tr>
</tbody>
</table>

Mean 1638 1562 1600

S.E. of marginal mean of N = 65.9 lb./ac.
S.E. of marginal mean of K = 47.3 lb./ac.
S.E. of body of table = 94.0 lb./ac.

Ref:- Pb. 51 (7).  Type:- 'M'.

Object:- To study the effect of different forms of N with and without Po. Sul.

1. BASAL CONDITIONS :
   (i) (a) Tobacó-Fellow-Whést-Födder: (b) Maize (fodder); (c) Nil. (ii) (a) Heavy loam. (b) N.A.
   (iii) 23.2.1951.  (iv)(a) 1-ploughing with roja plough; 5-desi ploughings; 2 rollers and 4 sohapa, (b) and
   (c) N.A. (d) 1' x 1'. (e) N.A. (v) 100 lb./ac. of N as F.Y.M. on 15.16.1.1951. (vi) T-21 (medium),
   (vii) Irrigated. (viii) One hoeing. (ix) 0.91'. (x) 16.6.1951.

2. TREATMENTS:
   All combinations of (1) and (2)
   (1) 2 levels of K₂O: K₀=0 and K₁=50 lb./ac.
   (2) 4 sources of N: N₁=F.Y.M. at 100 lb./ac. of N, N₂=A/s at 100 lb./ac. of N, N₃=Pot.
   Nit. at 100 lb./ac. of N and N₄=Ammo. Phos. at 100 lb./ac. of N.

3. DESIGN:
   (i) R.B.D. (ii) (a) 8. (b) N.A. (iii) 6. (iv) (a) N.A. (b) 55' x 10'. (v) N.A. (vi) Yes.

4. GENERAL:
   (i) Normal. N0 lodging. (ii) Nil. (iii) Dry wt. pit. wt. of stalk and ropes, wt. of green leaves, no. of
   leaves, length and breadth of leaves in cm., height in cm., no of plants at harvest and tobacco yield.  (iv)
   (a) 1949 to 1951. (b) No. (c) Nil.  (v) (a) No. (b)—. (vi) and (vii) Nil.

5. RESULTS:
   (i) 768.3 lb./ac.
   (ii) 170.79 lb./ac.
   (iii) Main-effect of N alone is highly significant.
(iv) Av. yield of tobacco in lb./ac.

<table>
<thead>
<tr>
<th></th>
<th>( K_0 )</th>
<th>( K_1 )</th>
<th>Mean</th>
</tr>
</thead>
<tbody>
<tr>
<td>( N_1 )</td>
<td>454.0</td>
<td>395.5</td>
<td>402.3</td>
</tr>
<tr>
<td>( N_2 )</td>
<td>720.4</td>
<td>781.5</td>
<td>751.0</td>
</tr>
<tr>
<td>( N_3 )</td>
<td>813.8</td>
<td>900.3</td>
<td>857.1</td>
</tr>
<tr>
<td>( N_4 )</td>
<td>1057.3</td>
<td>1068.4</td>
<td>1062.9</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th></th>
<th>S.E. of marginal mean of N</th>
<th>=49.30 lb./ac.</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>S.E. of marginal mean of K</td>
<td>=34.86 lb./ac.</td>
</tr>
<tr>
<td></td>
<td>S.E. of body of table</td>
<td>=69.73 lb./ac.</td>
</tr>
</tbody>
</table>

Crop: Tobacco.
Site: Agri. Stn., Ferozepur Cantt.

Object: To study the effect of graded doses of N in the form of F.Y.M. and A/S.

1. BASAL CONDITIONS:
   (i) (a) Nil. (b) Chari. (c) Nil. (ii) (a) Clay loam. (b) N.A. (iii) 24.3.1949. (iv) (a) 5 ploughings and 7 sodaga. (b) N.A. (c) 1 oz./marla. (d) Row to row 2'; plant to plant 1'. (e) N.A. (v) Nil. (vi) T—12 (medium). (vii) Irrigated. (viii) 6—7 toppings, suckerings and 4—5 hoeings. (ix) 5.8'5. (x) 26.7.1949.

2. TREATMENTS
   All combinations of (1) and (2)+a control.
   (1) 2 sources of N: \( S_1 \)=F.Y.M. and \( S_2 \)=A/S.
   (2) 3 levels of N: \( N_1 \)=50, \( N_2 \)=100 and \( N_3 \)=150 lb./ac. of N.

3. DESIGN:
   (i) R.B.D. (ii) (a) 7. (b) N.A. (iii) 6. (iv) (a) and (b) 55'x10'. (v) Nil. (vi) Yes.

4. GENERAL:
   (i) Good. No lodging. (ii) Nil. (iii) Rope weight. (iv) (a) 1949 to 1951. (b) No. (c) Nil. (v) (a) No. (b)—. (vi) Nil. (vii) Crop receiving N in A/S had dark coloured leaves as compared to plots receiving F.Y.M.

5. RESULTS
   (i) 1074 lb./ac.
   (ii) 191.0 lb./ac.
   (iii) Overall treatment effect is significant. Main effect of N and "control vs other treatments" effects are significant.
   (iv) Av. yield of tobacco in lb./ac.

   Control = 877 lb./ac.

   \[
   \begin{array}{ccc|c}
   \hline
   & S_1 & S_2 & Mean \\
   \hline
   N_1 & 1023 & 1003 & 1015 \\
   N_2 & 1001 & 1190 & 1096 \\
   N_3 & 1039 & 1381 & 1210 \\
   \hline
   Mean & 1023 & 1191 & 1107 \\
   \end{array}
   \]

   S.E. of marginal mean of \( S \) = 45.0 lb./ac.
   S.E. of marginal mean of \( N \) = 55.1 lb./ac.
   S.E. of body of table = 78.0 lb./ac.
Crop: Tobacco.  
Site: Agri. Stn., Ferozepur Cantt.  
Ref: Pb. 50(41).  
Type: ‘M’.

Object: To find out if F.Y.M. can be substituted by artificial fertilizers A/S.

1. BASAL CONDITIONS:
   (i) (a) Nil. (b) Maize (fodder). (c) Nil. (ii) (a) Clay loam. (b) N.A. (iii) 18.2.1950. (iv) (a) 5 ploughings and 7 sowing. (b) to (e) N.A. (v) Nil. (vi) T-12 (medium). (vii) Irrigated. (viii) 6-7 toppings, suckering and 4-5 hoeings. (ix) 1.19”. (x) 16.6.1950.

2. TREATMENTS:
   1. F.Y.M. at 50 lb./ac. of N.
   2. F.Y.M. at 100 lb./ac. of N.
   3. F.Y.M. at 150 lb./ac. of N.
   4. F.Y.M. at 200 lb./ac. of N.
   5. F.Y.M. at 300 lb./ac. of N.
   6. A/S at 50 lb./ac. of N.
   7. A/S at 75 lb./ac. of N.
   8. A/S at 100 lb./ac. of N.
   9. A/S at 150 lb./ac. of N.
   10. Control (no manure).

3. DESIGN:
   (i) R.B.D. (ii) (a) 10. (b) N/A. (iii) 5. (iv) (a) and (b) 36’x10’. (v) Nil. (vi) Yes.

4. GENERAL:
   (i) Normal. No lodging. (ii) Nil. (iii) Growth, height and rope weight. (iv) (a) 1949—1951. (b) No. (c) Nil. (v) [a] No (b)—. (vi) and (vii) Nil.

5. RESULTS:
   (i) 1251 lb./ac.
   (ii) 263.0 lb./ac.
   (iii) Treatments are not significantly different.
   (iv) Av. yield of tobacco 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>1182</td>
</tr>
<tr>
<td>3.</td>
<td>1372</td>
</tr>
<tr>
<td>4.</td>
<td>1372</td>
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<tr>
<td>5.</td>
<td>1458</td>
</tr>
<tr>
<td>6.</td>
<td>1204</td>
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<tr>
<td>7.</td>
<td>1245</td>
</tr>
<tr>
<td>8.</td>
<td>1207</td>
</tr>
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<td>9.</td>
<td>1251</td>
</tr>
<tr>
<td>10.</td>
<td>1070</td>
</tr>
</tbody>
</table>

S.E/mean = 117.6 lb./ac.

Crop: Tobacco.  
Site: Agri. Stn., Ferozepur Cantt.  
Ref: Pb. 51(8).  
Type: ‘M’.

Object: To find out if F.Y.M. can be substituted by artificial fertilizer A/S.

1. BASAL CONDITIONS:
   (i) (a) Tobacco-Fallow-Wheat-Fodder. (b) Guara. (c) Nil. (ii) (a) Heavy loam. (b) N.A. (iii) 24.2.1951. (iv) (a) 8 ploughings, 9 sowing and 2 rollings. (b) and (c) N.A. (d) 1’x1’. (e) N.A. (v) Nil. (vi) T-21 (medium). (vii) Irrigated. (viii) One gap filling, two hoeings, one topping and suckering. (ix) 0.91”. (x) 17.6.1951 and 26.6.1951.
2. TREATMENTS:
1. F.Y.M. at 50 lb./ac. of N.  
2. F.Y.M. at 100 lb./ac. of N.  
3. F.Y.M. at 150 lb./ac. of N.  
4. F.Y.M. at 200 lb./ac. of N.  
5. F.Y.M. at 300 lb./ac. of N.  
6. A/S at 25 lb./ac. of N.  
7. A/S at 50 lb./ac. of N.  
8. A/S at 75 lb./ac. of N.  
9. A/S at 100 lb./ac. of N.  
10. A/S at 150 lb./ac. of N.  
11. Control.

F.Y.M. applied before transplanting on 23.2.51. Half of A/S applied on 23.2.51 and the other half on 24.4.51.

3. DESIGN:
(i) R.B.D.  
(ii) (a) 11. (b) N.A.  
(iii) 6. (iv) (a) and (b) 27' x 10'.  
(v) Nil.  
(vi) Yes.

4. GENERAL:
(i) Normal. No lodging.  
(ii) Nil.  
(iii) Dry wt., pit wt. of stalk and ropes, wt. of green leaves, no. of leaves/plant, length and breadth of leaves in cm., height in cm., no. of plants at harvest and tobacco yield.  
(iv) (a) 1949—1951. (b) No.  
(c) Nil.  
(v) (a) No.  
(b)—  
(vi) and (vii) Nil.

5. RESULTS:
(i) 672.7 lb./ac.  
(ii) 163.50 lb./ac.  
(iii) Treatments are highly significantly different.  
(iv) Av. yield of tobacco in lb./ac.  

<table>
<thead>
<tr>
<th>Treatment</th>
<th>Av. yield</th>
<th>Treatment</th>
<th>Av. yield</th>
</tr>
</thead>
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</tr>
<tr>
<td>8.</td>
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<tr>
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<td>731.2</td>
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<td>900.6</td>
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<td>11.</td>
<td>435.9</td>
</tr>
<tr>
<td>6.</td>
<td>772.7</td>
<td></td>
<td></td>
</tr>
<tr>
<td>S.E./mean</td>
<td></td>
<td></td>
<td>= 66.75 lb./ac.</td>
</tr>
</tbody>
</table>

Crop :- Tobacco.  
Site :- Agri. Stn., Ferozepur Cantt.  
Ref :- Pb. 49(46).  
Type :- ‘M’.

Object :- To find a suitable time of application of manures.

1. BASAL CONDITIONS:
(i) (a) Nil.  
(b) Jowar.  
(c) Nil.  
(ii) (a) Clayey loam.  
(b) N.A.  
(iii) 17.3.1949.  
(iv) (a) 5 ploughings and 7 sohaga.  
(b) and (c) N.A.  
(d) Row to row 2', plant to plant 1'.  
(e) N.A.  
(v) Nil.  
(vi) T-12 (medium).  
(vii) Irrigated.  
(viii) 6-7 toppings, suckering and 4-5 hoeings.  
(ix) 5.87'.  
(x) 23.7.1949.

2. TREATMENTS:
1. Manure applied in full dose just before planting on 15.3.1949.  
2. Manure applied in two equal doses one month after planting and two months after planting on 17.4.1949 and 17.5.1949.  
Manure : A/S at 100 lb./ac. of N.

3. DESIGN:
(i) Paired plot.  
(ii) (a) 2. (b) N.A.  
(iii) 5. (iv) (a) and (b) 45’ x 8’.  
(v) Nil.  
(vi) Yes.

4. GENERAL:
(i) Normal. No lodging.  
(ii) (a) Nil.  
(iii) Rope weight.  
(iv) (a) 1949—1951. (b) and (c) No.  
(v) (a);  
and (b) No.  
(vi) and (vii) Nil.

5. RESULTS:
(i) 1380 lb./ac.  
(ii) 371.2 lb./ac.  
(iii) Treatments are not significantly different.
Crop: Tobacco.  
Site: Agri. Stn., Ferozepur Cantt.  
Object: To find the best time and method of application of fertilizers.

1. BASAL CONDITIONS:
   (i) (a) Nil. (b) Maize (fodder). (c) Nil. (ii) (a) Clay loam. (b) N.A. (iii) 22.2.1950. (iv) (a) to (e) N.A. (v) Nil. (vi) T-12 (medium). (vii) Irrigated. (viii) 6-7 topings, suckering and 4-5 hoeings. (ix) 1.19°. (x) 24.6.1959.

2. TREATMENTS:
   1. Manure applied in full dose before planting.
   2. ⅓ dose of manure applied before planting and ⅔ dose one month after planting.
   3. ⅔ dose of manure applied one month after planting and ⅔ dose two months after planting.

Manure: A/S at 100 lb./ac. applied on 2.2.1950, 27.3.1950 and 25.4.1950.

3. DESIGN:
   (i) R.B.D. (ii) (a) Nil. (b) N.A. (iii) 8. (iv) (a) and (b) 36″ × 19′. (v) Nil. (vi) Yes.

4. GENERAL:
   (i) Good. No lodging. (ii) Nil. (iii) Growth, height, no. of plants at harvest and rope wt. (iv) (a) 1949—1951. (b) and (c) No. (vi) and (vii) Nil.

5. RESULTS:
   (i) 1595 lb./ac.
   (ii) 257.3 lb./ac.
   (iii) Treatments are not significantly different.
   (iv) Av. yield of tobacco in lb./ac.  

<table>
<thead>
<tr>
<th>Treatment</th>
<th>Av. yield</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>1616</td>
</tr>
<tr>
<td>2.</td>
<td>1674</td>
</tr>
<tr>
<td>3.</td>
<td>1495</td>
</tr>
</tbody>
</table>

S.E./mean = 91.0 lb./ac.

---

Crop: Tobacco.  
Site: Agri. Stn., Ferozepur Cantt.  
Object: To find out the best time and method of application of fertilizers.

1. BASAL CONDITIONS:
   (i) (a) Nil. (b) and (c) N.A. (ii) (a) Heavy loam. (b) N.A. (iii) 22.2.1951. (iv) (a) 6 ploughings, 7 sahaga and 1 rolling. (b) and (c) N.A. (d) 1′ × 11′. (e) N.A. (v) Nil. (vi) T-21 (medium). (vii) Irrigated. (viii) One gap filling and one hoeing. (ix) 0.91°. (x) 24.6.1951.

2. TREATMENTS:
   1. Manure applied in full dose before planting.
   2. ⅔ dose of manure applied before planting and ⅔ dose one month after planting.
   3. ⅔ dose of manure applied one month after planting and ⅔ dose two months after planting.

Manure: 100 lb./ac. of N as A/S.
3. DESIGN:
(i) R.B.D. (ii) 3. (b) N.A. (iii) 8. (iv) (a) and (b) 27'×10'. (v) Nil. (vi) Yes.

4. GENERAL:
(i) Normal. No lodging. (ii) Nil. (iii) Dry wt., pit wt. of stalk and ropes, wt. of green leaves, no. of leaves/plant, length and breadth of leaves in cm., height in cm., no. of plants at harvest and tobacco yield. (iv) (a) 1950—1951. (b) No. (c) Nil. (v) (a) No. (b) —. (vi) and (vii) Nil.

5. RESULTS:
(i) 925.2 lb./ac.
(ii) 106.7 lb./ac.
(iii) Treatments are not significantly different.

<table>
<thead>
<tr>
<th>Treatment</th>
<th>Av. yield</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>950.3</td>
</tr>
<tr>
<td>2.</td>
<td>933.4</td>
</tr>
<tr>
<td>3.</td>
<td>892.9</td>
</tr>
<tr>
<td>S.E.:mean</td>
<td>-37.7 lb./ac.</td>
</tr>
</tbody>
</table>

Crop :- Tobacco.
Site :- Agri. Stn., Ferozepur Cantt.
Object :- To study if G.N.C. can be substituted for F.Y.M.

Ref :- Pb. 50(43).
Type :- 'M'.

1. BASAL CONDITIONS:
(i) (a) Nil. (b) Fallow. (c) Nil. (ii) (a) Clay loam. (b) N.A. (iii) 2. U.1950. (iv) (a) 7 ploughings and 8 sohaga. (b) and (c) N.A. (d) 15'×9'. (e) N.A. (v) Nil. (vi) T-12 (medium). (vii) Irrigated. (viii) 6-7 toppings, suckering and 4-5 hoeings. (ix) 1.19'. (x) 14.6.1950.

2. TREATMENTS:
1. G.N.C. at 300 lb./ac. of N.
2. F.Y.M. at 300 lb./ac. of N.

Manures applied before planting.

3. DESIGN:
(i) Paired plot. (ii) 2. (b) N.A. (iii) 5. (iv) (a) and (b) 22'×8'. (v) Nil. (vi) Yes.

4. GENERAL:
(i) Normal. No lodging. (ii) Nil. (iii) Growth, height, no. of plants at harvest, rope wt. and tobacco yield. (iv) (a) 1950—1951 (modified in 1951). (b) No. (c) Nil. (v) (a) Nil. (b) —. (vi) and (vii) Nil.

5. RESULTS:
(i) 1126 lb./ac.
(ii) 224.2 lb./ac.
(iii) Treatments are not significantly different.
(iv) Av. yield of tobacco in lb./ac.

<table>
<thead>
<tr>
<th>Treatment</th>
<th>Av. yield</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>1145</td>
</tr>
<tr>
<td>2.</td>
<td>1103</td>
</tr>
<tr>
<td>S.E./mean</td>
<td>-100.3 lb./ac.</td>
</tr>
</tbody>
</table>
Object:—To study if G.N.C. can be substituted for F.Y.M.

1. BASAL CONDITIONS:
   (i) (a) Tobacco—Fallow-Wheat-Fodder. (b) Guara (fodder). (c) Nil. (ii) (a) Heavy loam. (b) N.A. (iii) 23.2.1951. (iv) (a) 1 ploughing with raja plough, 4 desi ploughings, 1 roller and 5 sohag. (b) and (c) N.A. (d) 1' x 1'. (e) N.A. (v) Nil. (vi) T-21 (medium). (vii) Irrigated. (viii) 1 gap filling, 1 hoeing, 2 toppings and suckering. (ix) 0.91'. (x) 18.6.1951.

2. TREATMENTS:
   All combinations of (1) and (2)
   (1) 3 manures: M1=G.N.C. at 300 lb./ac. of N, M2=F.Y.M. at 300 lb./ac. of N, and M3=G.N.C. at 150 lb./ac. of N+F.Y.M. at 150 lb./ac. of N.
   (2) 2 times of application : T1=December 1950 and T2=February 1951.

3. DESIGN:
   (i) 3 x 2 Fact. in R.B.D. (ii) (a) 6. (b) N.A. (iii) 6. (iv) (a) N.A. (b) 27' x 10'. (v) N.A. (vi) Yes.

4. GENERAL:
   (i) Normal. No lodging. (ii) Nil. (iii) Dry wt., pit wt. of stalk and ropes, wt. of green leaves no. of leaves/plant, length and breadth of leaves in cm., height in cm., no. of plants at harvest and tobacco yield. (iv) (a) 1950 to 1951. (b) No. (c) Nil. (v) (a) No. (b) —. (vi) and (vii) Nil.

5. RESULTS:
   (i) 1295 lb./ac.
   (ii) 251.5 lb./ac.
   (iii) None of the effects is significant.
   (iv) Av. yield of tobacco lb./ac.

<table>
<thead>
<tr>
<th></th>
<th>T1</th>
<th>T2</th>
<th>Mean</th>
</tr>
</thead>
<tbody>
<tr>
<td>M1</td>
<td>1421</td>
<td>1366</td>
<td>1394</td>
</tr>
<tr>
<td>M2</td>
<td>1042</td>
<td>1262</td>
<td>1152</td>
</tr>
<tr>
<td>M3</td>
<td>1248</td>
<td>1429</td>
<td>1339</td>
</tr>
<tr>
<td>Mean</td>
<td>1237</td>
<td>1352</td>
<td>1295</td>
</tr>
</tbody>
</table>

S.E. of marginal mean of M = 72.6 lb./ac.
S.E. of marginal mean of T = 59.3 lb./ac.
S.E. of body of table = 102.7 lb./ac.
3. DESIGN:
(i) 3 x 2 Fact. in R.B.D. (ii) (a) 6. (b) N.A. (iii) 6. (iv) (a) 25' x 10'. (b) 22' x 10'. (v) 1.5' border left along breadth. (vi) Yes.

4. GENERAL:
(i) Normal. No lodging. (ii) Nil. (iii) Dry wt. of ropes, no. of leaves/plant, green wt., length and breadth of leaves in cm., height in cm., no. of plants at harvest and tobacco yield. (iv) (a) 1950-51. (b) and (c) No. (v) (a) and (vi) and (vii) Nil.

5. RESULTS:
(i) 974.0 lb./ac.
(ii) 191.1 lb./ac.
(iii) Treatments are highly significantly different.
(iv) Av. yield of tobacco in lb./ac.

<table>
<thead>
<tr>
<th>Treatment</th>
<th>T1</th>
<th>T2</th>
<th>Mean</th>
</tr>
</thead>
<tbody>
<tr>
<td>M1</td>
<td>1269.4</td>
<td>894.0</td>
<td>1081.7</td>
</tr>
<tr>
<td>M2</td>
<td>553.2</td>
<td>794.7</td>
<td>674.0</td>
</tr>
<tr>
<td>M3</td>
<td>1055.9</td>
<td>1276.6</td>
<td>1166.3</td>
</tr>
<tr>
<td>Mean</td>
<td>959.5</td>
<td>988.4</td>
<td>974.0</td>
</tr>
</tbody>
</table>

S.E. of marginal mean of M = 55.17 lb./ac.
S.E. of marginal mean of T = 45.05 lb./ac.
S.E. of body of table = 78.01 lb./ac.

Crop :- Tobacco.
Site :- Agri. Stn., Ferozepur Cantt.
Object :- To study the comparative effect of F.Y.M. and G.N.C.

Ref :- Pb. 50(54).
Type :- 'M'.

1. BASAL CONDITIONS:
(i) (a) Nil. (b) Fallow. (c) Nil. (ii) (a) Clay loam. (b) N.A. (iii) 9.3.1950. (iv) (a) 5 ploughings and 6 sowings. (b) N.A. (c) 1 oz./marla. (d) 12' x 9'. (e) N.A. (f) Nil. (v) T-26. (vi) Irrigated. (vii) 6-7 topping and suckerings and 4 hoeings. (ix) 1.19'. (x) 31.5.1950 to 15.6.1950.

2. TREATMENTS:
1. G N.C. at 350 lb./ac. of N.
2. F.Y.M. at 300 lb./ac. of N.

3. DESIGN:
(i) Paired plot. (ii) (a) 2. (b) N.A. (iii) 6. (iv) (a) N.A. (b) 22' x 10'. (v) N.A. (vi) Yes.

4. GENERAL:
(i) Normal. No lodging. (ii) Nil. (iii) Height, no. of plants at harvest and tobacco yield. (iv) (a) 1950 to 1951 (modified in 1951). (b) —. (c) —. (v) (a) No. (b) —. (vi) and (vii) Nil.

5. RESULTS:
(i) 344.1 lb./ac.
(ii) 132.0 lb./ac.
(iii) Treatment differences are not significant.
(iv) Av. yield of tobacco in lb./ac.

<table>
<thead>
<tr>
<th>Treatment</th>
<th>Av. yield</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>349.6</td>
</tr>
<tr>
<td>2</td>
<td>338.6</td>
</tr>
</tbody>
</table>

S.E./mean = 53.9 lb./ac.
Crop :: Tobacco.  
Site :: Agri. Stn., Ferozepur Cantt.  
Ref :: Pb. 53(25).  
Type :: 'M'.

Object :: To find out the utility of application of N at pre-flowering and post-flowering time.

1. BASAL CONDITIONS :

(i) (a) Tobacco—Fallow—Wheat—Guara. (b) Guara. (c) Nil.  (ii) (a) Loam. (b) N.A.  (iii) 3.2.1953.  
(iv) (a) 1 ploughing with raja plough, 8 desi ploughings, 8 seage and 1 horse hoe. (b) and (c) N.A.  
(d) 1' from row to row; 6' from plant to plant. (e) N.A.  (v) F.Y.M. at 50 lb./ac. of N was applied one month before planting by broadcast to all the plots. (vi) T-26 (medium). (vii) Irrigated. (viii) 3 weedings and hoeings. (ix) 1.37'. (x) 8.6.1953 and 15.6.1953.

2. TREATMENTS :

1. Control.  
2. 100 lb./ac. of N as A/S at planting.  
3. 50 lb./ac. of N as A/S at planting + 50 lb./ac. of N at flowering time.  
4. 50 lb./ac. of N as A/S at planting + 25 lb./ac. of N at pre-flowering + 25 lb./ac. of N at post-flowering time.  
5. 50 lb./ac. of N as A/S at planting +50 lb./ac. of N as A/S at post-flowering time.  

N applied in the form of A/S.

3. DESIGN :

(i) R.B.D. (ii) (a) 5, (b) N.A. (iii) 5. (iv) (a) 20' x9'. (b) 20' x8'. (v) 1 row on 2 sides of a plot.  
(vi) Yes.

4. GENERAL :

(i) Satisfactory. No lodging. (ii) Nil. (iii) Total no. of plants at harvest, average no. of leaves per plant, height in cm., average length of leaves in cm. and dry weight of tobacco. (iv) (a) 1953—1955. (b) and (c) Nil.  
(v) (a) and (b) No. (vi) and (vii) Nil.

5. RESULTS :

(i) 1182 lb./ac.  
(ii) 230 lb./ac.  
(iii) Treatment differences are highly significant.

(iv) Av. yield of dry leaf in lb./ac.  
<table>
<thead>
<tr>
<th>Treatment</th>
<th>Av. yield</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>776</td>
</tr>
<tr>
<td>2.</td>
<td>1135</td>
</tr>
<tr>
<td>3.</td>
<td>1380</td>
</tr>
<tr>
<td>4.</td>
<td>1371</td>
</tr>
<tr>
<td>5.</td>
<td>1246</td>
</tr>
<tr>
<td>S.E./mean</td>
<td>93.9 lb./ac.</td>
</tr>
</tbody>
</table>

Crop :: Tobacco.  
Site :: Agri. Stn., Ferozepur Cantt.  
Ref :: Pb. 53(31).  
Type :: 'M'.

Object :: To find out the utility of application of N at pre-flowering and post-flowering time.

1. BASAL CONDITIONS :

(i) (a) Tobacco—Fallow—Wheat—Guara. (b) Guara. (c) No. (ii) (a) Heavy loam. (b) N.A.  (iii) 3.2.1953.  
(iv) (a) 1 ploughing with raja plough, 5 desi ploughings, 8 planking and 1 horse hoe. (b) and (c) N.A.  
(d) 1' row to row and 9' plant to plant. (e) N.A.  (v) 300 lb./ac. of N was applied in the form of F.Y.M., one month before planting, by broadcasting. (vi) T-26 N-rustica (medium). (vii) Irrigated. (viii) 2 weedings and hoeing. (ix) 0.34'. (x) 20.5.1953 to 27.5.1953.

2. TREATMENTS :

1. Control.  
2. 100 lb./ac. of N as A/S at planting time.  
3. 50 lb./ac. of N as A/S at planting time + 50 lb./ac. of N as A/S at flowering time.  
4. 50 lb./ac. of N as A/S at planting time + 25 lb./ac. of N as A/S at pre-flowering time + 25 lb./ac. of N as A/S at post-flowering time.  
5. 50 lb./ac. of N as A/S at planting time + 50 lb./ac. of N as A/S at post-flowering time.
3. DESIGN:

(i) R.B.D.  (ii) R.  (b) N.A.  (iii) 6.  (iv) (a) 20' x 9'4".  (b) 20' x 8'.  (v) One row around.  (vi) Yes.

4. GENERAL:

(i) Normal.  No lodging.  (ii) Nil.  (iii) Length and breadth of leaves in cm, no. of plants at harvest, green plant weight, height of plant and dry weight of tobacco.  (iv) (a) 1953-1955.  (b) No.  (c) Nil.  (v) (a) Nil.  (b) No.  (vi) and (vii) Nil.

5. RESULTS:

(i) 1563 lb./ac.
(ii) 296.2 lb./ac.
(iii) Treatments are highly significantly different.
(iv) Av. yield of tobacco 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>1053</td>
<td>163.3</td>
</tr>
<tr>
<td>2.</td>
<td>913</td>
<td>172.3</td>
</tr>
<tr>
<td>3.</td>
<td>1928</td>
<td>232.1</td>
</tr>
<tr>
<td>4.</td>
<td>1534</td>
<td>202.4</td>
</tr>
</tbody>
</table>

Crop: Tobacco  Ref: Pb. 50(38).
Site: Agri. Stn., Ferozepur Cantt.  Type: 'M'.

Obj.1: To find the best manurial dose for nursery planting of Tobacco.

1. BASAL CONDITIONS:

(i) (a) Nil.  (b) Charil.  (c) Nil.  (ii) (a) Clay loam.  (b) N.A.  (iii) 22.2.1950.  (iv) (a) 6 ploughings and 8 sohaga.  (b) N.A.  (c) 1/2 oz./marla.  (d) 15' x 9'.  (e) N.A.  (v) Nil.  (vi) T-12 (medium).  (vii) Irrigated.  (viii) 6-7 toppings and suckerings and 4-5 hoeings.  (ix) 1.19'.  (x) 14.6.1950 and 24.6.1950.

2. TREATMENTS:

1. F.Y.M. at 100 lb./ac. of N.
2. F.Y.M. at 200 lb./ac. of N.
3. F.Y.M. at 300 lb./ac. of N.
4. A/S at 50 lb./ac. of N.
5. A/S at 100 lb./ac. of N.
6. A/S at 150 lb./ac. of N.

3. DESIGN:

(i) R.B.D.  (ii) 6.  (b) N.A.  (iii) 6.  (iv) (a) and (b) 72' x 7'.  (v) Nil.  (vi) Yes.

4. GENERAL:

(i) Normal.  No lodging.  (ii) Nil.  (iii) Growth, height, stand, no. of leaves, length and breadth of leaves, height of seedlings, rope weight, plant and tobacco yield.  (iv) (a) 1950-1951 (modified during 1950).  (b) No.  (c) Nil.  (v) (a) No.  (b) No.  (vi) and (vii) Nil.

5. RESULTS:

(i) 1013 lb./ac.
(ii) 215.3 lb./ac.
(iii) Treatments are not significantly different.
(iv) Av. yield of tobacco 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>1021</td>
<td>88.0</td>
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<tr>
<td>2.</td>
<td>1083</td>
<td></td>
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<tr>
<td>3.</td>
<td>931</td>
<td></td>
</tr>
<tr>
<td>4.</td>
<td>1035</td>
<td></td>
</tr>
<tr>
<td>5.</td>
<td>1095</td>
<td></td>
</tr>
<tr>
<td>6.</td>
<td>914</td>
<td></td>
</tr>
</tbody>
</table>
Crop: Tobacco.  
Site: Agri. Stn., Ferozepur Cantt.  
Object: To find the best manurial dose for the nursery planting of Tobacco.

1. BASAL CONDITIONS
(i) (a) Nil. (b) Jowar. (c) Nil. (ii) (a) Heavy loam. (b) N.A. (iii) 3.3.1951. (iv) (a) 8 ploughings, 8 sohaga, 1 horse hoe and 2 rollings. (b) and (c) N.A. (v) 1'x1' (medium). (vi) T-21 (medium). (vii) Irrigated. (viii) One gap filling, one topping and suckering. (ix) 0.91". (x) 20.6.1951.

2. TREATMENTS:
All combinations of (1) and (2)
(1) 6 applications of N: N1=100, N2=200 and N3=300 lb/ac. of N as F.Y.M., N4=50, N5=100 and N6=150 lb/ac. of N as A/S.
(2) 2 levels of basal dressing: B0; No basal dressing and B1=Basal dressing with F.Y.M. at 100 lb/ac. of N.
All the treatments applied at nursery stage.

3. DESIGN:
(i) 2x6 Fact. in R.B.D. (ii) (a) 12. (b) N.A. (iii) 6. (iv) (a) and (b) 22'x7'. (v) Nil. (vi) Yes.

4. GENERAL:
(i) Normal. No lodging. (ii) Nil. (iii) Dry wt.; pit wt. of stalk and ropes, green wt., no. of leaves/plant length and breadth of leaves in cm., height in cm., no. of plants at harvest and tobacco yield. (iv) (a) 1950 to 1951. (b) -. (c) -. (v) (a) No. (b) -. (vi) and (vii) Nil.

5. RESULTS:
(i) 490.8 lb/ac.
(ii) 124.4 lb/ac.
(iii) Over all treatments are not significant.
(iv) Av. yield of tobacco in lb/ac.

<table>
<thead>
<tr>
<th></th>
<th>N1</th>
<th>N2</th>
<th>N3</th>
<th>N4</th>
<th>N5</th>
<th>N6</th>
<th>Mean</th>
</tr>
</thead>
<tbody>
<tr>
<td>B0</td>
<td>509.1</td>
<td>512.0</td>
<td>500.7</td>
<td>475.2</td>
<td>489.3</td>
<td>497.8</td>
<td>497.4</td>
</tr>
<tr>
<td>B1</td>
<td>458.2</td>
<td>441.3</td>
<td>526.1</td>
<td>444.1</td>
<td>537.4</td>
<td>497.8</td>
<td>484.2</td>
</tr>
<tr>
<td>Mean</td>
<td>483.7</td>
<td>476.7</td>
<td>513.4</td>
<td>459.7</td>
<td>513.4</td>
<td>497.8</td>
<td>490.8</td>
</tr>
</tbody>
</table>

S.E. of marginal mean of B = 20.7 lb/ac.
S.E. of marginal mean of N = 35.9 lb/ac.
S.E. of body of table = 50.8 lb/ac.

---

Crop: Tobacco.  
Site: Agri. Stn., Ferozepur Cantt.  
Object: To study the effect of F.Y.M. and A/S in presence and absence of K2O.

1. BASAL CONDITIONS:
(i) (a) Nil, (b) Guar, (c) Nil. (ii) (a) Clay loam. (b) N.A. (iii) 9.3.1950 to 13.3.1950. (iv) (a) 5 ploughings and 6 sohaga. (b) N.A. (c) 1 oz./marla. (d) 12"x9". (e) N.A. (v) Nil. (vi) T-26. (vii) Irrigated. (viii) 6-7 toppings and suckerings and 4-5 hoeings. (ix) 1.19". (x) 31.5.1950 to 15.6.1950.

2. TREATMENTS:
Main-plot treatments:
N1=F.Y.M. at 100 lb/ac. of N, N2=F.Y.M. at 200 lb/ac. of N, N3=F.Y.M. at 300 lb/ac. of N.
N4=A/S at 50 lb/ac. of N, N5=A/S at 100 lb/ac. of N and N6=A/S at 150 lb/ac. of N.

Sub-plot treatments:
2 levels of K2O: K0=Nil, K2O and K1=50 lb/ac. of K2O as Pot. Sul.
3. DESIGN:
(i) Split-plot. (ii) 6 main-plots/block; 2 sub-plots/main-plot. (iii) 6. (iv) (a) N.A. (b) 22'×10'. (v) N.A. (vi) Yes.

4. GENERAL:
(i) Satisfactory. No lodging. (ii) Nil. (iii) Height, no. of plants at harvest and tobacco yield. (iv) (a) Not contd. (b) —. (c) —. (v) (a) No. (b) —. (vi) and (vii) Nil.

5. RESULTS:
(i) 509.4 lb./ac.
(ii) (a) 156.9 lb./ac.
(b) 140.5 lb./ac.
(iii) Main effect of N alone is highly significant.
(iv) Av. yield of tobacco in lb./ac.

<table>
<thead>
<tr>
<th></th>
<th>N1</th>
<th>N2</th>
<th>N3</th>
<th>N4</th>
<th>N5</th>
<th>N6</th>
<th>Mean</th>
</tr>
</thead>
<tbody>
<tr>
<td>K0</td>
<td>356.4</td>
<td>443.8</td>
<td>661.9</td>
<td>459.9</td>
<td>533.8</td>
<td>538.8</td>
<td>499.1</td>
</tr>
<tr>
<td>K1</td>
<td>523.3</td>
<td>525.3</td>
<td>676.3</td>
<td>468.4</td>
<td>588.0</td>
<td>536.3</td>
<td>519.6</td>
</tr>
</tbody>
</table>

Mean:
- S.E. of difference of two
  1. N marginal means
  2. K marginal means
  3. K means at the same level of N
  4. N means at the same level of K

---

Crop: Tobacco.
Site: Agri. Stn., Ferozepur Cantt.
Ref: Pb. 50(55).
Type: 'M'.

Object: To study the best time of application of manure.

1. BASAL CONDITIONS:
   (i) (a) Nil. (b) Maize. (c) Nil. (ii) (a) Clay loam. (b) N.A. (iii) 9.3.1950. (iv) (a) to 'c', N.A. (v) Nil (vi) T-26. (vii) Irrigated. (viii) 6-7 Toppings and suckering and 2 hoeings. (ix) 1.19•. (x) 3.5.1950.

2. TREATMENTS:
1. A/S at 100 lb./ac. of N full dose before planting.
2. A/S at 50 lb./ac. of N after one month of planting and 50 lb./ac. of N after 2 months of planting.
3. A/S at 50 lb./ac. of N before planting and 50 lb./ac. of N one month after planting.

3. DESIGN:
(i) R.B.D. (ii) (a) 3. (b) N.A. (iii) 8. (iv) (a) N.A. (b) 22'×10'. (v) N.A. (vi) Yes.

4. GENERAL:
(i) Normal. No lodging. (ii) Nil. (iii) Height, no. of plants and tobacco yield. (iv) (a) Continued. (b) —. (c) —. (v) (a) No. (b) —. (vi) and (vii) Nil.

5. RESULTS:
(i) 676.9 lb./ac.
(ii) 97.93 lb./ac.
(iii) Treatments are highly significantly different.
Crop: Tobacco.  
Site: Agri. Stn., Ferozepur Cantt.  

Object: To find out if F.Y.M. can be substituted for A/S.

1. BASAL CONDITIONS:
   (i) (a) Nil. (b) Char. (c) Nil.  
   (ii) (a) Heavy loam. (b) N.A.  
   (iii) 4.20.1951: (iv) (a) 1 ploughing with raja plough, 7 desi plough, 7 sohaga and 2 roller. (b) and (c) N.A.  
   (d) 2 X 17.  
   (e) N.A.  
   (f) As per treatments.  
   (vi) N-rustica, T-186 (medium).  
   (vii) Irrigated.  
   (viii) 1 gap filling, 2 toppings and suckering.  
   (ix) 0.91".  

2. TREATMENTS:
   All combinations of (1) and (2) + a control.  
   (1) 6 applications of N: N₁ = 100, N₂ = 200 and N₃ = 300 lb./ac. of N as F.Y.M; N₄ = 50, N₅ = 100  
   and N₆ = 150 lb./ac. of N as A/S.  
   (2) 2 levels of basal dressing: B₀ = No Basal dressing. B₁ = Basal dressing at 100 lb./ac. of N as F.Y.M. in 1st week of Feb.

DESIGN:  
(i) R.B.D.  
(ii) [a] 13.  
(iii) 5.  
(iv) (a) 27°×15°. (b) 27°×10°. (v) 2° left out all round the plots.  
(vi) Yes.

4. GENERAL:  
(i) Normal. No lodging.  
(ii) Nil.  
(iii) Dry wt. of ropes, no. of leaves/plant, green wt., length and breadth of leaves in cm., height in cm. and no. of plants at harvest.  
(iv) 1951=1953.  
(v) (a) No.  
(vi) and (vii) Nil.

5. RESULTS:  
(i) 1158 lb./ac.  
(ii) 178.4 lb./ac.  
(iii) N and 'control vs other treatments' effects are highly significant. B effect is significant while interaction B×M is not significant.  
(iv) Av. yield of tobacco in lb./ac.

<table>
<thead>
<tr>
<th>B₀</th>
<th>B₁</th>
<th>Mean</th>
</tr>
</thead>
<tbody>
<tr>
<td>N₁</td>
<td>910</td>
<td>956</td>
</tr>
<tr>
<td>N₂</td>
<td>941</td>
<td>1060</td>
</tr>
<tr>
<td>N₃</td>
<td>1035</td>
<td>1140</td>
</tr>
<tr>
<td>N₄</td>
<td>1119</td>
<td>1410</td>
</tr>
<tr>
<td>N₅</td>
<td>1271</td>
<td>1433</td>
</tr>
<tr>
<td>N₆</td>
<td>1489</td>
<td>1477</td>
</tr>
</tbody>
</table>

| Mean | 1128 | 1246 | 1187 |

S.E. of marginal means of N = 56.4 lb./ac.  
S.E. of marginal means of B = 32.6 lb./ac.  
S.E. of body of table = 79.8 lb./ac.
Crop: .. Tobacco.  
Site: .. Agri. Stn., Ferozepur Cantt.  

Object: - To find if F.Y.M. can be substituted for A/S.

1. BASAL CONDITIONS:
(i) (a) Nil.  (b) Potato.  (c) 50 lb./ac. of N.  (ii) (a) Heavy loam.  (b) N.A.  (iii) 16.2.1952.  (iv) (a) 7 ploughings, 6 sohaga and 1 triphally.  (b) N.A.  (c) 2 oz./marla.  (d) 12"×9".  (e) N.A.  (v) As per treatments.  (vi) T-26 (medium).  (vii) Irrigated.  (viii) 6 toppings and suckering and 5 hoeings.  (ix) 1.86".  (x) 1.2.6.1952.

2. TREATMENTS:
1. F.Y.M. at 100 lb./ac. of N.
2. F.Y.M. at 200 lb./ac. of N.
3. F.Y.M. at 300 lb./ac. of N.
4. A/S at 50 lb./ac. of N.
5. A/S at 100 lb./ac. of N.
6. A/S at 150 lb./ac. of N.
7. A/S at 50 lb./ac. of N+basal dressing.
8. A/S at 100 lb./ac. of N+basal dressing.
9. A/S at 150 lb./ac. of N+basal dressing.
10. Control.


3. DESIGN:
(i) R.B.D.  (ii) (a) 10.  (b) N.A.  (iii) 5.  (iv) (a) 22'×12'.  (b) 22'×10'.  (v) 1' along length of each plot including border and bund left out.  (vi) Yes.

4. GENERAL:
(i) Normal. No lodging.  (ii) Nil.  (iii) Dry wt. of ropes, green wt., no. of leaves/plant, breadth and length of leaves in cm., height in cm., no. of plants at harvest.  (iv) (a) 1951—1953.  (b) No.  (c) Nil.  (v) (a) No.  (b) —.  (vi) and (vii) Nil.

5. RESULTS:
(i) 1136 lb./ac.
(ii) 289.0 lb./ac.
(iii) Treatment differences are highly significant.
(iv) Av. yield of tobacco in lb./ac.

<table>
<thead>
<tr>
<th>Treatment</th>
<th>Av. yield</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>1092</td>
</tr>
<tr>
<td>2.</td>
<td>1091</td>
</tr>
<tr>
<td>3.</td>
<td>1082</td>
</tr>
<tr>
<td>4.</td>
<td>880</td>
</tr>
<tr>
<td>5.</td>
<td>1110</td>
</tr>
<tr>
<td>6.</td>
<td>1360</td>
</tr>
<tr>
<td>7.</td>
<td>1208</td>
</tr>
<tr>
<td>8.</td>
<td>1429</td>
</tr>
<tr>
<td>9.</td>
<td>1480</td>
</tr>
<tr>
<td>10.</td>
<td>624</td>
</tr>
</tbody>
</table>

S.E./mean = 129.3 lb./ac.
2. TREATMENTS:
1. F.Y.M. at 100 lb/ac. of N as basal dose.
2. F.Y.M. at 200 lb/ac. of N as basal dose.
3. F.Y.M. at 300 lb/ac. of N as basal dose.
4. A/S at 50 lb/ac. of N.
5. A/S at 100 lb/ac. of N.
6. A/S at 150 lb/ac. of N.
7. A/S at 200 lb/ac. of N as F.Y.M. as basal dose.
8. A/S at 300 lb/ac. of N as F.Y.M. as basal dose.
9. F.Y.M. one month before planting by broadcast and A/S applied at the time of sowing.
10. Control.

3. DESIGN:
(i) R.B.D. (ii) (a) 10. (b) N.A. (iii) 6. (iv) (a) 22' × 12'. (b) 22' × 10'. (v) 1' border left on two sides of each plot along length. (vi) Yes.

4. GENERAL:
(i) Normal. No lodging. (ii) Nil. (iii) Height in cm., green plant weight, length and breadth of leaf in cm., av. no. of leaves, dry weight of tobacco. (iv) (a) 1951—1953. (b) No. (c) Nil. (v) (a) Nil. (b) —. (vi) and (vii) Nil.

5. RESULTS:
(i) 966.2 lb/ac.
(ii) 380.6 lb/ac.
(iii) Treatment differences are highly significant.
(iv) Av. yield of tobacco in lb/ac.

<table>
<thead>
<tr>
<th>Treatment</th>
<th>Av. yield</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>555.0</td>
</tr>
<tr>
<td>2.</td>
<td>593.7</td>
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<tr>
<td>3.</td>
<td>689.9</td>
</tr>
<tr>
<td>4.</td>
<td>1133.3</td>
</tr>
<tr>
<td>5.</td>
<td>1112.5</td>
</tr>
<tr>
<td>6.</td>
<td>1451.1</td>
</tr>
<tr>
<td>7.</td>
<td>977.6</td>
</tr>
<tr>
<td>8.</td>
<td>1364.5</td>
</tr>
<tr>
<td>9.</td>
<td>1647.1</td>
</tr>
<tr>
<td>10.</td>
<td>493.9</td>
</tr>
</tbody>
</table>

S.E./mean = 170.2 lb/ac.

Crop :- Tobacco.  Ref :- Pb. 51(17).
Site :- Agri. Stn., Ferozepur Cantt.  Type :- ‘M’. 
Object :- To find out the best manurial formula for Tobacco crop.

1. BASAL CONDITIONS:
(i) (a) Nil. (b) Maize (fodder). (c) Nil. (ii) (a) Heavy loam. (b) N.A. (iii) 4.3.1951. (iv) (a) 1 raja ploughing, 6 desi ploughing, 1 tohapa and 1 roller. (b) and (c) N.A. (d) 2 × 1'. (e) N.A. (f) Nil. (vii) N — rustica T-16 (medium). (viii) Irrigated. (ix) N.A. (x) 0.91'. (x) 26.6.1951.

2. TREATMENTS
All combination of (1) and (2)
(1) 2 levels of K₂O: K₀ =0 and K₁ =50 lb/ac. of K₂O as Pot. Sul.
(2) 4 sources of N : N₁=A/S, N₂=Ammo. Phos. N₃=Pot. Nit. and N₄=F.Y.M. each at 100 lb/ac. of N.

3. DESIGN:
(i) 2 × 4 Fact. in R.B.D. (ii) (a) 8. (b) N.A. (iii) 6. (iv) (a) 24' × 10'. (b) 22' × 10'. (v) 1' on each side of a breadth of a plot. (vi) Yes.
4. GENERAL:
(i) Normal. No lodging. (ii) Nil. (iii) Dry wt. of ropes, no of leaves/plant, green wt., length and breadth of leaves in cm, height in cm, no. of plants at harvest. (iv) 1951 to 1953. (b) No. (b) No. (c) Nil. (v) (a) No. (b) —. (vi) and (vii) Nil.

5. RESULTS:
(i) 847.7 lb./ac.
(ii) 114.63 lb./ac.
(iii) N effect is highly significant, K effect is significant while interaction is not significant.
(iv) Av. yield of tobacco in lb./ac.

<table>
<thead>
<tr>
<th></th>
<th>K₀</th>
<th>K₁</th>
<th>Mean</th>
</tr>
</thead>
<tbody>
<tr>
<td>N₁</td>
<td>791.9</td>
<td>898.4</td>
<td>845.2</td>
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<tr>
<td>N₂</td>
<td>1025.7</td>
<td>1091.4</td>
<td>1058.6</td>
</tr>
<tr>
<td>N₃</td>
<td>970.3</td>
<td>1137.2</td>
<td>1053.8</td>
</tr>
<tr>
<td>N₄</td>
<td>441.5</td>
<td>424.7</td>
<td>433.1</td>
</tr>
</tbody>
</table>

Mean 807.4 887.9 847.7

S.E. of marginal mean of N = 33.09 lb./ac.
S.E. of marginal mean of K = 23.40 lb./ac.
S.E. of body of table = 46.80 lb./ac.

Crop :- Tobacco.  
Site :- Agri. Stn., Ferozepur Cantt.  
Object :- To find the best manurial formula for Tobacco crop.

1. BASAL CONDITIONS:
(i) (a) Nil. (b) Guara. (c) Nil. (ii) (a) Heavy loam. (b) N.A. (iii) 17.2.1952. (iv) (a) 8 ploughings 6 sohaga and 2 rollings. (b) N.A. (c) 2 oz./marla. (d) 12'×9'. (e) N.A. (v) Nil. (vi) T-26 (medium). (vii) Irrigated. (viii) 1 gap filling, 3 hoeings, 5 suckerings and topping. (ix) 1.86'. (x) 18.5.1952.

2. TREATMENTS:
All combinations of (1) and (2)
(1) 2 levels of K₂O : K₂=0 and K₂=50 lb./ac. of K₂O as Pot. Sul.
(2) 4 sources of N : N₁=A/S, N₂=Ammo. Phos., N₃=Pot. Nit. and N₄=F.Y.M. each at 100 lb./ac. of N.

3. DESIGN:
(i) 2×4 Fact. in R.B.D. (ii) (a) 8. (b) N.A. (iii) 6. (iv) (a) 22'×12'. (b) 22'×10'. (v) 1' along length of each plot left out as bunds. (vi) Yes.

4. GENERAL:
(i) Good. No lodging. (ii) Nil. (iii) Dry wt. ropes, green wt., no. of leaves/plant, breadth and length of leaves in cm., height in cm., no. of plants at harvest. (iv) (a) 1951 to 1953. (b) No. (c) Nil. (v) (a) No. (b) —. (vi) and (vii) Nil.

5. RESULTS
(i) 1533 lb./ac.
(ii) 223.2 lb./ac.
(iii) Main effect of N alone is highly significant.
(iv) Av. yield of tobacco in lb/ac.

<table>
<thead>
<tr>
<th>N1</th>
<th>N2</th>
<th>N3</th>
<th>N4</th>
<th>Mean</th>
</tr>
</thead>
<tbody>
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<td>1698</td>
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<td>1249</td>
</tr>
<tr>
<td>K₁</td>
<td>1358</td>
<td>1670</td>
<td>1626</td>
<td>1292</td>
</tr>
</tbody>
</table>

Mean: 1602 | 1684 | 1520 | 1271 | 1533

S.E. of marginal mean of K = 45.6 lb/ac.
S.E. of marginal mean of N = 64.4 lb/ac.
S.E. of body of table = 91.1 lb/ac.

Crop: Tobacco.
Site: Agri. Stn., Ferozepur Cantt.
Ref: Pb. 53 (27).
Type: 'M'.

Object: To find out the most suitable manurial combination for Tobacco.

1. BASAL CONDITIONS:
(i) (a) Tobacco-Fallow-Wheat-Guara. (b) Guara. (c) Nil. (ii) (a) Heavy loam. (b) N.A. (iii) 10.11.1953.
(iv) (a) 1 ploughing with raja plough, 7 desi ploughings, 9 plankings and 1 horse hoe. (b) and (c) N.A.
(d) 1' from row to row, 9' from plant to plant. (v) F.Y.M. at 100 lb/ac of N one month before planking by broadcast (vi) T-26 N-rustica (medium). (vii) Irrigated. (viii) 3 hoeings, (ix) 1.42", (x) 4.6.1953.

2. TREATMENTS:
All combinations of (1) and (2)
(1) 2 levels of K₂O as Pot. Sul.: K₂ = 0 and K₁ = 50 lb/ac.
(2) 4 sources of N: N₁ = A/S, N₂ = Ammo. Phos., N₃ = Pot. Nitrate and N₄ = F.Y.M. each at 100 lb/ac. of N.

3. DESIGN:
(i) 2 x 4 Fact. in R.B.D. (ii) (a) 8. (b) N.A. (iii) 6. (iv) (a) 22'x12'. (b) 22'x10'. (v) 1' border along length. (vi) Yes.

4. GENERAL:
(i) Normal. No lodging. (ii) Nil. (iii) Length and breadth of leaf in cm., average height of plant, no. of leaves per plant, green plant weight, no. of plants at harvest, dry weight. (iv) (a) 1951 to 1953. (b) No. (c) Nil. (v) (a) Nil. (b) =. (vi) and (vii) Nil.

5. RESULTS:
(i) 1143 lb/ac.
(ii) 385.4 lb/ac.
(iii) Over all treatments are highly significant. N effect is highly significant while other effects are not significant.
(iv) Av. yield of tobacco in lb/ac.

<table>
<thead>
<tr>
<th>N1</th>
<th>N2</th>
<th>N3</th>
<th>N4</th>
<th>Mean</th>
</tr>
</thead>
<tbody>
<tr>
<td>K₀</td>
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<td>1432</td>
<td>1646</td>
<td>598</td>
</tr>
<tr>
<td>K₁</td>
<td>1178</td>
<td>1143</td>
<td>1443</td>
<td>414</td>
</tr>
</tbody>
</table>

Mean: 1234 | 1288 | 1545 | 506 | 1144

S.E. of marginal mean of K = 78.7 lb/ac.
S.E. of marginal mean of N = 111.2 lb/ac.
S.E. of body of table = 222.5 lb/ac.
Crop :- Tobacco.  
Site :- Agri. Stn., Ferozepur.

Object :- To find out the best manurial formula for Tobacco.

1. BASAL CONDITIONS:
(i) (a) Nil.  
(ii) (a) Heavy loam.  
(iii) 2.3.1952.  
(iv) (a) 1 tractor ploughing, 7 ploughings, 9 plankings and 2 rollers.  
(b) N.A.  
(c) 10 lb./ac.  
(d) 1'x1'.  
(e) N.A.  
(v) Nil.  
(vi) T-23 (early).  
(vii) Irrigated.  
(viii) 1 gap filling, 4 hoeings, 6 toppings and suckering.  
(ix) 1.86'.  
(x) 19.6.1952.

2. TREATMENTS:

Main-plot treatments:
- 2 levels of F.Y.M. : F0 = 0 and F1 = 300 lb./ac. of N as F.Y.M.

Sub-plot treatments:
- 8 manurial combinations:
  - M0 = Control (no manure), M1 = A/S at 100 lb./ac. of N, M2 = G.N.C. at 100 lb./ac. of N, M3 = A/S at 100 lb./ac. of N+G.N.C. at 100 lb./ac. of N, M4 = A/S at 100 lb./ac. of N+Super at 50 lb./ac. of P2O5, M5 = A/S at 50 lb./ac. of N+Super at 50 lb./ac. of P2O5.
  - G.N.C., F.Y.M. and Super applied one month before planting and 1 dose of A/S applied before planting, 1 dose applied one month after planting, 1 dose applied on 22.4.1952 at the time of topping.

3. DESIGN:
- (i) Split-plot  
- (ii) (a) 2 main-plots/block and 8 sub-plots/main-plot.  
- (b) N.A.  
- (iii) 6.  
- (iv) (a) N.A.  
- (b) 36'x8'.  
- (v) N.A.  
- (vi) Yes.

4. GENERAL:
- (i) Normal. No lodging.  
- (ii) Nil.  
- (iii) Dry wt., pit wt. of stalk and rope, green wt., no. of leaves/plant, breadth and length of leaves in cm., height in cm., no. of plants at harvest.  
- (iv) (a) 1952 to 1954.  
- (b) No.  
- (c) Nil.  
- (v) (a) No.  
- (vi) Yes.  
- (vii) Nil.

5. RESULTS:
- (i) 334.4 lb./ac.  
- (ii) (a) 273.2 lb./ac.  
- (b) 162.7 lb./ac.

(iii) Main-plot treatment effects and interaction (main-plot x sub-plot) are not significant. Sub-plot treatment effects are highly significant.

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

<table>
<thead>
<tr>
<th></th>
<th>M0</th>
<th>M1</th>
<th>M2</th>
<th>M3</th>
<th>M4</th>
<th>M5</th>
<th>M6</th>
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<td>858.9</td>
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<td>941.5</td>
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<td>834.4</td>
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S.E. of difference of two:
1. F marginal means = 55.8 lb./ac.
2. M marginal means = 66.4 lb./ac.
3. M means at the same level of F = 93 lb./ac.
4. F means at the same level of M = 104.1 lb./ac.
Crop :- Tobacco.  
Object :- To find out best manurial formula for Tobacco.

1. BASAL CONDITIONS:
   (i) (a) Tobacco-Fallow-Wheat-Guara. (b) Guara.  (c) No.  (ii) (a) Heavy loam. (b) N.A.
   (iii) 25/26.2.1953. (iv) (a) 1 ploughing with raja plough, 6 desi ploughings and 7 plankings. 
   (b) and (c) N.A. (d) 1' from row to row and 9" from plant to plant. (e) N.A. (v) As per treatments.
   (vi) T-26 N—rastica (medium). (vii) Irrigated. (viii) 3 hoeings and weedicings. (ix) 0.34”.  (x) 21.5.1953 
   and 29.5.1953.

2. TREATMENTS:
   Main-plot treatments:
   2 levels of F.Y.M.: F₀ = No F.Y.M. and F₁ = 300 lb./ac. of N as F.Y.M.
   Sub-plot treatments:
   8 manural combinations: M₀ = Control (no manure), M₁ = A/S at 100 lb./ac. of N, M₂ = G.N.C. at 
   100 lb./ac. of N, M₃ = A/S at 50 lb./ac. of N+G.N.C. at 50 lb./ac. of N, M₄ = A/S at 100 lb./ac. of N 
   +Super at 50 lb./ac. of P₂O₅, M₅ = G.N.C. at 100 lb./ac. of N + Super at 50 lb./ac. of P₂O₅, M₆ = 
   A/S at 50 lb./ac. of N + G.N.C. at 50 lb./ac. of N + Super at 50 lb./ac. of P₂O₅, and M₇ = Super at 
   50 lb./ac. of P₂O₅.
   G.N.C., F.Y.M. and Super applied one month before planting, while A/S applied one week before 
   planting, 1/2 dose applied three weeks after planting and 1/2 applied at topping time. G.N.C. was applied 
   in plough furrows. A/S was broadcast.

3. DESIGN:
   (i) Split-plot. (ii) (a) 2 main-plots/block ; 8 sub-plots/main-plot. (b) N.A. (iii) 6. (iv) (a) 41’×9½’. 
   (b) 36’×8’. (v) N.A. (vi) Yes.

4. GENERAL:
   (i) Normal. No lodging. (ii) Nil. (iii) No. of plants at harvest, length in cm., date of flowering, average no. 
   of leaves, length and breadth of leaf in cm., green plant weight.  (iv) (a) 1952 to 1954. (b) No.  (c) 
   Nil.  (v) (a) Nil. (b)—.  (vi) and (vii) Nil.

5. RESULTS:
   (i) 1250 lb./ac.
   (ii) (a) 637.9 lb./ac.
   (b) 276.8 lb./ac.
   (iii) Sub-plot treatment effects are highly significant. Main-plot treatment effects and interaction main- 
   plot x sub-plot are not significant.
   (iv) Av. yield of tobacco in lb./ac.

<table>
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<tr>
<th></th>
<th>M₀</th>
<th>M₁</th>
<th>M₂</th>
<th>M₃</th>
<th>M₄</th>
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S.E. of difference of two
1. F marginal means = 120.2 lb./ac.
2. M marginal means = 113.0 lb./ac.
3. M means at the same level of F = 129.8 lb./ac.
4. F means at the same level of M = 198.2 lb./ac.
Crop :- Tobacco. Ref :- Pb. 52(90).
Site :- Agri. Stn., Ferozepur. Type :- 'M'.

Object:- To find out the best manurai formula for Tobacco.

1. BASAL CONDITIONS :
(i) (a) Nil. (b) Fallow. (c) Nil. (ii) (a) Heavy loam. (b) N.A. (iii) 27, 28.2.1952. (iv) (a) 5 desi ploughings, 6 sohaga and 3 rollerings. (b) N.A. (c) 2 oz./marla. (d) 1'x9". (e) N.A. (v) Nil. (vi) T-26 N-rustica (medium). (vii) Irrigated. (viii) 1 gap filling, 5 hoeings, 6 toppings and suckering. (ix) 1.86' (x) 24.5.1952.

2. TREATMENTS :
Main-plot treatments :
2 levels of F.Y.M. : F<sub>0</sub> = No F.Y.M. and F<sub>1</sub> = 300 lb./ac. of N as F.Y.M.
Sub-plot treatments :
8 manurai combinations : M<sub>0</sub> = Control (no manure), M<sub>1</sub> = A/S at 100 lb./ac. of N, M<sub>2</sub> = G.N.C. at 100 lb./ac. of N, M<sub>3</sub> = A/S at 50 lb./ac. of N+G.N.C. at 50 lb./ac. of N, M<sub>4</sub> = A/S at 100 lb./ac. of N+Super at 50 lb./ac. of P<sub>2</sub>O<sub>5</sub>, M<sub>5</sub> = G.N.C. at 100 lb./ac. of N+Super at 50 lb./ac. of P<sub>2</sub>O<sub>5</sub>, M<sub>6</sub> = A/S at 50 lb./ac. of N+G.N.C at 50 lb./ac. of N+Super at 50 lb./ac. of P<sub>2</sub>O<sub>5</sub> and M<sub>7</sub> = Super at 50 lb./ac. of P<sub>2</sub>O<sub>5</sub>


3. DESIGN :
(i) Split-plot. (ii) (a) 2 main-plots/block and 8 sub-plots/main-plot. (b) N.A. (iii) 6. (iv) (a) 42.3'x10'. (b) 36.3'x8'. (v) N.A. (vi) Yes.

4. GENERAL :
(i) Normal. No lodging. (ii) Nil. (iii) Dry wt. no. of leaves/plant, breadth and length of leaves in cm., height in cm. and no. of plants at harvest. (iv) (a) 1952 to 1954. (b) No. (c) Nil. (v) (a) No. (b)—. (vi) and (vii) Nil.

5. RESULTS :
(i) 1554 lb./ac.
(ii) (a) 334.7 lb./ac.
(iii) Main-plot treatment effects are significant, sub-plot treatment effects are highly significant, while interaction main-plot x sub-plot is not significant.
(iv) Av. yield of tobacco in lb./ac.

<table>
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<tr>
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<th>M&lt;sub&gt;1&lt;/sub&gt;</th>
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S.E. of difference of two
1. F marginal means = 68.3 lb./ac.
2. M marginal means = 104.1 lb./ac.
3. M means at the same level of F = 147.2 lb./ac.
4. F means at the same level of M = 153.6 lb./ac.
Crop: Tobacco.
Site: Agri. Stn., Ferozepur Cantt.

Objective: To find out the best manurial formula for Tobacco.

1. Basal Conditions:
   (i) Tobacco—Fallow—Wheat—Guara.
   (ii) Heavy loam.
   (iii) 2,3,3.1953.
   (iv) Ploughing with raja plough, 6 desi ploughings and 7 plankings.
   (v) Irrigated.
   (vi) Crop 1952 to 1954.

2. Treatments:

   Main-plot treatments: 2 levels of F.Y.M.: F0 = No F.Y.M. and F1 = 300 lb./ac. of N as F.Y.M.
   Sub-plot treatments: 8 combinations of manures: M0 = Control, (no manure), M1 = A/S at 100 lb./ac. of N, M2 = G.N.C. at 100 lb./ac. of N, M3 = A/S at 50 lb./ac. of N, M4 = G.N.C. at 100 lb./ac. of N, M5 = Super at 50 lb./ac. of P, M6 = A/S at 50 lb./ac. of N + Super at 50 lb./ac. of P.

3. Design:
   (i) Split-plot. (ii) 2 main-plots/block and 8 sub-plots/main-plot.
   (iii) 6.
   (iv) (a) N.A. (b) 22.9.51.

4. General:
   (i) Normal. No lodging. (ii) Nil. (iii) Number of leaves, height in cm., length and breadth of leaves in cm. and dry leaf weight.

5. Results:
   (i) Mean yield of tobacco in lb./ac.

<table>
<thead>
<tr>
<th></th>
<th>M0</th>
<th>M1</th>
<th>M2</th>
<th>M3</th>
<th>M4</th>
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<td>690.1</td>
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S.E. of difference of two
1. F marginal means = 50.0 lb./ac.
2. M marginal means = 72.6 lb./ac.
3. M means at the same level of F = 102.6 lb./ac.
4. F means at the same level of M = 108.3 lb./ac.
Crop : Tobacco.  
Site : Agri. Stn., Ferozepur Cantt.  
Ref : Pb. 52(89).  
Type : 'M'.  

Object : To find out response of different manures to N. rustica variety of Tobacco.

1. BASAL CONDITIONS:
(i) (a) Nil. (b) Fodder. (c) Nil. (ii) (a) Heavy loam. (b) N.A. (iii) 18, 19.2.1952. (iv) (a) 6 ploughings, 5 sowage and 3 roller. (b) and (c) N.A. (d) 12'9'. (e) N.A. (vi) Nil. (vii) T-26 (medium). (viii) Irrigated. (ix) 2 gap fillings, 3 hoeings, 4 toppings and suckering. (ix) 1.86'. (x) 17.5.1952 and 25.5.1952.

2. TREATMENTS:
Main-plot treatments:
- 2 levels of F.Y.M. : F₀=0, and F₁=100 lb./ac. of N as F.Y.M.
Sub-plot treatments:
All combinations of (1), (2) and (3)
(i) 2 levels of N as A/S : N₀=0 and N₁=100 lb./ac.
(ii) 2 levels of P₂O₅ as Super : P₀=0 and P₁=50 lb./ac.
(iii) 2 levels of K₂O as Pot. Sul. : K₀=0 and K₁=50 lb./ac.

3. DESIGN:
(i) Split-plot. (ii) (a) 2 main-plots/replication ; 8 sub-plots/main-plot, 4 sub-plots/block partially confounding NP, NK, PK and NPK. (b) N.A. (iii) 4. (iv) (a) 42' x 10'. (b) 36'3' x 8'9'. (v) N.A. (vi) Yes.

4. GENERAL:
(i) Setting and growth good ; crop normal. No lodging. (ii) Nil. (iii) Dry wt. and green wt., no. of leaves per plant, breadth and length of leaves in cm., height in cm. and no. of plants at harvest. (iv) (a) 1952 to 1954. (b) No (c) Nil. (v) (a) No (b) --. (vi) and (vii) Nil.

5. RESULTS:
(i) 1437 lb./ac.
(ii) (a) 117.1 lb./ac.
(b) 244.3 lb./ac.

(iii) Main effects of F is not significant. N effect is highly significant, P₂O₅ effect is significant, while all others are not significant.
(iv) Av. yield of tobacco in lb./ac.

|       | N₀  | N₁  | P₀   | P₁   | K₀  | K₁  | Mean
|-------|-----|-----|------|------|-----|-----|------
| F₀    | 1123| 1601| 1294 | 1429 | 1360| 1364| 1362 |
| F₁    | 1344| 1680| 1453 | 1371 | 1431| 1594| 1512 |
| Mean  | 1233| 1641| 1374 | 1503 | 1395| 1479| 1437 |
| K₀    | 1223| 1567| 1327 | 1463 |      |     |      |
| K₁    | 1243| 1714| 1420 | 1538 |      |     |      |
| P₀    | 1214| 1533|      |      |      |     |      |
| P₁    | 1252| 1748|      |      |      |     |      |

S.E. of difference of two:
1. F marginal means = 29.3 lb./ac.
2. N, P or K marginal means = 61.1 lb./ac.
3. N, P or K means at the same level of F = 86.4 lb./ac.
4. F means at the same level of N, P or K = 67.7 lb./ac.
5. means in body of NP, PK or NK table = 86.4 lb./ac.
Crop : Tobacco  
Ref: Pb. 53(26).  
Site : Agri. Stn., Ferozepur Cantt.  
Type : 'M'.

Object : To find out the response of different manures to N. rustica variety of Tobacco.

1. BASAL CONDITIONS:
   (i) (a) Tobacco-Fallow-Wheat-Guara. (b) Guara. (c) No. (ii) (a) Heavy loam. (b) N.A.
   (iii) 18, 19, 2, 1953. (iv) (a) 1 raje plough, 8 sohaga, 5 desi ploughings and 1 horse hoe. (b) and (c) N.A.
   (d) 12''x9''. (e) N.A. (v) Nil. (vi) T-26 improved (medium). (vii) Irrigated. (viii) 3 hoeings and
   weeding. (ix) 0.34''. (x) 20.5.1953 to 27.5.1953.

2. TREATMENTS:
   Main-plot treatments:
   2 levels of F.Y.M. : F0 = No F.Y.M., F1 = F.Y.M. at 100 lb./ac. of N.
   Sub-plot treatments:
   All combinations of (1), (2) and (3)
   (1) 2 levels of N as A/S : N0 = 0 and N1 = 100 lb./ac.
   (2) 2 levels of P2O5 as Super : P0 = 0 and P1 = 50 lb./ac.
   (3) 2 levels of K2O as Pot. Sul : K0 = 0 and K1 = 50 lb./ac.

3. DESIGN:
   (i) Split-plot. (ii) (a) 2 main-plots/replication ; 2 blocks/main-plot and 4 sub-plots/block. Interaction NP
   NK, PK and NPK are partially confounded. (b) N.A. (iii) 4. (iv) (a) 41''x9''. (b) 36''x8''. (v) One
   guard row on each side. (vi) Yes.

4. GENERAL:
   (i) Normal. No lodging. (ii) Nil. (iii) Height in cm., no. of leaves/plant, green plant wt., length and
   breadth of leaf in cm., no. of plants at harvest. (iv) (a) 1952 to 1954. (b) No. (c) Nil. (v) (a) No, (b) --.
   (vi) and (vii) Nil.

5. RESULTS:
   (i) 1159.3 lb./ac.
   (ii) (a) 1134.4 lb./ac.
   (b) 223.5 lb./ac.
   (iii) F effect is not significant. N effect is highly significant and P2O5 effect is significant. Others are
   not significant.
   (iv) Av. yield of tobacco in lb./ac.

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S.E. of difference of two
1. F marginal means = 283.6 lb./ac.
2. N, P or K marginal means = 55.9 lb./ac.
3. N, P or K means at the same level of F = 79.0 lb./ac.
4. F means at the same level of N, P or K = 289.1 lb./ac.
5. means in the body of NP, PK or NK table = 79.0 lb./ac.
Crop :- Tobacco.
Site :- Agri. Stn., Ferozepur Cantt.

Object :- To find out if A/S can be substituted by C/N.

1. BASAL CONDITIONS :
   (i) (a) Nil. (b) Guara. (c) Nil. (ii) (a) Heavy loam. (b) N.A. (iii) 1.3.1952. (iv) (a) 1 tractor ploughing, 9 har and 8 plankings. (b) N.A. (c) 10 lb./ac. (d) 1' x 1' 4". (e) N.A. (v) Nil. (vi) T-21 (medium). (vii) Irrigated. (viii) 2 gap filling, 5 hoeings 2 toppings and suckering. (ix) 1.86'. (x) 19.6.1952.

2. TREATMENTS :
   All combinations of (1) and (2) + a Control.
   (1) 2 sources of N : S1 = A/S and S2 = C/N.
   (2) 2 doses of N : N1 = 100 and N2 = 200 lb./ac.
   Fertilizers applied on 12.2.1952 by broadcast method.

3. DESIGN :
   (i) R.B.D. (ii) (a) 5. (b) N.A. (iii) 6. (iv) (a) and (b) 36' x 10' (v) Nil. (vi) Yes.

4. GENERAL :
   (i) Normal. No lodging. (ii) Nil. (iii) Dry wt., pit weight of stalk and ropes, green wt. in lb., no. of leaves per plant, breadth and length of leaves in cms., height in cms., no. of plants at harvest. (iv) (a) 1952-1954. (b) No. (c) Nil. (v) (a) No. (b)—. (vi) Nil. (vii) Treatments changed for experiment in 53 (23) and onwards.

5. RESULTS :
   (i) 1050 lb./ac.
   (ii) 223.2 lb./ac.
   (iii) Overall treatments are highly significantly different. "Control vs. other treatments" is highly significant, while others do not differ significantly.
   (iv) Av. yield of tobacco in lb./ac.

   Control = 585 lb./ac.

   \[
   \begin{array}{ccc}
   & S_1 & S_2 & \text{Mean} \\
   N_1 & 1099 & 1342 & 1221 \\
   N_2 & 972 & 1252 & 1112 \\
   \text{Mean} & 1036 & 1297 & 1167 \\
   \end{array}
   \]

   S.E. of any marginal mean = 6.4 lb./ac.
   S.E. of body of table = 9.1 lb./ac.

   Crop :- Tobacco.
   Site :- Agri. Stn., Ferozepur Cantt.

   Object :- To study the relative efficiency of C/N and A/S as sources of N for Tobacco.

1. BASAL CONDITIONS :
   (i) (a) Tobacco—Fallow—Wheat—Guara. (b) Guara. (c) Nil. (ii) (a) Heavy loam. (b) N.A. (iii) 3-4-5-1953. (iv) (a) 1 raja ploughing, 6 desi ploughings, 7 plankings and 1 horse hoe. (b) and (c) N.A. (d) 1' from row to row, 9' from plant to plant. (e) N.A. (v) Nil. (vi) T-21 N. Tobacco. (late). (vii) Irrigated. (viii) 3 hoeings including weeding. (ix) 1.37'. (x) 8.6.1953 and 16.6.1953.
2. TREATMENTS:

Main-plot treatments:
- 2 levels of F.Y.M.: \( F_0 = \text{no F.Y.M.}, \quad F_1 = \text{F.Y.M. at 100 lb./ac. of N} \)

Sub-plot treatments:
- \( M_0 = \text{Control (no manure)} \)
- \( M_1 = \text{A/S at 100 lb./ac. of N} \)
- \( M_2 = \text{A/S at 200 lb./ac. of N} \)
- \( M_3 = \text{C/N at 100 lb./ac. of N} \)
- \( M_4 = \text{C/N at 200 lb./ac. of N} \)

Fertilizers were applied at planting and half at flowering by broadcast with irrigation.

3. DESIGN:

(i) Split-plot.  (ii) (a) 2 main-plots/block; 5 sub-plots/main-plot.  (b) N.A.  (iii) 6.  (iv) (a) 22'×9'  (b) 22'×8'.  (v) One row on each side.  (vi) Yes.

4. GENERAL:

(i) Normal.  No lodging.  (ii) Nil.  (iii) No. of plants at the time of harvest, height in cm., date of flowering, average no. of leaves per plant, length and breadth of leaf in cm., green plant weight in cm., dry leaf weight.  (iv) (a) 1952 to 1954.  (b) No.  (c) Nil.  (v) (a) No.  (b) Nil.  (vi) and (vii) Nil.

5. RESULTS:

(i) 1011 lb./ac.
(ii) (a) 571.6 lb./ac.
(b) 281.3 lb./ac.
(iii) Sub-plot treatments effect is highly significant.
(iv) Av. yield of tobacco 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>( F_0 )</td>
<td>1575</td>
<td>331</td>
<td>634</td>
<td>1151</td>
<td>1114</td>
<td>961</td>
</tr>
<tr>
<td>( F_1 )</td>
<td>1681</td>
<td>445</td>
<td>758</td>
<td>1063</td>
<td>1360</td>
<td>1061</td>
</tr>
</tbody>
</table>

Mean: 1628, 388, 696, 1107, 1237, 1011

S.E. of difference of two
1. F marginal means: 147.6 lb./ac.
2. M marginal means: 114.8 lb./ac.
3. M means at the same level of F: 162.4 lb./ac.
4. F means at the same level of M: 207.1 lb./ac.

Crop: Tobacco.
Site: Agri. Stn., Ferozepur Cantt.
Ref: Pb. 52(96).
Type: 'M'.

Object: To study the effect of micro-nutrients on the yield and quality of Tobacco.

1. BASAL CONDITIONS:
(i) (a) Nil.  (b) Fallow.  (c) Nil.  (ii) (a) Heavy loam.  (b) N.A.  (iii) 10.3.1952.  (iv) (a) 6 hal, 5 sohaga and 3 roller.  (b) N.A.  (c) 2 oz./marla.  (d) 12'×9'.  (e) N.A.  (v) F.Y.M. at 100 lb./ac. of N applied on 12.2.52 by broadcast.  (vi) T-26 (medium).  (vii) Irrigated.  (viii) Two gap filling, 3 hoeings, 3 topings and suckering.  (ix) 1.86'.  (x) 17.3.1952 and 25.5.1952.

2. TREATMENTS:
1. 2 lb./ac. of Borax.
2. 3 lb./ac. of Borax.
3. 4 lb./ac. of Borax.
4. Control.

3. DESIGN:
(i) R.B.D.  (ii) 4.  (b) N.A.  (iii) 4.  (iv) (a) N.A.  (b) 6'×11'.  (v) N.A.  (vi) Yes.
4. GENERAL:
(i) Setting poor; growth normal. No lodging. (ii) Nil. (iii) Dry wt. of ropes, green wt. in lb., no. of leaves/plant, breadth and length of leaves in cm., height in cm. and no. of plants at harvest. (iv) (a) No. (b) and (c) --. (v) (a) No. (b) --. (vi) and (vii) Nil.

5. RESULTS:
(i) 3034 lb./ac.
(ii) 563.1 lb./ac.
(iii) Treatments are not significantly different.
(iv) Av. yield of tobacco in lb./ac.

<table>
<thead>
<tr>
<th>Treatment</th>
<th>Av. yield</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>3016</td>
</tr>
<tr>
<td>2.</td>
<td>3235</td>
</tr>
<tr>
<td>3.</td>
<td>3209</td>
</tr>
<tr>
<td>4.</td>
<td>2677</td>
</tr>
<tr>
<td>S.E./mean</td>
<td>=281.6 lb./ac.</td>
</tr>
</tbody>
</table>

Object: - To find out the best method of curing Tobacco leaves.

1. BASAL CONDITIONS:
(i) (a) Nil. (b) Charli. (c) Nil. (ii) (a) Heavy loam. (b) N.A. (iii) 22.2.1951. (iv) (a) 1 ploughing with raja plough, 5 desi ploughings, one disc harrowing and planking. (b) and (c) N.A. (d) 1' x 1½'. (e) N.A. (v) 200 lb./ac. of N as F.Y.M. a month before planting. (vi) T.21 (medium). (vii) Irrigated. (viii) one gap filling, one interculture with hoe, one topping and suckering. (ix) 0.91'. (x) 26.6.1951.

2. TREATMENTS:
1. Sun curing by cutting ½ of stem.
2. Sun curing whole plant.
3. Sun curing by priming.
4. Shade curing whole plant.
5. Shade curing by priming.

3. DESIGN:
(i) R.B.D. (ii) (a) 5. (b) N.A. (iii) 6. (iv) (a) and (b) 22' x 7½'. (v) Nil. (vi) Yes.

4. GENERAL:
(i) Normal. No lodging. (ii) Nil. (iii) Dry wt., pit wt. of stalk and ropes, green wt., no. of leaves/plant length and breadth of leaves in cm., height in cm., no. of plants at harvest and yield. (iv) (a) 1951 to 1952. (b) No. (c) Nil. (v) (a) No. (b) --. (vi) and (vii) Nil.

5. RESULTS:
(i) 944.7 lb./ac.
(ii) 145.57 lb./ac.
(iii) Treatment effects are not significant.
(iv) Av. yield of tobacco in lb./ac.

<table>
<thead>
<tr>
<th>Treatment</th>
<th>Av. yield</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>905.1</td>
</tr>
<tr>
<td>2.</td>
<td>1097.5</td>
</tr>
<tr>
<td>3.</td>
<td>916.5</td>
</tr>
<tr>
<td>4.</td>
<td>882.5</td>
</tr>
<tr>
<td>5.</td>
<td>912.1</td>
</tr>
<tr>
<td>S.E./mean</td>
<td>=59.4 lb./ac.</td>
</tr>
</tbody>
</table>
Crop: Tobacco.  
Site: Agri. Stn., Ferozepur Cantt.  
Type: ‘C’.  
Ref.: Pb. 52(84).

Object:—To find out the best method of curing Tobacco leaves.

1. BASAL CONDITIONS:
   (i) (a) Nil.  (b) Fallow.  (c) Nil.  (ii) (a) Heavy loam.  (b) N.A.  (iii) 29.2.1952.  (iv) (a) 1 tractor ploughing, 9 ploughings and 8 plankings.  (b) N.A.  (c) 10 lb./ac.  (d) 1' x 1'4'.  (e) N.A.  (v) 200 lb./ac. of N as F.Y.M. applied on 18.2.1952 ten days before planting by broadcast.  (vi) T.21 (medium).  (vii) Irrigated.  (viii) 2 gap fillings, 5 hoeings, 2 toppings and suckering.  (ix) 1.86°.  (x) 18.6.1952.

2. TREATMENTS:
   1. Sun curing by cutting half stalk at the base.
   2. Sun curing whole plant.
   3. Sun curing by priming.
   4. Shade curing whole plant.
   5. Shade curing by priming.

3. DESIGN:
   (i) R.B.D.  (ii) (a) 5.  (b) N.A.  (iii) 3.  (iv) (a) and (b) 22' x 7'.  (v) Nil.  (vi) Yes.

4. GENERAL:
   (i) Normal. No lodging.  (ii) Nil.  (iii) Dry wt., pit wt. of stalk and rope, green wt. in lb., number of leaves/plant, breadth and length of leaves in cm., height in cm., no. of plants at harvest and tobacco yield.  (iv) (a) 1951 to 1952.  (b) No.  (c) Nil.  (v) (a)Nil.  (b) —.  (vi) and (vii) Nil.

5. RESULTS:
   (i) 571.4 lb./ac.
   (ii) 169.5 lb./ac.
   (iii) Treatments do not differ significantly.
   (iv) Av. yield of tobacco in lb./ac.
   Treatment	Av. yield
   1.	410.1
   2.	715.6
   3.	627.9
   4.	588.3
   5.	514.8
   S E./mean = 69.2 lb./ac.

Crop: Tobacco.  
Site: Agri. Stn., Ferozepur Cantt.  
Type: ‘C’.  
Ref.: Pb. 49 (51).

Object:—To find the effect of topping and suckering on yield and quality of Tobacco.

1. BASAL CONDITIONS:
   (i) (a) Nil.  (b) Guara.  (c) Nil.  (ii) (a) Clay loam.  (b) N.A.  (iii) 23.2.1949.  (iv) (a) 5 ploughings and 7 suhga.  (b) and (c) N.A.  (d) 1' x 1'.  (e) N.A.  (v) 24 C.L. of F.Y.M.  (vi) T-12 (medium).  (vii) Irrigated.  (viii) Topping and suckering as per treatments, 4 to 5 hoeings.  (ix) 8.77°.  (x) 17.6.1949 to 15.7.1949.

2. TREATMENTS:
   All combinations of (1) and (2)
   (1) Two levels of suckering: S0 = No suckering and S1 = Suckering.
   (2) 4 stages of topping: T1 = Topping at 12 leaf stage, T2 = Topping at 15 leaf stage, T3 = Topping at 18 leaf stage and T4 = Topping at flowering stage.

3. DESIGN:
   (i) 2 x 4 Fact, in R.B.D.  (ii) (a) 8.  (b) N.A.  (iii) 6.  (iv) (a) and (b) 55' x 12'.  (v) Nil.  (vi) Yes.
4. GENERAL:

(i) Good. Setting good, growth good. No lodging. (ii) Nil. (iii) Rope wt./plot. (iv) (a) 1949 to 1951. (b) No. (c) Nil. (v) (a) Nil. (b) —. (vi) and (vii) Nil.

5. RESULTS:

(i) 1487 lb./ac.
(ii) 140.9 lb./ac.
(iii) Topping effect is not significant. Suckering effect is highly significant. Interaction is significant.
(iv) Av. yield of tobacco in lb./ac.

<table>
<thead>
<tr>
<th></th>
<th>T1</th>
<th>T2</th>
<th>T3</th>
<th>T4</th>
<th>Mean</th>
</tr>
</thead>
<tbody>
<tr>
<td>S₀</td>
<td>1291</td>
<td>1256</td>
<td>1398</td>
<td>1146</td>
<td>1249</td>
</tr>
<tr>
<td>S₁</td>
<td>1621</td>
<td>1629</td>
<td>1840</td>
<td>1810</td>
<td>1725</td>
</tr>
<tr>
<td>Mean</td>
<td>1456</td>
<td>1445</td>
<td>1569</td>
<td>1478</td>
<td>1487</td>
</tr>
</tbody>
</table>

S.E. of marginal means of T = 40.7 lb./ac.
S.E. of marginal means of S = 28.8 lb./ac.
S.E. of body of table = 57.5 lb./ac.


Object: To find out the effect of topping and suckering on yield of Tobacco.

1. BASAL CONDITIONS:

(i) (a) Nil. (b) Guara. (c) Nil. (ii) (a) Clay loam. (b) N.A. (iii) 20, 21.2.1930. (iv) (a) 6 ploughings and 6 sowaga. (b) N.A. (c) 3/4 oz./marla. (d) 15'×9'. (e) N.A. (v) 28 C.I./ac. of F.Y.M. one week before planting. (vi) T-12 (vii) Irrigated. (viii) Suckering, topping as per treatments and 4 to 5 hoeings. (ix) 119''. (x) 18.6 1950.

2. TREATMENTS:

Main-plot treatments: 2 levels of suckering: A₁=Suckering and topping and A₂=Suckering and no topping.

Sub-plot treatments: 4 stages of topping: T₁=12 leaf-stage, T₂=15 leaf-stage, T₃=18 leaf-stage and T₄=flowering stage.

3. DESIGN:

(i) Split-plot. (ii) (a) 2 main-plots/block; 4 sub-plots/main-plot. (b) N.A. (iii) 6. (iv) sub-plot (a) N.A. (b) 27'×12'. (v) N.A. (vi) Yes.

4. GENERAL:

(i) Satisfactory. No lodging. (ii) Nil. (iii) Growth, height, no. of plants at harvest, rope wt./plot. (iv) (a) 1949 to 1951. (b) No. (c) Nil (v) (a) Nil. (b) Nil. (vi) and (vii) Nil.

5. RESULTS:

(i) 1532 lb./ac.
(ii) (a) 125.8 lb./ac
(b) 191.0 lb./ac.
(iii) None of the effects is significant.
(iv) Av. yield of tobacco in lb./ac.

<table>
<thead>
<tr>
<th></th>
<th>T1</th>
<th>T2</th>
<th>T3</th>
<th>T4</th>
<th>Mean</th>
</tr>
</thead>
<tbody>
<tr>
<td>A1</td>
<td>1439</td>
<td>1523</td>
<td>1459</td>
<td>1554</td>
<td>1494</td>
</tr>
<tr>
<td>A2</td>
<td>1462</td>
<td>1546</td>
<td>1635</td>
<td>1635</td>
<td>1570</td>
</tr>
<tr>
<td>Mean</td>
<td>1451</td>
<td>1535</td>
<td>1547</td>
<td>1595</td>
<td>1532</td>
</tr>
</tbody>
</table>

S.E. of difference of two
1. A marginal means = 36.3 lb./ac.
2. T marginal means = 77.9 lb./ac.
3. T means at the same level of A = 110.3 lb./ac.
4. A means at the same level of T = 102.2 lb./ac.

Crop: Tobacco.
Site: Agri. Stn., Ferozepur Cahtt.
Ref: Pb. 51(13).
Type: ‘C’.

Object: To study the effect of topping and suckering on the yield of Tobacco.

1. BASAL CONDITIONS:
   (i) (a) Nil. (b) Fallow. (c) Nil.
   (ii) (a) Heavy loam. (b) N.A.
   (iii) 15.12.1951.
   (iv) (a) 1 ploughing by raja plough, 4 desi ploughings, 2 roller and 6 plankings. (b) and (c) N.A.
   (v) 200 lb./ac of N as F.Y.M. applied one and a half month before planting. Other details N.A.
   (vi) T-21(medium).
   (vii) Irrigated.
   (viii) 1 gap filling 1 topping and suckering. (ix) 0.91’. (x) 18.6.1951.

2. TREATMENTS:
   All combinations of (1) and (2)
   (1) 2 levels of suckering: S0=No suckering, S1=suckering;
   (2) 4 stages of topping: T1=Topping at 12 leaf stage, T2=Topping at 15 leaf stage, T3=Topping at 18 leaf stage and T4=Topping at flowering stage.

3. DESIGN:
   (i) 2 x 4 Fact. in R B.D. (ii) (a) 8: (b) N.A. (iii) 6. (iv) (a) and (b) 27’ x 10’.
   (v) Nil. (vi) Yes.

4. GENERAL:
   (i) Normal. No lodging. (ii) Nil. (iii) Dry wt., pit wt. of stalk and ropes, green wt., no. of leaves/plant length and breadth of leaves in cms, height in cms., no. of plants at harvest. (iv) (a) 1949—1951. (b) No.
   (c) Nil. (v) (a) No. (b)—. (vi) and (vii) Nil.

5. RESULTS:
   (i) 908.2 lb./ac.
   (ii) 227.11 lb./ac.
   (iii) None of the effects is significant.
   (iv) Av. yield of tobacco in lb./ac.

<table>
<thead>
<tr>
<th></th>
<th>T1</th>
<th>T2</th>
<th>T3</th>
<th>T4</th>
<th>Mean</th>
</tr>
</thead>
<tbody>
<tr>
<td>S0</td>
<td>878.1</td>
<td>807.2</td>
<td>912.7</td>
<td>974.9</td>
<td>893.2</td>
</tr>
<tr>
<td>S1</td>
<td>955.9</td>
<td>864.3</td>
<td>981.8</td>
<td>890.2</td>
<td>923.1</td>
</tr>
<tr>
<td>Mean</td>
<td>917.0</td>
<td>835.8</td>
<td>947.3</td>
<td>932.6</td>
<td>908.2</td>
</tr>
</tbody>
</table>

S.E. of marginal means of T = 65.56 lb./ac.
S.E. of marginal means of S = 46.36 lb./ac.
S.E. of body of table = 92.72 lb./ac.
Object:—To see the effect of double transplanting and thinning and vigour on yield of crop.

1. BASAL CONDITIONS:
   (i) (a) Nil. (b) Guara. (c) Nil. (ii) (a) Clay loam. (b) N.A. (iii) 28.2.1950 to 1.3.1950 (iv) (a) 6 ploughings, and 7 sowing. (b) N.A. (c) ½ oz. marla. (d) 15' x 9'. (e) N.A. (v) 24 C.L./ac. of F.Y.M. on 20.12.1949 two months before planting. (vi) T-12 (medium). (vii) Irrigated. (viii) 6-7 toppings, suckering and 4-5 hoeings. (ix) 1.19'. (x) 23.6.1950 to 30.6.1950.

2. TREATMENTS:
   1. Unthinned seedling.
   2. Double transplanting.
   3. Thinned seedling.

3. DESIGN:
   (i) R.B.D. (ii) (a) 3. (b) N.A. (iii) 6. (iv) (a) and (b) 22' x 7½'. (v) Nil. (vi) Yes.

4. GENERAL:
   (i) Normal. No lodging. (ii) Nil. (iii) Growth, height, stand and rope weight. (iv) (a) 1950-1951. (b) No. (c) Nil. (v) (a) and (b) Nil. (vi) and (vii) Nil.

5. RESULTS:
   (i) 1348 lb./ac.
   (ii) 324.8 lb./ac.
   (iii) Treatment differences are not significant.
   (iv) Av. yield of tobacco in lb./ac.
   Treatment   Av. yield
   1.        1307
   2.        1245
   3.        1491
   S.E./mean = 132.6 lb./ac.

Crop :- Tobacco.  
Site :- Agri. Stn., Ferozepur Cantt.  
Ref :- Pb. 50(37).  
Type :- 'M'.

Object:—To study the effect of double transplanting and thinning on vigour and yield of crop.

1. BASAL CONDITIONS:
   (i) (a) Nil. (b) Guara. (c) Nil. (ii) (a) Heavy loam. (b) N.A. (iii) 22.2.1951. (iv) (a) 1 ploughing with raja plough, 5 desi ploughing and 1 disc harrowing. (b) N.A. (c) 10 lb./ac. (d) 12' x 15'. (e) N.A. (v) 200 lb./ac. of N as F.Y.M. 5 weeks before planting. (vi) T-21 (medium). (vii) Irrigated. (viii) Gap-filling, 2 thinnings, 1 topping and suckering. (x) 0.91'. (x) 26.6.1951.

2. TREATMENTS:
   1. Control.
   2. Double transplanting.
   3. Thinned seedlings.

3. DESIGN:
   (i) R.B.D. (ii) (a) 3. (b) N.A. (iii) 6. (iv) (a) and (b) 22' x 7½'. (v) Nil. (vi) Yes.

4. GENERAL:
   (i) Normal. No lodging. (ii) Nil. (iii) Dry wt., pit wt. of stalk and ropes, green wt., no., of leaves/plant, length and breadth of leaves in cm., height in cm., no. of plants at harvest. (iv) (a) 1950-51. (b) and (c) Nil. (v) (a) and (b) No. (vi) and (vii) Nil.
5. RESULTS:

(i) 707.2 lb./ac.
(ii) 107.56 lb./ac.
(iii) Treatment differences are not significant.
(iv) Av. yield of tobacco in lb./ac.

<table>
<thead>
<tr>
<th>Treatment</th>
<th>Av. yield</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>630.8</td>
</tr>
<tr>
<td>2.</td>
<td>772.2</td>
</tr>
<tr>
<td>3.</td>
<td>718.5</td>
</tr>
<tr>
<td>S.E./mean</td>
<td>43.91 lb./ac.</td>
</tr>
</tbody>
</table>

Crop: Tobacco (Kharij).
Site: Agri. Stn., Ferozepur Cantt.

Object: To find out the best age for transplanting of seedlings.

1. BASAL CONDITIONS:

(i) (a) Nil. (b) Jowar. (c) Nil. (ii) (a) Clay loam. (b) N.A. (iii) 28.2.1950 to 1.3.1950. (iv) (a) 5 ploughings and 7 sohaqa. (b) N.A. (c) 1 oz. marla. (d) 15° X 9°. (e) N.A. (v) 24 C.L./ac. of F.Y.M. 5 weeks before flowering. (vi) T-12 (medium). (vii) Irrigated. (viii) 6-7 toppings, suckering and 4-5 hoeings. (ix) 19°. (x) 23.6.1950 to 30.6.1950.

2. TREATMENTS:

Age of seedlings at transplanting.
A1 8 weeks.
A2 9 weeks.
A3 10 weeks.
A4 11 weeks.
A5 12 weeks.
A6 13 weeks.

3. DESIGN:

(i) R.B.D. (ii) 6. (b) N.A. (iii) 6. (iv) (a) and (b) 22' X 71'. (v) Nil. (vi) Yes.

4. GENERAL:

(i) Normal. No lodging. (ii) Nil. (iii) Growth, height, no. of plants at harvest, no. of leaves, length, breadth and height of leaves, rope weight. (iv) (a) 1950—1952. (b) No. (c) Nil. (v) (a) and (b) Nil. (vi) and (vii) Nil.

5. RESULTS:

(i) 1130 lb./ac.
(ii) 200.7 lb./ac.
(iii) Treatment differences are not significant.
(iv) Av. yield of tobacco in lb./ac.

<table>
<thead>
<tr>
<th>Treatment</th>
<th>Av. yield</th>
</tr>
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<tbody>
<tr>
<td>A1</td>
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<td>1270</td>
</tr>
<tr>
<td>A6</td>
<td>1038</td>
</tr>
<tr>
<td>S.E./mean</td>
<td>81.94 lb./ac.</td>
</tr>
</tbody>
</table>
Crop : Tobacco.  
Site : Agri. Stn., Ferozepur Cantt.  
Object :-To find out the best age for transplanting of seedlings.

1. BASAL CONDITIONS:
   (i) (a) Nil. (b) Maize. (c) Nil.  (ii) (a) Heavy loam. (b) N.A.  (iii) 22.2.1951.  (iv) (a) 1 ploughing with raja plough, 5 desi ploughings, 1 disc harrowing and 7 plankings. (b) and (c) N.A.  (d) 1' x 1'/. (e) N.A.  (v) 200 lb./ac. of N as F.Y.M. five weeks before plantings. (vi) T.21 (medium). (vii) Irrigated. (viii) one gap filing, two hoeings, two topplings and suckerings.  (ix) 0.91".  (x) 26.6.1951.

2. TREATMENTS:
   Age of seedlings at transplanting : $A_1$=8 week old, $A_2$=9 week old, $A_3$=10 week old, $A_4$=11 week old, $A_5$=12 week old, $A_6$=13 week old.

3. DESIGN:
   (i) R.B.D.  (ii) 6.  (b) N.A.  (iii) 6.  (iv) (a) and (b) $22' \times 7'$.  (v) Nil.  (vi) Yes.

4. GENERAL:
   (i) Normal. No lodging.  (ii) Nil.  (iii) Dry wt., pit wt. of stalk and ropes, green wt., no. of leaves/plant, length and breadth of leaves in cm., height in cm., no. of plants at harvest (iv) (a) 1950 to 1952 (b) No.  (c) Nil.  (v) (a) No.  (b) -.  (vi) and (vii) Nil.

5. RESULTS:
   (i) 554.4 lb./ac.  (ii) 129.87 lb./ac.  (iii) Treatment differences are not significant.  (iv) Av. yield of tobacco in lb./ac. 

<table>
<thead>
<tr>
<th>Treatment</th>
<th>Av. yield</th>
</tr>
</thead>
<tbody>
<tr>
<td>$A_1$</td>
<td>478.0</td>
</tr>
<tr>
<td>$A_2$</td>
<td>557.2</td>
</tr>
<tr>
<td>$A_3$</td>
<td>543.1</td>
</tr>
<tr>
<td>$A_4$</td>
<td>599.7</td>
</tr>
<tr>
<td>$A_5$</td>
<td>528.9</td>
</tr>
<tr>
<td>$A_6$</td>
<td>619.5</td>
</tr>
<tr>
<td>S.E./mean</td>
<td>53.02 lb./ac.</td>
</tr>
</tbody>
</table>

---

Crop : Tobacco.  
Site : Agri. Stn., Ferozepur Cantt.  
Object :- To find best age for transplanting of seedlings.

1. BASAL CONDITIONS:
   (i) (a) Tobacco-Fallow-Wheat-Fodder. (b) Fodder. (c) Nil.  (ii) (a) Heavy loam. (b) N.A.  (iii) 26.2.1952.  (iv) (a) 1 tractor ploughing, 9 ploughings, and 8 plankings. (b) N.A.  (c) 8—10 lb./ac.  (d) $12' \times 15'$.  (e) N.A.  (v) 200 lb./ac. of N as F.Y.M. a week before planting.  (vi) T.21 (medium).  (vii) Irrigated.  (viii) Twice gap filling, 5 hoeings, two topplings and suckerings.  (ix) 1.80".  (x) 18.6.1952.

2. TREATMENTS:
   Age of seedlings at transplanting : $A_1$=8 week old, $A_2$=9 week old, $A_3$=10 week old, $A_4$=11 week old, $A_5$=12 week old, $A_6$=13 week old.

3. DESIGN:
   (i) R.B.D.  (ii) 6.  (b) N.A.  (iii) 6.  (iv) (a) N.A.  (b) $22' \times 7'$.  (v) N.A.  (vi) Yes.

4. GENERAL:
   (i) Normal. No lodging.  (ii) Nil.  (iii) Dry wt., pit wt. of stalk and rope, green wt. in lb., no. of leaves/plant, breadth and length in cm., height in cm., no. of plant at harvest and tobacco yield. (iv) (a) 1950 to 1952. (b) No. (c) Nil.  (v) (a) No.  (b) -.  (vi) and (vii) Nil.
5. RESULTS:
(i) 630. 8 lb./ac.
(ii) 117.16 lb./ac.
(iii) Treatments differ highly significantly.
(iv) Av. yield of tobacco in lb./ac.

<table>
<thead>
<tr>
<th>Treatment</th>
<th>Av. yield</th>
</tr>
</thead>
<tbody>
<tr>
<td>A1</td>
<td>543.1</td>
</tr>
<tr>
<td>A2</td>
<td>466.7</td>
</tr>
<tr>
<td>A3</td>
<td>650.6</td>
</tr>
<tr>
<td>A4</td>
<td>775.0</td>
</tr>
<tr>
<td>A5</td>
<td>594.0</td>
</tr>
<tr>
<td>S.E./mean</td>
<td>47.83 lb./ac.</td>
</tr>
</tbody>
</table>

Crop: Tobacco.
Site: Agri. Stn., Ferozepur Cantt.
Ref: Pb. 50(35).
Type: C.

Object: To find out the optimum seed rate for raising the nursery.

1. BASAL CONDITIONS:
(i) (a) Nil. (b) Maize. (c) Nil.
(ii) (a) Clay loam. (b) N.A.
(iii) 23.2, 1950/1.3.1950.
(iv) (a) 5 ploughings and 7 tohaga. (b) N.A. (c) As per treatments.
(d) 15" x 9". (e) N.A. (v) 24 C.L./ac. of F.Y.M. 9 weeks before plantings.
(vi) T-12 (medium). (vii) Irrigated. (viii) 6-7 toppings, suckering and 4-5 hoeings.
(ix) 1.19", (x) 24.6.1950 to 30.6.1950.

2. TREATMENTS:
Seed rate/incl.:
S1=½ oz., S2=1 oz., S3=2 oz., S4=4 oz., S5=6 oz., and S6=8 oz.

3. DESIGN:
(i) R.D.D. (ii) (a) 6. (b) N.A. (iii) 6. (iv) (a) and (b) 22' x 7'. (v) Nil. (vi) Yes.

4. GENERAL:
(i) Normal. No lodging. (ii) Nil. (iii) Growth height; no. of plants at harvest, rope weight.
(iv) (a) 1950—1952. (b) No. (c) Nil. (v) (a) Nil. (b)—. (vi) and (vii) Nil.

5. RESULTS:
(i) 973 lb./ac.
(ii) 219.5 lb./ac.
(iii) Treatments are not significantly different.
(iv) Av. yield of tobacco in lb./ac.

<table>
<thead>
<tr>
<th>Treatment</th>
<th>Av. yield</th>
</tr>
</thead>
<tbody>
<tr>
<td>S1</td>
<td>1078</td>
</tr>
<tr>
<td>S2</td>
<td>1007</td>
</tr>
<tr>
<td>S3</td>
<td>950</td>
</tr>
<tr>
<td>S4</td>
<td>1021</td>
</tr>
<tr>
<td>S5</td>
<td>1001</td>
</tr>
<tr>
<td>S6</td>
<td>781</td>
</tr>
<tr>
<td>S.E./mean</td>
<td>89.6 lb./ac.</td>
</tr>
</tbody>
</table>

Crop: Tobacco.
Site: Agri. Stn., Ferozepur Cantt.
Ref: Pb. 51(3).
Type: C.

Object: To find out the optimum seed rate for raising the nursery.

1. BASAL CONDITIONS:
(i) (a) Nil. (b) Jowar. (c) Nil.
(ii) (a) Heavy loam. (b) N.A. (iii) 21.2.1951.
(iv) (a) 1 ploughing with raja plough, 5 desi ploughings, disc harrowing and 7 plankings.
(b) and (c) N.A. (d) 1' x 1'. (e) As per treatments. (v) 200 lb./ac. of N in F.Y.M. five weeks before planting.
(vi) T-21 (medium). (vii) Irrigated. (viii) Twice gap filling, one hoeing and one topping.
(ix) 0.01", (x) 18.6.1951.
2. TREATMENTS:

Seed rate/marla: $S_1=0.13$ oz., $S_2=0.25$ oz., $S_3=0.5$ oz., $S_4=1$ oz., $S_5=2$ oz., $S_6=4$ oz., $S_7=6$ oz., and $S_8=8$ oz.

3. DESIGN:

(i) R.B.D. (ii) (a) 8. (b) N.A. (iii) 6. (iv) (a) and (b) $22' \times 7\frac{1}{2}'$. (v) Nil. (vi) Yes.

4. GENERAL:

(i) Normal. No lodging. (ii) Nil. (iii) Dry wt. of stalk and ropes, green wt., number of leaves/plant, length and breadth of leaves in cm., height in cm., no. of plants at harvest. (iv) (a) 1950—1952. (b) No. (c) Nil. (v) (a) No. (b)—. (vi) and (vii) Nil.

5. RESULTS:

(i) 582.7 lb./ac.
(ii) 106.17 lb./ac.
(iii) Treatments are significantly different.
(iv) Av. yield of tobacco in lb./ac.

<table>
<thead>
<tr>
<th>Treatment</th>
<th>Av. yield</th>
</tr>
</thead>
<tbody>
<tr>
<td>$S_1$</td>
<td>608.1</td>
</tr>
<tr>
<td>$S_2$</td>
<td>622.3</td>
</tr>
<tr>
<td>$S_3$</td>
<td>676.0</td>
</tr>
<tr>
<td>$S_4$</td>
<td>636.4</td>
</tr>
<tr>
<td>$S_5$</td>
<td>517.6</td>
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<tr>
<td>$S_6$</td>
<td>526.1</td>
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<tr>
<td>$S_7$</td>
<td>591.2</td>
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<tr>
<td>$S_8$</td>
<td>483.7</td>
</tr>
<tr>
<td>S.E./mean</td>
<td>43.34 lb./ac.</td>
</tr>
</tbody>
</table>

Crop: Tobacco, Site: Agri. Stn., Ferozepur Cantt. Object: To find out the optimum seed rate for raising nursery.

Ref: Pb. 52(82). Type: 'C'.

1. BASAL CONDITIONS

(i) (a) Tobacco—Fallow—Wheat—Fodder. (b) Fodder. (c) Nil. (ii) (a) Heavy loam. (b) N.A. (iii) 26.2.1952 (iv) (a) 1 tractor ploughing, 9 ploughings and 8 plankings. (b) N.A. (c) As per treatments. (d) 1' $\times$ 1'. (e) N.A. (v) 200 lb./ac. of N in F.Y.M. applied five weeks before planting by broadcast. (vi) T-21 (medium). (vii) Irrigated. (viii) Twice gap filling, 5 hoeings, 2 toppings and suckering. (ix) 1.86'. (x) 18.6.1952.

2. TREATMENTS:

Seed rate/marla: $S_1=0.13$ oz., $S_2=0.25$ oz., $S_3=0.5$ oz., $S_4=1$ oz., $S_5=2$ oz., $S_6=4$ oz., $S_7=6$ oz., and $S_8=8$ oz.

3. DESIGN:

(i) R.B.D. (ii) (a) 8. (b) N.A. (iii) 6. (iv) (a) and (b) $22' \times 7\frac{1}{2}'$. (v) Nil. (vi) Yes.

4. GENERAL:

(i) Normal. No lodging. (ii) Nil. (iii) Dry wt., pit wt. of stalk and ropes, green wt. in lb., no. of leaves/plant, breadth and length of leave in cm., height in cm., no. of plants at harvest. (iv) (a) 1950—1952. (b) No. (c) Nil. (v) (a) and (b) No. (vi) and (vii) Nil.

5. RESULTS:

(i) 687.3 lb./ac.
(ii) 176.45 lb./ac.
(iii) Treatments are significantly different.
(iv) Av. yield of tobacco in lb./ac.

<table>
<thead>
<tr>
<th>Treatment</th>
<th>Av. yield</th>
</tr>
</thead>
<tbody>
<tr>
<td>S₁</td>
<td>724.1</td>
</tr>
<tr>
<td>S₂</td>
<td>681.7</td>
</tr>
<tr>
<td>S₃</td>
<td>834.4</td>
</tr>
<tr>
<td>S₄</td>
<td>738.3</td>
</tr>
<tr>
<td>S₅</td>
<td>667.5</td>
</tr>
<tr>
<td>S₆</td>
<td>588.3</td>
</tr>
<tr>
<td>S₇</td>
<td>577.0</td>
</tr>
<tr>
<td>S₈</td>
<td>687.3</td>
</tr>
</tbody>
</table>

S.E./mean = 72.03 lb./ac.

Crop : Tobacco.
Site : Agri. Stn., Ferozepur Cantt.

Object — To find the best spacing and method of planting.

1. BASAL CONDITIONS:
(i) (a) Nil. (b) Maize. (c) Nil. (ii) (a) Clay loam. (b) N.A. (iii) 17.3.1950, (iv) (a) 5 ploughings and 6 solaga. (b) N.A. (c) 1 oz./marla. (d) As per treatments. (e) N.A. (v) C.L./ac. of F.Y.M. on 24.12.1949. (vi) T-26. (vii) Irrigated. (viii) 6-7 toppings and suckering; 4-5 hoeings. (ix) 1.19". (x) 23.5.1950 and 26.5.1950.

2. TREATMENTS:
Main-plot treatments:
All combinations of (1) and (2)
(i) 2 methods of planting: R=Ridge and F=Flat.
(ii) 3 spacings between rows: D₁=1', D₂=1½' and D₃=1¾'.

Sub-plot treatments:
4 spacings and within rows: S₁=6", S₂=9", S₃=12" and S₄=15".

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

4. GENERAL:
(i) Normal. No lodging. (ii) Nil. (iii) Height, no. of plants at harvest and yield. (iv) (a) 1950—1952. (b) No. (c) Nil. (v) (a) No. (b) —. (vi) and (vii) Nil.

5. RESULTS:
(i) 893 lb./ac.
(ii) (a) 322.4 lb./ac.
(b) 127.4 lb./ac.

(iii) Only S effect is highly significant, while all others are not significant.

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

<table>
<thead>
<tr>
<th></th>
<th>S₁</th>
<th>S₂</th>
<th>S₃</th>
<th>S₄</th>
<th>Mean</th>
<th>D₁</th>
<th>D₂</th>
<th>D₃</th>
</tr>
</thead>
<tbody>
<tr>
<td>R</td>
<td>1028</td>
<td>873</td>
<td>803</td>
<td>803</td>
<td>877</td>
<td>885</td>
<td>784</td>
<td>961</td>
</tr>
<tr>
<td>F</td>
<td>986</td>
<td>908</td>
<td>875</td>
<td>865</td>
<td>999</td>
<td>985</td>
<td>884</td>
<td>856</td>
</tr>
<tr>
<td>Mean</td>
<td>1007</td>
<td>891</td>
<td>839</td>
<td>834</td>
<td>893</td>
<td>935</td>
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<td>909</td>
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<td>D₁</td>
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<td>917</td>
<td>886</td>
<td>887</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>D₂</td>
<td>939</td>
<td>821</td>
<td>778</td>
<td>798</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>D₃</td>
<td>1031</td>
<td>933</td>
<td>853</td>
<td>818</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

S.E. of F or R marginal means = 46.5 lb./ac.
S.E. of S marginal means = 26.0 lb./ac.
S.E. of D marginal means = 57.0 lb./ac.
S.E. of difference of two
1. S means at a level of D = 63.7 lb./ac.
2. D means at a level of S = 97.7 lb./ac.
3. S means at a level of Method = 52.0 lb./ac.
4. Method marginal means at a level of S = 79.7 lb./ac.
5. Means in the body of Method x D = 80.5 lb./ac.

Ref : Pb. 50(52). Type : 'C'.
Object: To find best spacing and method of planting.

1. BASAL CONDITIONS:
(i) (a) Nil. (b) Fallow. (c) Nil. (ii) (a) Heavy loam. (b) N.A. (iii) 8,9,1,951. (iv) (a) 1 ploughing with raja plough, 5 desi ploughings, 6 plankings and 1 roller. (b) and (c) N.A. (d) As under treatments. (e) N.A. (v) 200 lb./ac. of N as F.Y.M. broadcast a month before planting. (vi) T 26 N-rustica (vii) Irrigated. (viii) N.A. (ix) 0.91”. (x) N.A.

2. TREATMENTS:
Main-plot treatments: All combinations of (1) and (2)
(1) 2 methods of planting: R=Ridge and F=Flat.
(2) 3 spacings between rows: \( D_1 = 1' \); \( D_2 = 1'\) and \( D_3 = 1'\).
Sub-plot treatments: 4 spacings within rows: \( S_1 = 6" \), \( S_2 = 9" \), \( S_3 = 12" \) and \( S_4 = 15" \).

3. DESIGN:
(i) (a) Split-plot. (ii) (a) 6 main-plots/block: 4 sub-plots/main-plot. (b) N.A. (ii) 4. (iv) (a) N.A. (b) Main-plot 60’x15’; sub-plot 15’x15’. (v) N.A. (vi) Yes.

4. GENERAL:
(i) Normal. No lodging. (ii) Nil. (iii) Tobacco yield. (iv) (a) 1950-1952. (b) No (c) Nil. (v) (a) and (b) No. (vi) and (vii) Nil.

5. RESULTS:
(i) 475.35 lb./ac.
(ii) (a) 311.56 lb./ac.
(b) 148.90 lb./ac.
(iii) None of the effects is significant.
(iv) Av. yield of tobacco in lb./ac.

<table>
<thead>
<tr>
<th>( S_1 )</th>
<th>( S_2 )</th>
<th>( S_3 )</th>
<th>( S_4 )</th>
<th>Mean</th>
<th>F</th>
<th>R</th>
</tr>
</thead>
<tbody>
<tr>
<td>( D_1 )</td>
<td>579.4</td>
<td>581.2</td>
<td>522.5</td>
<td>655.5</td>
<td>584.7</td>
<td>630.6</td>
</tr>
<tr>
<td>( D_2 )</td>
<td>510.3</td>
<td>526.3</td>
<td>399.1</td>
<td>407.2</td>
<td>460.7</td>
<td>470.5</td>
</tr>
<tr>
<td>( D_3 )</td>
<td>404.3</td>
<td>409.2</td>
<td>352.0</td>
<td>357.4</td>
<td>380.7</td>
<td>417.0</td>
</tr>
<tr>
<td>Mean</td>
<td>492.0</td>
<td>505.6</td>
<td>424.5</td>
<td>473.4</td>
<td>475.4</td>
<td></td>
</tr>
<tr>
<td>( F )</td>
<td>484.0</td>
<td>557.4</td>
<td>427.7</td>
<td>555.0</td>
<td>506.0</td>
<td></td>
</tr>
<tr>
<td>( R )</td>
<td>512.0</td>
<td>453.7</td>
<td>421.4</td>
<td>391.7</td>
<td>444.7</td>
<td></td>
</tr>
</tbody>
</table>

S.E. of D marginal means = 55.1 lb./ac.
S.E. of S marginal means = 30.4 lb./ac.
S.E. of F or R marginal means = 45.0 lb./ac.
S.E. of difference of two
1. S means at a level of D = 74.4 lb./ac.
2. D means at a level of S = 101.1 lb./ac.
3. S means at a level of Method = 60.8 lb./ac.
4. Method means at a level of S = 82.6 lb./ac.
5. means in the body of D x Method table = 77.9 lb./ac.
Crop: Tobacco.
Site: Agri. Stn., Ferozepur Cantt.

Object: To find out best spacing and method of planting for Tobacco.

1. BASAL CONDITIONS:
   (i) (a) Nil. (b) Fallow. (c) Nil. (ii) (a) Heavy loam. (b) N.A.  (iii) 25.2.1952.  (iv) (a) Tractor ploughing, 6 sohaga, 3 rollering and 1 tripahy.  (b) As per treatments.  (c) N.A.  (d) As per treatments.  (e) N.A.
   (v) F.Y.M. broadcast at 300 lb./ac. of N. 3 weeks before planting.  (vi) T.26 (medium).  (vii) Irrigated.
   (viii) 7 toppings, suckering, one gap filling and 4 hoeings.  (ix) 1.86'.  (x) 13,14,5,1952.

2. TREATMENTS:
   Main-plot treatments:
   All combinations of (1) and (2)
   (1) 2 methods of plantings: R=Ridge and F=Flat.
   (2) 3 spacings between rows: D1=1', D2=1¾' and D3=1½'.
   Sub-plot treatments:
   4 spacings within rows: S1=6", S2=9", S3=12" and S4=15".

3. DESIGN:
   (i) Split-plot.  (ii) (a) 6 main-plots/block; 4 sub-plots/main-plot.  (b) N.A.  (iii) 4.  (iv) (a) and (b) Main-plot 30'x30' Sub-plot 15'x15' (v) Nil.  (vi) Yes.

4. GENERAL:
   (i) Good. No lodging.  (ii) Nil.  (iii) Dry wt. of ropes, green wt., no. of leaves/plant, breadth, and length of leaves in cm., height in cm., no. of plants at harvest.  (iv) (a) 1950—1952.  (b) and (c) No.  (v) (a) and (b) No.  (vi) and (vii) Nil.

5. RESULTS:
   (i) 1071 lb./ac.
   (ii) (a) 256.5 lb./ac.
   (b) 219.7 lb./ac.
   (iii) Main effect of S is highly significant. Methods and spacings effects are highly significant while their interaction is not significant.
   (iv) Av. yield of tobacco in lb./ac.

<table>
<thead>
<tr>
<th></th>
<th>S1</th>
<th>S2</th>
<th>S3</th>
<th>S4</th>
<th>Mean</th>
<th>F</th>
<th>R</th>
</tr>
</thead>
<tbody>
<tr>
<td>D1</td>
<td>1364</td>
<td>1283</td>
<td>1099</td>
<td>1058</td>
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<td>951</td>
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<tr>
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<td>1114</td>
<td>1024</td>
<td>890</td>
<td>1071</td>
<td></td>
<td></td>
</tr>
<tr>
<td>F</td>
<td>1507</td>
<td>1228</td>
<td>1205</td>
<td>1052</td>
<td>1248</td>
<td></td>
<td></td>
</tr>
<tr>
<td>R</td>
<td>1002</td>
<td>999</td>
<td>843</td>
<td>729</td>
<td>893</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

S.E. of S marginal mean = 44.8 lb./ac.
S.E. of D marginal mean = 45.3 lb./ac.
S.E. of F or R marginal mean = 37.0 lb./ac.
S.E. of difference of two
1. S means at a level of D = 109.8 lb./ac.
2. D means at a level of S = 114.7 lb./ac.
3. Method means at a level of S = 93.7 lb./ac.
4. S means at a level of Method = 89.7 lb./ac.
5. means of the body of D x Method table = 64.1 lb./ac.
Crop := Tobacco.
Site := Agri. Stn., Ferozepur Cantt.
Object := To study the best time of planting.

1. BASAL CONDITIONS :
   (i) (a) Nil. (b) Chari. (c) Nil. (ii) (a) Clay loam. (b) N.A. (iii) As under treatments. (iv) (a) 6 ploughings and 8 sohaga. (b) N.A. (c) 3/4 oz. marla. (d) Row to row 2', plant to plant 1'. (e) N.A. (v) 24 C.L. of F.Y.M. (vi) T-12 (medium). (vii) Irrigated. (viii) 6—7 toppings and suckering; 4—5 hoeings. (ix) 5.87'. (x) 16.6.1949 to 24.7.1949.

2. TREATMENTS :
   Dates of planting: D₁ = 15.2.1949, D₂ = 22.2.1949, D₃ = 1.3.1949, D₄ = 8.3.1949, D₅ = 15.3.1949, D₆ = 22.3.1949, D₇ = 29.3.1949, D₈ = 5.4.1949 and D₉ = 12.4.1949.

3. DESIGN :
   (i) R.B.D. (ii) (a) 9. (b) N.A. (iii) 6. (iv) (a) and (b) 55'x10'. (v) Nil. (vi) Yes.

4. GENERAL :
   (i) Setting good, condition satisfactory. No lodging. (ii) Nil. (iii) Growth, no. of plants at harvest and rope weight. (iv) (a) 1949 to 1951. (b) No. (c) Nil. (d) . (e) and (f) Nil.

5. RESULTS :
   (i) 120 lb. ac.
   (ii) 164.4 lb./ac.
   Treatment differences are highly significant.
   (iv) Av. yield of tobacco in lb./ac.
   Treatment  | Av. yield |
   ---------- | --------- |
   D₁        | 1612      |
   D₂        | 1534      |
   D₃        | 1531      |
   D₄        | 1510      |
   D₅        | 1443      |
   D₆        | 1093      |
   D₇        | 764       |
   D₈        | 728       |
   D₉        | 592       |
   S.E./mean = 67.1 lb./ac.

---

Crop := Tobacco (Kharij).
Site := Agri. Stn., Ferozepur Cantt.
Object := To find the best date when seedling should be transplanted.

1. BASAL CONDITIONS :
   (i) (a) Nil. (b) N.A. (c) N.A. (ii) (a) Clay loam. (b) N.A. (iii) As under treatments. (iv) (a) to (e) N.A. (v) 23 C.L./ac. of F.Y.M. one month before planting. (vi) T-12 (medium). (vii) Irrigated. (viii) 6—7 toppings and suckering, and 4—5 hoeings. (ix) 1.19'. (x) 11.6.1950 to 30.6.1950.

2. TREATMENTS :
   Date of planting: D₁ = 15.2.1950, D₂ = 22.2.1950, D₃ = 1.3.1950, D₄ = 8.3.1950, D₅ = 15.3.1950, D₆ = 22.3.1950, D₇ = 29.3.1950, D₈ = 5.4.1950 and D₉ = 12.4.1950.

3. DESIGN :
   (i) R.B.D. (ii) (a) 9. (b) N.A. (iii) 8. (iv) (a) and (b) 27'x10'. (v) Nil. (vi) Yes.

4. GENERAL :
   (i) Setting good, condition satisfactory. No lodging. (ii) Nil. (iii) Growth, no. of plants at harvest and rope weight. (iv) (a) 1949 to 1951. (b) No. (c) Nil. (v) (a) Nil. (b) . (vi) and (vii) Nil.
5. RESULTS:
   (i) 1132 lb./ac.
   (ii) 269.8 lb./ac.
   (iii) Treatment differences are highly significant.
   (iv) Av. yield of tobacco in lb./ac.

<table>
<thead>
<tr>
<th>Treatment</th>
<th>Av. yield</th>
</tr>
</thead>
<tbody>
<tr>
<td>D1</td>
<td>1305</td>
</tr>
<tr>
<td>D2</td>
<td>1316</td>
</tr>
<tr>
<td>D3</td>
<td>1295</td>
</tr>
<tr>
<td>D4</td>
<td>1269</td>
</tr>
<tr>
<td>D5</td>
<td>1486</td>
</tr>
<tr>
<td>D6</td>
<td>1317</td>
</tr>
<tr>
<td>D7</td>
<td>1088</td>
</tr>
<tr>
<td>D8</td>
<td>477</td>
</tr>
<tr>
<td>D9</td>
<td>638</td>
</tr>
</tbody>
</table>

S.E./mean = 95.4 lb./ac.

Crop: Tobacco.  Ref: Pb. 51(11).
Site: Agri. Stn., Ferozepur Cantt. Type: 'C'.

Object: To find out the best date when the seedlings should be transplanted.

1. BASAL CONDITIONS:
   (i) (a) Tobacco-Fallow-Wheat-Fodder. (b) Char. (c) Nil. (ii) (a) Heavy loam. (b) N.A. (iii) As per treatments. (iv) (a) one ploughing, with raja plough, 8 deshi ploughings, 1 disc harrowing, 1 planking, and 2 rollers. (b) and (c) N.A. (d) 15" x 12". (v) F.Y.M. at 200 lb./ac. of N. (vi) T.21 (medium). (vii) Irrigated. (viii) 4 toppings and suckering, 4 hoeings and one gap filling. (ix) 0.91. (x) 18.6.1951.

2. TREATMENTS:

3. DESIGN:
   (i) R.B.D. (ii) 9. (b) N.A. (iii) 8. (iv) (a) and (b) 27' x 10' (v) Nil. (vi) Yes.

4. GENERAL:
   (i) Good. No lodging. (ii) Nil. (iii) Dry wt., pit wt. of stalk and ropes, green wt., no. of leaves/plant, length and breadth of leaves in cm., height in cm., no. of plants at harvest, (iv) (a) 1949 to 1951. (b) No. (c) Nil. (v) (a) No. (b) --. (vi) and (vii) Nil.

5. RESULTS:
   (i) 659.8 lb./ac.
   (ii) 193.2 lb./ac.
   (iii) Treatments differ highly significantly.
   (iv) Av. yield of tobacco in lb./ac.

<table>
<thead>
<tr>
<th>Treatment</th>
<th>Av. yield</th>
</tr>
</thead>
<tbody>
<tr>
<td>D1</td>
<td>1134.4</td>
</tr>
<tr>
<td>D2</td>
<td>966.2</td>
</tr>
<tr>
<td>D3</td>
<td>888.0</td>
</tr>
<tr>
<td>D4</td>
<td>1092.9</td>
</tr>
<tr>
<td>D5</td>
<td>767.5</td>
</tr>
<tr>
<td>D6</td>
<td>632.6</td>
</tr>
<tr>
<td>D7</td>
<td>242.4</td>
</tr>
<tr>
<td>D8</td>
<td>175.0</td>
</tr>
<tr>
<td>D9</td>
<td>99.2</td>
</tr>
</tbody>
</table>

S.E./mean = 68.3 lb./ac.
Crop : Tobacco.  
Site : Agri. Stn., Ferozepur Cantt.  
Type : ‘C’.  

Object : To find the best date when seedlings should be transplanted.

1. BASAL CONDITIONS:
   (i) (a) Nil. (b) Maize (fodder). (c) Nil. (ii) (a) Clay loam. (b) N.A. (iii) As under treatments. (iv) (a) 6 ploughings, 6 rohagas. (b) N.A. (c) 1 oz/marla. (d) 12” x 9”. (e) N.A. (v) 21 C.L./ac. of F.Y.M. (vi) T—26. (vii) Irrigated. (viii) 6-7 toppings and suckering, 4-5 hoeings. (ix) 1.19”. x) 23.5.1950 and 26.5.1950.

2. TREATMENTS:
   4 dates of planting: D1 = 22.2.1950, D2 = 1.3.1950, D3 = 8.3.1950, D4 = 15.3.1950.

3. DESIGN:
   (i) R.B.D. (ii) (a) 4. (b) N.A. (iii) 5. (iv) (a) N.A. (b) 22’ x 10’. (v) N.A. (vi) Yes.

4. GENERAL:
   (i) Normal. No lodging. (ii) Nil. (iii) Growth, height, no. of plants at harvest and yield. (iv) (a) 1950 to 1953. (b) No. (c) Nil. (v) (a) No. (b) —. (vi) and (vii) Nil.

5. RESULTS:
   (i) 933.8 lb./ac.  
   (ii) 167.17 lb./ac.  
   (iii) Treatments are not significantly different.  
   (iv) Av. yield of tobacco in lb./ac.  
   Treatment  | Av. yield  
   D4         | 839.1      
   D2         | 978.6      
   D3         | 896.1      
   D4         | 1021.3     
   S.E./mean  | =74.76 lb./ac.

---

Crop : Tobacco.  
Site : Agri. Stn., Ferozepur Cantt.  
Type : ‘C’.  

Object : To find the best date when seedlings should be transplanted.

1. BASAL CONDITIONS:
   (i) (a) Tobacco-Fallow-Wheat-Fodder. (b) Maize (fodder), (c) Nil. (ii) (a) Heavy loam. (b) N.A. (iii) As per treatments. (iv) (a) 1 ploughing with roja plough 5 desi ploughs, 7 plantings and 2 rollers. (b) and (c) N.A. (d) 1’ x 1’. (e) N.A. (v) 200 lb./ac. of N as F.Y.M. on 15.2.1951. (vi) T-16 (N-Rustica). (vii) Irrigated. (viii) N.A. (ix) 0.91”. (x) 16.6.1951.

2. TREATMENTS:
   11 dates of planting: D1 = 1.2.1951, D2 = 8.2.1951, D3 = 15.2.1951, D4 = 22.2.1951, D5 = 13.1.1951, D6 = 8.3.1951, D7 = 15.3.1951, D8 = 22.3.1951, D9 = 29.3.1951, D10 = 5.4.1951 and D11 = 12.4.1951.

3. DESIGN:
   (i) R.B.D. (ii) (a) 11. (b) N.A. (iii) S. (iv) (a) and (b) 22’ x 10’. (v) N.A. (vi) Yes.

4. GENERAL:
   (i) Good. No lodging. (ii) Nil. (iii) Dry wt. of ropes, no. of leaves/plant, green wt., length and breadth of leaves in cms., Height in cms., no. of plants at harvest. (iv) (a) 1950—1953. (b) No. (c) Nil. (v) (a) No. (b) —. (vi) and (vii) Nil.
5. RESULTS:

(i) 846.2 lb./ac.
(ii) 206.85 lb./ac.
(iii) Treatment differences are highly significant.
(iv) Av. yield of tobacco 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>D_1</td>
<td>1235.2</td>
<td>D_7</td>
<td>623.3</td>
</tr>
<tr>
<td>D_2</td>
<td>1368.1</td>
<td>D_8</td>
<td>613.7</td>
</tr>
<tr>
<td>D_3</td>
<td>1244.8</td>
<td>D_9</td>
<td>419.2</td>
</tr>
<tr>
<td>D_4</td>
<td>983.0</td>
<td>D_{10}</td>
<td>391.4</td>
</tr>
<tr>
<td>D_5</td>
<td>1315.6</td>
<td>D_{11}</td>
<td>217.2</td>
</tr>
<tr>
<td>D_6</td>
<td>894.3</td>
<td>S.E./mean</td>
<td>-92.5 lb./ac.</td>
</tr>
</tbody>
</table>

Crop :- Tobacco.
Site :- Agri. Stn., Ferozepur Cantt.

Object :- To find the best date when seedlings should be transplanted

1. BASAL CONDITIONS:

(i) (a) Nil. (b) Potato. (c) 50 lb./ac. N as A/S. (ii) (a) Heavy loam. (b) N.A. (iii) As per treatments.
(iv) (a) 7 ploughings, 6 subaha and 1 tripally. (b) N.A. (c) 2 ozs./marla. (d) 12"x9". (e) N.A. (v) 100 lb./ac. of F.Y.M. broadcast on 22.1.1952. 50 lb./ac. of N as A/S applied in between rows by broadcast on 23.4.1952. (vi) T-26 (medium). (vii) Irrigated. (viii) 6 toppings and suckering, 5 hoeings. (ix) 1.86'.
(x) 12.6.1952.

2. TREATMENTS:

11 dates of planting: D_1=1.2.1952, D_2=8.2.1952, D_3=15.2.1952, D_4=22.2.1952, D_5=29.2.1952, D_6=7.3.1952, D_7=14.3.1952, D_8=21.3.1952, D_9=28.3.1952, D_{10}=4.4.1952, D_{11}=11.4.1952.

3. DESIGN:

(i) R.B.D. (ii) (a) 11. (b) N.A. (iii) 6. (iv) (a) 22'x12'. (b) 22'x10'. (v) 1' each side of the breadth left as foot path. (vi) Yes.

4. GENERAL:

(i) Good. No lodging. (ii) Nil. (iii) Dry wt. of ropes, Green wt. in lb., no. of leaves/plant, breadth and length of leaves in cms., height in cms., no. of plants at harvest. (iv) (a) 1950—1953. (b) No. (c) Nil. (v) (a) No. (b) —. (vi) and (vii).

5. RESULTS:

(i) 1030.3 lb./ac.
(ii) 248.77 lb./ac.
(iii) Treatments differ highly significantly.
(iv) Av. yield of tobacco 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>D_1</td>
<td>1187.6</td>
<td>D_7</td>
<td>976.7</td>
</tr>
<tr>
<td>D_2</td>
<td>1113.5</td>
<td>D_8</td>
<td>1289.4</td>
</tr>
<tr>
<td>D_3</td>
<td>1256.4</td>
<td>D_9</td>
<td>849.0</td>
</tr>
<tr>
<td>D_4</td>
<td>1293.8</td>
<td>D_{10}</td>
<td>613.0</td>
</tr>
<tr>
<td>D_5</td>
<td>1450.4</td>
<td>D_{11}</td>
<td>154.8</td>
</tr>
<tr>
<td>D_6</td>
<td>1148.7</td>
<td>S.E./mean</td>
<td>=101.6 lb./ac.</td>
</tr>
</tbody>
</table>
Crop: Tobacco.  
Site: Agri. Stn., Ferozepur Cantt.  
Ref: Pb. 53(29).  
Type: 'C'.

Object: To find out the best time of planting of N-rustica.

1. BASAL CONDITIONS:
   (i) (a) Tobacco-Wheat-Guara. (b) Guara. (c) Nil. (ii) (a) Heavy loam. (b) N.A. (iii) As per treatments. (iv) (a) 1 ploughing with raja plough, 7 desi ploughings, 9 plankings, and 1 horse hoe. (b) and (c) N.A. (d) 1' x 9'. (e) N.A. (v) Nil. (vi) T-26 (medium). (vii) Irrigated. (viii) Hoeings. (ix) 0.34' to 1'. (x) 23.5.1953 to 16.6.1953.

2. TREATMENTS:
   11 dates of planting: D_1 = 1.2.1953, D_2 = 8.2.1953, D_3 = 15.2.1953, D_4 = 22.2.1953, D_5 = 1.3.1953, D_6 = 8.3.1953, D_7 = 15.3.1953, D_8 = 22.3.1953, D_9 = 29.3.1953, D_10 = 5.4.1953, and D_11 = 12.4.1953.

3. DESIGN:
   (i) R.B.D. (ii) (a) 11. (b) N.A. (iii) 6. (iv) (a) 22' x 12'. (b) 22' x 10'. (v) One row on either side of length. (vi) Yes.

4. GENERAL:
   (i) Normal. No lodging. (ii) Nil. (iii) Length and breadth of leaf. Av. height of plants, no. of leaves, green plant weight, dry weight, no. of plants, at harvest. (iv) (a) 1950-1953. (b) No. (c) Nil. (v) (a) Nil. (b) . (vi) and (vii) Nil.

5. RESULTS:
   (i) 564.1 lb./ac.  
   (ii) 33.37 lb./ac.  
   (iii) Treatment differences are highly significant.  
   (iv) Av. yield of tobacco in lb./ac.

<table>
<thead>
<tr>
<th>Treatment</th>
<th>Av. yield</th>
</tr>
</thead>
<tbody>
<tr>
<td>D_1</td>
<td>804.0</td>
</tr>
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<td>D_2</td>
<td>984.3</td>
</tr>
<tr>
<td>D_3</td>
<td>1107.4</td>
</tr>
<tr>
<td>D_4</td>
<td>937.7</td>
</tr>
<tr>
<td>D_5</td>
<td>651.3</td>
</tr>
<tr>
<td>D_6</td>
<td>621.6</td>
</tr>
<tr>
<td>S.E./mean</td>
<td>=136.3 lb./ac.</td>
</tr>
</tbody>
</table>

Crop: Tobacco.  
Site: Agri. Stn., Ferozepur Cantt.  
Ref: Pb. 50 (56).  
Type: 'C'.

Object: To find the effect of topping and suckering on the yield and quality of Tobacco.

1. BASAL CONDITIONS:
   (i) (a) Nil. (b) Maize (c) Nil. (ii) (a) Clay loam. (b) N.A. (iii) 4.3.1950. (iv) (a) 6 ploughings and 6 sohaga. (c) 1 oz./marla. (d) 1' x 9'. (e) N.A. (v) 21 C.L./ac. of F.Y.M. on 24.12.1949. (vi) T-26. (vii) Irrigated. (viii) As under treatments. (ix) 1.19'. (x) 23.5.1950, 26.5.1950.

2. TREATMENTS:
   Main-plot treatments:
   2 cultural operations: C_1 = Topping and C_2 = Topping and suckering.
   Sub-plot treatments:
   3 stages of operation: S_1 = at 8 leaf stage, S_2 = at 10 leaf stage and S_3 = at flowering stage.

3. DESIGN:
   (i) Split-plot. (ii) (a) 2 main-plots/block and 3 sub-plots/main-plot. (b) N.A. (iii) 9. (iv) (a) N.A. (b) 22' x 10'. (v) N.A. (vi) Yes.
4. GENERAL:
(i) Normal. No lodging. (ii) Nil. (iii) Height, no. of plants at harvest and tobacco yield. (iv) (a) 1950 to
(b) No. (c) Nil. (v) (a) No. (b) —. (vi) and (vii) Nil.

5. RESULTS:
(i) 361.3 lb./ac.
(ii) (a) 146.5 lb./ac.
(b) 106.5 lb./ac.
(iii) None of the effects is significant.
(iv) Av. yield of tobacco in lb./ac.

\[
\begin{array}{c|c|c|c|c}
 & S_1 & S_2 & S_3 & \text{Mean} \\
\hline
C_1 & 337.7 & 416.9 & 394.9 & 383.2 \\
C_2 & 307.7 & 339.4 & 371.1 & 339.4 \\
\hline
\text{Mean} & 322.7 & 378.2 & 383.0 & 361.3 \\
\end{array}
\]

S.E. of difference of two
1. C marginal means = 39.8 lb./ac.
2. S marginal means = 25.1 lb./ac.
3. S means at the same level of C = 50.2 lb./ac.
4. C means at the same level of S = 57.2 lb./ac.

Crop: Tobacco.
Site: Agri. Stn., Ferozepur Cantt.

Ref: Pb. 51(21).
Type: ‘C’.

Object: To find the effect of topping and suckering on yield and quality of Tobacco.

1. BASAL CONDITIONS:
(i) (a) Nil. (b) Fallow. (c) Nil. (ii) (a) Heavy loam. (b) N.A. (iii) 21.2.51. (iv) (a) 1 rode plough,
6 desi ploughings, 9 plankings and 1 horse hoe. (b) and (c) N.A. (d) 2’x1’. (o) N.A. (v) 100 lb./ac.
(ix) 0.91”. (x) 10.6.1951.

2. TREATMENTS:
All combinations of (1) and (2)
(1) 2 levels of suckering: \( S_1 = \) No suckering and \( S_2 = \) Suckering.
(2) 3 stages of topping: \( T_1 = \) Topping at 8 leaf stage, \( T_2 = \) Topping at 12 leaf stage and \( T_3 = \) Topping
at flowering.

3. DESIGN:
(i) 2 x 3 Fact. in R.B.D. (ii) (a) 6. (b) N.A. (iii) 6. (iv) (a) and (b) 22’ x 10’.
(v) Nil. (vi) Yes.

4. GENERAL:
(i) Normal. No lodging. (ii) Nil. (iii) Dry wt. of ropes, no. of leaves/plant, green wt., length and
breadth of leaves in cm., height in cm, and no. of plants at harvest. (iv) (a) 1950—1952. (b) No. (c)
Nil. (v) (a) No. (b) —. (vi) and (vii) Nil.

5. RESULTS:
(i) 720.6 lb./ac.
(ii) 121.7 lb./ac.
(iii) Main effect of S alone is highly significant.
(iv) Av. yield of tobacco in lb./ac.

<table>
<thead>
<tr>
<th></th>
<th>S1</th>
<th>S2</th>
<th>Mean</th>
</tr>
</thead>
<tbody>
<tr>
<td>T1</td>
<td>907.4</td>
<td>539.3</td>
<td>723.4</td>
</tr>
<tr>
<td>T2</td>
<td>803.3</td>
<td>625.4</td>
<td>714.4</td>
</tr>
<tr>
<td>T3</td>
<td>869.6</td>
<td>578.5</td>
<td>724.1</td>
</tr>
</tbody>
</table>

Mean 860.1 581.1 720.6

S.E. of marginal mean of T = 35.1 lb./ac.
S.E. of marginal mean of S = 28.7 lb./ac.
S.E. of body of table = 49.7 lb./ac.

Crop :- Tobacco.  Ref. :- Pb. 52(94).

Site :- Agri. Stn., Ferozepur Cantt.  Type :- 'C'.

Object :- To find the effect of topping and suckering.

1. BASAL CONDITIONS :  
(i) (a) Nil. (b) Fallow. (c) Nil. (ii) (a) Heavy loam. (b) N.A. (iii) 15.2.1952. (iv) (a) 1 tractor ploughing, 6 ploughings, 6 sohaga, 3 rollerings and one tripshally. (b) N.A. (c) 2 oz./mrla. (d) 12" x 9". (e) N.A. (v) 103 lb./ac. of N as F.Y.M. on 22.1.1952 and 28.1.1952 by broadcast, 50 lb./ac. of N as A/S broadcast on 23.4.1952. (vi) T-26 (medium). (vii) Irrigated. (viii) 5 hoeings. (ix) 1.86'. (x) 1,2,6.1952.

2. TREATMENTS :  
All combinations of (1) and (2)  
(1) 2 levels of suckering : S1 = No suckering and S2 = Suckering.  
(2) 3 stages of topping : T1 = Topping at 8 leaf stage, T2 = Topping at 12 leaf stage and T3 = Topping at flowering.

3. DESIGN :  
(i) 2 x 3 Fact. in R.B.D. (ii) (a) 6. (b) N.A. (iii) 6. (iv) (a) 22' x 12'. (b) 22' x 10' (v) One foot band on either side of length. (vi) Yes.

4. GENERAL :  
(i) Good. No lodging. (ii) Nil. (iii) Dry wt. of ropes, green wt., no. of leaves/plant, breadth and length of leaves in cm., height in cm., no. of plants at harvest. (iv) (a) 1950—1952. (b) No. (c) Nil. (v) (a) No. (b) —. (vi) and (vii) Nil.

5. RESULTS :  
(i) 1307 lb./ac.  
(ii) 315.4 lb./ac.  
(iii) Main effect of S is highly significant. Others are not significant.  
(iv) Av. yield of tobacco in lb./ac.

<table>
<thead>
<tr>
<th></th>
<th>S1</th>
<th>S2</th>
<th>Mean</th>
</tr>
</thead>
<tbody>
<tr>
<td>T1</td>
<td>1717</td>
<td>940</td>
<td>1329</td>
</tr>
<tr>
<td>T2</td>
<td>1516</td>
<td>884</td>
<td>1200</td>
</tr>
<tr>
<td>T3</td>
<td>1663</td>
<td>1123</td>
<td>1393</td>
</tr>
</tbody>
</table>

Mean 1632 982 1307

S.E. of marginal mean of T = 91.0 lb./ac.  
S.E. of marginal mean of S = 74.3 lb./ac.  
S.E. of body of table = 128.8 lb./ac.
Crop: Tobacco.  
Site: Agri. Stn., Ferozepur Cantt.  

Object:—To compare the effect of normal vs. over grown seedlings on the yield of Tobacco.

1. BASAL CONDITIONS:
   (i) (a) Nil.  (b) Fallow.  (c) Nil.  (ii) (a) Clay loam.  (b) N.A.  (iii) 22,23,2,1950.  (iv) (a) 5 ploughings and 6 "sohaga."  (b) and (c) N.A.  (d) 11'x9".  (e) N.A.  (v) 24 C.L./ac. of F.Y.M. on 20.12.1949.  

2. TREATMENTS:
   1. Over grown seedling (12-13 weeks old seedlings).
   2. Normal grown seedling (10 weeks old seedlings).

3. DESIGN:
   (i) R.B.D. (ii) (a) 2.  (b) N.A. (iii) 8.  (iv) (a) and (b) 22'x7', (v) Nil.  (vi) Yes.

4. GENERAL:
   (i) Normal.  No lodging.  (ii) Nil.  (iii) Rope weight.  (iv) (a) to (c) No.  (v) (a) and (b) No.  (vi) and (vii) Nil.

5. RESULTS:
   (i) 119 lb./ac.
   (ii) 219.31 lb./ac.
   (iii) Treatment differences are not significant.
   (iv) Av. yield of tobacco in lb./ac.
      Treatment      Av. yield
      1.            1184
      2.            1054
      5 E./mean     = 76.87 lb./ac.


Crop: Tobacco.  
Site: Agri. Stn., Ferozepur Cantt.  

Object:—To study the effect of method of planting and spacing on yield.

1. BASAL CONDITIONS:
   (i) (a) Nil.  (b) Fallow.  (c) Nil.  (ii) (a) Clay loam.  (b) N.A.  (iii) 8,9.3.1949.  (iv) (a) 6 ploughings and 8 "sohaga."  (b) and (c) N.A.  (d) As per treatments.  (e) N.A.  (v) 24 C.L./ac. of F.Y.M. 7 days before planting.  
   (vi) T.12 (medium).  (vii) Irrigated.  (viii) 6-7 'topping, suckerings and 4-5 hoeings.  (ix) 5.87", (x) 29.6.1949.

2. TREATMENTS:
   Main-plot treatments:
      2 methods of planting; M1 = Flat and M2 = Ridges.
   Sub-plot treatments:
      2 row to row spacings: D1 = 2' and D2 = 1 1/2'
   Sub-sub-plot treatments:
      3 plant to plant spacings: S1 = 9", S2 = 12", and S3 = 15".

3. DESIGN:
   (i) Split-plot.  (ii) (a) 2 main-plots/block; 2 sub-plots/main-plot and 3 sub-sub-plots/sub-plot.  (b) N.A.  
   (iii) 8.  (iv) (a) Main-plot: 54'x24' sub-plot: 54'x12' sub-sub-plot: 18'x12'.  (v) Nil.  (vi) Yes.

4. GENERAL:
   (i) Good: No lodging.  (ii) Nil.  (iii) Rope weight.  (iv) (a) 1949—52.  (b) and (c) No.  (v) (a) and (b) No.  
   (vi) and (vii) Nil.
5. RESULTS:

(i) 1541 lb./ac.

(ii) (a) 511.7 lb./ac.
(b) 279.5 lb./ac.
(c) 252.1 lb./ac.

(iii) Only D effect is significant, while all others are not significant

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

<table>
<thead>
<tr>
<th>D1</th>
<th>D2</th>
<th>Mean</th>
<th>S1</th>
<th>S2</th>
<th>S3</th>
</tr>
</thead>
<tbody>
<tr>
<td>M1</td>
<td>1500</td>
<td>1652</td>
<td>1576</td>
<td>1559</td>
<td>1569</td>
</tr>
<tr>
<td>M2</td>
<td>1442</td>
<td>1572</td>
<td>1507</td>
<td>1587</td>
<td>1514</td>
</tr>
<tr>
<td>Mean</td>
<td>1471</td>
<td>1612</td>
<td>1541</td>
<td>1573</td>
<td>1541</td>
</tr>
</tbody>
</table>

S.E. of marginal mean of M = 73.9 lb./ac.
S.E. of marginal mean of D = 40.3 lb./ac.
S.E. of marginal mean of S = 44.6 lb./ac.

S.E. of difference of two

1. D means at the same level of M = 80.7 lb./ac.
2. M means at the same level of D = 119.0 lb./ac.
3. S means at the same level of M = 89.1 lb./ac.
4. M means at the same level of S = 127.3 lb./ac.
5. S means at the same level of D = 89.1 lb./ac.
6. D means at the same level of S = 92.5 lb./ac.

Crop: Tobacco.
Site: Agri. Stn., Ferozepur Cantt.
Ref: Pb. 50(44).
Type: 'C'.

Object: To find out the effect of different rotations on yield and quality of Tobacco.

1. BASAL CONDITIONS:

(i) (a) As per treatments. (b) As per treatments. (c) 100 lb./ac. of N as ‘A/S’ (ii) (a) Clay loam. (b) N.A. (iii) 6.3.1950. (iv) (a) to (e) N.A. (v) Nil. (vi) T.12 (medium). (vii) Irrigated. (viii) 6—7 toppings, suckering and 4-5 hoeings. (ix) 1.19". (x) 22.6.1950.

2. TREATMENTS:

<table>
<thead>
<tr>
<th>T1</th>
<th>Tobacco-Maize-Tobacco—200% intensity of cropping.</th>
</tr>
</thead>
<tbody>
<tr>
<td>T2</td>
<td>Tobacco-Potato-Tobacco—200% intensity of cropping.</td>
</tr>
<tr>
<td>T3</td>
<td>Tobacco-Chari (fodder) Tobacco—100% intensity of cropping.</td>
</tr>
<tr>
<td>T4</td>
<td>Tobacco-Fallow-Tobacco—100% intensity cropping.</td>
</tr>
</tbody>
</table>

3. DESIGN:

(i) R.B.D. (ii) (a) 4. (b) N.A. (iii) 8. (iv) (a) and (b) 45’×81’. (v) Nil. (vi) Yes.

4. GENERAL:

(i) Satisfactory. No lodging. (ii) Nil. (iii) growth, height, no. of plants at harvest and rope weight. (iv) (a) 1950 to 1953. (b) No. (c) —. (v) (a) Nil. (b) —. (vi) and (vii) Nil.
5. RESULTS:
(i) 1309 lb./ac.
(ii) 206.0 lb./ac.
(iii) Treatments are highly significantly different.
(iv) Av. yield of tobacco in lb./ac.

<table>
<thead>
<tr>
<th>Treatment</th>
<th>Av. yield</th>
</tr>
</thead>
<tbody>
<tr>
<td>T₁</td>
<td>1361</td>
</tr>
<tr>
<td>T₂</td>
<td>1468</td>
</tr>
<tr>
<td>T₃</td>
<td>940</td>
</tr>
<tr>
<td>T₄</td>
<td>1467</td>
</tr>
<tr>
<td>S.E./mean</td>
<td>±72.8 lb./ac.</td>
</tr>
</tbody>
</table>

Crop :- Tobacco.  
Site :- Agri. Stn., Ferozepur Cantt.  
Ref :- Pb. 51(16).  
Type :- 'C'.

Object :- To find out the effect of different rotations on yield and quality of Tobacco.

1. BASAL CONDITIONS:
(i) (a) As per treatments.  
(ii) As per treatments.  
(iii) 100 lb./ac. of N as A/S.  
(iv) Heavy loam.  
(v) N.A.
(vi) 23.2.1951.  
(vii) 1 ploughing with raja plough, 6 desi ploughings, 8 plankings and 1 rollering.  
(viii) N.A.  
(ix) 2 gap fillings, 3 toppings and suckering.  
(x) 24.6.1951.

2. TREATMENTS:
T₁ = Tobacco-Fallow-Tobacco—100% intensity of cropping.
T₂ = Tobacco-Chari (fodder)-Tobacco—100% intensity of cropping.
T₃ = Tobacco-Maize-Tobacco—200% intensity of cropping.
T₄ = Tobacco-Potato-Tobacco—200% intensity of cropping.

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

4. GENERAL:
(i) Normal. No lodging.  
(ii) Nil.  
(iii) Dry wt., pit wt. of stalk and ropes, green wt., no. of leaves/plant, 
length and breadth of leaves in cm., height in cm., no. of plants at harvest.  
(iv) (a) 1950 to 1953.  
(b) No.  
(c) Nil.  
(d) Nil.  
(e) Nil.  
(f) Yes.  
(g) Nil.

5. RESULTS:
(i) 1152 lb./ac.  
(ii) 242.5 lb./ac.  
(iii) Treatments are not significantly different.
(iv) Av. yield of tobacco in lb./ac.

<table>
<thead>
<tr>
<th>Treatment</th>
<th>Av. yield</th>
</tr>
</thead>
<tbody>
<tr>
<td>T₁</td>
<td>1277</td>
</tr>
<tr>
<td>T₂</td>
<td>925</td>
</tr>
<tr>
<td>T₃</td>
<td>1248</td>
</tr>
<tr>
<td>T₄</td>
<td>1159</td>
</tr>
<tr>
<td>S.E./mean</td>
<td>±121.3 lb./ac.</td>
</tr>
</tbody>
</table>
Crop :- Tobacco.  
Site :- Agri. Stn., Ferozepur Cantt.  
Object :- To find out the effect of different rotations on yield and quality of Tobacco.

1. BASAL CONDITIONS:
   (i) (a) As under treatments. (b) As under treatments. (c) 100 lb./ac. of N as A/S. (ii) (a) Heavy loam. (b) N.A. (iii) 26.2.1952. (iv) (a) 6 desi ploughings, 5 plankings and 1 Lyalpur hoe. (b) N.A. (c) 10 lb./ac. (d) 1' × 1'. (e) N.A. (v) Nil. (vi) T-21 (medium). (vii) Irrigated. (viii) One gap filling, two hoeings, one topping and suckering. (ix) 1.86'. (x) 21.6.1952.

2. TREATMENTS:
   4 crop rotations :
   T1 = Tobacco-Fallow-Tobacco — 100% intensity of cropping.
   T2 = Tobacco-Maize-Tobacco — 200% intensity of cropping.
   T3 = Tobacco-Potato-Tobacco — 200% intensity of cropping.
   T4 = Tobacco-Chari (fodder)-Tobacco — 100% intensity of cropping.

3. DESIGN:
   (i) R.B.D. (ii) (a) 4. (b) N.A. (iii) 4. (iv) (a) 57.5' × 1.6'. (b) 44' × 16'. (v) N.A. (vi) Yes.

4. GENERAL:
   (i) Satisfactory. No lodging. (ii) Nil. (iii) Dry wt., pit wt. of stalk and ropes, green wt. in lbs., no. of leaves/plant, breadth and length of leaves in cm., no. of plants at harvest. (iv) (a) 1950—1953. (b) No. (c) Nil. (v) (a) N. (b) —. (vi) and (vii) Nil.

5. RESULTS:
   (i) 1783 lb./ac.
   (ii) 198.2 lb./ac.
   (iii) Treatments are significantly different.
   (iv) Av. yield of tobacco in lb./ac.

<table>
<thead>
<tr>
<th>Treatment</th>
<th>Av. yield</th>
</tr>
</thead>
<tbody>
<tr>
<td>T1</td>
<td>1976</td>
</tr>
<tr>
<td>T2</td>
<td>1688</td>
</tr>
<tr>
<td>T3</td>
<td>1956</td>
</tr>
<tr>
<td>T4</td>
<td>1512</td>
</tr>
<tr>
<td>S.E./mean</td>
<td>99.1 lb./ac.</td>
</tr>
</tbody>
</table>

---

Crop :- Tobacco.  
Site :- Agri. Stn., Ferozepur Cantt.  
Object :- To find out the effect of different rotations on yield and quality of Tobacco.

1. BASAL CONDITIONS:
   (i) (a) As per treatments. (b) As per treatments. (c) 100 lb./ac. of N as A/S. (iii) 21.2.1953. (iv) (a) 1 ploughing with raja plough, 4 desi ploughings, 4 plankings and 1 rollering. (b) and (c) N.A. (d) 1' from row to row and 9' from plant to plant. (e) N.A. (v) Nil. (vi) T-21 (late). (vii) Irrigated. (viii) 3 weedings and a boeing. (ix) 1.37'. (x) 23.6.1953.

2. TREATMENTS:
   4 crop rotations :
   T1 = Tobacco-Maize-Tobacco — 200% intensity of cropping.
   T2 = Tobacco-Potato-Tobacco — 200% intensity of cropping.
   T3 = Tobacco-Chari (fodder)-Tobacco — 100% intensity of cropping.
   T4 = Tobacco-Fallow-Tobacco — 100% intensity of cropping.
3. DESIGN:
(i) R.B.D. (ii) (a) 4. (b) N.A. (iii) 4. (iv) (a) 57'4 x 16'. (b) 44.38 x 16'. (v) One row on each side of length. (vi) Yes.

4. GENERAL:
(i) Normal. No lodging. (ii) Nil. (iii) No. of plants at harvest, height in centimeters, no. of leaves per plant, average length of leaf in cm., green plant weight, dry weight. (iv) (a) 1950—1953. (b) No. (c) Nil. (d) (a) No. (b)—. (vi) and (vii) Nil.

5. RESULTS:
(i) 1542 lb./ac.
(ii) 157.2 lb./ac.
(iii) Treatments are highly significantly different.
(iv) Av. yield of tobacco in lb./ac.

<table>
<thead>
<tr>
<th>Treatment</th>
<th>Av. yield</th>
</tr>
</thead>
<tbody>
<tr>
<td>T1</td>
<td>2114</td>
</tr>
<tr>
<td>T2</td>
<td>1674</td>
</tr>
<tr>
<td>T3</td>
<td>1296</td>
</tr>
<tr>
<td>T4</td>
<td>1083</td>
</tr>
<tr>
<td>S.E./mean</td>
<td>78.6 lb./ac.</td>
</tr>
</tbody>
</table>

Crop:- Tobacco.  
Ref:- Pb. 50(51).  
Type:- 'I'.

Object :- To study the effect of stoppage of irrigation.

1. BASAL CONDITIONS:
(i) (a) Nil. (b) Maize. (c) Nil. (iii) (a) Clay loam. (b) N.A. (iii) 4.3.1950. (iv) (a) 5 ploughings and 6 sohagya. (b) N.A. (c) 1 oz./marla. (d) 1' x 9'. (e) N.A. (v) 21 C.L./ac. of F.Y.M. on 24.12.1949. (vi) T-26. (vii) Irrigated. (viii) 6-7 toppings and suckering; 4-5 hoeings. (xi) 1.19'. (x) 26.5.1950.

2. TREATMENTS:
I1 = Weekly irrigations (control).  
I2 = Weekly irrigations up to 15th May and no irrigation after 15th May.  
I3 = Weekly irrigations up to 15th May and one irrigation after 15th May.  
I4 = Weekly irrigations up to 15th May and two irrigations after 15th May.

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

4. GENERAL:
(i) Normal. No lodging. (ii) Nil. (iii) Height, no. of plants at harvest and tobacco yield. (iv) (a) Not continued. (b)—. (c)—. (v) (a)— (b)—. (vi) and (vii) Nil.

5. RESULTS:
(i) 938.1 lb./ac.
(ii) 120.78 lb./ac.
(iii) Treatment differences are not significant.
(iv) Av. yield of tobacco in lb./ac.

<table>
<thead>
<tr>
<th>Treatment</th>
<th>Av. yield</th>
</tr>
</thead>
<tbody>
<tr>
<td>I1</td>
<td>1008.1</td>
</tr>
<tr>
<td>I2</td>
<td>946.5</td>
</tr>
<tr>
<td>I3</td>
<td>1010.9</td>
</tr>
<tr>
<td>I4</td>
<td>786.9</td>
</tr>
<tr>
<td>S.E./mean</td>
<td>60.39 lb./ac.</td>
</tr>
</tbody>
</table>
Object:—To study the effect of stoppage of irrigation.

1. BASAL CONDITIONS:
   (i) (a) Nil. (b) Fallow. (c) Nil. (ii) (a) Clay loam. (b) N.A. (iii) 24,25.2.1949. (iv) (a) 6 ploughings 7 sohaga and 1 roller. (b) N.A. (c) 3/4 oz./marla. (d) 1½'×1½'. (e) N.A. (v) F.Y.M. 24 C.L./ac. one week before planting. (vi) T-12 (medium). (vii) Irrigated. (viii) 6-7 toppings, 1 suckering and 4-5 hoeings. (ix) 5.87'. (x) 24.6.1949.

2. TREATMENTS:
   I₁=Weekly irrigations (control).
   I₂=Weekly irrigations upto 15 th May and no irrigation after 15th May.
   I₃=Weekly irrigations upto 15th May and one irrigation after 15th May.
   I₄=Weekly irrigations upto 15th May and two irrigations after 15th May.

3. DESIGN:
   (i) R.B.D. (ii) (a) 4. (b) N.A. (iii) 12. (iv) (a) and (b) 55'×12'. (v) Nil. (vi) Yes.

4. GENERAL:
   (i) Normal. No lodging. (ii) Nil. (iii) Rope weight. (iv) (a) 1949—1951. (b)—. (c)—. (v) (a) No. (b)—. (vi) and (vii) Nil.

5. RESULTS:
   (i) 1870 lb./ac.
   (ii) 165.5 lb./ac.
   (iii) Treatment differences are not significant.
   (iv) Av. yield of tobacco in lb./ac.
   Treatment | Av. yield
   ----------|-----------
   I₁  | 1794
   I₂  | 1894
   I₃  | 1853
   I₄  | 1938
   S.E./mean = 47.8 lb./ac.

Object:—To find out the effect of stoppage of irrigation.

1. BASAL CONDITIONS:
   (i) (a) Nil. (b) Charri. (c) Nil. (ii) (a) Clay loam. (b) N.A. (iii) 18.2.1950. (iv) (a) 5 ploughings and 7 sohaga. (b) N.A. (c) 3/4 oz./marla. (d) 15'×5'. (e) N.A. (v) 28 C.L./ac. of F.Y.M. a week before sowing. (vi) T-12. (vii) Irrigated. (viii) 6—7 toppings and suckering ; 4—5 hoeings. (ix) 1.19'. (x) 11.6.1950 to 18.6.1950.

2. TREATMENTS:
   I₁=Weekly irrigations till harvest.
   I₂=Weekly irrigations upto 15.5.1950 and no additional irrigation.
   I₃=Weekly irrigations upto 15.5.1950 and one additional irrigation.
   I₄=Weekly irrigations upto 15.5.1950 and two additional irrigations.

3. DESIGN:
   (i) R.B.D. (ii) (a) 4. (b) N.A. (iii) 8. (iv) (a) N.A. (b) 27'×10'. (v) N.A. (vi) Yes.

4. GENERAL:
   (i) Normal. No lodging. (ii) Nil. (iii) Growth, height, no. of plants at harvest and rope weight. (iv) (a) 1949 to 1951. (b) No. (c) Nil. (v) (a) No. (b)—. (vi) and (vii) Nil.
5. RESULTS:

(i) 1300 lb./ac.
(ii) 194.9 lb./ac.
(iii) Treatment differences are highly significant.
(iv) Av. yield of tobacco in lb./ac.

<table>
<thead>
<tr>
<th>Treatment</th>
<th>Av. yield</th>
</tr>
</thead>
<tbody>
<tr>
<td>I</td>
<td>1435</td>
</tr>
<tr>
<td>I₂</td>
<td>985</td>
</tr>
<tr>
<td>I₃</td>
<td>1291</td>
</tr>
<tr>
<td>I₄</td>
<td>1490</td>
</tr>
<tr>
<td>S.E./mean</td>
<td>68.9 lb./ac.</td>
</tr>
</tbody>
</table>

Crop: Tobacco.
Site: Agri. Stn., Ferozepur Cantt.
Object: To find out the effect of stoppage of irrigation.

Ref: Pb. 51 (12).
Type: 'T'.

1. BASAL CONDITIONS:

(i) (a) Tobacco-fallow-Wheat-fodder. (b) Maize (fodder). (c) Nil. (ii) (a) Heavy loam. (b) N.A.
(iii) 15.2.1951. (iv) (a) 1 ploughing with raja plough; 8 desi ploughings, 1 disc harrow, 11 plankings and 2 roller. (b) and (c) N.A. (d) 15°×12°. (e) N.A. (v) 200 lb./ac. of N as F.Y.M. on 3, 4.1.1951.
(vi) T-21 (medium). (vii) Irrigated. (viii) 4 toppings and suckering, 4 hoeings and one gap filling. (ix) 0.91°.
(x) 18.6.1951.

2. TREATMENTS:

I₁ = Weekly irrigations till harvest (control).
I₂ = Weekly irrigations upto 30.4-1951.
I₃ = Weekly irrigations upto 30.4.1951 and one additional irrigation.
I₄ = Weekly irrigations upto 30.4.1951 and two additional irrigations.

3. DESIGN:

(i) R.B.D. (ii) (a) 4. (b) N.A. (iii) 8. (iv) (a) N.A. (b) 27'×10'. (v) N.A. (vi) Yes.

4. GENERAL:

(i) Good. No lodging. (ii) Nil. (iii) Dry wt., pit wt. of stalk and ropes, green wt., no. of leaves/plant length and breadth of leaves in cms., height in cms., and no. of plants at harvest; (iv) (a) 1949 to 1951.
(b) No. (c) Nil. (v) (a) No. (b)—. (vi) and (vii) Nil.

5. RESULTS:

(i) 887.6 lb./ac.
(ii) 223.9 lb./ac.
(iii) Treatment differences are not significant.
(iv) Av. yield of tobacco in lb./ac.

<table>
<thead>
<tr>
<th>Treatment</th>
<th>Av. yield</th>
</tr>
</thead>
<tbody>
<tr>
<td>I₁</td>
<td>1004.7</td>
</tr>
<tr>
<td>I₂</td>
<td>735.1</td>
</tr>
<tr>
<td>I₃</td>
<td>884.1</td>
</tr>
<tr>
<td>I₄</td>
<td>864.6</td>
</tr>
<tr>
<td>S.E./mean</td>
<td>79.2 lb./ac.</td>
</tr>
</tbody>
</table>

Crop: Tobacco.
Site: Agri. Stn., Ferozepur Cantt.
Object: To find the best interval of irrigation as well as method of planting.

Ref: Pb. 49(49).
Type: 'CI'.

1. BASAL CONDITIONS:

(i) (a) Nil. (b) Chari. (c) Nil. (ii) a) Clay loam. (b) N.A. (iii) 19.2.1949. (iv) (a) 6 ploughings, 7 sodhaga and 1 roller. (b) As per treatments. (c) to (e) N.A. (v) 24 C.L. of F.Y.M. one week before planting. (vi) T-12 (medium). (vii) Irrigated. (viii) 6-7 toppings and suckering; 4-5 hoeings. (ix) 5.87°.
(x) 14.6.1949.
2. **TREATMENTS**:

**Main-plot treatments**
- 2 irrigation intervals: \( I_1 = 5, I_2 = 7 \) and \( I_3 = 9 \) days.

**Sub-plot treatments**
- 2 methods of planting: \( L_1 = \) Flat and \( L_2 = \) Ridges.

3. **DESIGN**:

(i) Split-plot. (ii) (a) 3 main-plots/block; 2 sub-plots/main plot. (b) N.A. (iii) 6. (iv) (a) and (b) Main-plot: \( 55' \times 12' \), sub-plot: \( 55' \times 6' \). (v) Nil. (vi) Yes.

4. **GENERAL**:

(i) Good. No lodging. (ii) Nil. (iii) Ropes wt. (iv) (a) Not continued. (b) and (c) -. (v) (a) No. (b) -. (vi) and (vii) Nil.

5. **RESULTS**:

(i) 1333 lb./ac. 
(ii) (a) 186.3 lb./ac. 
(b) 137.6 lb./ac.

(iii) None of the effects is significant.

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

<table>
<thead>
<tr>
<th></th>
<th>( L_1 )</th>
<th>( L_2 )</th>
<th>Mean</th>
</tr>
</thead>
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<tr>
<td>( I_1 )</td>
<td>1307</td>
<td>1431</td>
<td>1369</td>
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<td>( I_2 )</td>
<td>1295</td>
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<td>1341</td>
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<tr>
<td>( I_3 )</td>
<td>1312</td>
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<tr>
<td>Mean</td>
<td>1305</td>
<td>1361</td>
<td>1333</td>
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</table>

S.E. of marginal mean of \( I \) = 53.8 lb./ac.
S.E. of marginal mean of \( L \) = 32.4 lb./ac.
S.E. of difference between two \( I \) means at the same level of \( I \) = 79.4 lb./ac.
S.E. of difference between two \( L \) means at the same level of \( L \) = 94.5 lb./ac.

---

Crop : Tobacco.  
Site : Agri. Stn., Ferozepur Cantt.  
Ref : Pb. 50(50).  
Type : ‘CI’.

Object : To find out the best interval of irrigation and best method of planting.

1. **BASAL CONDITIONS**:

(i) (a) Nil. (b) Chari. (c) Nil. (ii) (a) Clay loam. (b) N.A. (iii) 9 to 13.3.1950. (iv) (a) 5 ploughings and 6 sodha. (b) As per treatments. (c) 1 oz./marla. (d) \( 12' \times 9' \). (e) N.A. (v) 21 C.L./ac. of F.Y.M. on 24.12.1949. (vi) T-26. (vii) Irrigated. (viii) 6-7 toppings and suckering; 4-5 hoeings. (ix) 1.19'. (x) 31.5.1950 to 15.6.1950.

2. **TREATMENTS**:

**Main-plot treatments**
- 3 irrigation intervals: \( I_1 = 5, I_2 = 7 \) and \( I_3 = 9 \) days.

**Sub-plot treatments**
- 2 methods of planting: \( L_1 = \) Flat and \( L_2 = \) Ridges.

3. **DESIGN**:

(i) Split-plot. (ii) (a) 3 main-plots/block; 2 sub-plots/main-plot. (b) N.A. (iii) 4. (iv) (a) N.A. (b) Sub-plots: \( 18' \times 10' \). (v) N.A. (vi) Yes.

4. **GENERAL**:

(i) Normal. No lodging. (ii) Nil. (iii) Growth height, no. of plants at harvest and yield. (iv) (a) 1950—1952. (b) No. (c) Nil. (v) (a) No. (b) -. (vi) and (vii) Nil.
5. RESULTS:

(i) 629.3 lb./ac.
(ii) (a) 184.6 lb./ac.
(b) 133.2 lb./ac.
(iii) None of the effects is significant
(iv) Av. yield of tobacco in lb./ac.

<table>
<thead>
<tr>
<th></th>
<th>L₁</th>
<th>L₂</th>
<th>Mean</th>
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<td>713.3</td>
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<td>575.6</td>
<td>577.2</td>
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<tr>
<td>I₃</td>
<td>569.6</td>
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<td>597.4</td>
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<td>657.0</td>
<td>601.5</td>
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</table>

S.E. of marginal mean of I = 65.3 lb./ac.
S.E. of marginal mean of L = 38.5 lb./ac.
S.E. of difference between two means at the same level of I = 94.2 lb./ac.
S.E. of difference between two means at the same level of L = 113.8 lb./ac.

Crop: Tobacco.
Site: Agri. Stn., Ferozepur Cantt.
Ref.: Pb. 51(20).
Type: 'CI'.

Object: To find the best interval of irrigation and test method of planting.

1. BASAL CONDITIONS:
   (i) (a) Nil. (b) Maize (fodder). (c) Nil. (ii) (a) Heavy loam. (b) N.A. (iii) 8.3.1951. (iv) (a) 8 desi ploughings, 9 plantings and 2 roller. (b) As per treatments. (c) —. (d) Row to row.1/4, plant to plant 1'. (e) N.A. (v) 200 lb./ac. of N as F.Y.M. by broadcast on 8.2.1951. (vi) N-rustica T.186 (medium). (vii) Irrigated. (viii) N.A. (ix) 0.91'. (x) 28.5.1951.

2. TREATMENTS:
   All combinations of (1) and (2)
   (1) 2 methods of sowing: L₁ = Flat and L₂ = Ridges.
   (2) 3 irrigations: I₁ = Irrigation after 5 days, I₂ = Irrigation after 7 days and I₃ = Irrigation after 9 days.

3. DESIGN:
   (i) 2 x 3 Fact. in R.B.D. (ii) (a) 6. (b) N.A. (iii) 6. (iv) (a) N.A. (b) 10' x 18'. (v) N.A. (vi) Yes.

4. GENERAL:
   (i) Normal. No lodging. (ii) Nil. (iii) Dry wt. of ropes, no. of leaves/plant green wt., length and breadth of leaves in ems., height in ems., no. of plants at harvest and yield. (iv) (a) 1950—52. (b) No. (c) —. (v) (a) No. (b) —. (vi) and (vii) Nil.

5. RESULTS:
   (i) 781.5 lb./ac.
   (ii) 181.94 lb./ac.
   (iii) Effects of I and L are highly significant. The interaction is not significant.
   (iv) Av. yield of tobacco in lb./ac.

<table>
<thead>
<tr>
<th></th>
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<th>I₃</th>
<th>Mean</th>
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<td>828.6</td>
<td>685.8</td>
<td>538.6</td>
<td>684.3</td>
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<tr>
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<td>910.7</td>
<td>788.1</td>
<td>645.7</td>
<td>781.5</td>
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</table>

S.E. of marginal mean of I = 51.52 lb./ac.
S.E. of marginal mean of L = 42.88 lb./ac.
S.E. of body of table = 74.27 lb./ac.
Crop: Tobacco.  
Site: Agri. Stn., Ferozepur Cantt.  
Ref.: Pb. 52(92).  
Type: 'CI'.

Object: To find the best interval of irrigation and the best method of planting.

1. BASAL CONDITIONS:
   (i) (a) Nil.  (b) Guara.  (c) Nil.  
   (ii) (a) Heavy loam.  (b) N.A.  (iii) 19.2.1950. 
   (iv) (a) 1 tractor ploughing 6 zohaga, 3 roller and 1 tripally.  
   (b) N.A.  (c) 2 ozs/mlra.  
   (d) 12" x 9".  (e) N.A.  
   (v) 30 lb/acre of N as F.Y.M. by broadcast on 28.1.1952 and 1.2.1952. 
   (vi) T-26 (medium).  (vii) Irrigated.  
   (viii) 7 topings and suckering, gap filling and 4 hoeings.  
   (ix) 1.86'.  
   (x) 13,14,5.1952.

2. TREATMENTS:
   All combinations of (1) and (2)
   (1) 2 methods of planting: L1=Flat and L2=Ridges. 
   (2) 3 irrigations: I1=5 days interval, I2=7 days interval and I3=9 days interval.

3. DESIGN:
   (i) 2 x 3 Fact. in R B.D.  
   (ii) (a) 6.  (b) N.A.  
   (iii) 6.  
   (iv) (a) 22' x 10'.  (b) 18' x 10'.  
   (v) 1' on breadth sides including buds left out.  
   (vi) Yes.

4. GENERAL:
   (i) Good. No lodging.  
   (ii) Nil.  
   (iii) Dry wt. of ropes, green wt. in lb., no. of leaves/plant, breadth and length of leaves in cms, height in cms., no. of plants at harvest and yield.  
   (iv) (a) 1950-52.  
   (b) No.  
   (c) Nil.  
   (v) (a) No.  
   (b) -.  
   (vi) and (vii) Nil.

5. RESULTS:
   (i) 1029 lb/acre.  
   (ii) 215.1 lb/acre.  
   (iii) I effect is not significant. L effect is highly significant, while interaction is significant. 
   (iv) Av. yield of tobacco in lb/acre,

<table>
<thead>
<tr>
<th></th>
<th>I1</th>
<th>I2</th>
<th>I3</th>
<th>Mean</th>
</tr>
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<td>1195</td>
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<tr>
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<tr>
<td>Mean</td>
<td>1072</td>
<td>932</td>
<td>1084</td>
<td>1029</td>
</tr>
</tbody>
</table>

S.E. of marginal mean of L = 50.7 lb/acre. 
S.E. of marginal mean of I = 62.1 lb/acre. 
S.E. of body of table = 87.8 lb/acre.

--

Crop: Tobacco.  
Site: Agri. Stn., Ferozepur Cantt.  
Ref.: Pb. 50(48).  
Type: 'CI'.

Object: To find out the best interval of irrigation, method of planting, spacing between rows and spacing between plants.

1. BASAL CONDITIONS:
   (i) (a) Nil.  
   (b) Guara.  
   (c) Nil.  
   (ii) (a) Clay loam.  (b) N.A.  
   (iii) 20-21.2.1950.  
   (iv) (a) 5 ploughings, and 6 zohaga.  
   (b) N.A.  
   (c) 2 ozs/mlra.  
   (d) As per treatments.  
   (e) N.A.  
   (v) 24 C.L/acre of F.Y.M. cne week before sowing.  
   (vi) T.12 (medium).  
   (vii) Irrigated.  
   (viii) 4-5 hoings, topping and suckering.  
   (ix) 1.19'.  
   (x) 18-6 1950.
2. TREATMENTS:
   Main-plot treatments:
   3 intervals of irrigation: \( I_1 = 5, I_2 = 7 \) and \( I_3 = 9 \) days.
   Sub-plot treatments:
   2 methods of planting: \( L_1 = \text{Flat} \) and \( L_2 = \text{Ridge} \).
   Sub-sub-plot treatments:
   2 spacing between rows: \( R_1 = 1' 1" \) and \( R_2 = 2' \).
   Sub-sub-sub-plot treatments:
   3 spacings between plants: \( S_1 = 9" \), \( S_2 = 12" \) and \( S_3 = 15" \).

3. DESIGN:
   (i) split-plot. (ii) (a) 3 main-plots/block ; 2 sub-plots/main-plot. 2 sub-sub-plots/sub-plot ; 3 sub-sub-sub plots/sub-sub-plot. (b) N.A. (iii) 4. (iv) sub-sub-sub-plot. (a) N.A. (b) 18' x 12' (v) N.A. (vi) Yes.

4. GENERAL:
   (i) Good. No lodging. (ii) Nil. (iii) growth height, no. of plants, rope wt. and yield. (iv) (a) 1949 to 1952. (b) No. (c) Nil. (v) (a) No. (b) =. (vi) Nil. (vii) Nil.

5. RESULTS:
   (i) 2977 lb./ac. (ii) (a) 446.4 lb./ac. (b) 1112.1 lb./ac. (c) 421.2 lb./ac. (d) 479.7 lb./ac. (iii) R and S effects are highly significant while interaction R x S is significant. Others are not significant. (iv) Av. yield of tobacco in lb./ac.

<table>
<thead>
<tr>
<th></th>
<th>( L_1 )</th>
<th>( L_2 )</th>
<th>Mean</th>
<th>( R_1 )</th>
<th>( R_2 )</th>
<th>( S_1 )</th>
<th>( S_2 )</th>
<th>( S_3 )</th>
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<td>3215</td>
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<tr>
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<td>3165</td>
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</tbody>
</table>

S.E. of I marginal means = 64.4 lb./ac.
S.E. of \( L \) marginal means = 131.1 lb./ac.
S.E. of \( R \) marginal means = 49.6 lb./ac.
S.E. of \( S \) marginal means = 69.2 lb./ac.
S.E. of difference of two:
1. \( L \) means at the same level of \( I \) = 321.0 lb./ac.
2. \( L \) means at the same level of \( L \) = 244.6 lb./ac.
3. \( R \) means at the same level of \( I \) = 121.6 lb./ac.
4. \( I \) means at the same level of \( R \) = 125.3 lb./ac.
5. \( I \) means at the same level of \( S \) = 169.6 lb./ac.
6. \( S \) means at the same level of \( I \) = 165.8 lb./ac.
7. \( L \) means at the same level of \( R \) = 198.2 lb./ac.
8. \( R \) means at the same level of \( L \) = 99.3 lb./ac.
9. \( L \) means at the same level of \( S \) = 217.1 lb./ac.
10. \( S \) means at the same level of \( L \) = 138.5 lb./ac.
11. \( R \) means at the same level of \( S \) = 133.1 lb./ac.
12. \( S \) means at the same level of \( R \) = 138.5 lb./ac.
Crop: Tobacco.
Site: Agri. Stn., Ferozepur Cantt.
Ref: Pb. 51(15).
Type: ‘CI’.

Object:—To find out the best method of planting on ridges or on flat beds, best spacing between plants and best interval of irrigation.

1. BASAL CONDITIONS:
   (i) (a) Nil. b) N.A. (c) Nil. (ii) (a) Heavy loam. (b) N.A. (iii) 23.2.1951. (iv) (a) to (c) N.A. (v) N.A. (vi) T—21 (medium). (vii) Irrigated. (viii) N.A. (ix) 0.91”. (x) 24.6.1951.

2. TREATMENTS:
   Main-plot treatments:
   3 intervals of irrigation: I₁=5, I₂=7 and I₃=9 days.
   Sub-plot treatments:
   All combinations of (1) and (2)
   (1) 2 methods of planting: L₁=Flat and L₂=Ridge.
   (2) 2 spacings between rows: R₁=11” and R₂=2’.
   Sub-sub-plot treatments:
   3 spacings between plants: S₁=9”, S₂=12” and S₃=15”.

3. DESIGN:
   (i) Split-plot. (ii) (a) 3 main-plots/block; 4 sub-plots/main-plot; 3 sub-sub-plots/sub-plot. (b) N.A. (iii) 4. (iv) sub-sub-plot. (a) N.A. (b) 18”x12”. (v) N.A. (vi) Yes.

4. GENERAL:
   (i) Normal. No lodging. (ii) Nil. (iii) Yield data. (iv) (a) 1949 to 1952. (b) No. (c) Nil. (v) (a) No. (b) —. (vi) and (vii) Nil.

5. RESULTS:
   (i) 1104 lb/ac.
   (ii) (a) 277.7 lb/ac.
   (b) 412.7 lb/ac.
   (c) 245.8 lb/ac.
   (iii) Sub-plot treatment effects and S effects are significant L×R effect is significant, R effect is highly significant while other effects are not significant.
   (iv) Av. yield of tobacco in lb/ac.

<table>
<thead>
<tr>
<th></th>
<th>L₁</th>
<th>L₂</th>
<th>Mean</th>
<th>R₁</th>
<th>R₂</th>
<th>S₁</th>
<th>S₂</th>
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</tbody>
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S.E. of I marginal means = 40.1 lb./ac.
S.E. of S marginal means = 35.5 lb./ac.
S.E. of R or L marginal means = 48.6 lb./ac.
S.E. of difference of two
1. L or R means at the same level of I = 119.1 lb./ac.
2. I means at the same level of L or R = 101.5 lb./ac.
3. S means at the same level of I = 86.9 lb./ac.
4. I means at the same level of S = 90.8 lb./ac.
5. S means at the same level of L or R = 70.9 lb./ac.
6. L or R means at the same level of S = 89.9 lb./ac.
7. Means of body of L×R table = 97.3 lb./ac.
Crop: Tobacco.  
Site: Agr. Stn., Ferozepur Cantt.  
Ref: Pb. 52(87).  
Type: 'CI'.

Object: To find out the best method of planting, best spacing between plants, and best interval of irrigation.

1. BASAL CONDITIONS:
   (i) (a) Nil. (b) Fallow. (c) Nil. (iii) (a) Heavy loam. (b) Nil. (iii) 6.3.1952. (iv) (a) 1 tractor ploughing, 9 fur., 2 roller and 9 planking. (b) to (c) N.A. (v) 45 C.L./ac. of F.Y.M. on 7.2.1952 to 11.2.1952. by broadcast. (vi) T-21 (medium). (vii) Irrigated. (viii) 2 gap fillings, 4 hoeings, 1 topping and suckering. (ix) 1.86.

2. TREATMENTS:
   Main-plot treatments:
   3 intervals of irrigation: I_1 = 5, I_2 = 7 and I_3 = 9 days.
   Sub-plot treatments:
   All combinations of (1) and (2).
   (1) 2 methods of planting: L_1 = Flat and L_2 = Ridge.
   (2) 2 spacings between rows: R_1 = 12 and R_2 = 21.
   Sub-sub-plot treatments:
   3 spacings between plants: S_1 = 9, S_2 = 12 and S_3 = 15.

3. DESIGN:
   (i) Split-plot. (iii) (a) 3 main-plots/block; 4 sub-plots/main-plot; 3 sub-sub-plots/sub-plot. (b) N.A. (iii) 4. (iv) sub-sub-plot. (a) N.A. (b) 15' x 12'. (v) N.A. (vi) Yes.

4. GENERAL:
   (i) Normal. No lodging. (ii) Nil. (iii) Dry wt. pit weight of stalk and ropes, green weight, no. of leaves/plant height in cms. no. of plants at harvest. (iv) (a) 1949—1952. (b) No. (c) Nil. (v) (a) No. (b)—(vi) and (vii) Nil.

5. RESULTS:
   (i) 1112 lb./ac.
   (ii) (a) 403.7 lb./ac.
   (b) 442.1 lb./ac.
   (c) 308.0 lb./ac.
   (iii) I effect is highly significant and S effect is significant. Others are not significant.
   (iv) Av. yield of tobacco in lb./ac.

<table>
<thead>
<tr>
<th></th>
<th>L1</th>
<th>L2</th>
<th>Mean</th>
<th>R1</th>
<th>R2</th>
<th>S1</th>
<th>S2</th>
<th>S3</th>
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<td>1263</td>
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<td>1381</td>
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<td>1275</td>
<td>1392</td>
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<td>I2</td>
<td>995</td>
<td>957</td>
<td>976</td>
<td>1056</td>
<td>895</td>
<td>1155</td>
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<td>809</td>
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<td>I3</td>
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<td>1145</td>
<td>997</td>
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<td>1118</td>
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<td>S3</td>
<td>1069</td>
<td>983</td>
<td>1026</td>
<td>1101</td>
<td>950</td>
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<td>R1</td>
<td>1246</td>
<td>1134</td>
<td>1190</td>
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<td></td>
</tr>
<tr>
<td>R2</td>
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<td>1033</td>
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<td></td>
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</tbody>
</table>

S.E. of I marginal means = 58.3 lb./ac.
S.E. of R or L marginal means = 52.1 lb./ac.
S.E. of S marginal means = 44.4 lb./ac.
S.E. of difference of two
1. L or R means at the same level of I = 127.6 lb./ac.
2. I means at the same level of L or R = 122.2 lb./ac.
3. S means at the same level of I = 108.9 lb./ac.
4. I means at the same level of S = 121.2 lb./ac.
5. S means at the same level of L or R = 89.0 lb./ac.
6. L or R means at the same level of S = 103.5 lb./ac.
7. means of body of L x R table = 62.8 lb./ac.
Crop: Groundnut.  
Site: Groundnut Expt. Farm, Samrala.  
Ref.: Pb. 52(166).  
Type: 'M'.

Object: To find out the response of Groundnut to different doses of A/S.

1. BASAL CONDITIONS:
(i) (a) Nil. (b) N.A. (c) Nil. (ii) (a) Sandy. (b) Refer soil analysis, Samrala. (iii) 14.7.1952. (iv) (a) to (e) N.A. (v) Nil. (vi) F-S. (vii) Unirrigated. (viii) N.A. (ix) 22.19*. (x) 15.11.1952.

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. 50 lb./ac. of N as A/S.

Time and method of application of treatments N.A.

3. DESIGN:
(i) R.B.D. (ii) (a) 6. (b) N.A. (iii) 6. (iv) (a) N.A. (b) 1/106th ac. (v) N.A. (vi) Yes.

4. GENERAL:
(i) Fair to satisfactory. No lodging. (ii) Nil. (iii) Germination counts and pod yield. (iv) (a) 1952—contd. (b) No. (c) Nil. (v) (a) No. (b) —. (vi) and (vii) Nil.

5. RESULTS:
(i) 2060 lb/ac.
(ii) 128.7 lb./ac.
(iii) Treatments are significantly different.
(iv) Av. yield of pod in lb./ac.

<table>
<thead>
<tr>
<th>Treatment</th>
<th>Av. yield</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>1888</td>
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<tr>
<td>2.</td>
<td>2017</td>
</tr>
<tr>
<td>3.</td>
<td>2115</td>
</tr>
<tr>
<td>4.</td>
<td>2131</td>
</tr>
<tr>
<td>5.</td>
<td>2044</td>
</tr>
<tr>
<td>6.</td>
<td>2162</td>
</tr>
</tbody>
</table>

S.E./mean = 52.5 lb./ac.
5. RESULTS:

(i) 2420 lb./ac.
(ii) 140.3 lb./ac.
(iii) Treatments are highly significantly different.
(iv) Av. yield of pod in lb./ac.

<table>
<thead>
<tr>
<th>Treatment</th>
<th>Av. yield</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>2212</td>
</tr>
<tr>
<td>2.</td>
<td>2553</td>
</tr>
<tr>
<td>3.</td>
<td>2460</td>
</tr>
<tr>
<td>4.</td>
<td>2494</td>
</tr>
<tr>
<td>5.</td>
<td>2390</td>
</tr>
<tr>
<td>6.</td>
<td>2412</td>
</tr>
<tr>
<td>S.E./mean</td>
<td>=57.3 lb./ac.</td>
</tr>
</tbody>
</table>

Crop: Groundnut.  
Site: Groundnut Expt. Farm, Samrala.  
Ref: Pb. 49 (83).  
Type: ‘M’.

Object: To find out the suitability of various artificial fertilizers and organic manures on groundnut yield under rainfed conditions.

1. BASAL CONDITIONS:

(i) Nil.  
(b) N.A.  
(c) Nil.  
(iii) (a) Sandy.  
(b) Refer soil analysis, Samrala.  
(iii) N.A.  
(iv) (a) to (e) N.A.  
(v) Nil.  
(vi) Punjab Groundnut No. 1.  
(vii) Unirrigated.  
(viii) N.A.  
(ix) N.A.  
(x) N.A.

2. TREATMENTS:

1. 25 lb./ac. of N as F.Y.M.
2. 25 lb./ac. of N as G.N.C.
3. 25 lb./ac. of N as A/S.
4. 25 lb./ac. of N as Ammo. Phos.
5. Control (no manure).


3. DESIGN:

(i) R.B.D.  
(ii) (a) 5.  
(b) N.A.  
(iii) 6.  
(iv) (a) N.A.  
(b) 1/66th ac.  
(v) N.A.  
(vi) Yes.

4. GENERAL:

(i) Fair. No lodging.  
(ii) Nil.  
(iii) Pod yield.  
(iv) (a) 1949 to 1950.  
(b) No.  
(c) Nil.  
(v) (a) No.  
(b) .  
(vi) and (vii) Nil.

5. RESULTS:

(i) 1823 lb./ac.
(ii) 269.9 lb./ac.
(iii) Treatments are highly significantly different.
(iv) Av. yield of pod in lb./ac.

<table>
<thead>
<tr>
<th>Treatment</th>
<th>Av. yield</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>1662</td>
</tr>
<tr>
<td>2.</td>
<td>1585</td>
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<tr>
<td>3.</td>
<td>2209</td>
</tr>
<tr>
<td>4.</td>
<td>2090</td>
</tr>
<tr>
<td>5.</td>
<td>1568</td>
</tr>
<tr>
<td>S.E./mean</td>
<td>=110.2 lb./ac.</td>
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</tbody>
</table>
Crop :- Groundnut. Site :- Groundnut Expt. Farm, Samrala. Ref :- Pb. 50 (92). Type :- 'M'.

Object :- To find out the suitability of various artificial fertilizers and organic manures on groundnut yield under rainfed conditions.

1. BASAL CONDITIONS :
   (i) (a) Nil. (b) Fallow. (c) Nil. (ii) (a) Sandy. (b) Refer soil analysis, Samrala. (iii) N.A. (iv) (a) to (c) N.A. (v) Nil. (vi) Punjab Groundnut No. 1. (vii) Unirrigated. (viii) N.A. (ix) 30.1° N.A.

2. TREATMENTS :
   1. 25 lb./ac. of N as F.Y.M.
   2. 25 lb./ac. of N as G.N.C.
   3. 25 lb./ac. of N as A/S.
   4. 25 lb./ac. of N as Amm. Phos.
   5. Control (no manure).

   F.Y.M. and G.N.C. applied ten days before sowing and A/S and Amm. Phos. applied one month after sowing.

3. DESIGN :
   (i) R.B.D. (ii) (a) 5. (b) N.A. (iii) 6. (iv) (a) N.A. (b) 1/66th ac. (v) N.A. (vi) Yes.

4. GENERAL :
   (i) Fair. No lodging. (ii) Nil. (iii) Av. shelling %, Av. wt. of 100 seeds, pod yield/ac. (iv) (a) 1949 to 1950. (b) No. (c) Nil. (v) (a) No. (b) — (vi) and (vii) Nil.
5. RESULTS:
(i) 1379 lb./ac.
(ii) 155.7 lb./ac.
(iii) Main effect of R alone is highly significant.
(iv) Av. yield of pod in lb./ac.

<table>
<thead>
<tr>
<th></th>
<th>P₁</th>
<th>P₂</th>
<th>P₃</th>
<th>Mean</th>
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<tr>
<td>Mean</td>
<td>1137</td>
<td>1095</td>
<td>1005</td>
<td>1079</td>
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</tbody>
</table>

S.E. of marginal mean of P = 63.6 lb./ac.
S.E. of marginal mean of R = 44.9 lb./ac.
S.E. of body of table = 36.7 lb./ac.

- - -

Crop: Groundnut.  
Site: Groundnut Expt. Farm, Samrala.  
Ref: Pb. 50(94).  
Type: 'C'.

Object: To study the effect of different spacings between rows and plants on yield.

1. BASAL CONDITIONS:
(i) (a) Nil. (b) N.A. (c) Nil. (ii) (a) Sandy. (b) Refer soil analysis, Samrala. (iii) N.A. (iv) (a) to (e) N.A. (v) Nil. (vi) E-4 (erect and bushy). (vii) Unirrigated. (viii) N.A. (ix) 30.8. (x) N.A.

2. TREATMENTS:
All combinations of (1) and (2)
(1) 3 spacings between plants: P₁=6", P₂=9" and P₃=12".
(2) 2 spacings between rows: R₁=9" and R₂=12".

3. DESIGN:
(i) 3x2 Fact. in R.B.D. (ii) (a) 6. (b) N.A. (iii) 6. (iv) (a) N.A. (b) 1/80 ac. (v) N.A. (vi) Yes.

4. GENERAL:
(i) Fair to good. No lodging. (ii) Nil. (iii) No. of plants/plot, seed rate/ac., pod yield. (iv) (a) 1949-50, (b) and (c) No. (v) (a) and (b) No. (vi) and (vii) Nil.

5. RESULTS:
(i) 831 lb./ac.
(ii) 199.9 lb./ac.
(iii) None of the effects is significant.
(iv) Av. yield of pod in lb./ac.

<table>
<thead>
<tr>
<th></th>
<th>P₁</th>
<th>P₂</th>
<th>P₃</th>
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<tbody>
<tr>
<td>R₁</td>
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<td>868</td>
<td>862</td>
<td>888</td>
</tr>
<tr>
<td>R₂</td>
<td>862</td>
<td>724</td>
<td>737</td>
<td>774</td>
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<tr>
<td>Mean</td>
<td>898</td>
<td>796</td>
<td>800</td>
<td>831</td>
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</tbody>
</table>

S.E. of marginal mean of R = 81.6 lb./ac.
S.E. of marginal mean of P = 47.1 lb./ac.
S.E. of body of table = 57.7 lb./ac.
Crop : - Groundnut.  
Site : - Groundnut Expt. Farm, Samrala.  
Ref : - Ph. 50(93).  
Type : - 'C'.

Object : - To study the effect of different spacings between rows and plants on yield of Groundnut.

1. BASAL CONDITIONS:
   (i) (a) Nil. (b) N.A. (c) Nil. (ii) (a) Sandy. (b) Refer soil analysis, Samrala. (iii) N.A. (iv) (a) to (e) N.A. (v) Nil. (vi) Samrala selection (spreading type). (vii) Unirrigated. (viii) N.A. (ix) N.A. (x) N.A.

2. TREATMENTS:
   All combinations of (1) and (2)
   (1) 3 spacings between plants : P₁=9", P₂=12", P₃=18" and P₄=24".
   (2) 2 spacings between rows : R₁=9" and R₂=12".

3. DESIGN:
   (i) 4 x 2 Fact. in R.B.D. (ii) (a) 8. (b) N.A. (iii) 6. (iv) (a) N.A. (b) 1/80ac. (v) N.A. (vi) Yes.

4. GENERAL:
   (i) Fair to good. No lodging. (ii) Nil. (iii) Pod yield. (iv) (a) 1949-1950. (b) No. (c) Nil. (v) (a) No. (b) -. (vi) and (vii) Nil.

5. RESULTS:
   (i) 1367 lb/ac.
   (ii) 207.2 lb/ac.
   (iii) Main effect of P and interaction P R are significant.
   (iv) Av. yield of pod in lb/ac.

<table>
<thead>
<tr>
<th></th>
<th>P₁</th>
<th>P₂</th>
<th>P₃</th>
<th>P₄</th>
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<td>1389</td>
<td>1162</td>
<td>1330</td>
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<tr>
<td>Mean</td>
<td>1483</td>
<td>1364</td>
<td>1369</td>
<td>1251</td>
<td>1367</td>
</tr>
</tbody>
</table>

S.E. of marginal mean of P = 59.8 lb/ac.
S.E. of marginal mean of R = 42.3 lb/ac.
S.E. of body of table = 84.6 lb/ac.
5. RESULTS:
(i) 1228 lb/ac.
(ii) 200.7 lb/ac.
(iii) Effect of P alone is highly significant.
(iv) Av. yield of pod in lb/ac.

<table>
<thead>
<tr>
<th></th>
<th>P₁</th>
<th>P₂</th>
<th>P₃</th>
<th>P₄</th>
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<td>1238</td>
<td>1258</td>
<td>1017</td>
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</table>

S.E. of marginal mean of P = 57.9 lb/ac.
S.E. of marginal mean of R = 41.0 lb/ac.
S.E. of body of table = 81.9 lb/ac.

Crop: Groundnut.
Site: Groundnut Expt. Farm, Samrala.
Ref: Pb. 51(38).
Type: 'CM'.

Object: To study the effect of application of N and P₂O₅ and spacing between plants on the yield of Groundnut.

1. BASAL CONDITIONS:
(i) (a) Nil. (b) N.A. (c) Nil. (ii) (a) Sandy. (b) Refer soil analysis, Samrala. (iii) 24.7.1951. (iv) (a) to (c) N.A. (v) N.A. (vi) Punjab Groundnut No. 1. (vii) Unirrigated. (viii) N.A. (ix) 19.45'. (x) 12.12.1951.

2. TREATMENTS:
Main-plot treatments:
3 spacings between plants: S₁=9", S₂=18" and S₃=24".

Sub-plot treatments:
All combinations of (1) and (2).
(1) 3 levels of N: N₀=Control, N₁=25 lb/ac. and N₂=50 lb/ac.
(2) 3 levels of P₂O₅: P₀=Control, P₁=25 lb/ac. and P₂=50 lb/ac.
Source of N is A/S and that of P₂O₅ is Super.

3. DESIGN:
(i) Split-plot. (ii) (a) 3 main-plots/block; 9 sub-plots/main-plot. (b) N.A. (iii) 3. (iv) (a) N.A. (b) 1/60 ac. (v) N.A. (vi) Yes.

4. GENERAL:
(i) Normal. No lodging. (ii) Nil. (iii) Germination counts and pod yield. (iv) (a) 1951 to 1954. (b) No. (c) Nil. (v) (a) No. (b) —. (vi) and (vii) Nil.

5. RESULTS:
(i) 1782 lb/ac.
(ii) (a) 229.2 lb/ac.
(b) 303.9 lb/ac.
(iii) Only main-plots are significantly different, while all others are not significant.
(iv) Av. yield of pod in lb./ac.

<table>
<thead>
<tr>
<th></th>
<th>P₀</th>
<th>P₁</th>
<th>P₂</th>
<th>Mean</th>
<th>N₀</th>
<th>N₁</th>
<th>N₂</th>
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<td>2222</td>
<td>1976</td>
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<tr>
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<td>1843</td>
<td>1800</td>
<td>1780</td>
<td>1959</td>
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<td>1763</td>
<td>1782</td>
<td>1876</td>
<td>1772</td>
<td>1698</td>
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</tbody>
</table>

S.E. of difference of two
1. S marginal means = 62.4 lb./ac.
2. N or P marginal means = 82.7 lb./ac.
3. N or P means at a level of S = 143.3 lb./ac.
4. S means at a level of N or P = 132.6 lb./ac.
S.E. of body of N×P table = 76.4 lb./ac.

Crop :- Groundnut.
Site :- Groundnut Expt. Farm, Samrala.
Ref :- Pb. 52(165).
Type :- 'CM'.

Object :- To study the effect of applications of N and P₂O₅ and spacing between plants on the yield of Groundnut.

1. BASAL CONDITIONS :
(i) (a) Nil. (b) Fallow. (c) Nil. (ii) (a) Sandy. (b) Refer soil analysis, Samrala. (iii) 15.7.1952. (iv) (a) to (c) N.A. (v) Nil. (vi) Punjab Groundnut No. 1. (vii) Unirrigated. (viii) N.A. (ix) 22.19°. (x) 20.11.1952.

2. TREATMENTS :
Main-plot treatments:
All combinations of (1) and (2).
(1) 3 levels of N : N₀=Control, N₁=25 lb./ac. and N₂=50 lb./ac.
(2) 3 levels of P₂O₅ : P₀=Control, P₁=25 lb./ac., and P₂=50 lb./ac.
Sub-plot treatments:
3 spacings between plant : S₁=9° S₂=18° and S₃=24°
Source of N is A/S and that of P₂O₅ is Super.

3. DESIGN .
(i) Split-plot. (ii) (a) 9 main-plots/block ; 3 sub-plots/main-plot. (iii) 4. (iv) (a) N.A. (b) 1/121 ac. (v) N.A. (vi) Yes.

4. GENERAL :
(i) Fair. No lodging. (ii) Nil. (iii) Germination counts and pod yield. (iv) (a) 1951 to 1954. (b) No (c) Nil. (v) (a) No. (b) -. (vi) and (vii) Nil.

5. RESULTS :
(i) 973 lb./ac.
(ii) (a) 292.8 lb./ac. (b) 175.3 lb./ac.
(iii) Only sub-plot treatment effect is highly significant, while all other treatments and their interactions are not significant.
Crop: Groundnut.  
Site: Groundnut Expt. Farm, Samrala.

Object: To study the effect of manure and spacing on yield of Groundnut crop.

1. BASAL CONDITIONS:
   (i) (a) Nil. (b) Fallow. (c) Nil. (ii) (a) Sandy. (b) Refer soil analysis, Samrala. (iii) 27.6.1953. (iv) (a) to (e) N.A. (v) Nil. (vi) Punjab Groundnut No. 1. (vii) Unirrigated. (viii) N.A. (ix) 20.16". (x) 20.11.1953.

2. TREATMENTS:
   Main-plot treatments: All combinations of (1) and (2).
   (1) 3 levels of N: N₀=Control, N₁=25 lb./ac. of N as A/S and N₂=50 lb./ac. of N as A/S.
   (2) 3 levels of P₂Ο₅: P₀=Control, P₁=25 lb./ac. of P₂O₅ as Super. and P₂=50 lb./ac. of P₂O₅ as Super.

Sub-plot treatments:
3 spacings between plants: S₁=9" S₂=18" S₃=27"

3. DESIGN:
   (i) Split-plot. (ii) (a) 9 main-plots/block and 3 sub-plots/main-plot. (b) N.A. (iii) 4. (iv) (a) 54' x 10'. (b) 45' x 8'. (v) 41' on length side and 1' on breadth side each. (vi) Yes.

4. GENERAL:
   (i) Satisfactory. No lodging. (ii) Nil. (iii) Pod yield. (iv) (a) 1951—1954. (b) No. (c) Nil. (v) (a) No. (b) —. (vi) Nil. (vii) Plot wise yield not available.

5. RESULTS:
   (i) 1639 lb./ac.
   (ii) (a) 54.12 lb./ac.
   (b) 86.5 lb./ac.
   (iii) Interaction PS is significant. All other effects and interactions are highly significant.

### Table: Yield of pod in lb./ac.

<table>
<thead>
<tr>
<th></th>
<th>S₁</th>
<th>S₂</th>
<th>S₃</th>
<th>Mean</th>
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<td>796</td>
<td>1043</td>
<td>958</td>
<td>1032</td>
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</table>

Mean: 1216 973 732

S.E. of difference of two
1. N or P marginal means =69.0 lb./ac.
2. S marginal means =41.3 lb./ac.
3. S means at a level of N or P =71.5 lb./ac.
4. N or P means at a level of S =90.4 lb./ac.
S.E. of body of N x P table =84.5 lb./ac.
Crop :-Groundnut. Site :-Groundnut Expt. Farm, Samralla. Object :-To study the response of different varieties of Groundnut to different doses of N and different spacings.

1. BASAL CONDITIONS :
   (i) (a) No. (b) N.A. (c) Nil. (ii) Sandy. (b) Refer soil analysis, Samralla. (iii) 26.7.1951. (iv) (a) to (e) N.A. (v) Nil. (vi) As per treatments. (vii) Unirrigated. (viii) N.A. (ix) 19.45°. (x) 7.12.1951.

2. TREATMENTS :
   Main-plot treatments :
   6 levels of N : \( N_0 = 0 \), \( N_1 = 10 \), \( N_2 = 20 \), \( N_3 = 30 \), \( N_4 = 40 \), \( N_5 = 50 \) lb./ac. of N.
   Sub-plot treatments :
   2 spacings between plants : \( S_1 = 12" \) and \( S_2 = 9" \).
   Sub-sub-plot treatments :
   2 varieties : \( V_1 = \) Punjab Groundnut and \( V_2 = \) Philippine pink.
   Source of N is A/S.

3. DESIGN :
   (i) Split-split-plot. (ii) (a) 6 main-plots/block; 2 sub-plots/main-plot; 2 sub-sub-plots/sub-plot. (b) N.A. (iii) 4. (iv) (a) N.A. (b) 1/80 ac. (v) N.A. (vi) Yes.

4. GENERAL :
   (i) Fair. No lodging. (ii) Nil. (iii) Germination counts and pod yield. (iv) (a) No. (b) and (c) Nil. (v) (a) No. (b) —. (vi) and (vii) Nil.

5. RESULTS :
   (i) 1203 lb./ac.
   (ii) (a) 234.0 lb./ac.
      (b) 192.2 lb./ac.
      (c) 106.7 lb./ac.
   (iii) Main-plots, sub-plots and sub-sub-plots treatment effects are highly significantly different, while all others are not significant.
Crop: Groundnut.  
Ref: Pb. 50(95).  
Site: Groundnut Expt. Farm, Samrala.  
Type: ‘D’.  
Object: To study the effect of spraying the crop with Bordeaux Mixture.

1. BASAL CONDITIONS:
   (i) (a) Nil. (b) Fallow. (c) Nil. (ii) (a) Sandy. (b) Refer soil analysis, Samrala. (iii) N.A. (iv) (a) to (e) N.A. (v) N.A. (vi) Punjab Groundnut No. 1. (vii) Irrigated. (viii) N.A. (ix) 30.8°. (x) N.A.

2. TREATMENTS:
   1. Control.
   2. One spraying with bordeaux mixture.
   3. Two sprayings with bordeaux mixture.
      First spray seven weeks after sowing and second 9 weeks after sowing.

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

4. GENERAL:
   (i) Fair. No lodging. (ii) Nil. (iii) Pod yield. (iv) (a) Not contd. (b)—. (c)—. (v) (a) No. (b)—. (vi) and (vii) Nil.

5. RESULTS:
   (i) 2009 lb/ac.
   (ii) 272.3 lb/ac.
   (iii) Treatment differences are highly significant.
   (iv) Av. yield of pod in lb/ac.

<table>
<thead>
<tr>
<th></th>
<th>N0</th>
<th>N1</th>
<th>N2</th>
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<th>N4</th>
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<th>V2</th>
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<td>1113</td>
<td>1322</td>
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<td>1216</td>
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<td>944</td>
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<td>1291</td>
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<td>1139</td>
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<td></td>
</tr>
</tbody>
</table>

S.E. of difference of two
1. N marginal means = 72.1 lb/ac.
2. S marginal means = 39.2 lb/ac.
4. S means at the same level of N = 96.1 lb/ac.
5. N means at the same level of S = 99.1 lb/ac.
6. V means at the same level of N = 53.4 lb/ac.
7. N means at the same level of V = 81.4 lb/ac.
8. V means at the same level of S = 30.8 lb/ac.
9. S means at the same level of V = 44.9 lb/ac.
Crop : - Groundnut.  Ref :- Pb. 51 (129).
Site : - Groundnut Expt. Farm, Samrala.  Type :- 'D'.

Object : - To study the effect of application of N and spraying with Bordeaux Mixture on Groundnut crop.

1. BASAL CONDITIONS :
   (i) (a) Nil. (b) Fallow. (c) Nil.  (ii) (a) Sandy. (b) Refer soil analysis, Samrala.  (iii) 26.7.1951.  (iv) (a) to (e) N.A.  (v) Nil.  (vi) Punjab Groundnut No. 1.  (vii) Unirrigated.  (viii) N.A.  (ix) 19.45'.  (x) 8.12.1951.

2. TREATMENTS :
   All combinations of (1) and (2)
   (1) 2 levels of N : N0 = 0 and N1 = 25 lb./ac. of N as A/S.
   (2) 3 levels of spraying : S0 = No spraying, S1 = One spraying with bordeaux mixture (2 : 2 : 40) and S2 = Two sprayings with bordeaux mixture (2 : 2 : 40).

3. DESIGN :
   (i) 3 x 2 Fact. in R.B.D.  (ii) (a) 6.  (b) N.A.  (iii) 6.  (iv) (a) N.A.  (b) 1/100 ac.  (v) N.A.  (vi) Yes.

4. GENERAL :
   (i) Fair. No lodging.  (ii) Nil.  (iii) Germination counts and pod yield.  (iv) (a) 1951–1953.  (b) No.  (c) Nil.  (v) (a) No.  (b) =.  (vi) and (vii) Nil.

5. RESULTS :
   (i) 1776 lb./ac.
   (ii) 330.0 lb./ac.
   (iii) None of the effects is significant.
   (iv) Av. yield of pod in lb./ac.

   \[
   \begin{array}{cccc}
   S_0 & S_1 & S_2 & \text{Mean} \\
   N_0 & 1731 & 1766 & 1817 & 1771 \\
   N_1 & 1626 & 1907 & 1809 & 1781 \\
   \text{Mean} & 1679 & 1837 & 1813 & 1776 \\
   \end{array}
   \]

   S.E. of marginal mean of N = 77.8 lb./ac.
   S.E. of marginal mean of S = 95.3 lb./ac.
   S.E. of body of table = 134.7 lb./ac.

Crop : - Groundnut.  Ref :- Pb. 52 (164).
Site : - Groundnut Expt. Farm, Samrala.  Type :- 'D'.

Object : - To study the effect of application of N and spraying with Bordeaux Mixture on Groundnut crop.

1. BASAL CONDITIONS :
   (i) (a) No.  (b) N.A.  (c) Nil.  (ii) (a) Sandy.  (b) Refer soil analysis, Samrala.  (iii) 15.7.1952.  (iv) to (e) N.A.  (v) Nil.  (vi) Punjab Groundnut No. 1.  (vii) Unirrigated.  (viii) N.A.  (ix) 22.19'.  (x) 18.11.1952.

2. TREATMENTS :
   All combinations of (1) and (2)
   (1) 2 levels of N : N0 = Control and N1 = 25 lb./ac. of N as A/S.
   (2) 3 levels of sprayings : S0 = No spraying, S1 = One spray and S2 = two sprayings with bordeaux mixture (2 : 2 : 40).

3. DESIGN :
   (i) 3 x 2 Fact. in R.B.D.  (ii) (a) 6.  (b) N.A.  (iii) 6.  (iv) (a) N.A.  (b) 1/106 ac.  (v) N.A.  (vi) Yes.
4. GENERAL:
(i) Fair. No lodging. (ii) Nil. (iii) Germination counts and pod yield. (iv) (a) 1951 to 1953. (b) No. (c) Nil. (v) (a) No. (b)—. (vi) and (vii) Nil.

5. RESULTS:
(i) 2048 lb./ac.
(ii) 275.0 lb./ac.
(iii) None of the effects is significant.
(iv) Av. yield of pod in lb./ac.

<table>
<thead>
<tr>
<th></th>
<th>$S_0$</th>
<th>$S_1$</th>
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<td>2037</td>
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<td>$N_1$</td>
<td>2053</td>
<td>2031</td>
<td>2122</td>
<td>2069</td>
</tr>
<tr>
<td>Mean</td>
<td>2014</td>
<td>2050</td>
<td>2080</td>
<td>2048</td>
</tr>
</tbody>
</table>

S.E. of marginal mean of S = 79.4 lb./ac.
S.E. of marginal mean of N = 64.8 lb./ac.
S.E. of body of table = 112.3 lb./ac.

Crop: Groundnut.
Site: Groundnut Expt. Farm, Samrala.
Object: To study the effect of application of N and sprayings with Bordeaux Mixture on Groundnut crop.

Ref: Pb. 53 (248).
Type: 'D'.

1. BASAL CONDITIONS:
(i) (a) Nil. (b) N.A. (c) Nil. (ii) (a) Sandy. (b) Refer soil analysis, Samrala. (iii) 27.6.1953. (iv) (a) to (e) N.A. (v) Nil. (vi) Punjab Groundnut No. 1. (vii) Unirrigated. (viii) N.A. (ix) 20.16". (x) 18.11.1953.

2. TREATMENTS:
All combinations of (1) and (2)
(1) 3 levels of N: $N_0$=Control and $N_1=25$ lb./ac. of N as A/S.
(2) 3 levels of sprayings: $S_0$=No spray, $S_1$=One spraying and $S_2$=two sprayings with bordeaux mixture.

3. DESIGN:
(i) 3 x 2 Fact. in R.B.D. (ii) (a) 6. (b) N.A. (iii) 6. (iv) (a) N.A. (b) 1/106 ac. (v) N.A. (vi) Yes.

4. GENERAL:
(i) Satisfactory. No lodging. (ii) Nil. (iii) Germination counts and pod yield. (iv) (a) 1951 to 1953, (b) No. (c) Nil. (v) (a) No. (b)—. (vi) and (vii) Nil.

5. RESULTS
(i) 2394 lb./ac.
(ii) 270.1 lb./ac.
(iii) None of the effects is significant.
(iv) Av. yield of pod in lb./ac.

<table>
<thead>
<tr>
<th></th>
<th>$S_0$</th>
<th>$S_1$</th>
<th>$S_2$</th>
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<tr>
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<td>2299</td>
<td>2375</td>
<td>2508</td>
<td>2394</td>
</tr>
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</table>

S.E. of marginal mean of S = 78.0 lb./ac.
S.E. of marginal mean of N = 63.7 lb./ac.
S.E. of body of table = 110.3 lb./ac.
Crop: Groundnut.  
Site: Jullundur Agri. Stn., Jullundur.  
Object: To find the best source of N for Groundnut crop.

1. **BASAL CONDITIONS:**
   (i) (a) No.  (b) Wheat.  (c) A/S at 30 lb./ac. of N on 7.11.1953.  (ii) (a) Loamy.  (b) Refer soil analysis, Jullundur.  (iii) 2.3.7.1953.  (iv) (a) 3 desi hal and 4 sohaga.  (b) N.A.  (c) 20 seer/ac.  (d) and (e) N.A.  (v) Nil.  (vi) F-15 (medium).  (vii) Irrigated.  (viii) Hoeing.  (ix) 24.61".  (x) 24.11.1953, 25.11.1953, 28.11.1953, 3.12.1953 and 8.12.1953.

2. **TREATMENTS:**
   1. Control.
   2. Urban compost 25 lb./ac. of N.
   3. Urban compost 5 lb./ac. of N.
   4. 25 lb./ac. of N as F.Y.M.
   5. 50 lb./ac. of N as F.Y.M.


3. **DESIGN:**
   (i) R.B.D.  (ii) 5.  (b) N.A.  (iii) 6.  (iv) (a) 108'-9" x 10'.  (b) 100.8' x 8'.  (v) 1' left out on breadth sides and nearly 4' on length side.  (vii) Yes.

4. **GENERAL:**
   (i) Normal.  No lodging.  (ii) Nil.  (iii) Pod yield.  (iv) (a) to (c) No.  (v) (a) and (b) No.  (vi) and (vii) Nil.

5. **RESULTS:**
   (i) 2572 lb./ac.
   (ii) 173.5 lb./ac.
   (iii) Treatments are significantly different.
   (iv) Av. yield of pod 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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<td>2.</td>
<td>2475</td>
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<tr>
<td>3.</td>
<td>2571</td>
</tr>
<tr>
<td>4.</td>
<td>2777</td>
</tr>
<tr>
<td>5.</td>
<td>2521</td>
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</tbody>
</table>

S.E./mean = 70.8 lb./ac.

---

Crop: *Brassica Compestris* (brown sarson).  
Site: Oildseed Res Stn., Gurgaon.  
Object: To study the phosphatic requirements of *B. Compestris* with special reference to presence and absence of nitrogen manure.

1. **BASAL CONDITIONS:**
   (i) (a) Nil.  (b) *Guara* t.r green manuring.  (c) No.  (ii) Sandy loam.  (b) N.A.  (iii) 3.11.1952.  (iv) (a) 4 plough and 4 sohaga.  (b) and (c) N.A.  (d) 6" row to row.  (e) N.A.  (v) *Guara* green manure  (vi) Brown sarson (medium).  (vii) Irrigated.  (viii) One hoeing.  (ix) 2.27".  (x) 7.3.1953.

2. **TREATMENTS:**
   All combinations of (1) and (2)
   (1) 3 levels of N: N<sub>1</sub>=Control, N<sub>1</sub>=25 lb./ac. of N as A/S and N<sub>2</sub>=50 lb./ac. of N as A/S.
   (2) 3 levels of P<sub>2</sub>O<sub>5</sub>: P<sub>1</sub>=Control, P<sub>1</sub>=25 lb./ac. of P<sub>2</sub>O<sub>5</sub> as Super and P<sub>2</sub>=50 lb./ac. of P<sub>2</sub>O<sub>5</sub> as Super.

Manures applied on 4.1.1953.
3. DESIGN:
(i) 3 x 3 Fact. in R.B.D.  (ii) (a) 9.  (b) N.A.  (iii) 4.  (iv) (a) 66' x 10';  (b) 64' x 8';  (v) 1' all round the net plot.  (vi) Yes.

4. GENERAL:
(i) Fair. No lodging.  (ii) Mild attack of aphids. Two sprayings with agrocide.  (iii) Plant height, no. of pods/plant, length of pod. Thousand grain weight and seed yield.  (iv) (a) 1952—continuing.  (b) and (c) No.  (v) (a) and (b) No.  (vi) and (vii) Nil.

5. RESULTS:
(i) 277.1 lb./ac.
(ii) 108.34 lb./ac.
(iii) None of the effects is significant.
(iv) Avg. yield of seed in lb./ac:

<table>
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<th></th>
<th>P₀</th>
<th>P₁</th>
<th>P₂</th>
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<tr>
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<td>254.3</td>
<td>277.1</td>
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S.E. of any marginal mean = 54.27 lb./ac.
S.E. of body of table = 31.33 lb./ac.

Crop: *Brassica Campestris* (brown sarson).  
Site: Oilseed Res. Stn., Gurgon.

Ref: Pb. 53(12).
Type: 'M'.

Object: To study the phosphatic requirements of *Brassica campestris* with special reference to the presence and absence of N.

1. BASAL CONDITIONS:
(i) Cotton-Fallow-Sarson.  (b) Fallow.  (c) Nil.  (d) Sandy loam.  (b) N.A.  (iii) 10.10.1953.  (iv) (a) 6 ploughings: 2 with hindustan and 4 with desi plough. 4 levellings with sohaga.  (b) N.A.  (c) 2½ sr.  (d) and (e) N.A.  (v) Nil.  (vi) Brown Sarson 'A' (medium).  (vii) Irrigated.  (viii) 2 hoeings and 2 weedings.  (ix) 7.28.  (x) 9.3.1954.

2. TREATMENTS:
All combinations of (1) and (2)
(1) 4 levels of N: N₀=0, N₁=30, N₂=60 and N₃=90 lb./ac.
(2) 3 levels of P₂O₅: P₀=0, P₁=25 and P₂=50 lb./ac.

3. DESIGN:
(i) 4 x 3 Fact. in R.B.D.  (ii) (a) 12.  (b) N.A.  (iii) 56.  (iv) (a) 5' x 42'.  (b) 3' x 36'.  (v) 1 row on each side.  (vi) Yes.

4. GENERAL:
(i) Good. No lodging.  (ii) Mild attack of aphids and alternaria. Two sprayings with agrocide.  (iii) Height of plant, No. of branches per plant, no. of pods/plant; length of pod, weight, seed yield.  (iv) (a) 1952—continuing.  (b) No.  (c) Nil.  (v) (a) No.  (b) —.  (vi) and (vii) Nil.

5. RESULTS:
(i) 1414 lb./ac.
(ii) 128.8 lb./ac.
(iii) N effect alone is highly significant.
(iv) Av. yield of seed in lb./ac.

<table>
<thead>
<tr>
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<th>P₁</th>
<th>P₂</th>
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<td>1420</td>
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S.E. of marginal mean of P
S.E. of marginal mean of N
S.E. of body of table

Crop : Sarson.

Site : Govt. Agri. Stn., Hansi.

Object : To study the best manure for Sarson.

1. BASAL CONDITIONS :
   (i) (a) Nil. (b) Fallow. (c) Nil. (ii) (a) Loam. (b) N.A. (iii) 28.9.1951. (iv) (a) 1 roāi plough, 5 ātā plough, 1 roller and 2 solāga. (b) N.A. (c) 21 sr./ac. (d) and (e) N.A.; (v) Nil. (vi) N.A. (vii) Irrigated. (viii) 1 weeding. (ix) 2.63°. (x) 1.3.1952.

2. TREATMENTS :
   1. Control.
   2. 40 lb./ac. of N as A/S.
   3. 40 lb./ac. of P₂O₅ as Super.
   4. 40 lb./ac. of N+40 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'×71'-2". (v) Nil. (vi) Yes.

4. GENERAL :
   (i) Poor to fair. No lodging. (ii) Nil. (iii) Seed yield. (iv) (a) No. (b) --. (c) --. (v) (a) No. (b) --. (vi) and (vii) Nil.

5. RESULTS :
   (i) 256.5 lb./ac.
   (ii) 42.01 lb./ac.
   (iii) Treatments are highly significant.
   (iv) Av. yield of seed in lb./ac.

<table>
<thead>
<tr>
<th>Treatment</th>
<th>Av. yield</th>
<th>S.E./mean</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>150.1</td>
<td>17.15</td>
</tr>
<tr>
<td>2.</td>
<td>343.9</td>
<td></td>
</tr>
<tr>
<td>3.</td>
<td>182.9</td>
<td></td>
</tr>
<tr>
<td>4.</td>
<td>349.0</td>
<td></td>
</tr>
</tbody>
</table>
Crop: Brown Sarson and Raya.  
Site: Oilseed Res. Stn., Gurgaon.  

Object: To determine optimum dose of N for the Raya and Sarson crops.

1. BASAL CONDITIONS:
   (i) (a) N.A. (b) Guara for green manuring. (c) Nil. (ii) (a) Sandy loam. (b) N.A. (iii) 4.11.1952. (iv) (a) ‘hindustan plough, 3 desi plough and 4 sohaga. (b) N.A. (c) 1½ plot/plot. (d) and (e) N.A. (v) Guara green manure. (vi) As per treatments. (vii) Irrigated. (viii) N.A. (ix) 2.27". (x) 7.3.1953.

2. TREATMENTS:
   Main-plot treatments:
   6 levels of N as A/S: N₀=Control, N₁=15 lb./ac. of N, N₂=30 lb./ac. of N, N₃=45 lb./ac. of N, N₄=60 lb./ac. and N₅=75 lb./ac. of N.
   Sub-plot treatments:

3. DESIGN:
   (i) Split-plot. (ii) (a) 6 main-plots/block and 2 sub-plots/main-plot. (b) N.A. (iii) 4. (iv) (a) and (b) 6'×63.13'. (v) Nil. (vi) Yes.

4. GENERAL:
   (i) Fair. No lodging. (ii) Mild attack of Aphis. (iii) Height of plot, no. of branches and pods/plant, length of pod, thousand grain wt. and seed yield (iv) (a) Net continued. (b) —. (c) —. (v) (a) Nil. (b) —. (vi) and (vii) Nil.

5. RESULTS:
   (i) 616.9 lb./ac. 
   (ii) (a) 137.0 lb./ac. 
   (b) 86.5 lb./ac. 
   (iii) Only “varieties” are highly significantly different, while others are not significant. 
   (iv) Av. yield of seed in lb./ac.

<table>
<thead>
<tr>
<th></th>
<th>V₁</th>
<th>V₂</th>
<th>Mean</th>
</tr>
</thead>
<tbody>
<tr>
<td>N₀</td>
<td>676.4</td>
<td>465.7</td>
<td>571.1</td>
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<td>N₁</td>
<td>628.4</td>
<td>487.9</td>
<td>558.2</td>
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<tr>
<td>N₂</td>
<td>746.7</td>
<td>480.5</td>
<td>613.6</td>
</tr>
<tr>
<td>N₃</td>
<td>643.2</td>
<td>473.1</td>
<td>558.2</td>
</tr>
<tr>
<td>N₄</td>
<td>861.3</td>
<td>590.0</td>
<td>725.7</td>
</tr>
<tr>
<td>N₅</td>
<td>835.4</td>
<td>513.8</td>
<td>674.6</td>
</tr>
<tr>
<td>Mean</td>
<td>731.9</td>
<td>501.8</td>
<td>661.9</td>
</tr>
</tbody>
</table>

S.E. of difference of two
1. N marginal means = 68.5 lb./ac.
2. V marginal means = 25.0 lb./ac.
3. V means at the same level of N=61.2 lb./ac.
4. N means at the same level of V=81.1 lb./ac.

---

Crop: Brassica Compestris (brown sarson).  
Site: Oilseed Res. Stn., Gurgaon.  

Object: To determine the optimum sowing date and spacing for brown Sarson

1. BASAL CONDITIONS:
   (i) (a) Cereals-Guara for green manuring—Brown sarson. (b) Guara for green manuring. (c) Nil. (ii) (a) Sandy loam. (b) N.A. (iii) As per treatments. (iv) (a) ‘hindustan plough, 3 desi plough and 4 sohaga. (b) and (c) N.A. (d) As per treatments. (e) N.A. (v) Guara green manured. (vi) Brown sarson medium. (vii) Irrigated. (viii) N.A. (ix) 2.27". (x) 6.3.1953.
2. TREATMENTS:

Main-plot treatments:

3 dates of sowing: \( D_1 = 12.10.1952, D_2 = 27.10.1952 \) and \( D_3 = 11.11.1952 \).

Sub-plot treatments:

3 spacings between rows: \( R_1 = 9', R_2 = 12' \) and \( R_3 = 15' \).

Sub-sub-plot treatments:

2 spacings between plants: \( S_1 = 3' \) and \( S_2 = 6' \).

3. DESIGN:

(i) Split-plot. (ii) (a) 3 main-plots/block; 3 sub-plots/main-plot; 2 sub-sub-plots/sub-plot. (b) N.A. (iii) 4. (iv) (a) and (b) 5' \( \times \) 63'. (v) Nil. (vi) Yes.

4. GENERAL:

(i) Fair. No lodging. (ii) Mild aphid attacks. Two sprayings with agroside. (iii) Height of plant, no of branches/plant, no. of pods/plant, pod length, thousand grain wt. and seed yield. (iv) (a) 1952 continuing. (b) No. (c) Nil. (v) (a) Nil. (b) ---. (vi) and (vii) Nil.

5. RESULTS:

(i) \( 221.5 \text{ lb./ac.} \)

(ii) (a) \( 190.45 \text{ lb./ac.} \)

(b) \( 106.44 \text{ lb./ac.} \)

(c) \( 73.37 \text{ lb./ac.} \)

(iii) Main effect of \( D \) is highly significant. \( S \) and interaction \( RS \) are significant. Other are not significant. (iv) Av. yield of seed in lb./ac.

\[
\begin{array}{cccccc}
 & R_1 & R_2 & R_3 & \text{Mean} & S_1 & S_2 \\
D_1 & 397.8 & 503.1 & 364.5 & 420.8 & 466.7 & 374.9 \\
D_2 & 177.8 & 150.0 & 164.5 & 164.1 & 171.9 & 156.3 \\
D_3 & 101.1 & 66.7 & 71.1 & 79.6 & 86.7 & 72.6 \\
\hline
\text{Mean} & 225.6 & 238.9 & 200.0 & & 221.5 & \\
S_1 & 253.1 & 263.0 & 208.9 & & 241.8 & \\
S_2 & 197.8 & 214.8 & 191.2 & & 201.3 & \\
\end{array}
\]

S.E. of difference of two

1. \( D \) marginal means \( = 54.96 \text{ lb./ac.} \)

2. \( R \) marginal means \( = 30.68 \text{ lb./ac.} \)

3. \( S \) marginal means \( = 17.29 \text{ lb./ac.} \)

4. \( R \) means at the same level of \( D \) \( = 52.22 \text{ lb./ac.} \)

5. \( D \) means at the same level of \( R \) \( = 70.08 \text{ lb./ac.} \)

6. \( S \) means at the same level of \( D \) \( = 29.95 \text{ lb./ac.} \)

7. \( D \) means at the same level of \( S \) \( = 58.92 \text{ lb./ac.} \)

8. \( S \) means at the same level of \( R \) \( = 29.95 \text{ lb./ac.} \)

9. \( R \) means at the same level of \( S \) \( = 37.32 \text{ lb./ac.} \)

Crop: *Brassica Compestris*.

Site: Oilseed Res. Stn., Gurgaon.

Object: To determine the optimum sowing date and spacing for brown *Sarson*.

Ref: Pb. 53(13).

Type: 'C'.
2. TREATMENTS:
   Main-plot treatments:
   Sub-plot treatments:
   All combinations of (1) and (2):
   (1) 3 spacings between rows: R_1=9", R_2=12", and R_3=15".
   (2) 2 spacings between plants: S_1=3' and S_2=6'.

3. DESIGN:
   (i) Split-plot. (ii) (a) 4 main-plots/block; 6 sub-plots/main-plot. (b) N.A. (iii) 6. (iv) (a) Main-plot 42'x30'. (c) Sub-plot 30'x6'. (v) N.A. (vi) Yes.

4. GENERAL:
   (i) Fair. (ii) Mild aphis attack. Two sprayings with agriicide. (iii) Heigh of plants, no. of branches per plant, no. of pods per plant, length of pod, thousand grain weight. (iv) (a) 1952—continued. (b) No. (c) Nil. (v) (a) Nil. (b)—. (vi) and (vii) Nil.

5. RESULTS:
   (i) 867.1 lb./ac.
   (ii) (a) 254.94 lb./ac. (b) 105.88 lb./ac.
   (iii) Main effect of D and interactions D x R and D x S are highly significant.
   (iv) Av. yield of seed in lb./ac.

<table>
<thead>
<tr>
<th></th>
<th>R_1</th>
<th>R_2</th>
<th>R_3</th>
<th>Mean</th>
<th>S_1</th>
<th>S_2</th>
</tr>
</thead>
<tbody>
<tr>
<td>D_1</td>
<td>1470.9</td>
<td>1356.5</td>
<td>1338.6</td>
<td>1402.0</td>
<td>1466.3</td>
<td>1337.7</td>
</tr>
<tr>
<td>D_2</td>
<td>1284.4</td>
<td>1333.5</td>
<td>1373.9</td>
<td>1330.6</td>
<td>1278.1</td>
<td>1383.1</td>
</tr>
<tr>
<td>D_3</td>
<td>746.2</td>
<td>684.4</td>
<td>663.0</td>
<td>697.9</td>
<td>711.4</td>
<td>624.3</td>
</tr>
<tr>
<td>D_4</td>
<td>42.9</td>
<td>29.0</td>
<td>41.6</td>
<td>37.8</td>
<td>47.1</td>
<td>28.6</td>
</tr>
<tr>
<td>Mean</td>
<td>886.1</td>
<td>860.8</td>
<td>854.3</td>
<td>867.1</td>
<td>890.7</td>
<td>843.4</td>
</tr>
</tbody>
</table>

S.E. of difference of two:
1. D marginal means = 60.08 lb./ac.
2. R marginal means = 21.61 lb./ac.
3. S marginal means = 17.65 lb./ac.
4. D means at the same level of D = 43.23 lb./ac.
5. D means at the same level of R = 69.69 lb./ac.
6. S means at the same level of D = 35.30 lb./ac.
7. S means at the same level of S = 69.69 lb./ac.
8. means in the b.dy of R X S table = 30.56 lb./ac.

Crop : Sarson.
Site : Oilseed Res. Stn., (M.A. Farm), Faridkot.
Object :—To find out the optimum time of sowing and manurial requirement of Sarson.
Ref :—Pb. 52(2).
Type :—‘CM’.

1. BASAL CONDITIONS:
   (i) (a) Nil. (b) Wheat. (c) N.A. (ii) (a) Loam. (b) Refer soil analysis, Faridkot. (iii) As per treatments. (iv) (a) 3 ploughings and 2 sabaga. (b) N.A. (c) 24 sq.m./ac. (d) 1’ row to row. (e) N.A. (v) Nil. (vi) Sarson brown local (medium). (vii) Irrigated. (viii) 1 weeding and 1 thinning. (ix) 0.76", (x) 11.3.1953 to 20.3.1953.
2. **TREATMENTS:**

**Main-plot treatments:**

**Sub-plot treatments:**
- 2 levels of N: $N_0=0$ and $N_1=25$ lb/ac. of N as A/S. N applied at 1st irrigation.

3. **DESIGN:**

(i) Split-plt. (ii) 5 main-plots/block; 2 sub-plots/main-plot. (iii) 6. (iv) (a) $8' \times 7'$. (b) $8' \times 14' \times 10'$.

4. **GENERAL:**

(i) Germination good, condition fair. No lodging. (ii) Aphid attack, spraying with DDT on 17.2.1953. (iii) Height in inches, pod/plant, seed yield. (iv) (a) No. (b)---. (c)---. (v) (a) No. (b)---. (vi) and (vii) NII.

5. **RESULTS:**

(i) 1206 lb/ac.

(ii) (a) 244.5 lb/ac.

(b) 101.8 lb/ac.

(iii) Date of sowing effect is highly significant, N effect is not significant while interaction is significant.

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

<table>
<thead>
<tr>
<th>$N_0$</th>
<th>$N_1$</th>
<th>Mean</th>
</tr>
</thead>
<tbody>
<tr>
<td>1402</td>
<td>1301</td>
<td>1352</td>
</tr>
<tr>
<td>1411</td>
<td>1461</td>
<td>1492</td>
</tr>
<tr>
<td>911</td>
<td>857</td>
<td>884</td>
</tr>
<tr>
<td>873</td>
<td>826</td>
<td>839</td>
</tr>
</tbody>
</table>

Mean 1207 1204 1205

S.E. of difference of two
1. $D$ marginal means = 99.8 lb/ac.
2. $N$ marginal means = 27.0 lb/ac.
3. $N$ means at the same level of $D$ = 60.5 lb/ac.
4. $D$ means at the same level of $N$ = 108.6 lb/ac.

---

**Crop:** Sarson (Brassica Compestris).

**Site:** Oilseed Res. Stn., (M.A. farm), Faridkot.

**Object:** To determine the optimum sowing time and irrigation requirements of Sarson.

**Ref:** Pb. 53(15).

**Type:** '-CP'.

---

1. **BASAL CONDITIONS:**

(i) (a) No. (b) Cotton. (c) 50 lb/ac. of N in the form of A/S. (ii) (a) Loam. (b) Refer soil analysis, Faridkot. (iii) As per treatments. (iv) (a) 10 ploughings and levellings. (b) to (e) N.A. (v) No. (vi) Brown A (medium). (vii) Irrigated. (viii) Thinning and hoeing. (ix) 1.76'. (x) 2.3.1954 to 23.3.1954.

2. **TREATMENTS:**

**Main-plot treatments:**
- 5 dates of sowing: $D_1=22.9.1953$, $D_2=3.10.1953$, $D_3=15.10.1953$, $D_4=27.10.1953$ and $D_5=13.11.1953$.

**Sub-plot treatments:**
- 3 levels of irrigation: $I_1=One$ irrigation, $I_2=Two$ irrigations and $I_3=Three$ irrigations.
3. DESIGN:
(i) Split-plot. (ii) (a) 5 main-plots/block; 3 sub-plots/main-plot. (b) N.A. (iii) 4. (iv) (a) 1/73.33 ac. (b) Main-plot=1/32 ac. Sub-plot=1/96 ac. (v) One row on each side and also buffer plot. (vi) Yes.

4. GENERAL:
(i) Good, but crop was lodged. Lodging occurred more in D2 and D8 sowings because of severe wind storm on 7.1.1954 when I2 and I3 plots of these sowings had received irrigation. (ii) No. (iii) Height, branches, pods, 100 kernel wt. and seed yield. (iv) (a) 1953—continued. (b) No. (c) Nil. (v) (a) No, (b) —, (vi) and (vii) Nil.

5. RESULTS:
(i) 755.3 lb./ac.
(ii) (a) 157.03 lb./ac.
(b) 139.76 lb./ac.
(iii) Dates of sowing effect is highly significant. Irrigation is significant. (iv) Av. yield of seed in lb./ac.

<table>
<thead>
<tr>
<th></th>
<th>I1</th>
<th>I2</th>
<th>I3</th>
<th>Mean</th>
</tr>
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<tbody>
<tr>
<td>D1</td>
<td>886.5</td>
<td>849.8</td>
<td>593.0</td>
<td>876.4</td>
</tr>
<tr>
<td>D2</td>
<td>808.8</td>
<td>836.4</td>
<td>643.4</td>
<td>762.9</td>
</tr>
<tr>
<td>D3</td>
<td>889.9</td>
<td>635.7</td>
<td>616.5</td>
<td>714.0</td>
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<tr>
<td>D4</td>
<td>965.5</td>
<td>726.4</td>
<td>802.0</td>
<td>831.3</td>
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<tr>
<td>D5</td>
<td>598.0</td>
<td>563.3</td>
<td>613.4</td>
<td>591.7</td>
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<tr>
<td>Mean</td>
<td>829.7</td>
<td>722.4</td>
<td>713.7</td>
<td>755.3</td>
</tr>
</tbody>
</table>

S.E. of difference of two
1. D marginal means = 64.11 lb./ac.
2. I marginal means = 44.19 lb./ac.
3. I means at the same level of D = 98.83 lb./ac.
4. D means at the same level of I = 103.06 lb./ac.

Crop :- *Brassica Juncea* (Raya).
Site :- Oilseed Res. Stn., Gurgaon.
Ref :- Pb. 52(9).
Type :- *M*.

Object:-To study the phosphate requirement of *B-juncea* with special reference to presence and absence of N.

1. BASAL CONDITIONS:
(l) (a) Nil. (b) Guara for green manuring. (c) No. (ii) (a) Sandy loam. (b) N.A. (iii) 3.11.1952
(iv) (a) One *hindustan* plough, 3 desi plough and 4 *sahaga*. (b) and (c) N.A. (d) 6' row to row. (e) N.A. (v) Guara green manured. (vi) *Raya* L-18. (vii) Irrigated. (viii) Nil. (ix) 2.27'. (x) 16.3.1953.

2. TREATMENTS:
All combinations of (1) and (2)
(1) 3 levels of N :
N0=0, N1=25 and N2=50 lb./ac.
(2) 3 levels of P2O5
P0=0, P1=25 and P2=50 lb./ac.
N as A/S and P2O5 as Super applied on 4.1.1953.

3. DESIGN:
(i) 3 x 3 Fact. in R.B.D. (ii) (a) 9. (b) N.A. (iii) 4. (iv) (a) N.A. (b) 64' x 8'. (v) Yes—one row each side. (vi) Yes.
4. GENERAL:
(i) Good. No lodging. (ii) Nil. (iii) Plant height, no. of branches and pods/plant, pod length, thousand grain weight and seed yield. (iv) (a) 1952—continuing. (b) No. (c) Nil. (v) (a) Nil. (b) —. (vi) Nil (vii) Nil.

5. RESULTS:
(i) 285.8 lb./ac.
(ii) 76.51 lb./ac.
(iii) N effect is significant while P$_2$O$_5$ and interaction N x P$_2$O$_5$ are not significant.
(iv) Av. yield of seed in lb./ac.

<table>
<thead>
<tr>
<th></th>
<th>P$_0$</th>
<th>P$_1$</th>
<th>P$_2$</th>
<th>Mean</th>
</tr>
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<tr>
<td>N$_0$</td>
<td>254.3</td>
<td>224.2</td>
<td>205.1</td>
<td>227.9</td>
</tr>
<tr>
<td>N$_1$</td>
<td>352.8</td>
<td>214.7</td>
<td>339.1</td>
<td>302.2</td>
</tr>
<tr>
<td>N$_2$</td>
<td>295.3</td>
<td>345.9</td>
<td>340.5</td>
<td>327.2</td>
</tr>
</tbody>
</table>

Mean 300.8 261.6 294.9 285.8

S.E. of any marginal mean = 18.26 lb./ac.
S.E. of body of table = 22.09 lb./ac.

---

Object:—To study the utility of P$_2$O$_5$ application to Raya with special reference to the presence and absence of N.

1. BASAL CONDITIONS
(i) (a) Cotton—Fallow—Raya. (b) Fallow. (c) Nil. (ii) (a) Sandy loam. (b) N.A. (iii) 10.10.1953. (iv) (a) 1 hindustan ploughing, 3 desi ploughings and 4 levellings. (b) Pore. (c) 2½ sr./ac. (d) N.A. (e) —. (v) Nil. (vi) Raya L-18 (medium). (vii) Irrigated. (viii) 2 thorough weedings and 2 hoeings. (ix) 7.28'. (x) 9.3.1954.

2. TREATMENTS:
All combinations of (1) and (2)
(1) 4 levels of N as A/S: N$_0$=0, N$_1$=25, N$_2$=50 and N$_3$=75 lb./ac. of N.
(2) 3 levels of P as Super: P$_0$=0, P$_1$=25 and P$_2$=50 lb./ac. of P$_2$O$_5$.

3. DESIGN:
(i) 4x3 Fact. in R.B.D. (ii) (a) 12. (b) N.A. (iii) 6. (iv) (a) 5’x42’. (b) 3’x36’-4’. (v) 1 row on each side. (vi) Yes.

4. GENERAL:
(i) Good. No lodging. (ii) Mild attack of alternaria. Control measures nil. (iii) Height of plant, no. of branches, no. of pods/plant, pod length and grain weight. (iv) (a) 1952—continued. (b) and (c) No. (v) (a) and (b) No. (vi) and (vii) Nil.

5. RESULTS:
(i) 1486 lb./ac.
(ii) 199.9 lb./ac.
(iii) None of the effects is significant.
Crop: *Brassica Juncea* (Raya).

Site: Oilseed Res. Stn., Gurgaon.

Object: To study the effect of placement of fertilizers like Super and A/S on Raya.

1. **BASAL CONDITIONS:**
   (i) (a) Not followed. (b) Sudan grass. (c) Nil. (ii) (a) Sandy loam. (b) N.A. (iii) 1.11.1952. (iv) (a) 4 plough (1 with *hindustan*, 3 with *desi* plough) and 4 *sohaga.* (b) N.A. (c) 2½ lb./ac. (d) and (e) N.A. (v) 10 C.L. of F.Y.M. (vi) *Raya* L.18. (vii) Irrigated. (viii) N.A. (ix) 2.27". (x) 25.3.1953.

2. **TREATMENTS:**
   1. Control.
   2. Super at 25 lb./ac. of P₂O₅ broadcast at sowing.
   3. Super at 25 lb./ac. of P₂O₅ drilled at sowing.
   4. A/S at 25 lb./ac. of N drilled at sowing.
   5. A/S at 25 lb./ac. of N broadcast with 1st irrigation.
   6. A/S at 25 lb./ac. of N broadcast at sowing.

Manures applied on 1.11.1952 and 4.1.1953.

3. **DESIGN:**
   (i) R.B.D. (ii) (a) 6. (b) N.A. (iii) 6. (iv) (a) 6' x 8' (v) Nil. (vi) Yes.

4. **GENERAL:**
   (i) Good. No lodging. (ii) Nil. (iii) Height of 10 plants, no. of branches and pods per plant, length of pod and thousand grain weight and yield of *raya*. (iv) (a) 1952—contd. (b) and (c) Nil. (v) (a) No. (b) No. (vi) and (vii) Nil.

5. **RESULTS:**
   (i) 464.6 lb./ac.
   (ii) 118.03 lb./ac.
   (iii) Treatments are not significantly different.
   (iv) Av. yield of *raya* in lb./ac.

<table>
<thead>
<tr>
<th>Treatment</th>
<th>Av. yield</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>488.6</td>
</tr>
<tr>
<td>2.</td>
<td>393.8</td>
</tr>
<tr>
<td>3.</td>
<td>353.7</td>
</tr>
<tr>
<td>4.</td>
<td>526.9</td>
</tr>
<tr>
<td>5.</td>
<td>521.4</td>
</tr>
<tr>
<td>6.</td>
<td>503.2</td>
</tr>
<tr>
<td>S.E./mean</td>
<td>48.17 lb./ac.</td>
</tr>
</tbody>
</table>
Crop: *Brassica Juncia* (Raya).
Site: Oilseed Res. Stn., Gurgaon.

Object: To study the effect of placement of fertilizer like Super and A/S on yield of Raya.

1. BASAL CONDITIONS:
   (i) (a) Cotton-Fallow-Raya. (b) Fallow. (c) Nil. (ii) (a) Sandy loam. (b) N.A. (iii) 7,8,10.1953.
   (iv) (a) 3 ploughings (1 with *hindustan* and 2 with *desi* plough) and 3 levellings. (b) N.A. (c) 2 1/2 sr./ac.

2. TREATMENTS:
   **Main-plot treatments:**
   5 levels of N: $N_0=0$ lb./ac., $N_1=50$ lb./ac. of N (early broadcast on 2.12.1953), $N_2=50$ lb./ac. of N (drilled on 6.10.1953), $N_3=50$ lb./ac. of N (late broadcast) and $N_4=50$ lb./ac. of N (half early and half late).
   N applied as A/S.

   **Sub-plot treatments:**
   3 levels of $P_2O_5$: $P_0=0$ lb./ac. of $P_2O_5$, $P_1=50$ lb./ac. of $P_2O_5$ (by broadcast) and $P_2=50$ lb./ac. of $P_2O_5$ (drilled on 6.10.1953.)
   $P_2O_5$ applied is Super.

3. DESIGN:
   (i) Split-plot. (ii) (a) 5 main-plots/block; 3 sub-plots/main-plot. (b) N.A. (iii) 6. (iv) (a) Main-plot: 21'x42' sub-plot: 6'x42'. (b) 4'x36'.4". (v) N.A. (vi) Yes.

4. GENERAL:
   (i) Good. No lodging. (ii) Mild attack of alternaria. Control measures nil. (iii) Height of plant, no. of branches per plant, no. of pods per plant, no. of grain per pod, length of pod, 100 grain weight and yield of *raya*. (iv) (a) 1952-continuing. (b) No. (c) Nil. (v) (a) No. (b)--. (vi) and (vii) Nil

5. RESULTS:
   (i) 1846 lb./ac.
   (ii) (a) 339.3 lb./ac.
   (b) 219.8 lb./ac.
   (iii) Only sub-plot treatments are highly significantly different.
   (iv) Av. yield of *raya* in lb./ac.

<table>
<thead>
<tr>
<th>P_1</th>
<th>P_2</th>
<th>P_3</th>
<th>Mean</th>
</tr>
</thead>
<tbody>
<tr>
<td>$N_0$</td>
<td>1600</td>
<td>1656</td>
<td>1763</td>
</tr>
<tr>
<td>$N_1$</td>
<td>1759</td>
<td>1878</td>
<td>2003</td>
</tr>
<tr>
<td>$N_2$</td>
<td>1828</td>
<td>1922</td>
<td>1981</td>
</tr>
<tr>
<td>$N_3$</td>
<td>1750</td>
<td>1700</td>
<td>2113</td>
</tr>
<tr>
<td>$N_4$</td>
<td>1947</td>
<td>1888</td>
<td>1903</td>
</tr>
</tbody>
</table>

Mean | 1777 | 1809 | 1953 | 1846 |

S.E. of difference of two
1. N marginal means = 113.1 lb./ac.
2. P marginal means = 56.7 lb./ac.
3. P means at the same level of N = 126.8 lb./ac.
4. N means at the same level of P = 153.4 lb./ac.
Crop: *Brassica Juncea* (Raya).

Site: Barley Res. Farm, Gurgaon.

Object:—To study the effect of N and P<sub>2</sub>O<sub>5</sub> on yield of Raya.

1. BASAL CONDITIONS:
   (i) (a) Barley-Mung-Barley or *Brassica* (G.M). (b) *Guara* green manured. (c) Nil. (ii) (a) Sandy loam. (b) N.A. (iii) 15.11.1951. (iv) (a) 1 hindustan ploughing and 4 desi ploughings. (b) *Fore.* (c) 24 sr./ac. (d) N.A. (e) No. (v) *Raya* L-18 (medium). (vi) Irrigated. (ix) 1.66". (x) 29.3.1952.

2. TREATMENTS:
   All combinations of (1) and (2)
   (1) 3 levels of N as A/S: N<sub>0</sub>=0, N<sub>1</sub>=25 and N<sub>2</sub>=50 lb./ac. of N.
   (2) 3 levels of P as Super: P<sub>0</sub>=0, P<sub>1</sub>=25 and P<sub>2</sub>=50 lb./ac. Super added on 15.11.1951; A/S added at the time of irrigation.

3. DESIGN:
   (i) R.B.D. (Fact.). (iii) 9. (b) N.A. (iii) 6. (iv) (a) 13'x66'. (b) 11'x64'. (v) 1' on each side of plot. (vi) Yes.

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

5. RESULTS:
   (i) 631.2 lb./ac. 
   (ii) 147.3 lb./ac.
   (iii) N alone is highly significant.
   (iv) Av. yield of grain in lb./ac.

<table>
<thead>
<tr>
<th></th>
<th>P&lt;sub&gt;0&lt;/sub&gt;</th>
<th>P&lt;sub&gt;1&lt;/sub&gt;</th>
<th>P&lt;sub&gt;2&lt;/sub&gt;</th>
<th>Mean</th>
</tr>
</thead>
<tbody>
<tr>
<td>N&lt;sub&gt;0&lt;/sub&gt;</td>
<td>322.2</td>
<td>523.8</td>
<td>505.2</td>
<td>450.4</td>
</tr>
<tr>
<td>N&lt;sub&gt;1&lt;/sub&gt;</td>
<td>663.0</td>
<td>721.3</td>
<td>661.7</td>
<td>652.0</td>
</tr>
<tr>
<td>N&lt;sub&gt;2&lt;/sub&gt;</td>
<td>753.2</td>
<td>766.4</td>
<td>763.8</td>
<td>761.1</td>
</tr>
<tr>
<td>Mean</td>
<td>579.5</td>
<td>670.5</td>
<td>643.6</td>
<td>631.2</td>
</tr>
<tr>
<td>S.E. of marginal mean of N</td>
<td>=34.71 lb./ac.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>S.E. of marginal mean of P&lt;sub&gt;2&lt;/sub&gt;O&lt;sub&gt;5&lt;/sub&gt;</td>
<td>=34.71 lb./ac.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>S.E. of body of table</td>
<td>=60.13 lb./ac.</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Crop: *Toria* (*Brassica napus*).

Site: Oilseed Res. Stn., M.A. Farm, Faridkot.

Object:—To determine the optimum sowing time and irrigational requirements of *Toria* crop.

1. BASAL CONDITIONS:
   (i) (a) No. (b) Cotton. (c) 50 lb./ac. of N in the form of A/S. (ii) (a) Loam. (b) Refer soil analysis, Faridkot. (iii) As per treatments. (iv) (a) 7 ploughings before sowing and levelling. (b) to (e) N.A. (v) No. (vi) Selection A (medium). (vii) Irrigated. (viii) Thinning and hoeing. (ix) 4.49". (x) 30.12.1953, to 5.3.1954.

2. TREATMENTS:
   Main-plot treatments:
   Sub-plot treatments:
   3 levels of irrigation: I<sub>1</sub>=One irrigation, I<sub>2</sub>=Two irrigations and I<sub>3</sub>=Three irrigations.
3. DESIGN:
(i) Split-plot.  (ii) (a) 5 main-plots/block; 3 sub-plots/main-plot.  (b) N.A.  (iii) 4.  (iv) (a) 1/73.33th ac.  (b) main-plot : 1/32th ac. and sub-plot : 1/96th ac.  (v) One row on each side and also buffer plot.  (vi) Yes.

4. GENERAL:
(i) Good.  (ii) No.  (iii) Height, branches, pods, wt. of 100 kernel and yield of toria.  (iv) (a) 1953—continued.  (b) N.A.  (c) Nil.  (v) (a) No.  (b) -.  (vi) and (vii) Nil.

5. RESULTS:
(i) 964 lb./ac.
(ii) (a) 320.4 lb./ac.
(b) 165.8 lb./ac.
(iii) Effect is highly significant.  Irrigation effect is significant.
(iv) Av. yield of toria in lb./ac.

<table>
<thead>
<tr>
<th></th>
<th>I₁</th>
<th>I₂</th>
<th>I₃</th>
<th>Mean</th>
</tr>
</thead>
<tbody>
<tr>
<td>D₁</td>
<td>408</td>
<td>617</td>
<td>531</td>
<td>519</td>
</tr>
<tr>
<td>D₂</td>
<td>1027</td>
<td>1012</td>
<td>1193</td>
<td>1077</td>
</tr>
<tr>
<td>D₃</td>
<td>1135</td>
<td>1315</td>
<td>1320</td>
<td>1257</td>
</tr>
<tr>
<td>D₄</td>
<td>964</td>
<td>1131</td>
<td>1217</td>
<td>1104</td>
</tr>
<tr>
<td>D₅</td>
<td>901</td>
<td>879</td>
<td>814</td>
<td>865</td>
</tr>
</tbody>
</table>

Mean 887 991 1015 964

S.E. of difference of two
1. D marginal means = 130.8 lb./ac.
2. I marginal means = 52.4 lb./ac.
3. I means at the same level of D = 117.3 lb./ac.
4. D means at the same level of I = 162.1 lb./ac.

Crop := Linseed (Rabi).


Object := To study the effect of graded doses of A/S on yield of Linseed.

1. BASAL CONDITIONS:
(i) (a) Nil.  (b) Soyabean.  (c) Nil.  (iii) (a) Loamy.  (b) N.A.  (iii) 5.11.1950.  (iv) (a) and (b) N.A.  (c) 15-18 sr./ac.  (d) N.A.  (e) N.A.  (v) Nil.  (vi) K-2 (early).  (vii) Irrigated.  (viii) 2 weedings.  (ix) 12.17'.  (x) 26.4.1951.

2. TREATMENTS:
1. Control.
2. A/S at 30 lb./ac.
3. A/S at 40 lb./ac.
4. A/S at 50 lb./ac.

3. DESIGN:
(i) R.B.D.  (ii) (a) 4.  (b) N.A.  (iii) 4.  (iv) (a) 9'x40'.  (b) 9'x40'.  (v) Nil.  (vi) Yes.

4. GENERAL:
(i) Normal.  No lodging.  (ii) Nil.  (iii) Yield of linseed.  (iv) (a) 1950 to 1953.  (b) No.  (c) Nil.  (v) (a) No.  (b) -.  (vi) and (vii) Nil.

5. RESULTS:
(i) 641.7 lb./ac.
(ii) 27.68 lb./ac.
(iii) Treatments are highly significantly different.
(iv) Av. yield of linseed in lb./ac.

<table>
<thead>
<tr>
<th>Treatment</th>
<th>Av. yield</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>501.7</td>
</tr>
<tr>
<td>2.</td>
<td>602.8</td>
</tr>
<tr>
<td>3.</td>
<td>692.3</td>
</tr>
<tr>
<td>4.</td>
<td>770.1</td>
</tr>
<tr>
<td>S.E./mean</td>
<td>= 13.84 lb./ac.</td>
</tr>
</tbody>
</table>

Crop :- Linseed.  
Ref :- Pb. 51(66).  
Site :- Linseed Breeding Sub-Stn., Nagrota Bagwan.  
Type :- ‘M’.  

Object :- To study the effect of graded doses of A/S and Super applied alone and in combination on yield of linseed.

1. BASAL CONDITIONS

(i) (a) Nil.  (b) Fallow.  (c) Nil.  (ii) (a) Loamy.  (b) N.A.  (iii) 23.11.1951.  (iv) (a) Ploughing and soothing.  (b) N.A.  (c) 15-18 ar. plot.  (d) 9" row to row.  (e) N.A.  (k) Nil.  (vi) K-2 (medium).  (vii) Irrigated.  (viii) N.A.  (ix) 12.67".  (x) 25.4.1952.

2. TREATMENTS:

All combinations of (1) and (2)

(1) 3 levels of N: N₀ = 0, N₁ = 40 and N₂ = 80 lb./ac. of N.

(2) 3 levels of P₂O₅: P₀ = 0, P₁ = 40 and P₂ = 80 lb./ac. of P₂O₅.

N applied as A/S and P₂O₅ as Super.

3. DESIGN:

(i) R.B.D. (Fact.)  (ii) (a) 9.  (b) N.A.  (iii) 4.  (iv) (a) N.A.  (b) 6.75‘ × 2.5’.  (v) N.A.  (vi) Yes.

4. GENERAL:

(i) Normal.  No lodging.  (ii) Nil.  (iii) Yield of linseed.  (iv) (a) 1950 to 1953.  (b) No.  (c) Nil.  (v) (a) Nil.  (b) -.  (vi) and (vii) Nil.

5. RESULTS:

(i) 978 lb./ac.

(ii) 67.6 lb./ac.

(iii) Effects of N and P₂O₅ are highly significant their interaction is not significant.

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

<table>
<thead>
<tr>
<th>P₀</th>
<th>P₁</th>
<th>P₂</th>
<th>Mean</th>
</tr>
</thead>
<tbody>
<tr>
<td>N₀</td>
<td>664</td>
<td>738</td>
<td>871</td>
</tr>
<tr>
<td>N₁</td>
<td>971</td>
<td>962</td>
<td>1037</td>
</tr>
<tr>
<td>N₂</td>
<td>1095</td>
<td>1195</td>
<td>1269</td>
</tr>
</tbody>
</table>

Mean | 910| 965|1059|978  |

S.E. of marginal means of N or P = 19.5 lb./ac.  
S.E. of body of table = 33.8 lb./ac.  

---

Crop :- Linseed.  
Ref :- Pb. 52(22).  
Site :- Linseed Breeding Sub-Stn., Nagrota Bagwan.  
Type :- ‘M’.  

Object :- To find out the optimum dose of N for Linseed Crop.

1. BASAL CONDITIONS:

(i) (a) No.  (b) Soyabean and maize.  (c) Nil.  (ii) (a) Loamy.  (b) N.A.  (iii) 30.10.1952.  (iv) (a) 2 ploughings and 2 plankings.  (b) Sown by kera.  (c) 23 sr./ac.  (d) and (e) N.A.  (iv) Nil.  (v) K-2 (early).  (vii) Irrigated.  (viii) N.A.  (ix) 9.98".  (x) N.A.
2. TREATMENTS :
1. Control.
2. 40 lb./ac. of N as A/S.
3. 60 lb./ac. of N as A/S.
4. 80 lb./ac. of N as A/S.
   A/S applied by broadcast on 7.1.1953.

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

4. GENERAL :
   (i) Good. Heavily lodged in plots under treatment 3 and 4. (ii) No. (iii) Yield of linseed. (iv) (a) 1950 to 1953. (b) No. (c) Nil. (v) (a) No. (b) —. (vi) and (vii) Nil.

5. RESULTS :
   (i) 881.6 lb./ac.
   (ii) 36.67 lb./ac.
   (iii) Treatments are highly significantly different.
   (iv) Av. yield of linseed in lb./ac.

<table>
<thead>
<tr>
<th>Treatment</th>
<th>Av. yield</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>518.6</td>
</tr>
<tr>
<td>2.</td>
<td>985.3</td>
</tr>
<tr>
<td>3.</td>
<td>985.3</td>
</tr>
<tr>
<td>4.</td>
<td>1037.2</td>
</tr>
<tr>
<td>S.E./mean</td>
<td>18.33 lb./ac.</td>
</tr>
</tbody>
</table>

Crop :- Linseed.
Site :- Linseed Breeding Sub-Stn., Nagrota Bagwan.
Object :- To find out the optimum doses of N and P₂O₅ for Linseed crop.

Ref :- Pb. 53(40).
Type :- 'M'.

1. BASAL CONDITIONS :
   (i) (a) Linseed—Maize—Soyabean. (b) Soyabean and soyabean maize mixture. (c) F.Y.M. at 120 m, A/S at 14.5 lb./ac. of N. (ii) (a) Loam. (b) N.A. (iii) 31.10.1953. (iv) (a) 2 ploughings and 2 sahaga (planking). (b) Sown by kera. (c) 24 sr./ac. (d) 9" row to row. (e) N.A. (v) Nil. (vi) K-2 (early). (vii) Irrigated. (viii) 1 hoeing and 2 weedings. (ix) 18.09". (x) 24.4.1954.

2. TREATMENTS :
   All combinations of (1) and (2)
   (1) 4 levels of N as A/S : N₀=0, N₁=40, N₂=60 and N₃=80 lb./ac. of N.
   (2) 3 levels of P as Super : P₀=0, P₁=40 and P₂=60 lb./ac. of P₂O₅.

3. DESIGN :
   (i) R.B.D. (Fact). (ii) (a) 12. (b) N.A. (iii) 4. (iv) (a) N.A. (b) 6'×12'. (v) 8 rows i.e. 4 rows along length of the field. (vi) Yes.

4. GENERAL :
   (i) Good condition, but crop was badly effected by hailstorm and the yield of seed was greatly reduced. (ii) No attack. (iii) Grain yield. (iv) (a) Continued with modifications 1950—1953. (b) No. (c) Nil. (v) (a) No. (b) —. (vi) and (vii) Nil.

5. RESULTS :
   (i) 269.0 lb./ac.
   (ii) 45 36 lb./ac.
   (iii) Effects of N and P₂O₅ and their interactions are significant.
(iv) Av. yield of linseed in lb./ac.

<table>
<thead>
<tr>
<th></th>
<th>( P_0 )</th>
<th>( P_1 )</th>
<th>( P_2 )</th>
<th>Mean</th>
</tr>
</thead>
<tbody>
<tr>
<td>( N_0 )</td>
<td>194.5</td>
<td>272.2</td>
<td>272.2</td>
<td>246.3</td>
</tr>
<tr>
<td>( N_1 )</td>
<td>305.6</td>
<td>311.1</td>
<td>233.4</td>
<td>350.0</td>
</tr>
<tr>
<td>( N_2 )</td>
<td>291.7</td>
<td>330.6</td>
<td>252.8</td>
<td>291.7</td>
</tr>
<tr>
<td>( N_3 )</td>
<td>194.5</td>
<td>175.0</td>
<td>194.5</td>
<td>188.0</td>
</tr>
<tr>
<td>Mean</td>
<td>296.6</td>
<td>272.2</td>
<td>238.2</td>
<td>269.0</td>
</tr>
</tbody>
</table>

S.E. of marginal mean of N = 13.09 lb./ac.
S.E. of marginal mean of \( P_2 \) = 11.34 lb./ac.
S.E. of body of table = 22.68 lb./ac.

Crop : Linseed.
Site : Linseed Breeding Sub-Stn., Nagrota Bagwan.
Ref : Pb. 51(65).
Type : 'M'.

Object :—To study the effect of graded doses of A/S on yield of Linseed crop.

1. BASAL CONDITIONS :
(i) (a) Linseed-Maize Soyabean. (b) Soyabean. (c) Nil. (ii) Loam. (b) N.A. (iii) 30.10.1951.
(iv) (a) Ploughing and sikhaga. (b) N.A. (c) 15-18 sr./ac. (d) 9" row to row. (e) N.A. (v) Nil.

2. TREATMENTS :
1. Control.
2. A/S at 40 lb./ac. of N.
3. A/S at 60 lb./ac. of N.
4. A/S at 80 lb./ac. of N.
Manured on 11.2.1952.

3. DESIGN :
(i) R.B.D. (ii) (a) 4. (b) N.A. (iii) 6. (iv) (a) N.A. (b) 36'x6'. (v) N.A. (vi) Yes.

4. GENERAL :
(i) and (ii) N.A (iii) Yield of linseed. (iv) (a) and (b) No. (c) — (v) (a) No. (b) —. (vi) and (vii) Nil.

5. RESULTS :
(i) 816.8 lb./ac.
(ii) 49.65 lb./ac.
(iii) Treatments are highly significantly different.
(iv) Av. yield of linseed in lb./ac.

<table>
<thead>
<tr>
<th>Treatment</th>
<th>Av. yield</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>570.4</td>
</tr>
<tr>
<td>2.</td>
<td>855.7</td>
</tr>
<tr>
<td>3.</td>
<td>959.4</td>
</tr>
<tr>
<td>4.</td>
<td>881.6</td>
</tr>
<tr>
<td>S.E./mean</td>
<td>=20.27 lb./ac.</td>
</tr>
</tbody>
</table>
Crop : Linseed.
Site : Linseed Breeding Sub-Stn., Nagrota Bagwan. Type : 'C'.

Object : To study the effect of preceding crop on yield of Linseed crop.

1. BASAL CONDITIONS :
(i) (a) Nil. (b) Rice. (c) Nil. (ii) (a) Loam. (b) N.A. (iii) 27.9.1952 and 1.11.1952. (iv) (a) and (b) Treatment 1—sowing by broadcast with one ploughing, treatment 2—2 ploughings. (c) 24 sr./ac. (d) and (e) N.A. (v) Nil. (vi) K-2 (early). (vii) Irrigated. (viii) N.A. (ix) 9.98°. (x) N.A.

2. TREATMENTS :
1. Sowing in standing rice on 27.9.1952.
2. Sowing in harvested rice field on 1.11.1952.

3. DESIGN :
(i) Paired plot. (ii) (a) 2. (b) N.A. (iii) 6. (iv) (a) and (b) 1/220th ac. (v) Nil. (vi) Yes.

4. GENERAL :
(i) Normal. No lodging. (ii) Nil. (iii) Yield of linseed. (iv) (a) No. (b) No. (c)—. (v) (a) No. (b)—. (vi) and (vii) Nil.

5. RESULTS :
(i) 777.9 lb./ac.
(ii) 64.50 lb./ac.
(iii) Treatments are highly significantly different.
(iv) Av. yield of linseed in lb./ac.

<table>
<thead>
<tr>
<th>Treatment</th>
<th>Av. yield</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>707.1</td>
</tr>
<tr>
<td>2.</td>
<td>848.6</td>
</tr>
<tr>
<td>S.E./mean</td>
<td>26.33 lb./ac.</td>
</tr>
</tbody>
</table>

Crop : Linseed (Rahi).
Site : Linseed Breeding Sub-Stn., Nagrota Bagwan. Type : 'C'.

Object : To study the effect of preceding crops on yield of Linseed crop.

1. BASAL CONDITIONS :
(i) (a) Nil. (b) Maize and rice. (c) Nil. (ii) (a) Loamy. (b) N.A. (iii) 5.11.1950. (iv) (a) and (b) N.A. (c) 15-18 sr./ac. (d) and (e) N.A. (vi) K-2 (early). (vii) Irrigated. (viii) Weeding. (ix) 12.7'. (x) 24.4.1951.

2. TREATMENTS :
2 previous crops :—
1. Maize.
2. Rice.

3. DESIGN :
(i) Paired plot. (ii) (a) 2. (b) N.A. (iii) 6. (iv) (a) 18'x6'. (b) 18'x6'. (v) Nil. (vi) Yes.

4. GENERAL :
(i) Normal. No lodging. (ii) Nil. (iii) Yield of linseed. (iv) (a) No. (b)—. (c)—. (v) (a) No. (b)—. (vi) and (vii) Nil.

5. RESULTS :
(i) 544.5 lb./ac.
(ii) 65.59 lb./ac.
(iii) Treatments are highly significantly different.
Crop: Linseed (Rabi).

Site: Linseed Breeding Sub-Stn., Nagrota Bagwan.

Ref: Pb. 50(3).
Type: 'C'.

Object: To study the effect of different seed rates on yield of Linseed.

1. BASAL CONDITIONS:
   (i) (a) Nil. (b) N.A. (c) N.A. (ii) Loamy. (b) N.A. (iii) 22.11.1950. (iv) (a) and (b) N.A. (c) As per treatments. (d) and (c) N.A. (v) N.A. (vi) K-2 (early). (vii) Irrigated. (viii) One weeding. (ix) 12.17". (x) 22.4.1951.

2. TREATMENTS:
   3 seed rates:
   1. 15 sr./ac.
   2. 18 sr./ac.
   3. 21 sr./ac.
3. DESIGN:
   (i) R.B.D. (ii) (a) 3. (b) N.A. (iii) 4. (iv) (a) and (b) 24'x7'. (v) Nil. (vi) Yes.

4. GENERAL:
   (i) Normal. No lodging. (ii) Nil. (iii) Yield of linseed. (iv) (a) 1950—53. (b) and (c) No. (v) (a) and (v) No. (vi) and (viii) Nil.

5. RESULTS:
   (i) 570.4 lb./ac.
   (ii) 61.36 lb./ac.
   (iii) Treatments are highly significantly different.
   (iv) Av. yield of linseed in lb./ac.
   Treatment       Av. yield
   1.               435.6
   2.               528.9
   3.               746.7
   S.E./mean = 30.68 lb./ac.

Crop: Linseed. Site: Linseed Breeding Sub-Stn., Nagrota Bagwan. Object: To study the effect of different seedrates on yield of Linseed.

1. BASAL CONDITIONS:
   (i) (a) Linseed-Maize and Soya bean. (b) Maize. (c) Nil. (ii) (a) Loamy. (b) N.A. (iii) 29.10.1951. (iv) (a) 4 ploughings and 4 sodaga. (b) N.A. (c) As under treatments. (d) 9' row to row. (e) N.A. (v) Nil. (vi) K-2 (medium). (vii) Irrigated. (viii) 2 weedings. (ix) 12.67'. (x) 24.4.1952.

2. TREATMENTS:
   4 seed rates:
   1. 15 sr./ac.
   2. 18 sr./ac.
   3. 21 sr./ac.
   4. 24 sr./ac.

3. DESIGN:
   (i) R.B.D. (ii) (a) 4. (b) N.A. (iii) 4. (iv) (a) 6'x60'. (b) 6'x45'. (v) 7½' left out as non-exptl. area on two sides of each plot. (vi) Yes.

4. GENERAL:
   (i) Normal. No lodging. (ii) Nil. (iii) Yield of linseed (iv) (a) 1950—1953. (b) No. (c) Nil. (v) (a) No. (b) No. (vi) and (vii) Nil.

5. RESULTS:
   (i) 596.4 lb./ac.
   (ii) 29.74 lb./ac.
   (iii) Treatments are highly significantly different.
   (iv) Av. yield of linseed in lb./ac.
   Treatment       Av. yield
   1.               518.6
   2.               601.5
   3.               689.7
   4.               575.6
   S.E./mean = 14.87 lb./ac.
Crop :- Linseed. 

Site :- Linseed Breeding Sub-Stn., Nagrota Bagwan. Type :- 'C'.

Object :- To find out optimum seedrate for K-2 variety of Linseed.

1. BASAL CONDITIONS:
   (i) (a) No. (b) Soyabean and maize mixture. (c) N.A. (ii) (a) Loam. (b) N.A. (iii) 28.10.1952. (iv) (a) 2 ploughings and 2 plankings. (b) Sown with small hand plough. (c) 24 sr./ac. (d) 9" row to row. (e) N.A. (v) N.A. (vi) K-2 (early). (vii) Irrigated. (viii) Nil. (ix) 9.98". (x) N.A.

2. TREATMENTS:
   Seedrate:
   1. 15 sr./ac.
   2. 18 sr./ac.
   3. 21 sr./ac.
   4. 24 sr./ac.

3. DESIGN:
   (i) R.B.D. (ii) (a) 4. (b) N.A. (iii) 4. (iv) (a) N.A. (b) 1/121 ac. (v) N.A. (vi) Yes.

4. GENERAL:
   (i) Normal. No lodging. (ii) Nil. (iii) Yield/plot. (iv) (a) 1950—1953. (b) No. (c) N.A. (v) (a) No. (b) —. (vi) and (vii) Nil.

5. RESULTS:
   (i) 478.4 lb./ac.
   (ii) 18.70 lb./ac.
   (iii) Treatments are highly significantly different.
   (iv) Av. yield of linseed in lb./ac.

<table>
<thead>
<tr>
<th>Treatment</th>
<th>Av. yield</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>311.1</td>
</tr>
<tr>
<td>2.</td>
<td>373.4</td>
</tr>
<tr>
<td>3.</td>
<td>482.3</td>
</tr>
<tr>
<td>4.</td>
<td>746.7</td>
</tr>
<tr>
<td>S.E./mean</td>
<td>9.35 lb./ac.</td>
</tr>
</tbody>
</table>

Crop :- Linseed. 

Site :- Linseed Breeding Sub. Stn., Nagrota Bagwan. Type :- 'C'.

Object :- To find out suitable seedrate for K-2 variety of Linseed.

1. BASAL CONDITIONS:
   (i) (a) Linseed-Maize and Soyabean. (b) Soyabean and maize mixture. (c) F.Y.M. at 133 md./ac. and A/S at 24 lb./ac. (iii) 29.10.1953. (iv) (a) 2 ploughings, 2 *sohaga* (planking). (b) Sown with 'small hand plough by beam. (c) As per treatments. (d) row to row distance 9". (e) —. (v) F.Y.M. at 83 md./ac. on 16.10.1955 broadcast. A/S at 40 lb./ac. of N on 29.11.1953 broadcast. (vi) K-2 early maturing. (vii) Irrigated. (viii) 2 weedings, 1 hoeing. (ix) 18.09". (x) 23.4.1954.

2. TREATMENTS:
   Seedrate:
   1. 18 sr./ac.
   2. 21 sr./ac.
   3. 24 sr./ac.
   4. 27 sr./ac.

3. DESIGN:
   (i) R.B.D. (ii) (a) 4. (b) N.A. (iii) 6. (iv) (a) N.A. (b) 9'×18'. (v) 8 rows. (vi) Yes.
2. TREATMENTS:
1. A/S at 75 lb./ac. of N.
2. A/N at 75 lb./ac. of N.
3. Ammo. Phos. at 75 lb./ac. of N.
4. Super at 94.5 lb./ac. of P₂O₅.

3. DESIGN:
(i) R.B.D. (ii) (a) 5. (b) N.A. (iii) 5. (iv) (a) 12' x 52'. (b) 12' x 45' - 4". (v) N.A. (vi) Yes.

4. GENERAL:
(i) No lodging  (ii) Nil.  (iii) Forage yield/plot.  (iv) (a) No. (b) --. (c) -. (v) (a) No. (b) -. (vi); and (vii) Nil.

5. RESULTS:
(i) 26.74 ton/ac.
(ii) 1.43 ton/ac.
(iii) Treatments are highly significantly different.
(iv) Av. yield of fodder in ton/ac.

<table>
<thead>
<tr>
<th>Treatment</th>
<th>Av. yield</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>27.90</td>
</tr>
<tr>
<td>2.</td>
<td>27.27</td>
</tr>
<tr>
<td>3.</td>
<td>29.01</td>
</tr>
<tr>
<td>4.</td>
<td>26.80</td>
</tr>
<tr>
<td>5.</td>
<td>22.70</td>
</tr>
<tr>
<td>S.E./mean</td>
<td>0.64 ton/ac.</td>
</tr>
</tbody>
</table>

Crop: Berseem (Rabi).
Site: Jullundur Agri. Stn., Jullundur.
Object: To study the effect of Super on grain yield of Berseem.
(iv) Av. yield of seed in lb./ac.  

<table>
<thead>
<tr>
<th>Treatment</th>
<th>Av. yield</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>440.9</td>
</tr>
<tr>
<td>2.</td>
<td>469.0</td>
</tr>
<tr>
<td>3.</td>
<td>512.2</td>
</tr>
<tr>
<td>S.E./mean</td>
<td>33.23 lb./ac.</td>
</tr>
</tbody>
</table>

Crop : Berseem.  
Site : Jullundur Agri. Stn., Jullundur.

Object : To study the effect of N and P₂O₅ on yield of Berseem fodder.

1. BASAL CONDITIONS:  
(i) (a) No. (b) Tobacco. (c) A/S at 30 lb./ac. of N.  
(ii) (a) Loamy. (b) Refer soil analysis, Jullundur.  
(iii) 22.11.1953.  
(iv) (a) 7 desi hal, 5 sohaga. (b) N.A. (c) 7 sr.ac. (d) and (e) N.A.  
(v) Nil.  

2. TREATMENTS:  
1. Control (uninoculated seed).  
2. Inoculated berseem seed.  
3. 100 lb./ac. of P₂O₅ as Super.  
4. 200 lb./ac. of P₂O₅ as Super.  
5. 50 lb./ac. of N as A/S.  
6. 100 lb./ac. of N as A/S.  
7. 100 lb./ac. of P₂O₅ as Super+50 lb./ac. of N as A/S.  
8. 100 lb./ac. of P₂O₅ as Super+100 lb./ac. of N as A/S.  
9. 200 lb./ac. of P₂O₅ as Super+50 lb./ac. of N as A/S.  
10. 200 lb./ac. of P₂O₅ as Super+100 lb./ac. of N as A/S.  
Super drilled one day before sowing and A/S by broadcast at sowing time.

3. DESIGN:  
(i) R.B.D.  
(ii) (a) 10. (b) 4.  
(iii) N.A.  
(iv) (a) and (b) 51.25'x8.5'. (v) Nil. (vi) Yes.

4. GENERAL:  
(i) Normal. No lodging.  
(ii) Nil. (iii) Fodder yield.  
(iv) (a) 1953 to 1955.  
(v) (a) No. (b)—. (vi) and (vii) Nil.

5. RESULTS:  
(i) 18.19 ton/ac.  
(ii) 1.36 ton/ac.  
(iii) Treatments are not significantly different.  
(iv) Av. yield of fodder in ton/ac.  

<table>
<thead>
<tr>
<th>Treatment</th>
<th>Av. yield</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>16.51</td>
</tr>
<tr>
<td>2.</td>
<td>16.92</td>
</tr>
<tr>
<td>3.</td>
<td>18.55</td>
</tr>
<tr>
<td>4.</td>
<td>18.78</td>
</tr>
<tr>
<td>5.</td>
<td>18.92</td>
</tr>
<tr>
<td>6.</td>
<td>18.69</td>
</tr>
<tr>
<td>7.</td>
<td>18.14</td>
</tr>
<tr>
<td>8.</td>
<td>17.33</td>
</tr>
<tr>
<td>9.</td>
<td>18.78</td>
</tr>
<tr>
<td>10.</td>
<td>19.24</td>
</tr>
<tr>
<td>S.E./mean</td>
<td>0.68 ton/ac.</td>
</tr>
</tbody>
</table>
Crop :- Berseem.  
Site :- Jullundur Agri. Stn., Jullundur.  
Object :-To study the relative effect of inoculation of Berseem seed and application of Nitrogen.

1. BASAL CONDITIONS:
   (i) (a) Not followed. (b) Fallow. (c) Nil. (ii) (a) Heavy loam. (b) Refer soil analysis, Jullundur.  
   (iii) 3.9.1953. (iv) (a) 1 raja plough, 3 desi plough and 4 sohaga. (b) to (e) N.A.  

2. TREATMENTS:
   1. Inoculated seed.  
   2. Re-inoculated seed.  
   3. 20 lb./ac. of N as A/S (½ drilled before sowing and ½ to be given after 1st cutting).  
   4. 10 lb./ac. of N as A/S + 20 lb./ac. of P₂O₅ drilled as Super before sowing + 10 lb./ac. of N as  
      A/S after 1st cutting applied on 17.12.1953 by broadcast.

3. DESIGN:
   (i) R.B.D. (ii) (a) 4. (b) N.A. (iii) 4. (iv) (a) N.A. (b) 98'x9.26'. (v) N.A. (vi) Yes.

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

5. RESULTS:
   (i) 30.55 ton/ac.  
   (ii) 1.07 ton/ac.  
   (iii) Treatments are significantly different.  
   (iv) Av. yield of fodder in ton/ac.  
   Treatment       Av. yield  
   1.               38.25  
   2.               37.77  
   3.               38.24  
   4.               38.49  
   S.E./mean = 0.54 ton/ac.

---

Crop :- Berseem.  
Site :- Agri. Stn., Karnal.  
Object :-To study the effect of different manures on yield of Berseem.

1. BASAL CONDITIONS:
   (i) (a) Nil. (b) Cotton. (c) N.A. (ii) (a) Loam. (b) N.A.  
   (iii) 16.10.1951. (iv) (a) 5 ploughings and  
   4 sohaga. (b) N.A. (c) 10 sr./ac. (d) and (e) N.A.  

2. TREATMENTS:
   1. A/S at 100 lb./ac. of N.  
   2. Ammo. Phos. at 100 lb./ac. of N.  
   3. Super at 125 lb./ac. of P₂O₅.  
   4. Control.  
   A/S and Super applied on 1.1.1952 by broadcast.

3. DESIGN:
   (i) R.B.D. (ii) (a) 4. (b) N.A. (iii) 6. (iv) (a) 12'x80'. (b) 10'x80'. (v) 2' from plot to plot left  
   out. (vi) Yes.
4. GENERAL:
(i) Normal. No lodging. (ii) Nil. (iii) Forage yield. (iv) (a) 1951-52. (b) and (c) No. (v) (a) and (b) No. (vi) and (vii) Nil.

5. RESULTS:
(i) 32.17 ton/ac.
(ii) 2.17 ton/ac.
(iii) Treatments are highly significantly different.
(iv) Av. yield of fodder in ton/ac.

<table>
<thead>
<tr>
<th>Treatment</th>
<th>Av. yield</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>31.82</td>
</tr>
<tr>
<td>2.</td>
<td>34.55</td>
</tr>
<tr>
<td>3.</td>
<td>33.88</td>
</tr>
<tr>
<td>4.</td>
<td>28.44</td>
</tr>
</tbody>
</table>

S.E./mean = 0.88 ton/ac.

Crop :-Berseem.  
Object :-To study the effect of different manures on the yield of Berseem.

Ref :-Pb. 52(131).  
Type :-"M".

1. BASAL CONDITIONS:
(i) (a) Nil. (b) Cotton. (c) N.A. (ii) (a) Loam. (b) N.A. (iii) 23.9.1952. (iv) (a) 5 ploughings and 4 sohaga. (b) N.A. (c) 10 shr./ac. (d) and (e) N.A. (v) Nil. (vi) Mascavi. (vii) 'Irrigated. (viii) Nil. (ix) 3.20°. (x) 6-8.11.1952 and 13-14.12.1952.

2. TREATMENTS:
1. A/S at 100 lb./ac. of N.
2. Ammo. phos. at 100 lb./ac. of N.
3. Super at 125 lb./ac. of P₂O₅.
4. Control.
   Super applied on 23.9.1952 before sowing. For A/S and Ammo. phos. dates N.A.

3. DESIGN:
(i) R.B.D. (ii) (a) 4. (b) N.A. (iii) 5. (iv) (a) and (b) 10' x 80'. (v) Nil. (vi) Yes.

4. GENERAL:
(i) No lodging. (ii) Nil. (iii) Forage yield. (iv) (a) 1951—1952. (b) Nil. (c) —. (v) (a) Nil. (b) —. (vi) Nil. (vii) Yield for only two cuttings is available. The subsequent cuttings were auctioned without recording the weight.

5. RESULTS:
(i) 7.27 ton/ac.
(ii) 0.72 ton/ac.
(iii) Treatments are not significantly different.
(iv) Av. yield of fodder in ton/ac.

<table>
<thead>
<tr>
<th>Treatment</th>
<th>Av. yield</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>6.99</td>
</tr>
<tr>
<td>2.</td>
<td>7.77</td>
</tr>
<tr>
<td>3.</td>
<td>7.42</td>
</tr>
<tr>
<td>4.</td>
<td>6.91</td>
</tr>
</tbody>
</table>

S.E./mean = 0.29 ton/ac.
Crop :- Berseem (Rabi)  
Object :- To study the effect of different manures on yield of Berseem.

1. BASAL CONDITIONS:
   (i) (a) Nil. (b) Maize for fodder. (c) Nil. (ii) (a) Loam. (b) N.A.  
   (iii) 23.9.1952. (iv) (a) 5 ploughings and 5 tohaga. (b) N.A. (c) 10 sr./ac. (d) and (e) N.A.  

2. TREATMENTS:
   1. A/S at 100 lb./ac. of N.  
   2. Ammo. phos. at 100 lb./ac. of N.  
   3. Super at 125 lb./ac. of P₂O₅.  
   4. Control.  
   Time and method of application of treatments - N.A.

3. DESIGN:
   (i) R.B.D.  (ii) (a) 4. (b) N.A. (iii) 6.  
   (iv) (a) and (b) 10'x80'. (v) Nil. (vi) Yes.

4. GENERAL:
   (i) Normal. No lodging. (ii) Nil. (iii) Forage yield. (iv) (a) 1951—1952. (b) Nil. (c) N.A.  
   (v) (a) Nil. (b) -. (vi) Nil. (vii) Yield record available only for 2 cutting. After taking 2 cuttings, subsequent 
   yield was not recorded by the Research Station because standing fodder was sold by auction on 10.2.1953.

5. RESULTS:
   (i) 7.32 ton/ac.  
   (ii) 1.09 ton/ac.  
   (iii) Treatments are significantly different.  
   (iv) Av. yield of fodder in ton/ac.
   Treatment  | Av. yield  
   1.          | 7.90       
   2.          | 8.03       
   3.          | 7.20       
   4.          | 6.16       
   S.E./mean  | 0.445 ton/ac.

Crop :- Berseem.  
Site :- Agri. Stn., Karnal.  
Object :- To study the effect of A/S, Super and Ammo. Phos. on Berseem yield

1. BASAL CONDITIONS:
   (i) (a) Nil. (b) Fallow. (c) Nil. (ii) (a) Clay loam. (b) N.A.  
   (iii) 26.10.1948. (iv) (a) to (e) N.A.  

2. TREATMENTS:
   1. A/S at 100 lb./ac. of N.  
   2. Ammo. Phos. at 100 lb./ac. of N+125 lb./ac. of P₂O₅.  
   3. Super at 125 lb./ac. of P₂O₅.  
   4. Control.  

3. DESIGN:
   (i) R.B.D.  (ii) (a) 4. (b) N.A. (iii) 12. (iv) (a) N.A. (b) 11'x80'. (v) N.A (vi) Yes.
4. GENERAL:

(i) Fair. No lodging. (ii) Nil. (iii) Forage yield. (iv) (a) 1948—1950. (b) No. (c) N.A. (v) (a) No. (b)—. (vi) Nil. (vii) Yield of only two cuttings is available, information about further cuttings is not available.

5. RESULTS:

(i) 8.17 ton/ac.
(ii) 1.25 ton/ac.
(iii) Treatments are highly significantly different.
(iv) Av. yield of fodder in ton/ac.

<table>
<thead>
<tr>
<th>Treatment</th>
<th>Av. yield</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>7.55</td>
</tr>
<tr>
<td>2.</td>
<td>11.13</td>
</tr>
<tr>
<td>3.</td>
<td>8.38</td>
</tr>
<tr>
<td>4.</td>
<td>5.63</td>
</tr>
<tr>
<td>S.E./mean</td>
<td>0.36</td>
</tr>
</tbody>
</table>

Crop: Berseem.  
Site: Agri. Stn., Karnal.  
Ref: Pb. 49(68).  
Type: 'M'.  

Object:—To study the effect of A/S, Super and Ammo. Phos. on the yield of Berseem.

1. BASAL CONDITIONS:


2. TREATMENTS:

1. A/S at 100 lb./ac. of N.
2. Ammo. Phos. at 100 lb./ac. of N +125 lb./ac. of P₂O₅.
3. Super at 125 lb./ac. of P₂O₅.
4. Control.


3. DESIGN:

(i) R.B.D. (ii) (a) 4. (b) N.A. (iii) 6. (iv) (a) and (b) 80' X 11'. (v) No. (vi) Yes.

4. GENERAL:

(i) Satisfactory. No lodging. (ii) Nil. (iii) Forage yield. (iv) (a) No. (b)—. (c) No. (v) (a) No. (b)—. (vi) and (vii) Nil.

5. RESULTS:

(i) 20.47 ton/ac.
(ii) 1.70 ton/ac.
(iii) Treatments are highly significantly different.
(iv) Av. yield of fodder in ton/ac.

<table>
<thead>
<tr>
<th>Treatment</th>
<th>Av. yield</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>18.21</td>
</tr>
<tr>
<td>2.</td>
<td>24.96</td>
</tr>
<tr>
<td>3.</td>
<td>21.96</td>
</tr>
<tr>
<td>4.</td>
<td>16.74</td>
</tr>
<tr>
<td>S.E./mean</td>
<td>0.69</td>
</tr>
</tbody>
</table>
Object:—To study the effect of A/S, Ammo, Phos and Super on the yield of Berseem fodder.

1. BASAL CONDITIONS

2. TREATMENTS:
   1. A/S at 100 lb./ac. of N.
   2. Ammo. Phos. at 100 lb./ac. of N+125 lb./ac. of P₂O₅.
   3. Super at 125 lb./ac. of P₂O₅.
   4. Control.

3. DESIGN:
   (i) R.B.D. (ii) (a) 4. (b) N.A. (iii) 12. (iv) (a) 12'×80'. (b) 12'×80'. (v) Nil. (vi) Yes.

4. GENERAL:
   (i) Satisfactory. No lodging. (ii) Nil. (iii) Forage yield/plot. (iv) (a) 1948—1950. (b) No. (c)—. (v) (a) No. (b)—. (vi) and (vii) Nil.

5. RESULTS:
   (i) 17.25 ton/ac.
   (ii) 11.32 ton/ac.
   (iii) Treatments are not significantly different.
   (iv) Av. yield of fodder in ton/ac.

<table>
<thead>
<tr>
<th>Treatment</th>
<th>Av. yield</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>15.75</td>
</tr>
<tr>
<td>2</td>
<td>20.41</td>
</tr>
<tr>
<td>3</td>
<td>18.84</td>
</tr>
<tr>
<td>4</td>
<td>14.02</td>
</tr>
<tr>
<td>S.E./mean</td>
<td>3.27 ton/ac.</td>
</tr>
</tbody>
</table>

Object:—To find the effect of A/S and Super on the yield of Berseem.

1. BASAL CONDITIONS:
   (i) (a) Nil. (b) N.A. (c) N.A. (ii) (a) Clay loam. (b) N.A. (iii) 16.11.1950. (iv) (a) 6 ploughings and 6 rollers. (b) N.A. (c) 3 chh./plot. (d) and (e) N.A. (v) Nil. (vi) Mascavi. (vii) Irrigated. (viii) Nil. (ix) 2.23°. (x) N.A.

2. TREATMENTS:
   All combinations of (1) and (2)
   (1) 3 levels of N: N₀=0, N₁=50, N₂=100 lb./ac.
   (2) 4 levels of P₂O₅: P₀=0, P₁=62.5, P₂=93.75, P₃=125 lb./ac.
   Source of N is A/S and of P₂O₅ as Super.

3. DESIGN:
   (i) 4×3 Fact. in R.B.D. (ii) (a) 12. (b) N.A. (iii) 4. (iv) (a) and (b) 8'×75'. (v) Nil. (vi) Yes.

4. GENERAL:
   (i) Fair. No lodging. (ii) Nil. (iii) Forage yield/plot. (iv) (a) No. (b)—. (c)—. (v) (a) No. (b)—. (vi) and (vii) Nil.
5. RESULTS:

(i) 20.18 ton/ac.
(ii) 2.11 ton/ac.
(iii) Effect of P and interaction NP are highly significant. Effect of N is not significant.
(iv) Av. yield of fodder in ton/ac.

<table>
<thead>
<tr>
<th></th>
<th>P₀</th>
<th>P₁</th>
<th>P₂</th>
<th>P₃</th>
<th>Mean</th>
</tr>
</thead>
<tbody>
<tr>
<td>N₀</td>
<td>13.19</td>
<td>18.09</td>
<td>24.29</td>
<td>23.36</td>
<td>19.73</td>
</tr>
<tr>
<td>N₁</td>
<td>17.98</td>
<td>14.95</td>
<td>23.66</td>
<td>25.85</td>
<td>20.61</td>
</tr>
<tr>
<td>N₂</td>
<td>19.54</td>
<td>22.29</td>
<td>16.68</td>
<td>22.24</td>
<td>20.19</td>
</tr>
<tr>
<td>Mean</td>
<td>16.90</td>
<td>18.44</td>
<td>21.54</td>
<td>23.82</td>
<td>21.18</td>
</tr>
</tbody>
</table>

S.E. of marginal mean of N = 0.53 ton/ac.
S.E. of marginal mean of P = 0.61 ton/ac.
S.E. of body of table = 1.05 ton/ac.

Crop : Berseem.
Site : Chemical Section, B.A. Farm, Rauni.

Ref : Pb. 53(113).
Type : 'M'.

Object : To study the effect of different doses of Super on Berseem crop.

1. BASAL CONDITIONS:

2. TREATMENTS:
   1. Control.
   2. 200 lb./ac. of Super.
   3. 400 lb./ac. of Super.
   4. 600 lb./ac. of Super.
   Super drilled 3' deep on 12.10.1953.

3. DESIGN:
   (i) R B.D. (ii) (a) 4. (b) N.A. (iii) 4. (iv) (a) 80.7' x 18', (b) 68' x 16'. (v) N.A. (vi) Yes.

4. GENERAL:
   (i) Good. No lodging. (ii) Nil. (iii) Fodder yield. (iv) (a) 1953 to 1954. (b) No. (c) Nil. (v) (a) No. (b) —. (vi) and (vii) Nil.

5. RESULTS:
   (i) 27.28 ton/ac.
   (ii) 3.85 ton/ac.
   (iii) Treatments are highly significantly different.
   (iv) Av. yield of fodder in ton/ac.

<table>
<thead>
<tr>
<th>Treatment</th>
<th>Av. yield</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>19.44</td>
</tr>
<tr>
<td>2.</td>
<td>27.97</td>
</tr>
<tr>
<td>3.</td>
<td>32.19</td>
</tr>
<tr>
<td>4.</td>
<td>29.54</td>
</tr>
</tbody>
</table>

S.E. /mean = 1.93 ton/ac.
Crop :- Berseem.  
Site :- Agri. Farm, Rohtak.  

Object :- To study the effect of Ammo. Phos. on yield of Berseem.

1. BASAL CONDITIONS:
   (i) (a) Nil. (b) Jowar. (c) Nil. (ii) (a) Loam. (b) N.A. (iii) 18.10.1948. (iv) (a) to (e) N.A. (v) Nil. (vi) Mascavi. (vii) Irrigated. (viii) Nil. (ix) 0.26", (x) 2nd cutting on 20.3.1949 and 3rd cutting on 24.5.1949.

2. TREATMENTS:
   1. Control.

3. DESIGN:
   (i) Paired-plot. (ii) (a) 2. (b) N.A. (iii) 8. (iv) (a) and (b) For four replications 0.08 ac. and for other four 0.10 ac. (v) Nil. (vi) Yes.

4. GENERAL:
   (i) Normal. No lodging. (ii) Nil. (iii) Fodder yield for two cuttings only. (iv) (a) 1948 to 1950. (b) No. (c) Nil. (v) (a) No. (b) —. (vi) Nil (vii) Yield data available only for 2nd and 3rd cutting.

5. RESULTS:
   (i) 4.510 ton/ac.
   (ii) 0.776 ton/ac.
   (iii) Treatments are not significantly different.
   (iv) Av. yield of fodder in ton/ac.

<table>
<thead>
<tr>
<th>Treatment</th>
<th>Av. yield</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>4.382</td>
</tr>
<tr>
<td>2.</td>
<td>4.637</td>
</tr>
<tr>
<td>S.E./mean</td>
<td>0.275 ton/ac.</td>
</tr>
</tbody>
</table>

Crop :- Berseem.  
Site :- Agri. Farm, Rohtak.  

Object :- To study the effect of Ammo. Phos. on yield of Berseem.

1. BASAL CONDITIONS:
   (i) (a) Nil. (b) Fallow. (c) Nil. (ii) (a) Loamy. (b) N.A. (iii) 27.10.1949. (iv) (a) to (e) N.A. (v) Nil. (vi) Mascavi. (vii) Irrigated. (viii) Nil. (ix) 2.15", (x) 1.1.1950 to 12.1.1950, 1.2.1950 to 13.2.1950, 1.3.1950 to 9.3.1950, 13.4.1950 to 18.4.1950.

2. TREATMENTS:
   1. Control.
   2. Ammo. Phos. at 40 lb./ac. of N.

3. DESIGN:
   (i) Paired-plot. (ii) (a) 2. (b) N.A. (iii) 5. (iv) (a) and (b) 1/10 ac. (v) Nil. (vi) Yes.

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

5. RESULTS:
   (i) 22.72 ton/ac.
   (ii) 2.05 ton/ac.
   (iii) Treatments are not significantly different.
Crop :- Berseem.
Site :- Agri. Farm, Rohtak.

Object :- To study the effect of Ammo. Phos. on yield of Berseem.

1. BASAL CONDITIONS :
   (i) (a) Nil. (b) Jowar. (c) Nil. (ii) (a) Loamy. (b) N.A. (iii) 5.10.1950. (iv) (a) to (c) N.A. (v) Nil. (vi) Mascavi. (vii) Irrigated. (viii) Nil. (ix) 1.83". (x) 27.1.1951, 22.2.1951, 17.3.1951, 8,12.4.1951 and 7,8.6.1951.

2. TREATMENTS :
   1. Control.
   2. Ammo. Phos. at 40 lb./ac. of N.

3. DESIGN :
   (i) Paired-plot. (ii) (a) 2. (b) N.A. (iii) 5. (iv) (a) N.A. (b) 1/10 ac. (v) Nil. (vi) Yes.

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

5. RESULTS :
   (i) 19.556 ton/ac.
   (ii) 1.510 ton/ac.
   (iii) Treatments are highly significantly different.
   (iv) Av. yield of fodder in ton/ac.
   Treatment | Av. yield |
   1. | 14.808 |
   2. | 24.573 |
   S.E./mean = 0.676 ton/ac.

Crop :- Berseem.
Site :- Agri. Farm (Soil Sub-Stn), Rohtak.

Object :- To study the effect of Ammo. Phos. on yield of Berseem.

1. BASAL CONDITIONS :

2. TREATMENTS :
   All combinations of (1) and (2)
   (1) 3 levels of N : N_0=0, N_1=50 and N_2=100 lb./ac.
   (2) 3 levels of P_2O_5 : P_0=0, P_1=100 and P_2=200 lb./ac.
   Source of N is A/S and of P_2O_5 is Super.
3. DESIGN:
(i) 3×3 Fact. in R.B.D. (ii) (a) 9. (b) N.A. (iii) 4. (iv) (a) N.A. (b) 1/40 ac. (v) N.A. (vi) Yes.

4. GENERAL:
(i) Normal. No lodging. (ii) Nil. (iii) Forage yield. (iv) (a) and (b) No. (c) — (v) (a) No. (b) —. (vi) and (vii) Nil.

5. RESULTS:
(i) 25.02 ton/ac.
(ii) 1.59 ton/ac.
(iii) None of the effects is significant.
(iv) Av. yield of fodder in ton/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>24.37</td>
<td>24.61</td>
<td>24.14</td>
<td>24.37</td>
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<tr>
<td>P₁</td>
<td>23.70</td>
<td>26.03</td>
<td>25.43</td>
<td>25.05</td>
</tr>
<tr>
<td>P₂</td>
<td>25.31</td>
<td>25.78</td>
<td>25.79</td>
<td>25.61</td>
</tr>
<tr>
<td>Mean</td>
<td>24.46</td>
<td>25.47</td>
<td>25.12</td>
<td>25.07</td>
</tr>
</tbody>
</table>

S.E. of any marginal mean = 0.46 ton/ac.
S.E. of body of table = 0.65 ton/ac.

Crop :- Berseem.

Site :- Agri. Farm (Soil Sub-Stn.), Rohtak.

Object :- To study the manurial requirements of Berseem.

1. BASAL CONDITIONS:

2. TREATMENTS:
All combinations of (1) and (2)
(1) 2 levels of N as A/S : N₀=0 and N₁=40 lb./ac. of N.
(2) 2 levels of P₃O₅ as Super : P₀=0 and P₁=60 lb./ac. of P₃O₅.

3. DESIGN:
(i) 2×2 Fact. in R.B.D. (ii) (a) 4. (b) N.A. (iii) 5. (iv) (a) and (b) 31°-35°×63°. (v) Nil. (vi) Yes.

4. GENERAL:
(i) Normal. No lodging. (ii) Nil. (iii) Green forage yield. (iv) (a) and (b) No. (c) —. (v) (a) No. (b) —. (vi) and (vii) Nil.

5. RESULTS:
(i) 31.77 ton/ac.
(ii) 1.45 ton/ac.
(iii) Treatments are highly significantly different. P₂O₅ effect is highly significant.
(iv) Av. yield of fodder in ton/ac.

<table>
<thead>
<tr>
<th></th>
<th>N₀</th>
<th>N₁</th>
<th>Mean</th>
</tr>
</thead>
<tbody>
<tr>
<td>P₀</td>
<td>29.33</td>
<td>31.20</td>
<td>30.27</td>
</tr>
<tr>
<td>P₁</td>
<td>33.67</td>
<td>32.88</td>
<td>33.28</td>
</tr>
<tr>
<td>Mean</td>
<td>31.50</td>
<td>32.04</td>
<td>31.77</td>
</tr>
</tbody>
</table>

S.E. of any marginal mean = 0.46 ton/ac.
S.E. of body of table = 0.65 ton/ac.
Crop :- Berseem
Site :- Fodder Res. Stn., Sirsa.

Object :- To find out a suitable dose of A/S for Berseem crop.

1. BASAL CONDITIONS :
   (i) (a) Nil. (b) Fallow. (c) Nil. (ii) (a) Loamy. (b) Refer soil analysis, Sirsa. (iii) 6.10.1948. (iv) (a) to (e) N.A. (v) Nil. (vi) Mascavi. (vii) Irrigated. (viii) Nil. (ix) 0.90". (x) N.A.

2. TREATMENTS :
   1. Control.
   2. A/S at 100 lb./ac. of N.
   3. A/S at 150 lb./ac. of N.
   A/S applied after taking 1st cut.

3. DESIGN :
   (i) R.B.D. (ii) (a) 3. (b) N.A. (iii) 6. (iv) (a) N.A., (b) 1/20 ac. (v) N.A. (vi) Yes.

4. GENERAL :
   (i) Normal. No lodging. (ii) Nil. (iii) Forage yield. (iv) (a) 1947—1948. (b) No. (c) Nil. (v) (a) No. (b)—. (vi) Nil. (vii) Six cuts were taken.

5. RESULTS :
   (i) 11.48 ton/ac.
   (ii) 1.03 ton/ac.
   (iii) Treatments are not significantly different.
   (iv) Av. yield of fodder in ton/ac.
      Treatment         Av. yield
      1.              11.34
      2.              11.41
      3.              11.70
      S.E./mean      0.42 ton/ac.

Crop :- Berseem (Rabi).
Site :- Fodder Res. Stn., Sirsa.

Object :- To find the response of Berseem to the application of F.Y.M., A/S and Super.

1. BASAL CONDITIONS :
   (i) (a) Nil. (b) Fallow. (c) Nil. (ii) (a) Heavy loam. (b) Refer soil analysis, Sirsa. (iii) 5.10.1950. (iv) (a) to (e) N.A. (v) Nil. (vi) Mascavi. (vii) Irrigated. (viii) Nil. (ix) 0.91". (x) 1st cut on 15-26.12.1950, 2nd on 31.1.1951, 3rd on 11.3.1951, 4th on 18.4.1951 and 5th cut on 9.5.1951.

2. TREATMENTS :
   1. Control.
   2. A/S at 60 lb./ac. of N.
   3. Super at 30 lb./ac. of P₂O₅.
   4. A/S at 60 lb./ac. of N+Super at 30 lb./ac. of P₂O₅.
   5. F.Y.M. at 375 md./ac.
   6. F.Y.M. at 750 md./ac.

3. DESIGN :
   (i) R.B.D. (ii) (a) 6. (b) N.A. (iii) 6. (iv) (a) and (b) 88'x8.25' (v) Nil. (vi) Yes.

4. GENERAL :
   (i) Satisfactory. No lodging. (ii) Nil. (iii) Forage yield. (iv) (a) 1950—1952. (b) No. (c) Nil. (v) (a) Nil. (vi) Nil. (vii) Yield of treatment 6 in 6th replication was not available and has been estimated by missing plot technique.
5. RESULTS:

(i) 32.19 ton/ac.
(ii) 3.001 ton/ac.
(iii) Treatments are not significantly different.
(iv) Av. yield of fodder in ton/ac.

<table>
<thead>
<tr>
<th>Treatment</th>
<th>Av. yield</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>30.68</td>
</tr>
<tr>
<td>2.</td>
<td>31.73</td>
</tr>
<tr>
<td>3.</td>
<td>33.89</td>
</tr>
<tr>
<td>4.</td>
<td>31.85</td>
</tr>
<tr>
<td>5.</td>
<td>31.59</td>
</tr>
<tr>
<td>6.</td>
<td>33.42</td>
</tr>
</tbody>
</table>

S.E. mean (other than treatment 6) = 1.225 ton/ac.
S.E. difference of two means when one mean is missing = 1.833 ton/ac.

Crop : Berseem (Rabz).

Ref : Pb. 51 (100).
Type : 'M'.

Object : To study the response of Berseem to the application of F.Y.M., A/S and Super.

1. BASAL CONDITIONS:
   (i) (a) Nil. (b) Jowar. (c) Nil. (ii) (a) Loam. (b) Refer soil analysis, Sirsa. (iii) 30.9.1951. (iv) (a) 1 raja, 3 day plough and 4 sowing. (b) N.A. (c) 4 chs/plot. (d) and (e) N.A. (v) Nil. (vi) Mascoli. (vii) Irrigated. (viii) Nil. (ix) 1.94'. (x) 1st cut—20 to 27.11.1951, 2nd cut—29.12.1951 to 6.1.1952, 3rd cut—6 to 19.2.1952, 4th cut—18 to 27.3.1952, 5th cut—5 to 18.4.1952 and 6th cut—29.4.1952 to 1.5.1952.

2. TREATMENTS:
   1. Control.
   2. A/S at 60 lb./ac. of N.
   3. Super at 30 lb./ac. of P₂O₅.
   4. A/S at 60 lb./ac. of N+Super at 30 lb./ac. of P₂O₅.
   5. F.Y.M. at 375 md./ac.
   6. F.Y.M. at 750 md./ac.


3. DESIGN:
   (i) R.B.D. (ii) (a) 6. (b) N.A. (iii) 5. (iv) (a) and (b) 8.25' x 132'. (v) Nil. (vi) Yes.

4. GENERAL:
   (i) Norcral. No lodging. (ii) Nil. (iii) Forage yield. (iv) (a) 1950 to 1952. (b) No. (c) Nil. (v) (a) Nil. (b)—. (vi) and (vii) Nil.

5. RESULTS
   (i) 29.41 lb./ac.
   (ii) 2.41 lb./ac.
   (iii) Treatment differences are highly significant.
   (iv) Av. yield of forage in ton/ac.

<table>
<thead>
<tr>
<th>Treatment</th>
<th>Av. yield</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>28.09</td>
</tr>
<tr>
<td>2.</td>
<td>25.88</td>
</tr>
<tr>
<td>3.</td>
<td>27.75</td>
</tr>
<tr>
<td>4.</td>
<td>30.57</td>
</tr>
<tr>
<td>5.</td>
<td>32.12</td>
</tr>
<tr>
<td>6.</td>
<td>32.03</td>
</tr>
</tbody>
</table>

S.E./mean = 1.08 ton/ac.
Crop :- Berseem.  
Site :- Fodder Res. Stn., Sirsa. 

Object :- To study the response of Berseem crop to the application of F.Y.M., A/S and Super.

1. BASAL CONDITIONS:
   (i) (a) No. (b) Fallow. (c) Nil.  
   (ii) (a) Heavy loam. (b) Refer soil analysis, Sirsa.  
   (iii) 26.9.1952.  
   (iv) (a) 2 desi plough and 1 desi plough. (b) Broadcast.  
   (c) 8 sr./ac.  
   (d) Nil.  
   (v) Nil.  
   (vi) Masravi.  
   (vii) Irrigated.  
   (viii) 2 hoeings and 1 weeding.  
   (ix) 7.36".  

2. TREATMENTS:
   1. Control.  
   2. 60 lb./ac. of N as A/S.  
   3. 30 lb./ac. of P2O5 as Super.  
   4. 60 lb./ac. of N as A/S + 30 lb./ac. of P2O5 as Super.  
   5. F.Y.M. at 375 md./ac.  
   6. F.Y.M. at 750 md./ac.  

3. DESIGN:
   (i) R.B.D.  
   (ii) (a) 6. (b) N.A. (iii) 6. (iv) (a) and (b) 13'x64'. (v) Nil. (vi) Yes.

4. GENERAL:
   (i) Below normal due to inadequate irrigation. No lodging.  
   (ii) Nil.  
   (iii) Forage yield.  
   (iv) (a) 1951 to 1952. (b) No. (c) Nil.  
   (v) (a) No. (b) Nil. (vi) Due to restricted supply of water during *rabi* season, crop was not able to utilize manure to the full extent. The crop suffered and began to show signs of dryness very early.

5. RESULTS:
   (i) 24.05 ton/ac.  
   (ii) 2.65 ton/ac.  
   (iii) Treatments are not significantly different.  
   (iv) Av. yield of forage in ton./ac.  

```
<table>
<thead>
<tr>
<th>Treatment</th>
<th>Av. yield</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>24.03</td>
</tr>
<tr>
<td>2.</td>
<td>24.05</td>
</tr>
<tr>
<td>3.</td>
<td>24.88</td>
</tr>
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<td>4.</td>
<td>22.49</td>
</tr>
<tr>
<td>5.</td>
<td>22.70</td>
</tr>
<tr>
<td>6.</td>
<td>26.77</td>
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</tbody>
</table>

S.E./mean = 1.08 ton/ac.
```
4. GENERAL:
(i) N.A. (ii) Nil. (iii) Forage yield. (iv) (a) 1952—1955. (b) No. (c) Nil. (v) (a) No. (b)—. (v.) (vi) and (vii) Nil.

5. RESULTS:
(i) 14.53 ton/ac.
(ii) 2.06 ton/ac.
(iii) N effect is highly significant while others are not significant.
(iv) Av. yield of fodder in ton/ac.

<table>
<thead>
<tr>
<th></th>
<th>P₀</th>
<th>P₁</th>
<th>P₂</th>
<th>P₃</th>
<th>Mean</th>
</tr>
</thead>
<tbody>
<tr>
<td>N₀</td>
<td>13.46</td>
<td>13.84</td>
<td>12.74</td>
<td>13.27</td>
<td>13.33</td>
</tr>
<tr>
<td>N₁</td>
<td>14.01</td>
<td>14.78</td>
<td>14.08</td>
<td>13.73</td>
<td>14.15</td>
</tr>
<tr>
<td>N₂</td>
<td>14.71</td>
<td>16.82</td>
<td>17.00</td>
<td>15.88</td>
<td>16.10</td>
</tr>
<tr>
<td>Mean</td>
<td>14.06</td>
<td>15.15</td>
<td>14.61</td>
<td>14.29</td>
<td>14.53</td>
</tr>
</tbody>
</table>

S.E. of marginal mean of N = 0.52 ton/ac.
S.E. of marginal mean of P = 0.59 ton/ac.
S.E. of body of table = 1.03 ton/ac.

Crop: Berseem.
Ref: Pb. 53(54).
Type: ‘M’.

Object: To study the response of Berseem to varying proportions of N and P₂O₅ applied alone and in combination.

1. BASAL CONDITIONS:

2. TREATMENTS:
1. Control.
2. 50 lb./ac. of N.
3. 100 lb./ac. of N.
4. 50 lb./ac. of P₂O₅.
5. 100 lb./ac. of P₂O₅.
6. 150 lb./ac. of P₂O₅.
7. 200 lb./ac. of P₂O₅.
8. 50 lb./ac. of N+50 lb./ac. of P₂O₅.
9. 100 lb./ac. of N+50 lb./ac. of P₂O₅.
10. 100 lb./ac. of N+100 lb./ac. of P₂O₅.
11. 100 lb./ac. of N+150 lb./ac. of P₂O₅.
12. 100 lb./ac. of N+200 lb./ac. of P₂O₅.
N as A/S and P₂O₅ as Super applied at the time of sowing by broadcast.

3. DESIGN:
(i) R.B.D. (ii) (a) 12. (b) N.A. (iii) 6. (iv) (a) 7’×62’. (b) 7’×58’. (v) 4’ on khat side (irrigation channel side). (vi) Yes.

4. GENERAL:
(i) Good. (ii) Nil. (iii) Green forage yield. (iv) a 1952—1955. (b) No. (c) Nil. (v) (a) No. (b)—. (vi) and (vii) Nil.

5. RESULTS:
(i) 52.158 ton/ac.
(ii) 2.603 ton/ac.
(iii) Treatment differences are highly significant.
Crop: Berseem.  Ref: Pb. 53(56).

Object: To study the effect of application of fertilizers on seed setting of Berseem.

1. BASAL CONDITIONS:
(i) (a) Nil. (b) Fallow. (c) Nil. (ii) (a) Loamy. (b) Refr. soil analysis, Sirsa. (iii) 28.9.1953. (iv) (a) 3 ploughs, 2 plankings and 1 horse hoe. (b) N.A. (c) Approximately 14 sere./ac. (d) and (e) N.A. (v) Nil. (vi) Mascavi. (vii) Irrigated. (viii) 2 weedings. (ix) 10.26°. (x) 1st cut 30.11.1953, 2nd cut—27.1.1954 to 29.1.1954, 3rd cut—8.3.1954 to 9.3.1954 and 4th cut—date not available.

2. TREATMENTS:
1. No manure.
2. 100 lb./ac. of N + 200 lb./ac. of P₂O₅ applied at the time of sowing.
3. 100 lb./ac. of N + 200 lb./ac. of P₂O₅ applied at sowing and after each cutting in equal quantities by ground application on 28.9.1953, 3.12.1953, 31.1.1954 and 18.3.1954.
4. 100 lb./ac. of N + 200 lb./ac. of P₂O₅ applied by spraying on 14.12.1953 and 31.1.1954.
N applied as A/S and P₂O₅ as Super.

3. DESIGN:
(i) R.B D. (ii) 6. (b) N.A. (iii) 6. (iv) (a) and (b) 9’x10’. (v) Nil. (vi) Yes.

4. GENERAL:
(i) Germination good. No lodging. (ii) Nil. (iii) Green fodder and seed yield. (iv) (a) 1953—55. (b) No (c) Nil. (v) (a) No. (b) —. (vi) and (vii) Nil.

5. RESULTS:

<table>
<thead>
<tr>
<th>Seed yield</th>
</tr>
</thead>
<tbody>
<tr>
<td>(i) 246.3 lb./ac.</td>
</tr>
<tr>
<td>(ii) 48.97 lb./ac.</td>
</tr>
<tr>
<td>(iii) Treatments are not significantly different.</td>
</tr>
<tr>
<td>(iv) Av. yield of seed in lb./ac.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Treatment</th>
<th>Av. yield</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>248.9</td>
</tr>
<tr>
<td>2.</td>
<td>238.5</td>
</tr>
<tr>
<td>3.</td>
<td>259.3</td>
</tr>
<tr>
<td>4.</td>
<td>238.5</td>
</tr>
<tr>
<td>S.E./mean</td>
<td>19.99 lb./ac.</td>
</tr>
</tbody>
</table>

Green fodder yield

| Treatments are not significantly different. |
| (iv) Av. yield of fodder in ton/ac. |

<table>
<thead>
<tr>
<th>Treatment</th>
<th>Av. yield</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>36.08</td>
</tr>
<tr>
<td>2.</td>
<td>35.26</td>
</tr>
<tr>
<td>3.</td>
<td>38.74</td>
</tr>
<tr>
<td>4.</td>
<td>36.15</td>
</tr>
<tr>
<td>S.E./mean</td>
<td>0.51 ton/ac.</td>
</tr>
</tbody>
</table>

Av. yield of fodder in ton/ac.

<table>
<thead>
<tr>
<th>Treatment</th>
<th>Av. yield</th>
</tr>
</thead>
<tbody>
<tr>
<td>7.</td>
<td>53.913</td>
</tr>
<tr>
<td>8.</td>
<td>52.221</td>
</tr>
<tr>
<td>9.</td>
<td>51.204</td>
</tr>
<tr>
<td>10.</td>
<td>54.980</td>
</tr>
<tr>
<td>11.</td>
<td>55.654</td>
</tr>
<tr>
<td>12.</td>
<td>54.899</td>
</tr>
<tr>
<td>S.E./mean</td>
<td>1.062 ton/ac.</td>
</tr>
</tbody>
</table>
Crop : Berseem.
Object : To study the effect of application of fertilizers at different times during the growth of crop on seed setting of Berseem.

1. BASAL CONDITIONS:
(i) (a) Nil. (b) Fallow. (c) Nil. (ii) (a) Medium loamy. (b) Refer soil analysis, Sirsa. (iii) 28.9.1953. (iv) (a) 3 ploughs, 2 plankings and 1 horse-hoe. (b) N.A. (c) 2 chh./plot. (d) and (e) N.A. (v) Nil. (vi) Mascavi. (vii) Irrigated. (viii) 1 weeding. (ix) 10.26". (x) 1st cut 24.11.1953 to 2.12.1953, 2nd cut 15.1.1954 to 21.1.1954, 3rd cut 28.2.1954 to 5.3.1954 and 4th cut 27.5.1954 to 28.5.1954.

2. TREATMENTS:
Date of application of fertilizers
At sowing time (on 28.9.1953) After 3rd cutting (on 18.3.1954)
1. Control 2. P$_2$O$_5$ at 100 lb./ac. + Nil.
3. P$_2$O$_5$ at 50 lb./ac. + 50 lb./ac. of P$_2$O$_5$.
4. P$_2$O$_5$ at 50 lb./ac. + 50 lb./ac. of P$_2$O$_5$ + 25 lb./ac. of N.
5. Nil + 100 lb./ac. of P$_2$O$_5$.
6. Nil + 100 lb./ac. of P$_2$O$_5$ + 25 lb./ac. of N
P$_2$O$_5$ as Super and N as A/S by broadcast.

3. DESIGN:
(i) R.B.D. (ii) (a), 6. (b) N.A. (iii) 6. (iv) (a) and (b) 7'x62'. (v) Nil. (vi) Yes.

4. GENERAL:
(i) Both germination and growth good. (ii) Nil. (iii) Green fodder and grain weight. (iv) (a) 1953—55. (b) - . (c) -. (v) (a) No. (b) -. (vi) Nil. (vii) For 1st 3 cuttings green fodder weight was taken and for the final (4th) cut grain yield was taken.

5. RESULTS:

<table>
<thead>
<tr>
<th>Treatment</th>
<th>Av. yield in lb./ac.</th>
<th>S.E./mean</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. (i) 325.8 lb./ac.</td>
<td>350.6</td>
<td>22.89 lb./ac.</td>
</tr>
<tr>
<td>2. 335.5</td>
<td>2. 328.1</td>
<td>3. 352.7</td>
</tr>
<tr>
<td>S.E./mean</td>
<td>= 0.64 ton/ac.</td>
<td>S.E./mean</td>
</tr>
</tbody>
</table>

Crop : Berseem.
Site : Jullundur Agri. Stn., Jullundur.
Object : To study the suitable time for Berseem to be left to set seed after taking final cutting.

1. BASAL CONDITIONS:
(i) (a) Nil. (b) Char. (c) Nil. (ii) (a) Loam. (b) Refer soil analysis, Jullundur. (iii) 23.9.1948. (iv) (a) 3 deshi, 1 horse hoe and 3 sohaga. (b) to (e) N.A. (v) 10 C.L. of F.Y.M. on 20.9.1948, A/S 123 lb. on 26.2.1948. (vi) Mascavi. (vii) Irrigated. (viii) Nil. (ix) 7.30". (x) 10.6.1949.

2. TREATMENTS:
1. Berseem left to set seed after taking final cutting on 29.2.1949.
2. Berseem left to set seed after taking final cutting on 31.3.1949.
3. DESIGN:
   (i) Paired'plot. (ii) (a) 2. (b) N.A. (iii) 8. (iv) (a) and (b) 1/32 ac. (v) Nil. (vi) Yes.

4. GENERAL:
   (i) Fair. No lodging. (ii) Nil. (iii) Seed yield. (iv) (a) No. (b) No. (c) —. (v) (a) No. (b) —. (vi) and (vii) Nil.

5. RESULTS:
   (i) 309. 9 lb./ac.
   (ii) 40.96 lb./ac.
   (iii) Treatments are not significantly different.
   (iv) Av. yield of seed in lb./ac.

   Treatment | Av. yield | S.E./mean
   ----------|-----------|-------------
   1.         | 308.6     |             |
   2.         | 311.1     | 14.48 lb./ac|

Crop: Berseem.

Object: To determine the optimum interval between two successive cuttings of Berseem to get maximum yield of green fodder.

1. BASAL CONDITIONS:
   (i) (a) Nil. (b) N.A. (c) Nil. (ii) (a) Loam. (b) Refer soil analysis, Sirsa. (iii) 31.9.1948. (iv) (a) to (e) N.A. (v) N.A. (vi) Mascavi. (vii) Irrigated. (viii) Nil. (ix) 0.90". (x) 16.11.1948 to 15.5.1949.

2. TREATMENTS:
   Interval between two berseem cuttings.
   1. 30 days interval through out.
   2. 40 days interval through out.
   3. 40 days to start with up to Feb., after which 30 days interval up to the end.

3. DESIGN:
   (i) R B.D. (ii) 3. (b) N.A. (iii) 6. (iv) (a) and (b) 1/60 ac. (v) Nil. (vi) Yes.

4. GENERAL:
   (i) Normal. No lodging. (ii) Nil. (iii) Forage yield. (iv) (a) No. (b) —. (c) —. (v) (a) No. (b) —. (vi) and (vii) Nil.

5. RESULTS:
   (i) 35.31 ton/ac.
   (ii) 2.90 ton/ac.
   (iii) Treatments are highly significantly different.
   (iv) Av. yield of fodder in ton/ac.

   Treatment | Av. yield | S.E./mean
   ----------|-----------|-------------
   1.         | 30.96     | 1.18 ton/ac |
   2.         | 36.43     |             |
   3.         | 38.55     |             |
Crop :- Berseem (Rabi).
Site :- Fodder Res. Stn., Sirsa.

Object :- To study the influence of F.Y.M. on forage and seed yield of Berseem at different cutting intervals.

1. BASAL CONDITIONS:
   (i) (a) Nil. (b) Jowar. (c) Nil. (ii) (a) Loam. (b) Refer soil analysis, Sirsa. (iii) 26.9.1949. (iv) (a) 1 raja, 3 desi hal and 4 sohaga. (b) N.A. (c) 8.25 rola/plot. (d) and (e) N.A. (v) Nil. (vi) Mascavi. (vii) Irrigated. (viii) Nil. (ix) 3.49'. (x) 2.11.1949, 1.1.1950 and 8.2.1950.

2. TREATMENTS:
   Main-plot treatments:
   3 levels of manure: \( M_0 = \) Control, \( M_1 = \) Medium dose of 375 md./ac. of F.Y.M. and \( M_2 = \) High dose of 750 md./ac. of F.Y.M.

   Sub-plot treatments:
   3 intervals between cuttings: \( D_1 = \) 30 days, \( D_2 = \) 30-40 days and \( D_3 = \) 40 days.
   F.Y.M. applied on 8, 9.9.1949.

3. DESIGN:
   (i) Split-plot. (ii) (a) 3 main-plots/block; 3 sub-plots/main-plot. (b) N.A. (iii) 4. (iv) (a) and (b) 62.22' \times 7'. (v) Nil. (vi) Yes.

4. GENERAL:
   (i) Good growth. No lodging. (ii) Nil. (iii) Forage yield. (iv) (a) No. (b) -. (c) -. (v) (a) No. (b) -. (vi) Nil. (vii) Each sub-plot is replicated twice in each main-plot.

5. RESULTS:
   (i) 25.82 ton/ac.
   (ii) (a) 6.655 ton/ac.
   (b) 6.120 ton/ac.
   (iii) None of the effects is significant.
   (iv) Av. yield of fodder in ton/ac.

\[
\begin{array}{ccc|c}
& D_1 & D_2 & D_3 & \text{Mean} \\
M_0 & 24.32 & 26.25 & 22.65 & 24.41 \\
M_1 & 21.48 & 27.38 & 26.04 & 24.97 \\
M_2 & 26.43 & 29.87 & 27.95 & 28.08 \\
\hline 
\text{Mean} & 24.08 & 27.83 & 25.55 & 25.82 \\
\end{array}
\]

S.E. of difference of two
1. M marginal means = 1.922 ton/ac.
2. D marginal means = 1.766 ton/ac.
3. D means at the same level of M = 3.060 ton/ac.
4. M means at the same level of D = 3.152 ton/ac.

---

Crop :- Berseem (Rabi).
Site :- Jullundur Agri. Stn., Jullundur.

Object :- To study the effect of irrigation on grain yield of Berseem.

1. BASAL CONDITIONS:
   (i) (a) Nil. (b) Maize. (c) Nil. (ii) (a) Loam. (b) Refer soil analysis, Jullundur. (iii) 12.10.1949. (iv) (a) 5 desi ploughing, 4 sohaga and 1 roller. (b) N.A. (c) 16 sr/ac. (d) and (e) N.A. (v) Nil. (v) Mascavi. (vii) Irrigated. (viii) 2 md. of A/S added on 28.11.1949. (ix) 6.14'. (x) 30/31.5.1950.
2. TREATMENTS:
Irrigations.
1. 6 days interval.
2. 9 days interval.
3. 12 days interval.

3. DESIGN:
(i) R.B.D. (ii) (a) 3. (b) N.A. (iii) 6. (iv) (a) N.A. (b) 1/32 ac. (v) N.A. (vi) Yes.

4. GENERAL:
(i) Germination good. No lodging. (ii) Nil. (iii) Grain yield. (iv) (a) No. (b) —. (c) —. (v) (a) No. (b) —. (vi) and (vii) Nil.

5. RESULTS:
(i) 579.2 lb./ac.
(ii) 60.83 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>808.5</td>
</tr>
<tr>
<td>2.</td>
<td>635.0</td>
</tr>
<tr>
<td>3.</td>
<td>294.2</td>
</tr>
<tr>
<td>S.E./mean</td>
<td>= 24.83 lb./ac.</td>
</tr>
</tbody>
</table>

Crop :- Berseem (Rabi).
Site :- Govt. Agri. Stn., Gurdaspur.

Object :- To study the effect of inoculation of Berseem seed on forage yield.

1. BASAL CONDITIONS:
(i) (a) Nil. (b) Tobacco. (c) N.A. (ii) (a) Loam. (b) N.A. (iii) 21.10.1951. (iv) (a) 2 desi hal and 3 sohaga and 1 roller. (b) N.A. (c) 5 sr./ac. (d) and (e) N.A. (v) F.Y.M. at 2 C.L. to the area on 19.10.1951. (vi) Mascavi. (vii) Irrigated. (viii) Nil. (ix) 7.03’. (x) 15.12.1951 to 27.2.1952. (3 cuttings).

2. TREATMENTS:
1. Control (uninoculated seed).
2. Inoculated seed.

3. DESIGN:
(i) Paired-plot. (ii) (a) 2. (b) N.A. (iii) 6. (iv) (a) and (b) 18’ x 63.75’. (v) Nil. (vi) Yes.

4. GENERAL:
(i) Growth normal, germination fair. No lodging. (ii) Nil. (iii) Forage yield. (iv) (a) No. (b) and (c) —. (v) (a) Nil. (b) —. (vi) and (vii) Nil.

5. RESULTS:
(i) 19.23 ton/ac.
(ii) 1.21 ton/ac.
(iii) Treatments are highly significantly different.
(iv) Av. yield of fodder in ton/ac.

<table>
<thead>
<tr>
<th>Treatment</th>
<th>Av. yield</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>16.09</td>
</tr>
<tr>
<td>2.</td>
<td>22.36</td>
</tr>
<tr>
<td>S.E./mean</td>
<td>= 0.49 ton/ac.</td>
</tr>
</tbody>
</table>
Object: To study the effect of inoculation of Berseem seed on forage yield.

1. BASAL CONDITIONS:
   (i) (a) Nil. (b) Fallow. (c) Nil. (j) (a) Loam. (b) N.A. (iii) 29.10.1951. (iv) (a) 1 raja plough, 4 desi plough, 4 sohaga and 2 horse hoe. (b) N.A. (c) 10 sr/ac. (d) and (e) N.A. (v) Nil. (vi) Mascavi. (vii) Irrigated. (viii) Nil. (ix) 2.80”. (x) 29.12.1951, 3.2.1952, 26.3.1952 and 21.4.1952.

2. TREATMENTS:
   1. Untreated seed sown.
   2. Inoculated seed sown.

3. DESIGN:
   (i) Paired-plot. (ii) (a) 2. (b) N.A. (iii) 6. (iv) (a) and (b) 12’x110’. (v) Nil. (vi) Yes.

4. GENERAL:
   (i) Satisfactory. No lodging. (ii) Nil. (iii) Forage yield. (iv) (a) 1951-1954. (b) (c) Nil. (v) No. (b) —. (vi) and (vii) Nil.

5. RESULTS:
   (i) 32.48 ton/ac.
   (ii) 1.21 ton/ac.
   (iii) Treatments are not significantly different.
   (iv) Av. yield of fodder in ton/ac.

<table>
<thead>
<tr>
<th>Treatment</th>
<th>Av. yield</th>
<th>S.E./mean</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>31.78</td>
<td>0.49</td>
</tr>
<tr>
<td>2.</td>
<td>32.79</td>
<td>0.49</td>
</tr>
</tbody>
</table>

Crop: Berseem (Rabi).
Site: Govt. Agri. Stn., Hansi.

Object: To study the effect of inoculation of seed on yield of Berseem.

1. BASAL CONDITIONS:
   (i) (a) Nil. (b) Wheat. (c) 50 lb/ac. of N as A/S in 2nd week of January 1952. (ii) (a) Loam. (b) N.A. (iii) 23.10.1952. (iv) (a) 6 desi plough, and 3 sohaga. (b) N.A. (c) 8-10 sr/ac. (d) and (e) N.A. (v) Nil. (vi) Mascavi. (vii) Irrigated. (viii) Nil. (ix) 1.86”. (x) 27.12.1952, 25.2.1953, 5.4.1953 2 5.1953.

2. TREATMENTS:
   1. Uninoculated seed sown.
   2. Inoculated seed sown.
   One quarter culture tin and one chattach of gur utilized for inoculating Berseem seed.

3. DESIGN:
   (i) Paired plot. (ii) (a) 2. (b) N.A. (iii) 6. (iv) (a) 12’x60.5’. (b) 12’x60.5’ (v) Nil. (vi) Yes.

4. GENERAL:
   (i) Good. No lodging. (ii) Nil. (iii) Forage yield. (iv) (a) 1951 to 1954. (b) No. (c) Nil. (v) (a) No. (b) —. (vi) and (vii) Nil.

5. RESULTS:
   (i) 27.19 ton/ac.
   (ii) 1.55 ton/ac.
   (iii) Treatments are not significantly different.
   (iv) Av. yield of fodder in ton/ac.

<table>
<thead>
<tr>
<th>Treatment</th>
<th>Av. yield</th>
<th>S.E./mean</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>26.80</td>
<td>0.63</td>
</tr>
<tr>
<td>2.</td>
<td>27.57</td>
<td>0.63</td>
</tr>
</tbody>
</table>

Ref: Pb. 51(27).
Type: ‘D’.

Ref: Pb. 52(103).
Type: ‘D’.
Crop: Berseem (Rabi).  
Site: Govt. Agri. Stn., Hansi.  
Object: To study the effect of inoculation of seed on yield of Berseem.

1. BASAL CONDITIONS:
(i) (a) Nil. (b) Wheat. (c) 50 lb/ac. of N as A/S in 2nd week of Jan 1952.  
(ii) (a) Loam. (b) N.A.  
(iii) 23.11.1952, (iv) (a) 7 desi plough, and 3 sohaga. (b) N.A.  
(c) 8-10 st/ac. (d) and (e) N.A.  
(v) Nil. (vi) Mascavi.  
(vii) Irrigated.  
(xii) Nil. (xiii) 1.86". (x) 24.2.1953, 20.3.1953, 4.4.1953, 1.5.1953.

2. TREATMENTS:
1. Uninoculated seed sown.  
2. Inoculated seed sown.  
One quarter culture tin and one chattaok gur utilized for inoculating Berseem seed on 22.10.1952.

3. DESIGN:
(i) Paired plot.  
(ii) (a) 2.  
(iii) 6.  
(iv) (a) and (b) 12' x 60.5'.  
(v) Nil.  
(vi) Yes.

4. GENERAL:
(i) Good. No lodging.  
(ii) Nil.  
(iii) Forage yield.  
(iv) (a) 1951 to 1954.  
(b) Nil.  
(c) Nil.  
(d) Nil.  
(e) Nil.  
(f) Nil.  
(g) Nil.  
(h) Nil.  
(i) Nil.  
(j) Nil.

RESULTS:
(i) 26.29 ton/ac.  
(ii) 1.71 ton/ac.  
(iii) Treatments are not significantly different.  
(iv) Av. yield of fodder in ton/ac.  

<table>
<thead>
<tr>
<th>Treatment</th>
<th>Av. yield</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>26.23</td>
</tr>
<tr>
<td>2.</td>
<td>26.34</td>
</tr>
<tr>
<td>S.E./mean</td>
<td>0.65 ton/ac</td>
</tr>
</tbody>
</table>

Crop: Berseem.  
Site: Govt. Agri. Stn., Hansi.  
Object: To study the effect of inoculation on forage yield of Berseem.

1. BASAL CONDITIONS:
(i) (a) Nil. (b) Jantar fodder (for green manuring). (c) Nil.  
(ii) (a) Heavy loam. (b) N.A.  
(iii) 1.11.1953.  
(iv) (a) 3 desi, 1 sohaga, 2 roller and 1 horse hoe. (b) to (e) N.A.  
(v) Jantar (fodder) ploughed in the field for green manuring.  
(vi) Mascavi.  
(vii) Irrigated.  
(xii) Nil. (xiii) 4.50". (x) 15.1.1954, 7.3.1954 and 18.4.1954.

2. TREATMENTS:
1. Control.  
2. Berseem seed inoculated.

3. DESIGN:
(i) Paired plot.  
(ii) (a) 2.  
(iii) 6.  
(iv) (a) and (b) 12' x 30.25'.  
(v) Nil.  
(vi) Yes.

4. GENERAL:
(i) Normal. No lodging.  
(ii) Nil.  
(iii) Forage yield.  
(iv) (a) 1951 to 1954.  
(b) Nil.  
(c) Nil.  
(d) Nil.  
(e) Nil.  
(f) Nil.  
(g) Nil.  
(h) Nil.  
(i) Nil.  
(j) Nil.
5. RESULTS:
(i) 103.03 ton/ac.
(ii) 3.75 ton/ac.
(iii) Treatments are not significantly different.
(iv) Av. yield of fodder in ton/ac.

<table>
<thead>
<tr>
<th>Treatment</th>
<th>Av. yield</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>102.27</td>
</tr>
<tr>
<td>2.</td>
<td>103.78</td>
</tr>
<tr>
<td>S.E./mean</td>
<td>1.53 ton/ac.</td>
</tr>
</tbody>
</table>

Crop :- Lucerne.
Site :- Fodder Res. Stn., Sirsa.

Object :- To study the effect of spacing on the yield of Lucerne.

1. BASAL CONDITIONS:

(i) N.A.  (ii) (a) Loam. (b) Refer soil analysis, Sirsa. (iii) By seed propagation. (iv) No. 9.

Object: To study the effect of cutting intervals on forage yield of Lucerne.

1. BASAL CONDITIONS:

(i) Previous wheat crop, no manuring given to wheat. (ii) (a) Loam. (b) Refer soil analysis, Sirsa. (iii) Raised from seed sown on 23.10.1950. (iv) Lucerne No. 8. (v) 1' row to row. (vi) Nil. (vii) N.A. (viii) 1 weeding cum hoeing. (ix) N.A. (x) Irrigated. (xi) Period of exp. 1.66'. (xii) N.A. But forage yield was taken upto 30.6.1951 for the experiment.
2. TREATMENTS:
Cutting intervals:
1. Cutting after 30 days.
2. Cutting after 40 days.
3. Cutting after 50 days.
4. Cutting between 30-40 days.
5. Cutting between 40-50 days.

3. DESIGN:
(i) R.B.D. (ii) (a) 5. (b) N.A. (iii) 6. (iv) Net area. 1/132 ac. (v) N.A. (vi) Yes.

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

RESULTS:
(i) 42.88 ton/ac.
(ii) 3.75 ton/ac.
(iii) Treatment effects are highly significant.
(iv) Av. yield of fodder in ton/ac.

<table>
<thead>
<tr>
<th>Treatment</th>
<th>Av. yield</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>34.19</td>
</tr>
<tr>
<td>2.</td>
<td>46.95</td>
</tr>
<tr>
<td>3.</td>
<td>48.87</td>
</tr>
<tr>
<td>4.</td>
<td>38.79</td>
</tr>
<tr>
<td>5.</td>
<td>45.58</td>
</tr>
<tr>
<td>S.E./mean</td>
<td>1.53 ton/ac.</td>
</tr>
</tbody>
</table>

Crop: Lucerne. Ref: Pb. 52(37).
Site: Fodder Res. Stn., Sirsa. Type: 'C'.

Object: To find the best time for leaving the crop for seed after taking final cutting of forage.

1. BASAL CONDITIONS:

2. TREATMENTS:
Date of final cuttings after which the crop was left for seed setting.
1. 15.12.1952 (control).
2. 15.1.1953.
3. 15.2.1953.
4. 15.3.1953.

3. DESIGN:
(i) R.B.D. (ii) (a) 4. (b) N.A. (iii) 12. (iv) 1/120 ac. (v) Nil. (vi) Yes.

4. GENERAL:
(i) Normal. (ii) Nil. (iii) Actual forage yield prior to leaving the crop for setting seed and seed yield per plot. (iv) (a) No. (b) N.A. (v) N.A. (vi) and (vii) Nil.

5. RESULTS:
(i) 137.38 lb./ac.
(ii) 35.32 lb./ac.
(iii) Treatments are highly significantly different.
(iv) Av. yield of seed in lb./ac.

<table>
<thead>
<tr>
<th>Treatment</th>
<th>Av. yield</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>224.23</td>
</tr>
<tr>
<td>2.</td>
<td>143.74</td>
</tr>
<tr>
<td>3.</td>
<td>87.17</td>
</tr>
<tr>
<td>4.</td>
<td>94.37</td>
</tr>
<tr>
<td>S.E./mean</td>
<td>10.20 lb./ac.</td>
</tr>
</tbody>
</table>
Crop :- Lucerne.  
Site :- Fodder Res. Stn., Sirsa.  
Ref :- Pb. 50(33).  
Type :- 'C'.  

Object :- To find suitable time for leaving the crop for setting seed after taking final cuttings of forage.

1. BASAL CONDITIONS:
   (i) Fall. (ii) (a) Loam. (b) Refer soil analysis, Sirsa. (iii) By seed propagation. (iv) Lucerne No. 3 (v) Crop was sown by hand drill on 22.10.1949 in rows 1' apart. (vi) Nil. (vii) Nearly 24 C.L./ac. F.Y.M. as basal dose in the month of May 1949. (viii) and (ix) Nil. (x) Irrigated. (xi) 1.66". (xii) Middle of June 1950.

2. TREATMENTS:
   Date of leaving the crop for seed after taking final cuttings on:
   1. No cutting.  7. 12.2.1950 after taking two cuttings.
   2. 1.1.1950 after taking one cutting. 8. 3.3.1950 after taking two cuttings.
   3. 21.1.1950 after taking one cutting. 9. 24.3.1950 after taking two cuttings.
   4. 12.2.1950 after taking one cutting. 10. 3.3.1950 after taking three cuttings.
   5. 3.3.1950 after taking one cutting. 11. 24.3.1950 after taking three cuttings.
   6. 24.3.1950 after taking one cutting.
   7. 12.2.1950 after taking two cuttings.
   8. 3.3.1950 after taking two cuttings.
   9. 24.3.1950 after taking two cuttings.
   10. 3.3.1950 after taking three cuttings.
   11. 24.3.1950 after taking three cuttings.
   12. 3.3.1950 after taking three cuttings.

3. DESIGN:
   (i) R.B.D. (ii) (a) 11. (b) N.A. (iii) 6. (iv) 1/220 ac. (v) Nil. (vi) Yes.

4. GENERAL:
   (i) Germination and growth satisfactory. (ii) Nil. (iii) Seed yield. (iv) (a) 1950-1951. (b) N.A. (v) N.A. (vi) and (vii) Nil.

5. RESULTS:
   (i) 197.7 lb./ac.
   (ii) 33.63 lb./ac.
   (iii) Treatment differences are highly significant.
   (iv) Av. yield of seed in lb./ac.

<table>
<thead>
<tr>
<th>Treatment</th>
<th>Av. yield</th>
<th>Treatment</th>
<th>Av. yield</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>378.1</td>
<td>7.</td>
<td>169.7</td>
</tr>
<tr>
<td>2.</td>
<td>279.1</td>
<td>8.</td>
<td>124.5</td>
</tr>
<tr>
<td>3.</td>
<td>247.0</td>
<td>9.</td>
<td>112.2</td>
</tr>
<tr>
<td>4.</td>
<td>287.6</td>
<td>10.</td>
<td>145.2</td>
</tr>
<tr>
<td>5.</td>
<td>180.1</td>
<td>11.</td>
<td>106.5</td>
</tr>
<tr>
<td>6.</td>
<td>144.3</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

S.E./mean = 13.73 lb./ac.

---

Crop :- Lucerne.  
Site :- Fodder Res. Stn., Sirsa.  
Ref :- Pb. 51(105), 50(33).  
Type :- 'C'.

Object :- To find suitable time for leaving the crop for setting seed after taking its final cutting for fodder.

1. BASAL CONDITIONS:
   (i) Previous crop wheat; No manuring. (ii) (a) Loam. (b) Refer soil analysis, Sirsa. (iii) By seed propagation. (iv) Lucerne No. 8. (v) Sown on 28.10.1950. (vi) Spacing 9" row to row. (vii) NE. (viii) 24 C.L./ac. F.Y.M. in May-June 1950. (ix) and (x) Nil. (xi) Irrigated. (xii) 1.66". (xiii) July 1951.

2. TREATMENTS:
   Date of leaving the crop for seed after taking final cutting on:
   1. No cut at all.  7. 12.2.1951 after taking 2 cuts.
   2. 1.1.1951 after taking 1 cut.  8. 3.3.1951 after taking 2 cuts.
   4. 12.2.1951 after taking 1 cut.  10. 3.3.1951 after taking 3 cuts.
   5. 3.3.1951 after taking 1 cut.  11. 24.3.1951 after taking 3 cuts.
   6. 24.3.1951 after taking 1 cut.
3. DESIGN:
(i) R.B.D. (ii) (a) 11. (b) N.A. (iii) 6. (iv) 1/224 ac. (v) Nil. (vi) Yes.

4. GENERAL:
(i) Normal. (ii) Nil. (iii) Seed yield. (iv) (a) 1950—1951. (b) N.A. (v) N.A. (vi) and (vii) Nil

5. RESULTS:
(i) 160.4 lb./ac.
(ii) 36.38 lb./ac.
(iii) Treatments are highly significantly different.
(iv) Av. yield of seed in lb./ac.

<table>
<thead>
<tr>
<th>Treatment</th>
<th>Av. yield</th>
<th>Treatment</th>
<th>Av. yield</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>265.0</td>
<td>7.</td>
<td>149.8</td>
</tr>
<tr>
<td>2.</td>
<td>180.5</td>
<td>8.</td>
<td>136.3</td>
</tr>
<tr>
<td>3.</td>
<td>191.0</td>
<td>9.</td>
<td>116.2</td>
</tr>
<tr>
<td>4.</td>
<td>199.7</td>
<td>10.</td>
<td>95.0</td>
</tr>
<tr>
<td>5.</td>
<td>181.4</td>
<td>11.</td>
<td>110.4</td>
</tr>
<tr>
<td>6.</td>
<td>139.2</td>
<td>S.E./mean</td>
<td>14.85 lb./ac.</td>
</tr>
</tbody>
</table>

Crop: Lucerne.  
Ref.: Pb. 53(61).  
Type: 'CM'.

Object: To study the effect of manuring, spacing and seed rate on seed yield of Lucerne.

1. BASAL CONDITIONS:
(i) Previous crops were Cow peas—Fallow—Wheat—Fallow. No manure to the previous crops. (ii) (a) Sandy loam. (b) Refer soil analysis, Sirsa. (iii) Propagation by seed. (iv) Lucerne no. 9. (v) Seed sown on 17.11.1953 as under treatments. Seed sown by broadcast and by hand drill. (vi) Nil. (vii) Nil. (viii) 4 hoeings with hand hoe to remove weeds and with hand on 12 and 15.2.1954. (ix) Nil. (x) Irrigated. (xi) 4,59". (xii) 9,12 5.1954.

2. TREATMENTS:
Main-plot treatments: 5 levels of manures : M₀—Control, M₁—100 lb./ac. of P₂O₅, M₂—100 lb./ac. of P₂O₅+50 lb./ac. of K₂O, M₃—100 lb./ac. of P₂O₅+50 lb./ac. of K₂O+25 lb./ac. of N in A/S and M₄—Treatment M₃ + trace elements.
Sub-plot treatments: 3 levels of spacing : S₀—Broadcast, S₁=1½' between rows and S₂=2' between rows.
Sub-sub-plot treatments: 3 seed rates : R₁=2 sr., R₂=3 sr. and R₃=4 sr./ac.
Trace elements include : (a) Copper Sulphate at 24 lb./ac. (b) Manganese Sulphate at 48 lb./ac. (c) Zinc Sulphate at 24 lb./ac. (d) Borax at 12 lb./ac. (e) Sodium Molybdate at 60 lb./ac. P₂O₅ as Super and K₂O as Pot. Sulphate. Fertilizers applied on 17.11.1953 and mixed with soil. Fertilizer were applied in rows and seeds were placed with hand drill just over the fertilizer.

3. DESIGN:
(i) Split-split-split-plot. (ii) (a) 5 main-plots/block; 3 sub-plots/main-plot and 3 sub-sub-plots/sub-plot. (b) N.A. (iii) 4. (iv) Main plot 26'×63'; sub-plot with S₀ spacing : 9'×63'; sub-plot with S₁ spacing 8'×63'. Sub-sub plot for S₁=21'×9', sub-sub plot for S₂=21'×8' Net plot size=6'×18'-2'. (v) Nil. (vi) Yes.

4. GENERAL:
(i) Satisfactory. (ii) Nil. (iii) Germination count ; population of seedling per square foot, height of crop in cm. No. of inflorescence per 1 sub-plot, no. of shoot/square ft., no. of inflorescence shoots per branch, no. of flowers inflorescence. No. of pods/inflorescence, no. of grains per pod. (iv) (a) 1953-54. (b) N.A. (v) N.A. (vi) and (vii) Nil.
5. RESULTS:

(i) 210.0 lb./ac.
(ii) N.A.
(iii) N.A.
(iv) Av. yield of seed in lb./ac.

<table>
<thead>
<tr>
<th></th>
<th>S₀</th>
<th>S₁</th>
<th>S₂</th>
<th>Mean</th>
<th>R₁</th>
<th>R₂</th>
<th>R₃</th>
</tr>
</thead>
<tbody>
<tr>
<td>M₀</td>
<td>184.3</td>
<td>268.8</td>
<td>225.7</td>
<td>226.3</td>
<td>225.7</td>
<td>237.8</td>
<td>215.3</td>
</tr>
<tr>
<td>M₁</td>
<td>142.6</td>
<td>196.4</td>
<td>173.6</td>
<td>170.9</td>
<td>185.7</td>
<td>169.5</td>
<td>157.4</td>
</tr>
<tr>
<td>M₂</td>
<td>158.8</td>
<td>218.1</td>
<td>220.6</td>
<td>199.2</td>
<td>209.8</td>
<td>200.6</td>
<td>187.1</td>
</tr>
<tr>
<td>M₃</td>
<td>195.0</td>
<td>246.0</td>
<td>275.1</td>
<td>258.7</td>
<td>236.4</td>
<td>243.3</td>
<td>236.4</td>
</tr>
<tr>
<td>M₄</td>
<td>165.4</td>
<td>225.7</td>
<td>254.0</td>
<td>215.0</td>
<td>216.4</td>
<td>220.2</td>
<td>208.5</td>
</tr>
</tbody>
</table>

Mean: 169.2  231.0  229.8  210.0

S.E.'s N.A.

Crop: Lucerne.

Ref.: Pb. 52(36).
Type: 'CV'.

Object: To study the forage producing capacity of different varieties along with their intervals of cutting.

1. BASAL CONDITIONS:

(i) 11 important Lucerne varieties were under observation in comparison with existing variety Lucerne no. 9 since 1951, after taking uniform cutting on 21.10.1952 experiment was started. (ii) (a) Loamy. (b) Refer soil analysis, Sirsa. (iii) By seed. (iv) See under treatments: (v) 13-11.1951. No spacings. (vi) N.A. (vii) Nil. (viii) Nil. (ix) No. (x) Irrigated. (xi) 9.21°. (xii) Cuttings taken up to 30.6.1953.

2. TREATMENTS:

Main-plot treatments:
12 varieties:
1. Medicago Sativa Ferax.
2. M. Media—M₁₀.
4. M. Media—Viking.
5. M. Media—Canute.
7. M. Sativa—Boobor wie strain.
10. Lucerne Grimm.
11. Lucerne Ladak.
12. Lucerne No. 9 (Standard).

Sub-plot treatments:
3 cutting intervals: C₁ =21 days, C₂ =28 days and C₃ =35 days.

3. DESIGN:

(i) Split-plot. (ii) (a) 12 main-plots/block and 3 sub-plots/main-plot. (b) N.A. (iii) 3. (iv) Plot size net. 1/774 ac. (v) Nil. (vi) Yes.

4. GENERAL:

(i) Good. (ii) Nil. (iii) Height in cm. on 11.2.1953 and forage yield. (iv) (a) and (b) No. (v) N.A. (vi) and (vii) Nil.

5. RESULTS:

(i) 15021 lb./ac.
(ii) (a) 3364.8 lb./ac.
(b) 3426.8 lb./ac.
(iii) All the effects are highly significant.
(iv) Av. yield of fodder 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>V₁</td>
<td>5506</td>
<td>11311</td>
<td>15292</td>
<td>10703</td>
</tr>
<tr>
<td>V₂</td>
<td>7961</td>
<td>14098</td>
<td>18974</td>
<td>13678</td>
</tr>
<tr>
<td>V₃</td>
<td>8260</td>
<td>17614</td>
<td>20633</td>
<td>15502</td>
</tr>
<tr>
<td>V₄</td>
<td>5772</td>
<td>9354</td>
<td>14396</td>
<td>9841</td>
</tr>
<tr>
<td>V₅</td>
<td>4113</td>
<td>6468</td>
<td>9786</td>
<td>6789</td>
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<tr>
<td>V₆</td>
<td>10184</td>
<td>13600</td>
<td>24315</td>
<td>16033</td>
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<tr>
<td>V₇</td>
<td>8492</td>
<td>11477</td>
<td>22789</td>
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<td>10582</td>
<td>14363</td>
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<tr>
<td>V₉</td>
<td>7691</td>
<td>14131</td>
<td>31148</td>
<td>17990</td>
</tr>
<tr>
<td>V₁₀</td>
<td>10980</td>
<td>10847</td>
<td>17614</td>
<td>13147</td>
</tr>
<tr>
<td>V₁₁</td>
<td>8525</td>
<td>12373</td>
<td>16685</td>
<td>12528</td>
</tr>
<tr>
<td>V₁₂</td>
<td>23784</td>
<td>27400</td>
<td>48563</td>
<td>33249</td>
</tr>
</tbody>
</table>

Mean: 9404 13586 22073 15021

S.E. of difference of two
1. V marginal means = 1585.9 lb./ac.
2. C marginal means =  807.5 lb./ac.
3. C means at the same level of V =2798.0 lb./ac.
4. V means at the same level of C =2781.2 lb./ac.

Crop : Lucerne.
Object: To study the influence of irrigation with final cutting of forage on the yield of Lucerne seed.

1. BASAL CONDITIONS:
   (i) Previous crop was wheat and a manure was given to wheat. (ii) (a) Loam. (b) Refer soil analysis, Sirsa. (iii) By seed propagation. (iv) Lucerne No. 8. (v) Sown on 22.10.1949 by hand drill at 1' apart rows. (vi) Nil. (vii) Nearly 24 C.L./ac. of F.Y.M. as basal dose in the month of May, 1949. (viii) Nil. (ix) Nil. (x) Irrigated. (xi) 1.66'. (x) N.A.

2. TREATMENTS:
   All combinations of (1) and (2)
   (1) 3 levels of irrigations: I₁=Low (3 to 4 irrigations), I₂=Medium (3 to 5 irrigations) and I₃=Liberal (4 to 6 irrigations).
   (2) 4 dates of final cutting: D₁=No cut, D₂=15.1.1950 D₃=15.2.1950 and D₄=15.3.1950.

3. DESIGN:
   (i) 4 x 3 Fact. in R.B.D. (ii) (a) 12. (b) N.A. (iii) 4. (iv) 1/120 ac. (v) Nil. (vi) Yes.

4. GENERAL
   (i) Normal. (ii) Nil. (iii) Seed yield. (iv) (a)1950-1951. (b) N.A. (v) N.A. (vi) and (vii) Nil.

5. RESULTS:
   (i) 147.9 lb./ac.
   (ii) 33.78 lb./ac.
   (iii) All effects are highly significant.
Av. yield of seed in lb./ac.

<table>
<thead>
<tr>
<th></th>
<th>D₀</th>
<th>D₁</th>
<th>D₂</th>
<th>D₃</th>
<th>Mean</th>
</tr>
</thead>
<tbody>
<tr>
<td>I₁</td>
<td>271.5</td>
<td>230.7</td>
<td>49.4</td>
<td>21.6</td>
<td>143.3</td>
</tr>
<tr>
<td>I₂</td>
<td>258.4</td>
<td>165.9</td>
<td>59.4</td>
<td>12.3</td>
<td>124.0</td>
</tr>
<tr>
<td>I₃</td>
<td>393.4</td>
<td>232.2</td>
<td>45.5</td>
<td>33.9</td>
<td>176.3</td>
</tr>
<tr>
<td>Mean</td>
<td>307.8</td>
<td>209.6</td>
<td>51.4</td>
<td>22.6</td>
<td>147.9</td>
</tr>
</tbody>
</table>

S.E. of marginal mean of I = 8.45 lb./ac.
S.E. of marginal mean of D = 9.75 lb./ac.
S.E. of body of table = 16.89 lb./ac.

Crop: Lucerne.
Site: Fodder Res. Stn, Sirsa.
Ref: Pb. 51(106)/50(34).
Type: ‘CI’

Object: To study the influence of irrigation with final cutting of forage on the yield of Lucerne seed.

1. BASAL CONDITIONS:

2. TREATMENTS:
All combinations of (1) and (2)
(1) 3 levels of irrigation: I₁=Restricted (3 to 4 irrigations), I₂=Medium (4 to 5 irrigations) and I₃=Liberal (5 to 6 irrigations).
(2) 4 dates of final cutting: D₀=No cut, D₁=15.1.1951, D₂=15.2.1951 and D₃=15.3.1951.

3. DESIGN:
(i) 4 x 3 Fact. in R.B.D. (ii) (a) 12. (b) N.A. (iii) 4. (iv) 1/120 ac. (v) Nil. (vi) Yes.

4. GENERAL:
(i) Normal. (ii) Nil. (iii) Seed yield. (iv) (a) 1950—1951. (b) N.A. (v) N.A. (vi) and (vii) Nil.

5. RESULTS:
(i) 130.0 lb./ac
(ii) 43.2 lb./ac.
(iii) Only time of final cutting effect is highly significant.
(iv) Av. yield of seed in lb./ac.

<table>
<thead>
<tr>
<th></th>
<th>D₀</th>
<th>D₁</th>
<th>D₂</th>
<th>D₃</th>
<th>Mean</th>
</tr>
</thead>
<tbody>
<tr>
<td>I₁</td>
<td>202.9</td>
<td>148.9</td>
<td>78.7</td>
<td>69.4</td>
<td>125.0</td>
</tr>
<tr>
<td>I₂</td>
<td>181.3</td>
<td>151.2</td>
<td>124.2</td>
<td>98.0</td>
<td>138.7</td>
</tr>
<tr>
<td>I₃</td>
<td>158.1</td>
<td>154.3</td>
<td>89.5</td>
<td>103.4</td>
<td>126.3</td>
</tr>
<tr>
<td>Mean</td>
<td>180.8</td>
<td>151.5</td>
<td>97.5</td>
<td>90.3</td>
<td>130.0</td>
</tr>
</tbody>
</table>

S.E. of marginal mean of I = 10.82 lb./ac.
S.E. of marginal mean of D = 12.49 lb./ac.
S.E. of body of table = 21.63 lb./ac.
Crop : - Chari.

Site : - Distt. Demonstration Farm, Ambala.

Object : - To find the best source of N for forage yield of Chari.

1. BASAL CONDITIONS :
   (i) (a) Nil. (b) Fallow. (c) Nil. (ii) (a) Hard clay. (b) N.A. (iii) 16.7.1950. (iv) (a) and (b) N.A. (c) 5 sr./plot. (d) and (e) N.A. (v) Nil. (vi) Local. (vii) Irrigated. (viii) Nil. (ix) 28.31°. (x) 26.11.1950.

2. TREATMENTS :
   All combinations of (1) and (2) + one control (no manure)
   (1) 2 levels of N : N1 = 50 and N2 = 75 lb./ac.
   (2) 3 sources of N : S1 = A/S, S2 = Ammo. Phos. and S3 = F.Y.M.

3. DESIGN :
   (i) R.B.D. (ii) (a) 7. (b) N.A. (iii) 4. (iv) (a) 67.25' x 12'. (b) 67.25' x 12'. (v) Nil. (vi) Yes.

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

5. RESULTS :
   (i) 13793 lb./ac.
   (ii) 1521.9 lb./ac.
   (iii) None of the effects is significant.
   (iv) Av. yield of forage in lb./ac.

   Control = 13469 lb./ac.

<table>
<thead>
<tr>
<th></th>
<th>N1</th>
<th>N2</th>
<th>Mean</th>
</tr>
</thead>
<tbody>
<tr>
<td>S1</td>
<td>13409</td>
<td>13270</td>
<td>13340</td>
</tr>
<tr>
<td>S2</td>
<td>14408</td>
<td>13325</td>
<td>13867</td>
</tr>
<tr>
<td>S3</td>
<td>14380</td>
<td>14353</td>
<td>14367</td>
</tr>
<tr>
<td>Mean</td>
<td>14066</td>
<td>13649</td>
<td>13857</td>
</tr>
</tbody>
</table>

   S.E. of marginal mean of N = 439.3 lb./ac.
   S.E. of marginal mean of S = 538.1 lb./ac.
   S.E. of body of table = 760.9 lb./ac.

Crop : - Guara.

Site : - Fodder Res. Stn., Sirsa.

Object : - To study the effect of application of phosphatic fertilizers on seed yield of Guara.

1. BASAL CONDITIONS :
   (i) (a) Nil. (b) Fallow. (c) Nil. (ii) (a) Loamy. (b) Refer soil analysis, Sirsa. (iii) 17.7.1953. (iv) (a) 2 ploughings and 1 planking. (b) Broadcast. (c) 10 sr./ac. (d) and (e) -. (v) Nil. (vi) Guara no. 2. (vii) Irrigated. (viii) Nil. (ix) 15.67°. (x) 25.11.1953 to 28.11.1953.

2. TREATMENTS :
   1. No manure.
   2. 30 lb./ac. of P2O5 as Super.
   3. 60 lb./ac. of P2O5 as Super.
   Fertiliser applied on 5.7.1953 by broadcast.
3. DESIGN:
   (i) R.B.D.  (ii) (a) 3.  (b) N.A.  (iii) 4.  (iv) (a) and (b) 26' x 122'.  (v) No.  (vi) Yes.

4. GENERAL:
   (i) Good and seed setting satisfactory.  (ii) Nil.  (iii) Fodder yield.  (iv) (a) 1953 to 1954.  (b) No.  (c) Nil.
   (v) (a) No.  (b) Nil.  (vi) and (vii) Nil.

5. RESULTS:
   (i) 1323 lb./ac.
   (ii) 125.8 lb./ac.
   (iii) Treatments are not significantly different.
   (iv) Av. yield of fodder in lb./ac.
   
   Treatment    Av. yield
   1.             1318
   2.             1279
   3.             1371
   S.E./mean    =  62.9 lb./ac.

Crop: Sudan grass
Site: Fodder Res. Stn., Sirsa
Ref: Pb. 53(50).

Object:—To study the maximum potential forage yield of Sudan grass.

1. BASAL CONDITIONS:
   (i) (a) Guara-Fallow-Sudan grass.  (b) Fallow.  (c) Nil.  (ii) (a) Loamy.  (b) Refer soil analysis, Sirsa.
   (iii) 9.4.1953.  (iv) (a) 2 ploughings and 1 planking.  (b) Broadcast.  (c) 7.5 mt./ac.  (d) & (e) —.  (v) Nil.

2. TREATMENTS:
   1. F.Y.M at 125 lb./ac. of N.
   2. F.Y.M. at 250 lb./ac. of N.
   3. A/S and C/N at 125 lb./ac. of N.
   4. A/S and C/N at 250 lb./ac. of N.
   5. F.Y.M. at 125 lb./ac. of N and A/S at 125 lb./ac. of N.
   6. A/S and C/N at 125 lb./ac. of N + Super at 62.5 lb./ac. of P₂O₅.
   7. A/S and C/N at 250 lb./ac. of N + Super at 125 lb./ac. of P₂O₅.
   8. Control.
   N Applied, 1 at the time of sowing as A/S, 2/3 in 3 equal doses on 28.4.1953, 19.6.1953 and 29.7.1953 as C/N.

3. DESIGN:
   (i) R.B.D.  (ii) (a) 8.  (b) N.A.  (iii) 6.  (iv) (a) & (b) 8.5' x 62'.  (v) Nil.  (vi) Yes.

4. GENERAL:
   (i) Satisfactory.  No Lodging.  (ii) Nil.  (iii) Fodder yield.  (iv) (a) 1953—1955.  (b) No.  (c) Nil.
   (v) (a) No.  (b) Nil.  (vi) & (vii) Nil.

5. RESULTS:
   (i) 31.31 ton/ac.
   (ii) 2.19 ton/ac.
   (iii) Treatments are highly significantly different.
   (iv) Av. yield of fodder in ton/ac.
   
   Treatment    Av. yield
   1.             23.69
   2.             36.99
   3.             28.29
   4.             30.44
   5.             31.02
   6.             35.99
   7.             38.08
   8.             24.05
   S.E./mean    =  0.89 ton/ac.
Crop: Sudan grass (Kharif).  
Object: To study the forage yielding capacity of Sudan grass along with other non-leguminous fodder crops.

1. BASAL CONDITIONS:
   (i) (a) Nil.  (b) Rapes.  (c) Nil.  (ii) (a) Loamy.  (b) Refer soil analysis, Sirsa.  (iii) 4.5.1949.  (iv) (a) to (e) N.A.  (v) 15 C.L./ac. of F.Y.M. to the area from 14.2.1949 to 16.2.49.  (vi) N.A.  (vii) Irrigated.  (viii) Nil.  (ix) 5.53". (x) All except teosinte 1st. cut—26.6.49 to 1.8.49. 2nd. cut—23.8.49 to 13.9.49. Teosinte gave one cutting 23.8.49 to 1.9.49.

2. TREATMENTS:
   1. Jowar Js. 263.
   2. Teosinte.
   4. Sudan grass.

3. DESIGN:
   (i) R.B.D.  (ii) (a) 4.  (b) N.A.  (iii) 6.  (iv) (a) & (b) 5'-6" × 132'.  (v) Nil.  (vi) Yes.

4. GENERAL:
   (i) Germivination and growth good. No lodging.  (ii) Nil.  (iii) Forage yield.  (iv) (a) Not continued, (b) —.  (c) —.  (v) (a) Nil.  (b) —.  (vi) & (vii) Nil.

5. RESULTS:
   (i) 28.38 ton./ac.
   (ii) 3.26 ton./ac.
   (iii) Treatments are not significantly different.
   (iv) Av. yield of fodder in ton./ac.
<table>
<thead>
<tr>
<th>Treatment</th>
<th>Av. yield</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>31.49</td>
</tr>
<tr>
<td>2.</td>
<td>26.78</td>
</tr>
<tr>
<td>3.</td>
<td>27.53</td>
</tr>
<tr>
<td>4.</td>
<td>27.73</td>
</tr>
<tr>
<td>S.E./mean</td>
<td>1.33 ton/ac</td>
</tr>
</tbody>
</table>

Crop: Teosinte (Kharif).  
Object: To study the variation in the seed yield as a result of variation in seed rate when sown late.

1. BASAL CONDITIONS:
   (i) (a) Nil.  (b) Berseem.  (c) Nil.  (ii) (a) Loam.  (b) Refer soil analysis, Sirsa.  (iii) 5.8.1949.  (iv) (a) 1 roja plough, 5 desi hal and 4 sohaga.  (b) N.A.  (c) As per treatments.  (d) and (e) N.A.  (v) F.Y.M. at 3 C.L. on 26.6.1949.  (vi) N.A.  (vii) Irrigated.  (viii) 1 weeding.  (ix) 6.84".  (x) 6.11.1949.

2. TREATMENTS:
   Seed rates:
   1. 4 sr./ac.
   2. 5' sr./ac.
   3. 6 sr./ac.
   4. 7 sr./ac.
   5. 8 sr./ac.

3. DESIGN:
   (i) R.B.D.  (ii) (a) 5.  (b) N.A.  (iii) 6.  (iv) (a) and (b) 8'-3" × 132'.  (v) Nil.  (vi) Yes.
4. GENERAL:

(i) Medium vegetation growth. No lodging. (ii) Attack of borer. (iii) Height of plant; thickness of stalk, no. of node bearing cobs, total no. and weight of grain/plant, % attack of borer and grain yield. (iv) (a) Nil. (b)—. (c)—. (v) (a) Nil. (b)—. (vi) and (vii) Nil.

5. RESULTS:

(i) 611.3 lb./ac.
(ii) 124.77 lb./ac.
(iii) Treatments are significantly different.
(iv) Av. yield of grain in lb./ac.

<table>
<thead>
<tr>
<th>Treatment</th>
<th>Av. yield</th>
</tr>
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<tbody>
<tr>
<td>1.</td>
<td>622.3</td>
</tr>
<tr>
<td>2.</td>
<td>581.1</td>
</tr>
<tr>
<td>3.</td>
<td>613.7</td>
</tr>
<tr>
<td>4.</td>
<td>596.6</td>
</tr>
<tr>
<td>5.</td>
<td>642.9</td>
</tr>
<tr>
<td>S.E./mean</td>
<td>57.98 lb./ac.</td>
</tr>
</tbody>
</table>

Crop:— Teosinte (Kharif).
Site:— Fodder Res. Stn., Sirsa.
Ref:— Pb. 49(34).
Type:— 'C'.

Object:— To study the variation in seed yield as a result of variation in seed rate when sown early.

1. BASAL CONDITIONS:

(i) (a) Nil. (b) Berseem. (c) Nil. (ii) (a) Loam. (b) Refer soil analysis, Sirsa. (iii) 23.6.1949. (iv) (a) 1 raja pough, 3 desi and 4 sakhru. (b) to (e) N.A. (v) N.A. (vi) N.A. (vii) Irrigated. (viii) 1 weeding.

2. TREATMENTS:

Seed rates.
1. 4 sr./ac.
2. 5 sr./ac.
3. 6 sr./ac.
4. 7 sr./ac.
5. 8 sr./ac.

3. DESIGN:

(i) R.B.D. (ii) 5. (b) N.A. (iii) 6. (iv) (a) and (b) 8'3" x 132'. (v) Nil. (vi) Yes.

4. GENERAL:

(i) High luxurient, vegetative growth, seed setting poor. No lodging. (ii) Attack of borer. (iii) Height of plant, thickness of stalk, no. of pods bearing cobs, total no. and weight of grain/plant, % attack of borer and grain yield. (iv) (a) Not contd. (b)—. (c)—. (v) (a) Nil. (b)—. (vi) and (vii) Nil.

5. RESULTS:

(i) 594.5 lb./ac.
(ii) 381.1 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>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>594.9</td>
</tr>
<tr>
<td>2.</td>
<td>592.3</td>
</tr>
<tr>
<td>3.</td>
<td>623.1</td>
</tr>
<tr>
<td>4.</td>
<td>570.9</td>
</tr>
<tr>
<td>5.</td>
<td>591.4</td>
</tr>
<tr>
<td>S.E./mean</td>
<td>=156.4 lb./ac.</td>
</tr>
</tbody>
</table>
Crop: - Teosinte.  
Ref: - Pb. 53(59).

Site: - Fodder Res. Stn., Sirsa.  
Type: - 'C'.

Object: - To find out best spacing for Teosinte seed crop.

1. BASAL CONDITIONS:
(i) (a) Nil. (b) Berseem. (c) Nil. (ii) (a) Loamy (heavy loam). (b) Refer soil analysis, Sirsa. (iii) 26/7.1953. (iv) (a) 1 raja plough, 1 desi plough and 1 planking. (b) N.A. (c) 1 charack/line of 32'. (d) As per treatments. (e) N.A. (f) Nil. (g) Teosinte, only this variety exists. (h) Irrigated. (i) 2 weedings and hoeings. (x) 9.1.1954.

2. TREATMENTS:
1. 1' spacing from line to line.
2. 1½ spacing from line to line.
3. 2' spacing from line to line.

3. DESIGN:
(i) R.B.D. (ii) (a) 3. (b) N.A. (iii) 6. (iv) (a) and (b) 36' x 132'. (v) Nil. (vi) Yes.

4. GENERAL:
(i) Satisfactory. No lodging. (ii) Nil. (iii) Seed yield. (iv) (a) 1953 to 1955. (b) Nil. (c) Nil. (d) No. (e) —. (vi) and (vii) Nil.

5. RESULTS:
(i) 1030 lb./ac.  
(ii) 241.5 lb./ac.  
(iii) Treatments are not significantly different.  
(iv) Av. yield of seed in lb./ac.

<table>
<thead>
<tr>
<th>Treatment</th>
<th>Av. yield</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>962</td>
</tr>
<tr>
<td>2.</td>
<td>1050</td>
</tr>
<tr>
<td>3.</td>
<td>1078</td>
</tr>
<tr>
<td>S.E./mean</td>
<td>98.6 lb./ac.</td>
</tr>
</tbody>
</table>

Crop: - Teosinte (Kharif).  
Ref: - Pb. 51(99).

Site: - Fodder Res. Stn., Sirsa.  
Type: - 'IM'.

Object: - To study the response of Teosinte to various agronomical factors.

1. BASAL CONDITIONS:
(i) (a) Nil. (b) Berseem. (c) Nil. (ii) (a) Light loam. (b) Refer soil analysis, Sirsa. (iii) 26.7.1951. (iv) (a) 1 raja, 4 desi plough and 6 sohaga. (b) N.A. (c) 9 chks. 2 rata/plot. (d) and (e) N.A. (f) Nil. (g) N.A. (h) Irrigated. (i) Irrigation after 1 week (high). (j) 15.10.1951 to 2.11.1951.

2. TREATMENTS:
All combinations of (1) and (2)
(1) 4 manures: M1 = Control, M2 = 60 lb./ac. of N as A/S, M3 = 16 tons of F.Y.M., M4 = 8 tons of F.Y.M.+30 lb./ac. of N as A/S.
(2) 3 levels of irrigation: I1 = Irrigation after 3 weeks (low), I2 = Irrigation after 2 weeks (medium), I3 = Irrigation after 1 week (high). F.Y.M. applied on 18, 20.7.1951, 1 dose of A/S on 26.7.1951 and on 9.9.1951.

3. DESIGN:
(i) R.B.D. (Factorial). (ii) (a) 12. (b) N.A. (iii) 4. (iv) (a) N.A. (b) 1/120th ac. (v) N.A. (vi) Yes.

4. GENERAL:
(i) Growth was good in high irrigated plots and poor in low irrigated plots. No lodging. (ii) Nil. (iii) Forage yield/plot. (iv) (a) No. (b) —. (c) —. (v) (a) No. (b) —. (vi) and (vii) Nil.
5. RESULTS:

(i) 21.18 ton/ac.

(ii) 4.315 ton/ac.

(iii) Manure effect is highly significant. Irrigation effect and interaction irrigation x manures are not significant.

(iv) Av. yield of fodder in ton/ac.

<table>
<thead>
<tr>
<th></th>
<th>M1</th>
<th>M2</th>
<th>M3</th>
<th>M4</th>
<th>Mean</th>
</tr>
</thead>
<tbody>
<tr>
<td>I1</td>
<td>18.51</td>
<td>19.12</td>
<td>19.84</td>
<td>20.66</td>
<td>19.53</td>
</tr>
<tr>
<td>I2</td>
<td>17.30</td>
<td>18.32</td>
<td>23.61</td>
<td>24.99</td>
<td>21.06</td>
</tr>
<tr>
<td>I3</td>
<td>16.97</td>
<td>24.30</td>
<td>28.55</td>
<td>22.04</td>
<td>22.56</td>
</tr>
<tr>
<td>Mean</td>
<td>17.59</td>
<td>20.58</td>
<td>24.00</td>
<td>22.56</td>
<td>21.18</td>
</tr>
</tbody>
</table>

S.E. of marginal mean of manures = 1.246 ton/ac.

S.E. of marginal mean of irrigation = 1.079 ton/ac.

S.E. of body of table = 2.157 ton/ac.

---

Crop: Teosinte.
Ref: Pb. 52(29).
Type: ‘IM’.

Object: To study the influence of irrigation and fertilizer treatment on yield of Teosinte.

1. BASAL CONDITIONS:

(i) (a) No. (b) Fallow. (c) Nil. (ii) (a) Loamy. (b) Refer soil analysis, Sirsa. (iii) 13.7.1952. (iv) (a) 5 desiplough, 1 horse hoe and 1 sohaga. (b) Broadcast. (c) 16 sr/ac. (d) and (e)--. (v) Nil. (vi) Teosinte (only one variety exists). (vii) Irrigated. (viii) 1 hoeing and weeding. (ix) 6.57'. (x) 4.10.1952 to 23.10.1952.

2. TREATMENTS:

Main-plot treatments:
3 levels of irrigation: I1 = Irrigation after one week, I2 = Irrigation after two weeks and I3 = Irrigation after three weeks.

Sub-plot treatments:
4 manures: M1 = Control, M2 = 75 lb/ac. of N as A/S, M3 = 75 lb/ac. of N as F.Y.M. and M4 = 37.5 lb/ac. of N as A/S + 37.5 lb/ac. of N as F.Y.M.

Date of application of fertilizers not available.

3. DESIGN:

(i) Split-plot. (ii) (a) 3 main-plots/block ; 4 sub-plots/main-plot. (b) N.A. (iii) 4. (iv) Sub-plot (a) 10' x 64'. (b) 10' x 61'. (v) 3' buffer plots in between the experimental plots and 3 foot border left on irrigation channel side. (vi) Yes.

4. GENERAL:

(i) Normal. No lodging. (ii) Nil. (iii) Fodder yield/plot. (iv) (a) No. (b)--. (c)--. (v) (a) No. (b)--. (v) and (vii) Nil.

5. RESULTS:

(i) 15.27 ton/ac.

(ii) (a) 7.254 ton/ac.

(b) 3.895 ton/ac.

(iii) Main-plot treatment effect is significant, sub-plots treatment effect is highly significant while interaction between them is not significant.
Crop :- Oats.  
Site :- Govt. Agri. Stn., Hansi.  

Ref. :- Pb. 48(55).  
Type :- 'M'.

Object :- To study the residual effect of organic manure applied to previous crop of Cotton.

1. BASAL CONDITIONS :
   (i) (a) Nil. (b) Cotton. (c) As per treatments. (ii) (a) Loam. (b) N.A. (iii) 19.12.1948. (iv) (a) and (b) N.A. (c) 12 cwh. /plot. (d) and (e) N.A. (v) Nil. (vi) Weston 11. (vii) Irrigated. (viii) Nil. (ix) 0.72". (x) 18.4.1949.

2. TREATMENTS:
Manure applied to previous cotton crop.
1. Town compost at 10 ton/ac.
2. Farm compost at 10 ton/ac.
3. Control.

3. DESIGN:
(i) R.B.D. (ii) (a) 3. (b) N.A. (iii) 8. (iv) (a) 12' x 74' - 4'. (b) 1/60 ac. (v) N.A. (vi) Yes.

4. GENERAL:
(i) Very poor. No lodging. (ii) Nil. (iii) Grain yield / plot. (iv) (a) and (b) No. (c) -- , (v) (a) No. (b) -- . (vi) and (vii) Nil.

5. RESULTS:
(i) 3130 lb./ac.
(ii) 437.1 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>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>3171</td>
</tr>
<tr>
<td>2.</td>
<td>3024</td>
</tr>
<tr>
<td>3.</td>
<td>3194</td>
</tr>
</tbody>
</table>

S.E./mean = 154.6 lb./ac.

---

Object :- To study the effect of varying doses of fertilizers on forage yield of Oats.

1. BASAL CONDITIONS:
(i) (a) Nil. (b) Jowar. (c) Nil. (ii) (a) Loam. (b) Refer soil analysis, Sirsa. (iii) 27.11.1951. (iv) (a) to (c) N.A. (v) Nil. (vi) Weston-11 (medium). (vii) Irrigated. (viii) Nil. (ix) 1.30". (x) 14.3.1952 to 20.3.1952.
2. TREATMENTS:
All combinations of (1) and (2)
(1) 2 levels of lime: \( L_0 = 0 \) and \( L_1 = 200 \) lb/ac.
(2) 5 manurial doses: \( M_0 = 0 \), \( M_1 = 20 \) 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.
A/S and C/N applied on 12.1.1952. Date of application of lime N.A.

3. DESIGN:
(i) 2x5 Fact. in R.B.D. (ii) (a) 10. (b) N.A. (iii) 6. (iv) (a) and (b) 8.5’x65’. (v) Nil. (vi) Yes.

4. GENERAL:
(i) Fair. No lodging. (ii) Nil. (iii) Forage yield/plot. (iv) 1951-1953. (b) No. (c) Nil. (v) (a) No. (b) Yes. (vii) Nil. (viii) Yes.

5. RESULTS:
(i) 13.12 ton/ac.
(ii) 1.96 ton/ac.
(iii) Over all treatment effect is highly significant. Manures effect is highly significant while others are not significant.
(iv) Av. yield of fodder in ton/ac.

<table>
<thead>
<tr>
<th></th>
<th>( M_0 )</th>
<th>( M_1 )</th>
<th>( M_2 )</th>
<th>( M_3 )</th>
<th>( M_4 )</th>
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<td>( L_1 )</td>
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<td>12.86</td>
<td>13.04</td>
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<td>13.12</td>
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</table>

S.E. of marginal mean of lime \(-0.358\) ton/ac.
S.E. of marginal mean of N doses \(-0.566\) ton/ac.
S.E. of body of table \(-0.801\) ton/ac.

---

Crop :- Oats.
Site :- Fodder Res. Stn., Sirsa.
Ref :- Pb. 52(33).
Type :- ‘M’.

Object :- To study the effect of fertilizers on yield of Oats.

1. BASAL CONDITIONS:
(i) (a) N.A. (b) Fallow, (c) Nil. (ii) (a) Loamy. (b) Refer soil analysis, Sirsa. (iii) 28.11.1952. (iv) (a) 4 desi plough, 1 bar harrow and 1 sohaga. (b) N.A. (c) 9 chk./plot. (d) and (e) N.A. (v) Nil. (vi) Weston-11 (medium). (vii) Irrigated. (viii) 2 weedicings and hoeings. (ix) 0.89’. (x) 24.3.1953, 26.3.1953 and 28.3.1953.

2. TREATMENTS:
All combinations of (1) and (2)
(1) 2 levels of lime: \( L_0 = 0 \) and \( L_1 = 200 \) lb/ac.
(2) 5 manurial doses: \( M_0 = 0 \), \( M_1 = 20 \) 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.
\( \frac{1}{2} \) amount of the fertilizer was applied on 28.11.1952 and the rest half applied on 4.1.1953 before watering, by broadcast.

3. DESIGN:
(i) 2x5 Fact. n R.B.D. (ii) (a) 10. (b) N.A. (iii) 4. (iv) (a) and (b) 13’x64’. (v) Nil. (vi) Yes.

4. GENERAL:
(i) Crop dried early due to lack of irrigation. No lodging. (ii) Nil. (iii) Forage yield/plot. (iv) (a) 1951-1953. (b) No. (c) Nil. (v) (a) No. (b) Yes. (vi) Nil. (vii) The growth of crop was satisfactory to start with. But the dry weather influenced the crop adversely which had to be cut in whithered state.
5. RESULTS:
(i) 8.02 ton/ac.
(ii) 0.941 ton/ac.
(iii) None of the effects is significant.
(iv) Av. yield of fodder in ton/ac.

<table>
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<tr>
<th></th>
<th>M₀</th>
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<th>M₃</th>
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<td>7.93</td>
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</table>

S.E. of marginal mean of M = 0.333 ton/ac.
S.E. of marginal mean of L = 0.210 ton/ac.
S.E. of body of table = 0.471 ton/ac.

Crop: Oats.

Object: To study response of Oats forage to A/S and C/N alone and in combination with lime.

1. BASAL CONDITIONS:
(i) Nil. (b) Fallow. (c) Nil. (ii) (a) Heavy loam. (b) Refer soil analysis, Sirsa. (iii) 29.10.1953.
(iv) (a) 1 ploughing with raja plough, 2 desi ploughings, 1 horse hoe and 1 planking. (b) Broadcast.
(c) 15 sq./ac. (d) and (e)—. (v) Nil. (vi) Weston—11 (medium, early). (vii) Irrigated. (viii) 2 seedings.
(ix) 4.71'.
(x) 8.2.1954 to 2.3.1954.

2. TREATMENTS:
All combinations of (1) and (2)
(1) 2 levels of lime: L₀=0 and L₁=200 lb./ac.
(2) 5 manurial doses: M₀=0, M₁=20 lb./ac. of N as A/S, M₂=40 lb./ac. of N as A/S, M₃=20 lb./ac. of N as C/N and M₄=40 lb./ac. of N as C/N.
Treatments applied on 28.10.1953 by broadcast.

3. DESIGN:
(i) 2 × 5 Fact. in R.B.D. (ii) (a) 10. (b) N.A. (iii) 4. (iv) (a) and (b) 8.5' × 64'. (v) Nil. (vi)'Yes.

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

5. RESULTS:
(i) 27.05 ton/ac.
(ii) 2.28 ton/ac.
(iii) None of the effects is significant.
(iv) Av. yield of fodder in ton/ac.'

<table>
<thead>
<tr>
<th></th>
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<th>M₂</th>
<th>M₃</th>
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<tr>
<td>Mean</td>
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<td>27.42</td>
<td>27.12</td>
<td>27.58</td>
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S.E. of marginal mean of M = 0.81 ton/ac.
S.E. of marginal mean of L = 0.05 ton/ac.
S.E. of body of table = 1.14 ton/ac.
Object: To study the response of different varieties of Oats to manures.

1. BASAL CONDITIONS:
   (i) (a) Nil. (b) Jowar. (c) Nil.  
   (ii) (a) Loam. (b) Refer soil analysis, Sirsa.  
   (iii) 27.11.1950. (iv) (a) to (e) N.A. (v) Nil.  
   (vi) As per treatments. (vii) Irrigated. (viii) Nil. (ix) 0.91. (x) 3.4.1951 to 18.4.1951.

2. TREATMENTS:
   Main-plot treatments:
   4 manures: M₀ = Control, M₁ = F.Y.M. at 15 ton/acre, M₂ = A/S at 40 lb./acre of N and M₃ = F.Y.M. at 71 ton/acre + A/S at 20 lb./acre of N.
   Sub-plot treatments:

3. DESIGN:
   (i) Split-plot. (ii) (a) 4 main-plots/replication; 5 sub-plots/main-plot. (b) N.A. (iii) 4.  
   (iv) (a) N.A. (b) 6'x63.5'. (v) N.A. (vi) Yes.

4. GENERAL:
   (i) Good. Growth is normal as there is no lodging. (ii) Nil. (iii) Fodder yield, height in cm., tillering, no. of leaves/plot, size of leaf and yield of fodder.  
   (iv) (a) 1950 to 1952. (b) No. (c) Nil.  
   (v) (a) No. (b)—. (vi) and (vii) Nil.

5. RESULTS:
   (i) 13.34 ton/acre.  
   (ii) (a) 2.723 ton/acre.  
   (b) 1.949 ton/acre.
   (iii) Varieties effect is highly significant while others are not significant.
   (iv) Av. yield of fodder in ton./acre.
   
<table>
<thead>
<tr>
<th>M₀</th>
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<td>12.60</td>
<td>13.65</td>
<td>14.01</td>
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</table>
   
   S.E. of difference of two
   1. M marginal means = 0.86 ton/acre.  
   2. V marginal means = 0.69 ton/acre.  
   3. V means at the same level of M = 1.38 ton/acre.  
   4. M means at the same level of V = 1.50 ton/acre.
2. TREATMENTS:

Main-plot treatments:
- 4 manures: M₀ = Control, M₁ = F.Y.M. at 15 ton/ac., M₂ = A/S at 40 lb./ac. of N and M₃ = F.Y.M. at 7½ ton/ac. + A/S at 20 lb./ac. of N.

Sub-plot treatments:
- 5 varieties: V₁ = Bunker, V₂ = Weston-11, V₃ = Fulghan, V₄ = FOS 1/29 and V₅ = Algeria.


3. DESIGN:
- (i) Split-plot. (ii) (a) 4 main-plots/block; 5 sub-plots/main-plot. (b) N.A. (iii) 4. (iv) (a) and (b) 6'x60.5'. (v) Nil. (vi) Yes.

4. GENERAL:
- (i) Normal. No lodging. (ii) Nil. (iii) Forage yield. (iv) (a) 1950 to 1952, (b) and (c) No. (v) (a) and (b) No. (vi) and (vii) No.

5. RESULTS:
- (i) 8.20 ton/ac.
- (ii) (a) 1.975 ton/ac.
- (b) 1.079 ton/ac.

(iii) Effect of manures and varieties are highly significant while their interaction is not significant.

(iv) Av. yield of fodder in ton/ac.

<table>
<thead>
<tr>
<th></th>
<th>V₁</th>
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<th>V₃</th>
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<tr>
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<td>8.96</td>
<td>7.79</td>
<td>7.61</td>
<td>8.20</td>
</tr>
</tbody>
</table>

S.E. of difference of two
- 1. M marginal means = 0.63 ton/ac.
- 2. V marginal means = 0.38 ton/ac.
- 3. V means at the same level of M = 0.76 ton/ac.
- 4. M means at the same level of V = 0.92 ton/ac.

Crop: Oats.

Ref: Pb. 52(34).
Type: ‘MV’.

Object: To study the forage yield of different varieties of Oats as influenced by different manures.

1. BASAL CONDITIONS:
- (i) (a) No. (b) Fallow. (c) Nil. (ii) (a) Light loam. (b) Refer soil analysis, Sirsa. (iii) 29.11.1952.
- (iv) (a) 4 test ploughings, 1 bar harrow and 1 sohaga. (b) N.A. (c) 41 chh./plot. (d) and (e) N.A.
- (v) Nil. (vi) As per treatments. (vii) Irrigated. (viii) 2 weedings and hoeings. (ix) 0.89". (x) 20.3.1953 to 24.3.1953 and 26.3.1953 to 30.3.1953.

2. TREATMENTS:

Main-plot treatments:
- 4 manures: M₀ = Control, M₁ = F.Y.M. at 15 ton/ac., M₂ = A/S at 40 lb./ac. of N. and M₃ = F.Y.M. at 7½ ton/ac. + A/S at 20 lb./ac. of N.

Sub-plot treatments:
- 5 varieties: V₁ = Bunker. 10 (early), V₂ = Weston-11 (early), V₃ = Fulghan (medium), V₄ = FOS 1/29 (late) and V₅ = Algeria (late).

Manures applied on 29.11.1952 by broadcast.
3. DESIGN:
(i) Split-plot. (ii) (a) 4 main-plots/block; 5 sub-plots/main-plot. (b) N.A. (iii) 4. (iv) (a) and (b) 68'-5"x68'-9". (v) Nil. (vi) Yes.

4. GENERAL:
(i) Good. No lodging. (ii) Nil. (iii) Forage yield. (iv) (a) 1950 to 1952. (b) and (c) No. (v) (a) and (b) Nil. (vi) Late type of varieties i.e., Algeria and FOS 1/29 gave low yields as they dried up owing to lack of irrigation.

5. RESULTS:
(i) 11.90 ton/ac.
(ii) (a) 4.09 ton/ac.
(b) 2.74 ton/ac
(iii) Effect of V s highly significant. Others are not significant.
(iv) Av. yield of forage in ton/ac.

<table>
<thead>
<tr>
<th></th>
<th>V1</th>
<th>V2</th>
<th>V3</th>
<th>V4</th>
<th>V5</th>
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<td>15.13</td>
<td>10.68</td>
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</table>

Mean 13.70 12.57 12.80 10.62 9.81 11.90

S.E. of difference of two
1. M marginal means = 1.29 ton/ac.
2. V marginal means = 0.97 ton/ac.
3. V means at the same level of M = 1.94 ton/ac.
4. M means at the same level of V = 2.16 ton/ac.

Crop :- Oats (Rabi).
Site :- Fodder Res. Stn., Sirsa.

Object :- To study the response of late maturing varieties of Oats to sowing dates and application of manure.

1. BASAL CONDITIONS:
(i) (a) No. (b) Fallow. (c) Nil. (ii) (a) Loamy. (b) Refer soil analysis, Sirsa. (iii) As per treatments. (iv) (a) and (b) N.A. (c) FOS 1/29: 4.8 chh./plot; Fulghau: 5.0 chh./plot; Algeria: 5.7 chh./plot. (d) and (e) N.A. (v) N.A. (vi) As per treatments. (vii) Irrigated. (viii) N.A. (ix) 3.49". (x) 13.3.1950 to 11.4.1950.

2. TREATMENTS:
Main-plot treatments:

Sub-plot treatments:
2 manures: M0=Control and M1=A/S at 1 md./ac.

Sub-sub-plot treatments:
3 varieties: V1=FOS 1/29 (late), V2=Fulghau. 15 (late) and V3=Algeria-31/19 (late). A/S applied to main-plot D1 on 1.1.1950, to main-plot D2 on 27.1.1950 and to main-plot D3 on 22.1.1950.

3. DESIGN:
(i) Split-plot. (ii) (a) 3 main-plots/block; 2 sub-plots/main-plot; 3 sub-sub-plots/sub-plot. (b) N.A. (iii) 2. (iv) (a) N.A. (b) 63'x71-8". (v) N.A. (vi) Yes.
4. GENERAL:
   (i) Fair. No lodging. (ii) No. (iii) Forage yield. (iv) (a) Not continued. (b) No. (c) No. (d) and (e) Nil.

5. RESULTS:
   (i) 13.33 ton/ac.
   (ii) (a) 1.81 ton/ac. (b) 2.36 ton/ac. (c) 1.45 ton/ac.
   (iii) The effect of D is significant. Other effects are not significant.
   (iv) Av. yield of forage in ton/ac.

<table>
<thead>
<tr>
<th></th>
<th>V₁</th>
<th>V₂</th>
<th>V₃</th>
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S.E. of difference of two
1. D marginal means = 0.74 ton/ac,
2. M marginal means = 0.79 ton/ac.
3. V marginal means = 0.59 ton/ac.
4. D means at the same level of M = 1.21 ton/ac.
5. D means at the same level of V = 1.11 ton/ac.
6. M means at the same level of V = 1.04 ton/ac.
7. M means at the same level of D = 1.36 ton/ac.
8. V means at the same level of D = 1.02 ton/ac.
9. V means at the same level of M = 0.84 ton/ac.

Crop :- Oats (Rabi).
Site :- Fodder Res. Stn., Sirsa.
Ref :- Ph. 49(42).
Type :- 'CMV'.
Object :- To study the response of early maturing varieties of Oats to sowing dates and application of manure.

1. BASAL CONDITIONS:
   (i) (a) Nil. (b) Fallow. (c) Nil. (ii) (a) Loam. (b) Refer soil analysis, Sirsa. (iii) As per treatments.
   (iv) (a) and (b) N.A. (c) Gidgee : 5.4 chh./plot; IP-1 : 6 chh./plot Bunker : 4.8 chh./plot; Weston-11:4.8 chh./plot; I.P.H.3 6 chh./plot and Lyallpur-1 : 6.4 chh./plot. (d) and (e) N.A. (v) Nil. (vi) As per treatments.
   (vii) Irrigated. (viii) Nil. (ix) 3.49". (x) 16.2.1950 to 31.3.1950.

2. TREATMENTS:
   Main-plot treatments:
   Sub-plot treatments:
   2 Manures : M₀ = Control (No manure). M₁ = A/S at 1 md./ac.
   Sub-sub-plot treatments:
   A/S applied on 1.1.1950 to D₁ plots, on 27.1.1952 to D₂ plots and on 2.8.1.1950 to D₃ plots.

3. DESIGN:
   (i) Split-plot. (ii) (a) 3 main-plots/replication, 2 sub-plots/main-plot and 6 sub-sub-plots/sub-plot. (b) N.A. (iii) 2. (iv) (a) and (b) 63' x 71' 8". (v) Nil. (vi) Yes.
4. GENERAL:
(i) Fair. No lodging. (ii) N.A. (iii) Forage yield. (iv) (a) Not continued. (b)—. (c)—. (v) (a) No. (b)—. (vi) and (vii) Nil.

5. RESULTS:
(i) 13.20 ton/ac.
(ii) (a) 4.27 ton/ac.
(b) 2.24 ton/ac.
(c) 1.51 ton/ac.
(iii) None of the effects is significant.
(iv) Av. yield of forage in ton/ac.

<table>
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<tr>
<th></th>
<th>( V_1 )</th>
<th>( V_2 )</th>
<th>( V_3 )</th>
<th>( V_4 )</th>
<th>( V_5 )</th>
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S.E. of difference of two
1. \( D \) marginal means = 1.23 ton/ac.
2. \( M \) marginal means = 0.53 ton/ac.
3. \( V \) marginal means = 0.62 ton/ac.
4. \( D \) means at the same level of \( M \) = 0.83 ton/ac.
5. \( D \) means at the same level of \( V \) = 1.57 ton/ac.
6. \( M \) means at the same level of \( V \) = 0.96 ton/ac.
7. \( M \) means at the same level of \( D \) = 0.92 ton/ac.
8. \( V \) means at the same level of \( M \) = 0.87 ton/ac.
9. \( V \) means at the same level of \( D \) = 1.07 ton/ac.

Crop := Rape (Rabi).
Ref := Ph. 49(37).
Type := 'CMV'.

Object := To study the response of Rape varieties to sowing time and manurial treatments.

1. BASAL CONDITIONS:
(i) (a) Nil. (b) Jowar. (c) Nil. (ii) (a) Loam. (b) Refer soil analysis, Sirsa. (iii) As per treatments.
(iv) (a) 1 raja plough, 3 desi plough and 4 sohaga. (b) N.A. (c) 1 chh. plot. (d) and (e) N.A. (v) Nil.

2. TREATMENTS:
Main-plot treatments:
3 dates of sowing: \( D_1 = 23.9.1949 \), and \( D_2 = 13.10.1949 \), \( D_3 = 2.11.1949 \).
Sub-plot treatments:
All combinations of (1) and (2)
(1) 2 levels of manures: \( M_0 \) = Control, \( M_1 = 15 \) ton/ac. F.Y.M.
(2) 3 varieties: \( V_1 \) = Japan rape, \( V_2 \) = R.L. 18 and \( V_3 \) = Local rape.
3. DESIGN:
(i) Split-plot. (ii) (a) 3 main-plots/block; 6 sub-plots/main-plot. (b) N.A. (iii) 4. (iv) (a) and (b) 1/140 ac. (v) Nil. (vi) Yes.

4. GENERAL:
(i) Satisfactory. No lodging. (ii) Nil. (iii) Forage yield. (iv) (a) 1949 to 1950. (b) No. (c) Nil. (v) (a) No. (b) --. (vi) and (vii) Nil.

5. RESULTS:
(i) 19.54 ton/ac.
(ii) (a) 5.557 ton/ac.
(b) 1.434 ton/ac.
(iii) Manures and variety effects are highly significant. Other effects are not significant.
(iv) Av. yield of fodder in ton/ac.

<table>
<thead>
<tr>
<th></th>
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<th>D3</th>
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<td>17.31</td>
<td>19.54</td>
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<td>22.47</td>
<td>20.40</td>
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<td>14.23</td>
<td>16.68</td>
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</table>

S.E. of difference of two
1. D marginal means =1.609 ton/ac.
2. M marginal means =0.338 ton/ac.
3. V marginal means =0.414 ton/ac.
4. V means at a level of D =0.717 ton/ac.
5. D means at a level of V =1.713 ton/ac.
6. M means at a level of D =0.585 ton/ac.
7. D means at a level of M =1.662 ton/ac.
S.E. of body of M x V table =0.414 ton/ac.

Crop: Rape.
Ref: Pb 50(30)
Type: 'CMV'.

Object: To study the response of Rape varieties to sowing time and manurial treatments.

1. BASAL CONDITIONS:
(i) (a) Nil. (b) Jowar. (c) Nil. (ii) (a) Loam. (b) Refer soil analysis, Sirsa. (iii) As per treatments.
(i') (a) to (e) N.A. (v) Nil. (vi) As per treatments. (vii) Irrigated. (viii) Nil. (ix) 0.21". (x) 25.11.1950 to 19.2.1951.

2. TREATMENTS:
Main-plot treatments:
Sub-plot treatments:
All combinations of (1) and (2)
(1) 2 levels of manures: M0 = Control and M1 = F.Y.M. at 10 ton/ac.
(2) 3 varieties: V1 = Japan, V2 = R.L. 18 and V3 = Local.

3. DESIGN:
(i) Split-plot. (ii) (a) 3 main-plots/block; 6 sub-plots/main-plot. (b) N.A. (iii) 4. (iv) Sub-plot. (a) N.A. (b) 1/180 ac. (v) N.A. (vi) Yes.
4. GENERAL:

(i) Germination good but growth is effected by severe cold and absence of rain. No lodging. (ii) Nil. (iii) Fodder yield. (iv) (a) 1949 to 1950. (b) No. (c) Nil. (v) (a) No. (b) Nil. (vi) and (vii) Nil.

5. RESULTS:

(i) 11.26 ton/ac.
(ii) (a) 2.05 ton/ac.
(b) (c) Nil.
(iii) (a) No. (b) Nil.
(iv) Av. yield of fodder in ton/ac.

<table>
<thead>
<tr>
<th></th>
<th>D1</th>
<th>D2</th>
<th>D3</th>
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<td>10.13</td>
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<tr>
<td>V3</td>
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<td>10.39</td>
<td>9.77</td>
<td>9.75</td>
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<td>11.28</td>
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</table>

Mean 10.77 11.96 11.04 11.26

Mean 9.49 10.28 10.01 9.93

M1 12.06 13.63 12.08 12.59

S.E. of difference of two
1. D marginal means =0.592 ton/ac.
2. M marginal means =0.351 ton/ac.
3. V marginal means =0.287 ton/ac.
4. V means at a level of D =0.608 ton/ac.
5. D means at a level of V =0.733 ton/ac.
6. M means at a level of D =0.497 ton/ac.
7. D means at a level of M =0.683 ton/ac.
S.E. of body of MxV table =0.351 ton/ac.

Crop :- Rape (Rabi).
Site :- Fodder Res. Stn., Sirsa.
Ref. :- Pb. 49(41).
Type :- 'CI'.
Object :- To study the response of Rape to spacings and irrigations.

1. BASAL CONDITIONS:

(i) a) Nil. (b) Fallow. (c) Nil. (ii) (a) Loam. (b) Refer soil analysis, Sirsa. (iii) 29.9.1949. (iv) (a) 1 raja hal, 6 deshi hal and 8 sohaga. (b) N.A. (c) 8.75 tolas/plot. (d) & (e) N.A. (v) 15 C.L. F.Y.M on 23,24,3.49. (vi) Japan Rape-(medium). (vii) Irrigated. (viii) Nil. (ix) 2.57" (x) N.A.

2. TREATMENTS:

Main-plot treatments:
3 levels of irrigation :-I1=No irrigation, I2=One irrigation and I3=Two irrigations.
Sub-plot treatments:
4 spacings :-S1=Broadcasting, S2=Rows 1' apart, S3=Rows 1' apart and S4=Rows 2' apart.

3. DESIGN:

(i) Split-plot, (ii) 3 main-plots/replication ; 4 sub-plots/main-plot. (b) N.A. (iii) 2. (iv) (a) & (b) sub-plots 12'x60.5'. (v) Nil. (vi) Yes.

4. GENERAL:

5. RESULTS:

(i) 1512 lb./ac.
(ii) (a) 189.5 lb./ac.
(b) 133.5 lb./ac.
(iii) None of the effects is significant.
(iv) Av. yield of seed in lb./ac.

\[
\begin{array}{|c|c|c|c|c|}
\hline
 & S_1 & S_2 & S_3 & S_4 & \text{Mean} \\
\hline
I_0 & 1601 & 1497 & 1504 & 1624 & 1557 \\
I_1 & 1524 & 1551 & 1497 & 1439 & 1503 \\
I_2 & 1504 & 1446 & 1365 & 1589 & 1476 \\
\hline
\text{Mean} & 1543 & 1498 & 1455 & 1551 & 1512 \\
\hline
\end{array}
\]

S.E. difference of two:
1. I marginal means = 94.7 lb./ac.
2. S marginal means = 77.1 lb./ac.
3. S means at a level of I = 133.5 lb./ac.
4. I means at a level of S = 149.5 lb./ac.

Crop :- Rape (Rabi).
Site :- Fodder Res. Stn., Sirsa.
Objec: To study the response of Rape to spacings and irrigations.

1. BASAL CONDITIONS:
   (i) (a) Nil. (b) Jowar. (c) Nil. (ii) (a) Loam. (b) Refer soil analysis, Sirsa. (iii) 9.10.50. (iv) (a) 1 raja plough, 4 den plough and 6 sohaga. (b) to (e) N.A. (v) N.A. (vi) Japan Rape. (vii) Irrigated. (viii) Nil. (ix) 0.21. (x) 13.1.1951.

2. TREATMENTS:
   All combinations of (1) and (2):
   (1) 3 levels of irrigations :- I_0 = No irrigation, I_1 = One irrigation and I_2 = Two irrigations.
   (2) 4 spacings :- S_1 = Broadcasting, S_2 = Rows 1' apart, S_3 = Rows 1\frac{1}{2}' apart and S_4 = Rows 2' apart.

3. DESIGN:
   (i) Fact. in R.B.D. (ii) (a) 12. (b) N.A. (iii) 4. (iv) (a) 6' x 63', (b) 6' x 60.5'. (v) N.A. (vi) Yes.

4. GENERAL:
   (i) Normal. No Lodging. (ii) Nil. (iii) Seed yield. (iv) (a) 1949—1950. (b) No. (c) Nil. (v)(a) No. (b) —. (vi) & (vii) Nil.

5. RESULTS:
   (i) 765.3 lb./ac.
   (ii) 165.6 lb./ac.
   (iii) None of the effects is significant.
   (iv) Av. yield of seed in lb./ac.

\[
\begin{array}{|c|c|c|c|c|}
\hline
 & S_1 & S_2 & S_3 & S_4 & \text{Mean} \\
\hline
I_0 & 748.3 & 632.6 & 678.9 & 705.9 & 691.4 \\
I_1 & 825.4 & 860.1 & 732.9 & 711.4 & 797.5 \\
I_2 & 825.4 & 756.0 & 833.1 & 813.9 & 807.1 \\
\hline
\text{Mean} & 799.7 & 749.6 & 748.3 & 763.7 & 765.3 \\
\hline
\end{array}
\]

S.E. of marginal mean of S = 47.81 lb./ac.
S.E. of marginal mean of I = 41.40 lb./ac.
S.E. of body of table = 82.81 lb./ac.
Crop :-Rape (Robi).
Site :-Fodder Res. Stn., Sirsa.
Ref :-Ph. 49(40).
Type :-'CIV'.

Object :-To study the response of Rape varieties to agronomic factors such as time of sowing and irrigation.

1. BASAL CONDITIONS :
   (i) Nil. (b) Jowar. (c) Nil. (ii) (a) Loam. (b) Refer soil analysis, Sirsa. (iii) As per treatments.
   (iv) (a) 1 raja hal, 3 desi hal and 4 sohaga. (b) N.A. (c) ½ chh./plot. (d) and (e) N.A. (v) 15 C.L.
   of F.Y.M. on 21.3.1949 and 23.3.1949. (vi) As per treatments. (vii) Irrigated. (viii) 1 weeding. (ix) 2.57'.
   (x) N.A.

2. TREATMENTS :
   Main-plot treatments :
   Sub-plot treatments :
   All combinations of (1) and (2)
   (1) 3 levels of irrigation : I3 =No irrigation, I2 =One irrigation and I1 =Two irrigations.
   (2) 3 varieties : V1 =Local, V2 =Japan rape and V3 =R.L. 18.

3. DESIGN :
   (i) Split-plot. (ii) (a) 3 main-plots/block ; 9 sub-plots/main-plot. (b) N.A. (iii) 2. (iv) (a) and (b)
   Sub-plot=62' × 7.3'. (v) Nil. (vi) Yes.

4. GENERAL :
   (i) Satisfactory. No lodging. (ii) Attack of caterpillar; dusting gammaxene. (iii) Seed yield. (iv) (a)
   1949—1950. (b) Nil. (c) Nil. (d) Nil. (e) Nil. (f) Nil. (g) Nil. (h) —. (vi) Nil. (vii) Experiment continued in year
   1950 with split-split-plot design.

5. RESULTS :
   (i) 1102 lb./ac.
   (ii) (a) 429.0 lb./ac.
   (b) 112.6 lb./ac.
   (iii) Varieties effect is highly significant. Interaction main-plot X sub-plot is highly significant while other
   effects are not significant.
   (iv) Av. yield of seed in lb./ac.

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<th>D1</th>
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<th>D3</th>
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S.E. of difference of two
1. D marginal means = 143.0 lb./ac.
2. I or V marginal means = 37.5 lb./ac.
3. I or V means at a level of D = 64.8 lb./ac.
4. D means at a level of I or V = 152.5 lb./ac.
5. S.E. of body of D X I table = 46.0 lb./ac.
Crop: Rapeseed (Rabi).
Ref: Pb. 50(24).
Type: 'CIV'.

Object: To study the response of Rape varieties to times of sowing and irrigations.

1. BASAL CONDITIONS:
   (i) (a) Nil. (b) N.A. (c) Nil. (ii) (a) Loam. (b) Refer soil analysis, Sirsa. (iii) As per treatments.
   (iv) (a) 1 raj, 4 desi and 6 sohaga. (b) N.A. (c) Japan Rape 10/29 chh./plot. (d) and (e) N.A. (v) N.A. (vi) As per treatments. (vii) Irrigated. (viii) N.A. (ix) 0.21". (x) N.A.

2. TREATMENTS:
   Main-plot treatments:
   3 date of sowing: \(D_1=28.9.1950, D_2=19.10.1950\) and \(D_3=10.11.1950\).
   Sub-plot treatments:
   3 levels of irrigation: \(I_0=\text{No irrigation}, I_1=\text{One irrigation} \) and \(I_2=\text{Two irrigations}\).
   Sub-sub-plot treatments:
   3 varieties: \(V_1=\text{Local}, V_2=\text{Japan rape} \) and \(V_3=\text{Raya L 18}\).

3. DESIGN:
   (i) Split-plot. (ii) (a) 3 main-plots/block; 3 sub-plots/main-plot; 3 sub-sub-plots/sub-plot. (b) N.A. (iii) 4. (iv) (a) and (b) Sub-sub-plot=4' x 60.5'. (v) N.A. (vi) Yes.

4. GENERAL:
   (i) Good. No lodging. (ii) Nil. (iii) Seed yield. (iv) (a) 1949--1950. (b) No. (c) Nil. (v) (a) No. (b) --. (vi) and (vii) Nil.

5. RESULTS:
   (i) 935.1 lb./ac.
   (ii) (a) 461.7 lb./ac. (b) 229.3 lb./ac. (c) 222.5 lb./ac.
   (iii) Varieties effect is highly significant, sub-plots effect and interaction main-plot x sub-plot is significant while all others are not significant.
   (iv) Av. yield of seed in lb./ac.

<table>
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<tr>
<th></th>
<th>(I_0)</th>
<th>(I_1)</th>
<th>(I_2)</th>
<th>Mean</th>
<th>(V_1)</th>
<th>(V_2)</th>
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S.E. of difference of two
- 1. D marginal means = 108.9 lb./ac.
- 2. I marginal means = 54.0 lb./ac.
- 3. V marginal means = 52.5 lb./ac.
- 4. V means at a level of I = 90.9 lb./ac.
- 5. I means at a level of V = 91.8 lb./ac.
- 6. V means at a level of D = 90.9 lb./ac.
- 7. D means at a level of V = 131.7 lb./ac.
- 8. I means at a level of D = 93.6 lb./ac.
- 9. D means at a level of I = 133.0 lb./ac.
Crop: *Senji* (Rabi).

Site: Govt. Agri. Stn., Gurdaspur.

Ref: Pb. 51 (71).

Object: To study the residual effect of manures applied to the previous Maize crop on the following Senji crop.

1. **BASAL CONDITIONS:**

   (i) (a) Nil. (b) Maize. (c) As under treatments. (ii) (a) Loam. (b) N.A. (iii) 20.10.1951. (iv) (a) 1 *raka* plough, 4 *desi* and 6 *sohaga*. (b) to (e) N.A. (v) Nil. (vi) N.A. (vii) Irrigated. (viii) Nil. (ix) 7.03". (x) 9, 19.2.1952.

2. **TREATMENTS:**

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

   (1) 3 sources of *N*: S₁ = A/S, S₂ = Ammo. Phos. and S₃ = F.Y.M.

   (2) 3 levels of N: N₁ = 50, N₂ = 75 and N₃ = 100 lb./ac.

   Manures applied to previous maize crop.

3. **DESIGN:**

   (i) R.B.D. (ii) 10. (b) N.A. (iii) 6. (iv) (a) and (b) 22' x 60.5'. (v) Nil. (vi) Yes.

4. **GENERAL:**

   (i) Normal. No lodging. (ii) Nil. (iii) Forage yield. (iv) (a) No. (b) -. (c) -. (v) (a) Nil. (b) -. (vi and (vii) Nil.

5. **RESULTS:**

   (i) 26615 lb./ac.
   (ii) 2662.8 lb./ac.

   (iii) Control vs others and sources of N effect are highly significant while levels of N is significant. Interaction source x level is not significant.

   (iv) Av. yield of forage in 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>24747</td>
<td>23575</td>
<td>27319</td>
<td>25214</td>
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<tr>
<td>S₂</td>
<td>26311</td>
<td>27627</td>
<td>28800</td>
<td>27579</td>
</tr>
<tr>
<td>S₃</td>
<td>26414</td>
<td>28697</td>
<td>28430</td>
<td>27847</td>
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<tr>
<td>Mean</td>
<td>25824</td>
<td>26633</td>
<td>28183</td>
<td>26880</td>
</tr>
</tbody>
</table>

S.E. of any marginal mean = 580.5 lb./ac.
S.E. of body of table = 1005.5 lb./ac.

---

Crop: *Senji*.


Ref: Pb. 52 (31).

Object: To study the behaviour of *Senji* crop to the application of N and P₂O₅ alone and in combination in different proportions.

1. **BASAL CONDITIONS:**

   (i) (a) Nil. (b) Fallow. (c) Nil. (ii) (a) Medium to heavy loam. (b) Refer soil analysis, Sirsa. (iii) 23.10.1952. (iv) (a) 3 *desi hal* and 2 *sohaga*. (b) Broadcast. (c) 4 *chk/plot*. (d) and (e) -. (v) Nil. (vi) F.O.S (medium). (vii) Irrigated. (viii) 3 weedings and hoeings. (ix) 0.89. (x) 14.2.1953 to 3.3.1953.

2. **TREATMENTS:**

   All combinations of (1) and (2)

   (1) 3 levels of *N*: N₀ = 0, N₁ = 50 and N₃ = 100 lb./ac. of N.

   (2) 4 levels of P₂O₅: P₀ = 0, P₁ = 50, P₂ = 100 and P₃ = 150 lb./ac. of P₂O₅.

   A/S and Super applied before sowing on 23.10.1952 by broadcast.
3. **DESIGN:**

(i) Fact. in R.B.D. (ii) (a) 12. (b) N.A. (iii) 4. (iv) (a) and (b) 8.5'x64'. (v) Nil. (vi) Yes.

4. **GENERAL:**

(i) Good. No lodging. (ii) Nil. (iii) Forage yield. (iv) (a) 1952 to 1954. (b) No. (c) Nil. (v) (a) No. (b)—. (vi) and (vii) Nil.

5. **RESULTS:**

(i) 17.30 ton/ac.
(ii) 1.57 ton/ac.
(iii) None of the effects is significant.
(iv) Av. yield of fodder in ton/ac.

<table>
<thead>
<tr>
<th></th>
<th>$P_0$</th>
<th>$P_1$</th>
<th>$P_2$</th>
<th>$P_3$</th>
<th>Mean</th>
</tr>
</thead>
<tbody>
<tr>
<td>$N_0$</td>
<td>15.04</td>
<td>17.67</td>
<td>17.56</td>
<td>17.04</td>
<td>16.83</td>
</tr>
<tr>
<td>$N_1$</td>
<td>17.28</td>
<td>18.20</td>
<td>16.95</td>
<td>18.03</td>
<td>17.62</td>
</tr>
<tr>
<td>$N_2$</td>
<td>16.42</td>
<td>17.11</td>
<td>18.25</td>
<td>18.07</td>
<td>17.46</td>
</tr>
<tr>
<td>Mean</td>
<td>16.25</td>
<td>17.66</td>
<td>17.59</td>
<td>17.71</td>
<td>17.30</td>
</tr>
</tbody>
</table>

S.E. of marginal mean of $N$ = 0.393 ton/ac.
S.E. of marginal mean of $P_2O_5$ = 0.454 ton/ac.
S.E. of body of table = 0.787 ton/ac.

6. **Crop:** Senji.
**Site:** Fodder Res. Stn., Sirsa.
**Ref:** Pb. 53(60).
**Type:** 'M'.

Object:—To study the behaviour of Senji crop to the application of $N$ and $P_2O_5$ alone and in combination.

1. **BASAL CONDITIONS:**

(i) (a) Nil. (b) Fallow. (c) Nil. (ii) (a) Loamy. (b) Refer soil analysis, Sirsa. (iii) 23.10.1953. (iv) (a) 1 raja plough, 2 desi plough and 1 horse hoe. (b) Broadcast. (c) 4 chk./plot. (d) and (e)—. (v) Nil. (vi) FOS I (medium). (vii) Irrigated. (viii) 3 weedings and hoeings. (ix) 4.71'. (s) 28.1.1954, 29.1.1954, 30.1.1954, 31.1.1954, 3.2.1954, 12.2.1954 and 4.2.1954.

2. **TREATMENTS:**

All combinations of (1) and (2)

(1) 3 levels of $N$: $N_0=0$, $N_1=50$ and $N_2=100$ lb./ac.

(2) 4 levels of $P_2O_5$: $P_0=0$, $P_1=50$, $P_2=100$ and $P_3=150$ lb./ac. of $P_2O_5$.

$P_2O_5$ applied as Super on 13.10.1953. Half dose of $N$ as A/S was applied on 13.10.1953 and the remaining half dose on 27.12.1953 by broadcast.

3. **DESIGN:**

(i) Fact. in R.B.D. (ii) (a) 12. (b) N.A. (iii) 4. (iv) (a) 10'x6"x64'. (b) 8'x8"x63'. (v) 8" and 6" left as border on length and breadth side of each plot. (vi) Yes.

4. **GENERAL:**

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

5. **RESULTS:**

(i) 11.46 ton/ac.
(ii) 1.11 ton/ac.
(iii) None of the effects is significant.
(iv) Av. yield of fodder inton/ac.

<table>
<thead>
<tr>
<th></th>
<th>P₀</th>
<th>P₁</th>
<th>P₂</th>
<th>P₃</th>
<th>Mean</th>
</tr>
</thead>
<tbody>
<tr>
<td>N₁</td>
<td>10.04</td>
<td>11.36</td>
<td>11.52</td>
<td>11.43</td>
<td>11.69</td>
</tr>
<tr>
<td>N₂</td>
<td>11.41</td>
<td>12.18</td>
<td>11.03</td>
<td>11.15</td>
<td>11.44</td>
</tr>
<tr>
<td>N₃</td>
<td>11.89</td>
<td>11.41</td>
<td>11.83</td>
<td>12.29</td>
<td>11.86</td>
</tr>
<tr>
<td>Mean</td>
<td>11.11</td>
<td>11.65</td>
<td>11.46</td>
<td>11.62</td>
<td>11.46</td>
</tr>
</tbody>
</table>

S.E. of marginal mean of N = 0.28 ton/ac.
S.E. of marginal mean of P = 0.32 ton/ac.
S.E. of body of table = 0.56 ton/ac.

Crop :- Kudzu Vine.
Site :- Fodder Res. Stn., Sirsa.
Ref :- Ph. 52(35).
Type :- 'C'.

Object :- To study the influence of cutting the grass at varying intervals after taking uniform cuttings on 5.7.1952.

1. BASAL CONDITIONS :

2. TREATMENTS :
   Cutting intervals :-
   1. Cutting after 35 days interval.
   2. Cutting after 49 days interval.
   3. Cutting after 63 days interval.

3. DESIGN :
   (i) R.B.D. (ii) (a) 3. (b) N.A. (iii) 4. (iv) 1/₄33 ac. (v) Nil. (vi) Yes.

4. GENERAL :
   (i) Normal. (ii) Nil. (iii) Forage yield. (iv) (a) 1952-53. (b) N.A. (v) N.A. (vi) and (vii) Nil.

5. RESULTS :
   (i) 12.86 ton/ac.
   (ii) 1.80 ton/ac.
   (iii) Treatments are not significantly different.
   (iv) Av. yield of fodder in ton/ac.

<table>
<thead>
<tr>
<th>Treatment</th>
<th>Av. yield</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>14.66</td>
</tr>
<tr>
<td>2.</td>
<td>12.58</td>
</tr>
<tr>
<td>3.</td>
<td>11.34</td>
</tr>
<tr>
<td>S.E./mean</td>
<td>0.90 ton/ac.</td>
</tr>
</tbody>
</table>
Crop :- Kudzu Vine.  
Site :- Fodder Res. Stn., Sirsa.  

Object :- To study the influence of cutting the grass at varying intervals after taking a uniform cutting on 24.4.1953.

1. BASAL CONDITIONS:

2. TREATMENTS:
   3 intervals of cutting
   1. 35 days.
   2. 49 days.
   3. 63 days.

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

4. GENERAL:
   (i) Good. (ii) No. (iii) Yield of fodder. (iv) (a) 1952-1953. (b) N.A. (v) N.A. (vi) and (vii) Nil.

5. RESULTS:
   (i) 14.57 ton/ac.
   (ii) 3.20 ton/ac.
   (iii) Treatments are not significantly different.
   (iv) Av. yield of fodder in ton/ac.
   Treatment       Av. yield
                    1.    12.98
                    2.    15.28
                    3.    15.45
   S.E./mean        = 1.60 ton/ac.

Crop :- Para Grass.  
Site :- Fodder Res. Stn., Sirsa.  

Object :- To study the influence of cutting the grass at varying intervals after taking a uniform cutting on 18.5.1953.

1. BASAL CONDITIONS:

2. TREATMENTS:
   Three intervals of cutting.
   1. 4 weeks.
   2. 5 weeks.
   3. 6 weeks

3. DESIGN:
   (i) R.B.D. (ii) (a) 3. (b) N.A. (iii) 3. (w) 9'×15'. (v) No. (vi) Yes.

4. GENERAL:
   (i) Good. (ii) Nil. (iii) Length of shoots and forage yield. (iv) (a) No. (b) No. (v) N.A. (vi) Nil. (vii) N.A.
5. RESULTS:
(i) 16.08 ton/ac.
(ii) 1.93 ton/ac.
(iii) Treatments are not significantly different.
(iv) Av. yield of fodder in ton/ac.

<table>
<thead>
<tr>
<th>Treatment</th>
<th>Av. yield</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>16.66</td>
</tr>
<tr>
<td>2.</td>
<td>14.27</td>
</tr>
<tr>
<td>3.</td>
<td>17.31</td>
</tr>
<tr>
<td>S.E./mean</td>
<td>1.12</td>
</tr>
</tbody>
</table>

Crop :– Tea.
Site :– Govt. Tea Farm, Palampur (Kangra).

Object :– To study the optimum dose of A/S and Super for Tea.

1. BASAL CONDITIONS:
(i) This area was under tea crop which was given 3 hoeings in a year and 160 lb. of A/S applied yearly.
(ii) (a) Red clay. (b) N.A. (iii) Transplanting. (iv) China. (v) Planted during the year 1880 at a distance of 5' each way. (vi) 2 years. (vii) No. (viii) 3 hoeings. (ix) No crop sown. (x) 8.18'.

2. TREATMENTS:
1. 40 lb./ac. of N as A/S applied in March.
2. 80 lb./ac. of N as A/S in March.
3. 120 lb./ac. of N as A/S+50 lb./ac. of P₂O₅ as Super in March.
4. 40 lb./ac. of N in March+40 lb./ac. of N in June as A/S.
5. 50 lb./ac. of P₂O₅ as Super in March.
6. 60 lb./ac. of N in March+60 lb./ac. of N in June as A/S.
7. Control.

3. DESIGN:
(i) R.B.D. (ii) (a) 7. (b) N.A. (iii) 6. (iv) 30 bushes. (v) Nil. (vi) Yes.

4. GENERAL:
(i) Normal. (ii) Nil. (iii) Nil. (iv) (a) 1932-continued. (b) N.A. (v) N.A. (vi) and (vii) Nil.

5. RESULTS:
(i) 2603 lb./ac.
(ii) 473.1 lb./ac.
(iii) Treatments are highly significantly different.
(iv) Av. yield of tea in lb./ac.

<table>
<thead>
<tr>
<th>Treatment</th>
<th>Av. yield</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>2526</td>
</tr>
<tr>
<td>2.</td>
<td>2693</td>
</tr>
<tr>
<td>3.</td>
<td>3095</td>
</tr>
<tr>
<td>4.</td>
<td>2943</td>
</tr>
<tr>
<td>5.</td>
<td>2982</td>
</tr>
<tr>
<td>6.</td>
<td>1998</td>
</tr>
<tr>
<td>7.</td>
<td>1982</td>
</tr>
<tr>
<td>S.E./mean</td>
<td>193.1 lb./ac.</td>
</tr>
</tbody>
</table>
Crop :- Tea.
Site :- Govt. Tea Farm, Palampur.

Object :- To find out the best time of pruning Tea.

1. BASAL CONDITIONS:
(i) This area was under tea crop which was given 3 hoeings in a year and 160 lbs. of A/S was applied yearly. (ii) (a) Red clay. (b) N.A. (iii) Transplanted. (iv) China. (v) Planted in 1880 at a distance of 5' each way. (vi) 2 years. (vii) Nil. (viii) 3 hoeings in a year. (ix) No crop is sown in the bushes. (x) Unirrigated. (xi) 88.18°. (xii) 14.4.1953, 8.5.1953, 17.7.1953, 18.8.1953, 9.9.1953 and 14.10.1953.

2. TREATMENTS:
Dates of pruning.
1. 1st November.
2. 22nd November.
3. 15th February.
4. 2nd June.

3. DESIGN:
(i) R.B.D. (ii) (a) 4. (b) N.A. (iii) 6. (iv) 30 bushes. (v) Nil. (vi) Yes.

4. GENERAL:
(i) Normal. (ii) Nil. (iii) Nil. (iv) 1952-continued. (b) N.A. (v) N.A. (vi) and (vii) Nil.

5. RESULTS:
(i) 2052 lb./ac.
(ii) 480.7 lb./ac.
(iii) Treatments are not significantly different.
(iv) Av. yield of tea in lb./ac.

<table>
<thead>
<tr>
<th>Treatment</th>
<th>Av. yield</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>2003</td>
</tr>
<tr>
<td>2.</td>
<td>1900</td>
</tr>
<tr>
<td>3.</td>
<td>2294</td>
</tr>
<tr>
<td>4.</td>
<td>2012</td>
</tr>
</tbody>
</table>
| S.E./mean | 196.3 lb./ac.

Crop :- Tea.
Site :- Govt. Tea Farm, Palampur.

Object :- To find out the optimum dose of A/S and best interval for pruning and plucking Tea.

1. BASAL CONDITIONS:
(i) This area was under the crop which was given three hoeings in a year and 160 lb. of A/S was applied yearly. (ii) (a) Red clay. (b) N.A. (iii) Transplanting. (iv) China. (v) Planted during the year 1880 at a distance of 5' each way. (vi) Two years. (vii) No. (viii) 3 hoeings. (ix) No crops sown. (x) Unirrigated. (xi) 88.18°. (xii) 14.4.1953, 8.5.1953, 17.7.1953, 18.8.1953, 9.9.1953 and 14.10.1953.

2. TREATMENTS:
All combinations of (1), (2) and (3)
(1) 3 levels of N : N₁ = 40, N₂ = 80 and N₃ = 120 lb./ac.
(2) 3 intervals of plucking : P₁ = weekly, P₂ = fortnightly and P₃ = monthly,
(3) 3 intervals of pruning : P₁₁ = after 1 year, P₁₂ = after 2 years and P₁₃ = after 3 years.

3. DESIGN:
(i) 3² Fact. in R.B.D. (ii) (a) 27. (b) N.A. (iii) 4. (iv) 30 bushes. (v) Nil. (vi) Yes.

4. GENERAL:
(i) Normal. (ii) Nil. (iii) Nil. (iv) 1951-continued. (b) N.A. (v) N.A. (vi) and (vii) Nil.
5. RESULTS:

(i) \( 2858 \) lb./ac.
(ii) \( 740.0 \) lb./ac.
(iii) Main effect of N is highly significant. Interaction N x PI is also significant.
(iv) Av. yield of tea in lb./ac.

<table>
<thead>
<tr>
<th></th>
<th>PI₁</th>
<th>PI₂</th>
<th>PI₃</th>
<th>Mean</th>
<th>Pr₁</th>
<th>Pr₂</th>
<th>Pr₃</th>
</tr>
</thead>
<tbody>
<tr>
<td>N₁</td>
<td>2393</td>
<td>2575</td>
<td>1987</td>
<td>2318</td>
<td>2502</td>
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<td>2292</td>
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<tr>
<td>N₂</td>
<td>2980</td>
<td>2431</td>
<td>2604</td>
<td>2671</td>
<td>2491</td>
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<td>N₃</td>
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<td>3382</td>
<td>3479</td>
<td>3695</td>
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Mean:

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<th>2858</th>
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<tr>
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<td>2835</td>
<td>2695</td>
<td>2792</td>
</tr>
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</tr>
<tr>
<td>Pr₃</td>
<td>3016</td>
<td>3006</td>
<td>2956</td>
<td>2993</td>
</tr>
</tbody>
</table>

S.E. of any marginal mean = 123.3 lb./ac.
S.E. of body of table = 213.6 lb./ac.

Crop: Gram.
Site: Govt. Agri. Stn., Hansi.

Object: To study the effect of mixed cropping on yield of Gram.

1. BASAL CONDITIONS:
   (i) (a) Nil. (b) Guara. (c) Guara green manured on 23.8.1952 by ploughing the field.
   (ii) (a) Loam. (b) N.A. (iii) 12.10.1952.
   (iv) (a) 3 deal plough, 4 rotation and 2 roller. (b) N.A. (c) 15 seer gram + 7½ seer Barley/wheat/; 15 seer gram + 7½ seer wheat/; 22½ kwar gram/ac. (d) and (e) N.A. (v) Nil. (vi) Gram: Punjab. 7 (medium); Wheat: C—594 (medium) and Barley: T—4 (medium). (vii) Irrigated. (viii) Nil. (ix) S.8". (x) 23, 24, 3.1952.

2. TREATMENTS:
   1. Gram alone.
   2. Gram + Barley.

3. DESIGN:
   (i) R.B.D. (ii) (a) 3. (b) N.A. (iii) 6. (iv) (a) 54°—5°×10'. (b) 54°—5°×10'. (v) Nil. (vi) Yes.

4. GENERAL:
   (i) Fair to satisfactory. No lodging. (ii) Some plots effected by Thangi, control measure Nil. (iii) Grain yield/plot. (iv) (a) No. (b) No. (c) -. (v) (a) No. (b) -. (vi) and (vii) Nil.

5. RESULTS:
   (i) 1079 lb./ac.
   (ii) 361.7 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>949</td>
</tr>
<tr>
<td>2.</td>
<td>1372</td>
</tr>
<tr>
<td>3.</td>
<td>916</td>
</tr>
</tbody>
</table>

S.E (mean) = 147.7 lb./ac.
Crop : Soyabean and Maize (Kharif).  
Site : Linseed Breeding Sub-Stn., Nagrota Bagwan.  
Type : 'X'.

Object : To study the suitability of sowing Soyabean and Maize in mixture to get maximum yield.

1. BASAL CONDITIONS :
   (i) (a) Nil.  (b) Linseed.  (c) Nil.  (ii) (a) Loamy.  (b) N.A.  (iii) 25.5.1950.  (iv) (a) 5 ploughings, and 4 subaga.  (b) to (e) N.A.  (v) Nil.  (vi) N.A.  (vii) Irrigated.  (viii) 2 weedicings and 2 hoeings.  (ix) 78.13₇₉ (x) Maize 24.9.50, Soyabean 15.10.1950.

2. TREATMENTS:
   1. Soyabean.

3. DESIGN :
   (i) R.B.D.  (ii) (a) 3.  (b) N.A.  (iii) 4.  (iv) (a) 18'x60'.  (b) 18'x60'.  (v) Nil.  (vi) Yes.

4. GENERAL:
   (i) Satisfactory.  No lodging.  (ii) Nil.  (iii) Grain yield.  (iv) (a) No.  (b) -.  (c) -.  (v) (a) No.  (b) -.  (vi) & (vii) Nil.

5. RESULTS:
   (i) 1394 lb./ac.
   (ii) 216.7 lb./ac.
   (iii) Treatments are highly significantly different.
   (iv) Av. yield of grain in lb./ac.
   Treatment  | Av. yield
   1.          | 1103
   2.          | 1960
   3.          | 1120
   S.E./mean  = 108.4 lb./ac.

Crop : Maize (Kharif).  
Site : Linseed Breeding Sub-Stn., Nagrota Bagwan.  
Type : 'X'.

Object : To study if sowing of Soyabean in Maize effects the yield of Maize crop.

1. BASAL CONDITIONS :
   (i) (a) Nil.  (b) Linseed.  (c) Nil.  (ii) (a) Loamy.  (b) N.A.  (iii) 20.5.1951.  (iv) (a) to (c) N.A.  (v) N.A.  (vi) Local.  (vii) Irrigated.  (viii) 1 weeding and 2 hoeings.  (ix) 78.13₇₉.  (x) 23.9.51.

2. TREATMENTS:
   1. Maize sown alone.
   2. Maize sown with Soyabean.

3. DESIGN :
   (i) Paired-plot.  (ii) (a) 2.  (b) N.A.  (iii) 4.  (iv) (a) 16'x12'.  (b) 16'x12'.  (v) Nil.  (vi) Yes.

4. GENERAL:
   (i) Below normal.  No lodging.  (ii) Nil.  (iii) Grain yield.  (iv) (a) 1951—1952.  (b) No.  (c) NIl.  (v) (a) No.  (b) -.  (vi) & (vii) Nil.

5. RESULTS:
   (i) 1097 lb./ac.
   (ii) 64.8 lb./ac.
   (iii) Treatments are significantly different.
   (iv) Av. yield of grain in lb./ac.
   Treatment  | Av. yield
   1.          | 1019
   2.          | 1175
   S.E./mean  = 32.4 lb./ac.
Crop :- Maize.  Ref :- Pb. 52(138).

Site :- Linseed Breeding Sub-Stn., Nagrota Bagwan.  Type :- 'X'.

Object :- To study if sowing of Soyabean in Maize effects the yield of Maize.

1. BASAL CONDITIONS :
   (i) (a) Nil.  (b) Wheat.  (c) Nil.  (ii) (a) Loamy.  (b) N.A.  (iii) 18.5.1952.  (iv) (a) 4 ploughings and 4 sohaga.  (b) to (e) N.A.  (v) N.A.  (vi) Local.  (vii) Irrigated.  (viii) 2 weedings and 2 hoeings.  (ix) 61.21".  (x) Maize 20.9.1552.

2. TREATMENTS :
   1. Maize sown alone.
   2. Maize sown with Soyabean.

3. DESIGN :
   (i) Paired-plot.  (ii) (a) 2.  (b) N.A.- (iii) 6.  (iv) (a) and (b) 9'x40'x9'.  (v) Nil.  (vi) Yes.

4. GENERAL :
   (i) Satisfactory.  No lodging.  (ii) Nil.  (iii) Yield/plot.  (iv) (a) 1951-52.  (b) and (c) No.  (v) (a) and (b) No.  (vi) and (vii) Nil.

5. RESULTS :
   (i) 1268 lb./ac.
   (ii) 38.3 lb./ac.
   (iii) Treatments are highly significantly different.
   (iv) Av. yield of maize in lb./ac.
   Treatment          Av. yield
   1.                  1196
   2.                  1340
   S.E./mean           = 15.6 lb./ac.

Crop :- Colocasia.  Ref :- Pb. 52(146).

Site :- Jullundur Agri. Stn., Jullundur.  Type :- 'X'.

Object :- To study the effect on yield of Colocasia, when sown alone and intercropped with Bitter Gourd.

1. BASAL CONDITIONS :
   (i) (a) Nil.  (b) Cotton.  (c) Nil.  (ii) (a) Loam with kaller patch.  (b) Refer soil analysis, Jullundur.  (iii) 6.3.1952.  (iv) (a) 5 desi ploughings and 3 sohaga.  (b) to (e) N.A.  (v) 10 ton/ac. of F.Y.M. was given before sowing.  (vi) Local.  (vii) Irrigated.  (viii) 6 hoeings and 1 earthing.  A/S was applied at 100 lb/ac. on 26.4.1952.  The crop was sprayed with Perinox. (ix) 29.86".  (x) 24,25.9.1952.

2. TREATMENTS :
   1. Crop sown alone.
   2. Intercropped with bitter gourd.

3. DESIGN :
   (i) Paired-plot.  (ii) (a) 2.  (b) N.A.  (iii) 4.  (iv) (a) N.A.  (b) 12'x33'.  (v) N.A.  (vi) Yes.

4. GENERAL :
   (i) Normal.  (ii) Nil.  (iii) Yield of colocasia.  (iv) (a) No.  (b) and (c) No.  (v) (a) and (b) No.  (vi) and (vii) Nil.

5. RESULTS :
   (i) 14453 lb./ac.
   (ii) 640.6 lb./ac.
   (iii) Treatments are not significantly different.
   (iv) Av. yield of colocasia in lb./ac.
   Treatment          Av. yield
   1.                  14934
   2.                  14001
   S.E./mean           = 320.3 lb./ac.
Crop :- Colocasia.  Ref :- Pb. 53 (224).
Site :- Jullundur Agri. Stn., Jullundur.  Type :- 'X'.

Object :- To investigate whether intercropping of Colocasia is economical if sown with Long melon or Bitter gourd or it should be sown alone.

1. BASAL CONDITIONS :
   (i) (a) Nil. (b) Sweet potato. (c) Nil. (ii) (a) Sandy loam. (b) Refer soil analysis, Jullundur. (iii) 12.2.1953. (iv) (a) 1 raja plough, 3 desi plough and 3 sohaga. (b) to (e) N.A. (v) Basal dose of compost was given at 8 ton/ac. (vi) Local. (vii) Irrigated. (viii) 4 hoings and one earthing up. (ix) 25.7.53. (x) 22.9.1953.

2. TREATMENTS :
   1. Colocasia sown alone.
   2. Colocasia intercropped with bitter gourd.
   3. Colocasia intercropped with long melon.

3. DESIGN :
   (i) R.B.D. (ii) (a) 3. (b) N.A. (iii) 4. (iv) (a) N.A. (b) 1/220th ac. (v) N.A. (vi) Yes.

4. GENERAL :
   (i) Condition of crop remained below normal due to high temperature, hot winds and short supply of water during May and June at the advanced stage of growth the crop was attacked by disease. (ii) At the advanced stage of growth the crops were attacked by mycological disease called, photophthora colocasia Rea and seriously affected the yield. (iii) Yield/plot. (iv) (a) 1953—contd. (b) No (c)—. (v) (a) No. (b)—. (vi) and (vii) Nil.

5. RESULTS :
   (i) 237.5 lb./ac.
   (ii) 1168.2 lb./ac.
   (iii) The treatments are not significantly different.
   (iv) Av. yield of colocasia in lb./ac.
   
<table>
<thead>
<tr>
<th>Treatment</th>
<th>Av. yield</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>24099</td>
</tr>
<tr>
<td>2.</td>
<td>24416</td>
</tr>
<tr>
<td>3.</td>
<td>22629</td>
</tr>
<tr>
<td>S.E./mean</td>
<td>554.1 lb./ac.</td>
</tr>
</tbody>
</table>

Crop :- Oats (Rabi).  Ref :- Pb. 48 (48).
Site :- Fodder Res. Stn., Sirsa.  Type :- 'X'.

Object :- To compare the forage yielding capacity of Oats when sown alone and in mixture with peas and field peas.

1. BASAL CONDITIONS :
   (i) (a) No. (b) N.A. (c) Nil. (ii) (a) Loam. (b) Refer soil analysis, Sirsa. (iii) 28.10.1948. (iv) (a) to (e) N.A. (v) N.A. (vi) Oats, local. (vii) Irrigated. (viii) Nil. (ix) 0.90". (x) N.A.

2. TREATMENTS :
   1. Oats.
   2. Peas.
   3. Field peas.
   4. Oats+peas.
   5. Oats+field peas.

3. DESIGN :
   (i) R.B.D. (ii) (a) 5. (b) N.A. (iii) 6. (iv) (a) N.A. (b) 1/80 ac. (v) N.A. (vi) Yes.

4. GENERAL :
   (i) Fair to good. No lodging. (ii) Nil. (iii) Forage yield/plot. (iv) (a) No. (b)—. (c)—. (v) (a) No. (b)—. (vi) and (vii) Nil.
5. RESULTS:

(i) 17.44 ton/ac.
(ii) 2.51 ton/ac.
(iii) Treatment effects are highly significant.
(iv) Av. yield of fodder in ton/ac.

<table>
<thead>
<tr>
<th>Treatment</th>
<th>Av. yield</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>22.69</td>
</tr>
<tr>
<td>2.</td>
<td>15.28</td>
</tr>
<tr>
<td>3.</td>
<td>9.10</td>
</tr>
<tr>
<td>4.</td>
<td>20.49</td>
</tr>
<tr>
<td>5.</td>
<td>19.64</td>
</tr>
<tr>
<td>S.E./mean</td>
<td>1.03 ton/ac.</td>
</tr>
</tbody>
</table>

Crop : Berseem.
Ref: 48(47).
Type: 'X'.

Object:—To study the influence of intercropping Rape with Berseem to augment fodder yield.

1. BASAL CONDITIONS:

   (i) (a) Nil. (b) Fallow. (c) Nil. (ii) (a) Loamy. (b) Refer soil analysis, Sirsa. (iii) 29.10.1948. (iv) (a) and (b) N.A. (c) As per treatments. (d) and (e) N.A. (v) N.A. (vi) Mascavi. (vii) Irrigated. (viii) Nil. (ix) 0.90". (x) 1st cut: 1.1.1949 to 11.1.1949, subsequent cutting on: 16.2.1949, 23.3.1949 and 20.4.1949.

2. TREATMENTS:

   1. 8 sr./ac. of berseem+2 chks. rape.
   2. 8 sr./ac. of berseem+4 chks. rape.
   3. 8 sr./ac. of berseem+6 chks. rape.
   4. 8 sr./ac. of berseem+8 chks. rape.
   5. Berseem alone.

3. DESIGN:

   (i) R.B.D. (ii) (a) 5. (b) N.A. (iii) 6. (iv) (a) N.A. (b) 1/36 th ac. (v) N.A. (vi) Yes.

4. GENERAL:

   (i) Fair. No lodging. (ii) Nil. (iii) Fodder yield. (iv) (a) 1948—1949. (b) No. (c) Nil. (v) (a) No. (b)—. (vi) and (vii) Nil.

5. RESULTS:

   (i) 25.61 ton/ac.
   (ii) 2.09 ton/ac.
   (iii) Treatments are highly significantly different.
   (iv) Av. yield of fodder in ton/ac.

<table>
<thead>
<tr>
<th>Treatment</th>
<th>Av. yield</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>25.35</td>
</tr>
<tr>
<td>2.</td>
<td>25.76</td>
</tr>
<tr>
<td>3.</td>
<td>27.13</td>
</tr>
<tr>
<td>4.</td>
<td>27.50</td>
</tr>
<tr>
<td>5.</td>
<td>22.33</td>
</tr>
<tr>
<td>S.E./mean</td>
<td>0.85 ton/ac.</td>
</tr>
</tbody>
</table>
Crop :- Berseem (Rabi).
Site :- Fodder Res. Stn., Sirsa.  
Ref :- Pb. 49(39).
Type :- 'X'.

Object :- To study the effect of intercropping Rape with Berseem on its forage yield.

1. BASAL CONDITIONS :
    (i) (a) Nil. (b) Jowar. (c) Nil.  
    (ii) (a) Loam. (b) Refer soil analysis, Sirsa.  
    (iv) (a) 1 raja, 3 dest ha and 4 sohaga.  
    (b) N.A. (c) As per treatments.  
    (d) and (e) N.A.  
    (vi) Mascavi.  
    (vii) Irrigated.  
    (viii) Nil. (ix) 3.49.  
    (x) 26.11.1949 to 28.3.1950.

2. TREATMENTS :
    1. Berseem + 2 chks. rape seed.  
    2. Berseem + 4 chks. rape seed.  
    4. Berseem + 8 chks. rape seed.  
    5. Berseem alone.  
    (v) 8 sr./ac. of Berseem used in all plots.

3. DESIGN :
    (i) R.B.D. (ii) (a) 5. (b) N.A. (iii) 6.  
    (iv) (a) and (b) 9.45 x 128'.  
    (v) Nil. (vi) Yes.

4. GENERAL :
    (i) Good growth. No lodging.  
    (ii) Nil. (iii) Forage yield.  
    (iv) (a) 1948-1949. (b) No. (c) Nil.  
    (a) Nil. (b) --.  
    (vii) 4.71.  
    (x) 2. 3.1954 to 15.3.1954.

5. RESULTS :
    (i) 39.05 ton/ac.  
    (ii) 3.42 ton/ac.  
    (iii) Treatments are not significantly different.  
    (iv) Av. yield of fodder in ton/ac.  
    Treatment | Av. yield  
    1. | 38.44  
    2. | 40.22  
    3. | 40.75  
    4. | 40.03  
    5. | 35.79  
    S.E./mean = 1.39 ton/ac.

Crop :- Metha and Oats.
Site :- Fodder Res. Stn., Sirsa.  
Ref :- Pb. 53(58).
Type :- 'X'.

Object :- To study the effect on the yield of Oats when sown alone or in combinations with Metha.

1. BASAL CONDITIONS :
    (i) Nil. (b) Fallow. (c) Nil.  
    (ii) (a) Loamy heavy to medium. (b) Refer soil analysis, Sirsa.  
    (iii) 29.10.1953.  
    (iv) (a) 2 desi plough and 1 planking. (b) N.A. (c) As per treatments.  
    (d) and (e) N.A.  
    (v) Nil. (vi) Metha No. 8 (medium) and Oats Weston 11 (medium).  
    (vii) Irrigated.  
    (viii) 3 hoeings and weeding.  
    (iv) 4.71'.  
    (x) 2.1.1954 to 15.3.1954.

2. TREATMENTS :
    Seed rate mixture/ac.  
    1. 25 sr./ac. of oats.  
    2. 20 sr./ac. of oats + 5 sr. of metha.  
    3. 15 sr./ac. of oats + 10 sr. of metha.  
    Sown by broadcast.

3. DESIGN :
    (i) R.B.D. (ii) (a) 3. (b) N.A. (iii) 8.  
    (iv) (a) and (b) 7' x 64'. (v) Nil. (vi) Yes.
4. GENERAL:
(i) Oats crop grew luxuriantly and metha plants were almost reduced to single shoots. (ii) Nil. (iii) Forage yield. (iv) (a) No. (b) and (c) —. (v) (a) No. (b) —. (vi) and (vii) Nil.

5. RESULTS:
(i) 21.24 ton/ac.
(ii) 1.71 ton/ac.
(iii) Treatments are not significantly different.
(iv) Av. yield of forage in ton/ac.

<table>
<thead>
<tr>
<th>Treatment</th>
<th>Av. yield</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>21.53</td>
</tr>
<tr>
<td>2.</td>
<td>21.02</td>
</tr>
<tr>
<td>3.</td>
<td>21.16</td>
</tr>
<tr>
<td>S.E./mean</td>
<td>=0.61 ton/ac.</td>
</tr>
</tbody>
</table>

Crop: Maize and Cowpeas (Kharif).
Object:-To study the effect of seed rate and time of sowing Maize and Cowpeas with a view to obtain maximum forage yield.

1. BASAL CONDITIONS:
(i) (a) Nil. (b) Fallow. (c) Nil. (ii) (a) Loam. (b) Refer soil analysis, Sirsa. (iii) As per treatments. (iv) (a) 1 raja, 5 desi ploughing and 7 sohaga. (b) N.A. (c) As per treatments. (d) and (e) N.A. (v) 12 C.L./ac. F.Y.M. applied before sowing. (vi) Local (medium). (vii) Irrigated. (viii) Nil. (ix) 7.33 M.

2. TREATMENTS:
Main-plot treatments:
2 dates of sowing: D1=25.3.1950 and D2=31.5.1950.
Sub-plot treatments:
4 seed rates: S1=16 sr./ac. of maize, S2=14 sr./ac. of maize+2 sr./ac. of cowpeas, S3=12 sr./ac. of maize+4 sr./ac. of cowpeas and S4=10 sr.ac. of maize+6 sr./ac. of cowpeas.

3. DESIGN:
(i) Split-plot. (ii) (a) 2 main-plots/block and 4 sub-plot/main-plots. (iii) 4. (iv) (a) Sub-plot. 62.5’x11.3’.
(b) N.A. (v) N.A. (vi) Yes.

4. GENERAL:
(i) Good. No lodging. (ii) Nil. (iii) Forage yield/plot. (iv) (a) 1950-1951. (b) No. (c) Nil. (v) (a) No. (b)—. (vi) and (vii) Nil.

5. RESULTS:
(i) 8.98 ton/ac.
(ii) (a) 5.31 ton/ac. (b) 1.11 ton/ac.
(iii) Dates of sowing effect is significant, while seed rate effect and interaction “dates of sowing x seed rate” are not significant.
(iv) Av. yield of forage in ton/ac.

<table>
<thead>
<tr>
<th></th>
<th>S1</th>
<th>S2</th>
<th>S3</th>
<th>S4</th>
<th>Mean</th>
</tr>
</thead>
<tbody>
<tr>
<td>D1</td>
<td>4.76</td>
<td>5.55</td>
<td>5.80</td>
<td>5.69</td>
<td>5.45</td>
</tr>
<tr>
<td>D2</td>
<td>13.63</td>
<td>12.25</td>
<td>12.03</td>
<td>12.16</td>
<td>12.52</td>
</tr>
<tr>
<td>Mean</td>
<td>9.20</td>
<td>8.90</td>
<td>8.92</td>
<td>8.92</td>
<td>8.98</td>
</tr>
</tbody>
</table>

S.E. of difference of two
1. D marginal means =1.88 ton/ac.
2. S marginal means =0.55 ton/ac.
3. S means at the same level of D =0.79 ton/ac.
4. D means at the same level of S =2.00 ton/ac.
Crop :-Maize and Cowpeas (Kharif).
Site :-Fodder Res. Stn., Sirsa.

Object :- To study the effect of seed rate and time of sowing on mixture of Maize and Cowpeas with a view to obtain maximum forage yield.

1. BASAL CONDITIONS:
   (i) (a) Nil. (b) Wheat. (c) Nil. (ii) (a) Loam. (b) Refer soil analysis, Sirsa. (iii) As per treatments.
   (iv) (a) and (b) N.A. (c) As per treatments. (d) and (e) N.A. (v) Nil. (vi) Local. (vii) Irrigated.
   (viii) Nil. (ix) 5.48". (x) 2 to 5.7.1951 and 9-11.1.1951.

2. TREATMENTS
   Main-plot treatments:
   2 dates of sowing: \( D_1 = 27.4.1951 \) and \( D_2 = 8.6.1951 \).
   Sub-plot treatments:
   4 seed rates: \( S_1 = 16 \text{ sr./ac. of maize}, \ S_2 = 14 \text{ sr./ac. of maize} + 2 \text{ sr./ac. of cowpeas}, \ S_3 = 12 \text{ sr./ac. of maize} + 4 \text{ sr./ac. of cowpeas}\) and \( S_4 = 10 \text{ sr./ac. of maize} + 6 \text{ sr./ac. of cowpeas}\).

3. DESIGN:
   (i) Split-plot. (ii) (a) 2 main-plots/block; 4 sub-plots/main-plot. (b) N.A. (iii) 4. (iv) (a) and (b) 60.5' x 9'. (v) Nil. (vi) Yes.

4. GENERAL:
   (i) Very poor. No lodging. (ii) Nil. (iii) Green forage yield. (iv) (a) 1950-1951. (b) No. (c) Nil. (v) (a) No. (b) No. (vi) and (vii) Nil.

5. RESULTS:
   (i) 24.57 ton/ac.
   (ii) (a) 1.58 ton/ac. (b) 0.71 ton/ac.
   (iii) None of the effects is significant.
   (iv) Av. yield of forage in ton/ac.

<table>
<thead>
<tr>
<th></th>
<th>( S_1 )</th>
<th>( S_2 )</th>
<th>( S_3 )</th>
<th>( S_4 )</th>
<th>Mean</th>
</tr>
</thead>
<tbody>
<tr>
<td>( D_1 )</td>
<td>31.41</td>
<td>32.51</td>
<td>21.86</td>
<td>22.96</td>
<td>27.18</td>
</tr>
<tr>
<td>( D_2 )</td>
<td>23.33</td>
<td>23.51</td>
<td>20.94</td>
<td>20.02</td>
<td>21.95</td>
</tr>
<tr>
<td>Mean</td>
<td>27.37</td>
<td>28.01</td>
<td>21.40</td>
<td>21.49</td>
<td>24.57</td>
</tr>
</tbody>
</table>

S.E. of difference of two
1. D marginal means = 0.55 ton/ac.
2. S marginal means = 0.35 ton/ac.
3. S means at a level of D = 0.55 ton/ac.
4. D means at a level of S = 0.71 ton/ac.

Crop :- Jowar and Guara.
Site :- Fodder Res. Stn., Sirsa.

Object :- To establish the best sowing date and seed rate for Jowar and Guara for forage yield.
2. TREATMENTS:
Main-plot treatments:
2 dates of sowing: D¹ = 26.4.1951 and D² = 7.6.1951.

Sub-plot treatments:
4 seed rates: S₁ = 20 sr./ac. of Jowar, S₂ = 16 sr./ac. of Jowar + 4 sr./ac. of Guara, S₃ = 14 sr./ac. of Jowar + 6 sr./ac. of Guara and S₄ = 12 sr./ac. of Jowar + 8 sr./ac. of Guara.

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) 60.5' x 9'.  (v) Nil.  (vi) Yes.

4. GENERAL:
(i) Satisfactory.  (ii) Nil.  (iii) Forage yield/plot.  (iv) (a) No.  (b) —.  (c) —.  (v) (a) Nil.  (b) —.  (vi) and (vii) Nil.

5. RESULTS:
(i) 23.22 ton/ac.
(ii) (a) 4.27 ton/ac.
(b) 1.24 ton/ac.

(iii) Dates of sowing and seed rate effects are highly significant while interaction is significant.

(iv) Av. yield of forage in ton/ac.

<table>
<thead>
<tr>
<th></th>
<th>S₁</th>
<th>S₂</th>
<th>S₃</th>
<th>S₄</th>
<th>Mean</th>
</tr>
</thead>
<tbody>
<tr>
<td>D¹</td>
<td>17.17</td>
<td>19.42</td>
<td>20.68</td>
<td>19.90</td>
<td>19.29</td>
</tr>
<tr>
<td>D²</td>
<td>27.53</td>
<td>28.68</td>
<td>26.47</td>
<td>25.87</td>
<td>27.14</td>
</tr>
<tr>
<td>Mean</td>
<td>22.35</td>
<td>24.05</td>
<td>23.58</td>
<td>22.89</td>
<td>23.22</td>
</tr>
</tbody>
</table>

S.E. of difference of two
1. D marginal means = 1.23 ton/ac.
2. S marginal means = 0.51 ton/ac.
3. S means at a level of D = 0.71 ton/ac.
4. D means at a level of S = 1.38 ton/ac.

---

**Crop:** Chari and Guara (Kharif).  
**Site:** Fodder Res. Stn., Sirsa.

Ref: Pb. 50(28).  
Type: 'X'.

Object:—To study the optimum seed rate of Chari and Guara to get maximum forage yield.

1. BASAL CONDITIONS:
(i) (a) Nil.  (b) Fallow.  (c) Nil.  (ii) (a) Loam.  (b) Refer soil analysis, Sirsa.  (iii) As per treatments.
(iv) (a) 1 rota, 4 desi ploughing and 5 tohga.  (b) to (e) N.A.  (v) 12 C.L./ac. of F.Y.M.  (vi) Local.  (vii) Irrigated.  (viii) Nil.  (ix) 7.12'.  (x) 15.7.1950 and 2.8.1950.

2. TREATMENTS
Main-plot treatments:

Sub-plot treatments:
4 seed rates: S₁ = 20 sr./ac. of Chari + 2 sr./ac. of Guara, S₂ = 16 sr./ac. of Chari + 4 sr./ac. of Guara, S₃ = 14 sr./ac. of Chari + 6 sr./ac. of Guara and S₄ = 12 sr./ac. of Chari + 8 sr./ac. of Guara.
3. DESIGN:
   (i) Split-plot. (ii) (a) 2 main-plots/block; 4 sub-plots/main-plot. (b) N.A. (iii) 4. (iv) Sub-plot. (a) and (b) 1/80 ac. (v) N.A. (vi) Yes.

4. GENERAL:
   (i) Satisfactory. No lodging. (ii) Nil. (iii) Forage yield. (iv) (a) No. (b) —. (c) —. (v) (a) No. (b) —. (vi) Nil.

5. RESULTS:
   (i) 23.12 ton/ac.
   (ii) (a) 11.21 ton/ac.
   (b) 4.44 ton/ac.
   (iii) None of the effects is significant.
   (iv) Av. yield of forage in ton/ac.

<table>
<thead>
<tr>
<th></th>
<th>S1</th>
<th>S2</th>
<th>S3</th>
<th>S4</th>
<th>Mean</th>
</tr>
</thead>
<tbody>
<tr>
<td>D2</td>
<td>24.24</td>
<td>25.18</td>
<td>25.73</td>
<td>24.80</td>
<td>25.00</td>
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<tr>
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<td>23.06</td>
<td>23.25</td>
<td>23.63</td>
<td>22.50</td>
<td>23.12</td>
</tr>
</tbody>
</table>

S.E. of difference of two
1. D marginal means = 3.97 ton/ac,
2. S marginal means = 2.22 ton/ac,
3. S means at a level of D = 3.14 ton/ac,
4. D means at a level of S = 3.28 ton/ac.
Crop: Wheat (Rabi).

Site: Seed Multiplication-cum-Demonstration Farm, Bhangrotu. Type: 'M'.

Object: To find out the effect of different treatments of artificial fertilizers on yield of Wheat.

1. **BASAL CONDITIONS**:
   (i) (a) Nil. (b) Fallow. (c) Nil. (ii) (a) Loamy. (b) N.A. (iii) 27.10.1953. (iv) (a) to (c) N.A. (v) Nil. (vi) Ridly (medium). (vii) Unirrigated. (viii) 1 weeding. (ix) 14.68°. (x) 3.5.1954.

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.
   Treatments applied before sowing in dry seed beds.

3. **DESIGN**:
   (i) Fact. in R.B.D. (ii) (a) 4. (b) N.A. (iii) 4. (iv) (a) N.A. (b) 22' × 6'. (v) N.A. (vi) Yes.

4. **GENERAL**:
   (i) Normal. No lodging. (ii) Nil. (iii) Tiller, germination, stand percentage and grain yield/plot. (iv) (a) Not continued. (b) and (e) N.A. (v) (a) No. (b) N.A. (vi) and (vii) Nil.

5. **RESULTS**:
   (i) 3060. lb./ac.
   (ii) 342.4 lb./ac.
   (iii) None of the effects is significant.
   (iv) Av. yield of grain in lb./ac.

<table>
<thead>
<tr>
<th></th>
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<th>N₁</th>
<th>Mean</th>
</tr>
</thead>
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<tr>
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<td>3076</td>
<td>3161</td>
<td>3119</td>
</tr>
<tr>
<td>P₁</td>
<td>3087</td>
<td>2917</td>
<td>3002</td>
</tr>
<tr>
<td>Mean</td>
<td>3082</td>
<td>3039</td>
<td>3060</td>
</tr>
</tbody>
</table>

'S.E. of any marginal mean  = 121.1 lb./ac.
'S.E. of body of table     = 171.2 lb./ac.

Crop: Wheat (Rabi).

Site: Potato Dev. and Res. Stn., Shilaroo. Type: 'M'.

Object: To study the effect of N, P₂O₅ and K₂O alone and in combination on yield of Wheat.

1. **BASAL CONDITIONS**:
   (i) (a) Nil. (b) Potato. (c) N.A. (ii) (a) Loamy to clayey. (b) N.A. (iii) 13.14.10.1951. (iv) (a) to (c) N.A. (v) Nil. (vi) N.P. 770 (medium). (vii) Unirrigated. (viii) Nil. (ix) 9.01°. (x) 7.7.1952.

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. Sul. : K₀ = 0 and K₁ = 20 lb./ac.
   N and K₂O applied on 15.3.1952 before earing. P₂O₅ applied with surface soil before sowing.
3. DESIGN:
(i) 2^3 Fact. in R.B.D. (ii) (a) 8. (b) N.A. (iii) 4. (iv) (a) 12' x 46'. (b) 6' x 40'. (v) 3' around. (vi) Yes.

4. GENERAL:
(i) Fair. No lodging. (ii) Nil. (iii) Germination and stand %, population count, tillering, height, straw and grain yield/plot. (iv) (a) Not continued. (b) and (c) No. (v) (a) and (b) No. (vi) and (vii) Nil.

5. RESULTS:
(i) 1041 lb./ac.
(ii) 227.3 lb./ac.
(iii) Only main effect of P is highly significant.
(iv) Av. yield of grain in lb./ac.

<table>
<thead>
<tr>
<th></th>
<th>P₀</th>
<th>P₁</th>
<th>Mean</th>
<th>K₀</th>
<th>K₁</th>
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<tr>
<td>N₀</td>
<td>709</td>
<td>1310</td>
<td>1010</td>
<td>970</td>
<td>1049</td>
</tr>
<tr>
<td>N₁</td>
<td>760</td>
<td>1384</td>
<td>1072</td>
<td>1100</td>
<td>1044</td>
</tr>
<tr>
<td>Mean</td>
<td>735</td>
<td>1347</td>
<td>1041</td>
<td></td>
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<tr>
<td>K₀</td>
<td>720</td>
<td>1350</td>
<td>1035</td>
<td></td>
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</tr>
<tr>
<td>K₁</td>
<td>749</td>
<td>1344</td>
<td>1047</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

S.E. of any marginal mean = 56.8 lb./ac.
S.E. of body of table = 80.4 lb./ac.

Crop: - Wheat. Ref: - Simple trials on cultivators' fields (T.C.M.), 1953.
Centre: - Arki-Solan (H.P.). Type: - 'M'.

Object: - I (a) (ii), To study the effect of different levels and sources of N.

1. BASAL CONDITIONS:

2. TREATMENTS:
O = Control.
N₁ = AJS at 20 lb./ac. of N.
N₂ = A/S at 40 lb./ac. of N.
N₁' = Urea at 20 lb./ac. of N.
N₂' = Urea at 40 lb./ac. of N.
Fertilizers broadcast before sowing.

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 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) Yield data. (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>O</td>
<td>1008</td>
</tr>
<tr>
<td>N₁</td>
<td>1074</td>
</tr>
<tr>
<td>N₂</td>
<td>1126</td>
</tr>
<tr>
<td>N₃</td>
<td>1232</td>
</tr>
<tr>
<td>N₄</td>
<td>1156</td>
</tr>
<tr>
<td>G.M.</td>
<td>1119</td>
</tr>
<tr>
<td>S.E./mean</td>
<td>57.84 lb./ac.</td>
</tr>
<tr>
<td>No. of expts.</td>
<td>8</td>
</tr>
</tbody>
</table>

Centre : Arki-Solan (H.P.).  Type : 'M'.

Object :—I (a) (ii), To study the effect of different levels and sources of N.

1. BASAL CONDITIONS:

2. TREATMENTS:
O = Control.  
N₁ = A/S at 20 lb./ac.  
N₂ = A/S at 40 lb./ac.  
N₃ = Urea at 20 lb./ac. of N.  
N₄ = Urea at 40 lb./ac. of N.  
Fertilizers broadcast before sowing.

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) Yield data.  (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>O</td>
<td>378</td>
</tr>
<tr>
<td>N₁</td>
<td>405</td>
</tr>
<tr>
<td>N₂</td>
<td>480</td>
</tr>
<tr>
<td>N₃</td>
<td>389</td>
</tr>
<tr>
<td>N₄</td>
<td>394</td>
</tr>
<tr>
<td>G.M.</td>
<td>409</td>
</tr>
<tr>
<td>S.E./mean</td>
<td>36.04 lb./ac.</td>
</tr>
<tr>
<td>No. of expts.</td>
<td>5</td>
</tr>
</tbody>
</table>
Centre :– Arki-Solan (H.P). Type :– ‘M’.

Object :– II, To study the effect of manures (N, P and K).

1. BASAL CONDITIONS:
   (i) N.A.
   (ii) Sandy to clayey-pH 7.2.
   (iii) Nil.
   (iv) N.A.
   (v) N.A. October-November.
   (vi) Unirrigated.
   (vii) N.A.
   (viii) N.A.
   (ix) N.A. (x) April-May.

2. TREATMENTS:

   \( O = \text{Control,} \)
   \( N = A/S \text{ at } 20 \text{ lb./ac. of N}. \)
   \( N\,P = A/S \text{ at } 20 \text{ lb./ac. of } N + \text{ Super at } 20 \text{ lb./ac. of } P_2O_5 \)
   \( N'P = A/N \text{ at } 20 \text{ lb./ac. of } N + \text{ Super at } 20 \text{ lb./ac. of } P_2O_5 \)
   \( N''P = \text{Urea at } 20 \text{ lb./ac. of } N + \text{ Super at } 20 \text{ lb./ac. of } P_2O_5 \)
   Fertilizers broadcast before sowing.

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) Yield data. (iv) (a) 1953—1956. (b) No. (c) N.A. (v) N.A. (vi) N.A. (vii) Nil.

5. RESULTS:

   \[
   \begin{array}{ll}
   \text{Treatment} & \text{Av. yield in lb./ac.} \\
   O & 569 \\
   N & 706 \\
   N\,P & 682 \\
   N'P & 639 \\
   N''P & 689 \\
   \text{G.M.} & 657 \\
   \text{S.E./mean} & 34.39 \text{ lb./ac.} \\
   \text{No. of expts.} & 3
   \end{array}
   \]

---

Centre :– Arki-Solan (H.P). Type :– ‘M’.

Object :– II, To study the effect of manures (N, P and K).

1. BASAL CONDITIONS:
   (i) N.A.
   (ii) Sandy to clayey-pH. 7.2.
   (iii) Nil.
   (iv) N.A.
   (v) N.A. October-November.
   (vi) Unirrigated.
   (vii) N.A.
   (viii) N.A.
   (ix) N.A. (x) April-May.

2. TREATMENTS:

   \( O = \text{Control,} \)
   \( N = A/S \text{ at } 20 \text{ lb./ac. of N}. \)
   \( N\,P = A/S \text{ at } 20 \text{ lb./ac. of } N + \text{ Super at } 20 \text{ lb./ac. of } P_2O_5 \)
   \( N'P = \text{Urea at } 20 \text{ lb./ac. of } N + \text{ Super at } 20 \text{ lb./ac. of } P_2O_5 \)
   Fertilizers broadcast before sowing.
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>O</td>
<td>903</td>
</tr>
<tr>
<td>N1</td>
<td>1065</td>
</tr>
<tr>
<td>N1P</td>
<td>1066</td>
</tr>
<tr>
<td>N1P*</td>
<td>1278</td>
</tr>
<tr>
<td>G.M.</td>
<td>1075</td>
</tr>
<tr>
<td>S.E./mean</td>
<td>108.4 lb./ac.</td>
</tr>
<tr>
<td>No. of expts.</td>
<td>4</td>
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</tbody>
</table>

Centre: Arki-Solan (H.P.) Type: 'M'.

Object: III, To study the effect of A/S with different sources of P.

1. BASAL CONDITIONS:

(i) (a) to (c) N.A. (ii) Sandy to clayey—pH 7.2. (iii) Nil. (iv) and (v) N.A. (vi) October—November. (vii) Unirrigated. (viii) and (ix) N.A. (x) April—May.

2. TREATMENTS:

<table>
<thead>
<tr>
<th>Treatment</th>
<th>Av. yield in lb./ac.</th>
</tr>
</thead>
<tbody>
<tr>
<td>O</td>
<td>526</td>
</tr>
<tr>
<td>N</td>
<td>560</td>
</tr>
<tr>
<td>N1P</td>
<td>554</td>
</tr>
<tr>
<td>N1P*</td>
<td>612</td>
</tr>
<tr>
<td>NP</td>
<td>622</td>
</tr>
<tr>
<td>G.M.</td>
<td>575</td>
</tr>
<tr>
<td>S.E./mean</td>
<td>26.91 lb./ac.</td>
</tr>
<tr>
<td>No. of expts.</td>
<td>3</td>
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</table>
Crop : - Wheat. Ref : - Simple trials on cultivators' fields (T.C.M.), 1953.
Centre : - Arki-Solan (H.P.) Type : - 'M'.

Object : - III. To study the effect of A/S with different sources of P.

1. BASAL CONDITIONS:
   (i) (a) to (c) N.A. (ii) Sandy to clayey-pH 7.2. (iii) Nil. (iv) and (v) N.A.- (vi) October—November.
   (vii) Irrigated. (viii) and (ix) N.A. (x) April—May.

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 P<sub>2</sub>O<sub>5</sub>.
   NP' = A/S at 20 lb./ac. of N+Nitro. phos. at 20 lb./ac. of P<sub>2</sub>O<sub>5</sub>.
   NP'' = A/S at 20 lb./ac. of N+Ammo. Phos. at 20 lb./ac. of P<sub>2</sub>O<sub>5</sub>.
   Fertilizers broadcast before sowing.

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:
   Treatment Av. yield in lb./ac.
   O 766
   N 932
   NP 887
   NP' 888
   NP'' 959
   G.M. 886
   S.E./mean 74.46
   No. of Experiments 9

Site : - Cereal Multiplication Farm, Bhanota. Type : - 'MV'.

Object : - To study the manurial requirements of different varieties of Wheat.

1. BASAL CONDITIONS:
   (i) (a) Nil. (b) Paddy. (c) Nil. (ii) (a) Loam. (b) N.A. (iii) 22.11.1953. (iv) (a) to (e) N.A. (v) Nil.
   (vi) As per treatments. (vii) Unirrigated. (viii) Nil. (ix) 23.94°. (x) 4th week of April to 1st week of May 1954.

2. TREATMENTS:
   Main-plot treatments:
   4 varieties: V₁ = NP-770, V₂ = Ridly, V₃ = S-100 and V₄ = Local.
   Sub-plot treatments:
   4 manures: M₀ = 0, M₁ = 100 lb./ac. of A/S, M₂ = 100 lb./ac. of Super and M₃ = 100 lb./ac. of A/S + 100 lb./ac. of Super.

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

4. GENERAL:
   (i) N.A. (ii) Nil. (iii) Grain yield. (iv) (a) Not contd. (b) No. (c) -. (v) (a) No. (b) -. (vi) Nil. (vii) Plot wise yield not available.
5. RESULTS:
(i) 1092 lb./ac.
(ii) (a), (b) and (iii) N.A.
(iv) Av. yield of grain in lb./ac.

<table>
<thead>
<tr>
<th></th>
<th>M₀</th>
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<th>M₂</th>
<th>M₃</th>
<th>Mean</th>
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<td>1557</td>
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<td>2343</td>
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<td>560</td>
<td>1292</td>
<td>1099</td>
<td>1415</td>
<td>1092</td>
</tr>
</tbody>
</table>

S.E.'s = N.A.

Crop: Wheat.
Site: Potato Dev. and Res. Stn., Shilaroo.
Object: To study the effect of manure on yield of Wheat.

1. BASAL CONDITIONS:
(i) (a) Nil. (b) Potato. (c) Nil. (ii) (a) Clayey to loam. (b) N.A. (iii) 18.10.1953. (iv) (a) and (b) N.A. (c) 40 sr./ac. (d) 9' row to row. (e) N.A. (vi) Nil. As per treatments. (vii) Unirrigated.
(vii) Nil. (ix) 18.32. (x) 4.7.1954.

2. TREATMENTS:
Main-plot treatments:
3 varieties: V₁ = NP-770, V₂ = S-100 and V₃ = Local.
Sub-plot 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 = 15 lb./ac.

3. DESIGN:
(i) Split-plot. (ii) (a) 3 main-plots/block; 4 sub-plots/main-plot. (b) N.A. (iii) 1. (iv) (a) 40'x9'. (b) 6'x37'. (v) N.A. (vi) Yes.

4. GENERAL:
(i) Fair. No lodging. (ii) Nil. (iii) Grain yield. (iv) (a) Not continued. (b) No. (c) —. (v) (a) No. (b) —. (vi) and (vii) Nil.

5. RESULTS:
(i) 245.20 lb./ac.
(ii) (a) 212.07 lb./ac.
(b) 100.16 lb./ac.
(iii) Only P effect is highly significant.
(iv) Av. yield of grain in lb./ac.

<table>
<thead>
<tr>
<th></th>
<th>V1</th>
<th>V2</th>
<th>V3</th>
<th>Mean</th>
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<th>P1</th>
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<td>198.9</td>
<td>144.4</td>
<td>253.4</td>
<td></td>
</tr>
<tr>
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<td>151.2</td>
<td>165.8</td>
<td>110.4</td>
<td>221.2</td>
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<tr>
<td></td>
<td>384.6</td>
<td>357.3</td>
<td>370.9</td>
<td>307.8</td>
<td>434.2</td>
<td></td>
</tr>
</tbody>
</table>

Mean |

| P0   | 254.6 |
|------|
| P1   | 323.7 |

S.E. of marginal mean of N or P = 20.45 lb./ac.
S.E. of body of N x P table = 28.90 lb./ac.
S.E. of difference of two
1. V marginal means = 74.98 lb./ac.
2. N or P means at the same level of V = 50.08 lb./ac.
3. V means at the same level of N or P = 82.92 lb./ac.

Crop :- Wheat (Rabi).
Site :- Cereal Multiplication Farm, Bhanota.
Ref. :- H.P. 53(250)
Type :- ‘CV’.

Object :- To find out the optimum date of sowing for Wheat varieties.

1. BASAL CONDITIONS :
   (i) (a) Nil. (b) N.A. (c) Nil. (ii) (a) Loam. (b) Refer soil analysis, Bhanota. (iii) As per treatments
   (iv) (a) and (b) N.A. (c) 821 lb./ac. (d) and (e) N.A. (v) N.A. (vi) As per treatments.
   (vii) Unirrigated. (viii) Nil. (ix) 23.94’. (x) 4th week of April to 1st week of May, 1954.

2. TREATMENTS :
   Main-plot treatments :
   3 dates of sowing : D1=18.10.1953, D2=10.11.1953 and D3=25.11.1953.
   Sub-plots treatments :
   4 varieties : V1=Local, V2=S—100, V3=Ridley and V4=NP—770.

3. DESIGN :
   (i) Split-plot. (ii) (a) 3 main-plots/block ; 4 sub-plots/main-plot. (b) N.A. (iii) 2. (iv) (a) 15’x3’.
   (b) 15’x3’. (v) Nil. (vi) Yes.

4. GENERAL :
   (i) Fair to normal. No lodging. (ii) Nil. (iii) Grain yield. (iv) (a) Not continued. (b) No. (c)
   —. (v) (a) No. (b) —. (vi) Nil. (vii) Plot-wise yield not available.

5. RESULTS :
   (i) 793 lb./ac.
   (ii) and (iii) N.A.
   (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>V1</td>
<td>1120</td>
<td>1182</td>
<td>622</td>
<td>975</td>
</tr>
<tr>
<td>V2</td>
<td>996</td>
<td>809</td>
<td>373</td>
<td>726</td>
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<tr>
<td>V3</td>
<td>871</td>
<td>436</td>
<td>498</td>
<td>602</td>
</tr>
<tr>
<td>V4</td>
<td>1182</td>
<td>871</td>
<td>560</td>
<td>871</td>
</tr>
</tbody>
</table>

Mean |

| Mean | 1042 | 825 | 513 | 793 |

S.E.s N.A.
Crop : Wheat (Rabi).

Site : Seed Multiplication Cum-Demons. Farm, Bhangrotu. Type :- 'CV'.

Object : To find suitable varieties for different sowing dates for Wheat crop.

1. BASAL CONDITIONS :
   (i) (a) Nil. (b) Paddy. (c) N.A. (ii) (a) Loamy. (b) N.A. (iii) As per treatments. 
   (iv) (a), (b) N.A. (c) 41.25 sr./ac. (d) row to row 9". (e) N.A. (v) 40 lb./ac. of N as F.Y.M. 
   (vi) As per treatments. (vii) Unirrigated. (viii) One weeding. (ix) 11.68". (x) 1st week of May, 1954.

2. TREATMENTS :
   All combinations of (1) and (2)
   (1) 4 dates of sowing : D1=25.10.1953, D2=8.11.1953, D3=22.11.1953 and D4=5.12.1953.
   (2) 6 varieties : V1=C-591, V2=NP-770, V3=C—250, V4=—225, V5=S—100 and V6=Ridley.

3. DESIGN :
   (i) Fact. in R.B.D. (ii) (a) 24. (b) N.A. (iii) 3. (iv) (a) N.A. (b) 6'x22". (v) N.A. (vi) Yes.

4. GENERAL :
   (i) Normal. Lodging from 25% to 100%. (ii) Slight attack of black and brown rust and also slight 
   incident of loose smut. (iii) Germination percentage, stand percentage, tillering/plot and yield/plot. (iv) (a) 
   Not continued. (b) No. (c) —. (v) (a) No. (b) —. (vi) and (vii) Nil.

5. RESULTS :
   (i) 1134 lb./ac.
   (ii) 527.0 lb./ac.
   (iii) N.A.
   (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>
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</thead>
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<td>V1</td>
<td>1139</td>
<td>813</td>
<td>912</td>
<td>1322</td>
<td>1047</td>
</tr>
<tr>
<td>V2</td>
<td>1117</td>
<td>1782</td>
<td>1436</td>
<td>1089</td>
<td>1356</td>
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<tr>
<td>V3</td>
<td>1018</td>
<td>1287</td>
<td>1365</td>
<td>1131</td>
<td>1200</td>
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<tr>
<td>V4</td>
<td>962</td>
<td>870</td>
<td>1103</td>
<td>1004</td>
<td>972</td>
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<tr>
<td>V5</td>
<td>1280</td>
<td>1167</td>
<td>1181</td>
<td>1414</td>
<td>1261</td>
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<tr>
<td>V6</td>
<td>1089</td>
<td>1174</td>
<td>636</td>
<td>976</td>
<td>969</td>
</tr>
</tbody>
</table>

Mean   1101 1174 1106 1156 1134

S.E. of marginal mean of V = 152.1 lb./ac.
S.E. of marginal mean of D = 124.2 lb./ac.
S.E. of body of table = 304.2 lb./ac.

Crop : Wheat (Rabi).


Object : To find out the optimum date of sowing for Wheat.

1. BASAL CONDITIONS :
   (i) (a) Nil. (b) Fallow. (c) Nil. (ii) (a) Clayey. (b) Refer soil analysis, Dhaula kuan. (iii) As per 
   treatments. (iv) (a) to (e) N.A. (v) N.A. (vi) As per treatments. (vii) Unirrigated. (viii) Nil, 
   (ix) 12.20". (x) Mid of May. 1954.

2. TREATMENTS :
   Main-plot treatments :
   3 sowing dates : D1=10.10.1953, D2=25.10.1953 and D3=2.11.1953.
   Sub-plot treatments :
   3 varieties : V1=NP-770, V2=S—100 and V3=Local.
3. DESIGN:
(i) Split-plot. (ii) (a) 3 main-plots/block; 3 sub-plots/main-plot. (b) N.A. (iii) 4. (iv) (a) N.A. (b) 1/403.33 ac. (v) N.A. (vi) Yes.

4. GENERAL:
(i) Normal. No lodging. (ii) Nil. (iii) Grain yield/plot. (iv) (a) Not continued. (b) No. (c) —. (v) Shilaroo, Parala. (b) N.A. (vi) & (vii) Nil.

5. RESULTS:
(i) 1118 lb./ac.
(ii) (a) 36.4 lb./ac. (b) 291.5 lb./ac.
(iii) Only V effect is highly significant.
(iv) Av. yield of grain in lb./ac.

<table>
<thead>
<tr>
<th></th>
<th>V1</th>
<th>V2</th>
<th>V3</th>
<th>Mean</th>
</tr>
</thead>
<tbody>
<tr>
<td>D1</td>
<td>726</td>
<td>1945</td>
<td>1050</td>
<td>1240</td>
</tr>
<tr>
<td>D2</td>
<td>946</td>
<td>1517</td>
<td>817</td>
<td>1093</td>
</tr>
<tr>
<td>D3</td>
<td>648</td>
<td>1413</td>
<td>998</td>
<td>1020</td>
</tr>
<tr>
<td>Mean</td>
<td>773</td>
<td>1625</td>
<td>955</td>
<td>1118</td>
</tr>
</tbody>
</table>

S.E. of difference of two
1. D marginal means = 148.8 lb./ac.
2. V marginal means = 118.9 lb./ac.
3. V means at the same level of D = 256.1 lb./ac.
4. D means at the same level of V = 224.6 lb./ac.

CROP: Wheat (Rabi).
SITE: Cereal Multiplication Farm, Parala.
Ref: H.P. 53(239).
Type: 'CV'.

Object:—To find the optimum date of sowing for Wheat crop.

1. BASAL CONDITIONS:
(i) (a) Nil. (b) N.A. (c) N.A. (ii) (a) Clayey loam. (b) N.A. (iii) As per treatments. (iv) (a) to (e) N.A. (v) N.A. (vi) As per treatments. (vii) Irrigated. (viii) Nil. (ix) 20.43°. (x) N.A.

2. TREATMENTS:
Main-plot treatments:
3 sowing dates: D1 = 1.10.1953, D2 = 15.10.1953 and D3 = 7.11.1953.
Sub-plot treatments:
3 varieties: V1 = NP-770, V2 = S-100 and V3 = Local.

3. DESIGN:
(i) Split-plot. (ii) (a) 3 main-plots/block; 3 sub-plots/main-plot. (b) N.A. (iii) 4. (iv) (a) and (b) 9' x 55'. (v) Nil. (vi) Yes.

4. GENERAL:
(i) Poor. Local variety lodged 20-40%. (ii) Slight attack of rust. (iii) Germination %, stand %, growth, vigour and grain yield/plot. (iv) (a) 1953-54 with modification. (b) No. (c) N.A. (v) (a) Shilaroo, Parala and Dhaula Kuan. (b) N.A. (vi) and (vii) Nil.

5. RESULTS:
(i) 570.1 lb./ac.
(ii) (a) 164.1 lb./ac. (b) 200.9 lb./ac.
(iii) Only D effect is significant.
(iv) Av. yield of grain in lb./ac.

<table>
<thead>
<tr>
<th></th>
<th>$V_1$</th>
<th>$V_2$</th>
<th>$V_3$</th>
<th>Mean</th>
</tr>
</thead>
<tbody>
<tr>
<td>$D_1$</td>
<td>551.6</td>
<td>769.4</td>
<td>684.5</td>
<td>668.5</td>
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<td>$D_2$</td>
<td>526.1</td>
<td>376.2</td>
<td>379.0</td>
<td>427.1</td>
</tr>
<tr>
<td>$D_3$</td>
<td>537.4</td>
<td>678.9</td>
<td>627.9</td>
<td>614.7</td>
</tr>
<tr>
<td>Mean</td>
<td>538.4</td>
<td>608.2</td>
<td>563.8</td>
<td>570.1</td>
</tr>
</tbody>
</table>

S.E. of difference of two
1. D marginal means $= 67.0$ lb./ac.
2. V marginal means $= 82.1$ lb./ac.
3. V means at the same level of D $= 142.1$ lb./ac.
4. D means at the same level of V $= 134.0$ lb./ac.

---

**Crop**: Wheat *(Rahi)*.

**Site**: Potato Dev. and Res. Stn., Shilaroo.

**Ref**: H.P. 51(120).

**Type**: 'CV'.

---

Object :- To find out the optimum time of sowing under unirrigated condition.

1. **BASAL CONDITIONS**:
   (i) (a) Nil. (b) Potato. (c) N.A. (ii) (a) Loamy to clayey. (b) N.A. (iii) 10.10.1951, 22.10.1951, 7.11.1951 and 22.11.1951. (iv) (a) to (e) N.A. (v) N.A. (vi) As per treatments. (vii) Unirrigated. (viii) Nil. (ix) 9.01°. (x) N.A.

2. **TREATMENTS**:
   All combinations of (1) and (2)
   (1) 4 sowing dates: $D_1 = 10.10.1951$, $D_2 = 22.10.1951$, $D_3 = 7.11.1951$ and $D_4 = 22.11.1951$.
   (2) 3 varieties: $V_1 =$ NP-770, $V_2 =$ Ridley (strain D) and $V_3 =$ Local.

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

4. **GENERAL**:
   (i) Fair. No lodging. (ii) Slight attack of yellow rust. (iii) Germination %, height and tillering, straw % and grain yield. (iv) (a) Not continued. (b) and (c) No. (v) (a) and (b) No. (vi) and (vii) Nil.

5. **RESULTS**:
   (i) 503.4 lb./ac.
   (ii) 141.1 lb./ac.
   (iii) V effect is highly significant while D effect is significant.
   (iv) Av. yield of grain in lb./ac.

<table>
<thead>
<tr>
<th></th>
<th>$D_1$</th>
<th>$D_2$</th>
<th>$D_3$</th>
<th>$D_4$</th>
<th>Mean</th>
</tr>
</thead>
<tbody>
<tr>
<td>$V_1$</td>
<td>378.1</td>
<td>408.4</td>
<td>559.6</td>
<td>514.2</td>
<td>465.1</td>
</tr>
<tr>
<td>$V_2$</td>
<td>264.2</td>
<td>324.9</td>
<td>514.3</td>
<td>335.1</td>
<td>364.7</td>
</tr>
<tr>
<td>$V_3$</td>
<td>566.9</td>
<td>710.9</td>
<td>808.9</td>
<td>635.2</td>
<td>680.5</td>
</tr>
<tr>
<td>Mean</td>
<td>403.1</td>
<td>481.4</td>
<td>627.6</td>
<td>501.5</td>
<td>503.4</td>
</tr>
</tbody>
</table>

S.E. of marginal mean of D $= 47.03$ lb./ac.
S.E. of marginal mean of V $= 40.73$ lb./ac.
S.E. of body of table $= 81.46$ lb./ac.
Crop: Wheat (Rabi).
Site: Potato Dev. and Res. Stn., Shilaroo.
Object: To find the optimum date of sowing for Wheat.

1. BASAL CONDITIONS:
   (I) (a) Nil. (b) Potato. (c) N.A. (ii) (a) Clayey to loamy. (b) N.A. (iii) As per treatments. (iv) (a) to (e) N.A. (v) N.A. (vi) As per treatments. (vii) Unirrigated. (viii) Nil. (ix) 18.32°. (x) N.A.

2. TREATMENTS:
   Main-plot treatments:
   3 sowing dates: \( D_1 = 10.10.1953, D_2 = 15.10.1953 \) and \( D_3 = 30.10.1953 \).
   Sub-plot treatments:
   3 varieties: \( V_1 = \text{Local}, \ V_2 = \text{NP-770} \) and \( V_3 = S-101 \).

3. DESIGN:
   (i) Split-plot. (ii) (a) 3 main-plots/blok; 3 sub-plots/main-plot. (b) N.A. (iii) 4. (iv) (a) N.A. (b) 18'×40'. (main-plot); 6'×40' (sub-plot). (v) N.A. (vi) Yes.

4. GENERAL:
   (i) Poor. No lodging. (ii) Nil. (iii) Grain yield/plot. (iv) Not continued. (b) No, (c)—. (v) (a) Shilaroo, Parala, Dhaula Kuan. (b) N.A. (vi) and (vii) Nil.

5. RESULTS:
   (i) 124.1 lb./ac.
   (ii) 64.46 lb./ac.
   (b) 71.4 lb./ac.
   (iii) D effect is significant, V effect is highly significant while interaction is not significant.
   (iv) Av. yield of grain in lb./ac.

<table>
<thead>
<tr>
<th></th>
<th>( V_1 )</th>
<th>( V_2 )</th>
<th>( V_3 )</th>
<th>Mean</th>
</tr>
</thead>
<tbody>
<tr>
<td>( D_1 )</td>
<td>3.0 5</td>
<td>154.6</td>
<td>72.9</td>
<td>176.0</td>
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<tr>
<td>( D_2 )</td>
<td>160.4</td>
<td>137.1</td>
<td>58.3</td>
<td>118.6</td>
</tr>
<tr>
<td>( D_3 )</td>
<td>145.9</td>
<td>67.1</td>
<td>20.4</td>
<td>77.8</td>
</tr>
<tr>
<td>Mean</td>
<td>2.2 2</td>
<td>119.6</td>
<td>5.6</td>
<td>124.1</td>
</tr>
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</table>

S.E. of difference of two
1. D marginal means =26.3 lb./ac.
2. V marginal means =29.1 lb./ac.
3. V means at the same level of D =50.5 lb./ac.
4. D means at the same level of V =48.9 lb./ac.

Crop: Barley.
Object: To find the best manural formula for Barley.

1. BASAL CONDITIONS:
   (I) (a) Nil. (b) Fallow. (c) Nil. (ii) (a) Clayey. (b) Refer soil analysis, Dhaula kuan. (iii) 12.11.1953.

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) 3 applications of \( P_2O_5 \): \( P_0 = 0, P_1 = 20 \) lb./ac. of \( P_2O_5 \) as Super and \( P_2 = 20 \) lb./ac. of \( P_2O_5 \) as B.M.
3. **DESIGN:**
   (i) Fact. in R.B.D.  
   (ii) (a) 6  
   (b) N.A.  
   (iii) 6  
   (iv) (a) and (b) 6' × 18'.  
   (v) Nil.  
   (vi) Yes.

4. **GENERAL:**
   (i) Normal.  
   No lodging.  
   (ii) Nil.  
   (iii) Straw and grain yield.  
   (iv) (a) Not.-contd.  
   (b) No.  
   (c)  
   (v) (a) No.  
   (b)  
   (vi) and (vii) Nil.

5. **RESULTS:**
   (i) 2027 lb./ac.  
   (ii) 422.6 lb./ac.  
   (iii) None of the effects is significant.  
   (iv) Av. yield of grain in lb./ac.  
   \[ \begin{array}{ccc}
   P_0 & P_1 & P_2 \\
   \hline
   N_0 & 1841 & 2126 & 2040 \\
   N_1 & 2019 & 2057 & 2126 \\
   \hline
   \text{Mean} & 1975 & 2091 & 2014 & 2027
   \end{array} \]
   S.E. of marginal mean of P = 122.0 lb./ac.  
   S.E. of marginal mean of N = 99.6 lb./ac.  
   S.E. of body of table = 172.5 lb./ac.

---

**Crop:** Potato.  
**Site:** Potato Dev. Res. Stn., Shilaroo.  
**Ref:** H.P. 51(124).  
**Type:** -'M'.

Object: To study the effect of N, P₂O₅ and K₂O in presence and absence of organic matter.

1. **BASAL CONDITIONS:**
   (i) (a) Nil.  
   (b) N.A.  
   (c) Nil.  
   (ii) (a) Loamy to clayey.  
   (b) N.A.  
   (iii) 5.5.1951.  
   (iv) (a) to (c) N.A.  
   (v) Nil.  
   (vi) Upto date (medium).  
   (vii) Unirrigated.  
   (viii) 2 hoeings and 2 earthings.  
   (ix) 49.51°.  
   (x) End of September 1951.

2. **TREATMENTS:**
   **Main-plot treatments:**
   - 2 levels of F.Y.M: \( F_0 = 0 \) and \( F_1 = 400 \) lb./ac. of F.Y.M.
   **Sub-plot treatments:**
   - All combinations of (1), (2) and (3)
   - (1) 2 levels of N as A/S: \( N_0 = 0 \) and \( N_1 = 40 \) lb./ac.
   - (2) 2 levels of P₂O₅ as Super: \( P_0 = 0 \) and \( P_1 = 80 \) lb./ac.
   - (3) 2 levels of K₂O as Pot. Sul.: \( K_0 = 0 \) and \( K_1 = 20 \) lb./ac.
   F.Y.M. applied one week before planting by mixing in soil.

3. **DESIGN:**
   (i) Split-plot.  
   (ii) (a) 2 main-plots/block; 8 sub-plots/main-plot.  
   (b) N.A.  
   (iii) 4.  
   (iv) (a) N.A.  
   (b) 10' × 5.25'.  
   (v) One buffer row maintained between two adjacent plots. In addition a length of 2' was cut at both the extremities of ridges to eliminate effect of extra spacing.  
   (vi) Yes.

4. **GENERAL:**
   (i) Normal.  
   No lodging.  
   (ii) Nil.  
   (iii) Tuber yield.  
   (iv) (a) 1951–1953.  
   (b) No.  
   (c) N.A.  
   (v) (a) No.  
   (b)  
   (vi) and (vii) Nil.

5. **RESULTS:**
   (i) 19142 lb./ac.  
   (ii) (a) 6285.4 lb./ac.  
   (b) 4769.1 lb./ac.
   (iii) N and F effects are significant, P effect is highly significant, while all other effects are not significant.
(v) Av. yield of tuber in lb./ac.

<table>
<thead>
<tr>
<th></th>
<th>N₀</th>
<th>N₁</th>
<th>P₀</th>
<th>P₁</th>
<th>K₀</th>
<th>K₁</th>
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<td>11797</td>
<td>21209</td>
<td>15851</td>
<td>17156</td>
<td>16503</td>
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<tr>
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<td>20383</td>
<td>14728</td>
<td>23556</td>
<td>18834</td>
<td>19450</td>
<td>19142</td>
</tr>
</tbody>
</table>

S.E. of difference of two
1. F marginal means
2. N, P or K marginal means
3. Means in the body of N×P, N×K or P×K tables
4. N, P or K means at the same level of F
5. F means at the same level of N, P or K

Crop :- Potato.
Site :- Potato Dev. and Res. Stn. Shilaroo.
Ref :- H.P. 52(157).
Type :- 'M'.

Object :- To study the effect of \( N, P_2O_5 \) and \( K_2O \) in presence and absence of organic matter.

1. BASAL CONDITIONS :
   (i) (a) Nil. (b) Nil. (c) Nil. (ii) (a) Loamy to clayey. (b) N.A. (iii) 28.4.1952. (iv) (a) to (e) N.A. (v) Nil. (vi) Uptodate (medium). (vii) Unirrigated. (viii) Hoeings on 1,3,6.1952 and earthing up on 6.7.1952. (ix) 30.42". (x) 2-t. 9.1952.

2. TREATMENTS :
   Main-plot treatments :
   2 levels of F.Y.M. : \( F_0 = 0 \) and \( F_1 = 400 \) lb./ac. of F.Y.M.
   Sub-plot treatments :
   All combinations of (1), (2) and (3)
   (1) 2 levels of N as A/S : \( N_0 = 0 \) and \( N_1 = 40 \) lb./ac.
   (2) 2 levels of \( P_2O_5 \) as Super : \( P_0 = 0 \) and \( P_1 = 80 \) lb./ac.
   (3) 2 levels of \( K_2O \) as Pot. Sul. : \( K_0 = 0 \) and \( K_1 = 20 \) lb./ac.

F.Y.M. applied one week before planting by mixing in soil.

3. DESIGN :
   (i) Split-plot. (ii) (a) 2 main-plots/block; 8 sub-plots/main-plot. (b) N.A. (iii) 4. (iv) (a) N.A. (b) 10'×5.25'. (v) N.A. (vi) Yes.

4. GENERAL :
   (i) Fair to Normal. No lodging. (ii) Disease N.A. sprayed twice with peroxonex. (iii) Tuber yield. (iv) (a) 1951—1953. (b) No. (c) —. (v) (a) No. (b) —. (vi) and (vii) Nil.

5. RESULTS :
   (i) 22319 lb./ac.
   (ii) (a) 4205.6 lb./ac.
   (b) 7201.0 lb./ac.
   (iii) F effect is significant, while P effect is highly significant.
iv) Av. yield of tuber in lb./ac.

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S.E. of difference of two
1. F marginal means
2. N, P or K marginal means
3. Means in the body of N×P, N×K or P×K table
4. N, P or K means at the same level of F
5. F means at the same level of N, P or K

---

Crop: Potato.  
Site: Potato Dev. and Res. Stn., Shilaroo.  
Ref: H.P. 53(230).  
Type: 'M'.

Object: To study the effect of N, P₂O₅ and K₂O in presence and absence of organic matter.

1. BASAL CONDITIONS:
   (i) (a) Nil.  (b) N.A.  (c) Nil.  (ii) (a) Loamy to clayey.  (b) N.A.  (iii) 3.5.1953.  (iv) (a) to (e) N.A.  (v) Nil.  (vi) Uptodate (medium).  (vii) Unirrigated.  (viii) 2 hoeings and I earthing.  (ix) 47.78°.  (x) End of Sept. 1953.

2. TREATMENTS:
   Main-plot treatments:
   2 levels of F.Y.M.: F₀=0 and F₁=400 lb./ac. of F.Y.M.  
   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=80 lb./ac.
   (3) 2 levels of K₂O as Pot. Sul.: K₀=0 and K₁=20 lb./ac.
   F.Y.M. applied one week before planting by mixing in soil.

3. DESIGN:
   (i) Split-plot.  (ii) (a) 2 main-plots/block; 8 sub-plots/main-plot.  (b) N.A.  (iii) 4.  (iv) (a) 12'×5.25'  
   (b) 10'×5.25'.  (v) No.  (vi) Yes.

4. GENERAL:
   (c) →.  (v) (a) No.  (b) →.  (vi) and (vii) Nil.

5. RESULTS:
   (i) 9672 lb./ac.
   (ii) (a) 1731.5 lb./ac.
   (b) 2589.4 lb./ac.
   (iii) F, N and P effects are highly significant. Other effects are not significant.
Av. yield of tuber in lb./ac.

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S.E. of difference of two
1. F marginal means = 432.9 lb./ac.
2. N, P or K marginal means = 647.3 lb./ac.
3. means in the body of N×P, N×K or P×K tables = 915.5 lb./ac.
4. N, P or K means at the same level of F = 915.5 lb./ac.
5. F means at the same level of N, P or K = 778.7 lb./ac.

Crop: Potato.
Site: Potato Dev. and Res. Stn., Shilaroo.
Object: To find the best time and method of application of fertilizers.

1. BASAL CONDITIONS:
   (i) (a) Nil. (b) N.A. (c) Nil.
   (ii) (a) Loamy to clayey. (b) N.A.
   (iii) 3rd week of April, 1952.
   (iv) (a) to (e) N.A.
   (v) 400 lb./ac. of F.Y.M. given a week before sowing.
   (vi) Up to date.
   (vii) Unirrigated.
   (viii) One earthing.
   (ix) 30.42".
   (x) 28.9.1952.

2. TREATMENTS:
   All combinations of (1) x (2) + a control
   (1) 3 times of application fertilizers: T₁ = At planting, T₂ = At earthing up and T₃ = Half at planting
   and half at earthing up.
   (2) 3 methods of application of fertilizers: M₁ = Broadcast, M₂ = In furrows and M₃ = Side bund.
   Fertilizer dose is 40 lb./ac. of N as A/S + 80 lb./ac. of P₂O₅ as Super + 20 lb./ac. of K₂O as Pot. Sul.
   M₁ = Fertilizer mixed in 1 : 5 ratio with soil and spread uniformly.
   M₂ = Furrows were opened 6" deep. The fertilizer was put in furrows by hand. This was covered with
   layer about 2". The seed tubers were put above this line.
   M₃ = Furrows were opened on either side of tuber line 2½" apart and 4" deep and fertilizer placed in
   these lines.

3. DESIGN:
   (i) R.B.D. (ii) (a) 10. (b) N.A. (iii) 4. (iv) (a) N.A. (b) 10' x 5.25'. (v) One buffer was maintained
   between adjacent plots to ward off border effect and a length of 2' at both extremities of ridges to eliminate
   effect of extra spacing. (vi) Yes.

4. GENERAL:
   (i) Normal. No lodging. (ii) Nil. (iii) Tuber yield. (iv) (a) 1952–1954. (b) N.A. (c) N.A. (v) (a) No.
   (b) nil. (vi) and (vii) Nil.

5. RESULTS:
   (i) 24660 lb./ac.
   (ii) 5425.4 lb./ac.
   (iii) Control vs other treatment effect and T effect are highly significant while M effect is significant.
Object: To find the best time and method of application of fertilisers.

1. BASAL CONDITIONS:
   (i) (a) Nil. (b) N.A. (c) Nil. (ii) (a) Loamy to clayey. (b) N.A. (iii) 4.5.1953. (iv) (a) to (e) N.A. (v) Nil. (vi) Up to date (medium). (vii) Unirrigated. (viii) N.A. (ix) 47.73R. (x) End of Sept. 1953.

2. TREATMENTS:
   All combinations of (1) and (2) + a control
   (1) 3 times of application of fertilizers: $T_1$ = At planting, $T_2$ = At earthing up and $T_3$ = Half at planting and half at earthing up.
   (2) 3 methods of application of fertilizers: $M_1$ = Broadcast, $M_2$ = In furrows and $M_3$ = Side bund.
   Fertilizer dose is 40 lb./ac. of N as A/S + 80 lb./ac. of P$_2$O$_5$ as Super + 20 lb./ac. of K$_2$O as Pot. Sul.

3. DESIGN:
   (i) R.B.D. (ii) (a) 10. (b) N.A. (iii) 4. (iv) (a) N.A. (b) $10^9 	imes 5.25$. (v) N.A. (vi) Yes.

4. GENERAL:
   (i) Normal. No lodging. (ii) Nil. (iii) No. of plants at harvest and tuber yield. (iv) (a) 1952 to 1954. (b) No. (c) - (v) (a) No. (b) - (vi) and (vii) Nil.

5. RESULTS:
   (i) 7142 lb./ac. (ii) 2248.6 lb./ac. (iii) Control vs other treatments-effect and M effect are significant while T effect is highly significant. (iv) Av. yield of tuber in lb./ac.

   Control = 13013 lb./ac.

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S.E. of any marginal mean $= 649,1$ lb./ac.
S.E. of body of table $= 1124.3$ lb./ac.
Crop: Potato.  
Site: Potato Dev. and Res. Stn., Shilaroo.  
Ref: H.P. 51 (122).  
Type: 'M'.

Object: To study proper dose of fertilizer required for obtaining maximum germination and yield of Potato.

1. BASAL CONDITIONS:
(i) (a) Nil. (b) N.A. (c) Nil. (ii) (a) Clayey to loamy. (b) N.A. (iii) 24.4.1951. (iv) (a) to (e) N.A. (v) Nil. (vi) Up to date (medium). (vii) Unirrigated. (viii) Hoeing on 29.5.1951, gap filling on 30.5.1951, earthing up and application of fertilizers on 4.7.1951. (ix) 49.15°. (x) End of September.

2. TREATMENTS:
Main-plot treatments:
2 levels of F.Y.M.: F₀ = 0 and F₁ = 400 md./ac. of F.Y.M.
Sub-plot treatments:
4 doses of fertilizers: M₀ = 0 (control), M₁ = A/S at 3 cwt./ac. + Super at 4 cwt./ac. + Pot. Sul. at 2 cwt./ac. (heavy dose), M₂ = A/S at 1.5 cwt./ac. + Super at 2 cwt./ac. + Pot. Sul. at 1 cwt./ac. (medium dose) and M₃ = A/S at 0.75 cwt./ac. + Super at 1 cwt./ac. + Pot. Sul. at 0.50 cwt./ac. (light dose).

3. DESIGN:
(i) Split-plot. (ii) (a) 2 main-plots/block; 4 sub-plots/main-plot. (b) N.A. (iii) 4. (iv) (a) 10' x 5.25'. (b) 8' x 5.25'. (v) N.A. (vi) Yes.

4. GENERAL:
(i) Fair. No lodging. (ii) No. (iii) Tuber yield and germination count. (iv) (a) No. (b) No. (e) —. (v) (a) No. (b) —. (vi) and (vii) N.A.

5. RESULTS:
(i) 17192 lb./ac.
(ii) (a) 2427.8 lb./ac. (b) 3017.3 lb./ac.
(iii) F effect is significant, M effect is highly significant while interaction is not significant.
(iv) Av yield of tuber in lb./ac.

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Mean:
14249 17351 16767 20399 17192

S.E. of difference of two
1. F marginal means = 858.4 lb./ac.
2. M marginal means = 1523.6 lb./ac.
3. M means at the same level of F = 2134.8 lb./ac.
4. F means at the same level of M = 2054.1 lb./ac.
2. TREATMENTS:

Main-plot treatments:
2 levels of F.Y.M., F0=0 and F1=400 md/ac. of F.Y.M.

Sub-plot treatments:
4 doses of fertilizers: M0 = 0 (control), M1 = A/S at 3 cwt/ac. + Super at 4 cwt/ac. + Pot. Sul. at 2 cwt/ac. (heavy dose) M2 = A/S at 1.5 cwt/ac. + Super at 2 cwt/ac. + Pot. Sul. at 1 cwt/ac. (medium dose) and M3 = A/S at 0.75 cwt/ac. + Super at 1 cwt/ac. + Pot. Sul. at 0.50 cwt/ac. (light dose).

3. DESIGN:

(i) Split-plot. (ii) (a) 2 main-plots/block; 4 sub-plots/main-plot (b) N.A. (iii) '4. (iv) (a) 10' x 5.25'. (b) 8' x 5.25'. (v) N.A. (vi) Yes.

4. GENERAL:

(i) Fair. No lodging. (ii) No. (iii) Germination count and tuber yield. (iv) (a) No. (b) No. (c) ---. (v) (a) No. (b) ---. (vi) and (vii) N.A.

5. RESULTS:

(i) 10260 lb./ac. (ii) (a) 5912.9 lb./ac. (b) 3517.4 lb./ac. (iii) None of the effects is significant. (iv) Av. yield of tuber in lb./ac.

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Mean = 12060

S.E. of difference of two
1. F marginal means = 2520.4 lb./ac.
2. M marginal means = 1758.7 lb./ac.
3. M means at the same level of F = 2487.2 lb./ac.
4. F means at the same level of M = 3001.6 lb./ac.


Object: To determine the best time and depth at which fertilizers should be applied to obtain maximum yield.

1. BASAL CONDITIONS:

(i) (a) Nil. (b) N.A. (c) Nil. (ii) (a) Clayey to loamy. (b) N.A. (iii) 6.5.1951. (iv) (a) to (e) N.A. (v) Nil. (vi) Upto date (medium). (vii) Unirrigated. (viii) 3 hoeings and earthing up. (ix) 49.51°. (x) 16.9.1951.

2. TREATMENTS:

Main-plot treatments:
2 levels of F.Y.M.: F0=0 and F1=400 md/ac. of F.Y.M.

Sub-plot treatments:
6 applications of fertilizers: M0 = No fertilizers, M1 = Full dose of fertilizer at planting on surface, M2 = Full dose of fertilizer at earthing on surface, M3 = Full dose of fertilizer at earthing 3' below surface, M4 = Half dose of fertilizer at planting + half dose at earthing on surface and M5 = Half dose of fertilizer at planting + half dose at earthing 3' below surface.

Full dose of fertilizer consists of 40 lb./ac. of N as A/S + 80 lb./ac. of P2O5 as Super and 20 lb./ac. of N as Pot. Sul. applied on 8, 9th July.
3. DESIGN:
(i) Split-plot. (ii) (a) 2 main-plots/block; 6 sub-plots/main-plot. (b) N.A. (iii) 4. (iv) (a) 10' × 5.25'.
(b) 8' × 5.25'. (v) N.A. (vi) Yes.

4. GENERAL:
(i) Normal. No lodging. (ii) Nil. (iii) Tuber yield. (iv) (a) No. (b) No. (c) —. (v) (a) No. (b) —.
(vi) and (vii) Nil.

5. RESULTS:
(i) 17996 lb./ac.
(ii) (a) 7431.7 lb./ac.
(b) 4730.2 lb./ac.
(iii) Only sub-plot treatments are highly significantly different.
(iv) Av. yield of tuber in lb./ac.

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S.E. of difference of two
1. F marginal means = 2145.3 lb./ac.
2. M marginal means = 2365.1 lb./ac.
3. M means at the same level of F = 334.1 lb./ac.
4. F means at the same level of M = 3731.7 lb./ac.

Crop: Potato.  Site: Potato Dev. and Res. Stn., Shilaroo.  Object: To determine the best time and depth at which fertilizers should be applied to obtain maximum yield.

1. BASAL CONDITIONS:
(i) (a) Nil. (b) N.A. (c) Nil. (ii) (a) Clay to loam. (b) N.A. (iii) 6.5.1951. (iv) (a) to (e) N.A.
(v) Nil. (vi) Craig's defiance (medium). (vii) Unirrigated. (viii) 3 hoeings and earthing up. (ix) 49.15'.
(x) 26.9.1951.

2. TREATMENTS:
Main-plot treatments:
2 levels of F.Y.M.: F0 = 0 and F1 = 400 md./ac. of F.Y.M.
Sub-plot treatments:
6 applications of fertilizers: M0 = No fertilizers, M1 = Full dose of fertilizer at planting on surface,
M2 = Full dose of fertilizer at earthing on surface, M3 = Full dose of fertilizer at earthing 3" below surface,
M4 = Half dose of fertilizer at planting + half dose at earthing 3" below surface, M5 = Half dose of fertilizer at planting + half dose at earthing 3" below surface.

Full dose of fertilizer consists of 40 lb./ac. of N as A/S + 80 lb./ac. of P2O5 as Super and 20 lb./ac. of N as Pot. Sul. applied on 8,9th July.

3. DESIGN:
(i) Split-plot. (ii) (a) 2 main-plots/block; 6 sub-plots/main-plot. (b) N.A. (iii) 4. (iv) (a) N.A. (b) 8' × 5.25'.
(v) N.A. (vi) Yes.

4. GENERAL:
(i) Normal. No lodging. (ii) Nil. (iii) Tuber yield. (iv) (a) No. (b) No. (c) —. (v) (a) No. (b) —.
(vi) and (vii) Nil.
5. RESULTS:

(i) 17294 lb./ac.
(ii) (a) 8830.0 lb./ac.
   (b) 9484.0 lb./ac.
(iii) All effects are not significant.
(iv) Av. yield of tuber in lb./ac.

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S.E. of difference of two

1. F marginal means = 2549.0 lb./ac.
2. M marginal means = 4741.9 lb./ac.
3. M means at the same level of F = 6706.2 lb./ac.
4. F means at the same level of M = 6631.4 lb./ac.

Crop: Potato.
Site: Potato Dev. and Res. Stn, Shilaroo.
Ref: H.P. 53(231).
Type: ‘M’.

Object: To determine the optimum dose of artificial mixture of N, P₂O₅, and K₂O combined with different levels of F.Y.M.

1. BASAL CONDITIONS:
   (i) (a) Nil. (b) N.A. (c) Nil. (ii) (a) Loamy to clayey. (b) N.A. (iii) 3.5.1953. (iv) (a) to (c) N.A. (d) Row to row 21" apart and plant to plant 12". (e) N.A. (vii) Nil. (vi) Upto date (medium). (vii) Unirrigated. (viii) N.A. (ix) 47.78". (x) 4.9.1953.

2. TREATMENTS:
   All combinations of (1) and (2) + a control.
   (1) 3 levels of F.Y.M.: F₁ = 100, F₂ = 200 and F₃ = 400 md./ac. of F.Y.M.
   (2) 4 levels of artificial mixture: M₀ = 0, M₁ = 200, M₂ = 400 and M₃ = 600 md./ac.
F.Y.M. spread in the plots and mixed with soil by khilua and just before planting artificial mixture was applied on both sides of a row 3" apart and 2" below the soil surface on 3.5.1953. Artificial mixture is a mixture of N, P₂O₅ and K₂O in the ratio of 2 : 4 : 1.

3. DESIGN:
   (i) R.B.D. (ii) (a) 13. (b) N.A. (iii) 4. (iv) (a) N.A. (b) 10' x 5.25'. (v) N.A. (vi) Yes.

4. GENERAL:
   (i) Normal No lodging. (ii) Damage by rats. (iii) Germination count and tuber yield. (iv) (a) to (c) No. (v) (a) No (b) -. (vi) and (vii) Nil.

5. RESULTS:
   (i) 15443 lb./ac.
   (ii) 3114.9 lb./ac.
   (iii) Only “control vs. other treatments” effect is highly significant.
(iv) Av. yield of tuter in lb./ac.

<table>
<thead>
<tr>
<th></th>
<th>M_3</th>
<th>M_1</th>
<th>M_2</th>
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Mean 16996 14578 15905 16887 16103

S.E. of marginal mean of F = 778.8 lb./ac.
S.E. of marginal mean of M = 899.2 lb./ac.
S.E. of body of table = 1557.5 lb./ac.

Crop: Potato.

Site: Potato Dev and Res. Stn., Shilaroo.

Object—To study the effect of spacing and seed size on the yield of Potato.

1. BASAL CONDITIONS:
   (i) (a) Nil. (b) N.A. (c) Nil. (ii) (a) Clayey to loamy. (b) N.A. (iii) 3rd week of April. (iv) (a) and (b) N.A. (c) R_1 S_1 = 25, R_1 S_2 = 50, R_1 S_3 = 75, R_2 S_1 = 20, R_2 S_2 = 40, R_2 S_3 = 60, R_3 S_1 = 16.6, R_3 S_2 = 33.2 and R_3 S_3 = 49.8 md./ac. (d) As per treatments. (e) N.A. (v) N.A. (vi) upto date (medium). (vii) Unirrigated. (viii) 2 hoeings, 1 earthing and 1 gap filling. (ix) 49.15°. (x) End of September.

2. TREATMENTS:
   Main-plot treatments:
   3 row to row spacings: R_1 = 16", R_2 = 20" and R_3 = 24".
   Sub-plot treatments:
   3 seed sizes: S_1 = 1 oz., S_2 = 2 oz. and S_3 = 3 oz.

3. DESIGN:
   (i) Split-plot. (ii) (a) 3 main-plots/block and 3 sub-plots/main-plot. (b) N.A. (iii) 4. (iv) (a) 10' x 7'. (b) 8' x 7'. (v) N.A. (vi) Yes.

4. GENERAL:
   (i) Normal. No lodging. (ii) Nil. (iii) Tuber yield. (iv) (a) 1951—1953. (b) No. (c) —. (v) (a) No. (b) —. (vi) and (vii) Nil.

5. RESULTS:
   (i) 10076 lb./ac.
   (ii) (a) 46641 lb./ac.
   (b) 40182 lb./ac.
   (iii) None of the effects is significant.
   (iv) Av. yield of tuber in lb./ac.

<table>
<thead>
<tr>
<th></th>
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<td>10251</td>
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</table>

Mean 10778 11115 8336 10076

S.E. of difference of two
1. R marginal means = 1904.1 lb./ac.
2. S marginal means = 1640.5 lb./ac.
3. S means at the same level of R = 2841.3 lb./ac.
4. R means at the same level of S = 3001.3 lb./ac.

Ref: H.P. 51(123).

Type: 'C'.
Crop : Potato.  
Site : Potato Dev. and Res. Stn., Shilaroo.  
Object : To study the effect of spacing and seed size on the yield of Potato.

1. BASAL CONDITONS :  
(i) (a) Nil. (b) N.A. (c) Nil. (ii) (a) clayey to loamy. (b) N.A. (iii) 20.4.1952. (iv) (a) and (b) N.A. (c) R1S1=25, R1S2=30, R1S3=35, R2S1=20, R2S2=40, R2S3=60, R3S1=16.6, R3S2=33.2 and R3S3=49.8 md./ac. (d) As per treatments. (e) N.A. (v) 400 md./ac. of F.Y.M. (vi) Upto date (medium). (vii) Unirrigated. (viii) 2 hoeings and 1 earthing up. (ix) 30.42”. (x) 29.9.1952.

2. TREATMENTS :  
Main-plot treatments :  
3 row to row spacings : R1=16”, R2=20” and R3=24”.  
Sub-plot treatments :  
3 seed sizes : S1=1 oz., S2=2 oz. and S3=3 oz.

3. DESIGN :  
(i) Split-plot. (ii) 3 main-plots/block ; 3 sub-plots/main-plot. (b) N.A. (iii) 4. (iv) (a) 10’x7’. (b) 8’x7’. (v) N.A. (vi) Yes.

4. GENERAL :  
(i) Fair. No lodging. (ii) Nil. (iii) Tuber yield. (iv) (a) 1951—1953. (b) No. (c) Nil. (v) (a) No. (b) —. (v) and (vii) Nil.

5. RESULTS :  
(i) 18878. lb./ac.  
(ii) (a) 5071 lb./ac.  
(b) 4140.6 lb./ac.  
(iii) Only S effect is significant.  
(iv) Av. yield of tuber in lb./ac.

<table>
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<th>S1</th>
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<th>S3</th>
<th>Mean</th>
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<td>13860</td>
<td>22681</td>
<td>17781</td>
<td>18107</td>
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</table>

Mean 15883 20162 20590 18878

S.E. of difference of two
1. R marginal means =2070.2 lb./ac.
2. S marginal means =1690.4 lb./ac.
3. S means at the same level of R =2927.9 lb./ac.
4. R means at the same level of S =3162.4 lb./ac.

Crop : Potato.  
Site : Potato Dev. and Res. Stn., Shilaroo.  
Object : To study the effect of spacing and seed size on the yield of Potato.

1. BASAL CONDITIONS :  
(i) (a) Nil. (b) N.A. (c) Nil. (ii) (a) Loamy to clayey. (b) N.A. (iii) 4.5.1953. (iv) (a) and (b) N.A. (c) R1S1=25, R1S2=50, R1S3=75, R2S1=20, R2S2=60, R2S3=80, R3S1=16.6, R3S2=33.2 and R3S3=49.8 md./ac. (d) and (e) N.A. (v) 400 md./ac. of F.Y.M. (vi) Up to date (medium). (vii) Unirrigated. (viii) 2 hoeings and 1 earthing up. (ix) 47.78”. (x) End of Sept. 1953.
2. TREATMENTS:

Main-plot treatments:
3 row to row spacings: R1 = 16", R2 = 20" and R3 = 24".

Sub-plot treatments:
3 seed sizes: S1 = 1 oz., S2 = 2 oz. and S3 = 3 oz.

3. DESIGN:
(i) Split-plot. (ii) (a) 3 main-plots/block; 3 sub-plots/main-plot. (b) N.A. (iii) 4. (iv) (a) 10'×7'.
(b) 8'×7'. (v) N.A. (vi) Yes.

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

5. RESULTS:
(i) 8336 lb./ac.
(ii) (a) 5975 lb./ac.
(b) 2987 lb./ac.
(iii) None of the effects is significant.
(iv) Av. yield of tuber in lb./ac.

<table>
<thead>
<tr>
<th>S1</th>
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<tr>
<td>Mean</td>
<td>7700</td>
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</table>

S.E. of difference of two
1. R marginal means = 2431 lb./ac.
2. S marginal means = 1219 lb./ac.
3. S means at the same level of R = 2112 lb./ac.
4. R means at the same level of S = 2987 lb./ac.

Site: Potato Dev. and Res. Stn., Shilaroo. Type: 'C'.

Object: To find out the proper depth of planting Potato seeds.

1. BASAL CONDITIONS:
(i) (a) Nil. (b) N.A. (c) Nil. (ii) (a) Clayey to loamy. (b) N.A. (iii) 4.5.1953. (iv) (a) to (e) N.A. (v) N.A. (vi) Upto date (medium). (vii) Unirrigated. (viii) N.A. (ix) 47.78'. (x) End of September.

2. TREATMENTS:
1. Seeds planted at a depth of 3.0'.
2. Seeds planted at a depth of 4.5'.
3. Seeds planted at a depth of 6.0'.

3. DESIGN:
(i) R.B.D. (ii) (a) 3. (b) N.A. (iii) 8. (iv) (a) 10'×7'. (b) 8'×7'. (v) N.A. (vi) Yes.

4. GENERAL:
(i) Poor. No lodging. (ii) Nil. (iii) Tuber yield. (iv) (a) No. (b) No. (c) —. (v) (a) No. (b) —. (vi) and (vii) Nil.
5 RESULTS:

(i) 371.7 lb/ac.
(ii) 2391.7 lb/ac.
(iii) Treatments are not significantly different.

(i) Av. yield of tubers in lb/ac.

<table>
<thead>
<tr>
<th>Treatment</th>
<th>Av. yield</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
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<tr>
<td>2.</td>
<td>5026</td>
</tr>
<tr>
<td>3.</td>
<td>3318</td>
</tr>
<tr>
<td>S.E./mean</td>
<td>846.3 lb/ac</td>
</tr>
</tbody>
</table>

Crop: Potato.  
Site: Potato Dev. and Res. Stn., Shilaroo.  
Ref.: H.P. 53 (236).  
Type: ‘C’.

Object: To see the beneficial effect, if any of green seed tubers before planting.

1. BASAL CONDITIONS:

(i) (a) Nil.  (b) N.A.  (c) Nil.  (ii) (a) Loamy to clayey.  (b) N.A.  (iii) 7.5.1953.  (iv) (a) to (e) N.A.  (v) N.A.  (vi) Upto date (medium).  (vii) Unirrigated.  (viii) 2 hoplings and 1 earthing up.  (ix) 47.78°.  (x) End of Sept. 1953.

2 TREATMENTS:

1. Whole tubers ungreened, direct from store planted.
2. Whole tubers greened, to be kept in light for two weeks and then planted.
3. Cut tubers ungreened planted.
4. Cut tubers greened planted.

3. DESIGN:

(i) R.B.D.  (ii) (a) 4.  (b) N.A.  (iii) 6.  (iv) (a) 10'x7'.  (b) 8’x7’.  (v) N.A.  (vi) Yes.

4. GENERAL:

(i) Poor. No lodging.  (ii) Nil.  (iii) Potato yield.  (iv) (a) No.  (b) No.  (c) =.  (v) (a) No.  (b) =.  (vi) and (vii) Nil.

5. RESULTS:

(i) 2505 lb/ac.
(ii) 1570.9 lb/ac.
(iii) Treatments are not significantly different.

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

<table>
<thead>
<tr>
<th>Treatment</th>
<th>Av. yield</th>
</tr>
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<tbody>
<tr>
<td>1.</td>
<td>2134</td>
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<tr>
<td>2.</td>
<td>2984</td>
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<tr>
<td>3.</td>
<td>3017</td>
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<tr>
<td>4.</td>
<td>1884</td>
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<tr>
<td>S.E./mean</td>
<td>641.3 lb/ac</td>
</tr>
</tbody>
</table>

Crop: Potato.  
Site: Potato Dev. and Res. Stn., Shilaroo.  
Ref.: H.P. 53(235).  
Type: ‘C’.

Object: To study the effect of cut tubers on germination and yield of Potato.

1. BASAL CONDITIONS:

(i) (a) Nil.  (b) N.A.  (c) Nil.  (ii) (a) Clayey to loamy.  (b) N.A.  (iii) 6.5.1953.  (iv) (a) to (e) N.A.  (v) N.A.  (vi) Upto date (medium).  (vii) Unirrigated.  (viii) N.A.  (ix) 47.78°.  (x) End of September 1953.

2. TREATMENTS:

1. Whole tubers planted.
2. Freshly cut tubers planted.
3. Freshly cut and dipped in solution of partially decomposed F.Y.M.+A/S and then planted.
3. DESIGN:
   (i) R.B.D (ii) (a) 3. (b) N.A. (iii) 8. (iv) (a) N.A. (b) 8' × 7'. (v) N.A. (vi) Yes.

4. GENERAL:
   (i) Poor. No lodging (ii) Nil. (iii) Tubber yield. (iv) (a) No. (b) No. (c) —. (v) (a) No. (b) —. (vi) and (vii) Nil.

5. RESULTS:
   (i) 5155 lb./ac.
   (ii) 2049.7 lb./ac.
   (iii) Treatments are not significantly different.
   (iv) Av. yield of tuber in lb./ac.

<table>
<thead>
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<th>Treatment</th>
<th>Av. yield</th>
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<td>2.</td>
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<td>6251</td>
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<tr>
<td>S.E./mean</td>
<td>724.7 lb./ac.</td>
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</table>

Crop :- Berseem.
Site :- Agri Res. Stn., Dhaula Kuan.
Object :- To study the manurial requirements for Berseem fodder.

1. BASAL CONDITIONS:
   (i) (a) Nil. (b) Fallow. (c) Nil. (ii) (a) Clayey. (b) Refer soil analysis, Dhaula Kuan. (iii) 28.10.1953.
   (iv) (a) to (e) N.A. (v) Nil. (vi) Masaevi. (vii) Irrigated. (viii) Nil. (ix) 12.28". (x) N.A.

2. TREATMENTS:
   1. Control.
   2. 200 lb./ac. of N as F.Y.M.
   3. 20 lb./ac. of N as A/S.
   4. 20 lb./ac. of P_2O_5 as Super.
   5. 20 lb./ac. of P_2O_5 as B.M.
   6. 20 lb./ac. of N as A/S. + 100 lb./ac. of N as F.Y.M.
   7. 20 lb./ac. of P_2O_5 as Super. + 100 lb./ac. of N as F.Y.M.
   8. 20 lb./ac. of P_2O_5 as B.M. + 100 lb./ac. of N as F.Y.M.
   9. 20 lb./ac of N as A/S + 20 lb./ac. of P_2O_5 as Super.
   10. 20 lb./ac. of N as A/S + 20 lb./ac. of P_2O_5 as B.M.

3. DESIGN:
   (i) R.B.D. (ii) (a) 10. (b) N.A. (iii) 6. (iv) (a) and (b) 6' × 18' (v) Nil. (vi) Yes.

4. GENERAL:
   (i) Fair. No lodging. (ii) Nil. (iii) Fodder yield. (iv) (a) Not continued. (b) No. (c) —. (v) (a) No. (b) —. (vi) & (vii) Nil.

5. RESULTS:
   (i) 14.01 ton/ac.
   (ii) 1.71 ton/ac.
   (iii) Treatments are not significantly different.
   (iv) Av. yield of fodder in ton/ac.

<table>
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<td>14.80</td>
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<td>10.</td>
<td>13.58</td>
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<tr>
<td>S.E./mean</td>
<td>0.70 ton/ac.</td>
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</table>
Crop: - Paddy (Kharij).

Site: - Rice Res. Stn., Khudwani.

Object: - To study the effect of A/S, Super and Pot. Sul. on yield of Paddy.

1. BASAL CONDITIONS:
   (i) (a) Paddy-Fallow-Paddy. (b) Fallow. (c) Nil. (ii) (a) Clay loam. (b) N.A. (iii) 26.5.1948. (iv) (a) N.A. (b) Broadcast. (c) N.A. (d) and (e) - . (v) Nil. (vi) China 972 (medium). (vii) Irrigated. (viii) N.A. (ix) 8.01". (x) 9.10.1948.

2. TREATMENTS:
   All combinations of (1), (2) and (3)
   (1) 3 levels of N as A/S: \( N_0 = 0 \), \( N_1 = 30 \) and \( N_2 = 60 \) lb./ac.
   (2) 3 levels of \( P_2O_5 \) as Super: \( P_0 = 0 \), \( P_1 = 25 \) and \( P_2 = 50 \) lb./ac.
   (3) 3 levels of \( K_2O \) as Pot. Sul: \( K_0 = 0 \), \( K_1 = 60 \) and \( K_2 = 120 \) lb./ac.
   Manures applied on 20.7.1948.

3. DESIGNS:
   (i) Fact. 3 partially confd. (ii) (a) 3 blocks/replica!on; 9 plots/block. (b) N.A. (iii) 4. (iv) (a) 40' x 5'. (b) 1/304 ac. (v) N.A. (vi) Yes.

4. GENERAL:
   (i) N.A. (ii) N.A. (iii) Grain yield. (iv) (a) 1942—1950. (b) No. (c)—. (v) (a) No. (b) Nil. (vi) and (vii) Nil.

5. RESULTS:
   (i) 2364 lb./ac.
   (ii) 527.4 lb./ac.
   (iii) None of the effects is significant.
   (iv) Av. yield of grain in lb./ac.

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<th>( P_2 )</th>
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</table>

S.E. of any marginal mean = 88.0 lb./ac.

S.E. of body of table = 132.2 lb./ac.
Crop :- Paddy (Kharif).
Site :- Rice Res. Stn., Khudwani.

Object :- To study the effect of A/S, Super and Pot. Sul. on yield of Paddy.

1. BASAL CONDITIONS :
   (i) (a) Paddy—Fallow-Paddy. (b) Fallow. (c) Nil. (ii) (a) Clay loam. (b) N.A. (iii) 23.5.1949. (iv) (a) N.A. (b) Broadcast. (c) N.A. (d) and (e) —. (v) Nil. (vi) China 972 (medium). (vii) Irrigated. (viii) N.A. (ix) 7.11. (x) 5.10.1949.

2. TREATMENTS :
   All combinations of (1), (2) and (3)
   (1) 3 levels of N as A/S : N₀ =0, N₁ =30 and N₂ =60 lb./ac.
   (2) 3 levels of P₂O₅ as Super : P₀ =0, P₁ =25 and P₂ =50 lb./ac.
   (3) 3 levels of K₂O as Pot. Sul : K₀ =0, K₁ =60 and K₂ =120 lb./ac.

3. DESIGN :
   (i) Fact. 3³ partially confd. (ii) (a) 3 blocks/replication ; 9 plots/block. (b) N.A. (iii) 4. (iv) (a) 40' x 5'. (b) 1/304 ac. (v) N.A. (vi) Yes.

4. GENERAL :
   (i) N.A. (ii) N.A. (iii) Grain yield. (iv) (a) 1942—1950. (b) No. (c) —. (v) (a) No. (b) Nil. (vi) and (vii) Nil.

5. RESULTS :
   (i) 3107 lb./ac.
   (ii) 552.6 lb./ac.
   (iii) Interaction NP alone is significant.
   (iv) Av. yield of grain in lb./ac.

<table>
<thead>
<tr>
<th>P₀</th>
<th>P₁</th>
<th>P₂</th>
<th>Mean</th>
<th>K₀</th>
<th>K₁</th>
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<td>2996</td>
<td>3113</td>
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</tbody>
</table>

   S.E. of any marginal mean = 92.1 lb./ac.
   S.E. of body of table = 159.5 lb./ac.
2. TREATMENTS:
All combinations of (1), (2) and (3)
(1) 3 levels of N as A/S: N₀=0, N₁=30 and N₂=60 lb./ac.
(2) 3 levels of P₂O₅ as Super: P₀=0, P₁=25 and P₂=50 lb./ac.
(3) 3 levels of K₂O as Pot. Sul.: K₀=0, K₁=60 and K₂=120 lb./ac.

3. DESIGN:
(i) Fact. 3³ partially confd. (ii) (a) 3 blocks/replication; 9 plots/block. (b) N.A. (iii) 4. (iv) (a) 5'×40'. (b) 1/304 ac. (v) N.A. (vi) Yes.

4. GENERAL:
(i) and (ii) N.A. (iii) Grain yield. (iv) (a) 1942—1950. (b) No. (c) —. (v) (a) No. (b) Nil. (vi) and (vii) Nil.

5. RESULTS:
(i) 3521 lb./ac.
(ii) 666.0 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>
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<td>3521</td>
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</tbody>
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S.E. of any marginal mean = 11.1 lb./ac.
S.E. of body of table = 192.5 lb./ac.

Crop :-Paddy (Kharif).
Site :-Rice Res. Stn., Khudwani.

Object :-To study the effect of organic and inorganic manures individually and in mixture on Paddy crop.

1. BASAL CONDITIONS:
(i) (a) Paddy—Fallow—Paddy. (b) Fallow. (c) Nil. (ii) (a) Clayey loam. (b) N.A. (iii) 27.5.1948.
(iv) (a) N.A. (b) Broadcast. (c) N.A. (d) and (e) —. (v) Nil. (vi) China 972 (medium). (vii) Irrigated.
(viii) N.A. (ix) 8.01°. (x) 10.10.1948.

2. TREATMENTS:
All combinations of (1) and (2)+a control.
(1) 2 levels of N: N₁=30 and N₀=45 lb./ac.
(2) 3 sources of N: S₁=F.Y.M., S₉=A/S and S₂=F.Y.M.+A/S.
F.Y.M. applied on 20.5.1948 while A/S on 21.7.1948.

3. DESIGN:
(i) R.B.D. (ii) (a) 7. (b) N.A. (iii) 6. (iv) (a) 40'×5'. (b) 1/304 ac. (v) N.A. (vi) Yes.

Ref :-J K. 48(68).
Type :-'M'.
4. GENERAL:
(i) Fair to normal. No lodging. (ii) Nil. (iii) Grain yield. (iv) (a) 1942-1951. (b) No. (c) —. (v) (a) No. (b) Nil. (vi) and (vii) Nil.

5. RESULTS:
(i) 2266 lb./ac.
(ii) 292.8 lb./ac.
(iii) "Control vs. others effect" is highly significant and S effect is significant.
(iv) Av. yield of grain in lb./ac.

<table>
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<tr>
<th>Control</th>
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<td>2407</td>
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<tr>
<td>Mean</td>
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<td>2388</td>
<td>2524</td>
<td>2393</td>
</tr>
</tbody>
</table>

S.E. of marginal mean of S = 84.5 lb./ac.
S.E. of marginal mean of N = 69.0 lb./ac.
S.E. of body of table = 119.5 lb./ac.

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Crop:— Paddy ('Kharif').
Site:— Rice Res. Stn., Khudwani.

Object:— To study the effect of organic and inorganic manures individually and in mixture on Paddy crop.

1. BASAL CONDITIONS:
(i) (a) Paddy-Fallow-Paddy. (b) Fallow. (c) Nil. (ii) (a) Clay loam. (b) N.A. (iii) 21.5.1949. (iv) (a) N.A. (b) Broadcast. (c) N.A. (d) and (e) =. (v) Nil. (vi) China 972 (medium). (vii) Irrigated. (viii) N.A. (ix) 7.11'. (x) 2.10.1949.

2. TREATMENTS:
All combinations of (1) and (2)+a control.
(1) 2 levels of N: N1=30 and N2=45 lb./ac.
(2) 3 sources of N: S1=F.Y.M., S2=A/S and S3=F.Y.M.+A/S.

3. DESIGN:
(i) R.B.D. (ii) (a) 7. (b) N.A. (iii) 6. (iv) (a) 40'x5'. (b) 1/304 ac. (v) N.A. (vi) Yes.

4. GENERAL:
(i) Good. No lodging. (ii) Nil. (iii) Grain yield. (iv) (a) 1942-1951. (b) No. (c) =. (v) (a) No. (b) Nil. (vi) and (vii) Nil.

5. RESULTS:
(i) 3644 lb./ac.
(ii) 425.8 lb./ac.
(iii) None of the effects is significant.
(iv) Av. yield of grain in lb./ac.

<table>
<thead>
<tr>
<th>Control—3129 lb./ac.</th>
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</thead>
<tbody>
<tr>
<td>S1</td>
</tr>
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<td>N1</td>
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<td>N2</td>
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<td>Mean</td>
</tr>
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</table>

S.E. of marginal mean of S = 122.9 lb./ac.
S.E. of marginal mean of N = 100.4 lb./ac.
S.E. of body of table = 173.5 lb./ac.
Crop: Paddy (Kharif).
Site: Rice Res. Stn., Khudwani.

Ref: J.K. 50(104).
Type: ‘M’.

Object: To study the effect of organic and inorganic manures individually and in mixture on Paddy crop.

1. BASAL CONDITIONS:
   (i) (a) Paddy-Fallow-Paddy. (b) Fallow. (c) Nil. (ii) Clayey loam. (b) N.A. (iii) 23.5.1950. (iv) (a) N.A. (b) Broadcast. (c) 60 lb./ac. (d) and (e) —. (v) Nil. (vi) China 972 (medium). (vii) Irrigated. (viii) N.A. (ix) 17.55”. (x) 3.10.1950.

2. TREATMENTS:
   All combinations of (1) and (2) + a control.
   (1) 2 levels of N: N1 = 30 and N2 = 45 lb./ac.
   (2) 3 sources of N: S1 = F.Y.M., S2 = A/S and S3 = F.Y.M + A/S.

F.Y.M. applied on 11.5.1950.

3. DESIGN:
   (i) R.B.D. (ii) (a) 7. (b) N.A. (iii) 6. (iv) (a) 5’x40’’. (b) 1/303 ac. (v) N.A. (vi) Yes.

4. GENERAL:
   (i) Normal. (ii) Nil. (iii) Grain yield. (iv) (a) 1942—1951. (b) No. (c) —. (v) (a) No. (b) Nil. (vi) and (vii) Nil.

5. RESULTS:
   (i) 3110 lb./ac.
   (ii) 726.2 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>S2</th>
<th>S3</th>
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<td>N2</td>
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<td>3847</td>
<td>3290</td>
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<tr>
<td>Mean</td>
<td>2783</td>
<td>3170</td>
<td>3690</td>
<td>3214</td>
</tr>
</tbody>
</table>

S.E. of marginal mean of S = 299.6 lb./ac.
S.E. of marginal mean of N = 171.2 lb./ac.
S.E. of body of table = 296.5 lb./ac.
3. **DESIGN:**

(i) R.B.D.  (ii) 7.  (b) N.A.  (iii) 6.  (iv) (a) 5′×40′.  (b) 1/304 ac.  (v) N.A.  (vi) Yes.

4. **GENERAL:**

(i) N.A.  (ii) Nil.  (iii) Grain yield.  (iv) (a) 1948 to 1951.  (b) No.  (c) Nil.  (v) (a) No.  (b) Nil.  (vi) Nil.  (vii) Nil.

5. **RESULTS:**

(i) 2730 lb./ac.

(ii) 943.4 lb./ac.

(iii) Treatments are not significantly different.

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

Control =1967 lb./ac.

<table>
<thead>
<tr>
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<td>N2</td>
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<tr>
<td>Mean</td>
<td>2591</td>
<td>2910</td>
<td>3071</td>
<td>2857</td>
</tr>
</tbody>
</table>

S.E. of marginal mean of S =272.3 lb./ac.

S.E. of marginal mean of N =222.4 lb./ac.

S.E. of body of table =385.1 lb./ac.

Crop :- Paddy (Kharif).

Site :- Rice Res. Stn., Khudwani.

Ref :- J.K. 52(179)/51(130).

Type :- 'M'.

Object :- To study the residual effect of organic and inorganic manure applied to Paddy last year.

1. **BASAL CONDITIONS:**

(i) (a) Paddy-Fallow-Paddy.  (b) Fallow.  (c) Nil.  (ii) (a) Clayey loam.  (b) N.A.  (iii) 21.5.1952 to 20.6.1952.  (iv) (a) N.A.  (b) Transplanting.  (c) —.  (d) and (e) N.A.  (v) Nil.  (vi) China 972 (medium).  (vii) Irrigated.  (viii) N.A.  (ix) 8.55'.  (x) 5.10.1952.

2. **TREATMENTS:**

All combinations of (1; and ) + a control.

(1) 2 levels of N : N1=30 and N2=45 lb./ac.

(2) 3 sources of N : S1=F.Y.M, S2=A/S and S3=F.Y.M.+A/S in 1 : 1 ratio on N basis.

Manures applied to previous paddy crop in 1951.

3. **DESIGN:**

(i) R.B.D.  (ii) 7.  (b) N.A.  (iii) 6.  (iv) (a) 5′×40′.  (b) 1/304 ac.  (v) N.A.  (vi) Yes.

4. **GENERAL:**

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

5. **RESULTS:**

(i) 2814 lb./ac.

(ii) 417.9 lb./ac.

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

Control = 2584 lb./ac.

<table>
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<tr>
<th></th>
<th>S1</th>
<th>S2</th>
<th>S3</th>
<th>Mean</th>
</tr>
</thead>
<tbody>
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<td>2793</td>
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<td>2901</td>
<td>2913</td>
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</table>

S.E. of marginal mean of S = 120.6 lb./ac.
S.E. of marginal mean of N = 98.5 lb./ac.
S.E. of body of table = 170.6 lb./ac.

Crop :- Paddy (Khafir).
Site :- Rice Res. Stn., Khudwani.

Object :- To study the effect of various doses of F.Y.M. on yield of Paddy.

1. BASAL CONDITIONS:
   (i) (a) Paddy–Fallow–Paddy. (b) Fallow. (c) Nil. (ii) (a) Clayey loam. (b) N.A. (iii) 18.5.1948.
   (iv) (a) N.A. (b) Broadcast. (c) N.A. (d) and (e) Nil. (v) Nil. (vi) China-972 (medium). (vii) Irrigated.
   (viii) N.A. (ix) 8.01". (x) 16.10.1948.

2. TREATMENTS:
   1. 60 lb./ac. of N as F.Y.M.
   2. 75 lb./ac. of N as F.Y.M.
   3. 90 lb./ac. of N as F.Y.M.
   4. 105 lb./ac. of N as F.Y.M.
   5. 120 lb./ac. of N as F.Y.M.
   6. 135 lb./ac. of N as F.Y.M.
   7. 150 lb./ac. of N as F.Y.M.

3. DESIGN:
   (i) R.B.D. (ii) (a) 7. (b) N.A. (iii) 6. (iv) (a) 40' x 5'. (b) 1/358 ac. (v) N.A. (vi) Yes.

4. GENERAL:
   (i) N.A. (ii) Nil. (iii) Grain yield. (iv) (a) 1944–1951. (b) and (c) No. (v) (a) and (b) No. (vi) and
   (vii) Nil.

5. RESULTS:
   (i) 4260 lb./ac.
   (ii) 927.3 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>
<th>S.E./mean</th>
</tr>
</thead>
<tbody>
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<td>1.</td>
<td>3564</td>
<td>–378.6 lb./ac.</td>
</tr>
<tr>
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<td>3.</td>
<td>4058</td>
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<td>4.</td>
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<td>5.</td>
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<tr>
<td>7.</td>
<td>4771</td>
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</table>
Crop :- Paddy (Kharif).
Site :- Rice Res. Stn., Khudwani.
Object :- To study the effect of various doses of F.Y.M. on yield of Paddy.

1. BASAL CONDITIONS :
   (i) (a) Paddy—Fallow—Paddy. (b) Fallow. (c) Nil. (ii) (a) Clayey loam. (b) N.A. (iii) 14.5.1949, (iv) (a) N.A. (b) Broadcast. (c) N.A. (d) and (e) —. (v) Nil. (vi) China-972 (medium). (vii) Irrigated. (viii) N.A. (ix) 7.11°. (x) 29.9.1949.

2. TREATMENTS:
   1. 60 lb./ac. of N as F.Y.M.
   2. 75 lb./ac. of N as F.Y.M.
   3. 90 lb./ac. of N as F.Y.M.
   4. 105 lb./ac. of N as F.Y.M.
   5. 120 lb./ac. of N as F.Y.M.
   6. 135 lb./ac. of N as F.Y.M.
   7. 150 lb./ac. of N as F.Y.M.
Manures applied on 2.5.1949.

3. DESIGN:
   (i) R.B.D. (ii) (a) 7. (b) N.A. (iii) 6. (iv) (a) 5' x 40'. (b) 1/358 ac. (v) N.A. (vi) Yes.

4. GENERAL:
   (i) Good. No lodging. (ii) Nil. (iii) Grain yield. (iv) (a) 1944—1951. (b) and (c) No. (v) (a) and (b) No. (vi) and (vii) Nil.

5. RESULTS:
   (i) 4934 lb./ac.
   (ii) 337.4 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>
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<tbody>
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<td>1</td>
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<td>6</td>
<td>5161</td>
</tr>
<tr>
<td>7</td>
<td>5213</td>
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</tbody>
</table>
S.E./mean  = 826.6 lb./ac.
3. DESIGN:
(i) R.B.D. (ii) (a) 8. (b) N.A. (iii) 6. (iv) (a) 5'×40'. (b) 1/304 ac. (v) N.A. (vi) Yes.

4. GENERAL:
(i) Normal. Crop lodged. (ii) Nil. (iii) Grain yield. (iv) (a) 1944—1951. (b) No. (c)— (v) (a) No. (b) Nil. (vi) and (vii) Nil.

5. RESULTS:
(i) 2103 lb./ac.
(ii) 678.1 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>
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<td>1986</td>
</tr>
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<td>4.</td>
<td>2036</td>
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<td>5.</td>
<td>2153</td>
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<td>6.</td>
<td>2166</td>
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<td>2217</td>
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<td>8.</td>
<td>2394</td>
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<tr>
<td>S.E./mean</td>
<td>276.8 lb./ac.</td>
</tr>
</tbody>
</table>

Crop :- Paddy (Kharif).
Site :- Rice Res. Stn., Khudwani.

Ref :— J.K. 51 (131)
Type :- ‘M’.

Object :- To study the effect of various doses of F.Y.M. on yield of Paddy.

1. BASAL CONDITIONS:
(i) (a) Paddy-Fallow-Paddy. (b) Fallow. (c) Nil. (ii) (a) Clayey loam. (b) N.A. (iii) 28.5.1951.
(iv) (a) N.A. (b) Broadcast. (c) 60 lb./ac. (d) and (e)—. (v) Nil. (vi) China 972 (medium).
(vii) Irrigated. (viii) N.A. (ix) 9.06. (x) 19.10.1951.

2. TREATMENTS:
1. Control (no manure).
2. 60 lb./ac. of N as F.Y.M.
3. 75 lb./ac. of N as F.Y.M.
4. 90 lb./ac. of N as F.Y.M.
5. 105 lb./ac. of N as F.Y.M.
6. 120 lb./ac. of N as F.Y.M.
7. 135 lb./ac. of N as F.Y.M.
8. 150 lb./ac. of N as F.Y.M.
F.Y.M. applied on 13.5.1951.

3. DESIGN:
(i) R.B.D. (ii) (a) 8. (b) N.A. (iii) 6. (iv) (a) 5'×40'. (b) 1/304 ac. (v) N.A. (vi) Yes.

4. GENERAL:
(i) N.A. (ii) Nil. (iii) Grain yield. (iv) (a) 1944—1951. (b) No. (c) Nil. (v) (a) No. (b) Nil.
(vi) and (vii) Nil.

5. RESULTS:
(i) 1930 lb./ac.
(ii) 352.1 lb./ac.
(iii) Treatments are significantly different.
Crop :- Paddy (Kharif).

Site :- Rice Res. Stn., Khudwani.

Object :- To study the residual effect of varying doses of F.Y.M. applied to Paddy last year.

1. BASAL CONDITIONS:
   (i) (a) Paddy-Fallow-Paddy. (b) Fallow. (c) Nil. (ii) (a) Clay loam. (b) Nil. (iii) 21.5.1952/23.6.1952.
   (iv) (a) N.A. (b) Transplanting. (c)—. (d) and (e) N.A. (v) Nil. (vi) China 972 (medium.) (vii) Irrigated.
   (viii) N.A. (ix) 8.45'. (x) 11.10.1952.

2. TREATMENTS:
   1. Control (no manure).
   2. 60 lb./ac. of N as F.Y.M.
   3. 75 lb./ac. of N as F.Y.M.
   4. 90 lb./ac. of N as F.Y.M.
   5. 105 lb./ac. of N as F.Y.M.
   6. 120 lb./ac. of N as F.Y.M.
   7. 135 lb./ac. of N as F.Y.M.
   8. 150 lb./ac. of N as F.Y.M.
   F.Y.M. applied to paddy crop last year.

3. DESIGN:
   (i) R.B.D. (ii) (a) 8. (b) N.A. (iii) 6. (iv) (a) 5'X10'. (b) 1/304 ac. (v) N.A. (vi) Yes.

4. GENERAL:
   (i) N.A. (ii) N.A. (iii) Grain yield. (iv) (a) Not continued. (b) No. (c)—. (v) (a) No. (b) Nil. (vi) and (vii) Nil.

5. RESULTS
   (i) 1309 lb./ac.
   (ii) 379.0 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>1140</td>
</tr>
<tr>
<td>2.</td>
<td>1140</td>
</tr>
<tr>
<td>3.</td>
<td>1159</td>
</tr>
<tr>
<td>4.</td>
<td>1469</td>
</tr>
<tr>
<td>5.</td>
<td>1419</td>
</tr>
<tr>
<td>6.</td>
<td>1368</td>
</tr>
<tr>
<td>7.</td>
<td>1431</td>
</tr>
<tr>
<td>8.</td>
<td>1343</td>
</tr>
<tr>
<td>S.E./mean</td>
<td>= 154.7 lb./ac.</td>
</tr>
</tbody>
</table>
Crop: Paddy (Kharif).
Site: Rice Res. Stn., Khudwani.

Object: To test the efficacy of green manuring with Lentil with and without Super.

1. BASAL CONDITIONS:
(i) (a) Paddy-Fallow-Paddy. (b) Fallow and Lentil. (c) Nil. (ii) (a) Clayey loam. (b) N.A. (iii) 26.5.1948. (iv) (a) N.A. (b) Broadcast. (c) N.A. (d) and (e)—. (v) Nil. (vi) China 1007 (medium early). (vii) Irrigated. (viii) N.A. (ix) 8.01'X (x) 3.10.1948.

2. TREATMENTS:
All combinations of (1) and (2)
(1) 2 levels of P2O5 as Super: P0=0, P1=50 lb./ac.
(2) 3 levels of G.M.: G0=0, G1=Lentil ploughed as G.M. at 50 lb./ac. of N and G2=Lentil sown for seed and harvested.

3. DESIGN:
(i) Fact. in R.B.D. (ii) (a) 6. (b) N.A. (iii) 4. (iv) (a) 40'x16'. (b') 1/82 ac. (v) N.A. (vi) Yes.

4. GENERAL:
(i) N.A. (ii) Nil. (iii) Grain yield. (iv) (a) 1946—1951. (b) No. (c)—. (v) (a) No. (b) Nil. (vi) and (vii) Nil.

5. RESULTS:
(i) 2043 lb./ac.
(ii) 284.6 lb./ac.
(iii) Main effect of G alone is highly significant.
(iv) Av. yield of grain in lb./ac.

<table>
<thead>
<tr>
<th>G0</th>
<th>G1</th>
<th>G2</th>
<th>Mean</th>
</tr>
</thead>
<tbody>
<tr>
<td>1640</td>
<td>2563</td>
<td>1625</td>
<td>2009</td>
</tr>
<tr>
<td>1707</td>
<td>2675</td>
<td>1845</td>
<td>2076</td>
</tr>
<tr>
<td>Mean</td>
<td>1674</td>
<td>2619</td>
<td>1835</td>
</tr>
</tbody>
</table>

S.E. of marginal mean of P = 82.2 lb./ac.
S.E. of marginal mean of G = 100.6 lb./ac.
S.E. of body of table = 142.3 lb./ac.

Crop: Paddy (Kharif).
Site: Rice Res. Stn., Khudwani.

Object: To test the efficacy of green manuring with Lentil with and without Super.

1. BASAL CONDITIONS:
(i) (a) No. (b) Fallow and Lentil. (c) Nil. (ii) (a) Clayey loam. (b) N.A. (iii) 19.5.1949. (iv) (a) N.A. (b) Broadcast. (c) N.A. (d) and (e)—. (v) Nil. (vi) China 1007 (medium early). (vii) Irrigated. (viii) N.A. (ix) 7.11'X (x) 29.9.1949.

2. TREATMENTS:
All combinations of (1) and (2)
(1) 2 levels of P2O5 as Super: P0=0 and P1=50 lb./ac.
(2) 3 levels of green manure: G0=0, G1=Lentil ploughed as G.M. at 50 lb./ac. of N and G2=Lentil sown for seed and harvested. Lentil ploughed as G.M. on 8.5.1949 while Super on 4.7.1949.
3. DESIGN
(i) Fact. in R.B.D. (ii) 6. (b) N.A. (iii) 4. (a) 16′ x 40′. (b) 1/82 ac. (v) N.A. (vi) Yes.

4. GENERAL:
(i) Normal (ii) Nil. (iii) Grain yield. (iv) (a) 1946—1951. (b) No. (c)—. (v) (a) No, (b) Nil. (vi) and (vii) Nil.

5. RESULTS:
(i) 2902 lb./ac.
(ii) 1151.6 lb./ac.
(iii) Only G effect is highly significant.
(iv) Av. yield of grain in lb./ac.


<table>
<thead>
<tr>
<th></th>
<th>G₀</th>
<th>G₁</th>
<th>G₂</th>
<th>Mean</th>
</tr>
</thead>
<tbody>
<tr>
<td>P₀</td>
<td>2296</td>
<td>3547</td>
<td>2614</td>
<td>2819</td>
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<tr>
<td>P₁</td>
<td>2588</td>
<td>3700</td>
<td>2665</td>
<td>2984</td>
</tr>
<tr>
<td>Mean</td>
<td>2442</td>
<td>3624</td>
<td>2640</td>
<td>2902</td>
</tr>
</tbody>
</table>

S.E. of marginal mean of P = 332.4 lb./ac.
S.E. of marginal mean of G = 407.1 lb./ac.
S.E. of body of table = 575.8 lb./ac.

Crop :- Paddy (Kharif).
Site :- Rice Res. Stn., Khudwani.

Object :- To test the efficacy of green manuring with Lentil with and without Super.

1. BASAL CONDITIONS :
(i) (a) Paddy-Fallow-Paddy. (b) Fallow-Lentil. (c) Nil. (ii) (a) Clayey loam. (b) N.A. (iii) 24.5.1950.
(iv) (a) N.A. (b) Broadcast. (c) N.A. (d) and (e)—. (v) Nil. (vi) China 1007 (medium early). (vii) Irrigated. (viii) N.A. (ix) 17.5.3. (x) 1.10.1950.

2. TREATMENTS:
All combinations of (1) and (2)
(1) 2 levels of P₂O₅ as Super : P₀ = 0 and P₁ = 50 lb./ac.
(2) 3 levels of green manure : G₀ = 0, G₁ = Lentil ploughed as G.M. at 50 lb./ac. of N and G₂ = Lentil sown for seed and harvested.

3. DESIGN
(i) Fact. in R.B.D. (ii) 6. (b) N.A. (iii) 4. (iv) (a) 16′ x 40′. (b) 1/82 ac. (v) N.A. (vi) Yes.

4. GENERAL:
(i) Normal. (ii) Nil. (iii) Grain yield. (iv) (a) 1944—1951. (b) No. (c) No. (v) (a) No. (b) Nil. (vi) and (vii) Nil.

5. RESULTS
(i) 2611 lb./ac.
(ii) 337.1 lb./ac.
(iii) G effect and interaction P x G are highly significant, while P effect is significant.
Object:—To test the efficacy of green manuring with Lentil with and without Super.

1. BASAL CONDITIONS:
   (i) (a) Paddy—Fallow—Paddy, (b) As per treatments, (c) Nil, (ii) (a) Clayey loam, (b) N.A. (iii) 25.5.1951. (iv) (a) N.A. (b) Broadcast, (c) N.A. (d) and (e) —. (v) Nil. (vi) China 1007 (medium early). (vii) Irrigated. (viii) 9.06". (x) 15.10.1951.

2. TREATMENTS:
   All combinations of (1) and (2):
   (1) 2 levels of $P_0G_0$ as Super: $P_0=0$ and $P_1=50$ lb./ac.
   (2) 3 levels of green manure: $G_0=0$, $G_1=$Lentil ploughed as G.M. at 50 lb./ac. of N and $G_2=$Lentil sown for seed harvested.
   Lentil ploughed as G.M. on 18.5.1951 and Super applied on 7.5.1951.

3. DESIGN:
   (i) Fact. in R.B.D. (ii) (a) 6, (b) N.A. (iii) 4. (iv) (a) 16'x40'. (b) 1/82 ac. (v) N.A. (vi) Yes.

4. GENERAL:
   (i) N.A. (ii) Nil. (iii) Grain yield. (iv) (a) 1946—1951. (b) No. (c) Nil. (v) (a) No. (b) Nil. (vi) and (vii) Nil.

5. RESULTS:
   (i) 2080 lb./ac.
   (ii) 471.4 lb./ac.
   (iii) None of the effects is significant.
   (iv) Av. yield of grain in lb./ac.

<table>
<thead>
<tr>
<th></th>
<th>$G_0$</th>
<th>$G_1$</th>
<th>$G_2$</th>
<th>Mean</th>
</tr>
</thead>
<tbody>
<tr>
<td>$P_0$</td>
<td>1359</td>
<td>2281</td>
<td>2153</td>
<td>1931</td>
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<tr>
<td>$P_1$</td>
<td>2126</td>
<td>2349</td>
<td>2209</td>
<td>2228</td>
</tr>
<tr>
<td>Mean</td>
<td>1743</td>
<td>2315</td>
<td>2181</td>
<td>2080</td>
</tr>
</tbody>
</table>

S.E. of marginal mean of $P$ = 136.1 lb./ac.
S.E. of marginal mean of $G$ = 166.7 lb./ac.
S.E. of body of table = 235.7 lb./ac.
Object:—To study the residual effect of green manuring with and without Super.

1. BASAL CONDITIONS:
   (i) (a) Paddy—Fallow—Paddy. (b: Fallow. (c) Nil. (ii) (a) Clayey loam. (b) N.A. (iii) 20.5.1952 21.6.1952. (iv) (a) N.A. (b) Transplanting. (c) —. (d) and (e) N.A. (v) Nil. (vi) China 1007 (medium early). (vii) Irrigated. (viii) N.A. (ix) 8.45*. (x) 8.10.1952.

2. TREATMENTS:
   All combinations of (1) and (2)
   (1) 2 levels of \( \text{P}_2\text{O}_5 \) as Super : \( \text{P}_0 = 0 \) and \( \text{P}_1 = 50 \text{ lb./ac.} \)
   (2) 3 levels of green manure : \( G_0 = 0 \), \( G_1 = \) Lentil ploughed as G.M. at 50 lb./ac. of N and \( G_2 = \) Lentil sown for seed harvested.
   Lentil ploughed as G.M. on 18.5.1951 and Super on 7.5.1951 applied to paddy crop last year.

3. DESIGN:
   (i) Fact. in R.B.D. (ii) (a) 6. (b) N.A. (iii) 4. (iv) (a) 16'x40'. (b) 1/82 ac. (v) N.A. (vi) Yes.

4. GENERAL:
   (i) and (ii) N.A. (iii) Grain yield. (iv) (a) Not continued. (b) No. (c) —. (v) (a) No. (b) Nil. (vi) and (vii) Nil.

5. RESULTS:
   (i) 2086 lb./ac.
   (ii) 337.6 lb./ac.
   (iii) None of the effects is significant.
   (iv) Av. yield of grain in lb./ac.

   \[
   \begin{array}{ccc|c}
   & G_0 & G_1 & G_2 & \text{Mean} \\
   \hline
   \text{P}_0 & 2176 & 2255 & 2070 & 2167 \\
   \text{P}_1 & 2360 & 1981 & 1676 & 2006 \\
   \hline
   \text{Mean} & 2268 & 2118 & 1873 & 2086 \\
   \end{array}
   \]

   S.E. of marginal mean of \( P \) = 97.5 lb./ac.
   S.E. of marginal mean of \( G \) = 119.4 lb./ac.
   S.E. of body of table = 168.8 lb./ac.
3. Design:
(i) R.B.D. (ii) (a) 5. (b) N.A. (iii) 6. (iv) (a) and (b) 9' × 40'. (v) Nil. (vi) Yes.

4. General:

5. Results:
(i) 2393 lb./ac.
(ii) 466.6 lb./ac.
(iii) Treatments are significantly different.
(iv) Av. yield of grain in lb./ac.

<table>
<thead>
<tr>
<th>Treatment</th>
<th>Av. yield</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>1962</td>
</tr>
<tr>
<td>2.</td>
<td>2165</td>
</tr>
<tr>
<td>3.</td>
<td>2420</td>
</tr>
<tr>
<td>4.</td>
<td>2513</td>
</tr>
<tr>
<td>5.</td>
<td>2904</td>
</tr>
<tr>
<td>S.E./mean</td>
<td>= 189.4 lb./ac.</td>
</tr>
</tbody>
</table>

Crop: Paddy (Kharif).
Site: Rice Res. Stn., Khudwani.
Object: To study the effect of F.Y.M. applied alone and in combination with A/S on yield of Paddy.

1. Basal Conditions:
(i) (a) Paddy-Fallow-Paddy. (b) Fallow. (c) Nil. (iii) (a) Clayey loam. (b) N.A. (iii) 25.5.1951.
(iv) (a) N.A. (b) Broadcast. (c) N.A. (d) and (e)—. (v) Nil. (vi) China 1007 (medium early). (vii) Irrigated. (viii) N.A. (ix) 9.06". (x) 16.10.1951.

2. Treatments:
1. Control (no manure).
2. 100 lb./ac. of N as F.Y.M.
3. 100 lb./ac. of N as F.Y.M. + 15 lb./ac. of N as A/S.
4. 100 lb./ac. of N as F.Y.M. + 30 lb./ac. of N as A/S.
5. 100 lb./ac. of N as F.Y.M. + 45 lb./ac. of N as A/S. F.Y.M. applied on 12.5.1951. While A/S on 16.7.1951.

3. Design:
(i) R.B.D. (ii) (a) 5. (b) N.A. (ii) 6. (iv) (a) and (b) 9' × 40'. (v) Nil. (vi) Yes.

4. General:
(i) N.A. (ii) N.A. (iii) Grain yield. (iv) (a) 1950—1952. (b) Nil. (v) (a) No. (b) Nil. (vi) and (vii) Nil.

5. Results:
(i) 2114 lb./ac.
(ii) 681.5 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>1.</td>
<td>1567</td>
</tr>
<tr>
<td>2.</td>
<td>1810</td>
</tr>
<tr>
<td>3.</td>
<td>2202</td>
</tr>
<tr>
<td>4.</td>
<td>2425</td>
</tr>
<tr>
<td>5.</td>
<td>2567</td>
</tr>
<tr>
<td>S.E./mean</td>
<td>= 278.2 lb./ac.</td>
</tr>
</tbody>
</table>
Crop: Paddy (Kharif).
Site: Rice Res. Stn., Khudwani.
Ref: J.K. 52(181).
Type: ‘M’.
Object: To study the effect of F.Y.M. applied alone and in combination with A/S on yield of Paddy.

1. BASAL CONDITIONS:
   (i) (a) Paddy—Fallow—Paddy, (b) Fallow. (c) Nil. (ii) (a) Clayey loam. (b) Nil. (iii) 20.5.1952/20.6.1952. (iv) (a) N.A. (b) Transplanting. (c) —. (d) and (e) N.A. (v) Nil. (vi) China 107 (medium early). (vii) Irrigated. (viii) N.A. (ix) 8.45°. (x) 9.10.1952.

2. TREATMENTS:
   1. Control (no manure)
   2. 100 lb./ac. of N as F.Y.M.
   3. 100 lb./ac. of N as F.Y.M.+15 lb./ac. of N as A/S.
   4. 100 lb./ac. of N as F.Y.M.+30 lb./ac. of N as A/S.
   5. 100 lb./ac. of N as F.Y.M.+45 lb./ac. of N as A/S.

3. DESIGN:
   (i) R.B.D. (ii) (a) 5. (b) N.A. (iii) 6. (iv) (a) and (b) 9’x40’. (v) N.A. (vi) Yes.

4. GENERAL:
   (i) N.A. (ii) N.A. (iii) Grain yield. (iv) (a) 1950-1952. (b) No. (c) Nil. (v) (a) No. (b) Nil. (vi) and (vii) Nil.

5. RESULTS:
   (i) 2612 lb./ac.
   (ii) 722.5 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>1.</td>
<td>2332</td>
</tr>
<tr>
<td>2.</td>
<td>2274</td>
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<tr>
<td>3.</td>
<td>2848</td>
</tr>
<tr>
<td>4.</td>
<td>2768</td>
</tr>
<tr>
<td>5.</td>
<td>2768</td>
</tr>
<tr>
<td>S.E. mean</td>
<td>295.0 lb./ac</td>
</tr>
</tbody>
</table>

Crop: Paddy (Kharif).
Site: Rice Res. Stn., Khudwani.
Ref: J.K. 50(109).
Type: ‘M’.
Object: To study the effect of green manuring alone and in combination with N on Paddy.

1. BASAL CONDITIONS:
   (i) Paddy—Fallow—Paddy, (b) Lentil. (c) Nil. (ii) (a) Clayey loam. (b) N.A. (iii) 24.5.1950. (iv) (a) N.A. (b) Broadcast. (c) N.A. (d) and (e) —. (v) China 107 (medium early). (vi) Irrigated. (vii) Yes.

2. TREATMENTS:
   1. Control (no manure).
   2. Lentil as green manure at 100 lb./ac. of N.
   3. Lentil as green manure at 100 lb./ac. of N+15 lb./ac. of N as A/S.
   4. Lentil as green manure at 100 lb./ac. of N+30 lb./ac. of N as A/S.
   5. Lentil as green manure at 100 lb./ac. of N+45 lb./ac. of N as A/S.

   Lentil ploughed as green manure on 15.5.1950 and A/S applied on 15.7.1950.

3. DESIGN:
   (i) R.B.D. (ii) (a) 5. (b) N.A. (iii) 6. (iv) (a) and (b) 1/12 ac. (v) Nil. (vi) Yes.
4. GENERAL:
(i) N.A. (ii) Nil. (iii) Grain yield. (iv) (a) 1950-1951. (b) and (c) No. (v) (a) and (b) No. (vi) and (vii) Nil.

5. RESULTS:
(i) 1694 lb./ac.
(ii) 385.8 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>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>1375</td>
</tr>
<tr>
<td>2.</td>
<td>1557</td>
</tr>
<tr>
<td>3.</td>
<td>1695</td>
</tr>
<tr>
<td>4.</td>
<td>1799</td>
</tr>
<tr>
<td>5.</td>
<td>2046</td>
</tr>
</tbody>
</table>
S.E./mean = 157.5 lb./ac.

Crop: Paddy (Kharif).
Site: Rice Res. Stn., Khudwani.
Ref: J.K. 51 (134).
Type: 'M'.

Object: To study the effect of G.M. alone and in combination with N on Paddy.

1. BASAL CONDITIONS:
(i) (a) Paddy-Lentil-Paddy. (b) Lentil. (c) Nil. (ii) (a) Clayey loam. (b) N.A. (iii) 25.5.1951. (iv) (a) N.A. (b) Broadcast. (c) 60 at lb./ac. (d) and (e)—. (v) Nil. (vi) China 1007 (medium early). (vii) Irrigated. (viii) N.A. (ix) 9.06°. (x) 16.10.1951.

2. TREATMENTS:
1. Lentil as G.M. at 100 lb./ac. of N.
2. Lentil as G.M. at 100 lb./ac. of N+A/S at 15 lb./ac. of N.
3. Lentil as G.M. at 100 lb./ac. of N+A/S at 30 lb./ac. of N.
4. Lentil as G.M. at 100 lb./ac. of N+A/S at 45 lb./ac. of N.
5. No manure.
Lentil ploughed on 14.5.1951 and A/S applied on 16.7.1951.

3. DESIGN:
(i) R.B.D. (ii) (a) 5. (b) N.A. (iii) 6. (iv) (a) 9'x40'. (b) 9'x40'. (v) Nil. (vi) Yes.

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

5. RESULTS:
(i) 2096 lb./ac.
(ii) 258.7 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>1989</td>
</tr>
<tr>
<td>2.</td>
<td>2198</td>
</tr>
<tr>
<td>3.</td>
<td>2262</td>
</tr>
<tr>
<td>4.</td>
<td>2192</td>
</tr>
<tr>
<td>5.</td>
<td>1710</td>
</tr>
</tbody>
</table>
S.E./mean = 105.6 lb./ac.
Object:—To study the effect of G.M. alone and in combination with N on Paddy.

1. BASAL CONDITIONS:
   (i) (a) Paddy-Lentil-Paddy. (b) Lentil. (ii) (a) Clayey loam. (b) N.A. (iii) 20 and 22.5.1952
   (iv) (a) N.A. (b) Broadcast. (c) —. (d) and (e) N.A. (v) Nil. (vi) China 1007 (medium early), (vi)
   Irrigated. (vii) N.A. (ix) 8.45”. (x) 9.10.1952.

2. TREATMENTS:
   1. Lentil as G.M. at 100 lb./ac. of N.
   2. Lentil as G.M. at 100 lb./ac. of N+A/S at 15 lb./ac. of N.
   3. Lentil as G.M. at 1:0 lb./ac. of N+A/S at 30 lb./ac. of N.
   4. Lentil as G.M. at 100 lb./ac. of N+A/S at 45 lb./ac. of N.
   5. Control.

3. DESIGN:
   (i) R.B. D. (ii) (a) 5. (b) N.A. (iii) 6. (iv) (a) 9’×43’. (b) 9’×40’. (v) Nil. (vi) Yes.

4. GENERAL:
   (i) N.A. (ii) N.A. (iii) Grain yield. (iv) (a) 1950 to 1952. (b) No. (c) —. (v) (a) No. (vi)
   and (vii) Nil.

5. RESULTS:
   (i) 1774 lb./ac.
   (ii) 475.4 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>
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<td>2</td>
<td>1785</td>
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<td>3</td>
<td>1674</td>
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<tr>
<td>4</td>
<td>2168</td>
</tr>
<tr>
<td>5</td>
<td>1578</td>
</tr>
<tr>
<td>S.E./mean</td>
<td>194.1 lb./ac.</td>
</tr>
</tbody>
</table>

Object:—To study the effect of A/S and C/N with and without lime on yield of Paddy.

1. BASAL CONDITIONS:
   (i) (a) Paddy-Fallow-Paddy. (b) Fallow. (c) Nil. (ii) (a) Clayey loam. (b) N.A. (iii) 2.5.1953 to 6.6.1953
   (iv) (a) N.A. (b) Transplanted. (c) —. (d) and (e) N.A. (v) Nil. (vi) China 1039 (medium early). (vii)

2. TREATMENTS:
   All combinations of (1) and (2)
   (1) 2 levels of lime : L0 = No lime and L1 = Lime at 2CO lb./ac.
   (2) 5 applications of N : M0 = Control, M1 = A/S at 20 lb./ac. of N, M2 = A/S at 40 lb./ac. of N, M3 = C/N at 20 lb./ac. of N and M4 = C/N at 40 lb./ac. of N.

3. DESIGN:
   (i) 2 x 5 Fact. in R.B.D. (ii) (a) 10. (b) N.A. (iii) 6. (iv) (a) 5’×43’. (b) 1/304 ac. (v) N.A. (vi) Yes
4. GENERAL:
(i) N.A.  (ii) N.A.  (iii) Grain yield.  (iv) 1953--continued.  (b) No.  (c) --.  (v) (a) Shalimar.  (b) Nil.  (vi) and (vii) Nil.

5. RESULTS:
(i) 2850 lb./ac.
(ii) 1676.5 lb./ac.
(iii) None of the effects is significant.
(iv) Av. yield of grain in lb./ac.

<table>
<thead>
<tr>
<th></th>
<th>L₀</th>
<th>L₁</th>
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<td>3091</td>
</tr>
<tr>
<td>Mean</td>
<td>2751</td>
<td>2949</td>
<td>2850</td>
</tr>
</tbody>
</table>

S.E. of marginal mean of $M$ = 484.0 lb./ac.
S.E. of marginal mean of $L$ = 306.1 lb./ac.
S.E. of body of table = 684.4 lb./ac.

Crop: Paddy (Kharij).
Site: Rice Res. Stn., Khudwani.
Object: To study the effect of varying doses of N in the form of Oilcake.

1. BASAL CONDITIONS:
(i) (a) Paddy Fallow-Paddy.  (b) Fallow.  (c) Nil.  (ii) (a) Clayey loam.  (b) N.A.  (iii) 23.5.1948.  (iv)
(a) N.A.  (b) Broadcast.  (c) N.A.  (d) and (e) --.  (v) Nil.  (vi) China 972 (medium).  (vii) Irrigated.
(viii) N.A.  (ix) 8.01".  (x) 19.10.1948.

2. TREATMENTS:
1. Control (no manure).
2. 20 lb./ac. of N as oilcake.
3. 40 lb./ac. of N as oilcake.
4. 60 lb./ac. of N as oilcake.
Oilcake applied on 3.7.1948.

3. DESIGN:
(i) R.B.D.  (ii) (a) 4.  (b) N.A.  (iii) 6.  (iv) (a) 40'X4'.  (b) 1/382 ac.  (v) N.A.  (vi) Yes.

4. GENERAL:
(i) N.A.  (ii) Nil.  (iii) Grain yield.  (iv) (a) 1944 to 1948.  (b) No.  (c) --.  (v) (a) No.  (b) Nil.  (vi)
and (vii) Nil.

5. RESULTS:
(i) 2677 lb./ac.
(ii) 307.1 lb./ac.
(iii) Treatments are highly significantly different.
Crop: Paddy (Kharif)  
Site: Rice Res. Stn., Khudwani.  
Ref: J.K. 49(5)/49(70).  
Type: 'M'.

Object: To study the residual effect of varying doses of N in the form of Oilcake.

1. BASAL CONDITIONS:
   (i) (a) Paddy-Fallow-Paddy. (b) Fallow. (c) Nil. (ii) (a) Clayey loam. (b) N.A. (iii) 15.4.1949.
   (iv) (a) N.A. (b) Broadcast. (c) N.A. (d) and (e) —. (v) Nil. (vi) China 972 (medium). (vii) Irrigated.
   (viii) N.A. (ix) 7.11. (x) 29.9.1949.

2. TREATMENTS:
   1. Control (no manure)
   2. 20 lb./ac. of N as oilcake.
   3. 40 lb./ac. of N as oilcake.
   4. 60 lb./ac. of N as oilcake.

   Manures applied in 1948.

3. DESIGN:
   (i) R.B.D. (ii) (a) 4. (b) N.A. (iii) 6. (iv) (a) 4'×40', (b) 1/382 ac. (v) N.A. (vi) Yes.

4. GENERAL:
   (i) Normal. No lodging. (ii) No. (iii) Grain yield. (iv) (a) 1949-1950. (b) Yes. (c)—. (v) (a) No. (b) Nil.
   (vi) Yes and (vii) Nil.

5. RESULTS:
   (i) 3745 lb./ac.
   (ii) 766.9 lb./ac.
   (iii) Treatments are not significantly different.
   (iv) Av. yield of grain in lb./ac.
   Treatment | Av. yield  
-------------|----------
1.          | 3243     
2.          | 3557     
3.          | 4031     
4.          | 4154     
S.E./mean  | 313.1 lb./ac.

Crop: Paddy (Kharif).  
Site: Rice Res. Stn., Khudwani.  
Ref: J.K. 50(105)/49(95)/48(70).  
Type: 'M'.

Object: To study the residual effect of varying doses of N in the form of Oilcake.

1. BASAL CONDITIONS:
   (i) (a) Paddy-Fallow-Paddy. (b) Fallow. (c) Nil. (ii) (a) Clayey loam. (b) N.A. (iii) 21.5.1950.
   (iv) (a) N.A. (b) Broadcast. (c) 60 lb./ac. (d) and (e) —. (v) 'Nil. (vi) China 972 (medium). (vii) Irrigated.
   (viii) N.A. (ix) 17.53. (x) 2.10.1950.
2. TREATMENTS:

1. Control (no manure).
2. 20 lb./ac. of N as oilcake.
3. 40 lb./ac. of N as oilcake.
4. 60 lb./ac. of N as oilcake.

Applied to the crop in 1949.

3. DESIGN:

(i) R.B.D. (ii) (a) 4, (b) N.A. (iii) 6. (iv) (a) 4'×40', (b) 1/332 ac., (v) N.A. (vi) Yes.

4. GENERAL:

(i) Normal. (ii) Nil. (iii) Grain yield. (iv) 1949-1950. (b) Yes. (c)—, (v) (a) No. (b) Nil. (vi) and
(vii) Nil.

5. RESULTS:

(i) 2672 lb./ac.
(ii) 653.9 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>2583</td>
</tr>
<tr>
<td>2.</td>
<td>2635</td>
</tr>
<tr>
<td>3.</td>
<td>2594</td>
</tr>
<tr>
<td>4.</td>
<td>2877</td>
</tr>
<tr>
<td>S.E./mean</td>
<td>266.9 lb./ac.</td>
</tr>
</tbody>
</table>

Crop: Paddy (Kharif).
Site: Rice Res. Stn., Khudwani.
Ref: J.K. 48(69).
Type: ‘M’.

Object: To compare the effect of different manures at two levels of N applied to Paddy.

1. BASAL CONDITIONS:

(i) (a) Paddy-Fallow-Paddy. (b) Fallow. (c) Nil. (ii) (a), Clayey loam. (b) N.A. (iii) 23.5.1948. (iv) (a) and (b) N.A. (c) Broadcast. (d) and (e)—, (v) Nil. (vi) China 972 (medium). (vii) Irrigated. (viii) N.A. (ix) 8.01". (x) 10.10.1948.

2. TREATMENTS:

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

(1) 2 levels of N: N_{1}=75 and N_{2}=90 lb./ac.
(2) 5 sources of N: S_{1}=F.Y.M., S_{2}=A/S, S_{3}=Lentil (G.M.), S_{4}=Oilcake and S_{5}=F.Y.M.+A/S.

3. DESIGN:

(i) R.B.D. (ii) (a) 11. (b) N.A. (iii) 4. (iv) (a) 40'×5', (b) 1/304 ac. (v) N.A. (vi) Yes.

4. GENERAL:

(i) N.A. (ii) Nil. (iii) Grain yield. (iv) (a) 1948-1949. (b) Yes. (c)—, (v) (a) No. (b) Nil. (vi) and (vii) Nil.

5. RESULTS:

(i) 1642 lb./ac.
(ii) 341.3 lb./ac.
(iii) Effect of sources and interaction source × level are significant. Effect of N is not significant.
(v) 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>
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<tr>
<td>N₂</td>
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<td>1235</td>
<td>2204</td>
<td>1416</td>
<td>1805</td>
<td>1750</td>
</tr>
<tr>
<td>Mean</td>
<td>1938</td>
<td>1264</td>
<td>2138</td>
<td>1401</td>
<td>1643</td>
<td>1677</td>
</tr>
</tbody>
</table>

S.E. of marginal mean of S  
S.E. of marginal mean of N  
S.E. of body of table  
S.E. of “control vs other” treatment means  

---

Crop: Paddy (Kharij).  
Site: Rice Res. Stn., Khudwani.  
Type: 'M'.  
Ref: J.K. 48(94)/48(69).

Object: To compare the residual effect of different manures at two levels of N.

1. BASAL CONDITIONS:
   (i) (a) Paddy-Fallow-Paddy.  (b) Fallow.  (c) Nil.  (ii) (a) Clayey loam.  (b) N.A.  (iii) 18.5.1949.  (iv) (a) and (b) N.A.  (c) Broadcast.  (d) and (e) → (v) Nil.  (vi) China 972 (medium).  (vii) Irrigated.  (viii) N.A.  (ix) 7.11°.  (x) 1.10.1949.

2. TREATMENTS:
   All combinations of (1) and (2) + a control.
   (1) 2 levels of N: N₁ = 75 and N₂ = 90 lb./ac.
   (2) 5 sources of N: S₁ = F.Y.M., S₂ = S/S, S₃ = Lentil (G.M.), S₄ = Oilcake and S₅ = F.Y.M. + A/S.

3. DESIGN:
   (i) R.B.D.  (ii) 11.  (b) N.A.  (iii) 4.  (iv) (a) 4C' x 5'.  (b) 1/304 ac.  (v) N.A.  (vi) Yes.

4. GENERAL:
   (i) Good.  No lodging.  (ii) Nil.  (iii) Grain yield.  (iv) (a) 1948-1949.  (b) Yes.  (c) → (v) (a) No.  (b) Nil.  (vi) and (vii) Nil.

5. RESULTS:
   (i) 3452 lb./ac.  
   (ii) 663.7 lb./ac.  
   (iii) None of the effects is significant.  
   (iv) Av. yield of grain in lb./ac.

Control = 3292 lb./ac.  

<table>
<thead>
<tr>
<th></th>
<th>S₁</th>
<th>S₂</th>
<th>S₃</th>
<th>S₄</th>
<th>S₅</th>
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<tr>
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<td>3976</td>
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<td>3510</td>
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<td>3085</td>
<td>3793</td>
<td>3392</td>
<td>3489</td>
<td>3468</td>
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</tbody>
</table>

S.E. of marginal mean of S  
S.E. of marginal mean of N  
S.E. of body of table  
S.E. of “control vs other” treatment means  

---
Crop : Paddy (Kharij).
Site : Prov.-Agri. Farm, Shalimar.

Ref : J.K. 53(281).
Type : M'.

Object : To study the effect of A/S and C/N on yield of Paddy with and without lime.

1. BASAL CONDITIONS :
(i) (a) Paddy—Fallow—Paddy, (b) Fallow. (c) Nil. (ii) (a) Clayey loam. (b) N.A. (iii) 2.5.1953/6.6.1953. (iv) (a) N.A. (b) Transplanted. (c) —. (d) and (e) N.A. (v) Nil. (vi) China 1039 (medium), (vii) Irrig. ted. (viii) N.A. (ix) 7.63'. (x) 11.9.1953.

2. TREATMENTS :
All combinations of (1) and (2)
(1) 2 levels of lime : L0 = 0 and L1 = 200 lb./ac.
(2) 5 applications 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) Fact. in R.B.D. (ii) (a) 10. (b) N.A. (iii) 6. (iv) (a) N.A. (b) 1/311 ac. (v) Nil. (vi) Yes.

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

5. RESULTS :
(i) 3273 lb./ac.
(ii) 682.6 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>
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<td>3316</td>
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<td>3153</td>
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<td>3273</td>
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</table>

S.E. of marginal mean of L = 124.6 lb./ac.
S.E. of marginal mean of N = 197.0 lb./ac.
S.E. of body of table = 278.7 lb./ac.

---

Crop :— Paddy (Kharij).
Site : Rice Res. Stn., Khudwani.

Ref : J.K. 53(259).
Type :-'MV'.

Object :—To study the effect of A/S and F.Y.M. on yield of different varieties of Paddy.

1. BASAL CONDITIONS :
(i) (a) Paddy—Fallow—Paddy, (b) Fallow. (c) Nil. (ii) (a) Clayey loam. (b) N.A. (iii) 2.5.1953/7.6.1953. (iv) (a) N.A. (b) Transplanted. (c) —. (d) and (e) N.A. (v) Nil. (vi) As per treatments. (vii) Irrigated. (viii) N.A. (ix) 7.63'. (x) 21.9.1953.

2. TREATMENTS :
Main-plot treatments :
2 varieties : V1 = China 1039 and V2 = Budge local.
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. of N.
(2) 4 applications of F.Y.M. : F1 = Pitted F.Y.M. at 125 md./ac., F2 = Pitted F.Y.M. at 250 md./ac., F3 = Exposed F.Y.M. at 125 md./ac. and F4 = Exposed F.Y.M. at 250 md./ac.
3. DESIGN
(i) Split-plot. (ii) (a) 2 main-plots/block; 16 sub-plots/main-plot. (b) N.A. (iii) 3. (iv) (a) 50' x 4'. (b) 1/304 ac. (v) N.A. (vi) Yes.

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

5. RESULTS:
(i) 5084 lb./ac.
(ii) (a) 718.1 lb./ac. (b) 608.5 lb./ac.
(iii) Varieties are highly significantly different. F.Y.M. as well as N effects are highly significant while others are not significant.
(iv) Av. yield of grain in lb./ac.

<table>
<thead>
<tr>
<th></th>
<th>F1</th>
<th>F2</th>
<th>F3</th>
<th>F4</th>
<th>Mean</th>
<th>N9</th>
<th>N1</th>
<th>N2</th>
<th>N3</th>
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</thead>
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<td>6198</td>
<td>5630</td>
<td>4244</td>
<td>5518</td>
<td>5941</td>
<td>6817</td>
</tr>
<tr>
<td>V2</td>
<td>4104</td>
<td>5397</td>
<td>3856</td>
<td>4798</td>
<td>4539</td>
<td>4104</td>
<td>4309</td>
<td>5013</td>
<td>5729</td>
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<tr>
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<td>5874</td>
<td>4530</td>
<td>5498</td>
<td>5084</td>
<td>3674</td>
<td>4914</td>
<td>5477</td>
<td>6273</td>
</tr>
</tbody>
</table>

S.E. of difference of two
1. Marginal means of V = 146.6 lb./ac.
2. Marginal means of N = 175.6 lb./ac.
3. N or F means at the same level of V = 284.4 lb./ac.
4. V means at the same level of N or F = 260.3 lb./ac.
5. S.E. of body of N x F table = 248.5 lb./ac.

Crop: Paddy (Kharif).
Site: Prov. Agri. Farm, Shalimar.
Ref: J. K. 53(262).
Type: 'MV'.

Object: To study the effect of A/S and Super on yield of different varieties of Paddy.

1. BASAL CONDITIONS:
(i) (a) Paddy-Fallow-Paddy. (b) Paddy. (c) Nil. (ii) (a) Clay loam. (b) N.A. (iii) 2.3.1953/6.6.1953.
(iv) (a) N.A. (b) Transplanted. (c) —. (d) and (e) N.A. (v) Nil. (vi) As per treatments. (vii) Irrigated. (viii) N.A. (ix) 7.63'. (x) 6.9.1953.

2. TREATMENTS:
All combinations of (1), (2) and (3)
(1) 3 varieties: V1=China 14 39, V2=Begum and V3=Lulzan.
(2) 3 levels of N as A/S: N0=0, N1=30 and N2=60 lb./ac.
(3) 3 levels of P2O5 as Super: P0=0, P1=30 and P3=60 lb./ac.

3. DESIGN:
(i) 3² Fact. Confd. (ii) (a) 3 blocks/replication; 9 plots/block. (b) N.A. (iii) 2. (iv) (a) 5' x 30'. (b) 5' x 28'. (v) N.A. (vi) Yes.
4. GENERAL:
(i) N.A. (ii) N.A. (iii) Grain yield. (iv) (a) 1953—continued. (b) No. (c) —. (v) (a) No. (b) Nil. (vi) and (vii) Nil.

5. RESULTS:
(i) 3079 lb/ac.
(ii) 698.4 lb/ac.
(iii) Only N effect is significant.
(iv) Av. yield of grain in lb./ac.

<table>
<thead>
<tr>
<th></th>
<th>V1</th>
<th>V2</th>
<th>V3</th>
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S.E. of any marginal mean = 164.4 lb/ac.
S.E. of body of any table = 285.2 lb/ac.

Crop : Paddy (Kharij).
Site : Prov. Agri. Farm, Shalimar.
Ref : J.K. 53(263).
Type : 'MV'.

Object :—To study the effect of A/S and F.Y.M. on yield of different varieties of Paddy.

1. BASAL CONDITIONS:
(i) (a) Paddy-Fallow-Paddy. (b) Fallow. (c) Nil. (ii) (a) Clayey loam. (b) N.A. (iii) 2.5.1953/7.6.1953.
(iv) (a) N.A. (b) Transplanted. (c) —. (d) 9"x9". (e) 4. (v) N.A. (vi) As per treatments. (vii) Irrigated. (viii) N.A. (ix) 7.63. (x) 12.9.1953.

2. TREATMENTS:
Main-plot treatments:
2 varieties : V1=China 1039 and V2=Begum barmati 370.
Sub-plot treatment:
All combinations of (1) and (2)
(1) 4 levels of N : N0=0, N1=20, N2=40 and N3=60 lb./ac.
(2) 4 doses of F.Y.M. : F1=125 md./ac. as pitted F.Y.M., F2=250 md./ac. as pitted F.Y.M., F3=125 md./ac. as exposed F.Y.M. and F4=250 md./ac. as exposed F.Y.M.
F.Y.M. applied on 3.6.1953 while N as A/S applied on 25.5.1953.

3. DESIGN:
(i) Split-plot. (ii) (a) 2 main-plots/block : 16 sub-plots/main-plot. (b) N.A. (iii) 3. (iv) (a) 5'x30', (b) 5'x30', (v) Nil. (vi) Yes.

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

(i) 2614 lb./ac.
(ii) (a) 1213.1 lb./ac.
(b) 540.2 lb./ac.
(iii) F effect is significant, N effect is highly significant while others are not significant.
(iv) Av. yield of grain in lb./ac.

<table>
<thead>
<tr>
<th></th>
<th>F_1</th>
<th>F_2</th>
<th>F_3</th>
<th>F_4</th>
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<th>V_2</th>
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<td>2508</td>
<td>2110</td>
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</table>

S.E. of difference of two
1. Marginal means of V = 247.6 lb./ac.
2. Marginal means of N or F = 156.0 lb./ac.
3. Means in the body of N x F table = 311.9 lb./ac.
4. N or F means at the same level of V = 220.5 lb./ac.
5. V means at the same level of N or F = 312.7 lb./ac.

Crop :- Paddy (Kharif).
Site :- Agri. Farm, Kawa.
Object :- To study the effect of cultural practices on yield of Paddy.

Ref :- J.K. 52(178).
Type :- ‘C’.

1. BASAL CONDITIONS:

(i) (a) Nil. (b) Fallow. (c) Nil. (ii) (a) Clayey. (b) N.A. (iii) 1.6.1952/11.7.1952. (iv) (a) N.A. (b) Transplanted. (c) —. (d) and (e) As per treatments. (v) Nil. (vi) China 1007 (medium). (vii) Irrigated. (viii) 2-3 hoeings. (ix) N.A. (x) 22.10.1952.

2. TREATMENTS:

All combinations of (1) and (2)
(1) Plant to plant spacings : D_1 = 3", D_2 = 6" and D_3 = 9".
(2) Seedlings/hole: S_1 = 2, S_2 = 4 and S_3 = 6 seedlings/hole.

3. DESIGN:

(i) Fact. in R.B.D. (ii) (a) 9. (b) N.A. (iii) 3. (iv) (a) and (b) 3' x 24'. (v) Nil. (vi) Yes.

4. GENERAL:

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

5. RESULTS:

(i) 3585 lb./ac.
(ii) 1049.5 lb./ac.
(iii) Only S effect is significant.
(iv) Av. yield of grain in lb./ac.

<table>
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<tr>
<th></th>
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<th>S3</th>
<th>Mean</th>
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<td>D3</td>
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<td>3764</td>
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</table>

Mean: 4436
S.E. of any marginal mean = 349.8 lb./ac.
S.E. of body of table = 605.9 lb./ac.

Crop: Paddy (Kharif).
Site: Rice Res. Stn., Khudwani.
Ref: J.K. 48(72).
Type: 'C'.

Object: To test the efficacy of different cultural treatments after first weeding.

1. BASAL CONDITIONS:
   (i) (a) Paddy—Fallow—Paddy. (b) Fallow. (c) Nil. 
   (ii) (a) Clayey loam. (b) N.A. 
   (iii) 25.5.1948. 
   (iv) (a) N.A. (b) Broadcast. (c) N.A. 
   (v) Nil. 
   (vi) China 972 (medium). 
   (vii) Irrigated. 
   (viii) Weeding on 29.6.1948. 
   (ix) 8.01°. 
   (x) 15.10.1948.

2. TREATMENTS:
   1. Reji (ploughing with local plough without iron tip) after 1st weeding.
   2. Cattle treading after 1st weeding.
   3. No treatment after 1st weeding.

3. DESIGN:
   (i) R.B.D. 
   (ii) 3. 
   (b) N.A. 
   (iii) 6. 
   (iv) (a) 40' x 10'. 
   (b) 1/143 ac. 
   (v) N.A. 
   (vi) Yes.

4. GENERAL:
   (i) N.A. 
   (ii) Nil. 
   (iii) Grain yield. 
   (iv) (a) 1947—1948. 
   (b) and (c) No. 
   (v) (a) and (b) No. 
   (vi) and (vii) Nil.

5. RESULTS:
   (i) 1927 lb./ac.
   (ii) 145.3 lb./ac.
   (iii) Treatments are highly significantly different.
   (iv) Av. yield of grain in lb./ac.
   Treatment     Av. yield
   1.            2130
   2.            2053
   3.            1997
   S.E./mean     59.3 lb./ac.

Crop: Paddy (Kharif).
Site: Rice Res. Stn., Khudwani.
Ref: J.K. 49(97).
Type: 'C'.

Object: To test the efficacy of different cultural treatments after first weeding.

1. BASAL CONDITIONS:
   (i) (a) Paddy—Fallow—Paddy. (b) Fallow. (c) Nil. 
   (ii) (a) Clayey loam. (b) N.A. 
   (iii) 21.5.1949. 
   (iv) (a) N.A. (b) Broadcast. (c) N.A. 
   (d) and (e) .—. (v) Nil. 
   (vi) China 972 (medium). 
   (vii) Irrigated. 
   (ix) 7.11°. 
   (x) 4.10.1949.
2. TREATMENTS:
1. Heji (ploughing with local plough without iron tip) after 1st weeding.
2. Cattle treading after 1st weeding.
3. No treatment after 1st weeding.

3. DESIGN:
(i) R.B.D. (ii) (a) 3. (b) N.A. (iii) 6. (iv) (a) 40' x 10'. (v) 1/143 ac. (v) N.A. (vi) Yes.

4. GENERAL:
(i) Normal. No lodging. (ii) Nil. (iii) Grain yield. (iv) (a) 1947—1949. (b) No. (c) —. (v) (a) No. (b) Nil. (vi) and (vii) Nil.

5. RESULTS:
(i) 3683 lb./ac.
(ii) 219.5 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>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
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<tr>
<td>2.</td>
<td>4092</td>
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<tr>
<td>3.</td>
<td>2848</td>
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<tr>
<td>S.E./mean</td>
<td>= 89.6 lb./ac.</td>
</tr>
</tbody>
</table>

---

Crop: Paddy (Kharif).

Object: To test the efficiency of different treatments after weeding over the control.

1. BASAL CONDITIONS:
(i) (a) to (c) N.A. (ii) (a) Clayey loam. (b) N.A. (iii) 16.5.1949. (iv) (a) N.A. (b) Broadcast. (c) N.A. (d) and (e) —. (v) Nil. (vi) China 972 (medium). (vii) Irrigated. (viii) N.A. (ix) 7.11'. (x) 2.10.1949.

2. TREATMENTS:
1. Paddy after oilseed crop (rape).
2. Paddy after Fallow (ploughing in autumn).
3. Paddy after Fallow (no cultivation in winter).
4. Paddy after Lentil (green manure).

3. DESIGN:
(i) R.B.D. (ii) (a) 4. (b) N.A. (iii) 6. (iv) (a) 8' x 50'. (b) 1/110 ac. (v) N.A. (vi) Yes.

4. GENERAL:
(i) Normal. No lodging. (ii) Nil. (iii) Grain yield. (iv) (a) Not continued. (b) No. (c) —. (v) (a) No. (b) Nil. (vi) and (vii) Nil.

5. RESULTS
(i) 3233 lb./ac.
(ii) 255.0 lb./ac.
(iii) Treatments are not significantly different.
(iv) Av. yield of grain in lb./ac.

<table>
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<tr>
<th>Treatment</th>
<th>Av. yield</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
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<tr>
<td>2.</td>
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<tr>
<td>3.</td>
<td>3187</td>
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<tr>
<td>4.</td>
<td>3344</td>
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<tr>
<td>S.E./mean</td>
<td>= 104.1 lb./ac.</td>
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</table>
Object:—To study the effect of different spacings and seedlings/hill on yield of Paddy.

1. BASAL CONDITIONS:
   (i) (a) Nil. (b) Fallow. (c) Nil. (ii) (a) Sandy loam. (b) N.A. (iii) 10.7.1952. (iv) (a) N.A.
   (b) Transplanted. (c) As per treatments. (d) and (e) As per treatments. (v) Nil. (vi) Basmati 370 (medium).
   (vii) Irrigated. (viii) N.A. (ix) N.A. (x) 27.10.1952.

2. TREATMENTS:
   - All combinations of (1) and (2)
     (1) Seedlings/hill: S_1 = 2, S_2 = 4, S_3 = 6 and S_4 = 8 seedlings/hill.
     (2) 3 plant to plant spacings: D_1 = 3", D_2 = 6" and D_3 = 9".

3. DESIGN:
   (i) Fact. in R.B.D. (ii) (a) 12. (b) N.A. (iii) 4. (iv) (a) 5' x 35'. (b) 5' x 35'. (v) Nil. (vi) Yes.

4. GENERAL:
   (i) N.A. (ii) N.A. (iii) Grain yield. (iv) (a) Not continued. (b) No. (c) Nil. (v) (a) No. (b) Nil.
   (vi) and (vii) Nil.

5. RESULTS:
   (i) 1064 lb./ac.
   (ii) 133.2 lb./ac.
   (iii) Only S \times D interaction is highly significant.
   (iv) Av. yield of grain in lb./ac.

<table>
<thead>
<tr>
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<tr>
<td>S_4</td>
<td>1105</td>
<td>1073</td>
<td>1011</td>
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</table>

Mean = 1064

S.E. of marginal mean of S = 38.4 lb./ac.
S.E. of marginal mean of D = 33.3 lb./ac.
S.E. of body of table = 66.6 lb./ac.
3. DESIGN:
(i) Fact. in R.B.D. (ii) (a) 12. (b) N.A. (iii) 4. (iv) (a) 32'×5.5'. (b) 1/312 ac. (v) N.A. (vi) Yes.

4. GENERAL:
(i) N.A. (ii) Nil. (iii) Grain yield. (iv) (a) 1947 to 1951. (b) No. (c)—. (v) (a) No. (b) Nil. (vi) and (vii) Nil.

5. RESULTS:
(i) 1798 lb./ac. (ii) 615.8 lb./ac. (iii) Only M effect is highly significant. (iv) Av. yield of grain in lb./ac.

<table>
<thead>
<tr>
<th></th>
<th>M₁</th>
<th>M₂</th>
<th>M₃</th>
<th>M₄</th>
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<td>1312</td>
<td>1970</td>
<td>1585</td>
<td>1395</td>
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S.E. of marginal mean of V =125.7 lb./ac.
S.E. of marginal mean of M =217.7 lb./ac.
S.E. of body of table =307.9 lb./ac.

Object:—To compare broadcast and transplanting methods with different Chinese varieties of Paddy.

1. BASAL CONDITIONS:
(i) (a) Paddy-Fallow-Paddy. (b) Fallow. (c) Nil. (ii) (a) Clayey loam. (b) N.A. (iii) As per treatments.
(iv) (a) N.A. (b) As per treatments. (c) N.A. (d) and (e)—. (v) Nil. (vi) As per treatments. (vii) Irrigated. (viii) N.A. (ix) 7.11°. (x) 18.10.1949.

2. TREATMENTS:
All combinations of (1) and (2).
(1) 2 varieties: V₁=China 972 and V₂=China 1067.

3. DESIGN:
(i) Fact. in R.B.D. (ii) (a) 12. (b) N.A. (iii) 4. (iv) (a) 5.5'×32'. (b) 1/312 ac. (b) N.A. (vi) Yes.

4. GENERAL:
(i) Normal. Information on lodging N.A. (ii) Nil. (iii) Grain yield. (iv) (a) 1947 to 1951. (b) No. (c)—. (v) (a) No. (b) Nil. (vi) and (vii) Nil.

5. RESULTS:
(i) 3411 lb./ac. (ii) 295.5 lb./ac. (iii) Both V and M effects are highly significant while interaction is not significant.
(iv) Av. yield of grain in lb./ac.

<table>
<thead>
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<th></th>
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<th>M₂</th>
<th>M₃</th>
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<td>2940</td>
<td>3723</td>
<td>3354</td>
<td>2755</td>
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</table>

S.E. of marginal mean of V = 60.3 lb./ac.
S.E. of marginal mean of M = 104.3 lb./ac.
S.E. of body of table = 147.8 lb./ac.

Crop: Paddy (Kharif).
Site: Rice Res. Stn., Khudwani.
Ref: J.K. 50(110).
Type: ‘CV’.

Object: To compare broadcast and transplanting methods with different Chinese varieties of Paddy.

1. BASAL CONDITIONS:
   (i) (a) Paddy-Fallow-Paddy. (b) Fallow. (c) Nil. (ii) (a) Clayey loam. (b) N.A. (iii) As per treatments.
   (iv) (a) N.A. (b) As per treatments. (c) —. (d) and (e) N.A. (v) Nil. (vi) As per treatment. (vii). Irrigated. (viii) N.A. (ix) 17.53". (x) 11.10.1950.

2. TREATMENTS:
   All combinations of (1) and (2)
   (1) 2 varieties: V₁ = China 972 and V₂ = China 988.

3. DESIGN:
   (i) R.B.D. Factorial. (ii) (a) 12. (b) N.A. (iii) 4. (iv) (a) 5² x 3². (b) 1/312 ac. (v) N.A. (vi) Yes.

4. GENERAL:
   (i) N.A. (ii) Nil. (iii) Grain yield. (iv) (a) 1947 to 1951. (b) No. (c) —. (v) (a) No. (b) Nil. (vi) and (vii) Nil.

5. RESULTS:
   (i) 1898 lb./ac.
   (ii) 1107.1 lb./ac.
   (iii) None of the effects is significant.
   (iv) Av. yield of grain in lb./ac.

<table>
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<th>M₃</th>
<th>M₄</th>
<th>M₅</th>
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<td>1443</td>
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<td>V₂</td>
<td>2447</td>
<td>2204</td>
<td>2174</td>
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<td>2150</td>
<td>1965</td>
<td>1809</td>
<td>1992</td>
<td>1853</td>
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S.E. of marginal mean of V = 226.0 lb./ac.
S.E. of marginal mean of M = 391.4 lb./ac.
S.E. of body of table = 553.6 lb./ac.
Crop :- Paddy (Kharif).
Site :- Rice Res. Stn., Khudwani.
Ref :- J.K. 51(135).
Type :- 'CV'.

Object :- To compare broadcast and transplanting methods with different Chinese varieties of Paddy.

1. BASAL CONDITIONS :
(i) (a) Paddy-Fallow-Paddy. (b) Fallow. (c) Nil. (ii) (a) Clayey loam. (b) N.A. (iii) As per treatments.
(iv) (a) N.A. (b) As per treatments. (c) N.A. (d) N.A. (e) N.A. (v) Nil. (vi) As per treatments.
(vii) Irrigated. (viii) N.A. (ix) 9.66'. (x) 22.10.1951.

2. TREATMENTS :
All combinations of (1) and (2)
(1) 2 varieties : V1=China 972 (medium) and V2=China 983 (medium).
(2) 6 methods of planting : M1=Broadcast on 18.5.1951, M2=Broadcast on 28.5.1951, M3=Broadcast on 7.6.1951, M4=Transplanted by local method on 20.5.1951, M5=Transplanted by local method on 27.5.1951 and M6=Transplanted by local method on 3.6.1951.

3. DESIGN :
(i) Fact. in R.B D. (ii) (a) 12. (b) N.A. (iii) 4. (iv) (a) 5.5'x32'. (b) 1/312 ac. (v) N.A. (vi) Yes.

4. GENERAL :
(i) N.A. (ii) N.A. (iii) Grain yield. (iv) (a) 1947—1951. (b) No. (c) Nil. (v) a) No. (b) Nil. (vi) and (vii) Nil.

5. RESULTS :
(i) 1165 lb./ac.
(ii) 200.8 lb./ac.
(iii) Main effect of M alone is highly significant.
(iv) Av. yield of grain in lb./ac.

<table>
<thead>
<tr>
<th></th>
<th>M1</th>
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S.E. of marginal mean of V = 45.1 lb./ac.
S.E. of marginal mean of M = 78.1 lb./ac.
S.E. of body of table = 110.4 lb./ac.

Crop :- Paddy (Kharif).
Site :- Rice Res. Stn., Khudwani.
Ref :- J.K. 48(75).
Type :- 'CV'.

Object :- To determine the proper seed rate for two different varieties of Paddy.

1. BASAL CONDITIONS :
(i) (a) Paddy-Fallow-Paddy. (b) Fallow. (c) Nil. (ii) (a) Clayey loam. (b) N.A. (iii) 24.5.1948. (iv) (a) N.A. (b) Broadcast. (c) As per treatments. (d) and (e)---. (v) Nil. (vi) As per treatments. (vii) Irrigated. (viii) N.A. (ix) 8.01'. (x) V1=29.9.1948 and V2=10.10.1948.

2. TREATMENTS :
All combinations of (1) and (2)
(1) 2 varieties : V1=China 972 and V2=Budgi (local high yielder).
(2) 4 seed rates : R1=48, R2=60, R3=72 and R4=84 lb./ac.
3. DESIGN:
(i) Factorial in R.B.D. (ii) (a) 8. (b) N.A. (iii) 4. (iv) (a) $40.5' \times 19'$. (b) 1/61 ac. (v) N.A. (vi) Yes.

4. GENERAL:
(i) N.A. (ii) Nil. (iii) Grain yield. (iv) (a) 1947—1951. (b) No. (c)—. (v) (a) No. (b) Nil. (vi) and (vii) Nil.

5. RESULTS:
(i) 1542 lb./ac.
(ii) 253.2 lb./ac.
(iii) R effect is highly significant, V effect is significant while interaction V × R is not significant.
(iv) Av. yield of grain in lb./ac.

<table>
<thead>
<tr>
<th></th>
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<th>R_3</th>
<th>R_4</th>
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<td>V_2</td>
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<td>Mean</td>
<td>1432</td>
<td>1459</td>
<td>1691</td>
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<td>1542</td>
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</table>

S.E. of marginal mean of V = 63.3 lb./ac.
S.E. of marginal mean of R = 89.5 lb./ac.
S.E. of body of table = 126.6 lb./ac.

Crop: Paddy (Kharij).
Site: Rice Res. Stn., Khudwani.
Object: To determine the proper seed rate for two different varieties of Paddy.

Ref: J.K. 49(101).
Type: 'CV'.

1. BASAL CONDITIONS:
(i) (a) Paddy—Fallow—Paddy. (b) Fallow. (c) Nil. (ii) (a) Clayey loam. (b) N.A. (iii) 12.5.1949. (iv) (a) N.A. (b) Broadcast. (c) As per treatments. (d) and (e)—. (v) Nil. (vi) As per treatments. (vii) Irrigated. (viii) N.A. (ix) 7.11*. (x) V_1=9.10.1949 and V_2=1.10.1949.

2. TREATMENTS:
All combinations of (1) and (2)
(1) 2 varieties : V_1=China 972 and V_2=Budgi (local high yielder).
(2) 4 seed rates : R_1=48, R_2=60, R_3=72 and R_4=84 lb./ac.

3. DESIGN:
(i) Fact. in R.B.D. (ii) (a) 8. (b) N.A. (iii) 4. (iv) (a) $40.5' \times 9'$. (b) 1/61 ac. (v) N.A. (vi) Yes.

4. GENERAL:
(i) Normal. (ii) Nil. (iii) Grain yield. (iv) (a) 1947—1951. (b) and (c) No. (v) (a) and (b) No. and (vi) and (vii) Nil.

5. RESULTS:
(i) 1877 lb./ac.
(ii) 553.4 lb./ac.
(iii) V effect alone is highly significant.
Crop: Paddy (Kharif).
Site: Rice Res. Stn., Khudwani.

Object: To determine the proper seed rate for two different varieties of Paddy.

1. BASAL CONDITIONS:
   (i) (a) Paddy—Fallow—Paddy. (b) Fallow. (c) Nil. (ii) (a) Clayey loam. (b) N.A. (iii) 19.5.1953. (iv) (a) N.A. (b) Broadcast. (c) As per treatments. (d) and (e) —. (v) Nil. (vi) As per treatments. (vii) Irrigated. (viii) N.A. (ix) 17.5.1950. (x) \( V_1 = 13.10.1950 \) and \( V_2 = 2.10.1950 \).

2. TREATMENTS:
   All combinations of (1) and (2)
   (1) 2 varieties: \( V_1 = \text{China 972} \) and \( V_2 = \text{budgi (local high yielder)} \).
   (2) 4 seed rates: \( R_1 = 48 \), \( R_2 = 60 \), \( R_3 = 75 \) and \( R_4 = 84 \) lb./ac.

3. DESIGN:
   (i) Fact. in R.B.D. (ii) (a) 8. (b) N.A. (iii) 4. (iv) (a) 19' x 40.5'. (b) 1/61 ac. (v) N.A. (vi) Yes.

4. GENERAL:
   (i) N.A. (ii) Nil. (iii) Grain yield. (iv) (a) 1947—1951. (b) and (c) No. (v) (a) and (b) No. (vi) and (vii) Nil.

5. RESULTS:
   (i) 1827 lb./ac.
   (ii) 354.6 lb./ac.
   (iii) None of the effects is significant.
   (iv) Av. yield of grain in lb./ac.

<table>
<thead>
<tr>
<th></th>
<th>( R_1 )</th>
<th>( R_2 )</th>
<th>( R_3 )</th>
<th>( R_4 )</th>
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<tr>
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<td>1883</td>
<td>2160</td>
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<td>( V_2 )</td>
<td>1533</td>
<td>1651</td>
<td>1914</td>
<td>1845</td>
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<td>1602</td>
<td>1767</td>
<td>2037</td>
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<td>1827</td>
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S.E. of marginal mean of \( V \) = 81.1 lb./ac.
S.E. of marginal mean of \( R \) = 114.8 lb./ac.
S.E. of body of table = 162.3 lb./ac.
Crop :- Paddy (Kharif).  
Site :- Rice Res. Stn., Khudwani.  
Object :- To determine the proper seed rate for two different varieties of Paddy.

1. BASAL CONDITIONS
(i) (a) Paddy—Fallow—Paddy. (b) Fallow. (c) Nil.  
(ii) (a) Clayey loam. (b) N.A.  
(iii) 2.6.1951. (iv) (a) N.A. (b) Broadcast. (c) As per treatments. (d) and (e) —. (v) Nil. (vi) As per treatments. (vii) Irrigated. (viii) N.A. (ix) 9.06". (x) 29.10.1951 (China 1039) and 18.10.1951 (Budgi).

2. TREATMENTS:
All combinations of (1) and (2)  
(1) 2 varieties: \( V_1 = \text{China 1039} \) and \( V_2 = \text{Budgi} \) (Local high yielder.)  
(2) 4 seed rates: \( R_1 = 48, R_2 = 60, R_3 = 72 \) and \( R_4 = 84 \) lb./ac.

3. DESIGN:
(i) Fact. in R.B.D. (ii) (a) 8. (b) N.A. (iii) 4. (iv) (a) 19'x40.5'. (b) 1/61 ac. (v) N.A. (vi) Yes.

4. GENERAL:
(i) and (ii) N.A. (iii) Grain yield. (iv) (a) 1947—1951. (b) No. (c) —. (v) (a) No. (b) Nil. (vi) and (vii) Nil.

5. RESULTS:
(i) 569.0 lb./ac.  
(ii) 161.6 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>
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<th>( R_4 )</th>
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<td>( V_2 )</td>
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<td>559.5</td>
<td>593.8</td>
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</tr>
<tr>
<td>Mean</td>
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<td>566.7</td>
<td>618.6</td>
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S.E. of marginal mean of \( V \) = 40.40 lb./ac.

S.E. of marginal mean of \( R \) = 57.13 lb./ac.

S.E. of body of table = 80.80 lb./ac.

---

Crop :- Paddy (Kharif).  
Site :- Rice Res. Stn., Khudwani.  
Object :- To study the effect of spacing on yield of Paddy varieties.

1. BASAL CONDITIONS:
(i) (a) Paddy—Fallow—Paddy. (b) Fallow. (c) Nil.  
(ii) (a) Clayey loam. (b) N.A.  
(iii) 25.5.1951/24.6.1951.  
(iv) (a) N.A. (b) Transplanting. (c) —. (d) As per treatments. (e) N.A. (v) Nil. (vi) As per treatments. (vii) Irrigated. (viii) N.A. (ix) 9.06". (x) 18.10.1951.

2. TREATMENTS:
All combinations of (1) and (2)  
(1) 2 varieties: \( V_1 = \text{China 1039} \) and \( V_2 = \text{Begum} \).  
(2) 3 spacings: \( S_1 = 5" \times 3" \), \( S_2 = 6" \times 6" \) and \( S_3 = 9" \times 9" \).

3. DESIGN:
(i) Fact. in R.B.D. (ii) (a) 6. (b) N.A. (iii) 6. (iv) (a) 6' x 32'. (b) 1/227 ac. (v) N.A. (vi) Yes.
4. GENERAL:

(i) N.A. (ii) Nil. (iii) Grain yield. (iv) (a) 1950-1951. (v) No. (c) Nil. (v) (a) No. (b) Nil. (vi) and (vii) Nil.

5. RESULTS:

(i) 1501 lb./ac.
(ii) 516.9 lb./ac.
(iii) S and V effects are highly significant while interaction is not significant.
(iv) Av. yield of grain in lb./ac.

<table>
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<td>1069</td>
<td>1501</td>
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</table>

S.E. of marginal mean of S = 149.2 lb./ac.
S.E. of marginal mean of V = 121.8 lb./ac.
S.E. of body of table = 211.0 lb./ac.

---

Crop: Paddy (Kharif).
Site: Rice Res. Stn., Khudwani.
Ref: J.K. 50(112).
Type: CV.

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

1. BASAL CONDITIONS:

(i) (a) Paddy-Fallow-Paddy. (b) Fallow. (c) Nil. (ii) (a) Clayey loam. (b) N.A. (iii) 18, 19.6.1950. (iv)
(a) N.A. (b) Transplanting. (c) --. (d) As per treatments. (e) N.A. (v) Nil. (vi) As per treatments.

2. TREATMENTS:

All combinations of (1) and (2)
(1) 2 varieties: V1 = China 1039 and V2 = Begum.
(2) 3 spacings: S1 = 3'x3', S2 = 6'x6' and S3 = 9'x9'.

3. DESIGN:

(i) Fact. in R.B.D. (ii) 6. (b) N.A. (iii) 6. (iv) (a) 6'x32'. (b) 1/227 ac. (v) N.A. (vi) Yes.

4. GENERAL:

(i) N.A. (ii) Nil. (iii) Grain yield. (iv) (a) 1950-1951. (b) No. (c) --. (v) (a) No. (b) Nil. (vi) and
(vii) Nil.

5. RESULTS:

(i) 1519 lb./ac.
(ii) 382.9 lb./ac.
(iii) S effect alone is highly significant.
(iv) Av. yield of grain in lb./ac.

<table>
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<tr>
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S.E. of marginal mean of V = 90.3 lb./ac.
S.E. of marginal mean of S = 110.5 lb./ac.
S.E. of body of table = 156.3 lb./ac.
Crop: Paddy (Kharif).
Site: Prov. Agri. Farm, Shalimar.

Object: To study the effect of number of seedlings and spacing on yield of different Paddy varieties.

1. BASAL CONDITIONS:
   (i) (a) Paddy-Fallow-Paddy. (b) Fallow. (c) Nil. (ii) (a) Clayey loam. (b) N.A. (iii) 23.4.1952/16.6.1952.
   (iv) (a) N.A. (b) Transplanting. (c)---. (d) and (e) As per treatments. (v) N.A. (vi) As per treatments.

2. TREATMENTS:
   Main-plot treatments:
   2 varieties: V₁=China 1039 (medium) and V₂=Begum basmati 370.
   Sub-plot treatments:
   All combinations of (1) and (2)
   (1) 3 spacings: S₁=3'x3", S₂=6"x6" and S₃=9"x9".
   (2) No. seedlings/hill: H₁=2, H₂=4, H₃=6 and H₄=8 seedling/hill.

3. DESIGN:
   (i) Split-plot. (ii) (a) 2 main-plots/block; 12 sub-plots/main-plot. (b) N.A. (iii) 4. (iv) (a) 30'x5'. (b) 28'x5'. (v) N.A. (vi) Yes.

4. GENERAL:
   (i) N.A. (ii) N.A. (iii) Grain yield. (iv) (a) Not continued. (b) No. (c) Nil. (v) (a) No. (b) Nil. (vi) and (vii) Nil.

5. RESULTS:
   (i) 2153 lb./ac.
   (ii) (a) 1072.5 lb./ac.
   (b) 465.5 lb./ac.
   (iii) Only S effect is highly significant.
   (iv) Av. yield of grain in lb./ac.

<table>
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<th>H₃</th>
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S.E. of difference of two
1. Marginal means of V =218.9 lb./ac.
2. Marginal means of H =134.3 lb./ac.
3. Marginal means of S =116.3 lb./ac.
4. means in SxH table =232.6 lb./ac.
5. H means at the same level of V =189.9 lb./ac.
6. V means at the same level of H =273.8 lb./ac.
7. S means at the same level of V =164.5 lb./ac.
8. V means at the same level of S =256.8 lb./ac.
Crop :- Paddy (Kharif).
Site :- Prov. Agri. Farm, Shalimar.

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

1. BASAL CONDITIONS:
   (i) 1 a) Paddy-Fallow-Paddy. (b) Fallow. (c) Nil. (ii) (a) Clayey loam. (b) N.A. (iii) 25-4-1952. (iv) (a) N.A. (b) Broadcast. (c) As per treatments. (d) and (e) -. (v) N.A. (vi) As per treatments. (vii) Irrigated. (viii) N.A. (ix) 8.45°. (x) 12.9.1952.

2. TREATMENTS:
   All combinations of (1) and (2)
   (1) 2 varieties : V1=China 1039 and V2=Begum.
   (2) 4 seed rates : R1=48, R2=60, R3=72 and R4=84 lb./ac.

3. DESIGN:
   (i) Fact in R.B.D. (ii) (a) 8. (b) N.A. (iii) 4. (iv) (a) 30’x6’. (b) 30’x6’. (v) Nil. (vi) Yes.

4. GENERAL:
   (i) N.A. (ii) N.A. (iii) Grain yield. (iv) (a) Not continued. (b) No. (c) -. (v) (a) No. (b) Nil. (vi) Nil. (vii) Seeds were soaked on 23.4.1952.

5. RESULTS:
   (i) 1182 lb./ac.
   (ii) 351 lb./ac.
   (iii) Only V effect is significant.
   (iv) Av. yield of grain in lb./ac.

<table>
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Mean 1233 915 1305 1275 1182

S.E. of marginal mean of R = 124.2 lb./ac.
S.E. of marginal mean of V = 87.8 lb./ac.
S.E. of body of table = 175.7 lb./ac.

Crop :- Paddy (Kharif).
Site :- Prov. Agri. Farm, Shalimar.

Object :- To study the effect of sowing by broadcast and transplanting on yield of different Paddy varieties.

1. BASAL CONDITIONS:
   (i) a) Paddy-Fallow-Paddy. (b) Fallow. (c) Nil. (ii) (a) Clayey loam. (b) N.A. (iii) As per treatments. (iv) a) N.A. (b) As per treatments. (c) to (e) N.A. (v) 2 C.L. F.Y.M/replication. (vi) As per treatments. (vii) Irrigated. (viii) N.A. (ix) 3.45°. (x) N.A.

2. TREATMENTS:
   All combinations of (1) and (2)
   D1 to D5 as broadcast and D6 to D10 by transplanting. Dates are according to Bikarmi Samvat.
3. DESIGN:
(i) Fact in R.B.D. (ii) (a) 20, (b) N.A. (iii) 4, (iv) (a) 5'x30', (b) 5'x28'. (v) 1' on each side along breadth. (iv) Yes.

4. GENERAL:
(i) N.A. (ii) N.A. (iii) Grain yield. (iv) (a) Not continued. (b) No. (c) —. (v) (a) No. (b) Nil. (vi) and (vii) Nil.

5. RESULTS:
(i) 1899 lb./ac.
(ii) 440.2 lb./ac.
(iii) Only V 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>D5</th>
<th>D6</th>
<th>D7</th>
<th>D8</th>
<th>D9</th>
<th>D10</th>
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<td>2168</td>
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<td>2022</td>
<td>1925</td>
<td>2120</td>
<td>2139</td>
<td>2564</td>
<td>2178</td>
<td>1974</td>
<td>2162</td>
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<tr>
<td>V2</td>
<td>1964</td>
<td>1789</td>
<td>1420</td>
<td>1672</td>
<td>1152</td>
<td>2022</td>
<td>1906</td>
<td>1332</td>
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<td>1429</td>
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<tr>
<td>Mean</td>
<td>2037</td>
<td>1979</td>
<td>1872</td>
<td>1847</td>
<td>1539</td>
<td>2071</td>
<td>2023</td>
<td>1998</td>
<td>1921</td>
<td>1702</td>
<td>1899</td>
</tr>
</tbody>
</table>

S.E. of marginal mean of V = 69.60 lb./ac.
S.E. of marginal mean of D = 155.64 lb./ac.
S.E. of body of table = 220.10 lb./ac.

---

**Crop:** Paddy (Kharif).  
**Ref:** J.K. 53 (267).  
**Type:** ‘CMV’.  
**Site:** Provincial Agri. Farm, Shalimar.  
**Object:** To study the effect of spacing, no. of seedlings and application of F.Y.M. on yield of Paddy varieties.

1. BASAL CONDITIONS:
(i) (a) Paddy-Fallow-Paddy, (b) Fallow, (c) Nil. (ii) (a) Clay loam, (b) N.A. (iii) 2.5.1953/8.6.1953. (iv) (a) N.A. (b) Transplanted. (c) —. (d) and (e) As per treatments. (viii) N.A. (ix) 7.6.53. (x) 13.9.1953.

2. TREATMENTS:
All combinations of (1), (2), (3) and (4)
(1) 3 varieties: V1=China 1039, V2=Begum biamati 370 and V3=Lolazan (local).
(2) 3 plant to plant spacings: D1=6", D2=8" and D3=10".
(3) No. seedlings/hill: S1=2, S2=4 and S3=6.
(4) 3 levels of F.Y.M.: M1=125, M2=250 and M3=375 md./ac.

3. DESIGN:
(i) 3^3 confounded. (ii) (a) 3 blocks/replication; 9 plots/block. (b) N.A. (iii) 2. (iv) (a) 5'x30'. (b) 5'x28'. (v) N.A. (vi) Yes.

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

5. RESULTS:
(i) 1168 lb./ac.
(ii) 228.0 lb./ac.
(iii) None of the effects is significant.
Crop: Wheat (Rabi).

Site: Prov. Agri. Farm, Shalimar.

Object: To study the effect of A/S and C/N on yield of Wheat.

1. BASAL CONDITIONS:
   (i) (a) Nil. (b) Fallow. (c) Nil. (ii) (a) Clayey loam. (b) N.A. (iii) 9.11.1953. (iv) (a) and (b) Broadcast. (c) N.A. (d) and (e) Nil. (v) Nil. (vi) NP/4 (medium). (vii) Irrigated. (viii) N.A. (ix) 9.21. (x) 20.5.1954.

2. TREATMENTS:
   All combinations of (1) and (2)
   (1) 2 sources of N: S₁ = C/N and S₂ = A/S.
   (2) 5 levels of N: N₁ = 20, N₂ = 40, N₃ = 60, N₄ = 80 and N₅ = 100 lb./ac.

3. DESIGN:
   (i) Fact. in R.B.D. (ii) (a) 10. (b) N.A. (iii) 4. (iv) (a) and (b) 5' × 30'. (v) Nil. (vi) Yes.

4. GENERAL:
   (i) N.A. (ii) N.A. (iii) Grain yield. (iv) (a) Not continued. (b) No. (c) Nil. (v) (a) No (b) Nil. (vi) Nil. (vii) Sarson was also sown mixed with wheat but only yield of wheat is available.

5. RESULTS:
   (i) 796.2 lb./ac.
   (ii) 369.94 lb./ac.
   (iii) None of the effects is significant.
   (iv) Av. yield of grain in lb./ac.

<table>
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<tr>
<th></th>
<th>N₁</th>
<th>N₂</th>
<th>N₃</th>
<th>N₄</th>
<th>N₅</th>
<th>Mean</th>
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<td>812.1</td>
<td>504.1</td>
<td>952.1</td>
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<td>616.1</td>
<td>896.1</td>
<td>952.1</td>
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<td>817.7</td>
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<td>Mean</td>
<td>840.1</td>
<td>714.1</td>
<td>700.1</td>
<td>952.1</td>
<td>774.8</td>
<td>796.2</td>
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S.E. of marginal mean of N = 130.30 lb./ac.
S.E. of marginal mean of S = 82.72 lb./ac.
S.E. of body of table = 184.97 lb./ac.
Crop: Wheat (Rabi).
Site: Prov. Agri. Farm, Shalimar.
Object: To study best manurial formula for Wheat crop.

1. BASAL CONDITIONS:
   (i) (a) Nil. (b) Paddy. (c) Nil. (ii) (a) Clayey loam. (b) N.A. (iii) 10.11.1953. (iv) (a) N.A. (b) Broadcast. (c) N.A. (d) and (e) —. (v) Nil. (vi) NP-4 (medium). (vii) Unirrigated. (viii) N.A. (ix) 9.21". (x) 20.5.1954.

2. TREATMENTS:
   1. Control (no manure).
   2. 100 md/ac. of F.Y.M.
   3. 200 md/ac. of F.Y.M.
   4. 40 lb/acre. of N as A/S
   5. 80 lb/acre. of N as A/S
   6. 40 lb/acre. of N as C/N
   7. 80 lb/acre. of N as C/N
   8. 50 md/ac. of F.Y.M.+20 lb/ac. of N as A/S
   9. 100 md/ac. of F.Y.M.+40 lb/ac. of N as A/S
   10. 50 md/ac. of F.Y.M.+20 lb/ac. of N as C/N
   11. 100 md/ac. of F.Y.M.+40 lb/ac. of N as C/N
   12. 100 md/ac. as Dal lake weed.
   13. 200 md/ac. as Dal lake weed.

3. DESIGN:
   (i) R.B.D. (ii) 13. (b) N.A. (iii) 4. (iv) (a) 30'x5' (b) 30'x5'. (v) Nil. (vi) Yes.

4. GENERAL:
   (i) N.A. (ii) N.A. (iii) Grain yield/plot. (iv) (a) Not continued. (b) No. (c) Nil. (v) (a) No. (b) Nil. (vi) Nil. (vii) Sarson was sown mixed with wheat but yield of only wheat is available.

5. RESULTS:
   (i) 898 lb/ac.
   (ii) 294.1 lb/ac.
   (iii) Treatments are not significantly different.
   (iv) Av. yield of grain 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>1.</td>
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<td>8.</td>
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<td>2.</td>
<td>747</td>
<td>9.</td>
<td>971</td>
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<td>3.</td>
<td>821</td>
<td>10.</td>
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<td>4.</td>
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<td>5.</td>
<td>1307</td>
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<td>6.</td>
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<td>7.</td>
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   S.E./mean = 147.1 lb/ac.

Crop: Wheat (Rabi).
Site: Central Prov. Agri. Exptl. Farm, Talab Tiloo, Jammu. Type: 'M'.

Object: To study effect of application of A/S and C/N with and without lime on wheat.

1. BASAL CONDITIONS:
   (i) (a) Nil. (b) Maize. (c) N.A. (ii) (a) Loamy type. (b) N.A. (iii) 13.5.1910. (Vikrami Samvat). (iv) (a) N.A. (b) Kera. (c) 32 sr/acre. (d) 9' row to row. (e) —. (v) Nil. (vi) NP-4 medium. (vii) Irrigated. (viii) Nil. (ix) N.A. (x) N.A.

2. TREATMENTS:
   All combinations of (1) and (2).
   (1) 2 levels of lime: L_1=0 and L_2=200 lb/ac.
   (2) 5 applications of N: N_1=0, N_2=20 lb/ac. of N as A/S, N_3=40 lb/ac. of N as A/S, N_4=20 lb/ac. of N as C/N and N_5=40 lb/ac. of N as C/N.
3. **DESIGN:**
   (i) Fact. in R.B.D. (ii) 10. (b) N.A. (iii) 6. (iv) (a) N.A. (b) 1/16 ac. (v) N.A. (vi) Yes.

4. **GENERAL:**
   (i) Poor. No lodging. (ii) Nil. (iii) Grain yield. (iv) (a) Not continued. (b) No. (c) No. (v) (a) No. (b) Nil. (vi) and (vii) Nil.

5. **RESULTS:**
   (i) 560.2 lb./ac.
   (ii) 119.07 lb./ac.
   (iii) None of the effects is significant.
   (iv) Av. yield of grain in lb./ac.

<table>
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<th></th>
<th>N₀</th>
<th>N₁</th>
<th>N₂</th>
<th>N₃</th>
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<td>587.0</td>
<td>560.2</td>
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S.E. of marginal mean of L = 21.74 lb./ac.
S.E. of marginal mean of N = 34.37 lb./ac.
S.E. of body of table = 48.61 lb./ac.

---

**Crop:** Wheat (Rabi).

**Ref:** J.K. S 2(167).

**Site:** Central Prov. Agri. Exptl. Farm Talab Tiloo, Jammu. **Type:** 'M'.

**Object:** To study the effect of varying doses of A/S and C/N on yield of Wheat.

1. **BASAL CONDITIONS:**
   (i) (a) Nil. (b) Fallow. (c) Nil. (ii) (a) Loamy type. (b) N.A. (iii) 12.8.2008. (Vikrami Samvat)
   (iv) (a) N.A. (b) By kera. (c) 32 sr./ac. (d) 8' row to row. (e) —. (v) Nil. (vi) NP-4 (medium).
   (vii) Irrigated. (viii) Nil. (ix) N.A. (x) 22,23.1.2009. (Vikrami Samvat)

2. **TREATMENTS:**
   All combinations of (1) and (2)
   (1) 2 sources of N : S₁ = A/S and S₂ = C/N.
   (2) 5 levels of N : N₁ = 20, N₂ = 40, N₃ = 60, N₄ = 80 and N₅ = 100 lb./ac.

3. **DESIGN:**
   (i) Fact. in R.B.D. (ii) 10. (b) N.A. (iii) 4. (iv) (a) and (b) 30' x 5'. (v) Nil. (vi) Yes.

4. **GENERAL:**
   (i) Good. No lodging. (ii) Nil. (iii) Grain yield/plot. (iv) (a) 1952–54. (b) and (c) No. (v) (a) and (b)
   No. (vi) and (vii) Nil.

5. **RESULTS:**
   (i) 3329 lb./ac.
   (ii) 327.8 lb./ac.
   (iii) None of the effects is significant.
   (iv) Av. yield of grain in lb./ac.

<table>
<thead>
<tr>
<th></th>
<th>N₁</th>
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<tr>
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<td>3285</td>
<td>3459</td>
<td>3323</td>
<td>3337</td>
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S.E. of marginal mean of S = 73.3 lb./ac.
S.E. of marginal mean of N = 115.9 lb./ac.
S.E. of body of table = 163.9 lb./ac.
Crop: Wheat (Rabi).
Site: Central Prov. Agri. Exptl. Farm, Talab Tiloo, Jammu. Type: 'M'.

Object: To study the effect of varying dose of A/S and C/N on yield of Wheat.

1. BASAL CONDITIONS:
   (i) (a) Nil. (b) Maize. (c) Nil. (ii) (a) Loamy type. (b) N.A. (iii) 12/13.8.2009. (Vikrami Samvat)
   (iv) (a) N.A. (b) By kera. (c) 32.5/40. (d) 8’-5’ row to row. (e) --. (v) Nil. (vi) NP-4 (medium).

2. TREATMENTS:
   All combinations of (1) and (2)
   (1) 2 sources of N: S1 = A/S and S2 = C/N.
   (2) 5 levels of N: N1 = 20, N2 = 40, N3 = 60, N4 = 80 and N5 = 100 lb./ac.

3. DESIGN:
   (i) Fact. in R.B.D. (ii) 10. (a) 30’ × 5’. (b) 30’ × 5’. (c) 32 sr./ac. (d) 8’-5’ row to row.
   (e) --. (f) 10.5.1954.

4. GENERAL:
   (i) N.A. (ii) Nil. (iii) Grain and straw yield. (iv) (a) 1932—54. (b) and (c) No. (v) (a) Nil. (b) Nil. (vi) Yes.
   (vii) Nil. (viii) Nil.

5. RESULTS:
   (i) 1261 lb./ac.
   (ii) 188.8 lb./ac.
   (iii) None of the effects is significant.
   (iv) Av. yield of grain in lb./ac.

<table>
<thead>
<tr>
<th></th>
<th>N1</th>
<th>N2</th>
<th>N3</th>
<th>N4</th>
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<td>1311</td>
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</table>

S.E. of marginal mean of S = 42.2 lb./ac.
S.E. of marginal mean of N = 66.7 lb./ac.
S.E. of body of table = 94.4 lb./ac.

Crop: Wheat (Rabi).
Site: Central Prov. Agri. Exptl. Farm, Talab Tiloo, Jammu. Type: 'M'.

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

1. BASAL CONDITIONS:
   (i) (a) Nil. (b) Maize. (c) Nil. (ii) (a) Loamy type. (b) N.A. (iii) 12/13.8.2009. (Vikrami Samvat)
   (iv) (a) N.A. (b) By kera. (c) 32.5/40. (d) 8’-5’ row to row. (e) --. (v) Nil. (vi) NP-4 (medium).

2. TREATMENTS:
   1. 40 lb./ac. of N as A/S applied in Autumn and in Spring.
   2. 40 lb./ac. of N as A/S applied in Autumn and in Spring.
   3. 40 lb./ac. of N as A/S applied in Autumn and in Spring.
   4. 40 lb./ac. of N as A/S applied full in Autumn.
   5. 40 lb./ac. of N as A/S applied full in Spring.

3. DESIGN:
   (i) R.B.D. (ii) 5. (b) N.A. (iii) 6. (iv) (a) 30’ × 5’. (b) 30’ × 5’. (v) Nil. (vi) Yes.
4. GENERAL:
   (i) Good. No lodging. (ii) Nil. (iii) Grain yield. (iv) (a) 1952-1954. (b) No. (c) Nil. (v) (a) No. (b) Nil. (vi) and (vii) Nil.

5. RESULTS:
   (i) 2116 lb./ac.
   (ii) 218.4 lb./ac.
   (iii) Treatments are not significantly different.
   (iv) Av. yield of grain in lb./ac.
   Treatment  | Av. yield
   1.          | 2128
   2.          | 2134
   3.          | 2103
   4.          | 2159
   5.          | 2054
   S.E./mean  | 89.3 lb./ac.

Crop: Wheat (Rabi).  Ref: J.K. 53(254.)
Site: Central Prov. Agri. Exptl. Farm, Talab Tiloo, Jammu. Type: 'M'.

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

1. BASAL CONDITIONS:
   (i) (a) Nil. (b) Fallow. (c) Nil. (ii) (a) Loamy type. (b) N.A. (iii) 3.8.2010. (Vikrami Samvat) (iv) (a) N.A. (b) By Kera. (c) 32 sr./ac. (d) 8'-9' row to row. (e) Nil. (vi) NP-4 (medium). (vii) Irrigated. (viii) Nil. (ix) N.A. (x) 13.5.1954.

2. TREATMENTS:
   1. 40 lb./ac. of N as A/S applied ½ in Autumn and ½ in Spring.
   2. 40 lb./ac. of N as A/S applied ½ in Autumn and ½ in Spring.
   3. 40 lb./ac. of N as A/S applied ½ in Autumn and ½ in Spring.
   4. 40 lb./ac. of N as A/S applied full in Autumn.
   5. 40 lb./ac. of N as A/S applied full in Spring.

3. DESIGN:
   (i) R.B.D. (ii) 5. (b) N.A. (iii) 6. (iv) (a) 30'x5'. (b) 30'x5'. (v) Nil. (vi) Yes.

4. GENERAL:
   (i) N.A. (ii) N.A. (iii) Grain and straw yield. (iv) (a) 1952-1954. (b) No. (c) Nil. (v) (a) ½, (b) Nil. (vi) and (vii) Nil.

5. RESULTS:
   (i) 957 lb./ac.
   (ii) 193.2 lb./ac.
   (iii) Treatments are not significantly different.
   (iv) Av. yield of grain in lb./ac.
   Treatment  | Av. yield
   1.          | 815
   2.          | 1052
   3.          | 952
   4.          | 1058
   5.          | 909
   S.E./mean  | 78.9 lb./ac.
Crop : - Wheat (Rabi).  
Ref :- J.K. 52(171).

Site :- Central Prov. Agri. Exptl. Farm, Talab Tilloo, Jammu. Type :- 'M'.

Object :- To study the effect of A/S and C/N with and without F.Y.M. on yield of Wheat.

1. BASAL CONDITIONS:
   (i) (a) Nil. (b) Maize. (c) Nil. (ii) (a) Loamy type. (b) N.A. (iii) 6.8.2009. (Vikrami Samvat)
   (iv) (a) N.A. lb. Kera.(c) 32 sr./ac. (d) 8'-9' row to row. (e) —. (v) Nil. (vi) NP-4. (vii) Irrigated.

2. TREATMENTS:
   1. Control (no manure).
   2. 100 lb./ac. of N as F.Y.M.
   3. 100 lb./ac. of N as F.Y.M. + 20 lb./ac. of N as A/S.
   4. 40 lb./ac. of N as A/S.
   5. 80 lb./ac. of N as A/S.
   6. 40 lb./ac. of N as C/N.
   7. 80 lb./ac. of N as C/N.
   8. 50 lb./ac. of N as F.Y.M. + 20 lb./ac. of N as A/S.
   9. 100 lb./ac. of N as F.Y.M. + 40 lb./ac. of N as A/S.
   10. 50 lb./ac. of N as F.Y.M. + 20 lb./ac. of N as C/N.
   11. 100 lb./ac. of N as F.Y.M. + 40 lb./ac. of N as C/N.

F.Y.M. applied on 6.8.2009, while A/S and C/N on 12.10.2000. (Dates are according to Vikrami Samvat.)

3. DESIGN:
   (i) R.B.D. (ii) (a) 11. (b) N.A. (iii) 4. (iv) (a) and (b) 30' X 5'. (v) Nil. (vi) Yes.

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

5. RESULTS:
   (i) 1181 lb./ac.
   (ii) 122.6 lb./ac.
   (iii) Treatments are not significantly different.
   (iv) Av. yield of grain in lb./ac.

   Treatment | Av. yield | Treatment | Av. yield
   1. | 1232 | 7. | 1073
   2. | 1017 | 8. | 1167
   3. | 1157 | 9. | 1325
   4. | 1409 | 10. | 1148
   5. | 1167 | 11. | 1223
   6. | 1073 | S.E./mean = 161.3 lb./ac.

Crop : - Wheat (Rabi).  
Ref :- J.K. 53(253).

Site :- Central Prov. Agri. Exptl. Farm, Talab Tilloo, Jammu. Type :- 'M'.

Object :- To study the effect of A/S and C/N with and without F.Y.M. on Wheat.

1. BASAL CONDITIONS:
   (i) (a) Nil. (b) Fallow. (c) Nil. (ii) (a) Loamy type. (b) N.A. (iii) 11.8.2010. (iv) (a) N.A. (b) By kera.
   (c) 32 sr./ac. (d) 8'-9' row to row. (e) —. (v) Nil. (vi) NP-4 (medium). (vii) Irrigated. (viii) Nil. (ix) N.A. (x) 12.13.5.1954.
2. **TREATMENTS:**

1. Control (no manure).
2. 100 lb./ac. of N as F.Y.M.
3. 200 lb./ac. of N as F.Y.M.
4. 40 lb./ac. of N as A/S.
5. 80 lb./ac. of N as A/S.
6. 200 lb./ac. of N as C/N.
7. 80 lb./ac. of N as C/N.
8. 100 lb./ac. of N as F.Y.M. + 20 lb./ac. of N as A/S.
9. 100 lb./ac. of N as F.Y.M. + 40 lb./ac. of N as A/S.
10. 50 lb./ac. of N as F.Y.M. + 20 lb./ac. of N as C/N.
11. 100 lb./ac. of N as F.Y.M. + 40 lb./ac. of N as C/N.

**Time and method of application—N.A.**

3. **DESIGN:**

(i) R.B.D.  
(ii) 11. (b) N.A.  
(iii) 11. (a) and (b) 30'×5'.  
(iv) Nil.  
(v) Yes.

4. **GENERAL:**

(i) (a) Nil. (b) Fallow. (c) Nil. (ii) (a) Clayey loam. (b) N.A.  
(iii) 10.12.11.953.  
(iv) (a) N.A. (b) Broadcast. (c) N.A. (d) and (e) Nil. (v) Nil. (vi) and (vii) Nil.

5. **RESULTS:**

(i) 1016 lb./ac.  
(ii) 135.5 lb./ac.  
(iii) Treatments are highly significantly different.

Feed 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>812</td>
<td>7.</td>
<td>821</td>
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<tr>
<td>2.</td>
<td>1055</td>
<td>8.</td>
<td>1008</td>
</tr>
<tr>
<td>3.</td>
<td>1232</td>
<td>9.</td>
<td>1419</td>
</tr>
<tr>
<td>4.</td>
<td>831</td>
<td>10.</td>
<td>989</td>
</tr>
<tr>
<td>5.</td>
<td>849</td>
<td>11.</td>
<td>1268</td>
</tr>
<tr>
<td>6.</td>
<td>858</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

S.E./mean =67.8 lb./ac.

---

**Crop:** Wheat (Rabi).  
**Site:** Prov. Agri. Farm, Shalimar.  
**Object:** To study the effect of F.Y.M. and A/S on yield of Wheat.

1. **BASAL CONDITIONS:**

(i) (a) Nil. (b) Fallow. (c) Nil. (ii) (a) Clayey loam. (b) N.A. (iii) 10.11.1953.  
(iv) (a) N.A. (b) Broadcast. (c) N.A. (d) and (e) Nil. (v) Nil. (vi) As per treatments. (vii) Irrigated. (viii) N.A. (ix) 9.31'. (x) 20.5.1954.

2. **TREATMENTS**

All combinations of (1) and (2)

1. 3 varieties: V₁=NP-4, V₂=IP-120 and V₃=F.
2. 5 manures: N₀=0, N₁=100 lb./ac. of N as F.Y.M., N₂=N₁+20 lb./ac. of N as A/S, N₃=N₁+40 lb./ac. of N as A/S and N₄=N₁+60 lb./ac. of N as A/S.

F.Y.M. applied before sowing. Date of application of A/S-N.A.

3. **DESIGN:**

(i) Fact. in R.B.D. (ii) 15. (b) N.A. (iii) 4. (iv) (a) 30'×5'. (b) 30'×5'. (v) Nil. (vi) Yes.

4. **GENERAL:**

(i) N.A. (ii) N.A. (iii) Grain yield. (iv) (a) Not continued. (b) No. (c) Nil. (v) (a) No. (b) Nil. (vi) Nil (vii) Sarson was also sown mixed with wheat but yield of only wheat is available.
5. RESULTS:
(i) 856.9 lb./ac.
(ii) 317.4 lb./ac.
(iii) Only M effect is highly significant.
(iv) Av. yield of grain in lb./ac.

<table>
<thead>
<tr>
<th></th>
<th>V₁</th>
<th>V₂</th>
<th>V₃</th>
<th>Mean</th>
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<tr>
<td>N₀</td>
<td>728.1</td>
<td>429.4</td>
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<td>765.4</td>
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<td>N₂</td>
<td>784.1</td>
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<td>N₃</td>
<td>1082.8</td>
<td>1045.4</td>
<td>922.1</td>
<td>1026.8</td>
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<tr>
<td>N₄</td>
<td>1045.4</td>
<td>1064.1</td>
<td>1015.4</td>
<td>1051.6</td>
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</tbody>
</table>

Mean 881.2 851.3 838.2 856.9

S.E. of marginal mean of N = 91.64 lb./ac.
S.E. of marginal mean of V = 70.98 lb./ac.
S.E. of body of table = 150.72 lb./ac.

Crop :- Wheat (Rabi).
Site :- Central Prov. Agri. Exptl. Farm, Talab Tiloo, Jammu. Type :- ‘MV’.

Object :- To study the effect of F.Y.M. alone and along with A/S on yield of Wheat.

1. BASAL CONDITIONS:
(i) (a) Nil. (b) Fallow. (c) Nil. (ii) (a) Loamy type. (b) N.A. (iii) 13.8.2009. (iv) (a) N.A. (b) By hera. (c) 32 st./ac. (d) 8°—9° row to row. (e)—. (v) Nil. (vi) As per treatments. (vii) Irrigated. (viii) Nil. (ix) N.A. (x) 27.1.2010.

2. TREATMENTS:
All combinations of (1) and (2)
(1) 3 varieties : V₁=C-591, V₂=NP-745 and V₃=NP-4.
(2) 5 applications of N : N₀=0, N₁=100 lb./ac. of N as F.Y.M., N₂=N₁+30 lb./ac. of N as A/S, N₃=N₁+45 lb./ac. of N as A/S and N₄=N₁+60 lb./ac. of N as A/S.

3. DESIGN:
(i) Fact. in R.B.D. (ii) (a) 15. (b) N.A. (iii) 4. (iv) (a) 30’×5’. (b) 30’×5’ (v) Nil. (vi) Yes.

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

5. RESULTS:
(i) 1318 lb./ac.
(ii) 275.7 lb./ac.
(iii) N effect is significant, V effect is highly significant, while interaction N×V is not significant.
(iv) Av. yield of grain in lb./ac.

<table>
<thead>
<tr>
<th></th>
<th>V₁</th>
<th>V₂</th>
<th>V₃</th>
<th>Mean</th>
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<td>N₀</td>
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<td>952</td>
<td>1139</td>
<td>1108</td>
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<td>N₁</td>
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<td>1185</td>
<td>1391</td>
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<tr>
<td>N₄</td>
<td>1662</td>
<td>1176</td>
<td>1521</td>
<td>1453</td>
</tr>
</tbody>
</table>

Mean 1566 1081 1307 1318

S.E. of marginal mean of V = 61.6 lb./ac.
S.E. of marginal mean of N = 79.6 lb./ac.
S.E. of body of table = 137.8 lb./ac.
Crop: Wheat (Rabi).

Site: Central Prov. Agri. Exptl. Farm, Talab Tiloo, Jammu. Type: 'MV'.

Object: To study the effect of P.Y.M. alone and along with A/S on yield of Wheat.

1. BASAL CONDITIONS:

(i) (a) Nil. (b) Maize. (c) Nil. (ii) (a) Loamy type. (b) N.A. (iii) 11.5.2010. Vikrami Samvat. (iv) (a) N.A. (b) By Kera. (c) 32.5 sq. ac. (d) 8-9' row to row (e) Nil. (vi) As per treatments, (vii) Irrigated. (viii) Nil. (ix) N.A. (x) 1 and 4.2.2011.

2. TREATMENTS

All combinations of (I) and (2).

(1) 3 varieties: V1 = C-591, V2 = NP-745 and V3 = NP-4.

(2) 5 applications of N: N0 = 0, N1 = 100 lb./ac. of N as F.Y.M., N2 = N1 + 30 lb./ac. of N as A/S, N3 = N1 + 45 lb./ac. of N as A/S, N4 = N1 + 60 lb./ac. of N as A/S.

3. DESIGN:

(i) Fact. in R.B.D. (ii) (a) 15. (b) N.A. (iii) 4. (iv) (a) 20' x 5'. (b) 20' x 5' (v) Nil. (vi) Yes.

4. GENERAL:

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

5. RESULTS:

(i) 1804 lb./ac.

(ii) 402.1 lb./ac.

(iii) Only N effect is highly significant.

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

<table>
<thead>
<tr>
<th>V1</th>
<th>V2</th>
<th>V3</th>
<th>Mean</th>
</tr>
</thead>
<tbody>
<tr>
<td>N0</td>
<td>1120</td>
<td>1190</td>
<td>1400</td>
</tr>
<tr>
<td>N1</td>
<td>1652</td>
<td>1680</td>
<td>1652</td>
</tr>
<tr>
<td>N2</td>
<td>2156</td>
<td>1806</td>
<td>1918</td>
</tr>
<tr>
<td>N3</td>
<td>2002</td>
<td>1778</td>
<td>2086</td>
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<tr>
<td>N4</td>
<td>2338</td>
<td>2394</td>
<td>1890</td>
</tr>
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</table>

Mean 1854 1770 1789 1804

S.E. of marginal mean of V = 89.9 lb./ac.

S.E. of the marginal mean of N = 116.1 lb./ac.

S.E. of body of table = 201.1 lb./ac.

---

Crop: Wheat (Rabi)

Site: Agri. Farm, Rajhani.

Object: To study the effect of different seed rates on yield of Wheat.

1. BASAL CONDITIONS:

(i, a) Nil. (b) Fallow. (c) Nil. (ii) (a) Sandy loam. (b) N.A. (iii) 18.11.1952. (iv) (a) N.A. (b) Broadcast. (c) As per treatments. (d) and (e) Nil. (vi) N.A. (vii) C-591 (medium). (viii) Irrigated. (ix) N.A. (x) 19.4.1953.

2. TREATMENTS

3 seed rates: R1 = 48, R2 = 56, and R3 = 64 lb./ac.
3. DESIGN:
   (i) R.B.D. (ii) (a) 3. (b) N.A. (iii) 4. (iv) (a) N.A. (b) 80'x12.25'. (v) N.A. (vi) Yes.

4. GENERAL:
   (i) N.A. (ii) N.A. (iii) Grain yield. (iv) (a) Not continued. (b) No. (c) Nil. (v) (a) No. (b) Nil. (vi) and (vii) Nil.

5. RESULTS:
   (i) 569.9 lb./ac.
   (ii) 89.34 lb./ac.
   (iii) Treatments are not significantly different.
   (iv) Av. yield of grain in lb./ac.
       Treatment         Av. yield
       R₁              506.5
       R₂              586.7
       R₃              586.7
       S.E./mean      = 44.67 lb./ac.

Crop : Wheat (Rabi).
Site : Prov. Agri. Farm, Shalimar.

Object : To study the best seed rate for Wheat.

1. BASAL CONDITIONS:
   (i) (a) Nil. (b) Fallow. (c) Nil. (ii) (a) Clayey loam. (b) N.A. (iii) 9.11.1952. (iv) (a) N.A. (b) Broadcast. (c) As per treatments. (d) and (e) Nil. (v) Wheat Ford (late type). (vi) Irrigated.
   (vii) N.A. (ix) 7.09°. (x) 22.5.1953.

2. TREATMENTS:
   3 seed rates : R₁ =48, R₂ =64 and R₃ =80 lb./ac.

3. DESIGN:
   (i) R.B.D. (ii) (a) 3. (b) N.A. (iii) 4. (iv) (a) 5'x40'. (b) 5'x40'. (v) N.A. (vi) Yes.

4. GENERAL:
   (i) N.A. (ii) N.A. (iii) Grain yield. (iv) (a) Not continued. (b) No. (c) Nil. (v) (a) No. (b) Nil. (vi) and (vii) Nil.

5. RESULTS:
   (i) 2154 lb./ac.
   (ii) 812.3 lb./ac.
   (iii) Treatments are not significantly different.
   (iv) Av. yield of grain in lb./ac.
       Treatment         Av. yield
       1.              2641
       2.              1853
       3.              1967
       S.E./mean      = 406.2 lb./ac.

Ref : J.K. 52 (186).
Type : 'C'.

Crop : Wheat (Rabi).
Site : Prov. Agri. Farm, Shalimar.
Crop: Wheat (Rabi).
Site: Central Prov. Agri. Exptl. Farm, Talab Tiloo, Jammu. Type: 'C'.

Object: —To study the effect of seed rate on yield of Wheat.

1. BASAL CONDITIONS:
   (i) (a) Nil. (b) Fallow. (c) Nil. (ii) (a) Loamy type. (b) N.A. (iii) 24.7.2008. (iv) (a) N.A. (b) Broadcast. (c) As per treatments. (d) and (e) —. (v) N.A. (vi) C-591 (medium). (vii) Irrigated. (viii) Nil. (ix) N.A. (x) 22.1.2009.

2. TREATMENTS:
   1. Normal seed rate at 28 seer/ac.
   2. Sub-normal seed rate at 24 seer/ac.
   3. Above normal seed rate at 32 seer/ac.

3. DESIGN:
   (i) R.B.D. (ii) 3. (b) N.A. (iii) 4. (iv) [a] and (b) 60' x 17.75'. v) Nil. (vi) Yes.

4. GENERAL:
   (i) Fair to normal. No lodging. (ii) Nil. (iii) Grain yield. (iv) (a) Not continued. (b) No. (c) Nil. (v) a. No. (b) N.I. (vi) Nil. (vii) Dates according to Vikrami Samvat.

5. RESULTS:
   (i) 1606 lb./ac.
   (ii) 92.4 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>1612</td>
</tr>
<tr>
<td>2.</td>
<td>1513</td>
</tr>
<tr>
<td>3.</td>
<td>1693</td>
</tr>
<tr>
<td>S.E./mean</td>
<td>46.2 lb./ac.</td>
</tr>
</tbody>
</table>

———

Crop: Wheat (Rabi).
Site: Central Prov. Agri. Exptl. Farm, Talab Tiloo, Jammu. Type: 'C'.

Object: —To study the optimum date of sowing for Wheat.

1. BASAL CONDITIONS
   (i) (a) Nil. (b) Fallow. (c) Nil. (ii) (a) Loamy type. (b) N.A. (iii) As per treatments. (iv) (a) N.A. (b) Sown by kera. (c) 30 sr./ac. (d) 8° row to row. (e) —. (v) Nil. (vi) C-591 (medium). (vii) Irrigated. (viii) Nil. (ix) N.A. (x) 27.1.2009.

2. TREATMENTS

3. DESIGN:
   (i) R.B.D. (ii) 5. (b) N.A. (iii) 5. (iv) (a) and (b) 60' x 17.75'. (v) Nil. (vi) Yes.

4. GENERAL
   (i) Fair to normal. No lodging. (ii) Nil. (iii) Grain yield/plot. (iv) (a) Not continued. (b) No. (c) Nil. (v) a. No. (b) No. (vi) Nil. (vii) Dates according to Vikrami Samvat.

5. RESULTS:
   (i) 861 lb./ac.
   (ii) 224.9 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>
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</tr>
<tr>
<td>D₄</td>
<td>629</td>
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<tr>
<td>D₅</td>
<td>387</td>
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<tr>
<td>S.E./mean</td>
<td>= 100.3 lb./ac</td>
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</table>

Crop: Wheat (Rabi).
Site: Agri. Farm, Gramwala.

Object: To study the optimum seed rate for different Wheat varieties.

1. Basal Conditions:
   (i) (a) Nil. (b) Maize. (c) Nil. (ii) (a) Clay loam. (b) N.A. (iii) 12.8.2009. (iv) (a) N.A. (b) Kera. (c) N.A. (d) Row to row 9". (e) —. (v) Nil. (vi) As per treatments. (vii) Unirrigated. (viii) Nil. (x) N.A. (x) 26.1.2010.

2. Treatments:
   A combinations of (1) and (2).
   (1) 2 varieties: V₁ = NP-4 and V₂ = C-591.
   (2) 6 seed rates: R₁ = 24, R₂ = 28, R₃ = 32, R₄ = 36, R₅ = 40 and R₆ = 44 sr./ac.

3. Design:
   (i) Fact. in R.B.D. (ii) (a) 12. (b) N.A. (iii) 4. (iv) (a) N.A. (b) 44 x 5'. (v) N.A. (vi) Yes.

4. General:
   (i) Fair to normal. No lodging. (ii) Nil. (iii) Grain yield. (iv) (a) Not continued. (b) and (c) No. (v) (a) No. (b) Nil. (vi) Nil. (vii) Dates according to Vikrami Samvat.

5. Results:
   (i) 634.3 lb./ac.
   (ii) 171.1 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>R₆</th>
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<td>655.5</td>
<td>751.0</td>
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<td>731.9</td>
<td>630.1</td>
<td>639.6</td>
<td>634.3</td>
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</table>

S.E. of marginal mean of V = 34.93 lb./ac.
S.E. of marginal mean of R = 60.50 lb./ac.
S.E. of body of table = 85.53 lb./ac.
Crop:—Wheat (Rabi).

Site:—Central Prov. Agri. Exptl. Farm, Talab Tilloo, Jammu. Type:—‘CV’.

Object:—To study the optimum seed rate for different Wheat varieties.

1. BASAL CONDITIONS:
   (i) (a) Nil. (b) Fallow. (c) Nil. (ii) (a) Loamy type. (b) N.A. (iii) 11/12.8.2009. Vikrami Samvat
   (iv) (a) N.A. (b) By kera. (c) As per treatments. (d) 5’-5’ row to row. (e)—. (v) Nil. (vi) As per treatments. (vii) Irrigated. (viii) Nil. (ix) N.A. (x) 24.2.2010.

2. TREATMENTS:
   All combinations of (1) and (2).
   (1) 2 varieties: \( V_1 = N.P-4 \) and \( V_2 = C-591 \).
   (2) 6 seedrates: \( R_1 = 24 \), \( R_2 = 28 \), \( R_3 = 32 \), \( R_4 = 36 \), \( R_5 = 40 \) and \( R_6 = 44 \) sr./ac.

3. DESIGN:
   (i) Fact. in R.B.D. (ii) (a) 12. (b) N.A. (iii) 4. (iv) (a) 30’ x 5’. (b) 30’ x 5’. (v) Nil. (vi) Yes.

4. GENERAL:
   (i) Fair to normal. No lodging. (ii) Nil. (iii) Grain yield. (iv) (a) 1952—1954. (b) No. (c) Nil.
   (v) (a) Agri. Farm, Gramwala. (b) Nil. (vi) and (vii) Nil.

5. RESULTS:
   (i) 1561 lb./ac.
   (ii) 2.8.2 lb./ac.
   (iii) V effect is highly significant, interaction \( R \times V \) is significant, while R effect is not significant.

\[
\begin{array}{cccccccc}
V_1 & & & & & & & \\
1344 & 1325 & 1279 & 1241 & 1437 & 1120 & 1291 \\
V_2 & 1746 & 1867 & 1970 & 2016 & 1568 & 1820 & 1831 \\
\hline
Mean & 1545 & 1596 & 1625 & 1629 & 1503 & 1470 & 1561 \\
\end{array}
\]

- S.E. of marginal mean of \( V \) = 55.7 lb./ac.
- S.E. of marginal mean of \( R \) = 87.8 lb./ac.
- S.E. of body of table = 124.1 lb./ac.
4. GENERAL:

(i) N.A.  (ii) N.A. (iii) Grain yield. (iv) (a) 1952-1954.  (b) No.  (c) No.  (v) (a) No.  (b) Nil.  
(vi) and (vii) Dates according to Vikrami Samvat.

5. RESULTS:

(i) 1612 lb./ac.
(ii) 226.5 lb./ac.

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

<table>
<thead>
<tr>
<th></th>
<th>R₁</th>
<th>R₂</th>
<th>R₃</th>
<th>R₄</th>
<th>R₅</th>
<th>R₆</th>
<th>Mean</th>
</tr>
</thead>
<tbody>
<tr>
<td>V₁</td>
<td>1633</td>
<td>1799</td>
<td>1940</td>
<td>2100</td>
<td>2052</td>
<td>1813</td>
<td>1890</td>
</tr>
<tr>
<td>Mean</td>
<td>1600</td>
<td>1566</td>
<td>1661</td>
<td>1750</td>
<td>1746</td>
<td>1548</td>
<td>1612</td>
</tr>
</tbody>
</table>

S.E. of the marginal mean of V = 46.2 lb./ac.
S.E. of the marginal mean of R = 80.1 lb./ac.
S.E. of body of table = 113.3 lb./ac.

Crop :: Maize (Kharif).
Site :: Agri. Farm, Gramwala.

Ref :: J.K. 52(172).
Type :: 'M'.

Object :: To study effect of F.Y.M. alone and in combination with A/S.

1. BASAL CONDITIONS:

(i) (a) Nil. (b) Wheat. (c) Nil. (ii) (a) Clay loam. (b) N.A. (iii) 10.7.1952. (iv) (a) N.A. (b) 
Broadcast. (c) N.A. (d) —. (e) —. (v) Nil. (vi) Maize cross No. 1 (medium). (vii) Unirrigated. 
(viii) 1 hoeing. (ix) N.A. (x) 27.9.1952.

2. TREATMENTS:

1. Control (no manure).
2. 100 lb./ac. of N as F.Y.M.
3. 100 lb./ac. of N as F.Y.M.+15 lb./ac. of N as A/S.
4. 100 lb./ac. of N as F.Y.M.+30 lb./ac. of N as A/S.
5. 100 lb./ac. of N as F.Y.M.+45 lb./ac. of N as A/S.

3. DESIGN:

(i) R.B.D. (ii) (a) 5. (b) N.A. (iii) 3. (iv) (a) 33’×16.5’. (b) 33’×16.5’. (v) Nil. (vi) Yes.

4. GENERAL:

(i) Fair. No lodging. (ii) Nil. (iii) Grain yield. (iv) (a) Not continued. (b) No. (c) —. (v) (a) No. 
(b) Nil. (vi) and (vii) Nil.

5. RESULTS:

(i) 812.5 lb./ac.
(ii) 292.5 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>S.E./mean</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>453</td>
<td>168.9 lb./ac.</td>
</tr>
<tr>
<td>2.</td>
<td>660</td>
<td></td>
</tr>
<tr>
<td>3.</td>
<td>1007</td>
<td></td>
</tr>
<tr>
<td>4.</td>
<td>913</td>
<td></td>
</tr>
<tr>
<td>5.</td>
<td>1027</td>
<td></td>
</tr>
</tbody>
</table>
Crop :— Maize (Kharif).
Site :— Agri. Farm, Gramwala.
Object :—To find the optimum date of sowing for Maize crop.

1. BASAL CONDITIONS :
   (i) (a) Nil. (b) Wheat. (c) Nil. (ii) (a) Clay loam. (b) N.A. (iii) As per treatments. (iv) (a) N.A. (b) Broadcast. (c) N.A. (d) —. (e) Nil. (vi) Maize cross No. 1 (medium). (vii) Unirrigated. (viii) One hoeing. (ix) N.A. (x) N.A.

2. TREATMENTS :
   4 sowing dates: \( D_1 = 23.3.2009, D_2 = 30.3.2009, D_3 = 5.4.2009 \) and \( D_4 = 12.4.2009 \).

3. DESIGN:
   (i) R.B.D. (ii) (a) 4. (b) N.A. (iii) 2. (iv) (a) N.A. (b) 33\( \times 2\'). (v) N.A. (vi) Yes.

4. GENERAL:
   (i) N.A. (ii) Nil. (iii) Grain yield. (iv) (a) Not continued. (b) No. (c) —. (v) (a) No. (b) Nil. (vi, Nil. (vii) Originally planned with 5 dates of sowing but conducted with 4 dates of sowing. Dates are according to Vikrami Samvat.

5. RESULTS :
   (i) 258. 9 lb./ac.
   (ii) 15 00 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>( D_1 )</td>
<td>678.9</td>
</tr>
<tr>
<td>( D_2 )</td>
<td>233.4</td>
</tr>
<tr>
<td>( D_3 )</td>
<td>84.9</td>
</tr>
<tr>
<td>( D_4 )</td>
<td>35.2</td>
</tr>
<tr>
<td>S.E./mean</td>
<td>= 10.61 lb./ac.</td>
</tr>
</tbody>
</table>