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 re-inforce 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.

New Delhi,
August 20, 1962.

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

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

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

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

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

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

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

Manurial (M), Cultural (C), Irrigational (I), Diseases, Pests and Chemicals other than 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 endeavours 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 1852-53.
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.

New Delhi,
August 16, 1962.

V.G. Pansri
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 headquaters</th>
<th>Regional Supervisors:</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. <strong>Andhra Pradesh</strong> (Hyderabad)</td>
<td>SHRI D.V.G. Krishnamoorthy, Deputy Director of Food Production, Andhra Pradesh.</td>
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<tr>
<td></td>
<td>SHRI Jagannath Rao, Joint Director of Agriculture (Research), Andhra Pradesh.</td>
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<tr>
<td></td>
<td>DR. Khadruddin Khan, Joint Director of Agriculture (Research), Andhra Pradesh.</td>
</tr>
<tr>
<td></td>
<td>SHRI Wahiuddin, Headquaters Deputy Director of Agriculture (Research), Andhra Pradesh.</td>
</tr>
<tr>
<td>2. <strong>Assam, Manipur and Tripura</strong> (Shillong)</td>
<td>SHRI I.K. Handique, Director of Agriculture, Assam.</td>
</tr>
<tr>
<td></td>
<td>SHRI S. Majid, Director of Agriculture, Assam.</td>
</tr>
<tr>
<td></td>
<td>DR. S.R. Barooha, Director of Agriculture, Assam.</td>
</tr>
<tr>
<td>3. <strong>Bihar</strong> (Sabour)</td>
<td>DR. R. Richaria, Principal, Agriculture College, Sabour.</td>
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<td></td>
<td>SHRI R.S. Roy, Principal, Agriculture College, Sabour.</td>
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<tr>
<td>4. <strong>Kerala</strong> (Trivandrum)</td>
<td>SHRI N. Shankara Menon, Director of Agriculture, Kerala.</td>
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<tr>
<td></td>
<td>SHRI P.D. Nair, Director of Agriculture, Kerala.</td>
</tr>
<tr>
<td>5. <strong>Madhya Pradesh</strong> (Gwalior)</td>
<td>Dr. T.R. Mehta, Principal, Agriculture College, Gwalior.</td>
</tr>
<tr>
<td>6. <strong>Madras</strong> (Coimbatore)</td>
<td>SHRI C.R. Sheshadri, Vice-Principal &amp; Secretary, Research Council, Agriculture College, Coimbatore.</td>
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<td></td>
<td>SHRI P.A. Venkateswaran, Vice-Principal &amp; Secretary, Research Council, Agriculture College, Coimbatore.</td>
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<tr>
<td></td>
<td>LATE SHRI M. Bhavani Sankara Rao, Vice-Principal &amp; Secretary, Research Council, Agriculture College, Coimbatore.</td>
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<tr>
<td></td>
<td>SHRI T. Natarajan, Agronomist &amp; Secretary, Research Council, Agriculture College, Coimbatore.</td>
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<td></td>
<td>SHRI A.H. Sarma, Extension Specialist &amp; Secretary, Research Council, Agriculture College, Coimbatore.</td>
</tr>
<tr>
<td>7. <strong>Maharashtra &amp; Gujerat</strong> (Former Bombay Statistician, Department of Agriculture, State) (Poona)</td>
<td>SHRI D.S. Ranga Rao, 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.*
8. MYSORE (Bangalore)  
Shri A. Anant Padmanabha Rau, State Statistician, Mysore State.

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

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

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

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

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

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

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

Abbreviations adopted for States are as follows :-

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

Abbreviations adopted for States are as follows :-

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

Repetition of the experiment in other years is indicated in the same line against 'reference' by stating the year and serial number for each repetition side by side e.g. U.P. 63(19)/52(42)/51(20) etc.

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

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

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

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

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

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

Abbreviations used in the text of the experiments :-

<table>
<thead>
<tr>
<th>Abbreviation</th>
<th>Meaning</th>
</tr>
</thead>
<tbody>
<tr>
<td>ac.</td>
<td>acre</td>
</tr>
<tr>
<td>Ammo. 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>
Information under the above heading to be read against the following items:

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

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

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

DESIGN

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

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

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

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

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

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

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

C. For experiments on cultivators' fields:
   (i) Crop condition during growth. (ii) Incidence of pests and diseases with control measures taken. (iii) Quantitative observations taken. (iv) In case of repetition in successive years—(a) from what year to what year, (b) whether treatments were assigned to the same plots in the same manner every year, (c) reference to combined analysis, if any. (v) In case of repetition in other places names of places along with reference. (vi) Abnormal occurrences, like heavy rains, frost, storm etc., if any. (vii) Any other important information.
<table>
<thead>
<tr>
<th>Sl. No.</th>
<th>Name of Crop</th>
<th>Botanical name</th>
<th>Assamese</th>
<th>Bengali</th>
<th>Oriya</th>
<th>Telugu</th>
<th>Tamil</th>
<th>Malayalam</th>
<th>Kannada</th>
<th>Marathi</th>
<th>Gujarati</th>
<th>Hindi</th>
<th>Punjabi</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>Rice, Paddy.</td>
<td>Oryza sativa L.</td>
<td>Dhan</td>
<td>Dhan</td>
<td>Dhano</td>
<td>Vadiu</td>
<td>Nei</td>
<td>Neliu</td>
<td>Bhatta</td>
<td>Bhat</td>
<td>Dapgar</td>
<td>Chajj</td>
<td>Dhap</td>
</tr>
<tr>
<td>2.</td>
<td>Tapioca.</td>
<td>Manihot utilissima</td>
<td>Sinolul</td>
<td>Shimal</td>
<td></td>
<td>Karra</td>
<td>Maravalli</td>
<td>Marach-</td>
<td>Tapioca</td>
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<tr>
<td></td>
<td></td>
<td>Manihot esculenta</td>
<td>Alu</td>
<td>Alu</td>
<td></td>
<td>Pendan-</td>
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<td>-</td>
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<tr>
<td>5.</td>
<td>Sweet potato.</td>
<td>Ipomea batatas Lam.</td>
<td>Misha</td>
<td>Aloo</td>
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<td>7.</td>
<td>Cashewnut.</td>
<td>Anacardium occidentale L.</td>
<td>Kaju</td>
<td>Kaju</td>
<td>Budam</td>
<td>Lankam-</td>
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<td>8.</td>
<td>Banana.</td>
<td>Musa paradisica L.</td>
<td>Kol</td>
<td>Paka-kala</td>
<td>Kadali</td>
<td>Arai</td>
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<td>Crotalaria StRaita.</td>
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<td>Vetiver.</td>
<td>N.A.</td>
<td>N.A.</td>
<td>N.A.</td>
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<td>13.</td>
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<td>N.A.</td>
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<td>14.</td>
<td>Yam.</td>
<td>N.A.</td>
<td>N.A.</td>
<td>N.A.</td>
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Glossary of Vernacular Names of Crops
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<td>EXPERIMENTAL RESULTS (CROP-WISE)</td>
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<tr>
<td>Banana</td>
<td>191</td>
</tr>
<tr>
<td>Ginger</td>
<td>193</td>
</tr>
<tr>
<td>Lemon Grass</td>
<td>197</td>
</tr>
<tr>
<td>Crotalaria Straita</td>
<td>199</td>
</tr>
<tr>
<td>Vettivert</td>
<td>200</td>
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<tr>
<td>Sesbania</td>
<td>202</td>
</tr>
<tr>
<td>Yam</td>
<td>203</td>
</tr>
<tr>
<td>Gingelly</td>
<td>203</td>
</tr>
</tbody>
</table>
MAP OF KERALA STATE SHOWING AGRO-CLIMATIC REGIONS, SOILS AND AGRICULTURAL RESEARCH STATIONS ETC.

DISTRICT BOUNDARIES

RIVERS

WESTERN GHATS

DISTRICT H.Q.

AGRICULTURAL RESEARCH STATIONS

LATERITE SOIL

COASTAL SANDY ALLUVIUM

VIRGIN FOREST SOIL

ALLUVIAL SOIL

RED SOIL

RED SANDY SOIL

BLACK SOIL

MIXED RED & BLACK SOIL

RED LOAM

KARI SOIL
KERALA STATE

1. GENERAL

The former Travancore-Cochin State along with the Malabar district and the Kasaragod taluka of South Kanara district of erstwhile Madras state after the reorganisation of states in 1956 form the present Kerala state. It is located between 8°—18° and 12°—48° north latitudes and between 74°—52° and 77°—22° east longitudes. The state is divided into 9 districts. The area of the state is about 9.6 million acres of which the total cropped area is about 5.5 million acres—the area under food crops covering about 70%, the rest being under non-food crops. The net area sown in 1955-56 was about 4.5 million acres and about 2.4 million acres was under forests.

2. PHYSICAL FEATURES & CLIMATE

The Kerala state—a strip of land running almost in south-north direction is situated between the vast Arabian Sea on the West and ranges of Western Ghats and Nilgiri hills on the East, both running parallel to each other. From the Western Ghats the country undulates to the west and presents a series of hills and valleys intersected by numerous rivers. On the west the country is more or less flat. These characteristics demarcate the State into three natural regions—the highland, the midland and the low land.

Highland:—The highland on the eastern portion of the state and containing most of the reserve forests occupies nearly 45% of the total area of the state. The annual rainfall ranges between 100" in the south and 200" in the north. The climate is cool and bracing. Means of communications are poor and cultivation is largely limited to plantation crops like tea, rubber and cardamom.

Midland:—The midland consists of uplands of varying elevations through which rivers have carved out long narrow valleys. It covers an area of nearly 37%. Rainfall ranges from 55" to 155". Rice is grown in the valleys while tapioca, coconut, pepper, ginger and rubber are cultivated on the hill slopes.

Low land:—The low land covering about 18% of the total area is narrow and irregular in shape. It has an almost continuous line of lagoons and backwaters receiving the drainage of several rivers. The rainfall ranges from 35" in the extreme south to 140" in the north. The soil is peculiarly suited to cultivation of rice and coconut.

3. SOILS

Trivandrum District:—The soil in the high land region is clay loam and rests on a bed of rocks. It is black in colour and rich in organic matter, nitrogen and potash and is slightly acidic. In the midland the soil is clay loam of lateritic origin, with an admixture of gravel and sand. The valleys of the midland have loamy clay soil with high sand content. The coastal strip is sandy with laterite foundation.

Quilon & Alleppey Districts:—The soil in the coastal tracts consists mainly of pure crystalline sands. The swamp paddy fields of the districts contain clay soil of different depths, mixed with varying proportions of organic matter in different stage of decay. The soils in the valleys and deltas of rivers are alluvial in nature, and consist mainly of fine silt. The soils in the hills are loamy in nature with a great admixture of humus. The soils in this region are generally deficient in nitrogen and phosphorus while the sandy soils along the coast are deficient in potash also.

Kottayam District:—Swamp peaty soil occurs generally in the low areas of the District. The soils in the hills are loamy with a great admixture of humus. The soils in this District are generally deficient in nitrogen, phosphorous and lime.
Ernakulam & Trichur Districts:—In the low land the soil is arenaceous consisting mainly of recent deposits of sand, and mud due to river alluvium. In the midland region, the soil is lateritic varying in quality from rich loam to unculturable laterite. On the slopes of Ghats in several places there is an overlying layer of black mould, formed of decayed vegetable matter.

Palghat, Kozhikode & Cannanore Districts:—In the narrow coastal belt the soil is arenaceous. In the plains, the soil is of the red ferruginous type composed of a mixture of clay and river sand. In the Ponnani Taluk (Palghat District) the clay content is high. In Chittur (Palghat District) a layer of black cotton soil is found in certain areas. The loamy soils of the table land are laterite in their origin. Laterite is a form of decomposed gneiss, and in itself a soil rather than a rock and is sensitive to weather conditions. The most valuable of these soils, from the point of view of fertility is the white or yellow clay which fills the tubular hollows that run through the laterite in every direction. This clay contains both iron and potash. In Wynad (Highland) the soils are of red ferruginous series, the fertility varying with the quantity of carbonaceous matter formed by the decomposition of organic substances.

4. IRRIGATION AND RAINFALL

Total irrigated area by various sources by the end of the First Five Year Plan was nearly 0.81 million acres. The various sources of irrigation and the area irrigated by them are given in Table below.

**TABLE 1.**

<table>
<thead>
<tr>
<th>Source</th>
<th>Area at the end of First Five Year Plan</th>
<th>percent of the total area irrigated</th>
<th>percent of total cultivated area</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Govt. Canals</td>
<td>327,671</td>
<td>40.4</td>
<td>7.3</td>
</tr>
<tr>
<td>2. Private Canals</td>
<td>68,113</td>
<td>8.4</td>
<td>1.5</td>
</tr>
<tr>
<td>3. Tanks</td>
<td>77,400</td>
<td>9.5</td>
<td>1.7</td>
</tr>
<tr>
<td>4. Wells</td>
<td>28,499</td>
<td>3.6</td>
<td>0.6</td>
</tr>
<tr>
<td>5. Other sources</td>
<td>309,380</td>
<td>38.1</td>
<td>7.0</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>811,063</strong></td>
<td><strong>100.0</strong></td>
<td><strong>18.1</strong></td>
</tr>
</tbody>
</table>

From the table above it is seen that nearly 18 percent of the net area sown (i.e. 4.5 million acres) is irrigated and 40 percent of the irrigated area is mainly through Government canals, the rest being irrigated by private canals, tanks or wells.

The normal annual rainfall throughout the state is about 122 inches. The state receives majority of the rainfall during the south-west monsoon. The south-west monsoon sets in early June and continues upto the end of September. The normal rainfall during this period is about 63 inches. During the months October to January the normal rainfall is about 20 inches.

5. AGRICULTURAL PRODUCTION

The most important crops of state are paddy, coconut and tapioca which comprise nearly 36, 20 & 10 percent respectively of the total cropped area in the state.

Rice and tapioca are the chief food crops and coconut besides being a food crop is also a commercial one. Besides these, Kerala holds practically a monopoly in the cultivation of rubber, cardamom, pepper etc. which cannot be easily grown elsewhere.

The following table gives the area under principal food crops, and average yield per acre for 1957-58.
TABLE 2

Table showing area under principal crops and average yield in lb./ac.

<table>
<thead>
<tr>
<th>Name of the crop</th>
<th>Area (000 acres)</th>
<th>Production (000 tons)</th>
<th>Av. yield lb./ac</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Paddy</td>
<td>1,912</td>
<td>874</td>
<td>1,024</td>
</tr>
<tr>
<td>2. Pulses</td>
<td>110</td>
<td>17</td>
<td>346</td>
</tr>
<tr>
<td>3. Tapica</td>
<td>558</td>
<td>1,569</td>
<td>6,298</td>
</tr>
<tr>
<td>4. Bananas</td>
<td>116</td>
<td>211</td>
<td>6,005</td>
</tr>
<tr>
<td>5. Sugarcane (gur)</td>
<td>22</td>
<td>35</td>
<td>3,564</td>
</tr>
<tr>
<td>6. Pepper</td>
<td>223</td>
<td>25.9</td>
<td>260</td>
</tr>
<tr>
<td>7. Ginger</td>
<td>23</td>
<td>9.2</td>
<td>900</td>
</tr>
<tr>
<td>8. Cardamom</td>
<td>69</td>
<td>0.99</td>
<td>32</td>
</tr>
<tr>
<td>9. Arecanut</td>
<td>144</td>
<td>—</td>
<td>45,000 (nuts)</td>
</tr>
<tr>
<td>10. Cashewnut</td>
<td>93</td>
<td>56</td>
<td>1,349</td>
</tr>
<tr>
<td>11. Coconut</td>
<td>1,107</td>
<td>—</td>
<td>2,800 (nuts)</td>
</tr>
<tr>
<td>12. Groundnut</td>
<td>33</td>
<td>—</td>
<td>950</td>
</tr>
<tr>
<td>13. Rubber</td>
<td>160</td>
<td>—</td>
<td>294</td>
</tr>
<tr>
<td>14. Coffee</td>
<td>41</td>
<td>—</td>
<td>164</td>
</tr>
<tr>
<td>15. Tea</td>
<td>99</td>
<td>—</td>
<td>679</td>
</tr>
</tbody>
</table>

6. AGRICULTURAL EXPERIMENTATION AND RESEARCH STATIONS

The experimentation is mainly concentrated on important food crops, such as Paddy and Tapioca and also on Coconut which is partly a food crop and a cash crop. Out of 238 experiments conducted on various crops during the period 1948-53 more than 60 percent were mainly on paddy. Out of these experiments on Paddy as much as 68 percent were manurial experiments.

The distribution of these 238 experiments conducted on different crops according to the type of treatments tried and crop is given in table below.

TABLE 3

Distribution of the 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>MC</th>
<th>VC</th>
<th>MVC</th>
<th>IC</th>
<th>D</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Paddy</td>
<td>111</td>
<td>1</td>
<td>7</td>
<td>3</td>
<td>7</td>
<td>2</td>
<td>1</td>
<td>11</td>
<td>143</td>
</tr>
<tr>
<td>Tapioca</td>
<td>16</td>
<td>—</td>
<td>24</td>
<td>—</td>
<td>1</td>
<td>—</td>
<td>—</td>
<td>—</td>
<td>41</td>
</tr>
<tr>
<td>Sugarcane</td>
<td>2</td>
<td>—</td>
<td>6</td>
<td>—</td>
<td>—</td>
<td>—</td>
<td>—</td>
<td>—</td>
<td>2</td>
</tr>
<tr>
<td>Chillies</td>
<td>3</td>
<td>—</td>
<td>6</td>
<td>—</td>
<td>—</td>
<td>—</td>
<td>—</td>
<td>—</td>
<td>10</td>
</tr>
<tr>
<td>Sweet Potato</td>
<td>2</td>
<td>—</td>
<td>1</td>
<td>—</td>
<td>—</td>
<td>—</td>
<td>—</td>
<td>—</td>
<td>3</td>
</tr>
<tr>
<td>Coconut</td>
<td>6</td>
<td>—</td>
<td>14</td>
<td>—</td>
<td>—</td>
<td>—</td>
<td>—</td>
<td>—</td>
<td>20</td>
</tr>
<tr>
<td>Others (Ginger etc.)</td>
<td>—</td>
<td>5</td>
<td>—</td>
<td>1</td>
<td>—</td>
<td>—</td>
<td>2</td>
<td>—</td>
<td>19</td>
</tr>
<tr>
<td>Total</td>
<td>151</td>
<td>1</td>
<td>57</td>
<td>3</td>
<td>9</td>
<td>2</td>
<td>1</td>
<td>14</td>
<td>238</td>
</tr>
</tbody>
</table>

In most of the manurial experiments conducted on Paddy and Tapioca, treatments consisted of both the organic and inorganic manures. The organic manures were tested against the artificial manures such as Amonium Sulphate, Superphosphate etc. The organic manures were either groundnut cake or green manures to supply nitrogen.

The levels of nitrogen tried in the form of Amonium Sulphate generally vary from 0 to 40 lb N/ac and that of $P_4O_{10}$ in the form of Super Phosphate vary similarly. The
amount of greenleaf in most of the experiments varied from 4000 to 6000 lb/ae. The groundnut cake as source of nitrogen was used to give about 20 to 40 lb. of nitrogen per acre.

There were no experiments of long term nature nor any rotational experiments. Some of the experiments on paddy continued on the same plots for 3 years at the most, there being two seasons in a year.

The design adopted for experiments was usually one of Randomised Blocks and in a few cases split plot was used. In randomised block designs, number of plots per block ranges from 6 to 9 while in split plot designs, there were usually 2 main-plots per replication with 3 to 5 sub-plots per main plot. The net plot size varied from nearly 1/200th of an acre to 1/40th of an acre. In few cases it was as small as 1/800th of an acre and also as large as 1/40th of an acre.

Experimental Stations.—A tabular statement giving details of experimental stations from where the experiments for the period 1948-53 were available is appended. Agricultural Research Station at Pattambi had maximum number of experiments on paddy. Out of 131 experiments reported from Pattambi 115 were on paddy alone, and out of these 85 were manurial experiments. The treatments tried in these experiments were of the nature as already discussed.

Research stations at Kasaragod, Kumarakom, Neyattinkara, Nileswhar II, Nileswhar III, Ochira, Pilicode & Thodupuzha are conducting experiments on coconut alone. During the period 1948-53 three experiments (two cultural and one manurial cum-cultural) on coconut were in progress at the Agricultural Research Station, Pilicode for manurial trials. Nitrogen was supplied in the forms of green leaf, Groundnut cake or Ammonium sulphate, Phosphorus as Bonemeal or Superphosphate and Potash as Woodash, Sulphate or Muriate of potash. Usual dose of manures for coconut trees was 0.5 lb N+0.5 lb P+1.0 lb K per tree per year over and above 50 to 100 lb. greenleaf. Experiments were generally laid out in randomised blocks, the number of plots varying from 2 to 8. The number of trees in an experimental plot varied from 6 to 12.
<table>
<thead>
<tr>
<th>Sl. No.</th>
<th>Name of the Experimental Station</th>
<th>District in which located</th>
<th>Tract it represents</th>
<th>Year of establishment</th>
<th>Major crops</th>
<th>Soil type &amp; Soil analysis if available</th>
<th>Normal Rainfall (inches)</th>
<th>Irrigation facilities</th>
<th>No. of experiments</th>
<th>General topography of the experimental area</th>
</tr>
</thead>
<tbody>
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<td></td>
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<td></td>
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<td></td>
<td></td>
<td>Depth—Fairly deep.</td>
<td>July: 20.40</td>
<td>No proper</td>
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<td></td>
<td>Colour—Brownish and black clay.</td>
<td>Aug: 11.76</td>
<td>drainage system.</td>
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<td>Structure—Good.</td>
<td>Sept: 6.22</td>
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<td></td>
<td>Structure—Good.</td>
<td>Sept: 6.22</td>
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<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>(b) Chemical Analysis—Refer soil analysis on page (6)</td>
<td>Oct: 9.98</td>
<td></td>
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</tr>
</tbody>
</table>

Soils of Agricultural Research Station—Ambalavayal.

(a) Broad soil types—Red loam and clay loam.
   (i) Depth—Fairly deep (more than 15 feet).
   (ii) Colour—Brownish and black clay.
   (iii) Structure—Good.

(b) Chemical analysis (As percentage of various constituents analysed)

<table>
<thead>
<tr>
<th>Particulars</th>
<th>Wet land 0—9&quot;</th>
<th>9&quot;—18&quot;</th>
<th>Wet land 0—9&quot;</th>
<th>9&quot;—18&quot;</th>
<th>Marshy area 0—9&quot;</th>
<th>9&quot;—18&quot;</th>
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<tbody>
<tr>
<td>Moisture</td>
<td>1.37</td>
<td>2.54</td>
<td>1.11</td>
<td>0.54</td>
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<tr>
<td>Loss on Ignition</td>
<td>9.04</td>
<td>3.50</td>
<td>3.66</td>
<td>2.15</td>
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<tr>
<td>Lime (CaO)</td>
<td>0.092</td>
<td>0.064</td>
<td>0.078</td>
<td>0.063</td>
<td></td>
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</tr>
<tr>
<td>Potash (K₂O)</td>
<td>0.132</td>
<td>0.183</td>
<td>0.225</td>
<td>0.19</td>
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<tr>
<td>Phosphoric acid (P₂O₅)</td>
<td>0.058</td>
<td>0.050</td>
<td>0.051</td>
<td>0.024</td>
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<tr>
<td>Nitrogen (N)</td>
<td>0.107</td>
<td>0.085</td>
<td>0.130</td>
<td>0.056</td>
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<tr>
<td>Available potash (K₂O)</td>
<td>0.081</td>
<td>0.021</td>
<td>0.014</td>
<td>0.011</td>
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<tr>
<td>Available phosphoric acid (P₂O₅)</td>
<td>0.004</td>
<td>0.005</td>
<td>0.015</td>
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<td>Mechanical analysis of wet-land soil.</td>
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<td>Clay</td>
<td>16.93</td>
<td>18.13</td>
<td>13.80</td>
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<tr>
<td>Silt</td>
<td>8.97</td>
<td>7.62</td>
<td>7.43</td>
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<tr>
<td>Fine sand</td>
<td>50.47</td>
<td>30.99</td>
<td>53.69</td>
<td>45.41</td>
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<tr>
<td>Coarse sand</td>
<td>28.85</td>
<td>42.17</td>
<td>25.15</td>
<td>43.37</td>
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<td>Acid solubles.</td>
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<td>Water soluble salts</td>
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<td>0.040</td>
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<tr>
<td>Carbonate (CO₂)</td>
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<tr>
<td>Bicarbonate (HCO₃)</td>
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<tr>
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<tr>
<td>Chloride (Cl₂)</td>
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<tr>
<td>Lime (CaO)</td>
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<tr>
<td>Magnesia (MgO)</td>
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<tr>
<td>Radicals</td>
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<td>Calcium sulphate</td>
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<td>Magnesium sulphate</td>
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<td>Sodium sulphate</td>
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<td>Sodium chloride</td>
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<td></td>
<td>0.0120</td>
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<tr>
<td>Total</td>
<td>0.1342</td>
<td>0.2154</td>
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</table>
## Fertility status and Mechanical composition of the main soil types at the Central Coconut Research Station, Kasaragod.

<table>
<thead>
<tr>
<th>Soil Types</th>
<th>Depths</th>
<th>N percent</th>
<th>P&lt;sub&gt;2&lt;/sub&gt;O&lt;sub&gt;5&lt;/sub&gt; percent</th>
<th>K&lt;sub&gt;2&lt;/sub&gt;O percent</th>
<th>Lime</th>
<th>Iron</th>
<th>Coarse sand percent</th>
<th>Fine sand percent</th>
<th>Silt percent</th>
<th>Clay percent</th>
<th>pH</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sandy</td>
<td>0-12&quot;</td>
<td>0.04</td>
<td>Trace</td>
<td>Trace</td>
<td>0.13</td>
<td>0.004</td>
<td>0.02</td>
<td>Trace</td>
<td>7.56</td>
<td>10.52</td>
<td>1.00</td>
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<tr>
<td>Loam</td>
<td>12-24&quot;</td>
<td>0.03</td>
<td>0.003</td>
<td>Trace</td>
<td>0.11</td>
<td>Trace</td>
<td>4.50</td>
<td>Nil</td>
<td>88.20</td>
<td>8.80</td>
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<tr>
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<td>24-48&quot;</td>
<td>0.03</td>
<td>0.040</td>
<td>Trace</td>
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<td>Trace</td>
<td>7.12</td>
<td>Nil</td>
<td>86.75</td>
<td>2.00</td>
<td>3.15</td>
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<tr>
<td>Red</td>
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<td>0.03</td>
<td>Trace</td>
<td>Trace</td>
<td>0.08</td>
<td>Trace</td>
<td>2.72</td>
<td>Nil</td>
<td>80.25</td>
<td>7.28</td>
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<td>0.004</td>
<td>Trace</td>
<td>0.07</td>
<td>Trace</td>
<td>3.20</td>
<td>Nil</td>
<td>83.00</td>
<td>6.64</td>
<td>1.00</td>
</tr>
<tr>
<td></td>
<td>24-48&quot;</td>
<td>0.04</td>
<td>0.060</td>
<td>Trace</td>
<td>0.03</td>
<td>Trace</td>
<td>4.08</td>
<td>Nil</td>
<td>81.50</td>
<td>3.00</td>
<td>0.30</td>
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<tr>
<td>Sandy</td>
<td>0-12&quot;</td>
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<td>0.070</td>
<td>0.010</td>
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<td>Trace</td>
<td>2.48</td>
<td>Nil</td>
<td>81.50</td>
<td>2.50</td>
<td>4.60</td>
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<td>0.030</td>
<td>0.010</td>
<td>0.07</td>
<td>Trace</td>
<td>2.48</td>
<td>Nil</td>
<td>83.25</td>
<td>3.00</td>
<td>2.95</td>
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<td>24-48&quot;</td>
<td>0.04</td>
<td>0.060</td>
<td>0.005</td>
<td>0.03</td>
<td>Trace</td>
<td>3.12</td>
<td>Nil</td>
<td>87.50</td>
<td>3.00</td>
<td>1.48</td>
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<tr>
<td>Laterite</td>
<td>0-12&quot;</td>
<td>0.03</td>
<td>0.060</td>
<td>0.020</td>
<td>0.24</td>
<td>Trace</td>
<td>9.92</td>
<td>0.03</td>
<td>51.75</td>
<td>13.50</td>
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<td>Gravelly</td>
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<td>0.070</td>
<td>0.020</td>
<td>0.23</td>
<td>Trace</td>
<td>10.96</td>
<td>0.04</td>
<td>32.50</td>
<td>11.75</td>
<td>1.25</td>
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<tr>
<td>Soil</td>
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<td>0.060</td>
<td>Trace</td>
<td>1.29</td>
<td>0.05</td>
<td>3.84</td>
<td>0.02</td>
<td>15.00</td>
<td>35.00</td>
<td>3.55</td>
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</table>
### Statement Showing Details of Experimental Stations

<table>
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<tr>
<th>No</th>
<th>Station Details</th>
<th>Description</th>
<th>Year</th>
<th>Cultivars</th>
<th>Details</th>
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</table>

#### Chemical Analysis

<table>
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<tr>
<th>Horizon</th>
<th>N%</th>
<th>P&lt;sub&gt;2&lt;/sub&gt;O&lt;sub&gt;5&lt;/sub&gt;%</th>
<th>K&lt;sub&gt;2&lt;/sub&gt;O%</th>
<th>CaO%</th>
<th>MgO%</th>
<th>Avl.</th>
<th>Avl.</th>
<th>pH</th>
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</thead>
<tbody>
<tr>
<td>A</td>
<td>-0.029</td>
<td>-0.023</td>
<td>-0.039</td>
<td>-0.053</td>
<td>-0.036</td>
<td>-0.012</td>
<td>-0.009</td>
<td>6.6</td>
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<tr>
<td>B</td>
<td>0.026</td>
<td>0.020</td>
<td>0.038</td>
<td>0.035</td>
<td>0.035</td>
<td>-0.007</td>
<td>0.007</td>
<td>6.5</td>
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<tr>
<td>C</td>
<td>0.026</td>
<td>0.036</td>
<td>0.036</td>
<td>0.037</td>
<td>-0.037</td>
<td>-0.006</td>
<td>0.008</td>
<td>6.4</td>
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</table>

#### Mechanical Analysis

- N.A.

---

4-Paddy: Sandy coastal area; Entirely rainfed. Paddy lands interspersed with coconut gardens. No irrigation is possible.

1: Level plain Land

---

Pot watering started from 1948 (Coconut) (not included)
### STATEMENT SHOWING DETAILS OF EXPERIMENTAL STATIONS

<table>
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<th>1</th>
<th>2</th>
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<th>4</th>
<th>5</th>
<th>6</th>
<th>7</th>
<th>8</th>
<th>9</th>
<th>10</th>
</tr>
</thead>
</table>
1. Reclaimed clayey soil of the back water area. | June 24.28 | Nil | 2—Coconut—Both started from 1953, hence not included | Trees are planted in single or double rows on narrow bunds separated by deep linear channels. Bunds with one row of trees range in width from 8-10 feet while the bunds with two rows of trees, range from 25-35'; water level in the area is very high often two to three ft. from the surface. |
3. Structure—Gravelly & loamy
4. Soil Analysis
(i) Chem. Anal. N.A.
2—Sweet potato | The experimental area consists of 6 terraces. All the individual terraces are almost level but all the terraces are not of the same type. The third and fourth terraces have a slight sloping along East-West direction. |

**Notes:**
- Figures for June '58 to May '59.
<table>
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<tr>
<th>1</th>
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<th>11</th>
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<tbody>
<tr>
<td>(7)</td>
<td>Mannuthy, Agri. Res. Station</td>
<td>Trichur</td>
<td>Laterite soil of the hill slopes.</td>
<td>1915</td>
<td>2 crops of paddy in wet lands. Mango, Banana and other fruit crops in garden land.</td>
<td>(1) Laterite soil and sandy loam</td>
<td>(2) Depth—2'</td>
<td>(3) Structure—Coarse</td>
<td>(4) Colour.</td>
<td>(5) Soil Analysis.</td>
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</table>

Av. for the years 1943, '44 and '45.
<table>
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<tr>
<th>No.</th>
<th>Station Details</th>
<th>Year</th>
<th>Crop</th>
<th>Details</th>
<th>Analysis Dates</th>
<th>Results</th>
<th>Notes</th>
</tr>
</thead>
<tbody>
<tr>
<td>9</td>
<td>Neyyattinkara, Regional Coconut Research Station</td>
<td>1948</td>
<td>Coconut</td>
<td>Deep red loamy soil with poor rainfall</td>
<td>June 21.48</td>
<td>Nil</td>
<td>2 expts. both started from 1952 onwards of coconut. The area is plain land with deep red loam allowing nearly all kinds of vegetation. The crop included in the area is coconut. The watertable is very low.</td>
</tr>
<tr>
<td></td>
<td>Trivandrum, Vellayani P.O. Nemom</td>
<td></td>
<td></td>
<td></td>
<td>July 8.86</td>
<td>Natural drainage</td>
<td></td>
</tr>
<tr>
<td>10</td>
<td>Nileshwar II Coconut Res. Stn.</td>
<td>1916</td>
<td>Coconut</td>
<td>Red sandy loam</td>
<td>June 44.29</td>
<td>Nil</td>
<td>Nil</td>
</tr>
<tr>
<td></td>
<td>Cannanore, 1 mile from Nileshwar Rly. Station</td>
<td></td>
<td></td>
<td></td>
<td>July 47.91</td>
<td>The soil is well drained but during the south west monsoon</td>
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<tr>
<td></td>
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<td></td>
<td>Aug. 21.00</td>
<td>stagnation is observed in a few fields for some days.</td>
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</table>
### STATEMENT SHOWING DETAILS OF EXPERIMENTAL STATIONS

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<tr>
<td>(11) Nileshwar III, Coconut Res. Station.</td>
<td>Conna-</td>
<td>Sandy soils near the sea coast.</td>
<td>1916</td>
<td>Coconu</td>
<td>(1) Pure litoral</td>
<td>N.A.</td>
<td>There are 4 filter points from where the water is pumped out for irrigating nursery areas, coconut seedlings &amp; grown-up trees. The soil is well drained.</td>
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<tr>
<td></td>
<td>nore.</td>
<td>2 miles from Nileshwar Rly. Stn.</td>
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<td>(2) Depth—20&quot;</td>
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<td>(3) Colour—White.</td>
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<td>(4) Structure—Coarse sand with admixture of small percent of clay.</td>
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<td>(5) Soil Analysis:-</td>
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<td>(i) Chemical Analysis Top soil Subsoil</td>
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<td>(ii) Total P2O5 0.011</td>
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<td>(iv) N</td>
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<td>0.018</td>
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<td>(v) Av. P2O5</td>
<td>0.000</td>
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<td>(vi) Av. K2O</td>
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<td>(2) Depth—6&quot;-10&quot;</td>
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<td>(3) Colour—Reddish brown.</td>
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<td>14.82</td>
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<td>7.40</td>
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<td>N 0.08%</td>
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<td>0.68</td>
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<td>P2O5 0.05%</td>
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<td>K2O 0.23%</td>
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<td>CaO Trace</td>
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<td>PH 6.4</td>
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<td>(Figures for the year 1957—58).</td>
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<td>Type</td>
<td>Year</td>
<td>Crops Planted</td>
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<tr>
<td>Pattambi, Agri. Res. Station</td>
<td>Palghat</td>
<td>1927</td>
<td>Paddy</td>
<td>The soil is of laterite origin, the soil of modern or dry lands being of red gravelly nature and that of single crop and double crop wet land being of sandy loam to loam in character.</td>
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</table>

**Soil Analysis.**

<table>
<thead>
<tr>
<th>Month</th>
<th>Moisture[1%]</th>
<th>Org. matter[%]</th>
<th>Sand[%]</th>
<th>Fe₂O₃[%]</th>
<th>Al₂O₃[%]</th>
<th>Lime[%]</th>
<th>Mg[%]</th>
<th>K₂O[%]</th>
<th>P₂O₅[%]</th>
<th>N[%]</th>
<th>Avl. K₂O[%]</th>
<th>Avl. P₂O₅[%]</th>
<th>pH</th>
</tr>
</thead>
<tbody>
<tr>
<td>Wet land</td>
<td>2.33</td>
<td>10.06</td>
<td>57.40</td>
<td>11.52</td>
<td>16.78</td>
<td>0.081</td>
<td>0.068</td>
<td>0.210</td>
<td>0.269</td>
<td>0.123</td>
<td>0.0062</td>
<td>0.0036</td>
<td>7.54</td>
</tr>
<tr>
<td>Modan land or dry land</td>
<td>2.17</td>
<td>9.35</td>
<td>58.40</td>
<td>10.73</td>
<td>18.57</td>
<td>0.018</td>
<td>0.085</td>
<td>0.292</td>
<td>0.407</td>
<td>0.198</td>
<td>0.0163</td>
<td>0.00114</td>
<td>7.5</td>
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</table>

**Mech Analysis.**

<table>
<thead>
<tr>
<th></th>
<th>Fine gravel</th>
<th>Coarse sand</th>
<th>Silt</th>
<th>Fine silt</th>
<th>Clay</th>
</tr>
</thead>
<tbody>
<tr>
<td>Wet land</td>
<td>11.07</td>
<td>18.44</td>
<td>7.60</td>
<td>20.32</td>
<td>22.10</td>
</tr>
<tr>
<td>Dry land</td>
<td>10.48</td>
<td>13.25</td>
<td>7.34</td>
<td>21.08</td>
<td>29.80</td>
</tr>
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</table>

**Chemical Analysis.** (As percentage of various constituents analysed)
### STATEMENT SHOWING DETAILS OF EXPERIMENTAL STATIONS

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<th>1</th>
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<th>7</th>
<th>8</th>
<th>9</th>
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<tbody>
<tr>
<td>(i) Chemical Analysis:</td>
<td></td>
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<td></td>
<td>(2) Depth 4'-6'</td>
<td>July</td>
<td>43.53</td>
<td>There are proper facilities for drainage.</td>
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<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>(3) Brownish red.</td>
<td>Aug</td>
<td>20.76</td>
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<td></td>
<td>(4) Structure Sticky when wet and hard when dry.</td>
<td>Sept</td>
<td>10.53</td>
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<td>(5) Soil Analysis</td>
<td>Oct</td>
<td>10.53</td>
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<td>Nov</td>
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<td>Dec</td>
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<td>Jan</td>
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<td></td>
<td>Feb</td>
<td>0.02</td>
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<tr>
<td>Top Soil (0—12&quot;)</td>
<td>Org. matter</td>
<td>Total P₂O₅</td>
<td>N</td>
<td>Total K₂O</td>
<td>Avl P₂O₅</td>
<td>K₂O</td>
<td>Avl</td>
<td>March</td>
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<tr>
<td>5.39</td>
<td>0.081</td>
<td>0.085</td>
<td>0.17</td>
<td>0.0066</td>
<td>0.0025</td>
<td>April</td>
<td>2.61</td>
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<tr>
<td>Sub Soil (12—24&quot;)</td>
<td>5.76</td>
<td>0.064</td>
<td>0.071</td>
<td>0.20</td>
<td>0.0069</td>
<td>0.0018</td>
<td>May</td>
<td>10.60</td>
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<td>(i) Mech. Analysis.</td>
<td></td>
<td>Clay</td>
<td>Total</td>
<td>Silt</td>
<td>Fine sand</td>
<td>Coarse sand</td>
<td>Total</td>
<td>141.81</td>
<td>(Av. of 10 years 1948—1957)</td>
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<tr>
<td>Top Soil</td>
<td>27.73</td>
<td>6.90</td>
<td>22.43</td>
<td>44.35</td>
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<tr>
<td>Sub Soil</td>
<td>32.41</td>
<td>7.60</td>
<td>18.26</td>
<td>42.70</td>
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<td>(2) Depth—6'—9'</td>
<td>July</td>
<td>42.13</td>
<td>1—Paddy</td>
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<td>(3) Colour Red.</td>
<td>Aug</td>
<td>21.88</td>
<td>10—Chilies</td>
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<td>(4) Soil Analysis</td>
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<td>6.65</td>
<td>6—Ginger</td>
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<td>(i) Chem. Analysis. N. A</td>
<td>Oct</td>
<td>6.79</td>
<td>17—Total</td>
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<td>Dec</td>
<td>Nil</td>
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<td>Jan</td>
<td>0.64</td>
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<td>Feb</td>
<td>Nil</td>
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<td>March</td>
<td>Nil</td>
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<td>April</td>
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<td>May</td>
<td>10.53</td>
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<td>Total</td>
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<td>(Av. of 10 years 1948—1957)</td>
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</table>

The station is situated on the top of a small hill and the land is gradually sloping toward south. Bunds & cross bunds have been laid-out to prevent soil erosion.

The experimental area is undulated and the perennial crops entirely depend on rainfall.
### STATEMENT SHOWING DETAILS OF EXPERIMENTAL STATIONS

<table>
<thead>
<tr>
<th>Station</th>
<th>Location</th>
<th>Year</th>
<th>Crop</th>
<th>Type of Crop</th>
<th>Mountwise figures</th>
<th>Soil Analysis</th>
<th>Miscellaneous Details</th>
</tr>
</thead>
<tbody>
<tr>
<td>(16) Thodpuzha, Regional Coconut Research Station</td>
<td>Ernakulam</td>
<td>1948</td>
<td>Coconut</td>
<td>Laterite</td>
<td>Nil.</td>
<td>N.A. Av. 125° of rainfall per year.</td>
<td>The whole area under manurial as well as the cultural experiments is uneven and undulating. Water level is very low. Certain areas in the station are completely rocky.</td>
</tr>
<tr>
<td>(17) Tiruallai, Tapioca Research Station</td>
<td>Alleppy Midland tract</td>
<td>1952</td>
<td>Tapioca</td>
<td>Laterite</td>
<td>32.80</td>
<td>Nil.</td>
<td>A small hillock sloping on all sides which are protected from erosion by small mud walls (kayalas).</td>
</tr>
</tbody>
</table>

#### (i) Chemical Analysis

<table>
<thead>
<tr>
<th>Component</th>
<th>Surface Soil (0&quot;—12&quot;)</th>
<th>Subsoil (12&quot;—24&quot;)</th>
<th>pH</th>
<th>loss on ignition</th>
<th>N%</th>
<th>P₂₅%</th>
<th>K₂₅%</th>
<th>Lime</th>
<th>Total salts</th>
<th>Chlorides</th>
<th>Sulphate</th>
</tr>
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<td>6.9</td>
<td>6.7</td>
<td>12.1</td>
<td>11.2</td>
<td>11.2</td>
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<td>0.22</td>
<td>0.03</td>
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#### (ii) Mechanical Analysis—N.A.
<table>
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<th>Locality</th>
<th>Horizon</th>
<th>Moisture %</th>
<th>Loss on ignition %</th>
<th>CaO %</th>
<th>MgO %</th>
<th>P₂O₅ %</th>
<th>K₂O %</th>
<th>Fe₂O₃ %</th>
<th>N %</th>
<th>Available P₂O₅ %</th>
<th>Available K₂O %</th>
<th>PH</th>
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<tbody>
<tr>
<td>Hill</td>
<td>0-12&quot;</td>
<td>3.82</td>
<td>13.56</td>
<td>Trace</td>
<td>0.044</td>
<td>0.051</td>
<td>0.116</td>
<td>11.76</td>
<td>0.046</td>
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<tr>
<td>Slope</td>
<td>12-24&quot;</td>
<td>3.66</td>
<td>13.50</td>
<td></td>
<td>0.042</td>
<td>Trace</td>
<td>0.166</td>
<td>11.04</td>
<td>0.119</td>
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<td>Nursery area</td>
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<td>0.098</td>
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<td>18-36&quot;</td>
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<td>11.65</td>
<td></td>
<td>0.052</td>
<td>0.063</td>
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<td></td>
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<tr>
<td>Hill slope</td>
<td>0-9&quot;</td>
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<td>13.00</td>
<td></td>
<td>0.042</td>
<td>Trace</td>
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<td>11.28</td>
<td>0.066</td>
<td></td>
<td></td>
<td>6.4</td>
</tr>
</tbody>
</table>

Note (1) Low Calcium status-Addition of lime recommended 1-2 lb. per tree.
(2) High fixation of P₂O₅ and K₂O-Addition of organic fertile Farm Yard Manure or compost or green manure.
<table>
<thead>
<tr>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
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<th>7</th>
<th>8</th>
<th>9</th>
<th>10</th>
<th>11</th>
</tr>
</thead>
<tbody>
<tr>
<td>Trivandrum Tapioca Research Station</td>
<td>Trivan- drum 3 miles from Trivan- drum Rly. Stn.</td>
<td>Lowland</td>
<td>1945</td>
<td>Tapioca</td>
<td>(1) Laterite</td>
<td>67°</td>
<td>Pot watering in summer months.</td>
<td>28-Tapioca</td>
<td>Information not available.</td>
<td></td>
</tr>
</tbody>
</table>

(1) Chemical Analysis. (%)
- Moisture: 2.84
- Insoluble mineral matter: 71.34
- N:
- P₂O₅: 0.094
- Avl. P₂O₅: 0.047
- Avl. K₂O: 0.66
- Lime: 0.043
- PH: 7.5

(2) Colour: Red

(3) Soil Analysis:
- Moisture: 3.06
- Pot watering in summer months.
- Information not available.

(4) Mechanical Analysis. %
- Sand: 33.79
- Fine: 19.97
- Clay: 33.35
- Silt: 8.65

(5) Information not available.
1. BASAL CONDITIONS:
   (i) (a) NIL (b) Paddy (c) G.L. at 500 lb./ac. + Super at 150 lb./ac. + A/S at 75 to 150 lb./ac.

2. TREATMENTS:
   1. No Lime.
   2. Lime 1000 lb./ac.
   3. Lime 2000 lb./ac.
   4. Lime 3000 lb./ac.

3. DESIGN:
   (i) R.B.D. (ii) 4 (b) N.A. (iii) 4 (iv) (a) & (b) 24' x 24' (v) Nil (vi) Yes.

4. GENERAL:
   (i) Satisfactory. (ii) Nil. (iii) Grain weight (iv) (a) 1949 1st crop, 1950 1st crop (b) Yes. (c) N.A. (v) (a) & (vii) N.A.

5. RESULTS:
   (i) 2764 lb./ac.
   (ii) 1560 lb./ac.
   (iii) The treatments do not differ significantly.
   (iv) Grain weight in lb./ac.

Crop :-Paddy (1st crop) Ref :-K. 49(12)
Site :-Agri. Res. Stn. Ambalavayal Type :-'M'

Object — To find out if application of slaked lime to marshy wet land will increase the productivity of such lands.

1. BASAL CONDITIONS:
   (i) (a) NIL. (b) Paddy (c) G.L. at 500 lb./ac. + Super at 150 lb./ac. + A/S at 75 to 150 lb./ac.

2. TREATMENTS:
   1. No lime
   2. Lime 1000 lb./ac.
   3. Lime 2000 lb./ac.
   4. Lime 3000 lb./ac.

Lime applied one week before planting as basal dressing.
3. DESIGN:
(i) R. B. D. (ii) (a) 4 (b) N. A. (iii) 4 (iv) (a) (b) 24' x 24' (v) Nil (vi) Yes.

4. GENERAL:
(i) Satisfactory. (ii) NIL. (iii) Grain weight. (iv) (a) 1949-1st crop to 1950 1st crop (b) Yes (c) N. A. (v) (a) (b) N. A. (vi) & (vii) NIL.

5. RESULTS.
(i) 2424 lb/ac.
(ii) 330 lbf/ac.
(iii) The treatments are not significantly different.
(iv) Grain weight in lb/ac.

<table>
<thead>
<tr>
<th>Treatment</th>
<th>Mean</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
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<tr>
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</tr>
<tr>
<td>3</td>
<td>2321</td>
</tr>
<tr>
<td>4</td>
<td>2424</td>
</tr>
</tbody>
</table>

S. E. of treatment means = 165 lb/ac.

Crop: Paddy (1st crop)  
Site: Paddy Breeding Stn. Kayan Kulam  
Object: To investigate the effect of treating seeds with nutrient solution as a means of supplying the required nutrients.

1. BASAL CONDITIONS:
   (i) (a) Nil (b) Paddy (c) 1000 lb/ac. of fresh Cowdung Top dressing with ash at the rate of 33 tins/ac. (Standard Kerosene tins) (ii) Sandy loam (b) Refer Soil Analysis (iii) 18.4.1949. (iv) (a) one ploughing with iron plough and 2 with desi plough. Levelling and breaking clots. (b) Dibbling seeds in furrows. (c) 100 lb/ac. (d)-(e)-(v) 2 cwt of B.M./ac. and top dressing with ash at the rate of 35 tins/ac. (vi) “Kotchu Vitthu” Local short duration variety (83 to 90 days.) (vii) Unirrigated. (viii) Two intercultivations first 21 days and 2nd 30 days after planting. Weeding along with intercultivation. (ix) About 100” (18.4.1949 to 3.8.1949) (x) 3.8.1949.

2. TREATMENTS:
   1. Adding super to the soil.
   2. 5 per cent super, seed-treatment for 12 hours.
   3. 5 per cent M.O.P., seed treatment for 12 hours.
   4. 5 per cent Potassium phosphate, seed treatment for 12 hours.
   5. Adding M.O.P. to the soil.
   6. Seed treated in plain water for 12 hours.
   7. Untreated (Control).

3. DESIGN:
   (i) R.B.D. (ii) (a) 7 (b) N.A. (iii) 6 (iv) (a) 20' x 10' (b) 19' x 9' (v) A border of 2' between plots and between blocks was left. One row of 6" width was discarded all round each net plot. (vi) Yes.

4. GENERAL:
   (i) Satisfactory, No lodging. (ii) NIL. (iii) Grain and straw weight. (iv) (a) No (b) No (c) No (v) (a), (b) Nil. (vi) & (vii) NIL.

5. RESULTS:
(i) 840 lb/ac.
(ii) 244 lb/ac.
(iii) The treatment differences are not significant.
(iv) Grain yield in lb. per acre.

<table>
<thead>
<tr>
<th>Treatment</th>
<th>Mean</th>
</tr>
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<tbody>
<tr>
<td>1</td>
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<tr>
<td>4</td>
<td>940</td>
</tr>
<tr>
<td>5</td>
<td>749</td>
</tr>
</tbody>
</table>
Crop: Paddy (2nd crop)  
Site: Paddy Breeding Stn. Kayan Kulam  
Ref: K. 49 (2)  
Type: 'M'

Object: To investigate the effect of treating seedlings with Bindolye acetic acid as a means of increasing yield.

1. BASAL CONDITIONS:
   (i) (a) Nil  (b) Paddy  (c) 2 cwt Bone meal + Ash 35 tons/ac.  
   (ii) (a) Sandy loam, (b) Soil analysis N. A.  
   (iii) 17-7-1949: 30-8-1949.  
   (iv) (a) 2 ploughings with iron plough and 3 with desi plough. One leveling
   (b) Transplanting in lines (c)---(d) 6"×6" (e) One (v) Fresh Cowdung at the rate of 1000 lb./ac.
   (vi) "Chamba" late (6 months) local. (vii) Unirrigated. (viii) Two weedings one 25 days and the other 40 days after planting. (ix) About 90" (17·7.1949 to 15-1-1950) (x) 15.1.1950.

2. TREATMENTS
   (1) Spraying water on seedlings (Control)  
   (2) Dissolving 1 mg of Bindolye acetic acid in 100 c.c. of water and dividing the solution into 7 groups. Spraying the solution at the rate of one group/day for 7 days with an atomiser.  
   (3) Same as (2) using 5 milligrams of Bindolye acetic acid.  
   (4) ... do ... 10 ... do ...  
   (5) ... do ... 25 ... do ...

3. DESIGN:
   (i) R. B. D.  
   (ii) (a) 5 (b) N. A.  
   (iii) 4 (iv) (a) 8' × 7' (b) 7' × 6' (v) A border of 2' between plots and 2' between blocks was kept. A guard row of 6" width was discarded all round each net plot. (vi) Yes.

4. GENERAL:
   (i) Satisfactory. No lodging. (ii) Nil (iii) Grain weight (iv) (a) 1949 & 1950 (b) The experiment was conducted for two seasons and the treatments were assigned to the same plots during both seasons (c) N. A. (v) (a, b) Nil (vi) & (vii) Nil.

5. RESULTS:
   (i) 1406 lbs/ac  
   (ii) 358 lbs/ac.  
   (iii) The treatments differences are not significant.  
   (iv) Grain yield in lb. ac.

<table>
<thead>
<tr>
<th>Treatment</th>
<th>Mean</th>
</tr>
</thead>
<tbody>
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</tr>
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<td>4</td>
<td>1439</td>
</tr>
<tr>
<td>5</td>
<td>1588</td>
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</tbody>
</table>

S. E. of treatment means: = 179 lb./ac.

---

Crop: Paddy (2nd crop)  
Site: Paddy Breeding Stn. Kayan Kulam  
Ref: K. 50 (1)  
Type: 'M'

Object: To investigate the effect of treating the seeds with Bindolye acetic acid as a means of increasing yield.

1. BASAL CONDITIONS:
   (i) (a) Nil  (b) Paddy  (c) 2 cwt of B. M.,ac and top dressing with 35 tins of ash/ac. (Standard Kerosene tins)  
   (ii) (a) Sandy loam  (b) N. A.  
   (iii) 20-6-50 (iv) (a) 2 ploughings with iron plough and 3 with desi plough.
One levelling and breaking clods (b) transplanting in lines. (c)—(d) 6’ x 6’ (bothways) (e) single seedlings/ hole. (v) Fresh Cow dung at: 100 lb./ac. (vi) Local and late Variety. (vii) Rainfed. (viii) Two weeding first after 25 days and the other after 40 days of planting (ix) About 103” (20.6-1950 to 20.2-51). (x) 20.2-1951.

2. TREATMENTS:
1. Spraying water on seedlings (Control)
2. Dissolving 1 milligrams of Bindolye acetic acid in 1000 c. c. of water and dividing the solution in 2 groups. Spraying the solution at the rate of one group/day for 7 days with an atomiser.
3. Same as (2) using 5 milligrams of Bindolye acetic acid.
4. do 10 do ...
5. do 15 do ...
6. do 25 do ...

3. DESIGN:
(i) L Sq. (ii) 6 (b) N. A. (iii) 6 (iv) (a) 7’ x 7’ (b) 6’ x 6’ (v) A border of 2’ between plots and 2’ between blocks was kept. A guard row of 6” width was discarded all round each net plot. (vi) Yes.

4. GENERAL:
(i) Satisfactory, No lodging. (ii) NIL (iii) Grain weight (iv) (a) 1949 2nd crop 1950 2nd crop. (b) No (c) Nil (v) (a) & (b) Nil (vi) & (vii) Nil.

5. RESULTS:
(i) 634 lb./ac.
(ii) 90 lb./ac.
(iii) The treatments differ highly significant.
(iv) Grain yield in lb./ac.

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</tr>
<tr>
<td>6</td>
<td>706</td>
</tr>
</tbody>
</table>

S. E. of treatment means = 37 lb/ac.

Crop :- Paddy (2nd crop) Site :- Central Farm, Munnuthy Object :- To find out the most beneficial dosage of manures containing N and P105, either alone or in combination.

1. BASAL CONDITIONS
(i) (a) Nil (b) Paddy (c) Green leaf 1 ton/ac. Ash 1 ton/ac. (ii) (a) Sandy loam, (b) Refer soil analysis
(iii) 15.9.1950. (iv) (a) 3 ploughings with country plough and levelling (b) transplanting in lines (c)—(d)
About 6’x6’ (e) 2 to 3 (v) As under treatments (vi) Chembavu local, Medium (4 months). (vii) Rainfed. (viii) Single weeding 20 to 30 days after transplanting. (iv) 12.94” (15.9.50 to 11.1.15) (x) 11.1.1951.

2. TREATMENTS:
All Combinations of (1), (2)
(1) 3 levels of N as G.N.C. :-15, 221 and 30 lb. N/ac. (2) 2 levels of P2O5 as B.M. :-10, 15 lb. P2O5/ac. and 2 Selective treatments are,
(a) Control (No manure).
(b) 15 lb. N/ac as G.N.C.
All treatments including Selective treatments received a basal dressing of G.L. at 1 ton/ac + F.Y.M. at 1 ton/ac + Ash at 1/2 ton/ac.
Green leaf and F.Y.M. applied before transplanting.
Ash at the time of transplanting. Other manures within 2 to 3 weeks after transplanting along with weeding.

3. DESIGN:
(i) R.B.D. (ii) 8 (b) N.A. (iii) 4 (iv) (a) Plot size varied (b) 21 cents (v) A central area of 21 cents was harvested from each plot leaving the rest for border effects (vi) Yes.
4. GENERAL:
(i) Satisfactory. (ii) N.A. (iii) Grain yield. (iv) (a) 1950 (2nd crop) to 1952 (2nd crop) (b) Yes (c) N.A. (v) (a) Nil (b) Nil. (vi) & (vii) Nil.

5. RESULTS:
(i) 2419 lb./ac.
(ii) 206.4 lb./ac.
(iii) Main effect of P alone is significant. Others are not significant.
(iv) Mean Grain yield in lb./ac.
(a) = 2378 lb./ac.
(b) = 2272 lb./ac.

<table>
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<tr>
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<td>2464</td>
<td>2482</td>
<td>2451</td>
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</tbody>
</table>

S.E. for the marginal mean of P = 59.6 lb./ac.
S.E. for marginal mean of N = 72.9 lb./ac.
S.E. for the body of table = 103.2 lb./ac.

Crop : Paddy (1st crop)  
Site : Central Farm, Mannuthy  
Ref : K. 51(4)/50(4)  
Type : 'M'

Object : To find out the most beneficial dosage of measures containing N and P, either alone or in combination.

1. BASAL CONDITIONS:
(i) (a) Nil (b) Paddy (c) Same experiment in these plots. (ii) (a) Sandy loam (b) Refer soil analysis Mannuthy. (iii) 24.4.1951. (iv) (a) 3 ploughing with country plough (b) transplanting in lines (c) 6" x 6" (e) 2 or 3 (v) Pl. See Treatments (vi) Chembavu, Local Medium (4 months). (vii) Rainfed. (viii) Single weeding just at the time of application of manures. (ix) 71.77'' (24.4.1951 to 23.8.1951). (x) 23.8.1951.

2. TREATMENTS:
All Combinations of (1), (2)
(1) 3 levels of N as G.N.C. := 15, 22½ and 30 lbs. N/ac.
(2) 2 levels of P₂O₅ as B.M. := 10, 15 lbs. P₂O₅/ac.
and 2 Selective treatments.
(a) Control (No manure).
(b) 15 lb. N/ac. as G.N.C.
All treatments including Selective treatments received a basal dressing of (G.L. at 1 ton/ac. + F.Y.M. at 1 ton/ac. + Ash at 1/2 ton/ac.

3. DESIGN:
(i) R.B.D. (ii) (a) 8 (b) N.A. (iii) 4 (iv) (a) Plot size varied (b) 2½ cents. (v) A central area of 2½ cents was harvested from each plot leaving the rest for border effects. (vi) Yes.

4. GENERAL:
(i) Satisfactory. (ii) N.A. (iii) Grain yield. (iv) (a) 1950 (2nd crop) to 1952 (2nd crop) (b) Yes (c) N.A. (v) (a) (b) Nil. (vi) & (vii) Nil.

5. RESULTS:
(i) 1523 lb./ac.
(ii) 286.4 lb./ac.
(iii) None of the treatment effects is significant.
(iv) Mean Grain yield in lb./ac.
(a) = 1618 lb./ac.
(b) = 1483 lb./ac.
<table>
<thead>
<tr>
<th>N</th>
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<th>15</th>
<th>22½</th>
<th>30</th>
<th>mean</th>
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<td>1325</td>
<td>1728</td>
<td>1547</td>
</tr>
</tbody>
</table>

S.E. for marginal mean of P = 82.7 lb./ac.
S.E. for marginal mean of N = 101.2 lb./ac.
S.E. for the body of table = 143.2 lb./ac.

Crop: Paddy (2nd crop)
Site: Central Farm, Mannuthy
Ref: K. 51(6)/51(4)/50(4)
Type: 'M'

Object: To find out the most beneficial dosage of manures containing N and P, either alone or in combination.

1. BASAL CONDITIONS:
   (i) (a) Nil (b) Paddy (c) Same experiment was in these plots (ii) (a) Sandy loam (b) Refer soil analysis Mannuthy (iii) 6.9.1951. (iv) (a) 3 ploughing with country plough, levelling (b) Transplanting in lines (c) — (d) 6" x 6" (e) 2 to 3 (f) As under treatments. (vi) Chembavu Local Medium (4 months) (vii) Rainfed (viii) Single weeding just before the application of manures. (ix) 17.8" (6.9.1951 to 9.1.1952) (x) 9.1.1952.

2. TREATMENTS.
   All Combinations of (1) and (2)
   (1) 3 levels of N as G.N.C: —15, 22½ and 30 lb. N/ac.
   (2) 2 levels of P, O as B.M: —10, 15 lb. P, O/ac. and
   2 selective treatments.
   (a) Control (No manure).
   (b) 15 lb. N/ac. as G.N.C.
   All treatments including selective treatments received a basal dressing of G.L. at 1 ton/ac. + F.Y.M. at 1 ton/ac. + Ash at 1/2 ton/ac.

3. DESIGN:
   (i) R.B.D. (ii) (a) 8 (b) N.A. (iii) 4 (iv) (a) Plot Size varied (b) 2½ cents. (v) A central area of 2½ cents was harvested from each plot leaving the rest for border effects. (vi) Yes.

4. GENERAL:
   (i) Satisfactory; (ii) N.A. ; (iii) Grain yield; (iv) (a) 1950 (2nd crop) to 1952 (2nd crop) (b) Yes (c) N.A. ; (v) (a), (b) Nil ; (vii) & (vii) Nil.

RESULTS:
   (i) 1894 lb./ac.
   (ii) 145.2
   (iii) Main effect of P alone is significant. Others are not significant.
   (iv) Mean grain yield in lb./ac.
   (a) —1848 lb./ac.
   (b) =1798

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<th>N</th>
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Mean | 1881 | 1916 | 1957 | 1918 |

S.E. for the marginal mean of N = 51.3 lb./ac.
S.E. for of P = 41.9
S.E. for the body of table = 72.6
Object: To find out the most beneficial dosage of manures containing N and P₂O₅ either alone or in combination.

1. BASAL CONDITIONS:
   (i) (a) Nil (b) Paddy (c) Same experiment was on these plots. (ii) (a) Sandy loam (b) Refer soil analysis (iii) 22.4.52. (iv) (a) 3 ploughings with country plough. (b) Transplanting in lines. (c) — (d) 6" x 6" (e) 2 to 3 (v) As under Treatments (vi) Chemavu, local, medium (4 months) (vii) Rainfed (viii) Single weeding just before applying manures. (ix) 61.13" (22.4.1952 to 23.8.1952) (x) 23.8.1952.

2. TREATMENTS:
   All Combinations of (1), (2)
   (i) 3 levels of N as G.N.C. — 15, 22 and 30 lb. N/acre.
   (2) 2 levels P₂O₅ as B.M. — 10 lb. P₂O₅/acre and 2 selective treatments
      (a) Control (No manure).
      (b) 15 lb. N/acre as G.N.C.
   All treatments including selective treatments received a basal dressing of G.L. at 1 ton/acre + F.Y.M. at 1 ton/acre + Ash at 1/2 ton/acre. Manures applied on 27.5.1952.

3. DESIGN:
   (I) R.B.D. (ii) (a) 8 (b) N.A. (iii) 4 (iv) (a) Varied slightly (b) About 2 1/2 cents. (v) A central area of 2 1/2 cents from each plot was harvested and the rest discarded for border effects (vi) Yes.

4. GENERAL:
   (i) Satisfactory (ii) N.A. (iii) Grain yield. (vi) (a) 1950 (2nd crop) to 1952 (2nd crop) (b) Yes. (c) N.A. (v) (a), (b) Nil (vi) & (vii) Nil.

5. RESULTS:
   (i) 2053 lb./acre.
   (ii) 285.6 .
   (iii) Main effect of N alone is significant.
   Others are not significant.
   (iv) Mean grain yield in lb./acre.
      (a) = 1916 lb./acre.
      (b) = 2071 .

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mean | 1970 | 1929 | 2319 | 2073 |
S. E. for the marginal mean of N = 100.9 lb./acre.
S. E. for the marginal mean of P = 82.4 .
S. E. for body of table = 142.8 .

Crop : Paddy (2nd crop) Site : Central Farm, Mannuthy Object : To find out the most beneficial dosage of manures containing N and P₂O₅ either alone or in combination.

1. BASAL CONDITIONS:
   (i) (a) Nil (b) Paddy (c) Same experiment was on these plots. (ii) (a) Sandy loam (b) Refer soil analysis (iii) 15.9.1950. (iv) (a) 3 ploughings with country plough and levelling (b) transplanting in lines (c) — (d) 6" x 6" (e) 2 to 3. (v) As under Treatments (vi) Chemavu, Local Medium (4 months.) (vii) Rainfed. (viii) Single weeding at the time of application of manures. (ix) 17.80" (15.9.1950 to 11.1.1951). (x) 11.1.1951.
2. TREATMENTS:
All Combinations of (1), (2)
(1) 3 levels of N as G.N.C.: —15, 22 1/2 and 30 lb. N/ac.
(2) 2 levels of P\textsubscript{2}O\textsubscript{5} as B.M.: —10, 15 lb. P\textsubscript{2}O\textsubscript{5}/ac. and
2 Selective treatments.
(a) Control (No manure).
(b) 15 lb. N/ac. as G.N.C.
All treatments including Selective treatments received a basal dressing of G.L. at 1 ton/ac. + F.Y.M. at 1 ton/ac. + Ash at 1/2 ton/ac. Manures applied on 30.8.1952.

3. DESIGN:
(i) R.B.D. (ii) (a) 8 (b) N.A. (iii) 4 (iv) (a) Plot size varied (b) 21/2 cents. (v) A central area of 2 1/2 cents was harvested from each plot leaving the rest for border effects. (vi) Yes.

4. GENERAL:
(i) Satisfactory. (ii) N.A. (iii) Grain yield. (iv) (a) 1950 (2nd crop) to 1952 (2nd crop) (b) Yes (c) N.A. (v) (a) (b) Nil. (vi) & (vii) Nil.

5. RESULTS:
(i) 1729 lb./ac.
(ii) 142.4 lb./ac.
(iii) Main effect of P alone is significant. Others are not significant.
(iv) Mean grain yield in lb./ac.
(a) = 1726 lb./ac.
(b) = 1809 lb./ac.

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S.E. for the the marginal mean of N = 50.3 lb./ac.
S.E. for the marginal mean of P = 41.1 lb./ac.
S.E. for body of the table = 71.2 lb./ac.

Crop: Paddy (2nd crop)  
Site: Central Farm, Mannuthy

Object: To find out the maximum potential yield with N obtained from G.N.C. or A/S and P\textsubscript{2}O\textsubscript{5} from B.M.

1. BASAL CONDITIONS:
(i) (a) Nil (b) Paddy (c) Green leaf at 1 ton/ac. (ii) (a) Sandy loam (b) Refer Soil Analysis
(iii) 30.8.1950. (iv) (a) 3 ploughing with country plough and levelling (b) transplanting in lines (c)—
(d) 6" x 6" (e) 2 to 3. (v) Green leaf 1 ton/ac. F.Y.M. 1 ton/ac. (at the time of ploughing) Ash at 1/2 ton/ac. at the time of transplanting. (vi) Chittini, Local Medium (4 months). (vii) Rainfed. (viii) One weeding just before application of G.N.C. or A/S and B.M. (ix) 12.94" (30.8.50 to 9.1.1951). (x) 9.1.1951.

2. TREATMENTS:
All possible combinations of
1. 2 levels of N viz N\textsubscript{1}=40 N\textsubscript{2}=50 lb./ac.
2. 2 sources of N viz. G.N.C. & A/S.
3. 2 levels of P\textsubscript{2}O\textsubscript{5} as B.M. viz. P\textsubscript{1}=20 P\textsubscript{2}=30 lb./ac.
Treatments top-dressed one month after planting.

3. DESIGN:
(i) 2\textsuperscript{a} fact. in R.B.D. (ii) (a) 8 (b) N.A. (iii) 4 (iv) (a) Varied slightly (b) 21/2 cents. (v) A central area of 2 1/2 cents was harvested leaving the rest for border effects. (vi) Yes.
4. GENERAL:
(i) Satisfactory. (ii) N.A. (iii) Grain yield. (iv) (a) 1950 (2nd crop) to 1952 (2nd crop) (b) Yes (c) N.A. (v) (a) Nil (b) Nil. (vi) Nil. (vii) Nil.

5. RESULTS:
(i) 2275 lb./ac.
(ii) 240 lb./ac.
(iii) Neither main effects nor interactions are significant.
(iv) Av. grain yield in lb./ac.

<table>
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<tr>
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<td>P1</td>
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<td>2384</td>
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<td>P2</td>
<td>2258</td>
<td>2252</td>
</tr>
<tr>
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S.E. of body of table = 85 lb./ac.
S.E. of marginal means = 60 lb./ac.

Crop : Paddy (1st crop)  
Site : Central Farm Mannuthy  
Ref : - K. 51(3)/50(3)  
Type : '-M'

Object : To find out maximum potential yield with N obtained from G.N.C. or A/S, and P, O, from B. M.

1. BASAL CONDITIONS:
(i) (a) Nil (b) Paddy (c) Same experiment was in these plots. (ii) (a) Sandy loam (b) Refer soil analysis.
(iii) 25.4.1951. (iv) (a) 3 ploughings with country plough. (b) Transplanting. (c) — (d) 6" x 6" (e) 2 or 3
(v) Green leaf 1 ton/ac. along with ploughing + Ash 1/2 ton/ac. after planting (vi) Vattan. Local
Medium (4 months) (vii) Rainfed (viii) Single weeding just before applying the manures. (ix) 71.77" (25.4.1951-to 22.8.1951) (x) 22.8.1951.

2. TREATMENTS:
All Combinations of
(i) Two levels of N—40 (N1), 50 (N2) lb/ac.
(ii) Two sources of N—G.N.C., and A/S.
(iii) Two levels of P1 O, = 20 (P1). 30(P2) lb/ac.

Applied on 25.6.1951.

3. DESIGN:
(i) 2nd fraction R.B.D. (ii) (a) 8 (b) N.A. (iii) 4 (iv) (a) Slightly varied (b) 24 cents. (v) A central area
of 24 cents from each plot was harvested leaving the rest for border effects. (vi) Yes.

4. GENERAL:
(i) Satisfactory (ii) N.A. (iii) Grain yield. (iv) (a) 1950 (2nd crop) to 1952 (2nd crop) (b) Yes. (c) N.A.
(v) (a). (b) N.A (vi) & (vii) N.A.
5. RESULTS:

(i) 1808 lb/ac.
(ii) 204 lb/ac.
(iii) Neither main effect nor their interactions are significant.
(iv) Grain yield in lb/acre.

<table>
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<tr>
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<th>N₂</th>
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S.E. of body of table = 73 lb/ac.
S.E. of marginal means = 51 lb/ac.

Crop : Paddy (2nd crop)  Ref : K. 51(5)/51(3)/50(3)
Site : Central Farm, Mannuthy Type : 'M'

Object : To find-out the maximum potential yield with N obtained from G.N.C. or A/S and P₂O₅ from B.M.

1. BASAL CONDITIONS:

(i) (a) NIL (b) Paddy (c) Same experiment was in these plots. (ii) (a) Sandy loam. (b) Refer soil analysis (iii) 28.8.1951. (iv) (a) 3 ploughings with country plough, levelling. (b) Transplanting in lines. (c) (d) 6' x 6'
(e) 2' to 3' (v) G.L. 1 ton/ac. F.Y.M. 1 ton/ac. (at the time of ploughing) Ash 4' ton/ac. at the time of transplanting. (vi) Chittini, local Medium (4 months) (vii) Rainfed. (viii) One weeding just before application of G.N.C. or A/S and B.M. (ix) 17.1" (28.8.51 to 4.1.52.) (x) 4.1.1952.

2. TREATMENTS:

All combinations of
(i) 2 levels of N - 40 (N₁), 50 (N₂) lb/ac.
(ii) 2 sources of N- G.N.C & A/S.
(iii) 2 levels of P₂O₅ - 20 (P₁), 30 (P₂) lb/ac. as B.M.

3. DESIGN:

(i) 29 fact. in R.B.D. (ii) (a) 8 (b) N.A. (iii) 4 (iv) (a) Varied slightly. (b) 2¼ cents. (v) A central area of 2¼ cents was harvested leaving the rest for border effects. (vi) Yes.

4. GENERAL:

(i) N.A. (ii) Not recorded (iii) Grain yield. (iv) (a) 1950 (2nd crop) to 1952 (2nd crop) (b) Yes (c) N.A. (v) (a), (b) Nil. (vii) & (vii) N.A.

5. RESULTS:

(i) 2101 lb/ac.
(ii) 156 lb/ac.

(iii) The 'forms of N' are significant, the interaction between 'forms of N' and 'levels of N' is significant. Other main effects and interactions are not significant.
(iv) Mean yield in lb./ac.

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Mean |
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P₁    | P₂    | Mean |
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Mean |
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S.E. of body of table = 56 lb/ac
S.E. of marginal means = 39 lb/ac.

---

Crop : Paddy (1st crop)
Site : Central Farm, Mannuthy.
Ref : K. 52(12)/51(3,5)/50(3)
Type : M'

Object : To find out the best combination of N obtained from G.N.C. or A/S and P₁ O₁ obtained from B.M. for obtaining the maximum yield.

1. BASAL CONDITIONS:
   (i) (a) Nil (b) Paddy (c) Same experiment was in these plots (ii) (a) Sandy loam (b) Refer soil analysis
   (iii) 21.4.1952. (iv) (a) 3 ploughings with country plough (b) Transplanting in lines (c) 6" x 6" (d) 2 or 3 (e) G.L. 1 ton/ac + Ash 1/2 ton/ac. after planting. (vi) Local medium (4 months) (vii) Rainfed.
   (viii) Single weeding just at the time of applying manures. (ix) 61.13" (21.4.1952 to 20.8.1952) (x) 20.8.52.

2. TREATMENTS:
   All combinations of
   (i) 2 levels of N—40 (N₁), 50 (N₂) lb/ac.
   (ii) 2 source of N—G.N.C., A/S. and
   (iii) 2 levels of P₁ O₁ as B.M.—20 (P₁), 30 (P₂) lb/ac.
   Manures applied on 21.5.1952.

3. DESIGN:
   (i) 2² fact. in R.B.D. (ii) (a) 8 (b) N.A. (iii) 4 (iv) (a) Varying slightly (b) 24 cents. (v) A central area of 24 cents from each plot was harvested leaving the rest for border effects. (vi) Yes.

4. GENERAL:
   (i) Satisfactory (ii) N.A. (iii) Grain yield (iv) (a) 1950-2nd crop to 1952-2nd crop (b) Yes (c) N.A. (v) (a), (b) Nil & (vii) N.A.

5. RESULTS:
   (i) 2150 lb/ac.
   (ii) 206 lb/ac.
   (iii) Neither main effects nor interactions are significant.
   (iv) Table of means in lb/ac.

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Mean |
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</table>
Object: To find out the best combination of N obtained from G.N.C. or A/S and P obtained from B.M. for obtaining the maximum yield.

1. BASAL CONDITIONS:
   (i) (a) Nil (b) Paddy (c) Same experiment was in these plots. (ii) (a) Sandy loam (b) Refer soil analysis (iii) 20.8.52 (iv) (a) 3 ploughing with centre plough, levelling (b) Transplanting in lines. (c) (d) 6' x 6' (e) 2 to 1. (e) Green leaf 1 ton + F.Y.M. 1 ton/ac. + Ash 1/2 ton/ac. at the time of transplanting. (vi) Local, Medium (4 months) (vii) Rainfed. (viii) One weeding just before application of manures. (ix) 17.80" (28.8.1952 to 5.1.1953) (x) 5.1.1953.

2. TREATMENTS:
   All combinations of
   (i) 2 levels of N—40 (N1), 50 (N2) lb/ac.
   (ii) 2 sources of N—G.N.C., A/S.
   (iii) 2 levels of P, 20 (P1), 30 (P2) lb/ac. as B.M.

3. DESIGN:
   (i) 2 x 2 in R.B.D. (ii) (a) 8 (b) N.A. (iii) 4 (iv) (a) Vary slightly. (b) 2J cents. (v) A central area of 2J cents was harvested leaving the rest for border effects. (v) Yes.

4. GENERAL:
   (i) Satisfactory (ii) (a) N.A. (iii) Grain yield. (iv) (a) 1950-2nd crop to 1952-2nd crop (b) Yes. (c) N.A. (v) (a), (b) Nil. (vi) & (vii) N.A.

5. RESULTS:
   (i) 1854 lb/ac.
   (ii) 128 lb/ac.
   (iii) Only the main effect of levels of N and interaction levels of N x P are significant.
   (iv) Table of means lb/ac.

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<tr>
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</tr>
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S. E. of body of table = 46 lb/ac.
S. E. of marginal mean = 32 lb/ac.
Crop :- Paddy (2nd crop)  
Site :- Chemical Section, Central Farm Ollukara, Mannuthy. Type :-‘M’

Object :- To find out the best time for application of Oil cakes to paddy crop.

1. BASAL CONDITIONS : 
(i) (a) Nil (b) Paddy (c) Same experiment was in these plots. (ii) (a) Sandy loam (b) Refer soil analysis (iii) 27.9.48. (iv) (a) 3 ploughings with country plough, levelling (b) Transplanting in lines (c) — (d) 6" x 6" (e) 2 to 3. (v) Green leaf at 1 ton/ac. at the time of ploughing; Ash at 1 ton/ac. at the time of transplanting. (vi) Chemavu local Medium. (vii) Rainfed. (viii) Single weeding 20 to 30 days after transplanting. (ix) 21.9.48 (22.5.48 to 23.9.1948). (x) 23.9.1948.

2. TREATMENTS : 
1. 15 lb/ac. of N as G.N.C. (powdered) at the time of transplanting.

3. DESIGN : 
(i) R.B.D.  (ii) (a) 8 (b) N.A.  (iii) 4  (iv) (a) Size of plots varied slightly. Maximum size being about 3.3 cents (64’ x 22’) (b) 3 cents. (v) A central area of 3 cents was harvested from each plot & the rest if any discarded for border effect. (vi) Yes.

4. GENERAL : 
(i) Poor.  (ii) N.A.  (iii) Grain & straw yield.  (iv) (a) 1947-1st crop to 1949-2nd crop (b) Yes.  (c) N.A.  (v) (a) Nil (b) Nil.  (vi) Nil.  (vii) Nil.

5. RESULTS : 
(i) 916 lb/ac.  
(ii) 81 lb/ac.  
(iii) The treatment differences are not significant.  
(iv) Grain yield in lb/ac.

<table>
<thead>
<tr>
<th>Treatment</th>
<th>Mean yield</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>962</td>
</tr>
<tr>
<td>2.</td>
<td>857</td>
</tr>
<tr>
<td>3.</td>
<td>927</td>
</tr>
<tr>
<td>4.</td>
<td>973</td>
</tr>
<tr>
<td>5.</td>
<td>931</td>
</tr>
<tr>
<td>6.</td>
<td>893</td>
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<tr>
<td>7.</td>
<td>944</td>
</tr>
<tr>
<td>8.</td>
<td>843</td>
</tr>
</tbody>
</table>

S.E. of treatment mean = 41 lb/ac.

30

Crop :- Paddy (1st crop)  
Site :- Chemical Section, Central Farm Ollukara, Mannuthy. Type :-‘M’

Object :- To find out the best time for application of Oil cakes to paddy crop.

1. BASAL CONDITIONS : 
(i) (a) Nil (b) Paddy (c) Same experiment was in these plots. (ii) (a) Sandy loam (b) Refer soil analysis (iii) 22.6.48. (iv) (a) 3 ploughings with country plough, levelling (b) Transplanting in lines (c) — (d) 6" x 6" (e) 2 to 3. (v) Green leaf at 1 ton/ac. at the time of ploughing; Ash at 1 ton/ac. at the time of transplanting. (vi) Chemavu local Medium. (vii) Rainfed. (viii) Single weeding 20 to 30 days after transplanting. (ix) 10.10” (22.6.43 to 23.9.1948). (x) 23.9.1948.

2. TREATMENTS : 
1. 15 lb/ac. of N as powdered G.N.C. at the time of transplanting as top dressing.

3. 16 lb/ac. as powdered G.N.C. 8 days after transplanting as top dressing.

4. 24 lb/ac. as powdered G.N.C. 16 days after transplanting as top dressing.
3. DESIGN:
(i) R.B.D. (ii) (a) 8 (b) N.A. (iii) 4 (iv) (a) Size of plots varied slightly, maximum size being about 3.3 cents (64' x 22') (b) 3 cents. (v) A central area of 3 cents was harvested from each plot and the rest if any was discarded for border effects. (vi) Yes.

4. GENERAL:
(i) Satisfactory (ii) N.A. (iii) Grain and straw yield. (iv) (a) 1947-1st crop to 1949-2nd crop (b) Yes (c) N.A. (v) (a) Nil (b) Nil. (vi) Nil. (vii) Nil.

5. RESULTS:
(i) 1377 lb./ac. 
(ii) 174 lb./ac. 
(iii) The treatment differences are not significant. 
(iv) Grain yield

<table>
<thead>
<tr>
<th>Treatment</th>
<th>Mean yield</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
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<tr>
<td>2.</td>
<td>1314</td>
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<tr>
<td>3.</td>
<td>1335</td>
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<tr>
<td>4.</td>
<td>1430</td>
</tr>
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<td>5.</td>
<td>1411</td>
</tr>
<tr>
<td>6.</td>
<td>1402</td>
</tr>
<tr>
<td>7.</td>
<td>1347</td>
</tr>
<tr>
<td>8.</td>
<td>1405</td>
</tr>
</tbody>
</table>

S.E. of treatment mean = 87 lb./ac.

Crop :-Paddy (1st crop)
Site :-Central Farm, Mannuthy.
Ref :-K. 49(3)
Type :-'M'

Object:- To find-out the best time of application of Oil cakes to paddy crop.

1. BASAL CONDITIONS:
(i) (a) Nil. (b) Paddy (c) Same experiment was in these plots. (ii) (a) Sandy loam. (b) Refer soil analysis
(iii) 12.6.1949. (iv) (a) 3 ploughings with country plough and levelling. (b) Transplanting (c) 6x6" (e) 2 to 3 (v) G.L. at the rate of 1 ton/ac. at the time of ploughing on 26.5.1949. Ash 1ton/ac at the time of transplanting. (vi) Chembavu, Local, Medium (4 months) (vii) Rainfed. (viii) Single weeding 20 to 30 days after transplanting. (ix) 116.42'. (12.6. 1949 to 11.9.1949) (x) 11.9.1949.

2. TREATMENTS:
1. 15 lb/ac. N as powdered G.N.C. as the time of transplanting at top dressing.
2. ................................. 8 days after transplanting ................ do .................
3. ................................. 16 days after transplanting ................ do .................
4. ................................. 24 days after transplanting ................ do .................
5. ................................. 32 days after transplanting ................ do .................
6. ................................. 40 days after transplanting ................ do .................
7. ................................. 48 days after transplanting ................ do .................
8. ................................. 56 days after transplanting ................ do .................

3. DESIGN:
(i) R.B.D. (ii) (a) 8 (b) N.A. (iii) 4 (iv) (a) Size of plots varied slightly, maximum size being about 3.3 cents (64' x 22') (b) 3 cents (v) A central area of 3 cents was harvested from each plot and the rest if any was discarded for border effect. (vi) Yes.

4. GENERAL:
(i) N.A. (ii) N.A. (iii) Grain and straw yield. (iv) (a) 1947-1st crop to 1949-2nd crop (b) Yes. (c) N.A.
(v) (a), (b) Nil. (vi) & (vii) N.A.

5. RESULTS:
(i) 1118 lb./ac.
(ii) 157 lb./ac.
(iii) The treatments differences are not significant.
(iv) Grain yield in lb/ac.

<table>
<thead>
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<td>4</td>
<td>1206</td>
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<td>5</td>
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<td>6</td>
<td>1131</td>
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<td>7</td>
<td>1023</td>
<td></td>
</tr>
<tr>
<td>8</td>
<td>1054</td>
<td></td>
</tr>
</tbody>
</table>

Crop : Paddy (2nd crop)
Site : Central Farm, Mannuthy.

Object : To find out the best time for application of Oil cakes to paddy crop.

1. BASAL CONDITIONS:
   (i) (a) Nil (b) Paddy (c) sand exp. was in these plots. (ii) (a) Sandy loam (b) Refer soil analysis (iii) 29.9.1949. (iv) (a) 3 ploughings with country plough and leveling (b) Transplanting in lines (c)—(d) 6" x 6" (e) 2 to 3 (v) G.L. 1 ton/ac. F.Y.M. 1¼ tons/ac., and Ash at 1 ton/ac. at the time of transplanting (G.L. & F.Y.M. at the time of ploughing on 12.9.1949) (vi) Athian, Medium, local (4 months) (vii) Rainfed. (viii) Single weeding 20 to 30 days after transplanting. (ix) 10.48" (27.9.1949 to 9.1.1950) (x) 9.1.1950.

2. TREATMENTS:
   1 15 lb/ac. N as powdered G.N.C. at the time of transplanting as top dressing.
   2 ............ do .... ...... 8 days after transplanting ............ do ............
   3 ............ do .... ...... 16 ...... do ........ ......... do ............
   4 ............ do .... ...... 24 ...... do ........ ......... do ............
   5 ............ do .... ...... 32 ...... do ........ ......... do ............
   6 ............ do .... ...... 40 ...... do ........ ......... do ............
   7 ............ do .... ...... 48 ...... do ........ ......... do ............
   8 ............ do .... ...... 56 ...... do ........ ......... do ............

3. DESIGN:
   (i) R.B.D. (ii) (a) 8 (b) N.A. (iii) 4 (iv) (a) size of plots varied slightly; maximum size being about 3.3 cents (64' x 22') (b) 3 cent (v) A central area of 3 cents was harvested from each plot and the rest if any was discarded for border effects. (vi) Yes.

4. GENERAL:
   (i) N.A. (ii) N.A. (iii) Grain and Straw yield. (iv) (a) 1947-1st crop to 1949 2nd crop (b) Yes. (c) N.A. (v) (a), (b) Nil. (vi) & (vii) Nil.

5. RESULTS:
   (i) 1427 lb/ac.
   (ii) 167.0 lb/ac.

   (ii) The treatment differences are not significant.

   (iv) Grain yield in lb/ac.

<table>
<thead>
<tr>
<th>Treatment</th>
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</tr>
</thead>
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<td>8</td>
<td>1306</td>
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</tr>
</tbody>
</table>
Crop :- Paddy (2nd crop)  
Site :- Central Farm, Mannuthy.  

Object :- To evolve the best and most economic combination of A/S, B.M., Ash and F.Y.M. to get the highest yield of paddy.

1. BASAL CONDITIONS :  
(i) (a) Nil (b) Paddy (c) G. L. 1 ton/ac. F.Y.M. 1 ton/ac. Ash 1/2 ton/ac. (ii) (a) Sandy loam (b) Refer soil analysis. (iii) 19 to 25.9.1953 (iv) (a) 3 ploughings with country plough, levelling. (b) Transplanting in lines. (c) (—) (d) (e) 6' X 6' (f) 2 to 3. (v) Nil (vi) Cochin 1, local, medium. (vii) Rainfed. (viii) Weeding on 19.10.1953. A/S was top dressed immediately after weeding on 20th and 21st Oct. 1953. (ix) 14.45" (19.9.1953 to 11.1.1954) (x) 11.1.1954.

2. TREATMENTS :  
1. Control.  
2. Ash at 1 ton/ac.  
4. (2) + (3).  
5. (4) + A/S at 20 lb/ac. N  
6. (4) + A/S at 40 lb N/ac.  
7. (4) + A/S at 60 lb N/ac.  
8. (5) + B.M. at 20 lb P₂O₅/ac.  
9. (6) + B.M. at 40 lb P₂O₅/ac.  
10. (7) + B.M. at 60 lb P₂O₅/ac.  
11. (5) + B.M. at 80 lb P₂O₅/ac.

Ash, F.Y.M., G.L. and B.M. applied while ploughing before planting. A/S applied as top dressing about 4 weeks after transplanting when weeding is carried out.

3. DESIGN :  
(i) R.B.D. (ii) (a) 16 (b) N.A. (iii) 4 (iv) (a) Vary from 2½ to 3 cents approximately. (b) 2½ cents (v) A central area of 2½ cents from each plot was harvested leaving the rest for border effects. (vi) Yes.

4. GENERAL :  
(i) Satisfactory (ii) N.A. (iii) Grain yield. (iv) (a) 1953—2nd crop, to 1955—2nd crop (b) Yes. (c) N.A. (v) (a) & (b) Nil (vi) & (vii) Nil.

5. RESULTS :  
(i) 1703 lb/ac.  
(ii) 199.0 lb/ac.  
(iii) The treatment difference are not significant.  
(iv) Grain yield in lb/ac.  

<table>
<thead>
<tr>
<th>Treatment</th>
<th>Mean</th>
<th>Treatment</th>
<th>Mean</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
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<td>9.</td>
<td>1751</td>
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<tr>
<td>2.</td>
<td>1772</td>
<td>10.</td>
<td>1826</td>
</tr>
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<td>3.</td>
<td>1657</td>
<td>11.</td>
<td>1827</td>
</tr>
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<td>4.</td>
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<td>12.</td>
<td>1790</td>
</tr>
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<td>5.</td>
<td>1735</td>
<td>13.</td>
<td>1380</td>
</tr>
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<td>6.</td>
<td>1567</td>
<td>14.</td>
<td>1801</td>
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<td>7.</td>
<td>1578</td>
<td>15.</td>
<td>1790</td>
</tr>
<tr>
<td>8.</td>
<td>1801</td>
<td>16.</td>
<td>1570</td>
</tr>
</tbody>
</table>

S.E. of treatment mean = 100.0 lb/ac.

Crop :- Paddy (2nd crop)  
Site :- Paddy Breeding Station, Monkompu.  

Object :- To test the efficacy of Hyperphosphate over Bone meal.

1. BASAL CONDITIONS :  
(i) (a) Nil (b) Paddy (c) Nil (ii) (a) Clayey in nature (b) N.A. (iii) 14.11.1952. (iv) (a) 2 types of ploughings (Dry and wet ploughings) and levelling (b) Sprouted seeds sown by broadcast (c) 130 lb/ac. (d) — (—) (e) Nil. (vi) MO₂ Variety Early, Improved (vii) Irrigated. (viii) 2 weedings. (ix) Nil. (x) 7.2.1953.

2. TREATMENTS :  
1. 2 cwts of Hyper phosphate/ac.  
2. 2 cwts of Bone meal/ac.
Applied on the 22nd day after sowing.

3. DESIGN:
(i) two 2 x 2 Lat. Sq. (ii) (a) 2 (b) N.A. (iii) 4 (iv) (a) 68' x 30' (b) 66' x 28' (v) 1 foot border round the plot was discarded. (vi) Yes.

4. GENERAL:
(i) Excellent growth in Hyper phosphate plots, partial lodging on 10.1.1953. (ii) Slight attack of rice hispa. Spraying of insecticides done. (iii) Weight of grain. (iv) (a) 1952 to 1954 (b) Yes. (c) N.A. (v) (a), (b) Nil. (vi) & (vii) Nil.

5. RESULTS:
(i) 646 lb/ac. 29 lb/ac.
(ii) The treatment differences are significant.
(iii) Treatment

<table>
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<tr>
<th>Treatment</th>
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<th>Mean 2</th>
</tr>
</thead>
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<td>S. E. of treatment means</td>
<td>~14 lb/ac.</td>
<td></td>
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</tbody>
</table>

Crop :- Paddy (2nd crop)  
Site :- Paddy Breeding Stn. Monkompnu.  
Ref :- K. 53(4)/52(2)  
Type :- M'.

Object :- To test the efficacy of Hyper phosphate over Bonemeal.

1. BASAL CONDITIONS:
(i) Nil (b) Paddy - (c) Nil (ii) (a) Clayey in nature (b) N.A. (iii) 18.11.1953 (iv) (a) The field is ploughed twice (dry and wet ploughing) and levelled (b) Sprouted seeds are sown by broadcast (c) 130 lb/ac. (d) (e) Nil (vi) MO4 Variety early, Improved (vii) Irrigated. (viii) 2 weedings. (ix) Nil (x) 21.2.1954.

2. TREATMENTS:
(1) Hyper phosphate at 2 cwt./ac.
(2) Bone meal at 2 cwt./ac.
Applied 3 weeks after sowing.

3. DESIGN:
(i) Two (2 x 2) L. Squ. (ii) (a) 2 (b) N.A. (iii) 4 (iv) (a) 68' x 30' (b) 66' x 28' (v) 1 foot border all round the plot was discarded. (vi) Yes.

4. GENERAL:
(i) Excellent growth in Bone meal plots, partial lodging on 7.1.1954 (ii) Slight attack of rice hispa. Spraying of insecticides done. (iii) Weight of grain. (iv) (a) 1952 to 1954 (b) Yes. (c) N.A. (v) (a), (b) Nil. (vi) & (vii) Nil.

5. RESULTS:
(i) 725 lb/ac.
(ii) 5.0 lb/ac.
(iii) Treatment differences are significant.
(iv) Yield of grain in lb/ac.

<table>
<thead>
<tr>
<th>Treatments</th>
<th>Mean 1</th>
<th>Mean 2</th>
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<td>700</td>
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<tr>
<td>S. E. of treatments means</td>
<td>~2.0 lb/ac.</td>
<td></td>
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</tbody>
</table>

Crop :- Paddy (2nd crop)  
Ref :- K. 53(27)  
Type :- M'.

Object :- To find out the direct manural value of fertilizers and effect of lime in correcting soil acidity.
1. BASAL CONDITIONS:
(i) (a) Nil (b) Paddy (c) 4,000 lb. G.L.+75 lb A/S/ac. (ii) (a) Laterite loam (b) Refer soil analysis Pattambi. (iii) 14.8.53/23.9.53. (iv) (a) 7 ploughings (b) Transplanted in lines (c)—(d) 6"x6" (e) 2 (f) Nil (v) PTB—18 (medium 130 days). (vii) Unirrigated. (vii) 2 weedings. (ix) 22.80" (14.8. 1953 to 13.1.1954). (x) 13.1.1954.

2. TREATMENTS:
Main plot treatments :-I. No Nitrogen. 
2. 60 lb. N/ac. as A/S
3. , as Compost.
4. ,, as C.M.
5. ,, as G. L.
Sub plot treatments :-All Combination of (1), (2) & (3)
(1) \(P_1\)=No \(P_1\), \(P_0\)
\(P_1\)=60 lb/ac. \(P_2\) as super
(2) \(K_1\)=No Potash
\(K_1\)=60 lb. \(K_2\) O/ac. as Pot sulphate.
(3) \(L_1\)=no lime.
\(L_1\)=1500 lb. lime/ac.
A/S top dressed one month after planting. Cattle Manure and G.L. at the time of puddling. Lime one month before planting.

3. DESIGN:
(i) Split plot. (ii) (a) 5 main plots; 8 sub-plots/main plot. (b) N.A (iii) 4 (iv) (a), (b) 16'x25' (v) Nil (vi) Yes.

4. GENERAL:
(i) Satisfactory. (ii) Nil. (iii) Grain weight (iv) (a) No (b) No. (c) Nil (v) (a), (b) Nil (vi) & (vii) Nil.

5. RESULTS:
(i) 2404 lb/ac.
(ii) (a) = 251.5 lb/ac.
(b) = 192.8 lb/ac.
(iii) Main plot treatments and Main effect of \(P\) are highly significant. Other effects and interactions are not significant.
(iv) grain weight in lb/ac.

<table>
<thead>
<tr>
<th></th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
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<td>2559</td>
<td>2614</td>
<td>2614</td>
<td>2614</td>
<td>2570</td>
</tr>
</tbody>
</table>

| Mean  | 2201 | 2444 | 2335 | 2476 | 2559 |

1. S.E. for the diff. of 2 main treat. means = 62.9 lb/ac.
2. " " 2 Sub-plot treat " = 61.0 lb/ac.
3. " "  at the same level of main plot treatment. = 136.8 lb/ac.
4. S.E. for the diff. of 2 main plot treatment means at the same level of sub-plot treatment. = 142.8 " ".
1. **BASAL CONDITIONS**:

   (i) (a) Nil (b) Paddy (c) G.L. about 5,000 lb/ac + A/S. 100 to 150/ac. (ii) (a) Laterite Loam (b) Refer Soil Analysis for Pattambi (iii) 18.8.48 & 27.10.1948. (iv) (a) 6 ploughings +2 puddlings (b) Transplanting in lines (c) — (d) 5" to 6" between plants and about 10" between rows (e) Three to four (v) 2000 lb/ac. G.L. at the time of puddling. (vi) PTB 20, Medium, Improved (vii) Rainfed (viii) One or two weedicings if required at an interval of one month from the date of planting (ix) 30.9. '48 to 1.2. '49. (x) 1.2.1949.

2. **TREATMENTS**:

   All combinations of Cake, Super and Ash each at two levels.

   Cake 0 and 500 lb/ac. one week after planting as top dressing.

   Super 0 & 200 along last puddling as basal.

   Ash 0 & 4000 after super just before planting as basal.

3. **DESIGN**:

   (i) 2^2 fact in R.B.D. (ii) (a) 8 (b) N.A. (iii) 4 (iv) (a), (b) 12' x 35' (v) Nil. (iv) Yes.

4. **GENERAL**:

   (i) Satisfactory (ii) Nil (iii) Grain weight. (iv) 1948-2nd crop to 1951-2nd crop (b) No (c) N.A. (v) (a) Nil (b) Nil (vi) & (vii) Nil.

5. **RESULTS**:

   (i) 2163 lb/ac.

   (ii) 94 lb/ac.

   (iii) Main effect of ash and cake only are highly significant.

   (vi) Grain weight in lb/ac.

<table>
<thead>
<tr>
<th>Cake</th>
<th>0</th>
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</thead>
<tbody>
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<tr>
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<td>2110</td>
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<table>
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<tr>
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<td>2163</td>
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</table>

   S.E. of body of table: 33 lb/ac.

   S.E. of marginal means: 23 lb/ac.

---

**Crop**: Paddy (1st crop)

**Site**: Agri. Res. Stn. Pattambi

**Object**: To find out the effect of Cake, Ash and Super applied alone or in combination.

**Ref.**: K. 49(33)

**Type**: M'
1. BASAL CONDITIONS:
(i) (a) Nil (b) Paddy (c) G.L. about 5,000 lb./ac.+A/5 100 to 150 lb./ac. (ii) (a) Laterite loam (b) Refer soil analysis Pattambi (iii) 13.10.1949; 12.11.1949; (iv) (a) 6 ploughings and 2 puddlings (b) Transplanted in lines (c)—(d) 4" to 6" between plants and 10" between rows. (e) 3 to 4 (v) Green Leaf at 2000 lb./ac. at the time of ploughing. (vi) PTB 2, Medium, Improved. (vii) Rainfed (viii) one or two weedicings if required at an interval of one month from planting. (ix) 77.46" (3:5.49 to 25.10.1949) (x) 25.10.1949.

2. TREATMENTS:
All possible combinations of 2 levels of G.N.C., 2 levels of Super and 2 levels of Wood Ash.
G.N.C. 0 & 500 lb./ac.
Super 0 & 200 lb./ac.
Wood ash 0 & 4,000 lb./ac.
Super applied along with last ploughing and ash applied after the application of Super just before planting. G.N.C. applied as top dressing one week after planting.

3. DESIGN:
(i) 2² Fact in R.B.D. (ii) (a) S (b) N.A. (iii) 4 (iv) (a) 17"x20" (b) Nil (v) 3 to 4 (vi) Nil

4. GENERAL:
(i) Satisfactory (ii) Nil (iii) Grain weight (iv) (a) 1948-2nd crop to 1951-2nd crop (b) No. (c) N.A. (v) (a), (b) Nil (vi) & (vii) Nil.

5. RESULTS:
(i) 2716 lb./ac.
(ii) 154.0 lb./ac.
(iii) Main effect of Cake is highly significant. Interaction of Cake with Ash is significant.
(iv) Grain weight in lb./ac.

<table>
<thead>
<tr>
<th>G.N.C.</th>
<th>0</th>
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<th>Mean</th>
</tr>
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<td></td>
<td></td>
</tr>
<tr>
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<tr>
<td>200</td>
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<tr>
<td>0</td>
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<td>2748</td>
<td>2716</td>
</tr>
</tbody>
</table>

S. E. of body of table = 54.0 lb./ac.
S.E. of marginal means = 18.0 lb./ac.

Crop :-Paddy (2nd crop)
Site :-Agri. Res. Stn, Pattambi.

Ref :-K. 49(39)
Type :-M'

Object :-To find out the effect of Cake, Ash and Super applied alone or in combination.

1. BASAL CONDITIONS:
(i) (a) Nil (b) paddy (c) G.L. about 5000 lb./ac.+A/S 100 to 150 lb./ac. (ii) (a) Laterite loam (b) Refer soil analysis Pattambi (iii) 13.10.49; 12.11.1949 (iv) (a) 6 ploughings and 2 puddlings (b) Transplanted in lines (c)—(d) 4" to 6" between plants and 10" between rows. (e) 3 to 4 (v) Leaf at 2000 lb./acre at
at the time of ploughing. (vi) PTB 20; Medium, Improved, (vii) Rainfed. (viii) One or two weeding 40
required at an interval of one month from planting. (ix) 10.43" (13.10.1949 to 20.2.1950) (x) 22.2.1950.

2. TREATMENTS :
All possible combinations of 2 levels of G.N.C., 2 levels of Super and 2 levels of Wood Ash.
G.N.C. Super Wood ash
0 & 200 lb./acre. 0 & 200 lb./acre. 0 & 4,000 lb./acre.
Super applied along with first ploughing and ash applied after application of super just before planting.
G.N.C. applied as top dressing one week after planting.

3. DESIGN :
(i) 24 Factorial in R.B.D. (ii) N.A. (iii) 4 (iv) (5), (b) 17' x 20' (v) Nil ; (vi) Yes.

4. GENERAL :
(i) Satisfactory (ii) Nil (iii) Grain Weight (iv) (a) 1948-2nd crop to 1951-2nd crop (b) No (c) N.A. (v) (a),
(b) Nil (vi) & (vii) Nil.

5. RESULTS :
(i) 1764 lb./ac.
(ii) 270.0 lb./ac.
(iii) Main effects and interaction are not significant.
(iv) Grain weight in lb./ac.

<table>
<thead>
<tr>
<th>G.N.C.</th>
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<th>Mean</th>
</tr>
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<tbody>
<tr>
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</tr>
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<td>1805</td>
<td>1897</td>
<td>1851</td>
</tr>
<tr>
<td>Mean.</td>
<td>1714</td>
<td>1814</td>
<td>1764</td>
</tr>
</tbody>
</table>

| Wood ash | 0   | 1617| 1733 | 1676 |
|          | 1809| 1894| 1851 |
| Mean.    | 1714| 1814| 1764 |

S.E. of body of table : = 95.0 lb./ac.
S.E. of marginal means : = 68.0 lb./ac.

Ref: -K. 50(13)/49(39) Type: -M'

Object: -To find out the effect of Cake, Ash and Super applied alone or in combination.

1. BASAL CONDITIONS :
(i) (a) Nil (b) Paddy (c) 2000 lb G.L/acre (ii) Laterite loam (b) Refer soil analysis for Pattambi (iii)
2.6.1950; 7.7.1950. (iv) (a) Puddling 10 times, levelling three times. (b) Seedlings aged one month transplanted
(c)—(d) in bulk (c) 2 to 3 (v) Nil (vi) PTB 20 Short (4 months) Improved. (vii) Rainfed (viii) One weeding
3 or 4 weeks after planting. (ix) 96.42" (2.6.1950 to 27.9.1950) (x) 27.9.1950

2. TREATMENTS :
All combinations of N, P, K each at two levels.
39

**G.N.C.** O (N₀), 500 (N₁) lb/ac.
**Super** O (P₀), 200 (P₁) lb/ac.
**Ash** O (K₀), 4000 (K₁) lb/ac.
Super applied at the time of final ploughing; Ash applied just after the application of super. G.N.C. applied as top dressing one week after planting.

3. **DESIGN:**
   (i) 2² factor in R.B.D. (ii) 8 (b) N.A. (iii) 4 (iv) (a), (b) 16 x 27 (v) Nil - 2' interspace between plots.
   (vi) Yes.

4. **GENERAL:**
   (i) Satisfactory (ii) Nil (iii) Grain weight (iv) a 1948 2nd crop to 1951-2nd crop-both seasons every year (b) Yes (c) N.A. (v) (a), (b) Nil (vi) Nil.

5. **RESULTS:**
   (i) 1487 lb/ac.
   (ii) 191 lb/ac.
   (iii) Main effects of N. and K alone are highly significant
   (iv) Grain weight in lb/ac.

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<tr>
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<td>1105</td>
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S.E. of body of table = 68 lb/ac
S.E. of marginal means = 47 lb/ac

Crop :-Paddy (2nd crop)  
Ref :-K. 50(31)/50(13)/49(39)  
Type :-'M'

Object :-To find out the effect of Cake, Ash and Super applied alone or in combination.

1. **BASAL CONDITIONS:**
   (i) (a) Nil (b) Paddy (c) As per treatments and basal dressing of K. 50 (13) (ii) (a) Lateritic loam (b) Refer soil analysis Pattambi (iii) 13.9.50; 31.10.1950. (iv) (a) Pudling 6 times, levelling 3 times (b) Seedlings aged one month transplanted (c)–(d) in bulk (e) 2 to 3 (v) G.L. 20/0 lb/ac at the time of planting. (vi) PTB 20, Short (4 months), Improved (vii) Rainfed. (viii) One weeding 3 to 4 weeks after planting (ix) 16.36" (13.9.50 to 7.2.1951)(x) 7.2.1951.

2. **TREATMENTS:**
   All possible combinations of
   (i) G.N.C. at 0 (N₀), 500 (N₁) lb/ac.
   (ii) Super at 0 (P₀), 200 (P₁) lb/ac.
   (iii) Ash at 0 (K₀), 4000 (K₁) lb/ac.
   G.N.C. applied one week after planting as top dressing.
   Super at basal dressing after leaf at the time of planting.
   Ash as basal dressing after super at the time of planting.
3. **DESIGN:**
(i) 2^2 factorial in R.B.D. (ii) 8 (b) N.A. (iii) 4 (iv) (a),(b) 16''x27'' (v) Nil, 4' bund and 1' furrow between plots (vi) Yes.

4. **GENERAL:**
(i) Satisfactory (ii) Nil (iii) Grain weight; Straw weight (iv) (a) 1948-2nd crop to 1951-2nd crop (b) Yes (c) N.A. (v) (a), (b) Nil (vi) & (vii) Nil.

5. **RESULTS:**
(i) 1265 lb/ac.
(ii) 171 lb/ac.
(iii) Main effect of N alone is highly significant.
(iv) Grain weight in lb/ac.

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<table>
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S.E. of body of table = 60 lb/ac.
S.E. of marginal means = 42 lb/ac.

**Crop:** Paddy (1st crop)

**Site:** Agri. Res. Stn. Pattambi

**Ref:** 51(9)/50 (13, 31)/49 (39)

**Type:** 'M'

**Object:** To find-out the effect of Cake, Ash and Super applied alone or in combination.

1. **BASAL CONDITIONS:**
(i) (a) Nil (b) Paddy, (c) As per treatments. (ii) (a) Laterite loam (b) Refer soil analysis Pattambi (iii) 2.6.51; 3.7.51 (iv) (a) Puddling 6 times, levelling 3 times. (b) Seedlings transplanted from wet nursery. Average age of seedling about one month. (c) (d) Planted in bulk (c) 2 to 3 (v) 200 lbs of G.M. applied at the time of puddling. (vi) PDR. 2 Medium (4 to 5 months). Improved. (vii) rain fed (viii) One weeding 3 to 4 weeks after planting and another weeding if necessary. (ix) 50.25° (2.6.51 to 19.10.51) (x) 19.10.51.

2. **TREATMENTS:**
All Combinations of
(i) Cake 0 (N_0), 500 (N_1) lb/ac.
(ii) Super 0 (P_0), 200 (P_1) lb/ac.
(iii) Ash 0 (K_0), 4000 (K_1) lb/ac.
Cake and ash at the time of transplanting by broadcast. Super at the time of last puddling by broadcast.

3. **DESIGN:**
(i) 2^2 factorial in R.B.D. (ii) 8 (b) N.A. (iii) 4 (iv) (a), (b) 16''x27'' (v) Nil. (vi) Yes.
4. GENERAL:

(i) Plots manured with G.N.C. showed a better growth of deep green foliage than with other treatments.

(ii) Nil. (iii) Grain weight. (iv) (a) 1948-2nd crop to 1951-2nd crop (b) Yes, from 1949-2nd crop onwards.

(v) (a) Nil. (b) Nil. (vii) The rain-fall (S.W. Monsoon) was deficient by about 20" from normal and the distribution was erratic.

5. RESULTS:

(i) 1717 lb/ac.

(ii) 203 lb/ac.

(iii) The main effects of N and K alone are significant.

(vi) Grain yield in lb/ac.

<table>
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<th>N</th>
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<td>1825</td>
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<tr>
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<td>1800</td>
<td>1717</td>
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<td>1717</td>
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S.E. of body of table = 72 lb/ac.
S.E. of marginal means = 51 lb/ac.

Crop: Paddy (2nd crop)
Ref: K. 51(13)/51(9)/50/13,31)/49(39)
Type: "M"

Object: To find out the effect of Cake, Ash and Super applied alone or in combination.

1. BASAL CONDITIONS:

(i) (a) Nil (b) Paddy (c) As per treatments and basal dressing in K. 51 (9) (ii) (a) Laterite loam (b) Refer soil analysis Pattambi. (iii) 27.9.51; 2.11.51. (iv) (a) Puddling 6 times, levelling 3 times (b) Seedlings transplanted from wet nursery. Average age of seedlings about one month. (c)-(d) planted in bulk. (c) 2 to 3 (v) G.M. 2000 lb/ac. applied at the time of puddling. (vi) PTB 20. Improved, short duration (4 months.) (vii) Rainfed. (viii) One weeding 3 to 4 weeks after planting and another weeding when necessary. (ix) 23.76" (27.9.1951. to 9.2.1952) (x) 9.2.1952.

2. TREATMENTS:

All combinations of

(i) Cake 0 (N<sub>0</sub>), 500 (N<sub>1</sub>) lb/ac.
(ii) Super 0 (P<sub>0</sub>), 200 (P<sub>1</sub>) lb/ac.
(iii) Ash 0 (K<sub>0</sub>), 4000 (K<sub>1</sub>) lb/ac.

Cake and Ash broadcast at the time of transplanting.
Super at the time of last puddling by broadcast.

3. DESIGN:

(i) 2<sup>2</sup> factorial in R.B.D. (ii) 8 (b) N.A. (iii) 4 (iv) (a), (b) 16 x 27 (v) Nil. (vi) Yes.
GENERAL:

(i) Rainfall and its distribution was erratic. Plots manured with G.N.C. showed a better growth with deep green foliage than with other treatments. (ii) Nil. (iii) Grain and straw weight. (iv) (a) 1948 2nd crop. (b) Yes; from 1949 2nd crop onward. (c) N.A. (v) (a), (b) Nil. (vi) & (vii) Nil.

RESULTS:

(i) 2146 lb/ac.
(ii) 128 lb/ac.
(iii) The main effects of N and P are significant and of K highly significant. None of the interactions is significant.
(iv) Grain weight in lb/ac.

<table>
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<th>N1</th>
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</tr>
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<td>2252</td>
</tr>
<tr>
<td>Mean</td>
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<td>2348</td>
<td>2146</td>
</tr>
</tbody>
</table>

S.E. of body of table = 45 lb/ac.
S.E. of marginal means = 32 lb/ac.


1. BASAL CONDITIONS:

(i) (a) Nil (b) Paddy (c) About 5000 lb/ac. G.L. + A/S. 100 to 150 lb/ac. (ii) (a) Laterite Loam (b) Refer soil analysis Pattambi. (iii) 5.5.48. 12 & 13.7.48. (iv) (a) 6 ploughings. 2 puddlings. (b) Transplanting in lines. (c) — (d) 4 to 6" between plants and about 10" between rows. (e) 3 to 4 (v) Nil (vi) PTB 2. Medium. Improved (vii) Rainfed. (viii) One or two weedicings if required at an interval of one month from planting (ix) 8.61" (5.5.48 to 24.10.48) (x) 24.10.48.

2. TREATMENTS:

Proportion of G.N.C. | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9
<table>
<thead>
<tr>
<th></th>
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<tbody>
<tr>
<td>G.N.C. 400 lb/ac</td>
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<td>0</td>
<td>0</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>G.L. 4000 lb/ac</td>
<td>0</td>
<td>0</td>
<td>1</td>
<td>0</td>
<td>1</td>
<td>0</td>
<td>0</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>A/S. 150 lb/ac</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>1</td>
<td>0</td>
<td>1</td>
<td>0</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>G.N.C. 400 lb/ac</td>
<td>One week after planting as top dressing.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>G.L. 4000 lb/ac</td>
<td>At the time of puddling as basal dressing.</td>
<td></td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>A/S. 150 lb/ac</td>
<td>One month after planting as top dressing.</td>
<td></td>
<td></td>
<td></td>
<td></td>
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</table>

3. DESIGN

(i) R.B.D. (ii) (a) 9 (b)N.A. (iii) 6 (iv) (a), (b) 11'×8' (v) Nil (vi) Yes.

4. GENERAL:

(i) Satisfactory (ii) Nil (iii) Grain weight. (iv) (a) 1948 - 1st crop to 1952 - 1st crop (b) NO (c) N.A. (v) (a), (b) Nil (vi) & (vii) Nil.

5. RESULTS:

(i) 2170 lb/ac.
(ii) 266 lb/ac.
(iii) Treatments are not significantly different.
(iv) Grain weight in lb/ac.

<table>
<thead>
<tr>
<th>Treatment</th>
<th>Mean</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
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<tr>
<td>2</td>
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<tr>
<td>3</td>
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</tr>
<tr>
<td>8</td>
<td>2219</td>
</tr>
<tr>
<td>9</td>
<td>2192</td>
</tr>
</tbody>
</table>

S.E. of treatment means: = 108 lb/ac.

---

Crop: Paddy (2nd crop)  
Ref: K. 48 (29)  
Type ‘M’

Object: To find out the best proportion of G.N.C., G.L. & A/S for maximum economic return.

1. BASAL CONDITIONS:
   (i) (a) Nil (b) Paddy (c) G.L. about 5000 lb./ac. + A/S. 100 to 150 lb./ac.  
   (ii) (a) Laterite loam (b) Refer soil analysis Pattambi. (iii) 24.9.48 & 9.11.1948.  
   (iv) (a) 6 ploughings, 2 puddlings. (b) Transplanting in lines. (c) (d) 4' to 6' between plants and about 10' between rows.  
   (e) 3 to 4. (v) Nil (vi) PTB 21, Medium improved. (vii) Rainfed (viii) One or two weedicings if required at an interval of one month from planting. (ix) 13.81' (24.9.48 to 12.2.49) (x) 12.2.1949.

2. TREATMENTS:

<table>
<thead>
<tr>
<th>Treatment</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>6</th>
<th>7</th>
<th>8</th>
<th>9</th>
</tr>
</thead>
<tbody>
<tr>
<td>Proportion of G.N.C. 400 lb/acre.</td>
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<td>1</td>
<td>0</td>
<td>0</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>G.L. 4000 lb./ac.</td>
<td>0</td>
<td>0</td>
<td>1</td>
<td>0</td>
<td>1</td>
<td>0</td>
<td>0</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>A/S at 150 lb./ac.</td>
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<td>0</td>
<td>0</td>
<td>1</td>
<td>0</td>
<td>0</td>
<td>1</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>G.N.C.: One week after planting as top dressing.</td>
<td></td>
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<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>G.L.: At the time of puddling as basal dressing.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>A/S.: As top dressing one month after planting.</td>
<td></td>
<td></td>
<td></td>
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<td></td>
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<td></td>
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<td></td>
</tr>
</tbody>
</table>

3. DESIGN:
   (i) R.B.D. (ii) (a) 9 (b) N.A. (iii) 6 (iv) (a), (b) 12' x 30' (v) Nil. (vi) Yes.

4. GENERAL:
   (i) Satisfactory (ii) Nil (iii) Grain weight (iv) (a) 1948-1st crop to 1952-1st crop. (b) No. (c) N.A. (v) (a) Nil (b) N.A. (vi) & (vii) Nil.

5. RESULTS:
   (i) 2494 lb./ac.  
   (ii) 139 lb./ac.  
   (iii) The treatment differences are highly significant.  
   (iv) Grain weight in lb./ac.

<table>
<thead>
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<th>Treatment</th>
<th>Mean</th>
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</thead>
<tbody>
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<td>3</td>
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</tr>
<tr>
<td>8</td>
<td>2632</td>
</tr>
<tr>
<td>9</td>
<td>2581</td>
</tr>
</tbody>
</table>

S.E. of treatment means: = 57 lb./ac.
Crop: Paddy (1st crop)  

Object: To find out the best properties of G.N.C, G.L., and A/S for maximum economic return.

1. BASAL CONDITIONS:
   (i) (a) Nil (b) Paddy (c) Same experiment was in these plots. (ii) (a) Laterite loam (b) Refer soil analysis Pattambi. (iii) 31.5.1949; 11.7.1949 (iv) (a) 6 ploughings and 2 puddings (b) Transplanted in lines (c) (d) 4" to 6" between plants and 10" between rows. (e) 3 to 4 (v) Nil (vi) PTB 2 Medium, Improved. (vii) Rainfed. (viii) One or two weedings if required at an interval of one month from planting. (ix) 79.22" (31.5.1949 to 27.10.1949). (x) 27.10.1949.

2. TREATMENTS:
   Treatment 1 2 3 4 5 6 7 8 9
   Proportion of G.N.C. 400 lb./ac. 0 0 0 0 0 0 0 0 0
   G. L. 4000 lb./ac. 0 0 0 0 0 0 0 0 0
   A/S. 150 lb./ac. 0 0 0 0 0 0 0 0 0
   G.N.C. one week after planting as top dressing. G.L.: At the time of puddling as basal. A/S. One month after planting as top dressing.

3. DESIGN:
   (i) R.B.D. (ii) (a) 9 (b) N.A. (iii) 6 (iv) (a) (b) 12'x39' (v) Nil (vi) Yes.

4. GENERAL:
   (i) Satisfactory (ii) Nil (iii) Grain weight (iv) (a) 1948-1st crop to 1952-1st crop. The experiment was modified in 1950-2nd crop and then it was repeated in the same field. During 1948 2nd crop and 1949-1st crop it was conducted in another field. (b) No (c) N.A. (v) (a) (b) Nil (vi) & (vii) Nil

5. RESULTS:
   (i) 2599 lb./ac.
   (ii) 213.0 lb./ac.
   (iii) The treatments do not differ significantly.
   (iv) Grain weight in lb./ac.

   Treatment 1 2 3 4 5 6 7 8 9
   Mean 2460 2683 2520 2541 2722 2581 2622 2762 2501

   S. E. of treatment means: =87.0 lb./ac.

Crop: Paddy (2nd crop)  

Object: To find out the best proportion of G.N.C, G.L., and A/S to get maximum economic return.

1. BASAL CONDITIONS:
   (i) (a) Nil (b) Paddy (c) G.L. about 5000 lb./ac. 4-A/S 100 to 150 lb./ac. (ii) (a) Laterite loam (b) Refer soil analysis Pattambi. (iii) 17.10.1949; 11.11.1949. (iv) (a) 6 ploughings and 2 puddings. (b) Transplanted in lines (c) (d) 4" to 6" between plants and 10" between rows. (e) 3 to 4 (v) Nil (vi) PTB 30 Medium Improved (vii) Rainfed. (viii) One or two weedings if required at an interval of one month from planting. (ix) 10.43" (17.10.1949 to 18.2.50) (x) 18.2.1950.
2. TREATMENTS:

<table>
<thead>
<tr>
<th>Treatments</th>
<th>1</th>
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<th>3</th>
<th>4</th>
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<th>6</th>
<th>7</th>
<th>8</th>
<th>9</th>
</tr>
</thead>
<tbody>
<tr>
<td>G.N.C. (400 lb/ac.)</td>
<td>0</td>
<td>1</td>
<td>0</td>
<td>0</td>
<td>1/3</td>
<td>1/3</td>
<td>1/3</td>
<td>1/3</td>
<td>1/3</td>
</tr>
<tr>
<td>G. L. (4000 lb/ac.)</td>
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<td>0</td>
<td>1</td>
<td>0</td>
<td>0</td>
<td>1/3</td>
<td>1/3</td>
<td>1/3</td>
<td>1/3</td>
</tr>
<tr>
<td>A/S. (150 lb/ac.)</td>
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<td>1</td>
<td>0</td>
<td>1/3</td>
<td>1/3</td>
<td>1/3</td>
<td>1/3</td>
</tr>
</tbody>
</table>

G.N.C. : one week after planting as top dressing.
G.L. : At the time of puddling as basal.
A/S. : One month after planting as top dressing.

3. DESIGN:

(i) R.B.D. (ii) 9 (b) N.A. (iii) 4 (iv) (a, b) 12' × 30' (v) Nil (vi) Yes.

4. GENERAL:

(i) Satisfactory (ii) Nil (iii) Grain weight (iv) (a) 1948-1st crop to 1952-1st crop
The experiment was modified in 1950-2nd crop and then it was repeated in the same field. During 1948-2nd crop and 1949 1st crop it was conducted in another field. (b) No (c) N.A. (v) (a, b) Nil (vi) & (vii) Nil.

5. RESULTS:

<table>
<thead>
<tr>
<th>Treatment</th>
<th>Mean.</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
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</tr>
<tr>
<td>2.</td>
<td>2692</td>
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<tr>
<td>3.</td>
<td>2526</td>
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<td>4.</td>
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<td>7.</td>
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</tr>
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<td>8.</td>
<td>2616</td>
</tr>
<tr>
<td>9.</td>
<td>2602</td>
</tr>
</tbody>
</table>

S. E. of treatment means : = 99.0 lb/ac

Crop : Paddy (1st crop)  Ref : K. 50 (29)
Site : Agri. Res. Stn. Pattambi. Type : 'M'

Object : To find out the best proportion of G.N.C., G.L., & A/S as manure to paddy crop for maximum economic return.

1. BASAL CONDITIONS:

(i) (a) Nil (b) Paddy (c) G.L. 5000 lb/ac. and A/S 100 to 150 lb/ac. (ii) (a) Laterite loam (b) Refer soil analysis for Pattambi (i) 5.6.1950; 7.7.1950. (iv) (a) 6 puddlings and 3 levellings (b) Seedlings transplanted from wet nursery at the age of one month (c) (d) planted in bulk (e) 2 to 3 (v) Nil. (vi) PTB 2, Medium 4 to 5 months (vii) Rainfed (vi) One weeding 3 or 4 weeks after planting (ix) 96.42" (5.6 50 to 25.10 1950) (x) 25.10 1950.

2. TREATMENTS:

<table>
<thead>
<tr>
<th>Treatment</th>
<th>Proportion</th>
</tr>
</thead>
<tbody>
<tr>
<td>G.N.C. (400 lb/ac.)</td>
<td>0</td>
</tr>
<tr>
<td>Green Leaf (4000 lb/ac.)</td>
<td>0</td>
</tr>
<tr>
<td>A/S. (150 lb/ac.)</td>
<td>0</td>
</tr>
</tbody>
</table>

G.L. applied at the time of puddling as basal dressing.
G.N.C. applied one week after planting as top dressing A/S applied 1 month after planting as top dressing.

3. DESIGN:

(i) R.B.D. (ii) 9 (b) N.A. (iii) 6 (iv) (a) (b) 11½' × 20' (v) Nil (v) feet bund; 1 foot furrow (vi) Yes.

4. GENERAL:

(i) Satisfactory (ii) Nil (iii) Grain weight (iv) (a) 1948-1st crop to 1952-1st crop (b) No (c) N.A. (v) (a) (b) Nil (vi) & (vii) Nil.
5. RESULTS

(i) 1860 lb/ac.
(ii) 190 lb/ac.
(iii) The treatments are highly significant.
(iv) Grain weight in lb/ac.

<table>
<thead>
<tr>
<th>Treatment</th>
<th>Mean</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
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<td>2026</td>
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<td>1758</td>
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<td>8</td>
<td>1931</td>
</tr>
<tr>
<td>9</td>
<td>1994</td>
</tr>
</tbody>
</table>

S.E. of treatment means = 78 lb/ac.

Crop :- Paddy (2nd crop)
Object :- To find out the best proportion of the 3 sources of N viz G.N.C 400 lb/ac, G.L. 4000 lb/ac and A/S 150 lb/ac for maximum economic return.

1. BASAL CONDITIONS:
   (I) (a) Nil (b) Paddy (c) 5000 lb G.L/ac. and 100 to 150 lb A/S/ac
   (ii) (a) Laterite loam (b) Refer soil analysis Pattambi
   (iii) 13.9.50; 31.10.50.
   (iv) (a) Puddling 6 times, levelling 3 times (b) seedlings transplanted from a wet nursery at the age of one month (c) planted in bulk (e) 2 to 3.
   (v) Nil. (vi) PTB 20: Short duration-4 months Improved.
   (vii) Rainfed.
   (viii) One weeding 3 to 4 weeks after planting.

2. TREATMENTS:
   Treatments
<table>
<thead>
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<th>Proportions</th>
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<th>8</th>
<th>9</th>
<th>10</th>
<th>11</th>
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<tbody>
<tr>
<td>G.N.C. 400 lb/ac</td>
<td></td>
<td></td>
<td></td>
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<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>G.L. 4000 lb/ac</td>
<td>0</td>
<td>1</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
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<td>0</td>
</tr>
<tr>
<td>A/S 150 lb/ac</td>
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<td>0</td>
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<td>0</td>
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<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
</tbody>
</table>

   G.L applied at the times of puddling as basal dressing.
   G.N.C. one week after planting as top dressing.
   A/S one month after planting as top dressing.

3. DESIGN:
   (i) R.B.D. (ii) 11 (b) N.A. (iii) 6 (iv) (a) (b) 10' x 14' (v) Nil; (vi) Bund and 1' furrow between plots.
   (v) Yes.

4. GENERAL:
   (i) Satisfactory (ii) Nil (iii) Grain & Straw weight (iv) (a) 1948-1st crop to 1952 1st crop (b) from 1950-2nd crop (c) N.A. (v) (a) Nil (b) Nil (vi) & (vii) Nil.

5. RESULTS:
   (i) 1509 lb/ac.
   (ii) 181 lb/ac.
   (iii) The treatments differences are highly significant.
   (iv) Grain weight in lb/ac.

<table>
<thead>
<tr>
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<th>Mean</th>
<th>Treatment</th>
<th>Mean</th>
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<td>1457</td>
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</tbody>
</table>

S.E. of treatment means = 74 lb/ac.
Object: To find out the best proportion of G.N.C. G.L and A/S as manures to paddy crop for maximum economic return.

1. BASAL CONDITIONS:

(i) (a) Nil (b) Paddy (c) As per treatments. (ii) (a) Laterite loam (b) Refer soil analysis from Pattambi (iii) 2.6.1951: 4.7.1951. (iv) (a) Puddling 6 times and levelling 3 times. (b) Seedlings transplanted from wet nursery. Average age of seedlings about one month (c) (d) Planted in bulk (e) 2 to 3 (v) Nil (vi) PTB 2 Medium 4 to 5 months. Improved. (vii) Rainfed. (viii) One weeding 3 to 4 weeks after planting; Another weeding if required one month after 1st weeding (ix) 50.25° (2.6.1951 to 25.10.1951) (x) 25.10.1951.

2. TREATMENTS:

<table>
<thead>
<tr>
<th>Treatment</th>
<th>Proportion of</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>6</th>
<th>7</th>
<th>8</th>
<th>9</th>
<th>10</th>
<th>11</th>
</tr>
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<tbody>
<tr>
<td>G.N.C. 400 lb/ac</td>
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<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
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<td>0</td>
<td>0</td>
<td></td>
</tr>
<tr>
<td>G.L 4000 lb/ac</td>
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<td>1</td>
<td>0</td>
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<td>0</td>
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<td>0</td>
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<td></td>
</tr>
<tr>
<td>A/S 150 lb/ac</td>
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<td>0</td>
<td>1</td>
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<td>0</td>
<td>0</td>
<td></td>
</tr>
</tbody>
</table>

G.N.C. applied one week after planting as top dressing.
G.L. applied at the time of preparatory cultivation as basal dressing.
A/S one month after planting as top dressing.

3. DESIGN:

(i) R.B.D. (ii) (a) 11 (b) N.A. (iii) 6 (iv) (a) 10'x11' (v) Nil (vi) yes.

4. GENERAL:

(i) Satisfactory (ii) Nil (iii) Grain weight (iv) 1948-1st crop to 1952-1st crop (b) Yes. (c) N.A. (v) (a) (b) Nil (vi) The rainfall (S.W. Monsoon) was in deficit by about 20 inches from normal and the distribution was erratic. The monsoon failed at critical times and gained strength at inopportune moments making the crop growth from bad to worse. (vii) Nil.

5. RESULTS:

<table>
<thead>
<tr>
<th>Treatment</th>
<th>Mean</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>1697</td>
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<tr>
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</tr>
<tr>
<td>4.</td>
<td>1898</td>
</tr>
<tr>
<td>5.</td>
<td>1574</td>
</tr>
<tr>
<td>6.</td>
<td>1892</td>
</tr>
<tr>
<td>7.</td>
<td>1690</td>
</tr>
<tr>
<td>8.</td>
<td>1934</td>
</tr>
<tr>
<td>9.</td>
<td>1729</td>
</tr>
<tr>
<td>10.</td>
<td>1859</td>
</tr>
<tr>
<td>11.</td>
<td>1828</td>
</tr>
</tbody>
</table>

S.E. of treatment means = 85 lb/ac.
3 to 4 weeks after planting. Another weeding done if required one month after 1st weeding. (ix) 23.76" (27.9.51 to 11.2. 1952) (x) 11.2.1952.

2. TREATMENTS:

<table>
<thead>
<tr>
<th>Treatments</th>
<th>Proportion</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>1 2 3 4 5 6 7 8 9 10 11</td>
</tr>
<tr>
<td>G. N. C. 400 lb/ac.</td>
<td>0 0 0 0 0 0 0 0 0 0</td>
</tr>
<tr>
<td>G. L. 4000 lb/ac.</td>
<td>0 0 0 0 0 0 0 0 0 0</td>
</tr>
<tr>
<td>A/S 150 lb/ac.</td>
<td>0 0 0 0 0 0 0 0 0 0</td>
</tr>
</tbody>
</table>

G.N.C. applied one week after planting as top dressing.
G.L. applied at the time of preparatory cultivation as basal dressing.
A/S one month after planting as top dressing.

3. DESIGN:

(i) R.B.D. (ii) (a) N.A. (iii) 6 (iv) (a) 10'x14' (v) Nil (vi) Yes.

4. GENERAL:

(i) Satisfactory. Plots with A/S in full and 3 dose had good growth. The rain fall distribution was erratic and uneven. Crop did not suffer for want of rain during its life end. (ii) Nil. (iii) Grain & straw weight. (iv) (a) 1948-1st crop to 1952-1st crop (b) Yes. (c) N.A. (v) (a) (b) Nil (vi) & (vii) Nil.

5. RESULTS:

(i) 2035 lb/ac.
(ii) 150 lb/ac.
(iii) The treatments differences are highly significant.
(iv) Grain weight in lb/ac.

<table>
<thead>
<tr>
<th>Treatment</th>
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</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>1608</td>
</tr>
<tr>
<td>2.</td>
<td>2011</td>
</tr>
<tr>
<td>3.</td>
<td>1981</td>
</tr>
<tr>
<td>4.</td>
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</tr>
<tr>
<td>5.</td>
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</tr>
<tr>
<td>6.</td>
<td>2099</td>
</tr>
<tr>
<td>7.</td>
<td>1954</td>
</tr>
<tr>
<td>8.</td>
<td>2136</td>
</tr>
<tr>
<td>9.</td>
<td>2108</td>
</tr>
<tr>
<td>10.</td>
<td>2221</td>
</tr>
<tr>
<td>11.</td>
<td>3053</td>
</tr>
</tbody>
</table>

S. E. of treatment means =61 lb/ac.

---

Crop : Paddy (1st crop)  Ref : K. 52 (29)/51 (25,26)/50(30)
Site: Agri. Res. Stn. Pattambi. Type : 'M'

Object : To find out the best proportion of G.N.C.; G.L and A/S as manures to paddy.

1. BASAL CONDITIONS:

(i) (a) Nil (b) Paddy (c) As under treatments (ii) (a) Laterite loam (b) Refer Soil analysis Pattambi. (iii) 26.5.1952 : 11.7.1952. (iv) (a) 6 Puddlings; 3 levellings. (b) Transplanting in lines (c) —(d) 6' x 4" (e) 3 to 4 (v) Nil (v) PTB 2, medium, improved (vii) Rainfed. (viii) 1st weeding one month after planting; another weeding one month after 1st weeding. (ix) 57.96" in 79 rainy days (26.5.1952 to 20.10.1952). (x) 20.10.1952.

2. TREATMENTS:

<table>
<thead>
<tr>
<th>Treatments</th>
<th>Proportions</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>1 2 3 4 5 6 7 8 9 10 11</td>
</tr>
<tr>
<td>G. L. 4000 lb/ac.</td>
<td>0 0 1 0 0 0 0 0 0 0 0</td>
</tr>
<tr>
<td>G. N. C. 400 lb/ac.</td>
<td>0 0 0 0 0 0 0 0 0 0 0</td>
</tr>
<tr>
<td>A/S 150 lb/ac.</td>
<td>0 0 0 0 0 0 0 0 0 0 0</td>
</tr>
</tbody>
</table>

G.N.C. applied one week after planting as top dressing.
G.L. applied at the time of puddling as basal dressing.
A/S applied one month after planting as top dressing.
3. DESIGN:
(i) R.B.D. (ii) (a) 11 (b) N.A. (iii) 6 (iv) (a, b) 10'x14' (v) Nil. (vi) Yes.

4. GENERAL:
(i) Satisfactory. (ii) Nil. (iii) Grain & straw weight. (iv) (a) 1948-1st crop to 1952-1st crop (In the same field from 1950-2nd crop) (b) Yes. (c) N.A. (v) (a, b) Nil. (vi) & (vii) Nil.

5. RESULTS:
(i) 2190 lb/ac.
(ii) 257 lb/ac.
(iii) The treatments do no differ significantly.
(iv) (Grain weight in lb/ac.)

<table>
<thead>
<tr>
<th>Treatment</th>
<th>Mean.</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>2075</td>
</tr>
<tr>
<td>2.</td>
<td>2252</td>
</tr>
<tr>
<td>3.</td>
<td>2246</td>
</tr>
<tr>
<td>4.</td>
<td>2077</td>
</tr>
<tr>
<td>5.</td>
<td>2266</td>
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<tr>
<td>6.</td>
<td>2369</td>
</tr>
<tr>
<td>7.</td>
<td>2072</td>
</tr>
<tr>
<td>8.</td>
<td>2231</td>
</tr>
<tr>
<td>9.</td>
<td>2197</td>
</tr>
<tr>
<td>10.</td>
<td>2106</td>
</tr>
<tr>
<td>11.</td>
<td>2105</td>
</tr>
</tbody>
</table>

S. E. of treatment means = 105 lb/ac.

---

Crop :-Paddy. (1st crop)  

Object :-To maximise the yield of paddy by application of N as well as P alone and in combinations at higher levels than the maximum so far tried.

1. BASAL CONDITIONS:
(i) (a) Nil (b) Paddy. (c) 200 lb. G.L. +2 cwt G.N.C.+56 lb. A/S/ac. (ii) (a) Laterite loam (b) Refer Soil analysis Pattambi. (iii) 11.5.48/2.7.48. (iv) (a) 6 puddlings; 3 levellings (b) Transplanting in lines (c) - (d) 6'x6' (e) 2. (f) Nil. -(vi) PTB 2 'improved' 135 days duration. (vii) Rainfed. (viii) Two weedings at intervals of one month from planting. (ix) 80.77" in 87 rainy days (11.5.48 to 24.10.1948) (x) 24.10.1.48.

2. TREATMENTS -
All combinations of 6 levels of N, 3 levels of P2O5 and 2 levels of K2O.

Levels of N
N0 : Control.
N1 : Green leaf 6000 lb/ac.
N2 : N1 + 30 lb. N/ac as G.N.C.
N3 : N1 + 60 lb. N/ac as G.N.C.
N4 : N3 + 90 lb. N/ac as G.N.C.
N5 : N4 + 120 lb. N/ac as G.N.C.

Levels of P2O5
P1 : No super.
P2 : 33 lb. P2O5/ac. as Super
P3 : 60 lb. P2O5/ac.

Levels of K2O
K0 : No Potash.
K1 : 60 lb; K2O/ac. as pot. sulphate.

Green leaf applied at the time of puddling, G.N.C. applied at the time planting; P2O5 before planting K2O at the time of planting.

3. DESIGN:
(i) 6x3x2 factorial in R.B.D.(ii) (a) 36 (b) N.A. (iii) 4 (iv) (a,b) 171’x111’ (v) Nil. (vi) Yes.

4. GENERAL:
(i) Satisfactory. (ii) Nil (iii) Grain weight. (iv) (a) 1947 1st crop to 1949 2nd crop. (b) No (c) N.A. (v) (a,b) Nil (vi) & (vii) Nil.
5. RESULTS:
(i) 1821 lb./ac.
(ii) 344 lb./ac.
(iii) Main effect of N alone is highly significant.
(iv) Grain weight in lb./ac.

<table>
<thead>
<tr>
<th></th>
<th>N₁</th>
<th>N₂</th>
<th>N₃</th>
<th>N₁</th>
<th>N₂</th>
<th>N₃</th>
<th>Mean</th>
</tr>
</thead>
<tbody>
<tr>
<td>P₀</td>
<td>1413</td>
<td>1874</td>
<td>1853</td>
<td>1874</td>
<td>1866</td>
<td>1968</td>
<td>1808</td>
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<tr>
<td>P₁</td>
<td>1597</td>
<td>1766</td>
<td>1928</td>
<td>1935</td>
<td>1922</td>
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<td>1852</td>
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<td>1844</td>
<td>1883</td>
<td>1887</td>
<td>1844</td>
<td>1950</td>
<td>1821</td>
</tr>
</tbody>
</table>

S.E. of body of table: N×P = 121 lb./ac.
S.E. of marginal means N = 69

Crop: Paddy. (2nd crop).
Object: To maximise the yield of paddy by application of N as well as P manures alone and in combinations at higher levels than the maximum so far tried.

1. BASAL CONDITIONS:
(a) Nil (b) Paddy. (c) G.L. 3000 lb./ac. (ii) Laterite loam. (b) Refer Soil analysis, Pattambi
(iv) 6 puddlings 3 levellings
(c) Transplanting in lines (c)–(d) 6°x5° (v) Nil
(iv) PTB 21 improved 125 days duration. (vii) Rainfed. (viii) Two weedings at an interval of one month from planting. (ix) 14.51" in 16 rainy days. (24.9.48 to 10.2.1949) (x) 9 & 10.2.1949.

2. TREATMENTS:
All combinations of 6 levels of N, 3 levels of P₂₀₅ and 2 levels of K₂O.

3. DESIGN:
(i) 5x3x2 Factorial in R.B.D. (ii) (a) N.A. (iii) 4 (iv) (a,b)14"x17" (v) Nil (vi) Yes.
4. GENERAL:
(i) Satisfactory (ii) Nil (iii) Grain weight (iv) (a) 1947-1st crop. to 1949-2nd crop (b) No. (c) N.A. (v) (a, b) Nil (vi) & (vii) Nil.

5. RESULTS:
(i) 2803 lb/ac.
(ii) 290 lb/ac.
(iii) Main effect of N alone highly significant
(iv) Grain weight 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>
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<td>3017</td>
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<tr>
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<td>2773</td>
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<td>3044</td>
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<td>2807</td>
</tr>
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<td>P₂</td>
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<td>2706</td>
<td>2881</td>
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<td>3084</td>
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<tr>
<td>K₁</td>
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<td>2715</td>
<td>2895</td>
<td>2985</td>
<td>2985</td>
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<td>2847</td>
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<tr>
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<td>2674</td>
<td>2777</td>
<td>2922</td>
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<td>3120</td>
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<table>
<thead>
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<th>P₁</th>
<th>P₂</th>
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<td>2904</td>
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<tr>
<td>Mean</td>
<td>2762</td>
<td>2807</td>
<td>2839</td>
</tr>
</tbody>
</table>

S.E. of body of table. N×P = 102 lb/ac.
- do - N×K = 84 ...
- do - P×K = 58 ...
S.E. of Marginal means. N = 58 ...
- do - P = 42 ...
- do - K = 33 ...


Object: To maximise the yield of paddy by the application of N as well as P₂O₅ in combinations at higher levels than the maximum tried so far.

1. BASAL CONDITIONS:
(i) (a) Nil. (b) Paddy (c) As under treatments (ii) (a) Lateritic loam (b) Refer Soil analysis Pattambi. (iii) 2.6.1949 and 8.7.1949. (iv) (a) 6 puddlings; 3 levelings (b) transplanted (c)-(d) planted in bulk (e) 3 to 4 (v) Nil. (vi) PTB 2 medium; improved 135 days. (vii) Rainfed. (viii) One weeding 3 or 4 weeks after planting. (ix) 77.46" in 79 rainy days. (2.6.49 to 19.10.1949) (<) 19.10.1949.

2. TREATMENTS:
All combinations of 6 levels of N, 3 levels of P₂O₅&2 level of K₂O.
Levels of N
N₁: Control.
N₂: G.L. 600 lb/ac.
N₃: N₂+30 lb. N/ac. as G.N.C.
N₄: N₂+60 lb. N/ac. as G.N.C.
N₅: N₂+90 lb. N/ac. as G.N.C.
N₆: N₂+120 lb. N/ac. as G.N.C.
Level P₂O₅
P₀: No P₂O₅
P₁: 30 lb. P₂O₅/ac as super
P₂: 60 lb. P₂O₅/ac as super
Levels of K₂O
K₀: No Potash.
K₁: 63 lb. K₂O/ac as pot. sulphate.
G.L. applied at the time of 1st puddling. G.N.C. applied one week after planting as basal dressing super at the time of last puddling and K₂SO₄ at the time of planting as basal dressing.
3. DESIGN:
   (i) 6x3x2 factorial in R.B.D. (ii) 36 (b) N.A. (iii) 4 (iv) (a,b) 11'x17' (v) Nil. (vi) Yes.

4. GENERAL:
   (i) Satisfactory. (ii) Nil (iii) Grain and straw weight. (iv) (a) 1947 1st crop to 1949 2nd crop (b) Yes (1948 2nd crop to 1949 2nd crop.) (c) N.A. (v) (a,b) Nil. (vi) & (vii) Nil.

5. RESULTS:
   (i) 2463 lb./ac.
   (ii) 214 lb./ac.
   (iii) Main effect of 'N' alone highly significant
   (iv) Grain weight lb./ac.

<table>
<thead>
<tr>
<th></th>
<th>N₀</th>
<th>N₁</th>
<th>N₂</th>
<th>N₃</th>
<th>N₄</th>
<th>N₅</th>
<th>Mean</th>
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<tbody>
<tr>
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<th>P₁</th>
<th>P₂</th>
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<td>2416</td>
<td>2478</td>
<td>2495</td>
<td>2463</td>
</tr>
</tbody>
</table>

S.E. of body of table N x P = 76 lb./ac.

Crop :- Paddy. (2nd crop).

Object:— To maximize the yield of paddy by application of N, as well as P alone and in combinations at higher levels than the maximum so far tried.

1. BASAL CONDITIONS:—
   (i) (a) Nil (b) Paddy (c) As under treatments (ii) (a) Laterite loam (b) Refer soil analysis Pattambi.
   (iii) 14.10.49, & 9.11.49. (iv) (a) 6 puddlings ; 3 Levelling. (b) Transplanting in lines. (c)—(d) 6'x6'
   (e) 2. (v) Nil. (v) PTB 4 Improved 140 days duration. (vi) Rainfed. (vii) Two weeding at intervals of one month from planting. (ix) 15'. (14.10.49 to 24.2.50) (x) 24.2.50.

2. TREATMENTS:—
   All combinations of 6 levels of N, 3 levels of P₀ O₂ and 2 levels of K₂O.

<table>
<thead>
<tr>
<th>Levels of N</th>
<th>Levels of P₀O₂</th>
<th>Levels of K₂O</th>
</tr>
</thead>
<tbody>
<tr>
<td>N₀</td>
<td>O lb/ac.</td>
<td>P₀=O lb/ac</td>
</tr>
<tr>
<td>N₁</td>
<td>6000 lb.</td>
<td>P₁=30 lb. / ac</td>
</tr>
<tr>
<td>N₂</td>
<td>50 lb. N /ac</td>
<td>P₂=60 lb. / ac</td>
</tr>
<tr>
<td>N₃</td>
<td>+ 60 lb. N /ac</td>
<td>X</td>
</tr>
<tr>
<td>N₄</td>
<td>+ 90 lb. N /ac</td>
<td></td>
</tr>
<tr>
<td>N₅</td>
<td>+ 120 lb. N /ac</td>
<td></td>
</tr>
</tbody>
</table>
   | G.L. applied at the time of pudding, N as G.N.C. applied at the time of planting, P₀O₂ as super applied before planting, K₂O as Pot. Sulphate at planting.

3. DESIGN:—
   (i) 6x3x2 fact in R.B.D. (ii) 36 (b) N.A. (iii) 4 (iv) (a & b) 11'x17'. (v) Nil (vi) Yes.
4. **GENERAL:**

(i) Satisfactory (ii) Nil (iii) Grain weight. (iv) (a) 1947-1st crop to 1949-2nd crop (b) Yes. (c) N.A. (v) (a,b) Nil (vi) Nil. (vii) No original yield data available for this experiment.

5. **RESULTS:**

Results as presented in the Annual report of the station:

Grain weight lb/ac.

<table>
<thead>
<tr>
<th>Treatment</th>
<th>P₀</th>
<th>P₁</th>
<th>P₂</th>
<th>Mean.</th>
</tr>
</thead>
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<td>3666</td>
<td>3497</td>
<td>3582</td>
</tr>
</tbody>
</table>

S.E. of diff. of N marginal means = 131 lb. / ac.
The treatments are not significantly different.

<table>
<thead>
<tr>
<th>Treatment</th>
<th>K₀</th>
<th>K₁</th>
<th>Mean.</th>
</tr>
</thead>
<tbody>
<tr>
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<td>3574</td>
<td>3579</td>
</tr>
</tbody>
</table>

S.E. of diff. of two body means = 144 lb. / ac.

PK interaction is not significant.

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<th>N₂</th>
<th>N₄</th>
<th>N₆</th>
</tr>
</thead>
<tbody>
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<td>3624</td>
<td>3473</td>
<td>3639</td>
</tr>
</tbody>
</table>

S.E. of difference of two body means = 185 lb./ac.

NK interaction is not significant.

<table>
<thead>
<tr>
<th>N+Leaf 6000</th>
<th>N₂</th>
<th>N₄</th>
<th>N₆</th>
</tr>
</thead>
<tbody>
<tr>
<td>P₀</td>
<td>3378</td>
<td>3368</td>
<td>3342</td>
</tr>
</tbody>
</table>

S.E. of diff. of two body means = 228 lb./ac.

<table>
<thead>
<tr>
<th>Treatment receiving leaf as basal dressing.</th>
<th>P₀</th>
<th>P₁</th>
<th>P₂</th>
<th>Mean.</th>
</tr>
</thead>
<tbody>
<tr>
<td>N₀</td>
<td>3536</td>
<td>3666</td>
<td>3579</td>
<td></td>
</tr>
</tbody>
</table>

S.E. of difference of two means = 149 lb./ac.
The treatments are not significantly different.

<table>
<thead>
<tr>
<th>Treatment</th>
<th>K₀</th>
<th>K₁</th>
<th>Mean.</th>
</tr>
</thead>
<tbody>
<tr>
<td>N₀</td>
<td>3415</td>
<td>3310</td>
<td>3363</td>
</tr>
</tbody>
</table>

S.E. of difference of two Means. = 118 lb./ac.
The treatments are not significantly different.

<table>
<thead>
<tr>
<th>Treatment</th>
<th>P₀</th>
<th>P₁</th>
<th>P₂</th>
<th>Mean.</th>
</tr>
</thead>
<tbody>
<tr>
<td>K₀</td>
<td>3415</td>
<td>3310</td>
<td>3363</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Treatment</th>
<th>P₀</th>
<th>P₁</th>
<th>P₂</th>
<th>Mean.</th>
</tr>
</thead>
<tbody>
<tr>
<td>K₀</td>
<td>3378</td>
<td>3368</td>
<td>3342</td>
<td></td>
</tr>
</tbody>
</table>

S.E. of diff. of two means in the body of table = 363 lb./ac.

PK interaction is not significant.

---

**Crop:** Paddy (2nd crop)  
**Site:** Agri. Res. Stn. Pattambi.  
**Ref.:** K. 48 27  
**Type:** 'M'

Object: To find out the effect of C.M. 5 tons/ac. and Super 40 lb P₂O₅/ac alone and in combinations.

1. **BASA CONDITIONS:**

(i) (a) Nil (b) Paddy (c) G.L. about 5000 lb/ac.+A/S. 100 to 150 lb/ac. (ii) (a) Laterite loam. (b) Refer soil analysis for Pattambi. (iii) 9.9.48, 20.10.1948. (iv) (a) 6 ploughings; 2 puddlings. (b) planting
In lines. (c) — (d) 4' to 6' between plants and about 10' between rows. (e) 3 to 4. (v) Nil (vi) PTB 21. Improved - Medium. (vii) Rainfed. (viii) One or two weeding at an interval of one month from planting if required (ix) 14.84° (9.9.48 to 20.1.1949) (x) 20.1.49.

2. TREATMENTS:
All Combinations of (1) & (2)
(1) 0 & 5 tons C.M./ac.
(2) 0 & 40 lb P<sub>2</sub>O<sub>5</sub> / ac as super
C.M. applied along with 1st puddlings and super at time of the final ploughing and levelling.

3. DESIGN:
(i) 2<sup>2</sup> factorial in R.B.D. (ii) (a) 4 (b) N.A. (iii) 6 (iv) (a) (b) 14'×30' (v) Nil (vi) Yes.

4. GENERAL:
(i) Satisfactory. (ii) Nil (iii) Grain weight (iv) (a) 1949 2nd crop to 1950 - 1st crop (b) No (c) N.A. (v) (a) Nil. (b) Nil (vi) & (vii) Nil.

5. RESULTS:
(i) 2661 lb/ac.
(ii) 203 lb/ac.
(iii) Main effect of C.M. alone is significant
(iv) Grain weight in lb/ac.

<table>
<thead>
<tr>
<th>C.M.</th>
<th>0 tons</th>
<th>5 tons</th>
<th>mean.</th>
</tr>
</thead>
<tbody>
<tr>
<td>P&lt;sub&gt;2&lt;/sub&gt;O&lt;sub&gt;5&lt;/sub&gt;</td>
<td>1863</td>
<td>1983</td>
<td>1923</td>
</tr>
<tr>
<td>40</td>
<td>1988</td>
<td>2074</td>
<td>2031</td>
</tr>
<tr>
<td>mean.</td>
<td>1925</td>
<td>2029</td>
<td>1977</td>
</tr>
</tbody>
</table>

S.E. of marginal means = 26 lb/ac.
S.E. of body of table. = 37 lb/ac.

Crop :—Paddy (1st crop)  Ref.—K. 49 (26)
Site :—Agri. Res. Stn. Pattambi  Type :—‘M’

Object :—To find out the effect of C.M, 5 tons/ac. and Super 49 lb/ac. P<sub>2</sub>O<sub>5</sub> alone and in combination.

1. BASAL CONDITION:
(i) (a) Nil (b) Paddy (c) G.L. 5000 lb.+A/S 100 to 150 lb. of per acre. (ii) (a) Laterite loam (b) Refer soil analysis Pattambi. (iii) 21.5.1949; 25.6.1949. (iv) (a) 6 puddlings; 3 levellings (b) transplanting in bulk (c) — (d) 6'×4' (e) 3 to 4 (v) Nil (vi) PTB 32. Medium 4 to 5 months. (vii) Rainfed. (viii) One weeding three to four weeks after planting. (ix) 88.92° in 88 rainy days. (21.5.1949 to 12.10.1949) (x) 12.10.1949.

2. TREATMENTS:
All Combinations of (1) & (2)
(1) 0 and 5 tons/ac of C.M.
(2) 0 and 40 lb P<sub>2</sub>O<sub>5</sub>/ac. as super
C.M. applied along with 1st puddling.
Super applied at the time of final ploughing and levelling.

3. DESIGN:
(i) 2<sup>2</sup> factorial in R.B.D. (ii) (a) 4 (b) N.A. (iii) 6 (iv) (a,b) 15'×20' (v) Nil (vi) Yes.

4. GENERAL:
(i) Satisfactory. (ii) Nil (iii) Grain and Straw weight. (iv) (a) 1949 1st crop to 1950 1st crop (b) No (c) N.A. (v) (a,b) Nil (vi) & (vii) Nil.

5. RESULTS:
(i) 2661 lb/ac.
(ii) 203 lb/ac.
(iii) Main effect of C.M. alone is significant
(iv) Grain weight in lb/ac.
Crop: - Paddy (2nd crop)  
Site: - Agri. Res. Stn. Pattambi  
Ref: - K. 49 (38)  
Type: - 'M'

Object: - To find out the effect of CM 5 tons/ac. and super 40 lb. P_2O_5/ac. alone and in combinations.

1. BASAL CONDITIONS:
   (i) (a) Nil (b) Paddy (c) G.L. about 50-0 lb./ac. + A/S. 100 to 150 lb./ac.  
       (ii) (a) Laterite loam (b) Refer soil analysis Pattambi.  
       (iv) (a) 6 ploughings and 2 puddlings (b) Transplanted in lines (c)-(d) 4" to 6" between plants 10" between rows.  
           (e) 3 to 4 (v) Nil (vi) PTB 20. 
   Medium. 
   Improved.  
   (vii) Rainfed.  
   (viii) One on two weedings at intervals of one month from planting if required (ix) 7.28" (25.9.1949 to 28.1.1950) (x) 28.1.1950.

2. TREATMENTS:
   All combinations of (1) and (2)  
   (1) 0 and 5 tons/ac. C.M.  
   (2) 0 and 40 lb/ac. P_2O_5 as Super 
   C.M. applied as basal dressing at the time of puddling.  
   Super applied as basal dressing before planting.

3. DESIGN:
   (i) 2^2 factorial in R.B.D.  
   (ii) (a) 4 (b) N.A.  
   (iii) 6 (iv) (a,b) 15' x 23' (v) Nil  
   (vi) Yes.

4. GENERAL:
   (i) Satisfactory 
   (ii) Nil 
   (iii) Grain weight (iv) (a) 1948-2nd crop to 1950-1st crop (b) No 
       (c) N.A.  
       (v) (a, b) Nil (vi) & (vii) Nil.

5. RESULTS:
   (i) 779 lb./ac.  
   (ii) 134.0 lb./ac.  
   (iii) Main effect of CM alone is significant  
   (iv) Grain weight in lb./ac.  

   C.M. | 0 tons | 5 tons | Mean.  
   ---- |-------|-------|--------  
   P_2O_5 |       |       |        
   0 lb. | 648   | 810   | 729    
   5 lb.  | 762   | 896   | 829    

   Mean.  
   705  
   S.E. of body of table = 54.0 lb./ac.  
   S.E. of marginal means = 38.0 "

---

Crop: - Paddy (1st crop)  
Site: - Agri. Res. Stn. Pattambi  
Ref: - K. 50 (22)  
Type: - 'M'

Object: - To verify whether C.M. acts best in the presence of a P fertiliser.

1. BASAL CONDITIONS:
   (i) (a) Nil (b) Paddy (c) G.L. 50:0 lb. and A/S. 100 to 150 lb./ac.  
       (ii) (a) Laterite loam (b) Refer soil analysis for Pattambi.  
       (iii) 3.6.1950 ; 4.7.1950.  
       (iv) (a) Puddling 6 times ; levelling 3 times (b) Transplanting in lines (c)-(d) 6" x 4" (e) 3 to 4 (v) Nil.  
       (vi) PTB 2; Improved Medium 4 to 5 months. (vii) Rainfed  
       (viii) One weeding 3 to 4 weeks after planting.  
       (ix) 96.42" (3.6.1950 to 25.10.1950) (x) 25.10.1950.
2. **TREATMENTS:**

All possible combinations of (1) and (2)

1. 0 and 5 ton/ac. of C. M.
2. 0 and 40 lb./ac. $P_2O_5$ as Super

C. M. applied at the time of puddling as basal and super also applied at the time of puddling before planting.

3. **DESIGN:**

(i) 2$^n$ factorial in R.B.D. (ii) (a) 4 (b) N.A. (iii) 6 (iv) (a) (b) 2$^5$ $\times$ $15^\prime$ (v) Nil; $1\frac{1}{2}$ to 2' interspace between plots. (vi) Yes.

4. **GENERAL:**

(i) Satisfactory. (ii) Nil (iii) Grain weight. (iv) (a) 1948-2nd crop to 1950-1st crop (b) No (c) N.A. (v) (a) (b) N.A. (vi) & (vii) Nil.

5. **RESULTS:**

(i) 1673 lb./ac.
(ii) 179 lb./ac.
(iii) Main effect of C. M. alone is significant
(iv) (Grain weight in lb./ac.)

<table>
<thead>
<tr>
<th>C.M.</th>
<th>0 tons</th>
<th>5 tons</th>
<th>Mean.</th>
</tr>
</thead>
<tbody>
<tr>
<td>$P_2O_5$</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>0 lb.</td>
<td>1549</td>
<td>1710</td>
<td>1629</td>
</tr>
<tr>
<td>40 lb.</td>
<td>1597</td>
<td>1835</td>
<td>1716</td>
</tr>
</tbody>
</table>

S. E. of the body of table : 73 lb./ac.
S. E. of marginal means : 52 lb./ac.

**Crop:** Paddy (1st crop)

**Site:** Agri. Res. Stn. Pattambi

**Ref:** K. 48 (19)

**Type:** 'M'

Object: To find out the effect of Reno Hyperphosphate (a new rock phosphate ground to extreme fineness) with Super and Bonemeal.

1. **BASAL CONDITIONS:**

(i) (a) Nil (b) Paddy (c) G.L. 5000 lb./ac. + A/S.100 to 150 lb./ac. (ii) (a) Laterite loam (b) Refer Soil analysis for Pattambi. (iii) 5.5.1948. 12.7.1948. (iv) (a) 6 ploughings: 2 puddlings (b) Transplanting in lines (c) 4 to 6 between plants and about 10" between rows (e) 3 to 4 (v) Green manure crop of Dhaicha at 5000 lb./ac. at the time of puddlings. (vi) PTB 2, Medium Improved. (vii) Rainfed. (viii) One or two weedings at an interval of one month from planting if required (ix) 82.61" (5.5. 48 to 24.10.1948. (x) 24.10.1948.

2. **TREATMENTS:**

All combinations of (1) and (2)

(1) 2 levels of $P_2O_5$ :30, 45 lb./ac.
(2) 4 sources of $P_2O_5$

(a) Reno Hyper (26/27)

(b) " " (28/29)

(c) Super

(d) C. M.

and one control (No manure)

All applied along with last ploughing.

3. **DESIGN:**

(i) R.B.D. (ii) (a) 9 (b) N.A. (iii) 4 (iv) (a) (b) 10' $\times$ 22' (v) Nil. (vi) Yes.

1. **GENERAL:**

(i) Satisfactory (ii) Nil (iii) Grain weight. (iv) (a) 1948 1st crop to 1949 2nd crop. (b) No. (c) N.A. (v) (a) (b) Nil (vi) & (vii) Nil.

5. **RESULTS:**

(i) 2697 lb./ac.
(ii) 190.0 lb./ac.
Main effects, interaction and control vs. others are not significant.

**Mean grain yield in lb./ac.**

<table>
<thead>
<tr>
<th>Source</th>
<th>Hyper (26/27)</th>
<th>Hyper (28/29)</th>
<th>Super</th>
<th>B.M.</th>
<th>Mean</th>
</tr>
</thead>
<tbody>
<tr>
<td>Level</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>30 lb.</td>
<td>2673</td>
<td>2772</td>
<td>2562</td>
<td>2810</td>
<td>2704</td>
</tr>
<tr>
<td>45 lb.</td>
<td>2598</td>
<td>2624</td>
<td>2859</td>
<td>2748</td>
<td>2707</td>
</tr>
<tr>
<td>Mean</td>
<td>2636</td>
<td>2698</td>
<td>2711</td>
<td>2719</td>
<td>2706</td>
</tr>
</tbody>
</table>

S.E. for marginal mean of levels of $P_2O_5 = 47.5$ lb./ac.

S.E. for sources = 67.5

S.E. for body of table = 95.0

S.E. for control vs any other mean in the body of the table = 135.0

**Crop:** Paddy (2nd crop)  
**Site:** Agri. Res. Stn. Pattambi  
**Ref:** K. 48(24)  
**Type:** 'M'

Object: To find out the effect of Reno Hyperphosphate (a new rock phosphate ground to extreme fineness) with Super and Bone meal.

1. **BASAL CONDITIONS:**
   (i) (a) Nil (b) Paddy (c) G.L. 5000 lb./ac. + A/S.100 to 150 lb./ac.  
   (ii) (a) Laterite Loam (b) Refer soil analysis Pattambi.  
   (iii) 1.8.48 and 12.9.1948.  
   (iv) (a) 6 ploughings, 2 puddlings.  
   (b) Transplanting in lines (c)–(d) 4" to 6" between plants and 10" between rows.  
   (e) 3 to 4 (v) Green manure crop of Dhaincha at 5000 lb./ac. at the time of puddling.  
   (vi) PTB 20. Medium, Improved.  
   (vii) Rainfed.  
   (viii) One or two weedings if required at an interval of one month from planting.  
   (ix) 33.9" (1.8.48 to 14.1.1949)  

2. **TREATMENTS:**
   All combinations of (1) & (2)
   (1) 2 levels of $P_2O_5 = 33.45$ lb./ac.
   (2) 4 sources of $P_2O_5 = (a)$ Reno Hyper (26/27).  
   (b) Reno Hyper (28/29).  
   (c) Super.  
   (d) B. M.  
   and one control (no manure)
   All applied as basal dressing at planting.

3. **DESIGN:**
   (i) R.B.D.  
   (ii) (a) 9 (b) 4 (iii) 4 (iv) (a) (b) 10' x 22' (v) Nil.  
   (vi) Yes.

4. **GENERAL:**
   (i) Satisfactory  
   (ii) Nil  
   (iii) Grain weight.  
   (iv) (a) 1948-1st crop to 1949-2nd crop.  
   (b) No.  
   (c) 1  
   (v) (a) Nil.  
   (b) Nil.  
   (vi) & (vii) Nil.

5. **RESULTS:**
   (i) 3016 lb./ac.  
   (ii) 30.00  
   (iii) Main effects, interaction and control vs others are not significant.  
   (iv) (Mean grain yield in lb./ac.) Control = 2970 lb./ac.

<table>
<thead>
<tr>
<th>Source</th>
<th>Hyper (26/27)</th>
<th>Hyper (28/29)</th>
<th>Super</th>
<th>B.M.</th>
<th>Mean</th>
</tr>
</thead>
<tbody>
<tr>
<td>Levels</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>50</td>
<td>3020</td>
<td>2978</td>
<td>2962</td>
<td>2995</td>
<td>2989</td>
</tr>
<tr>
<td>45</td>
<td>3118</td>
<td>3028</td>
<td>3028</td>
<td>3044</td>
<td>3055</td>
</tr>
<tr>
<td>Mean</td>
<td>3269</td>
<td>3003</td>
<td>2995</td>
<td>302</td>
<td>3022</td>
</tr>
</tbody>
</table>
S. E. for the marginal mean of level of $P_2O_5$=23.50 lb./ac.
S. E. for source =33.00
S. E. for the body of table =47.00
S. E. for control vs any other mean in the body of table=66.00

Crop: Paddy (1st crop)  Ref: K. 49 (32)

Object: To find out the effect of Reno Hyperphosphate (a new Rock phosphate ground to extreme fineness) with Super and Bone meal.

1. BASAL CONDITIONS:
   (i) (a) Nil (b) Paddy (c) G.L. 50 lb/ac. + A/S100 to 150 lb/ac. (ii) (a) Laterite loam (b) Refer soil analysis Pattambi (iii) 31.5.1940; 1.7.1949. (iv) (a) 6 ploughings and 2 puddlings (b) Transplanted in lines (c) – (d) 4" to 6" between plants and 10" between rows. (e) 3 to 4 (v) G.L. 5000 lb/ac- as basal dressing at the time of puddling. (vi) PTB 2. Medium. Improved. (vii) Rainfed. (viii) One or two weedings if required at an interval of one month from planting. (ix) 77.46" (31.5.49. to 24.10 1949) (v) 24.10.1949.

2. TREATMENTS:
   All combinations of (1) & (2)
   (1) 2 levels of $P_2O_5$:–30, 45 lb/ac.
   (2) 4 sources of $P_2O_5$  (a) Reno hyper (26/27)
       (b) Reno Hyper (28/29).
       (c) Super
       (d) B.M.
       and one Control (no manure)
   All manures applied as basal before planting.

3. DESIGN:
   (i) R.B.D. (ii) (a) 9 (b) N.A. (iii) 4 (iv) (a), (b) 13’x23’ (v) Nil (vi) Yes.

4. GENERAL:
   (i) Satisfactory. (ii) Nil (iii) Grain weight. (iv) (a) 1948 1st crop to 1949 2nd crop (b) Nil (c) N.A. (v) (a,b) Nil (vi) & (vii) Nil.

5. RESULTS:
   (i) 2721. lb/ac.
   (ii) 175.0
   (iii) Only the interaction of sources x levels of $P_2O_5$ is significant.
   (iv) (Mean grain yield in lb/ac.)
   Control = 2850 lb/ac.

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
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<td>2796</td>
<td>2477</td>
<td>2704</td>
<td>2768</td>
<td>2686</td>
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<td>30</td>
<td>2668</td>
<td>2538</td>
<td>2622</td>
<td>2750</td>
<td>2723</td>
</tr>
<tr>
<td>45</td>
<td>2712</td>
<td>2668</td>
<td>2663</td>
<td>2759</td>
<td>2705</td>
</tr>
</tbody>
</table>

S.E. for the marginal means of levels of $P_2O_5$ = 43.5 lb/ac.
S.E. for sources of $P_2O_5$ = 62.0
S.E. for the body of table = 87.0
S.E. for control vs. any other means in the table. = 124.0

Crop: Paddy (2nd crop)  Ref: K. 49 (36)
Site: Agri. Res. Stn Pattambi.  Type: ‘M’

Object: To find out the effect of Reno Hyperphosphate (a new rock phosphate ground to extreme fineness) with Super and Bone meal.
1. BASAL CONDITIONS:—
(i) (a) Nil (b) Paddy. (c) G.L. 5000 lb/ac. + A/S 100 to 150 lb/ac. (ii) (a) Laterite loam (b) Refer Soil analysis Pattambi. (iii) 20.9.49 ; 8.11.1949. (iv) (a) 6 ploughings and 2 puddlings.
(b) Transplanted in lines (c) — (d) 4 to 6" between plants and 10" between rows. (e) 3 to 4 (vii) G.L. at 5000 lb/ac. as basal dressing at the time of puddling. (vi) PTB 18. Medium Improved. (vii) Rainfed. (viii) One or two weedings if required at an interval of one month from planting. (ix) 14.93° (20.9.1949 to 17.2.1950) (x) 17.2.1959.

2. TREATMENTS:—
All combinations of (1) and (2)
(1) 2 levels of P<sub>2</sub>O<sub>5</sub>: 30,45 lb/ac.
(2) 4 sources of P<sub>2</sub>O<sub>5</sub>:— (a) Hyper (26/27)
(b) Hyper (28/29)
(c) Super
(d) B.M.
All manures applied as Basal before planting.

3. DESIGN:—
(i) R.B.D. (ii) (a) 9 (b) N.A. (iii) 4 (iv) (a,b) 11' x 19'
(v) Nil (vi) Yes.

4. GENERAL:—
(i) Satisfactory (ii) Nil (iii) Grain weight (iv) (a) 1943 1st crop to 1949 2nd crop (b) No (c) N.A. (v) (a) & (b) Nil (vi) & (vii) Nil.

5. RESULTS:—
(i) 1649 lb/ac
(ii) 138.0 ..
(iii) only Control vs. others is significant.
(iv) (Mean grain yield in lb/ac.)
   Control = 1484 lb/ac.

<table>
<thead>
<tr>
<th>Source</th>
<th>Hyper 26/27</th>
<th>Hyper 28/29</th>
<th>Super.</th>
<th>B.M. Mean.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Levels 30</td>
<td>1642</td>
<td>1719</td>
<td>1576</td>
<td>1667</td>
</tr>
<tr>
<td>45</td>
<td>1655</td>
<td>1642</td>
<td>1642</td>
<td>1811</td>
</tr>
<tr>
<td>Mean</td>
<td>1649</td>
<td>1681</td>
<td>1609</td>
<td>1739</td>
</tr>
</tbody>
</table>

S.E. for marginal means of levels of P<sub>2</sub>O<sub>5</sub> = 34.5 lb/ac.
S.E. for " " of source of P<sub>2</sub>O<sub>5</sub> = 49.0 ..
S.E. for the body of the table = 69.0 ..
S.E. for Control vs. any mean in the body of the table = 98.3 ..

Crop:— Paddy (2nd crop)  Site:— Agri. Res. Stn. Pattambi.  Ref:— K. 48(22)  Type:— ‘M’

Object:— To assess the comparative efficacy of different kinds of green leaves.

1. BASAL CONDITIONS:—
(i) (a) Nil (b) Paddy (c) G.L. 5000 lb/ac. + A/S. 100 to 150 lb/ac. (ii) (a) Laterite loam (b) Refer soil analysis for Pattambi. (iii) 1.8.48. 21.9.1948. (iv) (a) 6 dry ploughings and 2 puddlings. (b) Transplanted in lines. (c) — (d) 4" to 6" between plants and about 10" between rows. (e) 3 to 4 (vii) Nil. (vi) PTB18. Medium Improved. (vii) Rainfed. (viii) One or two weedings if required at an interval of one month from planting. (ix) 30.9.48° (1.8.48 to 13.1.1949) (x) 13.1.1949.

2. TREATMENTS:—
1. No manure
2. Hyperphoshptate 5000 lb / ac.
3. Vengair (Ptero carpus Marsupium) 5000 lb / ac.
4. Mango leaves 5000 lb / ac.
   Applied as basal dressing at the time of puddling

3. DESIGN:—
(i) R.B.D. (ii) (a) 4 (b) N.A. (iii) 6(iv) (a) (b) 5’ x 40’ (v) Nil (vi) Yes

4. GENERAL:—
(i) Satisfactory. (ii) Nil (iii) Grain and straw weight. (iv) (a) 1948 - 2nd crop to 1949 - 2nd crop. (b) Nil. (c) Nil (v) (a),(b) Nil (vi) & (vii) Nil.
5. RESULTS:
(i) 2801 lb/acre.
(ii) 318 lb/acre.
(iii) The treatments are not significantly different.
(iv) Grain weight in lb/acre.

<table>
<thead>
<tr>
<th>Treatment</th>
<th>Mean</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>2831</td>
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<tr>
<td>2</td>
<td>2868</td>
</tr>
<tr>
<td>3</td>
<td>2760</td>
</tr>
<tr>
<td>4</td>
<td>2949</td>
</tr>
</tbody>
</table>
S.E. of treatment means = 131 lb/acre.

Grain weight in lb/acre. Treatment means; I. 2631 2. 2868 3. 1760 4. 2949

25.10.1949. (v) 77.46" (2.6.1949 to 25.10.49) (v) 77.46" 25.10.1949.

Ref. - K. 40(35) Type: 'M'

Crop :- Paddy (1st crop)


Object:—To assess the comparative merit of seven different kinds of green leaves.

BASAL CONDITIONS:
(i) (a) Nil (b) Paddy (c) G.L. about 5500 lb./acre. + A/S. 100 to 150 lb./acre. (ii) (a) Laterite loam (b) Refer soil analysis Pattambi (iii) 2.6.1949 : 20.7.1949. (iv) (a) 6 ploughings and 2 puddings (b) Transplanting in lines (c) (d) 4" to 6" between plants and 10" between rows. (e) 3 to 4 (v) Nil (vi) P.T.B. 2. Medium Improved. (vii) Rained. (viii) One or two weedicings if required at intervals of one month from planting. (ix) 77.46" (2.6.1949 to 25.10.49)

25.10.1949.

2. TREATMENTS:
1. Hyptis-sva-veolens 4000 lb./acre.
2. Vengai 4000 lb./acre.
3. Mango 4000 lb./acre.
4. Crotoloaria Strata 4000 lb./acre.
5. Kolinji 4000 lb./acre.
6. Dhaincha 4000 lb./acre.
7. Sesbania speciosa 4000 lb./acre.
All as basal dressing at the time of puddling.

3. DESIGN:
(i) R.B.D. (ii) (a) 7 (b) N.A. (iii) 4 (iv) (a.b) 12'×25' (v) Nil (vi) Yes.

4. GENERAL:
(i) Satisfactory. (ii) Nil (iii) Grain weight (iv) (a) 1948-2nd crop to 1949-2nd crop (b) Nu (c) N.A. (v) (a,b) Nil (vi) & (vii) Nil.

5. RESULTS:
(i) 2246 lb./acre.
(ii) 245.0 lb./acre.
(iii) The treatments do not differ significantly.
(iv) (Grain weight in lb./acre.)

<table>
<thead>
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<th>Treatments</th>
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</thead>
<tbody>
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<td>2314</td>
</tr>
<tr>
<td>6</td>
<td>2259</td>
</tr>
<tr>
<td>7</td>
<td>2206</td>
</tr>
</tbody>
</table>
S.E. of treatment means = 123.0 lb/acre.

Ref. - K. 49(40) Type: 'M'

Crop :- Paddy (2nd crop)


Object:—To assess the comparative merit of seven different kinds of green leaves.

1. BASAL CONDITIONS:
(i) (a) Nil (b) Paddy (c) G.L.: about 5500 lb./acre. + A/S. 100 to 150 lb./acre. (ii) (a) Laterite loam (b) Refer soil analysis Pattambi. (iii) 17.10.49 ; 11.11.1949. (iv) (a) 6 ploughings and 2 puddings
Transplanted in lines (c)—(d) 4" to 6" between plants and 10" between rows (e) 3 to 4 (v) Nil (vi) PTB 20. Medium. Improved (vii) Rainfed. (viii) One or two weedicings if required at intervals of one month from planting—(ix) 5.54" (17.10.1949 to 8.2.1950) (x) 8.2.1950

2. TREATMENTS:
   1. Hypsis spinosella 4000 lb./ac.
   2. Vengai 4000 lb./ac.
   3. Mango 4000 lb./ac.
   4. Crotoloaria Straita 4000 lb./ac.
   5. Kolinji 4000 lb./ac.
   6. Dhaincha 4000 lb./ac.
   7. Control (no leaf)

   All as basal dressing at the time of puddling.

3. DESIGN:
   (i) R.B.D. (ii) (a) 7 (b) N.A. (iii) 4 (iv) (a,b) 12' x 25' (v) Nil (vi) Yes.

4. GENERAL:
   (i) Satisfactory (ii) Nil (iii) Grain weight (iv) (a) 1948-2nd crop to 1949-2nd crop (b) No (c) N.A. (v) (a,b) Nil (vi) & (vii) Nil.

5. RESULTS:
   (i) 2888 lb./ac.
   (ii) 463.0 lb./ac.
   (iii) The treatments do not differ significantly.
   (iv) Grain weight (lb./ac.)

   Treatment          Mean.
   1.                        3013
   2.                        2921
   3.                        3086
   4.                        2913
   5.                        2904
   6.                        2814
   7.                        2569
   S.E. of treatment means = 232.0 lb./ac.

---

Crop:—Paddy (2nd crop)
Ref:—K. 48(25)
Type:—‘M’

Object:—To find out the effect of applying Super before and after final ploughing.

1. BASAL CONDITIONS
   (i) (a) Nil (b) Paddy (c) About 5000 lb./ac. of G.L. + 100 to 150 lb./ac. of ‘A/S’ (ii) (a) Laterite loam (b) Refer soil analysis for Pattambi. (iii) 18.8.48/27.9.1948. (iv) (a) 6 ploughings. 2 puddlings (b) Planning in lines (c)—(d) 4" to 6" between plants and about 10" between rows (e) 2 to 3 (v) Nil (vi) PTB 18, Medium Improved (vii) Rainfed (viii) One or two weedicings if required at an interval of one month from planting. (ix) 23.15" (18.8.1948 to 18.1.1949) (x) 18.1.1949.

2. TREATMENTS:
   1. Super at 150 lb./ac. before final ploughing and levelling.
   2. Super at 150 lb./ac. after final ploughing and levelling.
   3. No super.

3. DESIGN:
   (i) R.B.D. (ii) (a) 3 (b) N.A. (iii) 6 (iv) (a) (b) 21' x 38' (v) Nil. About 14' to 2' interspace between plots. (vi) Yes.

4. GENERAL:
   (i) Satisfactory (ii) Nil (iii) Grain weight. (iv) (a) 1945-2nd crop to 1950-1st crop (b) No (c) N.A. (v) (a) (b) Nil (vi) & (vii) Nil.

5. RESULTS:
   (i) 2306 lb./ac.
   (ii) 117 lb./ac.
   (iii) The treatments are not significantly different.
   (iv) Grain weight lb./ac.
Object: To find out the effect of applying Super before and after final ploughing.

1. BASAL CONDITIONS:
   (i) (a) Nil (b) Paddy (c) About 5000 lb. G.L./ac + 100 to 150 lb. A/S/ac
   (ii) (a) Laterite loam (b) Refer soil analysis Pattambi (iii) 17.10.49; 11.11.1949
   (iv) (a) 6 ploughings and 2 puddlings (b) Transplanted in
   lines (c) (d) 4" to 6" between plants and
   10" between rows. (e) 3 to 4 (v) G.L. 2000 lb/ac at the time of 1st
   puddling (vi) PTB 2. Medium 4 to 5 months (vii) Rainfed
   (viii) One weeding three to four weeks after planting. (ix) 10.43" (10.1.1949 to 23.2.1950) (x) 23.2.1950.

2. TREATMENTS:
   1. Super at 150 lb./ac before final ploughing.
   2. Super at 150 lb./ac after final ploughing.
   3. Control (no Super)

3. DESIGN:
   (i) R.B.D. (ii) (a) 3 (b) N.A. (iii) 4 (iv) (a,b) 15'x40' (v) Nil (vi) Yes.

4. GENERAL:
   (i) Satisfactory (ii) Nil (iii) Grain and straw weight. (iv) (a) 1948-2nd crop to
   1950-1st crop (b) No. (c) N.A. (v) (a,b) Nil (vi) & (vii) Nil.

RESULTS:
   (i) 2133 lb./ac.
   (ii) 168.0
   (iii) The treatments do not differ significantly.
   (iv) (Grain weight lb./ac.)
   Treatment
<table>
<thead>
<tr>
<th>Mean</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
</tr>
<tr>
<td>2216</td>
</tr>
<tr>
<td>2.</td>
</tr>
<tr>
<td>2056</td>
</tr>
</tbody>
</table>
   | 3.    | 2126
   | S.E. of treatment mean = 48 lb./ac.

Object: To find-out the effect of applying Super before and after final ploughing.

1. BASAL CONDITIONS:
   (i) (a) Nil (b) Paddy (c) About 5000 lb. G.L.+100 to 150 lb. A/S/ac
   (ii) (a) Laterite loam (b) Refer soil analysis Pattambi (iii) 21.5.49; 25.6.1949.
   (iv) (a) 6 puddlings and 3 levellings (b) bulk, transplanted (c) (d) 6"x4"
   (e) 3 to 4 (v) G.L. 2000 lb/ac at the time of 1st puddling (vi) PTB 2. Medium 4 to 5 months (vii) Rainfed
   (viii) One weeding three to four weeks after planting. (ix) 81.46" (21.5.1949 to 12.10.1949) (x) 12.10.1949.

2. TREATMENTS:
   1. Super at 150 lb./ac before final ploughing.
   2. Super at 150 lb./ac after final ploughing.
   3. Control (no Super)

3. DESIGN:
   (i) R.B.D. (ii) (a) 3 (b) N.A. (iii) 4 (iv) (a,b) 25'x25' (v) Nil (vi) Yes.

4. GENERAL:
   (i) Satisfactory (ii) Nil (iii) Grain and straw weight. (iv) (a) 1948-2nd crop to
   1950-1st crop (b) No. (c) N.A. (v) (a,b) Nil (vi) & (vii) Nil.
5. RESULTS:
(i) 2314 lb./ac.
(ii) 171.0 lb./ac.
(iii) The treatments do not differ significantly.
(iv) (Grain weight in lb./ac.)

<table>
<thead>
<tr>
<th>Treatment</th>
<th>Mean</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>2269</td>
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<tr>
<td>2.</td>
<td>2351</td>
</tr>
<tr>
<td>3.</td>
<td>2323</td>
</tr>
</tbody>
</table>

S.E. of treatment means = 106 lb./ac.

Crop :- Paddy (1st crop)
Object :- To find out the effect of applying super before and after final ploughing.

1. BASAL CONDITIONS :
(i) (a) Nil (b) Paddy (c) G.L. About 5000 lb./ac.+100 to 150 lb. ac./A/S (ii) (a) Laterite loam (b) Refer soil analysis Pattambi (iii) 3.6.1950 : 3.7.1950. (iv) (a) Puddling 6 times levelling 3 times. After the first ploughing green manure is incorporated and trampled (b) Transplanted in bulk (c)—(d) 4” X 6” (e) to 2” (f) 2000 lb of G.L. applied on 18.6.50 at the time of puddling. (vii) Rainfed. (viii) One weeding three to four weeks after planting.

2. TREATMENTS :
1. Super 300 lb/ac before final ploughing as basal dressing.
2. Super 300 lb/ac. after final ploughing as top dressing.
3. Control. (no Super)

3. DESIGN :
(i) R.B.D. (ii) (a) 3 (b) N.A. (iii) 8 (iv) (a) 10’X21’ (v) Nil ; 1’ to 2’ interspace between plots (vi) Yes.

4. GENERAL :
(i) Satisfactory (ii) Nil (iii) Grain weight (iv) (a) 1948-2nd crop to 1953-1st crop (b) No. (c) N.A. (v) (a) (b) Nil (vi) & (vii) Nil.

5. RESULTS:
(i) 2226 lb/ac.
(ii) 300 lb/ac.
(iii) The treatments are not significantly different.
(iv) (Grain weight in lbs/acere.)

<table>
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<th>Mean</th>
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<tbody>
<tr>
<td>1.</td>
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<td>2.</td>
<td>2192</td>
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<tr>
<td>3.</td>
<td>2197</td>
</tr>
</tbody>
</table>

S.E. of the treatment means = 106 lb/ac.

Crop :- Paddy (2nd crop)
Object :- To find out whether Engrais Fertiliser which contains 10%N and 14% P2O5 can be used as a substitute for A/S and Super.

1. BASAL CONDITIONS :
(i) (a) Nil (b) Paddy (c) GL About 5000 lb./ac.+100 to 150 lb. ac./A/S (ii) (a) Laterite loam. (b) Refer soil analysis Pattambi (iii) 29.9.1949 ; 9.11.1949. (iv) (a) 6 ploughings and 2 puddlings (b) Transplanted in lines (c)—(d) 4” to 6” between plant and 11” between rows. (e) 3 to 4 (v) GL 2330 lb/ac. at the of time of puddling. (vi) PTB 12. Medium. Improved. (vii) Rainfed. (viii) One or two weedings if required at intervals of one month from planting.

2. TREATMENTS :
1. Engrais Fertiliser 300 lb/ac. as basal dressing at the time of puddling.
2. 25 lb./ac. N as A/S top dressing one month after planting + 40 lb. P₂O₅/ac. as super as basal dressing along with final ploughing.

3. Control. (no manure)

3. DESIGN:
   (i) R.B.D. (ii) (a) 3 (b) N.A. (iii) 8 (iv) (a,b) 15'×21' (v) Nil (vi) Yes.

4. GENERAL:
   (i) Satisfactory. (ii) Nil (iii) Grain weight (iv) (a) 1949-2nd crop to 1950-1st crop (b) No (c) N.A. (v) (a,b) Nil (vi) & (vii) Nil.

5. RESULTS:
   (i) 1872 lb./ac. (ii) 97.0 lb./ac. (iii) The treatment differences are highly significant. (iv) (Grain weight in lb./ac.)

<table>
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<th>Mean</th>
</tr>
</thead>
<tbody>
<tr>
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<td>2.</td>
<td>2060</td>
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<tr>
<td>3.</td>
<td>1556</td>
</tr>
</tbody>
</table>

S.E. of treatment means = 35.0 lb./ac.

---

Crop :- Paddy (1st crop)  
Ref :- K. 50 (20)  
Type :- 'M'

Object :- To compare 'Engrais' fertiliser mixture which contains 10% N and 14% P₂O₅ with A/S and Super to supply equal quantities of N and P applied individually.

1. BASAL CONDITIONS:
   (i) (a) Nil (b) Paddy (c) G.L. About 5000 lb./ac. + 100 lb. A/S/ac. (ii) (a) Lateritic loam (b) Refer soil analysis Pattambi (iii) 3.6.50 : 4.7.1950. (iv) (a) Puddlings 6 times levelling 3 times. After first ploughing G.L. is incorporated and trampled. 3 or 4 days after, 4 ploughings are given (b) Seedlings transplanted (c)—(d) 6'×4' (e) 2 to 3. (v) G.L. 2000 lb./ac. at the time of puddling. (vi) P.T.B. 2. Medium. 4 to 5 months Improved. (vii) Rainfed. (viii) One weeding 3 or 4 weeks after planting. (ix) 96.42" (3.6.50 to 16.10.50) (x) 16.10.50.

2. TREATMENTS:
   1. Engrais fertiliser 100 lb./ac. as basal dressing at the time of puddling.
   2. 25 lb./ac. N as A/S top dressing one month after planting + 40 lb. P₂O₅/ac. as Super as basal dressing along with final ploughing.
   3. Control. (no manure)

3. DESIGN:
   (i) R.B.D. (ii) (a) 3 (b) N.A. (iii) 8 (iv) (a) (b) 12'×25' (v) Nil 1½' to 2' interspace between plots (vi) Yes.

4. GENERAL:
   (i) Satisfactory. (ii) Nil (iii) Grain weight (iv) (a) 1949-2nd crop to 1950-1st crop. (b) No. (c) N.A. (v) (a) (b) Nil. (vi) & (vii) Nil.

5. RESULTS:
   (i) 2297 lb./ac. (ii) 213 lb./ac. (iii) The treatment differ highly significantly. (iv) (Grain weight in lb./ac.)

<table>
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<th>Treatments</th>
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<tbody>
<tr>
<td>1.</td>
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<td>3.</td>
<td>2038</td>
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S.E. of treatment means = 75 lb./ac.
Crop - Paddy (1st crop)  Ref.: K. 49(20)
Site: - Agri. Res. Strn. Pattambi.  Type: - 'M'

Object: - To find out the comparative response of F.Y.M. and Compost to paddy.

1. BASAL CONDITIONS:
   (i) (a) Nil (b) Paddy (c) F.Y.M. 5 C.L. /ac. + Ash. 1000 lb. /ac. (ii) (a) Laterite loam (b) Refer soil analysis Pattambi. (iii) 3.5.1949. (iv) (a) 10 to 12 ploughings (b) Seeds broadcast (c) 75 to 100 lb. /ac. (d) - (e) - (v) Nil (vi) Kattamodan, Improved, Medium-123 days. (vii) Rainfed. (viii) One weeding 3 to 4 weeks after planting. (ix) 78.00" (1.5.1949 to 3.9.1949) (x) 3.9.1949.

2. TREATMENTS:
   1. No Manure
   2. Compost to supply 60 lb. N/ac.
   3. F.Y.M. to supply 60 lb. N/ac.
      Applied as basal dressing at the time of ploughing.

3. DESIGN:
   (i) R.B.D. (ii) (a) 3 (b) N.A. (iii) 6 (iv) (a), (b) 38" x 29" (v) Nil (vi) Yes.

4. GENERAL:
   (i) Satisfactory (ii) Nil (iii) Grain & Straw weight. (iv) (a) 1949 to 1951 (1st crop only). 1952 Residual effect studied. (b) Yes. (c) N.A. (v) (a) (b) Nil. (vi) & (vii) Nil.

5. RESULTS:
   (i) 1172 lb. /ac.
   (ii) 230.0 lb. /ac.
   (iii) The treatments do not differ significantly.
   (iv) Grain weight in lb. /ac.

   Treatment  Mean
   1.         1015
   2.         1245
   3.         1255
   S.E. of treatment means = 94.0 lb. /ac.

Crop: - Paddy 1st Crop  Ref.: K. 50 (14)/49 (20)
Site: - Agri. Res, Strn. Pattambi.  Type: - 'M'

Object: - To study the comparative response of dry paddy to the application of F.Y.M. and compost.

1. BASAL CONDITIONS:
   (i) (a) NIL (b) Paddy (c) As per transplants and basal dressing of K49(20)(ii) (a) Laterite loam (b) Refer soil analysis Pattambi (iii) 30.5.50, 13.6.50 (iv) (a) 10-12 ploughings (b) Transplanted (c) - (d) bulk. (e) 2 to 3 (v) Nil (vi) PTB 28; short duration; (120 days.) Improved (vii) Rainfed (viii) One weeding three to four weeks after planting. (ix) 96.42" (30.5.1950 to 12.10.1950) (x) 12.10.1950.

2. TREATMENTS:
   1. No manure.
   2. Compost to supply 60 lb N/ac.
   3. F.Y.M. to supply 60 lb N/ac.
      Applied as basal dressing at the time of ploughing.

3. DESIGN:
   (i) R.B.D. (ii) (a) 3 (b) N.A. (iii) 6 (iv) (a) (b) 29" x 38". (v) No; 1/2' to 2' interspace between plots. (vi) Yes.

4. GENERAL:
   (i) Satisfactory (ii) NIL (iii) Grain weight (iv) (a) 1949 1st crop to 1951 - 1st crop (one crop only per year) ; during 1952 esidual effect studied (b) Yes (c) N.A. (v) (a) (b) Nil. (vi) & (vii) Nil.

5. RESULTS:
   (i) 1024 lb./ac.
   (ii) 113 lb./ac.
   (iii) The treatments do not differ significantly.
   (iv) Grain weight in lb./ac.
<table>
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</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
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<tr>
<td>2.</td>
<td>1055</td>
</tr>
<tr>
<td>3.</td>
<td>1040</td>
</tr>
</tbody>
</table>

S.E. of treatment means = 46 lb/ac.

**Crop**: Paddy (1st crop)  
**Site**: Agri. Res. Stn. Pattambi.  
**Ref**: K.51(7)/50 (14)/49 (20)  
**Type**: ‘M’

Object:—To evaluate the comparative merits of F.Y.M. and compost of farm wastes.

1. BASAL CONDITIONS:
   
   (i) (a) Nil (b) Paddy (c) As per treatments and basal dressing K. 50 (14) (ii) (a) Laterite loam (b) Refer soil analysis, Pattambi (iii) 4.5.1951 (iv) (a) Puddling 6 times, levelling 3 times. After first ploughing G.M. is incorporated and trampled, 4 to 5 ploughings given (b) transplanted from wet nursery (c) bulk planting 3 or 4 days later.  
   
   (e) 2 to 3 (v) Nil (vi) PTB 28, Short 120 days Improved (vii) Transplanted  
   
   (c)–(d) (e)–(f) (g)–(h) (i)–(j) (k)–(l) (m)–(n) (o)–(p) (q)–(r) (s)–(t) (u)–(v) (w)–(x) (y)–(z).  
   
   (t) 3 to 4 weeks after planting and another weeding if necessary one month after 1st weeding  
   
   (x) 30.8.1951 (y) 29.8.1951.

2. TREATMENTS:
   
   1. No manure  
   
   2. Compost to supply 60 lb N/ac.  
   
   3. F.Y.M. to supply 60 lb N/ac.  
   
   All manures applied at the time of puddling.

3. DESIGN:
   
   (i) R.B.D. (ii) (a) 3 (b) N.A. (iii) 6 (iv) (a), (b) 38’x29’ (v) Nil; (vi) Yes.

4. GENERAL:
   
   (i) Practically there was no difference among the various treated plots; Growth Satisfactory  
   
   (ii) Nil  
   
   (iii) Grain and straw weight (iv) (a) 1949-1st crop 1951-1st crop (1st crop only) during 1952 residual effect studied  
   
   (b) Yes (c) N.A.  
   
   (v) (a) (b) Nil (vi) & (vii) Nil.

5. RESULTS:
   
   (i) 1727 lb/ac.  
   
   (ii) 20 lb/ac.  
   
   (iii) Treatment differences are significant.  
   
   (iv) (Grain weight in lb/ac.)  
   
<table>
<thead>
<tr>
<th>Treat.</th>
<th>Mean</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>1522</td>
</tr>
<tr>
<td>2.</td>
<td>1693</td>
</tr>
<tr>
<td>3.</td>
<td>1967</td>
</tr>
</tbody>
</table>

S.E. of treatment means = 8 lb/ac.

**Crop**: Paddy (1st crop)  
**Site**: Agri. Res. Stn. Pattambi.  
**Ref**: K. 52 (28)/51(7)/50 (14)/49;20  
**Type**: ‘M’

Object:—To study the residual effect of the application of F.Y.M. and compost.

1. BASAL CONDITIONS:
   
   (i) (a) Nil (b) Paddy (c) As under treatments and basal dressing of K.51 (7).  
   
   (ii) (a) Laterite loam (b) Refer soil analysis, Pattambi (iii) 23.5.1952; 30.6.1952.  
   
   (iv) (a) Puddling 6 times, levelling 3 times (b) Transplanted  
   
   (c)–(d) 6”x4” (e) 2 to 3 (Age of seedlings one month.) (v) Nil (vi) PTB—28, Short (120 days) Improved, (vii) Rainfed. (viii) One weeding 3 to 4 weeks after planting and another weeding after a month if required.  
   
   (ix) about 67” (23.5.1952 to 11. 9. 1952) (x) 11.9. 1952.
2. TREATMENTS:
   Residual effect of
   1. No. manure.
   2. Compost to supply 60 lb N/ac.
   3. F.Y.M. to supply 60 lb N/ac.
   Applied during the past 3 years.

DESIGN:
(i) R.B.D. (ii) (a) 3 (b) N.A. (iii) 6 (iv) (a),(b) 38'×29' (v) Nil (vi) Yes.

4. GENERAL:
(i) Not satisfactory. (ii) Nil. (iii) Grain & Straw weight. (iv) (a) 1949 to 1951. In 1952 residual effects studied (b) Yes. (c) N.A. (v) (a), (b) Nil (vi) & (vii) Nil.

5. RESULTS:
(i) 453 lb/ac.
(ii) 196 lb/ac.
(iii) The treatments do not differ significantly.
(iv) (Grain weight in lb/ac.)

<table>
<thead>
<tr>
<th>Treatment</th>
<th>Mean</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>384</td>
</tr>
<tr>
<td>2.</td>
<td>479</td>
</tr>
<tr>
<td>3</td>
<td>496</td>
</tr>
</tbody>
</table>

S.E. of treatment mean. = 80 lb/ac.

---

Crop :- Paddy (1st crop)  
Ref :- K. 49 (19)  
Type :- 'M'

Object:-To know whether the radioactive stimulant Alphatron will give increased yield of paddy.

1. TREATMENTS:
   (i) (a) Nil (b) Paddy (c) 5000 lb. G.L/ac. + 100 to 150 lb. A/S/ac. (ii) (a) Laterite loam (b) Refer soil analysis, Pattambi. (iii) 9.5.1949 (iv) (a) 10 to 12 ploughings (b) Seeds broadcast and covered by shallow ploughing (c) 75 lb/ac.(d),—(e)— (v) Nil (vi) PTB 22, Improved, Medium (vii) Rainfed. (viii) One weeding three to four weeks after planting. (ix) 76.18' in 68 rainy days. (9.5.1949 to 23.8. '49) (x) 23. 8. '49.

2. TREATMENTS:
   Treated with
   1. Alphatron 5 lb/ac.
   2. Alphatron 10 lb/ac.
   3. Alphatron 20 lb/ac.
   4. Control (untreated)
   Applied Mixing with 100 lb. of surface soil/ac. and placing along furrows before sowing and covered by bush harrow.

3. DESIGN:
   (i) R.B.D. (ii) (a) 4 (b) N.A. (iii) 6 (iv),(a),(b) 32'×28' (v) Nil; 2' interspace between plots. (vi) Yes.

4. GENERAL:
   (i) Satisfactory (ii) Nil. (iii) Grain & Straw weight. (iv) (a) 1949-1st crop to 1950-1st crop (1st crop only) (b) No (c) N.A. (v) (a),(b) Nil. (vi) & (vii) Nil.

5. RESULTS:
(i) 1333 lb/ac.
(ii) 124.0 lb/ac.
(iii) The treatments are not significantly different.
(iv) Grain weight in lb/ac.

<table>
<thead>
<tr>
<th>Treatment</th>
<th>Mean</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
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<tr>
<td>2.</td>
<td>1329</td>
</tr>
<tr>
<td>3.</td>
<td>1453</td>
</tr>
<tr>
<td>4.</td>
<td>1290</td>
</tr>
</tbody>
</table>

S.E. of treatment means = 50.0 lb/ac.
Crop: Paddy (1st crop)  
Ref: K. 50 (11)  
Type: 'M'

Object: To find whether the radioactive stimulant Alphatron will give increased yield of paddy.

1. BASAL CONDITIONS:
   (i) (a) Nil (b) Faddy (c) G.L. 5000 lb/ac + A/S. 100 to 150 lb/ac.  
   (ii) (a) Laterite loam (b) Refer soil analysis, Pattambi.  
   (iii) 2.5.1950; 2.6.1950 (iv) (a) Puddling 6 times, levelling 3 times. After first ploughing G.L. (about 4000 lb/ac) incorporated and trampled 4 to 5 ploughings given after 3 or 4 days; plot levelled. (b) Transplanted (c)–(d) in bulk; (e) 2 to 3. (v) About 4000 lb G.L./ac. applied after the first ploughing. (vi) PTB 22 improved, Medium (vii) Rainfed (viii) one weeding 3 to 4 weeks after planting. (ix) 96.42° (2.5.1950 to 8.9.1950) (x) 8.9.1950.

2. TREATMENTS:
   1. Control.
   2. Alphatron 10 lb/ac.
   3. Alphatron 20 lb/ac.

   Top dressing one month after planting.

3. DESIGN:
   (i) R.B.D. (ii) (a) 3 (b) N.A. (iii) 8 (iv) (a)/(b) 25'x17' (v) Nil; 2' interspace between plots (vi) Yes.

4. GENERAL:
   (i) Satisfactory. (ii) Nil. (iii) Grain weight (iv) (a) 1949-1950 (only during 1st crop season) (b) Yes. (c) N.A. (v) (a), (b) Nil (vi) & (vii) Nil.

5. RESULTS:
   (i) 1473 lb/ac.  
   (ii) 280 lb/ac.  
   (iv) The treatments are not significant.  
   (iv) Grain weight in lb/ac.

<table>
<thead>
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<th>Treatment</th>
<th>Mean</th>
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</thead>
<tbody>
<tr>
<td>1.</td>
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<td>2.</td>
<td>1480</td>
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<tr>
<td>3.</td>
<td>1420</td>
</tr>
</tbody>
</table>

S.E. of treatment means = 100 lb/ac.

Crop: Paddy (1st crop)  
Ref: K. 50 (18)  
Type: 'M'

Object: To find the effect of application of phosphates to leguminous crops on the following paddy crop.

1. BASAL CONDITIONS:
   (i) (a) Nil (b) Paddy (c) 5000 lb G.L/ac and 100 to 150 lb A/S/ac.  
   (ii) (a) Laterite loam (b) Refer soil analysis, Pattambi.  
   (iii) 23.5.50; 23.6.50 (iv) (a) Puddling 6 times, levelling 3 times. Green manure tramped. (b) Transplanted (c)–(d) bulk; (e) 2 to 3 (v) Nil (vi) PTB 9: Medium 130 days. (vii) Rainfed (viii) One weeding 3 or 4 weeks after planting. (ix) 96.42° (23.5.50 to 13.10.1950) (x) 13.10.1950.

2. TREATMENTS:
   1. 30 lb P₂O₅/ac as super—basal dressing at the time of puddling.
   2. 30 lb P₂O₅/ac as B.M.—basal dressing at the time of puddling.
   3. Control.

Above treatments applied to Dhanicha crop sown on 1.2.50 and ploughed in situ on 20.6.1950.

3. DESIGN:
   (i) R.B.D. (ii) (a) 3 (b) N.A. (iii) 8 (iv) (a)/(b) 18'x17' (v) Nil: 1/2 to 2' interspace between plots (vi) Yes.

4. GENERAL:
   (i) Satisfactory. (ii) Nil. (iii) Grain and Dhanicha weight (iv) (a) 1950-1st crop (only during 1st-crop) (b) No. (c) Nil (v) (a), (b) Nil (vi) & (vii) Nil.

5. RESULTS:
   (i) 2313 lb/ac.  
   (ii) 222 lb/ac.  
   (iii) The treatments are not significant.  
   (iv) Grain weight in the lb/ac.
Crop: Paddy (1st crop)  Ref.-K. 50(16)

Site: Agri. Res. Stn. Pattambi.  Type: 'M'

Object: To find out the effect of application of phosphate to leguminous crops on the following paddy crop

1. BASAL CONDITIONS:

(i) (a) Nil  (b) Paddy (c) 5000 lb. G.L./ac and 100 to 150 lb A/S./ac.  (ii) (a) Lateritic loam  (b) Refer soil analysis, Pattambi.  (iii) 2.6.50, 15.7.50.  (iv) (a) Puddling 6 times levelling, 3 times G.L. trampled  (b) transplanted in line  (c) — (d) 6" × 4"  (e) 2 to 3  (f) Nil  (g) PTB 10, Short: 100 days, Improved  (h) Rainfed.  (vii) One weeding, three or four weeks after planting.  (x) 96.42" (2.6.50 to 29.9.50.)

2. TREATMENTS:

Following treatments applied to Kolinji sown on 24.10.1949. Trampled on 10.7.50.

1. 30 lb. P₂O₅/ac. as super Basal dressing at the time of puddling.

2. 3 lb. P₂O₅/ac. as B.M.

3. Control.

3. DESIGN:

(i) R.B.D.  (ii) (a) 3  (b) N.A.  (iii) 6"  (iv) (a) (b) 24' × 28'  (v) Nil; 14' to 2' interspace between plots.  (vi) Yes.

4. GENERAL:

(i) Satisfactory.  (ii) Nil  (iii) Grain and of Kolinji weight  (iv) (a) 1950-1st crop. only during the 1st crop season  (b) No.  (c) N.A.  (v) (a, b) Nil  (vi) & (vii) Nil.

5. RESULTS:

(i) 1062 lb./ac.

(ii) 133 lb./ac.

(iii) The treatments are not significant.

(iv) (Grain weight in lb./ac.)

<table>
<thead>
<tr>
<th>Treat.</th>
<th>Mean</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>1037</td>
</tr>
<tr>
<td>2.</td>
<td>1155</td>
</tr>
<tr>
<td>3.</td>
<td>993</td>
</tr>
</tbody>
</table>

S.E. of treatment means : 52 lb./ac.

———
4. G.L. 3500 lb/ac. + Fused phosphate to supply 30 lb \( P_2O_5 \) /ac. as basal dressing along with final ploughing and levelling.

5. A/S 33 lb N/ac. + Super 33 lb \( P_2O_5 \) /ac.

6. A/S. 30 lb N/ac. + Fused phosphate 30 lb \( P_2O_5 \) /ac.

7. G.L. 2500 lb/ac. + A/S 30 lb N/ac.

8. G.L. 2500 lb/ac. + A/S 30 lb N/ac. + Super 30 lb \( P_2O_5 \) /ac.

9. G.L. 2500 lb/ac. + A/S 30 lb N/ac. + Fused phosphate 30 lb \( P_2O_5 \) /ac.

3. DESIGN:

(i) R.B.D. (ii) 9, (b) N.A. (iii) 4 (iv) (a), (b) 13' x 20' (v) Nil; 1' to 2' interspace between plots.

(vi) Yes.

4. GENERAL:

(i) Satisfactory (ii) Nil (iii) Grain weight. (iv) (a) 1950 1st crop to 1951 2nd crop (both seasons in a year) (b) Yes (c) N.A. (v) (a), (b) 13' x 20' (vi) & (vii) Nil.

5. RESULTS:

(i) 1844 lb/ac.

(ii) 489 lb/ac.

(iii) The treatments are not significant.

(iv) Grain weight in lb/ac.

<table>
<thead>
<tr>
<th>Treatment</th>
<th>Mean.</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
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<tr>
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<td>1832</td>
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<td>3.</td>
<td>1842</td>
</tr>
<tr>
<td>4.</td>
<td>1926</td>
</tr>
<tr>
<td>5.</td>
<td>1591</td>
</tr>
<tr>
<td>6.</td>
<td>1591</td>
</tr>
<tr>
<td>7.</td>
<td>2052</td>
</tr>
<tr>
<td>8.</td>
<td>2020</td>
</tr>
<tr>
<td>9.</td>
<td>1863</td>
</tr>
</tbody>
</table>

S.E. of treatment mean = 244 lb/ac.

Crop:— Paddy (2nd crop)  Ref:—K. 50 (35)/50 (15)

Site:— Agri. Res. Stn. Pattambi.  Type:—‘M’

Object:— To compare the efficacy of fused phosphate which contains 22% \( P_2O_5 \) with super over a basal dressing of green manure.

1. BASAL CONDITIONS:

(i) (a) Nil (b) Paddy (c) As per treatments (ii) (a) Laterite loam (b) Refer soil analysis, Pattambi (iii) 13.9.50. 3.10.50. (iv) (a) Puddling 6 times, levelling 3 times; after first ploughing green leaf in-corporated and trampled (b) transplanted from wet nursery at the age of one month (c)—(d) Planted in bulk (e) 2 to 3 (v) Nil; (vi) PTB 20; Short 4 months. (vii) Rainfed (viii) One weeding 3 to 4 weeks after planting; (ix) 19.36' (13.9.1950 to 8.2.1951) (x) 8.2.1951.

5. TREATMENTS:

1. G.L. 2500 lb/ac.

2. A/S to supply 30 lb N/ac.

3. G.L. 3500 lb/ac. + super to supply 30 lb \( P_2O_5 \) /ac.

4. G.L. 3500 lb/ac. + fused phosphate to supply 30 lb \( P_2O_5 \) /ac.

5. A/S to supply 30 lb N/ac. + Super to supply 30 lb \( P_2O_5 \) /ac.

6. A/S 30 lb N/ac. + fused phosphate to supply 30 lb \( P_2O_5 \) /ac.

7. G.L. 2500 lb/ac. + A/S to supply 30 lb N/ac.

8. G.L. 2500 lb/ac. + super to supply 30 lb \( P_2O_5 \) /ac.

9. G.L. 2500 lb/ac. + fused phosphate to supply 30 lb \( P_2O_5 \) /ac.

Green leaf applied at the time of puddling as basal dressing.

A/S top dressed one month after planting.

Super as basal dressing at the time of final ploughing.

3. DESIGN:

(i) R.B.D. (ii) 9, (b) N.A. (iii) 4 (iv) (a), (b) 13' x 20' (v) Nil, 1' bund and 1' furrow between plots.

(vi) Yes.

4. GENERAL:

(i) Satisfactory (ii) Nil (iii) Grain and straw weight (iv) (a) 1950—1st crop to 1951—2nd crop (b) Yes (c) N.A. (v) (a), (b) Nil (vi) & (vii) Nil.
5. RESULTS:

(i) 1752 lb/ac.
(ii) 627 lb/ac.
(iii) The treatments are not significantly different.
(iv) Grain weight in lb/ac.

<table>
<thead>
<tr>
<th>Treatment</th>
<th>Mean</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
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<tr>
<td>2.</td>
<td>1592</td>
</tr>
<tr>
<td>3.</td>
<td>1717</td>
</tr>
<tr>
<td>4.</td>
<td>1612</td>
</tr>
<tr>
<td>5.</td>
<td>1444</td>
</tr>
<tr>
<td>6.</td>
<td>1634</td>
</tr>
<tr>
<td>7.</td>
<td>2094</td>
</tr>
<tr>
<td>8.</td>
<td>2158</td>
</tr>
<tr>
<td>9.</td>
<td>1823</td>
</tr>
</tbody>
</table>

S.E. of treatment means = 113 lb/ac.

Crop :- Paddy (1st crop)  Ref :- K. 51 (10)/50 (15, 35)
Site :- Agri. Res. Stn. Pattambi.  Type :- 'M'

Object :- To compare the efficacy of fused phosphate which contains 22% P₂O₅ with super phosphate.

1. BASAL CONDITIONS:
(i) (a) Nil (b) Paddy (c) As per treatments (ii) (a) Laterite loam (b) Refer soil analysis Pattambi (iii) 2.6.51; 5.7.1951. (iv) (a) Puddling 6 times levelling 3 times. (b) 4 to 5 ploughings are given (b) seedlings transplanted from wet nursery. Average age of seedlings is about one month. (c)–(d) Planted in bulk (e) 2 to 3 (v) Nil. (vi) PTB 2 Medium 4 to 5 months improved. (vii) Rainfed (viii) One weeding 3 to 4 weeks after planting. Another weeding if necessary. (ix) 50.25 (2.6.51 to 24.10.51) (x) 24.10.1951.

2. TREATMENTS:
1. G.L. 2500 lb/ac.
2. A/S to supply 30 lb N/ac.
5. A/S to supply 30 lb N/ac.+Super to supply 32 lb. P₂O₅/ac.
6. A/S to supply 30 lb. N/ac.+ Fused phosphate to supply 30 lb. P₂O₅/ac.

3. DESIGN:
(i) R.B.D. (ii) (a) 9 (b) N.A. (iii) 4 (iv) (a), (b) 13' × 20' (Nil (vi) Yes.

4. GENERAL:
(i) The rainfall (S.W. Monsoon) was deficient by about 20' from normal and the distribution was erratic.
(ii) Nil (iii) Grain weight (iv) (a) 1950-1st crop to 1951-2nd crop (1) Yes (c) N.A. (v) (a), (b) Nil. (vi) & (vii) Nil.

5. RESULTS:
(i) 2205 lb/ac.
(ii) 326 lb/ac.
(iii) The treatment differences are not significant.
(iv) Grain yield in lb/ac.

<table>
<thead>
<tr>
<th>Treatment</th>
<th>Mean</th>
</tr>
</thead>
<tbody>
<tr>
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<td>3.</td>
<td>2331</td>
</tr>
<tr>
<td>4.</td>
<td>2142</td>
</tr>
<tr>
<td>5.</td>
<td>1809</td>
</tr>
<tr>
<td>6.</td>
<td>2373</td>
</tr>
<tr>
<td>7.</td>
<td>2268</td>
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<tr>
<td>8.</td>
<td>2276</td>
</tr>
<tr>
<td>9.</td>
<td>2184</td>
</tr>
</tbody>
</table>

S.E. of treatment means = 163 lb/ac.
Crop : Paddy (2nd crop)  
Object : To compare the efficacy of fused phosphate which contains 22% P_2O_5 with super.

1. BASAL CONDITIONS:
   (i) (a) Nil (b) Paddy (c) As per treatments (ii) (a) Laterite loam (b) Refer soil analysis Pattambi
   (iii) 27.9.1951 ; 3.11.1951. (iv) (a) Puddling 6 times levelling 3 times (b) Seedlings transplanted from
   wet nursery. Average age of seedlings about one month (c) (d) Planted in bulk (e) 2 to 3 (v) Nil (vi) PTB
   20 Improved short (12) days (vii) Rainfed. (viii) One weeding 3 to 4 weeks after planting. Another
   weeding if necessary. (ix) 23.7.51 (27.9.51 to 20.2.1952) (x) 20.2.1952.

2. TREATMENTS:
   1. G.L. 2500 lb./ac.
   2. A/S to supply 30 lb. N/ac.
   3. G.L. 3500 lb./ac.+Super to supply 30 lb. P_2O_5/ac.
   4. G.L. 350 lb./ac.+fused phosphate to supply 30 lb. P_2O_5/ac.
   5. A/S to supply 30 lb. N/ac.+Super to supply 30 lb. P_2O_5/ac.
   6. A/S to supply 30 lb. N/ac.+fused phosphate to supply 30 lb. P_2O_5/ac.
   10. G.L. applied on 3.10.1951 at the time of puddling.
       Fused phosphate and super applied on 3.11.51 at the time of final puddling and levelling by broadcast.
       A/S applied on 5.8.1951 as top dressing on 3.12.51 one month after planting.

3. DESIGN:
   (i) R.B.D. (ii) (a) 9 (b) N.A. (iii) 4 (iv) (a) (b) 13' x 20' (v) Nil (vi) Yes.

4. GENERAL:
   (i) Good. (ii) Nil (iii) Grain weight (iv) 1950 1st crop to 1951 2nd crop (b) Yes (c) N.A (v) (a) (b) Nil,
   (vi) & (vii) Nil.

5. RESULTS:
   (i) 1979 lb./ac.
   (ii) 694 lb./ac.
   (iii) The treatment differences are not significant.
   (iv) Grain yield in lb./ac.

   Treatment | Mean
   1.          | 1868
   2.          | 2058
   3.          | 2142
   4.          | 1764
   5.          | 1616
   6.          | 1838
   7.          | 2164
   8.          | 2416
   9.          | 1952

S.E. of treatment means = 346 lb./ac.

Crop : Paddy (1st crop)  
Object : To evaluate the effect of Super with and without G.L.

1. BASAL CONDITIONS:
   (i) (a) Nil (b) Paddy (c) 5000 lb./ac. G.L. and 150 lb./ac. A/S (ii) (a) Laterite loam (b) Refer soil analysis
   Pattambi (iii) 19.5.1950 ; 3.6.1950. (iv) (a) Puddling 6 times, levelling 3 times (b) Seedlings transplanted from
   wet nursery at the age of one month. (c) (d) Planted in bulk (e) 2 to 3 (v) Nil (vi) PTB 2. Improved,
   Medium 4 to 5 months (vii) Rainfed (viii) One weeding 3 to 4 weeks after planting (ix) 96.42° (19.5.1950 to

TREATMENTS:
   All combinations of (1) & (2)
   (1) G.L. at 3 levels : 0, 2000, 4000 and 6000 lb./ac.
   (2) Super at 3 levels : 0, 30 and 60 lb. P_2O_5/ac.
   G.L. applied as basal dressing at the time of puddling.
   Super applied as basal dressing at puddling after G.L.
3. **DESIGN:**
   (i) 4 x 3 factorial in R.B.D. (ii) (a) 12 (b) N.A. (iii) 4 (iv) (a), (b) 13'x 17' (v) Nil; f' furrow between plots (vi) Yes.

4. **GENERAL:**
   (i) Satisfactory (ii) Nil (iii) Grain weight (iv) (a) 195'-1st crop to 1952-1st crop (Repeated both seasons) (b) Yes (c) N.A. (v) (a) (b) Nil (vi) & (vii) Nil.

5. **RESULTS:**
<table>
<thead>
<tr>
<th>Leaf lb/ac.</th>
<th>0</th>
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<th>4000</th>
<th>6000</th>
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<td></td>
<td></td>
</tr>
<tr>
<td>0</td>
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<td>2245</td>
<td>2284</td>
<td>2130</td>
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<tr>
<td>60</td>
<td>1952</td>
<td>2308</td>
<td>2182</td>
<td>2421</td>
<td>2218</td>
</tr>
<tr>
<td>Mean</td>
<td>1963</td>
<td>2146</td>
<td>2234</td>
<td>2293</td>
<td>2159</td>
</tr>
</tbody>
</table>

S.E. of body of table = 146 lb/ac.
S.E. of Marginal means (Super) = 73 lb/ac.
S.E. of Marginal means (Leaf) = 84 lb/ac.

---

Crop: Paddy (2nd crop)  

Object: To evaluate the effect of Super with and without G.L.

1. **BASAL CONDITIONS:**
   (i) (a) Nil (b) Paddy (c) As per treatments (ii) (a) Laterite loam (b) Refer soil analysis Pattambi. (iii) 13.9.1950: 31.10.1950. (iv) (a) Puddling 6 times, levelling three times (b) transplanted from wet nursery at the age of one month (c) 2 to 3. (v) Nil. (vi) PTB 20: Short 4 months Improved. (vii) Rainfed (viii) One weeding 3 to 4 weeks after planting. (ix) 16.36' (13.9.1950 to 8.2.1951. (x) 8.2.1951.

2. **TREATMENTS:**
   All combinations of (1) & (2)  
   (1) G.L. at 4 levels: -O, 2000, 4000 & 6000 lb/ac.  
   (2) Super at 3 levels: -0, 30 & 60 lb/ac. P<sub>2</sub>O<sub>5</sub>.  
   G.L. applied as basal dressing at the time of puddling.  
   Super applied as basal dressing at puddling after G.L.

3. **DESIGN:**
   (i) 4 x 3 factorial in R.B.D. (ii) (a) 12 (b) N.A. (iii) 4 (iv) (a) (b) 13'x 17' (v) Nil; f' band and 1' furrow between plots. (vi) Yes.

4. **RESULTS:**
<table>
<thead>
<tr>
<th>P&lt;sub&gt;2&lt;/sub&gt;O&lt;sub&gt;5&lt;/sub&gt; lb/ac.</th>
<th>0</th>
<th>2000</th>
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<td>1268</td>
<td>1387</td>
<td>1474</td>
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</tbody>
</table>

Ref.: K. 50,32);50(28)  
Type: ‘M’
Crop: Paddy (1st crop)
Ref: K. 51 (11)/50 (28,32)
Type: 'M'

Object: To evaluate the effect of Super with and without G.L.

1. BASAL CONDITIONS:
   (i) Nil (ii) Paddy (c) As per treatments (ii) (a) Laterite loam (b) Refer soil analysis Pattambi. (iii) 2.6.1951: 4.7.51 (iv) (a) Puddling 6 times levelling 3 times. 4 to 5 ploughings are given after 3 or 4 days (b) Seedlings transplanted from wet nursery. Average age of seedling is about one month (c) — (d) Planted in bulk (e) 2 to 3 (v) Nil (vi) PTB 2 Medium, 4 to 5 months; (improved (vii) Rainfed (viii) One weeding 3 or 4 weeks after planting. Another if necessary one month after 1st. weeding. (ix) 50.25° (2.6.51 to 24.10.51.) (x) 24.10.1951.

2. TREATMENTS:
   All combinations of (1) & (2)
   (1) Leaf at 4 levels: O (N₀), 2000 (N₁) 4000 (N₂) and 6000 (N₃) lb./ac.
   (2) P₂O₅ as super at levels 0 (P₀) 30 (P₁) and 60 (P₂) lb. P₂O₅/ac.
   Manures applied at the time of puddling.

3. DESIGN:
   (i) 3x4 fact in R.B.D. (ii) 12 (b) N.A. (iii) 4 (iv) (a), (b) 13°×17° (v) Nil (vi) Yes.

4. GENERAL:
   (i) The rainfall (S.W. Monsoon) was deficient by about 20° from normal and the distribution was erratic.
   (ii) Nil (iii) Grain yield. (iv) (a) 1950 1st crop to 1952 (1st crop) (b) Yes. (c) N.A. (v) (a), (b) Nil. (vi) & (vii) Nil.

5. RESULTS:
   (i) 2287 lb./ac.
   (ii) 191 lb./ac.
   (iii) The effect of N is significant; that of P is highly significant; interaction N×P is not significant.
   (iv) Grain yield 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>Mean</td>
<td>2069</td>
<td>2286</td>
<td>2463</td>
<td>2331</td>
<td>2287</td>
</tr>
</tbody>
</table>

S.E. of body of table = 98 lb./ac.
S.E. of marginal means (N) = 56 lb./ac.
S.E. of marginal means (P) = 48 lb./ac.

Crop: Paddy (2nd crop)
Ref: K. 51 (15)/51 (11)/50 (28,32)
Type: 'M'

Object: To evaluate the effect of Super with and without G.L.

1. BASAL CONDITIONS:
   (i) (a) Nil (b) Paddy (c) As per treatments (ii) (a) Laterite loam (b) Refer soil analysis Pattambi. (iii) 27.9.51: 21.11.51; (iv) (a) Puddling 6 times, levelling 3 times (b) Seedlings transplanted from wet nursery. Average age of seedlings is about one month (c) — (d) Planted in bulk (e) 2 to 3 (v) Nil (vi) PTB
23. Improved Short 120 days (vii) Rainfed (viii) One weeding three to four weeks after planting. Another weeding if necessary. (ix) 21.76" (27.9.51 to 8.2.52) (x) 8.2.1952.

2. TREATMENTS:
All combinations of (1) & (2)
(i) G.L. at 4 levels : O (N0), 2000 (N1), 4000 (N2), and 6000 (N3) lb/ac.
(ii) P2O5 as super at 3 levels O (P0), 30 (P1), and 60 (P2) lb P2O5/ac. Manures applied at the time of puddling.

3. DESIGN:
(i) 3x4 fact in R.B.D. (ii) (a) 12 (b) N.A. (iii) 4 (iv) (a) (b) 13 'x 17' (v) Nil ;(vi) Yes.

4. GENERAL:
(i) Nil (iii) Grain and straw weight (iv) (a) 1950-1st crop to 1952 (1st crop.) (b) Yes (c) N.A. (v) (a) Nil. (vi) Nil

5. RESULTS:
(i) 2307 lb/ac.
(ii) 215 lb/ac.
(iii) Effect of N is significant and of P is highly significant; interaction N P is not significant.
(iv) (Grain yield in lb/ac.)

<table>
<thead>
<tr>
<th>N0</th>
<th>N1</th>
<th>N2</th>
<th>N3</th>
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<td>2118</td>
<td>2327</td>
<td>2474</td>
<td>2807</td>
<td>2431</td>
</tr>
</tbody>
</table>

Mean 2028 2175 2356 2672 2537

S.E. of body of table =108 lb/ac.
S.E. of Marginal means (N) =62 lb/ac.
S.E. of marginal means (P) =54 lb/ac.

Crop: Paddy (1st crop) Ref: K. 52 (30)/51 (11,15) 50 (28,32)
Site: Agri. Res. Stn. Pattambi. Type: 'M'
Object: To evaluate the effect of Super in two doses at 30 lb & 60 lb/ac. with green leaf in 4 doses.

1. BASAL CONDITIONS:
(i) (a) Nil (b) Paddy (c) As under treatments, (ii) (a) Laterite loam (b) Refer soil analysis Pattambi. (iii) 26.5.1952 : 7.1.1952. (iv) (a) 6 puddlings, 3 levellings, 3 puddlings, 3 puddlings, 3 puddlings, 3 puddlings, 3 puddlings, 3 puddlings. (v) Nil (vi) REF 2, Medium 4 to 5 months Improved. (vii) Rainfed. (viii) One weeding one month after planting. Another weeding a month afterwards if required. (ix) 56.86" in 84 rainy days. (26.5.1955 to 21.10.1955) (x) 21.10.1952.

2. TREATMENTS:
All combinations of (1) and (2)
(i) 3 levels of P2O5 Super - 0,30,60 lb/ac.
(ii) 4 levels of G.L. : 0,2000,4000 and 6000 lb/ac.
Both applied at the time of puddling as basal.

3. DESIGN:
(i) 3x4 Fact R.B.D. (ii) (a) 12 (b) N.A. (iii) 4 (iv) (a), (b) 13 'x 17' (v) Nil ;(vi) Yes.

4. GENERAL:
(i) Nil (iii) Grain weight (iv) (a) 1950-1st-crop to 1952 1st crop (b) Yes. (c) N.A. (v) (a,b) Nil (vi) & (vii) Nil

5. RESULTS:
(i) 2381 lb/ac.
(ii) 290 lb/ac.
(iii) Main effects of G.L. and P are highly significant. Interactions not significant.
Crop : Paddy (1st crop)  Ref: K. 51 (32)
Site : Agri. Res. Stn. Pattambi. Type: 'M'

Obj: To find out if heavy manuring of the transplanted second crop would obviate the necessity of basal manuring for the following broadcast crop of paddy and maintained the fertility of the soil.

1. BASAL CONDITIONS:
   (i) (a) Nil (b) Paddy (c) 4000 lb/ac. GL+100 to 150 lb. A/S/ac. (ii) Laterite loam (b) Refer soil analysis Pattambi (iii) 20.4.1951. (iv) (a) 10 ploughings (b) Seeds are sown by broadcast. They are covered by another ploughing (c) about 75 lb/ac. (d) & (e) — (v) Nil (vi) PTB 2; Medium 4 to 5 months Improved. (vii) Rainfed (viii) One weeding 3 to 4 weeks after sowing. Another weeding if necessary one month after 1st weeding. (ix) 50.25" (20.4.51 to 26.9.1951) (x) (26.9.1951).

TREATMENTS:

Main plot treatments
(1) 6000 lb/ac.
(2) C.M. 10 tons/ac.
(3) No manure.
G.L. and Cowdung applied at the time of puddling in the second crop season of the previous year.

Sub-plot treatments
(1) Green leaf 3000 lb/ac. + super to supply 30 lb. P₂O₅/ac. + A/S 150 lb/ac.
(2) No manure.
Applied during the 1st crop season of 1951. G.L. and super (applied in subplots) are given on 20.4.51, A/S (subplots) applied on 10.7.1951.

DESIGN:
   (i) Split plot design (ii) (a) 3 main plots/block and two sub plots/main plot. (b) N.A. (iii) 4 (iv) (a) (b) Sub plot 36"x32' Main plot 36"x65' (v) Nil; (vi) Defective randomisation

4. GENERAL:
   (i) Satisfactory. (ii) (Nil) (iii) Grain weight (iv) (a) 1951 1st crop to 1953 1st crop (b) Yes (c) N.A. (v) (a, b) Nil (v) & (vi) Nil.

5. RESULTS:
   (i) 2087 lb/ac.
   (ii) (a) 108 lb/ac. (b) 202 lb/ac.
   (iii) Main treatments are significant. Sub treatments are highly significant. Interaction not significant.
   (iv) (Grain weight in lb/ac.)
<table>
<thead>
<tr>
<th>Main plot</th>
<th>1</th>
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<th>3</th>
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<td>Mean</td>
<td>2232</td>
<td>2203</td>
<td>2006</td>
<td>2087</td>
</tr>
</tbody>
</table>

S.E. of diff. of two marginal means (mainplot) = 54 lb/ac. 
S.E. of diff. of two marginal means (subplot) = 82 lb/ac. 
S.E. of diff. of two main plots means for same subplot treatment = 114 lb/ac. 
S.E. of diff. of two subplot means for the same main plot treatment = 143 lb/ac.
Object:—To find out if heavy manuring of previous transplanted second crop would obviate the necessity of basal manuring of the next 1st crop.

1. BASAL CONDITIONS:
   (i) (a) Nil (b) Paddy (c) As per treatment (ii) (a) Laterite loam (b) Refer soil analysis Pattambi
   (iii) 27.9.51; 29.10.1951. (iv) (a) puddling 6 times. levelling 3 times. (b) Seedlings transplanted from wet nursery (c)—(d) 6'×6' (e) 2. (v) Nil (vi) PTB 20 Short duration (4 months) Improved. (vii) Rainfed (viii) One weeding 3 or 4 weeks after planting. Another weeding if necessary one month after 1st weeding. (ix) 23.7.51 (27.9.51 to 30.1.1952) (x) 30.1.52.

2. TREATMENTS:
   Main plot treatments.
   (1) G.L. 6000 lb./ac.
   (2) C.M. 10 tons /ac.
   (3) No manure

   Sub plot treatments.
   (1) G.L. 2000 lb./ac. + super to supply 30 lb: P<sub>2</sub>O<sub>5</sub>/ac.+A/S 150 lb./ac.
   (2) No Manure.

   These treatments were applied during the 1st crop season of 1951. G.L. and super (applied in subplots) were given on 20.4.51 and ploughed in A/S (sub plots) applied on 10.7.1951.

3. DESIGN:
   (i) Split plot design. (ii) (a) 3 main plots/block and two sub plots/main plot. (b) N.A. (iii) 4 (iv) (a) (b) sub plot 36'×36' main plot 36'×36' (v) Nil. (vi) Defective Randomisation.

4. GENERAL:
   (i) Satisfactory. (ii) Nil (iii) Grain and straw weight (iv) (a) 1951 1st crop to 1953 (1st crop) (b) Yes (c) N.A. (v) (a) (b) Nil. (vi) & (vii) Nil.

5. RESULTS:
   
<table>
<thead>
<tr>
<th>Main plot</th>
<th>Sub plot</th>
<th>1</th>
<th>2</th>
<th>3</th>
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<td>2327</td>
<td>2419</td>
<td>2029</td>
<td>2258</td>
</tr>
</tbody>
</table>

   S.E. of difference of two marginal means (main plot) = 31 lb./ac.
   - (sub plot) = 58 lb./ac.
   - main plot means for the same level of sub plot = 78 lb./ac.
   - S.E. of diff. of two sub plot means for the same level of main plot = 101 lb./ac.
2 Improved 125 days durations. (vii) Rainfed. (viii) 2 weedings at intervals of one month from sowing (ix) 58.60" in 80 rainy days (21.5.1952 to 8.10.1952) (x) 8.10.1952.

2. TREATMENTS:

Main plot (applied to the 1st crop) Leaf and super applied on 16.5.1952.

Sub plot (Applied to the 1951 2nd crop)

1. No manure
2. G.L. 2000 lb/ac. at the time of puddling. + P₂O₅ 30 lb/ac. as super as basal+A/S 150 lb/ac. top dressed.

1. G.L. 6000 lb/ac. at the time of puddling.
2. C.M. 10 cartloads/ac. at the time of puddling.
3. No manure.

3. DESIGN:

(i) Split plot design with defective randomisation (ii) (a) 2 main plots and 3 sub plots/main plot (b) N.A.
(iii) 4 (iv) (a) 35 'x 36.5' (b) 32 'x 65.5'. (v) Nil (vi) Defective randomisation.

4. GENERAL:

(i) Satisfactory (ii) Nil (iii) Grain weight (iv) (a) 1951-1st crop to 1953-1st crop (b) Yes. (c) N.A.
(v) (a, b) Nil. (vii) & (vii) Nil.

5. RESULTS:

(i) 1451 lb/ac.
(ii) (a) 326 lb/ac.
(b) 123 lb/ac.
(iii) Both main and sub plot treatments are significant Interaction is not significant.
(iv) Grain weight in lb/ac.

<table>
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<td>1069</td>
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</table>

Mean: 1538 1464 1352 1451

S.E. of diff. of two marginal means (mainplot) =133 lb/ac. (subplot) =62 lb/ac.
S. E. of diff of two mainplot means for the same sub-plot. =151 lb/ac.
S.E. of diff. of two sub plot means for the same main plot =88 lb/ac.

Crop :-Paddy (2nd crop)                  Ref :-K. 52 (34)/52 (33)/51 (32,34)
Site :-Agri Res. Stn. Pattambi.               Type :-'M'

Object :-To find out if heavy manuring of the previous transplanted 2nd crop would obviate the necessity of basal manuring for the following broadcast crop of paddy so as to maintain the fertility of the soil.

2. BASAL CONDITIONS:

(i) (a) Nil. (b) Paddy (c) As under treatments and basal dressing of K 52.(33) (ii) Laterite loam (b) Refer Soil analysis Pattambi. (iii) 13.9.1957 : 30.10.1959 (iv) (a) 4 ploughings, 1 digging (b) planting in lines (c) -(d) 6'x 6' (e) 2 (v) Nil (vi) PTB-20 Improved, 125 days duration (ix) 16.10" in 18 rainy days (13.9.1952 to 28.1.1953) (x) 28.1.1953.

2. TREATMENTS:

Main plot treatment : 1. No manure.
(Effect of 1952 1st crop)
2. G.L. 2000 lb/ac. at the time of ploughing+Super 30 lb P₂O₅/ac. at the time of ploughing before planting+A/S 150 lb/ac. top dressed one month after planting.

Sub-plot treatments : 1. G.L. 6000 lb/ac. at the time of ploughing.
(Effect of 2nd crop)
2. C.M. 10 C.L./ac. at the time of ploughing.
3. No manure.

3. DESIGN:
(i) Split plot (ii) 2 main-plots and 3 sub-plots/main plot. (b) N.A. (iii) 4 (iv) (a) 36.5' x 65.0' (b) x 36.5' x 32.5' (v) Nil. (vi) Defective randomisation.

4. GENERAL:
(i) Satisfactory (ii) Nil (iii) Grain weight (iv) (a) 1951-1st crop to 1953-1st crop (b) Yes (c) N.A. (v) (a), (b) Nil (vi) & (vii) Nil.

5. RESULTS:
(i) 1805 lb./ac. (ii) (a) 649.6 lb./ac. (b) 151.5 lb./ac. (iii) None of the main and sub-plot effects and their interaction is significant. (iv) A > . grain weight lb./ac.

<table>
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<tr>
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<td>1805</td>
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S. E. of diff. of two marginal means (main-plot) do (sub-plot) = 46 lb./ac. = 78 lb./ac.
S. E. of diff. of two main plot means for the same sub-plot = 101 lb./ac.
S. E. of diff. two sub-plot means for the same main-plot = 109 lb./ac.

Object:--To study the residual effect of manures given to the 2nd crop of the previous year.

1. BASAL CONDITIONS:
(i) (a) Nil. (b) Paddy (c) As under treatments and basal dressing K 52 (34) (ii) (a) Laterite loam (b) Refer soil analysis Pattambi. (iii) 7.5.1953. (iv) (a) 7 ploughings (b) broadcast (c) 36 lb/ac. (d)---(e). (vii) Unirrigated (viii) 2 weedings. (ix) 66.86" in 4 rainy days. (7.5.1953 to 9.10.1953) (x) 9.10.1953.

2. TREATMENTS:
Main plot treatments:
(1) No manure.
(2) G.L. 2000 lb./ac. + Super 30 lb. P₂O₅/ac + A/S 150 lb./ac.
Sub-plot treatments (applied to 1952 2nd crop) :-
(1) C.M. 10 C.L./ac.
(2) G.L. 6000 lb./ac.
(3) No manure.
G.L. applied at the time of puddling. Super before and after ploughing. A/S top dressed one month after planting.

3. DESIGN:
(i) Split plot (ii) 2 main-plots : 3 sub-plots per main-plot. (b) N.A. (iii) 4 (iv) (a) 36' x 65' (b) 36' x 32' (v) Nil. (vi) Yes.

4. GENERAL:
(i) Satisfactory (ii) Nil (iii) Grain weight (iv) (a) 1951-1st crop to 1953-1st crop. (b) Yes (c) N.A. (v) (a), (b) Nil (vi) & (vii) Nil.

5. RESULTS:
(i) 1783 lb./ac. (ii) 649.6 lb./ac. (b) 151.5 lb./ac.
(iii) None of the main and sub-plot effects and their interaction is significant. (iv) A > . grain weight lb./ac.
Crop: Paddy (1st crop)  Ref: K 51 (31)
Site: Agri. Res. Stn. Pattambi.  Type: 'M'

Object: To find out the efficacy of application of super to leguminous green manure crops like Dhaincha, in the double crop land.

1. BASAL CONDITIONS:
   (i) (a) Nil (b) Paddy (c) G.L. 5000 lb./ac. + A/S. 100 to 150 lb./ac.  (ii) (a) Laterite loam (b) Refer soil analysis Pattambi.  (iii) 5.6.51, 7.7.1951.  (iv) (a) Puddling 6 times, levelling 3 times (b) Seedlings transplanted from wet nursery.  Average age of seedlings is about one month (c) 2 to 3(v) Nil (vi) PTB 3, Medium 4 to 5 months, Improved (vii) Rainfed (viii) One weeding 3 to 4 weeks after planting and another weeding if necessary one month after the 1st weeding (ix) 50.25" (5.6.1951 to 19.11.1951) (x) Nil.

2. TREATMENTS:
   Dhaincha sown on 31.1.1951. Trampled on 1.7.1951.
   1. G.M. without phosphate.
   2. Do +super to supply 30 lb. P₂O₅/ac. to G.M. crop.
   3. Do +super to supply 60 lb. P₂O₅/ac. to G.M. crop.
   4. G.L. as in (2)+super at 30 lb. P₂O₅/ac. to paddy.
   5. G.L. as in (3)+super at 60 lb. P₂O₅/ac. to paddy.
   6. G.L. alone as in (2)
   7. G.L. alone as in (3)

Super was applied to green manure on 31.1.51 and to paddy on 7.7.51: Time of application final puddling and levelling.

3. DESIGN:
   (i) R.B.D.  (ii) (a) 7 (b) N.A.  (iii) 4 (iv) (a), (b) 15' x 20' (v) Nil (vi) Yes

4. GENERAL:
   (i) Poor (ii) Nil (iii) Grain weight (iv) (a) No (b) Nil (v) (a) (b) Nil (vi) Nil (vii) Nil  (viii) Nil  (ix) The rainfall (S.W. Monsoon) was deficit by about 20" from normal and the distribution was erratic.

5. RESULTS:
   (i) 1873 lb./ac.
   (ii) 145 lb./ac.
   (iii) The treatment differences are significant
   (iv) Grain weight in lb./ac.

   Treatments.  Mean.
   1.  1634
   2.  1787
   3.  2033
   4.  1824
   5.  1978
   6.  1851
   7.  2005

S. E. of treatment means: = 73 lb./ac.
Crop :- Paddy (1st crop)  
Ref :- K. 51 (20)
Type :- 'M'

Object :- To find out the efficacy of application of super to leguminous green manure crops like wild, indigo in the single crop land.

1. BASAL CONDITIONS:
(i) (a) Nil. (b) Paddy. (c) 5000 G.L. lb./ac. + A/S 100 to 150 lb./ac. (ii) (a) Laterite loam (b) Refer soil analysis, Pattambi. (iii) 2.6.51, 27.7.51 (iv) (a) Puddling 6 times, levelling 3 times (b) Seedlings transplanted from wet nursery. Average age of seedlings is about one month (c) — (d) planted in bulk (e) 2 to 3 (v) Nil. (vi) PTB 7, Improved 120 days duration short. (vii) Purely rainfed (viii) One weeding 3 or 4 weeks after planting and another weeding if necessary one month after 1st weeding. (ix) 50.25° (2.6.51 to 18.10.51) (x) 18.10.51.

2. TREATMENTS:
(I) G.M. without phosphate.
(2) G.M. + super to supply 30 lb. P₂O₅/ac. to G.M. Crop.
(3) do + super to supply 60 lb. P₂O₅/ac. to G.M. Crop.
(4) G.L. manuring as in (2) + super 30 lb. P₂O₅/ac. to paddy.
(5) G.L. as in (3) + super 60 lb. P₂O₅/ac. to paddy.
(6) G.L. alone as in (2).
(7) G.L. alone as in (3).

3. DESIGN:
(i) R.B.D. (ii) (a) 7 (b) N.A. (iii) 4 (iv) (a), (b) 15′ × 18′ (v) Nil (vi) Yes.

4. GENERAL:
(i) Pots manured with phosphates had a better stand with good growth of green manure. Though the result did not satisfy the test of significance increased yield of G.L. and paddy was obtained with the application of super. (ii) Nil (iii) Grain weight (iv) (a) No. (b) Nil. (v) (a), (b) Nil. (vi) & (vii) Nil.

5. RESULTS:
(i) 989 lb./ac.
(ii) 258 lb./ac.
(iii) The treatments are not significantly different.
(iv) Average grain yield in lb./ac.

<table>
<thead>
<tr>
<th>Treatment</th>
<th>Mean</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
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<td>3.</td>
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<td>4.</td>
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<td>7.</td>
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</table>

S. E. of treatment means = 129 lb./ac.

Crop :- Paddy (1st crop)  
Ref :- K. 51 (12)
Type :- 'M'

Object :- To compare the efficacy of a Semiacidulated phosphate (Dicalcium phosphate) against Super over a basal dressing of G.N.C

1. BASAL DRESSING:
(i) (a) Nil (b) Paddy (c) G.L 500 lb./ac + A/S 100 to 150 lb./ac (ii) (a) Laterite loam : (b) Refer to soil analysis Pattambi (iii) 13-7-1951 ; 4-9-1951. (iv) (a) Puddling 6 times, levelling 3 times (e) Seedlings transplanted from wet nursery. Average age of seedlings about one month (c) — (d) Planted in bulk (e) 2 to 3 (v) Nil. (vi) PTB 2, Medium 4 to 5 month, Improved (vii) Rainfed (viii) One weeding 3 to 4 weeks after planting and another if necessary. (ix) 50.25° (13.7.1951 : to 15.11.1951) (x) 15.11.1951.

2. TREATMENT:
1. Control.
2. G.N.C. to supply 40 lb. N/ac.
4. G.N.C. to supply 40 lb. N/ac + Semiacidulatate Phosphate to supply 80 lb. P₂O₅/ac by broadcast.
5. G.N.C. to supply 40 lb. N/ac + Super to supply 80 lb. P₂O₅/ac by placement.
G.N.C. was applied at the time of planting by broadcast.
Super and Semiacidulatated phosphate applied at the time of last puddling.

3. DESIGN:
(i) R.B.D.
(ii) (a) 6 (b) N.A. (iii) 5 (iv) (a), (b) 32' x 27' (v) Nil (vi) Yes

4. GENERAL:
(i) Satisfactory (ii) Nil (iii) Grain Weight (iv) (a) 1951-1st crop to 1953-1st crop (b) Yes (c) N.A. (v) (a), (b) Nil (vi) & (vii) Nil.

5. RESULTS:
(i) 1126 lb./ac.
(ii) 145 lb./ac.
(iii) The treatments differences are not significant.
(iv) Grain yield in lb./ac.

<table>
<thead>
<tr>
<th>Treatment</th>
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<th>S.E. of treatment means</th>
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<td>=65 lb./ac.</td>
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<td>3</td>
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<td></td>
</tr>
<tr>
<td>6</td>
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<td></td>
</tr>
<tr>
<td>S.E.</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Crop:—Paddy (2nd crop)  
Site:—Agri. Res. Stn. Pattambi  
Type:—'M'  
Ref:—K. 51 (16) / 51 (12)

Object:—To compare the efficacy of a Semiacidulatated phosphate (Dicalcium phosphate) against Super over a basal dressing of G.N.C.

1. BASAL CONDITIONS:
(i) (a) Nil (b) Paddy (c) As per treatments. and basal dressing K 51 (12) (ii) (a) Lateritic loam (b) Refer soil analysis, Pattambi (iii) 5:10.51: 3.12.1951 (iv) (a) Puddling 6 times levelling 3 times (b) Seedling transplanted from wet nursery. Average age of seedlings about one month (c) N.A. (d) Planted in bulk (e) 2 to 3 (f) Nil (g) PTB 10-Short-duration 100 days, Improved (iv) Rainfed (viii) One weeding three or four weeks after planting and another if necessary. (ix) 23°76' (5.10.51 to 25.2.52) (x) 25.2.1952.

2. TREATMENTS:
1. Control
2. G.N.C. to supply 40 lb. N/ac.
3. G.N.C. to supply 40 lb. N/ac + Super to supply 80 lb. P₂O₅/ac applied by Broad-cast.
4. G.N.C. to supply 40 lb. N/ac + Semiacidulatated phosphate to supply 80 lb. P₂O₅/ac applied broadcast.
5. G.N.C. to supply 40 lb. N/ac + Super to supply 80 lb. P₂O₅/ac applied by placing.
6. G.N.C. to supply 40 lb. N/ac. applied placing; G.N.C. was applied at the time of planting by broadcast.
Super and Semiacidulatated phosphate applied at the time of last puddling.

3. DESIGN:
(i) R.B.D.  
(ii) (a) 6 (b) N.A. (iii) 5 (iv) (a), (b) 32' x 27' (v) Nil (vi) Yes

4. GENERAL:
(i) Satisfactory (ii) Nil (iii) Grain Weight (iv) (a) 1951-1st crop to 1953-1st crop (b) Yes. (c) N.A. (v) Nil (vi) & (vii) Nil

5. RESULTS:
(i) 1126 lb./ac.
(ii) 145 lb./ac.
(iii) The treatment differences are highly significant.
(iv) Grain yield in lb./ac.

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</tr>
<tr>
<td>6</td>
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</tr>
</tbody>
</table>

S.E. of treatment means =64 lb./ac.
Crop :- Paddy (1st crop)
Site :- Agri. Res. Stn. Pattambi

Ref :- K. 52 (21) 51 (12,16)
Type :- 'M'

Object :- To compare the efficacy of Dicalcium phosphate with Super over a basal dressing of G.N.C.

1. BASAL CONDITIONS :
   (i) (a) Nil (b) Paddy (c) As per treatments. (ii) (a) Lateritic loam (b) Refer soil analysis Pattambi (iii) 26.5.1952; 10.7.1953 (iv) (a) 7 ploughings (b) broadcast (c) 35 lb./ac. (d) 6'x6' (e) 2 to 3 (v) Nil (vi) PTB - 2 (medium) 135 days duration. (vii) Unirrigated. (viii) 2 weedings. (ix) 60.7' in 74 rainy days. (x) 24.10.52

2. TREATMENT :
   1. Control.
   3. (2)+ Super to supply 80 lb. P₂O₅/ac by broadcast
   4. (2)+ Dicalcium phosphate 80 lb. P₂O₅/ac by broadcast
   5. (2)+ Super 60 lb P₂O₅/ac by placement
   6. (2)+ Dicalcium phosphate 80 lb. P₂O₅/ac by placement

   Treatments applied at planting.

3. DESIGN :
   (i) R.B.D. (ii) (a) N A. (iii) 5 (iv) (a), (b) 32'x57' (v) NIL (vi) Yes

4. GENERAL :
   (i) Satisfactory. (ii) Nil (iii) Grain and Straw Weight. (iv) (a) 1951-1st crop to 1953-1st crop (b) Yes. (c) N A. (v) (a), (b) Nil (vi) & (vii) Nil.

5. RESULTS :
   (i) 2404 lb./acre
   (ii) 141.2 lb/acre.
   (iii) The treatments differ highly significantly
   (iv) Grain weight in lb./ac.

   Treatments.

<p>| | | |</p>
<table>
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<tr>
<td>1</td>
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</table>

   S.E per treatment mean = 65.1 lb./ac.

---

Crop :- Paddy (2nd crop)
Site :- Agri. Res. Stn. Pattambi

Ref :- K. 52(19)/52(21)/51(12) .16
Type ; 'M'

Object:- To compare the efficacy of Dicalcium phosphate with Super over a basal dressing of G.N.C.

1. BASAL CONDITIONS :
   (i) (a) Nil (b) Paddy (c) As per treatments and basal dressing in K 1952 (21) (ii) (a) Lateritic loam (b) Refer soil analysis Pattambi (iii) 21.9.52; 10.11.52. (iv)(a) 7 ploughings and levelling (b) Transplanting (c) (d) 6'x6' (e) 2 (v) Nil (vi) PTB 20. Medium. (vii) Rainfed (viii) 2 weedings (ix) 16.04' in 18 rainy days (24.9.52 to 3.2.53) (x) 3.2. 1953.

2. TREATMENTS :
   1. Control.
   2. G.N.C. at 40 lb. N/ac.
   3. (2)+ Super 80 lb. P₂O₅/ac by broadcast
   4. (2)+ Dicalcium phosphate 80 lb. P₂O₅/ac by broadcast
   5. (2)+ Super 80 lb. P₂O₅/ac by placement.
   6. (2)+ Dicalcium Phosphate 80 lb. P₂O₅/ac. by placement.
   Applied before planting.
3. DESIGN:
(i) R.B.D. (ii) (a) 6 (b) N.A. (iii) 5 (iv) (a,b) 32' x 27' (v) Nil (vi) Yes.

4. GENERAL:
(i) Satisfactory. (ii) Nil (iii) Grain and straw weight. (iv) [a] Yes [1951] 1st crop to 1953 1st crop. (b) Yes (c) N.A. (v) (a,b) Nil (vi) & (vii) Nil.

5. RESULTS:
(i) 1637 lb/ac
(ii) 1441.6 lb/ac.
(iii) The treatment differ highly significantly.
(iv) Grain weight is lb/ac.

<table>
<thead>
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<th>Treatments</th>
<th>Mean</th>
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<tbody>
<tr>
<td>1</td>
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<td>5</td>
<td>1764</td>
</tr>
<tr>
<td>6</td>
<td>1755</td>
</tr>
</tbody>
</table>

S.E. of treatment means = 64.7 lb/ac.

Crop:—Paddy (1st crop)

Object:—To compare the efficacy of Dicalcium phosphate with Super over a basal dressing of G.N.C.

1. BASAL CONDITIONS:
(i) (a) Nil (b) Paddy (c) As under treatments and basal dressing K 52 (v) Nil (ii) (a) Laatstef ixem (b) Refer soil analysis Pattambi. (iii) 19.6, 1953; 25.7, 1953. (iv) (a) 7 ploughings and levelling (b) broadcast (c) 36 lb/ac. (d) — (e) — (f) Nil (vii) PTB 2 Medium 135 days. (viii) un-irrigated; (vii) 2 weedings (ix) 74.46" in 78 rainy days. (x) 26.10.1953.

2. TREATMENTS:
1. Control (No manure)
2. G.N.C. at 40 lb. N/ac.

Treatments applied at planting.

3. DESIGN:
(i) R.B.D. (ii) (a) 6 (b) N.A. (iii) 5 (iv) (a), (b) 32' x 27' (v) Nil (vi) Yes.

4. GENERAL:
(i) Satisfactory; (ii) Nil (iii) Grain weight (iv) (a) 1951—(1st crop) to 1953—(1st crop) (b) Yes (c) N.A. (v) (a), (b) Nil (vi) & (vii) Nil.

5. RESULTS:
(i) 2138 lb/ac.
(ii) 166.9 lb/ac.
(iii) Treatments differ highly significantly.
(iv) Grain yield in lb/ac.

<table>
<thead>
<tr>
<th>Traitments</th>
<th>Mean</th>
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<tbody>
<tr>
<td>1</td>
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<td>2188</td>
</tr>
<tr>
<td>6</td>
<td>2369</td>
</tr>
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</table>

S.E. of treatment mean = 74.7 lb/ac.
Object: To find out the comparative effect of C/N as against A/S on the yield of paddy.

1. BASAL CONDITIONS:
   (i) (a) Nil (b) Paddy (c) 4000 lb/ac. G.L. + 100 lb/ac. A/S (iii) Laterite loam (b) N.A. (iii) 28.5.1952.
   (v) (a) 7 ploughings (b) transplanting (c) → (d) 6" × 6". (e) 2 or 3 (v) Nil (vi) PTB-2 Medium; 135 days.
   (vii) Unirrigated. (viii) 3 weedicings. (ix) 58.80" in 78 rainy days (28.5.1952 to 24.10.52) (x) 24.10.52.

2. TREATMENTS:
   All combinations (1), (2) and (3).
   (I) 2 levels of N: 40, 60 lb/ac.
   (2) 2 sources of N: A/S, C/N.
   (3) 2 basal dressings: (a) No basal dressing. (b) Lime 450 lb/ac. + F.Y.M. 3 tons/ac. + Super to give P₂O₅ 30 lb/ac.

One extra treatment: Lime 450 lb/ac + F.Y.M. 3 tons/ac. + Super to give P₂O₅ 30 lb/ac.

DESIGN:
(i) R.B.O. (ii) (a) 9 (b) N.A. (iii) 5 (iv) (a, b) 18' × 23' (v) Nil (vi) Yes.

4. GENERAL:
   (i) Satisfactory. (ii) Nil. (iii) Grain and straw weight (iv) (a) 1952-1st crop to 1954-2nd crop, experiment failed during 1953-2nd crop. (b) Yes (c) N.A. (v) (a, b) Nil. (vi) & (vii) Nil.

5. RESULTS:
   (i) 2642 lb/ac.
   (ii) 130.9...
   (iii) Main effect of basal dressing (i.e. in presence of other treatments), basal dressing vs. other treatments and main effect of N are highly significant; others are not significant.
   (iv) Mean Grain yield in lb/ac. Basal dressing alone

<table>
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<tr>
<th>Levels of N</th>
<th>Source of N</th>
<th>Mean</th>
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S.E. for B.D. alone vs any other mean = 32.9 lb/ac.
S.E. for marginal mean = 4.16...
S.E. for body of table = 58.6...

Crop :—Paddy (1st crop) Ref :— K. 52 (26).
Site :- Agri. Res. Stn. Pattambi. Type :- 'M'

1. BASAL CONDITIONS:
   (i) (a) Nil (b) Paddy (c) As per treatments and basal dressing K.52(26) (ii) (a) Laterite loam (b) Refer Soil analysis Pattambi (iii) 24.9.1952 : 10.11.1952. (iv) (a) 7 ploughings (b) Transplanted in lines (c) spacing [6" × 6". (d) 2 (v) Nil. (vi) PTB 20 (Medium) (viii) Unirrigated. (viii) 2 weedings. (ix) 16.04" (24.9.1952 to 3.2.1953.) (x) 3.2.1953.

2. TREATMENTS:
   All combinations of (1), (2), & (3)
   (1) 2 levels of N: 40, 60 lb/ac.
   (2) 2 Sources of N: A/S, C/N.
   (3) 2 Basal dressings: (a) No B.D. (b) Lime 450 lb/ac. + F.Y.M. 3 tons/ac. + Super 30 lb/ac. P₂O₅.

One extra treatment: Lime 450 lb/ac + F.Y.M. 3 tons/ac. + Super 30 lb/ac P₂O₅.

S.E. for B.D. alone vs any other mean = 32.9 lb/ac.
S.E. for marginal mean = 4.16...
S.E. for body of table = 58.6...

Crop :—Paddy (2nd crop) Ref :— K. 52 (18)/52(26)
Site :- Agri. Res. Stn. Pattambi. Type :- 'M'

Object: To find out the comparative effect of C/N as against A/S on the yield of paddy.
Lime one month before planting: F.Y.M. at the time of ploughing; Super at the time of puddling before planting. A/S and C/N top dressed one month after planting.

3. DESIGN:
(i) R.B.D. (ii) (a) 9 (b) N.A. (iii) 5 (iv) (a), (b) 18' × 23' (v) Nil (vi) 'Yes.

4. GENERAL:
(i) Satisfactory. (ii) Nil (iii) Grain and straw weight. (iv) (a) 1952 (1st crop) to 1954 (2nd crop) Failed during 1953 (2nd crop) (b) Yes, (c) N.A. (v) (a), (b) Nil (vi) & (vii) Nil.

5. RESULTS:
(i) 1485 lb./ac.
(ii) 390.4...
(iii) Main effect of B.D. is highly significant. Others are not significant.
(iv) Mean grain yield in lb./ac.
Basal dressing alone = 1570 lb./ac.

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<td>(b) 1859</td>
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S.E. for B.D. alone vs. any other mean = 246.8 lb./ac.
S.E. for marginal means = 143.4...
S.E. for body of table = 174.6...

Crop :- Paddy (1st crop)
Ref :- K. 53 (32)/52 (26.18)
Type :- 'M'

Object :- To find-out the comparative effect of C/N against A/S.

1. BASAL CONDITIONS:
(i) (a) Nil (b) Paddy (c) Same experiment was in these plats. (ii) (a) Laterite loam (b) Refer soil analysis Pattambi. (iii) 10.6.1953 : 15.7.1953. (iv) (a) 7 ploughings and levelling (b) Transplanting in lines. (c) — (d) 6" × 6" (e) 2 (v) Nil (vi) PTB-2; Medium 135 days duration. (viii) Not irrigated (vii) 2 weedings.
(ix) 74.46" in 78 rainy days. (10.6.1953 to 27.10.1953) (x) 27.10.1953.

2. TREATMENTS:
All combinations of (1), (2) & (3)
(1) 2 levels of N :- 40, 60 lb./ac.
(2) 2 Sources of N :- A/S, C/N
(3) 2 Basal dressings :- (a) No B.D. (b) Lime 450 lb/ac + F.Y.M. 3 ton/ac + Super 30 lb/ac. P_2O_5
One extra treatment :- Lime 450 lb/ac + F.Y.M. 3 ton/ac + Super + 30 lb/ac. P_2O_5
Lime one month before planting. F.Y.M. at the time of ploughing, Super before planting. A/S and C/N. one month after planting.

3. DESIGN:
(i) R.B.D. (ii) (a) 9 (b) N.A. (iii) 5 (iv) (a), (b) 18' × 23' (v) Nil (vi) 'Yes.

4. GENERAL:
(i) Satisfactory. (ii) Nil (iii) Grain weight (iv) (a) 1952 (1st crop) to 1954 (2nd crop) (b) Yes, Failed in 1953 2nd crop (c) N.A. (v) (a), (b) Nil (vi) & (vii) Nil.

5. RESULTS:
(i) 2447 lb./ac.
(ii) 205.9...
(iii) Main effect of (source of N) and B.D. are highly significant. Others are not significant.
(iv) Mean grain yield in lb./ac.
Crop : Paddy (1st crop)  Ref. : K. 49 (30)

Object : To find-out the effect of Ultraphos fertiliser which contains 22% P<sub>2</sub>O<sub>5</sub> on the yield of Paddy.

1. BASAL CONDITIONS :
   (i) (a) Nil (b) Paddy (3) 5000 lb./ac. of G.L. + 100 to 150 lb./ac. of A/S (ii) (a) Laterite loam (b) Refer soil analysis Pattambi (iii) 15.5.1949 ; 20.6.1949 (iv) (a) Puddling ; 3 levellings (b) Transplanted in bulk (c)–(d) 6’ X 6’ (e) 3 to 4. (v) 5000 lb./ac. G.L. as basal at the time of puddling. (vi) PTB 9 (vii) Rainfed. (viii) One weeding three to four weeks after planting. (ix) 88.93’ (15.5.49 to 15.10.1949) (x) 15.10.1949.

2. TREATMENTS :
   All combinations of (1)&(2)
   (1) 2 levels of P<sub>2</sub>O<sub>5</sub> : 30, 60 lb./ac.
   (2) 2 Sources of P<sub>2</sub>O<sub>5</sub> : Super & Ultraphos
   Control (No manure)
   Applied at the time of final ploughing and levelling.

3. DESIGN :
   (i) R.B.D. (ii) (a) 5 (b) N.A. (iii) 6 (iv) (a, b) 20’ X 22’ (v) Nil ; (vi) Yes.

4. GENERAL :
   (i) Satisfactory (ii) Nil (iii) Grain weight (iv) (a) 1949-1st crop; (during 1949-2nd crop expl. failed) (b) Yes. (c) N.A. (v) (a, b) Nil. (vi) & (vii) Nil

5. RESULTS :
   (i) 1624 lb./ac.
   (ii) 158.0
   (iii) Main effects, interaction and control vs. others are not significant.
   (iv) (Mean grain yield in lb./ac.)

<table>
<thead>
<tr>
<th>Source</th>
<th>Super</th>
<th>Ultra</th>
<th>Mean</th>
</tr>
</thead>
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</tr>
<tr>
<td>mean</td>
<td>1653</td>
<td>1599</td>
<td>1626</td>
</tr>
</tbody>
</table>

S.E. for marginal means = 44.5 lb/ac.
S.E. for the body of table = 63.0
S.E. for control vs. any mean in the body of table = 89.0
Crop: Paddy (1st crop)  Ref: K. 52 (24)
Site: Agri. Res. Stn. Pattambi.  Type: 'M'

Object: To find out how far the calcium carbonate slurry compares with slaked lime when applied to paddy crop at different doses over a basal dressing of 5000 lb/ac of G.L.

1. BASAL CONDITIONS:
   (i) (a) Nil. (b) Paddy (c) 4000 lb/ac. of G.L. + 100 lb/ac. of A/S (ii) (a) Laterite loam (b) Refer soil analysis Pattambi (iii) 28.5.1952; 21.7.1952. (iv) (a) 7 ploughings and leveling of field. (b) Transplanting (c) 6" x 6" (d) 2 (v) Green manure at 5000 lb/ac. (vi) PTB-2 Medium 135 days duration. (vii) Unirrigated. (viii) 2 weedings.  (ix) 57.24" in 78 rainy days. (28.5.1952 to 20.10.1952) (x) 20.10.1952.

2. TREATMENTS:
   1. No manure.
   2. Lime 1 ton/ac.
   3.  
   4.  
   5. Calcium Carbonate slurry 1 ton/ac.
   6.  
   7.  

G.L. at the time of puddling; Lime and Cal. Car. applied one month before planting.

3. DESIGN:
   (i) R.B.D. (ii) (a) 7 (b) N.A. (iii) 4 (iv) (a,b) 20' x 50' (v) N (vi) Yes.

4. GENERAL:
   (i) Satisfactory. (ii) Nil. (iii) Grain and straw weight (iv) (a) 1952 1st crop to 1953 1st crop (b) Yes (c) N.A. (v) & (vii) Nil.

5. RESULTS:
   (i) 2795 lb/ac.
   (ii) 275.6 lb/ac.
   (iii) The treatments do not differ significantly.
   (iv) Grain yield in lb/ac.

<table>
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<tr>
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<td>3025</td>
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</tr>
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<td>6</td>
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<tr>
<td>7</td>
<td>2701</td>
</tr>
</tbody>
</table>

S.E. of treatment means 137.8 lb/ac.

Crop: Paddy (2nd crop)  Ref: K. 52 (20)/52 (24)  Type: 'M'

Object: To find out how far the calcium carbonate slurry compares with slaked lime when applied to paddy crop at different doses over a basal dressing of 5000 lb/ac. of G.L.

BASAL CONDITIONS:
   (i) (a) Nil. (b) Paddy (c) As under treatments and basal dressing K 52 (24) (ii) (a) Laterite loam (b) Refer soil analysis Pattambi (iii) 24.9.1952; 21.11.1952 (iv) (a) 7 ploughings and leveling (b) Transplanted (c) 6" x 6" (d) 2 (v) G.L. 5000 lb/ac. as basal dressing on 17.11.1952. (vi) PTB-20 (Medium) (vii) Unirrigated. (viii) 2 weedings. (ix) 16.04" in 18 rainy days (24.9.1952 to 14.2.1953). (x) 14.2.1953.

2. TREATMENTS:
   1. No lime (unmanured)
   2. Lime 1 ton/ac.
   3.  
   4.  
   5. Calcium Carbonate slurry 1 ton/ac.
   6.  
   7.  

Lime and Calcium Carbonate slurry applied on 6.11.52.
3. DESIGN:
(i) R.B.D. (ii) (a) 7 (b) N.A. (iii) 4 (iv) (a,b) 26' x 50' (v) Nil (vi) Yes.

4. GENERAL:
(i) Satisfactory. (ii) Nil (iii) Grain and straw weight (iv) (a) Yes 1952—1st crop to 1953—1st crop (b) Yes (c) N.A. (v) (a,b) Nil. (vi) & (vii) Nil.

5. RESULTS:
(i) 214 lb./ac.
(ii) 257.5 lb./ac.
(iii) The treatments differ highly significantly.
(iv) Grain weight in lb./ac.

<table>
<thead>
<tr>
<th>Treatments</th>
<th>Mean</th>
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<tbody>
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<tr>
<td>4.</td>
<td>2762</td>
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<tr>
<td>5.</td>
<td>1898</td>
</tr>
<tr>
<td>6.</td>
<td>1919</td>
</tr>
<tr>
<td>7.</td>
<td>2070</td>
</tr>
</tbody>
</table>

E.S. per treatment mean = 128.8 lb./ac.

Crop :- Paddy (1st crop)  Ref :- R 53 (30)/52 (24,20)
Site :- Agri. Res. Stn. Pattambi.  Type :- 'M'

Object :- To find out how far the calcium carbonate slurry would compare with slaked lime when applied to paddy at different doses?

1. BASAL CONDITIONS:
(i) (a) Nil (b) Paddy (c) As under treatments and basal dressing K 52 (20) (ii) (a) Laterite loam (b) Refer soil analysis Pattambi (iii) 10.6.1953 ; 17.7.1953 (iv) (a) 7 ploughings and levelling (b) Transplanting (c) — (d) 6'x6' (e) 2 (v) Green leaf 5000 lb./ac. at the time of puddling. (vi) PTB-2. Medium 135 days duration. (vii) Not irrigated (viii) 2 weeding. (ix) 74.60 in 78 rainy days (10.6.1953 to 28.10.1953) (x) 28.10.1953.

2. TREATMENTS:
1. Control (No lime)
2. Lime at 2 tons/ac.
3. ... at 1 ... 
4. ... at 3 ... 
6. ... 2 ...
7. ... 3 ...
Lime and Cal. Car. one month before planting.

3. DESIGN:
(i) R.B.D. (ii) (a) 7 (b) N.A. (iii) 4 (iv) (a,b) 26' x 50' (v) Nil (vi) Yes.

4. GENERAL:
(i) Satisfactory (ii) Nil (iii) Grain weight (iv) (a) Yes 1952—1st crop to 1953—1st crop (b) Yes. (c) N.A. (v) (a,b) Nil (vi) & (vii) Nil.

5. RESULTS:
(i) 2444 lb./ac.
(ii) 233.2 lb./ac.
(iii) Treatments differ highly significantly.
(iv) Grain weight in lb./ac.

<table>
<thead>
<tr>
<th>Treatment</th>
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<tbody>
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<tr>
<td>5.</td>
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<td>6.</td>
<td>2428</td>
</tr>
<tr>
<td>7.</td>
<td>2362</td>
</tr>
</tbody>
</table>

S.E. of treatment mean = 116.6 lb./ac.
Crop: Paddy (1st crop)  Ref: K 52 (23)
Site: Agri. Res. Stn. Pattambi. Type: 'M'
Object: To study the effect of application of phosphate through green manure as compared to direct application to paddy (single crop land).

1. RASAL CONDITIONS:
   (i) (a) Nil (b) Paddy (c) 400 lb/ac. G.L. + 100 lb/ac. A/S as basal dressing. (ii) (a) Laterite loam (b) Refer soil analysis Pattambi (iii) 2 6.1952; 22.7.1952. (iv) (a) 7 ploughings (b) Transplanting in lines (c) (d) 6" x 6" (e) 2 (f) Nil (g) PTB-7; Early: 125 days duration. (v) Unirrigated. (vi) 2 weedings. (vii) 56.17" in 74 rainy days. (2.6.1952 to 9.10.1952) (xi) 9.10.1952.

2. TREATMENTS:
   1. Control.
   2. G.M. crop.
   3. Super 30 lb P₂O₅/ac to green manure crop.
   4. G.M and Super 30 lb P₂O₅/ac direct to paddy.
   5. Super 45 lb P₂O₅/ac to G.M. crop.
   6. Green manure and Super 45 lb P₂O₅/ac direct to paddy.
   7. Super 60 lb P₂O₅/ac to G.M. crop.
   8. G.M. and Super 60 lb P₂O₅/ac direct to paddy.

Note: For treatments (2) to (8) a green manure crop or wild indigo will be grown in the experimental plots. The G.M. crop will be trampled and ploughed in. In treatments (3), (5) and (7) P₂O₅ to paddy is supplied through the green manure crop while in treatments (4), (6) and (8) P₂O₅ is supplied direct to paddy.

3. DESIGN:
   (i) R.B.D. (iii) S (a) 8 (b) N.A. (iv) L (a, b) 18' x 9' (v) Nil (vi) Yes.

4. GENERAL:
   (i) Satisfactory. (ii) NIL (iii) Grain and straw weight. (iv) (a) 1952 (1st crop) (b) No, (c) Nil, (v) (a, b) Nil, (vi) & (vii) Nil.

5. RESULTS:
   (i) 1274 lb/ac.
   (ii) 1579...
   (iii) The treatments do not differ significantly.
   (iv) Grain yield in lb/ac.

<table>
<thead>
<tr>
<th>Treatments</th>
<th>Mean</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
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<td>3.</td>
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</tr>
<tr>
<td>4.</td>
<td>1379</td>
</tr>
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<td>5.</td>
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</tr>
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<td>6.</td>
<td>1332</td>
</tr>
<tr>
<td>7.</td>
<td>1509</td>
</tr>
<tr>
<td>8.</td>
<td>1394</td>
</tr>
</tbody>
</table>

S.E. per treatment mean 79.0 lb/ac.

Crop: Paddy (1st crop)  Ref: K 53 (22)
Site: Agri. Res. Stn. Pattambi. Type: 'M'
Object: To study the effect of application of phosphate through green manure as compared to the direct application to paddy (double crop land).

1. BASAL CONDITIONS:
   (i) (a) Nil (b) Paddy (c) About 4300 lb/ac. G.L. + 100 lb/ac. A/S (ii) (a) Laterite loam (b) Refer soil analysis Pattambi (iii) 20.5.1952; 5.7.1952. (iv) (a) 7 ploughing and levelling (b) Transplanting in lines (c) (d) 6" x 6" (e) 2 (f) Nil (g) PTB-26 Medium; 125 days duration. (v) Unirrigated. (vi) 2 weedings, (vii) 51.58" in 83 rainy days (20.2.1952 to 9.10.52) (x) 9.10.1952.

2. TREATMENTS:
   1. Control.
   2. G.M.
   3. Super 30 lb P₂O₅/ac to G.M. crop.
   4. Green manure and Super 30 lb P₂O₅/ac direct to paddy.
   5. Super 45 lb P₂O₅/ac to G.M. crop.
6. G.M. and Super 43 lb P$_2$O$_5$/ac direct to paddy.
7. Super 60 lb P$_2$O$_5$/ac to G.M. crop
8. G.M. and Super 60 lb P$_2$O$_5$/ac direct to paddy

(G.M. Daincha sown on 13.2.1952 and trampled on 28.6.1952)

Note: For treatments (2) to (8) a green manure crop of Daincha will be grown on experimental plots. The green manure crop will be trampled and ploughed in. In treatments (3), (5) and (7) P$_2$O$_5$ is supplied through the green manure crop while in treatments (4), (6) and (8) P$_2$O$_5$ is supplied direct to paddy.

3. DESIGN:
   (i) R.B.D (ii) a 8 (b) N.A. (iii) 4 (iv) (a, b) 14' x 46' (v) Nil (vi) Yes.

4. GENERAL:
   (i) Satisfactory (ii) NIL (iii) 4 (iv) Grain and straw weight, (iv) (a) 1552 (1st crop) (b) No (c) Nil (v) (a), (b) Nil (vi) & (vii) Nil

5. RESULTS:
   (i) 1552 lb/ac.
   (ii) 180.3 lb/ac.
   (iii) The treatment differences are highly significant,
   (vi) Grain weight lb/ac.

   Crop: Paddy (1st crop)  
   Ref: K 53(29)  
   Type: 'M'

Object: To determine the best method of application of phosphate manures either as direct application to paddy or as indirect application through the preceding green manure crop.

1. BASAL CONDITIONS:
   (i) (a) Nil (b) Paddy (c) 3000 lb/ac G.L + 75 lb/ac A/S (ii) (a) Laterite loam. (b) Refer soil analysis Pattambi. (iii) 10.6.1953; 17.7.1953. (iv) (a) 7 ploughings and levelling the plots. (b) Transplanting in lines (c)-(d) 6' x 6' (e) 2 (v) Nil. (vi) PTB. - 2 Medium 135 days duration (vii) Un irrigated. (viii) 2 weedings (ix) 74-46' in 78 rainy days. (10.6.1953. to 19.10.1953) (x) 19.10.1953.

2. TREATMENTS:
All combinations of (a) & (b)  
(a) Three G.M. crops viz.  
(1) Wild indigo  
(2) Daincha  
(3) Sesbaina  
(b) Three methods of applying P$_2$O$_5$ viz.  
(1) at 45 lb/ac. as super through the green manure.  
(2) green manure + Super 45 lb P$_2$O$_5$/ac. direct to paddy.  
(3) green manure + Super 63 lb P$_2$O$_5$/ac. direct to paddy.

3. DESIGN:
   (i) 3 x 3 factorial in R.B.D. (ii) 9 (b) N.A. (iii) 4 (iv) (a, b) 28' x 16' (v) Nil (vi) Yes.

4. GENERAL:
   (i) Satisfactory. (ii) NIL (iii) Grain weight (iv) (a) No (b) No (c) Nil. (v) (a, b) Nil. (vi) & (vii) Nil

5. RESULTS:
   (i) 2338 lb/ac.  
   (ii) 289.3 lb/ac.  
   (iii) Neither the main effects nor their interaction is significant;
Crop: Paddy (1st crop)  
Ref:- K. 53 (26)  
Type:- 'M'

Object:—To determine the organic matter requirements of soil in the form of O.M. over a basal dressing of 60 lb. P_{2}O_{5} /ac. as super applied by plough and 45 lb. N/ac. A/S as top dressing.

1. BASAL CONDITIONS:
   (i) Nil
   (b) Paddy
   (c) 4000 lb/ac. green leaf + 75 lb. A/S/ac.  
   (ii) Laterite loam
   (b) Refer soil analysis Pattambi.  
   (iii) 10.6.1953; 15.7.1953  
   (iv) (a) 7 ploughings and levelling
   (b) transplanting
   (c)-(d) 6"x6" (e) (v) 61 lb. P_{2}O_{5} /ac. super by placement + A/S 45 lb. N/ac as top dressing one month after planting.  
   (vi) PTB. - 2 Medium. (vii) Not irrigated. (viii) 2 weedings. (ix) 74.56° in 78 rainy days. (10.6.1953 to 30.10.1953). (x) 30.10.1953.

2. TREATMENTS:
   (1) 3 levels of C.M.: 2100, 5000, 7500 lb/ac.  
   (2) 3 sources of organic matter:—C.M, G.L. and Compost and Control (no manure).  
   G.L and Compost applied in terms of equivalent organic matter of C.M.  
   Treatments applied at the time of planting.

3. DESIGN:
   (i) R.B.D. (ii) (a) 10 (b) N.A. (iii) 4 (iv) (a),(b) 14x44' (v) Nil (v) (a), (b) Nil (vi) & (vii) Nil.

5. RESULTS:
   (i) 2494 lb/ac.  
   (ii) 157.7 lb/ac.  
   (iii) Only control vs others is significant.  
   Others are not significant.  
   (iv) Mean grain yield in lb/ac.  
   Control=2316 lb/ac.

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<tr>
<th>Source Levels</th>
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<th>G.L.</th>
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<th>Mean.</th>
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<td>2513</td>
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</table>

S.E. for marginal means = 45.5 lb/ac.
S.E. for the body of the table = 78.8 lb/ac.
S.E. for control vs any mean in body of table = 111.4 lb/ac.

Crop:-Paddy. (1st crop).  
Ref:-K. 53 (28)  
Type:'M'
1. **BASAL CONDITIONS**:

(i) (a) Nil (b) Paddy (c) 4000 lb./ac G.L. + 100 lb./ac A/S (ii) (a) Laterite loam (b) Refer soil analysis Pattambi (iii) 10.6.53/18.7.1953. (iv) (a) 7 ploughings (b) Transplanting in lines (c)–(d) 6"×6", (e) (2) Nil (vi) PTB 2 Medium 135 days (vii) Unirrigated (viii) 2 weedings. (ix) 74.46" in 78 rainy days. (10.6.53 to 30.10.53) (x) 30.10.1953.

2. **TREATMENTS**:

All combinations of (1) and (2).

(1) 4 levels of N: -0; 30; 45 and 60 lb. N/ac as A/S. Super applied before planting and A/S one month after planting.

(2) 4 levels of P₂O₅: -0; 30; 45 and 60 lb. P₂O₅/ac as Super.

3. **DESIGN**:

(i) 4' factorial in R.B.D. (ii) (a) 16 (b) N.A. (iii) 4 (iv) (a), (b) 10'×48'. (v) Nil (vi) Yes.

4. **GENERAL**:

(i) Satisfactory. (ii) Nil (iii) Grain & Straw weight. (iv) (a) No (b) No (c) Nil (v) (a), (b) Nil (vi) & (vii) Nil.

5. **RESULTS**:

(i) 2503 lb./ac (ii) 329.6 lb./ac. (iii) Neither main effects nor interaction is significant.

(iv) Average grain yield in lb./ac.

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</tbody>
</table>

S.E. of marginal means = 81.9 lb./ac.

S.E. of body of table = 16.8 lb./ac.

---

Crop : Paddy (1st crop)

Ref : K. 51 (60)
Type : 'M'

Object :—To find out how far paddy crop will respond to the P manures at laterite soil in presence of iron and alumina.

1. **BASAL CONDITIONS**:

(i) (a) Nil (b) Paddy (c) 5000 lb./ac. of G.L. at the time of puddling+100 to 150 lb./ac. A/S top dressed one month before flowering. (ii) (a) Laterite loam, (b) Refer soil analysis Pattambi, (iii) 13.7.1951. (iv) (a) Puddling 6 times, levelling 3 times. (b) The plots levelled and seedling transplanted from wet nursery. (c)—(d) 6"×4" (e) 2 to 3. (v) Nil. (vi) P.T.B. 9 Medium. 125 days—Improved. (vii) Purely Rainfed. (viii) One weeding one month after planting and another weeding if needed. (ix) 50.25" (13.7.1951 to 13.11.1951) (x) 13.11.1951.

2. **TREATMENTS**:

All Combinations of (1), (2) and (3).

(1) 3 levels of G.L. : -0 (L₀), 5000 (L₁), 7500 (L₂) lb./ac.

(2) 4 levels of P₂O₅ as Super : -0 (P₀), 30 (P₁), 45 (P₂), and 60 (P₃) lb. P₂O₅/ac.

(3) 3 levels of lime : -0 (C₀), 1500 (C₁), 3000 (C₂) lb./ac.

G.L. applied at the time of puddling at basal dressing. Lime applied one month before planting by broadcasting. Super at the time of last puddling by broadcast.

3. **DESIGN**:

(i) 4×3×1 factorial in R.B.D. (ii) (a) 36 (b) N.A. (iii) 2 (iv) (a) N.A. (b) 19×204' (1/112 ac.) Compact block. (v) Nil (vi) Yes.

**GENERAL**:

(i) Satisfactory. (ii) Nil (iii) Grain yield in lb./plot. (iv) (a) 1951—1st crop—Viruppu; 1953—2nd crop—Mundakan. (b) Yes (c) N.A. (v) (d), (b) N.A. (vii) Nil (viii) Nil.
5. RESULTS:

(i) 1053 lb./ac.
(ii) 777.9 lb./ac.
(iii) Main effect of L alone is highly significant. Others are not significant.
(iv) Average grain yield in lb./ac.

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S.E. for the marginal mean of L or C
P = 158.8 lb./ac.
P x C = 183.3 lb./ac.

Crop :- Paddy (2nd crop).
Ref :- K 51 (61)/51 (60).
Type :- 'M'.

Object :- To find-out how far Paddy crop will respond to P manuring in Laterite soils in the presence of iron and alumina.

1. BASAL CONDITIONS:

(i) (a) Nil. (b) Paddy. (c) Same experiment was conducted in these plots during the last season. (ii) (a) Laterite loam (b) Refer soil analysis Pattambi. (iii) 5.10.1951. (iv) (a) Puddling 6 times, levelling 3 times. (b) The plots levelled and seedlings transplanted from wet nursery. Av. age of seedlings is about one month ; (c)---(d) 6"x4" (e) 2 to 3. (v) Nil. One weeding one month after planting and another weeding if needed. (ix) 23.76" (5.10.51 to 3.3.1952) (x) 3.3.1952.

2. TREATMENTS:

All combinations of (1), (2) and (3).
(1) 3 levels of G.L. :- O (L₀), 50 (L₁), 75 (L₂). lb./ac.
(2) 4 levels of P₂O₅ as Super :- O(P₀), 30(P₁), 45(P₂) and 60(P₃) lb. P₂O₅/ac.
(3) 3 levels of lime :- O(C₀), 1500 (C₁), 3000(C₂) lb./ac.

G.L. applied at the time of puddling as basal dressing. Lime applied one month before planting by broadcasting. Super at the time of last puddling by broadcast.
3. DESIGN:
(i) $4 \times 3 \times 3$ factorial in R.B.D. (ii) (a) 36 (b) N.A. (iii) 2 (iv) (a) N.A. (b) $19' \times 20\frac{1}{2}$ (1/112 ac.) compact block. (v) Nil. (vi) Yes.

4. GENERAL:
(i) Satisfactory. (ii) Nil. (iii) Grain yield in lb./plot. (iv) (a) 1951-1st crop-Vinippu.; 1933-2nd crop Mundakan. (b) Yes (c) N.A. (d) N.A. (v) & (vi) Nil.

5. RESULTS:
(i) 1105 lb./ac.
(ii) 14.90 lb./ac.
(iii) All main effects and interactions are highly significant.
(iv) Av. as green yield in lb./ac.

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S.E. for the marginal mean of $L$ or $C$ = 3.04 lb./ac.
S.E. for the marginal mean of $P$ = 3.51 lb./ac.
S.E. for the body of table $P \times L$ or $P \times C$ = 6.08 lb./ac.
S.E. for the body of table $L \times C$ = 5.26 lb./ac.

Crop: Paddy (1st crop)
Site: Agri. Res. Stn. Pattambi
Ref: K. 52 (38)/51 (60,61)
Type: 'M'

Object: To find out how far Paddy crop will respond to P manuring in laterite soils in the presence of iron and alumina.

1. BASAL CONDITIONS:
(i) (a) Nil (b) Paddy (c) Same experiment was on these plots during last season (ii) (a) Laterite loam (b) Refer soil analysis Pattambi. (iii) 25.5.1955; 30.6.52 (iv) (a) 7 Ploughings (b) Transplanting in lines (c)=$6\frac{1}{2}' \times 6\frac{1}{2}'$ 2 (v) Nil (vi) PTB-9 Improved. 133 days duration. (ii) Rainfed (ii) 2 weedings at intervals of one month from planting (ix) 61.67' in 85 rainy days (25.5.1955 to 31.10.1952) (x) 31.10.1952.

2. TREATMENTS:
All combinations of 3 levels of leaf x 4 levels of $P_2O_5$ as super x 3 levels of lime.
Leaf: 0 ($L_0$), 5000 ($L_1$), 7500 ($L_2$) lb./ac.
Super 0 (P₀), 30 (P₁), 45 (P₂), 60 (P₃) lb. P₂O₅/ac.
Lime: 0 (C₀),1500 (C₁), 3000 (C₂) lb/ac.
Leaf applied at the time of puddling.
Lime one month before planting by broadcast.
Super at the time of puddling by broadcast.

1. DESIGN:
(i) 4 x 4 x 3 Factorial in R.B.D (ii) (a) 35, (b) N.A. (iii) 4 (iv) (a), (b) 19° x 20°. (v) Nil (vi) Yes.

4. GENERAL:
(i) Satisfactory (ii) Nil (iii) Grain and straw weight. (iv) (a) 1931-1st crop to 1933-2nd crop (b) Yes. (c) N.A. (v) (a), (b) Nil. (vi) & (vii) Nil.

5. RESULTS:
(i) 17.8 lb/ac.
(ii) 230 lb/ac.
(iii) Leaf Super and Lime are significant at 1% level. Interactions are not significant. Linear component of lime is significant at 1% level.
(vii) Grain weight in lb/ac.

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S.E. of body of table P x L or P x C = 66 lb/ac.
S.E. of body of table L x C = 58 lb/ac.
S.E. of marginal mean of L or C = 34 lb/ac.
S.E. of marginal mean of P = 38 lb/ac.

Crop:- Paddy (2nd crop)
Object:- To find out how far paddy crop with respond to phosphatic manuring in lateritic soils in the presence of iron and aluminum.

1. BASAL CONDITIONS:
(i) (a) Nil (b) Paddy (c) Same experiment was in these fields (ii) (a) Laterite loam (b) Refer soil analysis Pattambi. (iii) 27.9.1932 : 6:12,1932 (iv) (a) 6 puddings 3 levellings (b)-Transplanting (c)-transplanting 11 x 11 in 18 rainy days. (v) Nil. (vi) PTB 21. Improved, 125 days duration. (vii) Rainfed (viii) 2 weedings at intervals of one month from planting. (ix) 16.0" in 18 rainy days. 27.9.1932 to 27.2.1923 (a) 27.2.1923.
2. TREATMENTS:
All combinations of 3 levels of Leaf × 4 levels of Super × 3 levels of lime.
Leaf: O (L₀), 5000 (L₁), 7500 (L₂) lb/ac.
Super: O (P₀), 30 (P₁), 40 (P₂), 60 (P₃) lb/ac. P₂O₅
Lime: O (C₀), 1500 (C₁), 3030 (C₂) lb/ac.
Leaf applied at the time of puddling.
Lime one month before planting by broadcast.
Super at the time of last puddling by broadcasting.

3. DESIGN:
(i) 4 × 3 × 3 fact in R.B.D. (ii) (a) 36 (b) N.A. (iii) 4 (iv) (a,b) 19' × 20' (v) Nil (vi) Yes.

4. GENERAL:
(i) Not good (ii) Nil (iii) Grain and straw height (iv) (a) 1951-1st crop 1953-2nd crop (both crops in a year)
(b) Yes. (c) N.A. (v) (a,b) Nil (vi) & (vii) Nil.

5. RESULTS:
(i) 1348 lb/ac.
(ii) 232 lb/ac.
(iii) N,P and C are highly significant. Interactions are not significant. Response to C is linear.
(iv) Grain weight in lb/ac.

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S.E. of body of table L × P or C × P = 67 lb./ac.
S.E. of body of table L × C = 58 lb./ac.
S.E. of marginal means L or C = 34 lb./ac.
S.E. of marginal means (P) = 39 lb./ac.

Ref: K. 53(35, 52(38, 39).
Type: M’

Object—To find out how far paddy crop will respond to the phosphate manures in laterite soils in the presence of iron and alumina.

1. BASAL CONDITIONS:
(i) (b) Nil. (b) Paddy (c) same experiment was in these fields. (ii) (a) Laterite loam (b) Refer soil analysis Pattambi. (iii) 3.6.1953; 13.7.1953. (iv) (a) 7 ploughings; (b) Transplanting in lines (c) — (d) 6" × 6" (e)
2 (vi) Nil. (vii) PTB. 9 Medium 135 days (vii) Unirrigated. (viii) 2 weedings. (ix) 17.06" in 14 rainy days. (3.6.53 to 10.10.53) (x) 10.10.1953.

2. TREATMENTS:
All combinations of (1) (2) and (3)
(1) Leaf at L\(_0\) = 0 ; L\(_1\) = 5000; L\(_2\) = 7500 lb./ac.
(2) \(P_1\) \(P_2\) as super at \(P_1\) = 0 ; \(P_2\) = 35 & \(P_3\) = 60 lb./ac.
(3) Lime at \(C_0\) = 0; \(C_1\) = 1500 & \(C_2\) = 3000 lb./ac.
Leaf applied at the time of puddling and super at the time of last puddling. Lime one month before planting.

3. DESIGN:
(i) 4 x 3 x 3 factorial in R.B.D. (ii) (a) Nil (b) N.A. (iii) 4 (iv) (a,b) 19' x 20.5' (v) Nil. (vi) Yes.

4. GENERAL:
(i) Satisfactory. (ii) Nil (iii) Straw and grain weight. (iv) (a) 1951 (1st crop) to 1953 (2nd crop) (b) Yes (c) N.A. (v) (a), (b) Nil (vi) & (vii) Nil.

5. RESULTS:
(i) 2764 lb./ac.
(ii) 2795 lb./ac.
(iii) Main effects of L, Paud C and interaction L x C are highly significant.
(iv) Grain weight lb./ac.

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S.E. for the marginal means of L & C = 40.4 lb./ac.
S.E. for the body of the tables L x P or C x P = 46.2 lb./ac.
S.E. for the body of the tables L x C = 69.9 lb./ac.

Crop:- Paddy. (2nd crop)  Ref:- K. 53(31)/53 (35)/52(38,39).
Site:- Agri. Res. Stn. Pattambi. Type:- 'M'.
(2) \( P_2O_5 \) as super at \( P = 0 \); \( P_1 = 30 \); \( P_2 = 45 \) and \( P_3 = 60 \) lb. \( P_2O_5/\text{ac.} \).

(3) Lime at \( C_0 = 0 \); \( C_1 = 1500 \) and \( C_2 = 3000 \) lb./ac.

Leaf at the time of puddling and super at the time of last puddling.

Leaf one month before planting.

3. DESIGN:

(i) \( 4 \times 3 \times 3 \) factorial in RBD. (ii) (a) 36 (b) N.A. (iii) 4 (iv) (a), (b) \( 19" \times 20.5" \) (v) Nil (vi) Yes.

4. GENERAL:

(i) Satisfactory (ii) Nil (iii) Straw and grain weight. (iv) (a) 1951 (1st crop) to 1953 (1st crop) (b) Yes (c) N.A. (v) (a), (b) Nil. (vi) & (vii) Nil.

5. RESULTS:

(i) 1132 lb./ac.

(ii) 159.0 lb./ac.

(iii) Main effect of \( P \) is significant. Main effects of \( L \) and \( C \) are highly significant. Interactions not significant.

(iv) Average grain yield in lb./ac.

<table>
<thead>
<tr>
<th>( L_0 )</th>
<th>( L_1 )</th>
<th>( L_2 )</th>
<th>Mean</th>
<th>( C_0 )</th>
<th>( C_1 )</th>
<th>( C_2 )</th>
</tr>
</thead>
<tbody>
<tr>
<td>( P_0 )</td>
<td>925</td>
<td>1056</td>
<td>1105</td>
<td>1029</td>
<td>946</td>
<td>591</td>
</tr>
<tr>
<td>( P_1 )</td>
<td>1074</td>
<td>1168</td>
<td>1251</td>
<td>1164</td>
<td>1033</td>
<td>1214</td>
</tr>
<tr>
<td>( P_2 )</td>
<td>1074</td>
<td>1212</td>
<td>1233</td>
<td>1173</td>
<td>1087</td>
<td>1248</td>
</tr>
<tr>
<td>( P_3 )</td>
<td>1069</td>
<td>1186</td>
<td>1224</td>
<td>1160</td>
<td>1055</td>
<td>1186</td>
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<tr>
<td>Mean</td>
<td>1036</td>
<td>1156</td>
<td>1203</td>
<td>1132</td>
<td>1030</td>
<td>1160</td>
</tr>
</tbody>
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<table>
<thead>
<tr>
<th>( L_0 )</th>
<th>( L_1 )</th>
<th>( L_2 )</th>
<th>Mean</th>
<th>( C_0 )</th>
<th>( C_1 )</th>
</tr>
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<tr>
<td>( C_0 )</td>
<td>883</td>
<td>1053</td>
<td>1155</td>
<td>1030</td>
<td></td>
</tr>
<tr>
<td>( C_1 )</td>
<td>1076</td>
<td>1165</td>
<td>1239</td>
<td>1150</td>
<td></td>
</tr>
<tr>
<td>( C_2 )</td>
<td>1149</td>
<td>1250</td>
<td>1216</td>
<td>1205</td>
<td></td>
</tr>
<tr>
<td>Mean</td>
<td>1036</td>
<td>1156</td>
<td>1203</td>
<td>1132</td>
<td></td>
</tr>
</tbody>
</table>

S.E. for marginal means of \( L \) or \( C \) = 23 lb./ac.

S.E. of \( P \) = 26.5 lb./ac.

S.E. for the body of the table, \( L \times P \) or \( C \times P \) = 45.9 lb./ac.

S.E. \( L \times C \) = 39.8 lb./ac.

Crop: Paddy (1st crop)


Ref: K. 48(21)

Type: 'M'

Object: To study the smitable time for application of G.N.C. as a source of N

1. BASAL CONDITIONS:

(i) (a) Nil (b) Paddy (c) About 5,000 lb./ac. G.L + 100 to 150 lb/ac. A/S. (ii) (a) Laterite loam (b) Refer soil analysis Pattambi. (iii) 11.5.48 5.7.48 (iv) (a) 6 ploughings, 2 puddlings. (b) planting in lines (c) - (d) 4" to 6" between plants & about 10" in rows (e) 3 to 4 (v) Nil (vi) PTB 2-

Medium, Improved (vii) Rainfed (viii) One or two weedings if required at interval of one month from planting (ix) 77.90" (11.5.1948 to 6.10.1948) (x) 6.10.1948.

2. TREATMENTS:

1. No manure.
2. Cake 20 lb. N/ac. at planting.
3. Cake 20 lb. N/ac. 3 weeks after planting.
4. Cake 40 lb. N/ac. at planting.
5. Cake 40 lb. N/ac. 3 weeks after planting.
6. Cake 20 lb. N/ac. at planting + 20 lb. N/ac. 3 weeks after planting.
3. DESIGN:
   (i) R.B.D. (a) 6 (b) N.A. (iii) 6 (iv) (a), (b) 18' x 24' (v) Nil; about 1½ to 2 feet interspace between plots.
   (v) Yes.

4. GENERAL:
   (i) Satisfactory (ii) Nil (iii) Grain weight. (iv) (a) 1948 - 1st crop to 1948 2nd crop (b) Yes. (c) N.A.
   (b) Nil (v) Nil. (vii) Nil.

5. RESULTS:
   (i) 1908 lb./ac.
   (ii) 138 lb./ac.
   (iii) The treatment differences are significant.
   (iv) Grain weight in lb./ac.

<table>
<thead>
<tr>
<th>Treatment</th>
<th>Mean yield</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>1782</td>
</tr>
<tr>
<td>2.</td>
<td>1895</td>
</tr>
<tr>
<td>3.</td>
<td>1815</td>
</tr>
<tr>
<td>4.</td>
<td>2025</td>
</tr>
<tr>
<td>5.</td>
<td>2005</td>
</tr>
<tr>
<td>6.</td>
<td>1928</td>
</tr>
</tbody>
</table>

S.E. of treatment mean = 56 lb./ac.

Crop: Paddy (2nd crop)
Ref: K 48(28)
Type: 'M'

Object: To study the smitable time for application of G.N.C. as source of N.

7. BASAL CONDITIONS:
   (i) (a) Nil. (b) Paddy (c) Same ext. was in these plots (ii) (a) Laterite loam (b) Refer soil analysis Pattambi.
   (iii) 19.9.48/2.11.48 (iv) (a) 6 ploughings, 2 puddlings. (b) Transplanted in lines (c) - (d) 4' - 6' between plants and about 10' between rows. (e) N.A. (v) Nil (vi) PTB 20, Medium Improved (vii) Rainfed (viii) One or two weedings at intervals of one month, if required. (ix) 14.51" (19.9.48. to 4.2.49) (x) 4.2.49.

2. TREATMENTS:
   1. No manure.
   2. G.N.C. 20 lb. N/ac at planting.
   3. G.N.C. 20 lb. N/ac at three weeks after planting.
   5. G.N.C. 40 lb. N/ac three weeks after planting.

3. DESIGN:
   (i) R.B.D. (ii) (a) 6 (b) N.A. (iii) 6 (iv) (a) (b) 18' x 24' (v) Nil. About 1½ ft. to 2 ft. interspace
   between plots. (vi) Yes.

4. GENERAL:
   (i) Satisfactory (ii) Nil (iii) Grain weight (iv) (a) 1948 - 1st crop to 1948. 2nd crop (b) Yes. (c) N.A.
   (vi) (a) Nil (b) Nil. (vi) Nil. (vii) Nil.

5. RESULTS:
   (i) 1720 lb./ac.
   (ii) 138 lb./ac.
   (iii) Treatment differences are highly significant.
   (iv) Mean grain yield in lb./ac.

<table>
<thead>
<tr>
<th>Treatment</th>
<th>Mean yield</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>1504</td>
</tr>
<tr>
<td>2.</td>
<td>1689</td>
</tr>
<tr>
<td>3.</td>
<td>1636</td>
</tr>
<tr>
<td>4.</td>
<td>1832</td>
</tr>
<tr>
<td>5.</td>
<td>1705</td>
</tr>
<tr>
<td>6.</td>
<td>1782</td>
</tr>
</tbody>
</table>

S.E. of treatment means = 73 lb./ac.
Object: To assess the comparative merits of the Compost made out of leaves of Jack, Cashew, mango and to find out if large quantities of these leaves available in this tract can be usefully utilized for manuring of paddy.

1. BASAL CONDITIONS:
(i) (a) Nil. (b) Paddy (c) 5000 lb. compost or G.L. + 112 lb. Super + 100 lb/ac. A/S. (ii) (a) Red laterite (b) Refer soil analysis Taliparamba. (iii) 14.7.53 ; 17.10.53. (iv) (a) 3 ploughings levelling digging corners (b) Planting in bulk seedlings of age one anothsrown in a nursery. (c) 12" to 18" (e) 2 to 3 (v) 112 lb. Super / ac. as basal dressing during last ploughing. 100 lb/ac. A/S as top dressing one month after planting. (vi) PTB 9. Improved. (vii) Rainfed. (viii) one or two weedings at an interval of one month from planting. (ix) About 100" (2.5.1953 to 17.10.1953) (x) 17.10.1953.

2. TREATMENTS:
1. Jack leaf compost at 5 ton/ac.
2. Mango leaf
3. Cashew leaf
4. Control.

3. DESIGN:
(i) R.B.D. (ii) (a) 4 (b) N.A. (iii) 8 (iv) (a), (b) 12' x 30' (v) No (vi) Yes.

4. GENERAL:
(i) Satisfactory. (ii) Slight attack of Helminthosporium spraying of 1% B.H.C. tried. (iii) Grain weight (iv) (a) No (b) No (c) Nil (v) (a), (b) Nil. (vi) data N.A. All details collected from annual reports. (vii) Nil

5. RESULTS:
(i) 2718 lb./ac.
(ii) 2401
(iii) The treatment differences are highly significant.
(iv) (Grain weight in lb./ac.)

<table>
<thead>
<tr>
<th>Treatment</th>
<th>Mean.</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>2718</td>
</tr>
<tr>
<td>2.</td>
<td>2401</td>
</tr>
<tr>
<td>3.</td>
<td>2233</td>
</tr>
<tr>
<td>4.</td>
<td>1993</td>
</tr>
</tbody>
</table>

S.E. of treatment mean = 75 lb./ac.

Crop : Paddy

Object: To compare Japanese method with the local method of cultivation.

1. BASAL CONDITIONS:
(i) (a) N.A. (b) Paddy (c) Nil. (ii) Sandy loam. (iii) Nil. (iv) Improved Co. 3 (v) (a) 6 to 10 ploughings. (b) Transplanting. (c) N.A. (d) 6 inch x 6 inch in lines. (e) 2 or 3 for farm method. (vi) Planting sets with the receipt of good premonsoon showers. (vii) Rainfed. (viii) Interculture with Japanese Rotary weeder done during the 4th, 6th and 8th week after transplanting for treatment (S). One weeding one month after planting for treatment (1) to (4). (ix) 24.24 inch. (x) January, 54.

2. TREATMENTS:
1. Control.
2. CM 11200 lb./ac. + Super 112 lb./ac. + 80 lb. A/S/ac. applied one month after planting.
3. CM 11200 lb./ac. + 200 lb. Super/ac. + 100 lb. A/S/ac. applied at planting.
4. CM 11200 lb./ac. + 100 lb. Super/ac. + 100 lb. A/S/ac. at planting + 100 lb. super/ac. + 100 lb. A/S/ac. one month after planting.
5. Seedlings raised under the Japanese method+CM. 11200 lb./ac. + 100 lb. Super/ac. + 100 lb. A/S/ac. at planting + 100 lb. Super/ac. + 100 lb. A/S/ac. one month after planting. (Spacing 10 inches x 4 inches 4 seedlings/poles).

For treatments (1) to (4) seedlings raised by the local method. Cattle Manure applied at the time of ploughing as basal dressing.

3. DESIGN:
(i) R.B.D. (ii) 5 replications. (iii) (a) (b) 21 cents. (iv) N.A.
4. GENERAL:
(i) Good. (ii) Nil. (iii) Grain and straw weights. (iv) (a) to (c) Nil. (v) (a) (b) Nil. (vi) and (viii) Nil.

5. RESULTS:
(i) 2446 lb./ac.
(ii) 184.8 lb./ac.
(iii) Treatment differences are significant at 1 per cent level.
(iv) Treatment
<table>
<thead>
<tr>
<th>No.</th>
<th>Treatment</th>
<th>Mean</th>
<th>S.E./mean</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Control</td>
<td>1914</td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>NP'</td>
<td>2228</td>
<td></td>
</tr>
<tr>
<td>3</td>
<td>NP'</td>
<td>2608</td>
<td></td>
</tr>
<tr>
<td>4</td>
<td>NP'</td>
<td>2233</td>
<td></td>
</tr>
<tr>
<td>5</td>
<td>NP'</td>
<td>2942</td>
<td></td>
</tr>
<tr>
<td>6</td>
<td>NP'</td>
<td>2670</td>
<td></td>
</tr>
<tr>
<td>7</td>
<td>G.M.</td>
<td>2433</td>
<td></td>
</tr>
<tr>
<td>8</td>
<td>S.E./mean</td>
<td>127.5</td>
<td></td>
</tr>
</tbody>
</table>

Crop: Paddy (2nd crop)  
Centre: Chalkudy (Kerala)  
Ref.: Simple trials on cultivators’ fields (T.C.M.)  
Year: 1953; Type: ‘M’  
Object: IV (iii) 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) Laterite-loam-pH 5.5 (iii) G.M. applied in most trials (iv) N.A. (v) N.A. (v) September-October (vii) Irrigated (viii) N.A. (ix) 80° (x) January-February.

2. TREATMENTS:
NP' = A/S at 40 lb. N/ac.
NP' = " " " + Nitrophos at 20 lb. P₂O₅/ac.
NP' = " " " + Ammo. Phos 20 "
NP' = " " " + " 40 "
P applied before the last puddling while N at tillering.

DESIGN:
(i) & (ii) Eleven community project centres, representing the entire paddy growing tract of the country, were selected. From each community project centre, one development block was selected. Villages were selected at random from the selected block and a list of cultivators growing paddy for each selected village was prepared. From this list, two cultivators were selected at random and one field each belonging to them was taken for trial. In each selected field an unreplicated trial was laid out (iii) N.A. (iv) Yes

4. GENERAL:
(i) Normal (ii) Nil (iii) Yield data (iv) 1953-56 (b) No (c) N.A. (v) NA (vi) Nil (vii) Nil.

5. RESULTS:
Treatments
<table>
<thead>
<tr>
<th>No.</th>
<th>Treatments</th>
<th>Av. yield in lb./ac.</th>
<th>S.E./mean</th>
<th>No. of expts.</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>Control</td>
<td>1914</td>
<td></td>
<td></td>
</tr>
<tr>
<td>N</td>
<td>2228</td>
<td>2608</td>
<td></td>
<td></td>
</tr>
<tr>
<td>NP'</td>
<td>2233</td>
<td>2942</td>
<td></td>
<td></td>
</tr>
<tr>
<td>NP'</td>
<td>2670</td>
<td>2433</td>
<td></td>
<td></td>
</tr>
<tr>
<td>G.M.</td>
<td>127.5</td>
<td>7</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Crop: Paddy (2nd crop)  
Centre: Chalkudy (Kerala)  
Ref.: Simple trials on cultivators’ fields (T.C.M.)  
Year: 1953; 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) Laterite-loam- pH 5.5. (iii) G.M. applied in most trials (iv) N.A. (v) N.A. (vi) September-October (vii) Irrigated (viii) N.A. (ix) 80°(x) January-February.

2. TREATMENTS:
   0 = Control
   N = A/S at 40 lb N/ac.
   NP₁ = " " " " " + Super at 20 lb P₂O₅/ac.
   NP₂ = " " " " " + " 40 "
   NP₃ = " " " " " + Nitro. phos at 20 lb P₂O₅/ac.
   NP₄ = " " " " " + " 40 "

P applied before the last puddling while N applied at tillering.

3. DESIGN:
   (i) & (ii) Eleven community project centres, representing the entire paddy growing tract of the country, were selected. From each community project centre, one development block was selected. Villages were selected at random from the selected block and a list of cultivators growing paddy for each selected village was prepared. From this list, two cultivators were selected at random and one field each belonging to them was taken for trial. In each selected field an unreplicated trial was laid out (iii) N.A. (iv) Yes

4. GENERAL:
   (i) Normal (ii) Nil (iii) Yield data (iv) (a) 1953-56 (b) No (c) N.A. (v) N.A. (vi) Nil (vii) Nil.

5. RESULTS:

<table>
<thead>
<tr>
<th>Treatments</th>
<th>Av. yield in lb/ac</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>1749</td>
</tr>
<tr>
<td>N</td>
<td>2083</td>
</tr>
<tr>
<td>NP₁</td>
<td>2308</td>
</tr>
<tr>
<td>NP₂</td>
<td>2129</td>
</tr>
<tr>
<td>NP₃</td>
<td>2215</td>
</tr>
<tr>
<td>NP₄</td>
<td>2185</td>
</tr>
<tr>
<td>G.M.</td>
<td>2095</td>
</tr>
<tr>
<td>S.E./mean</td>
<td>79.81</td>
</tr>
<tr>
<td>No. of exps.</td>
<td>8</td>
</tr>
</tbody>
</table>

Crop:- Paddy (2nd)
Ref:- Simple trials on cultivators fields (T.C.M.)
Centre:- Chalkudy (Kerela)
Year: 1953; Type: 'M'
Object:— IV (ii) 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) Laterite-loam-P.H.55. (iii) G.M. applied in most trials (iv) N.A. (v) N.A. (vi) September-October. (vii) Irrigated (viii) N.A. (ix) 90° (x) January-February.

2. TREATMENTS:
   0 = Control
   N = A/S at 40 lb N/ac.
   NP₁ = " " " " " + Super at 20 lb P₂O₅/ac.
   NP₂ = " " " " " + " 40 "
   NP₃ = " " " " " + Nitro. phos at 20 lb P₂O₅/ac.
   NP₄ = " " " " " + " 40 "

P applied before the last puddling while N applied at tillering.

3. DESIGN:
   (i) & (ii) Eleven community project centres, representing the entire paddy growing tract of the country, were selected. From each community project centre, one development block was selected. Villages were selected at random from the selected block and a list of cultivators growing paddy for each selected village was prepared. From this list, two cultivators were selected at random and one field each belonging to them was taken for trial. In each selected field an unreplicated trial was laid out (iii) N.A. (iv) Yes

GENERAL:
   (i) Normal (ii) Nil (iii) Yield data (iv) (a) 1953-56 (b) No (c) N.A. (v) N.A. (vi) Nil (vii) Nil.
4. RESULTS:

<table>
<thead>
<tr>
<th>Treatments</th>
<th>Av. yield in lb./ac.</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>1921</td>
</tr>
<tr>
<td>N</td>
<td>2217</td>
</tr>
<tr>
<td>NP</td>
<td>2566</td>
</tr>
<tr>
<td>NP*</td>
<td>2096</td>
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<td>2626</td>
</tr>
<tr>
<td>NP*</td>
<td>2206</td>
</tr>
<tr>
<td>G.M.</td>
<td>2272</td>
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<tr>
<td>S.E./mean</td>
<td>116.8</td>
</tr>
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<td>No. of expts.</td>
<td>8</td>
</tr>
</tbody>
</table>

Crop: Paddy (2nd crop)  Ref: Simple trials on cultivator's fields (T.C.M.)
Centre: Chalkudy (Kerala)  Year: 1953; Type: M

Object: To study the effect of A/S with different sources of P.

1. BASAL CONDITIONS:

2. DESIGN:
   (i) & (ii) Eleven community project centres, representing the entire paddy growing tract of the country were selected. From each community project centre, one development block was selected. Villages were selected from the randomly selected block and a list of cultivators growing paddy for each selected village was prepared. From this list, two cultivators were selected at random and one field each belonging to them was taken for trial. In each selected field an unreplicated trial was laid out (iii) N.A. (iv) Yes.

3. GENERAL:
   (i) Normal (ii) Nil (iii) Seed data, (iv) 1953-56 (b) No. (c) N.A. (v) N.A. (vi) and (vii) Nil.

4. RESULTS:

<table>
<thead>
<tr>
<th>Treatments</th>
<th>Av. yield in lb./ac.</th>
</tr>
</thead>
<tbody>
<tr>
<td>O</td>
<td>1680</td>
</tr>
<tr>
<td>N</td>
<td>2125</td>
</tr>
<tr>
<td>NP</td>
<td>2303</td>
</tr>
<tr>
<td>NP*</td>
<td>2344</td>
</tr>
<tr>
<td>NP**</td>
<td>2325</td>
</tr>
<tr>
<td>G.M.</td>
<td>2156</td>
</tr>
<tr>
<td>S.E./mean</td>
<td>113.5</td>
</tr>
<tr>
<td>No. of expts.</td>
<td>8</td>
</tr>
</tbody>
</table>

Crop: Paddy (2nd crop)  Ref: Simple trials on cultivator's fields (T.C.M.)
Centre: Chalkudy (Kerala)  Year: 1953; Type: M

Object: To study the effect of different levels and types of N, and P.

1. BASAL CONDITIONS:
2. TREATMENTS:

O = Control
P = 20 lb P₀₂/ac. as Super
N₁P = A/S at 20 lb N/ac. + 20 lb P₀₂/ac. as Super
N₁₁P = Urea at 20 lb N/ac. + ....
N₁₁₁P = .... 40 lb N/ac. + ....
P and K applied before the last puddling while N applied at sowing.

3. DESIGN:

(i) & (ii) Eleven community project centres, representing the entire paddy growing tract of the country, were selected. From each community project centre, one development block was selected. Villages were selected at random from the selected block and a list of cultivators growing paddy for each selected village was prepared. From this list, two cultivators were selected at random and one field each belonging to them was taken for trial. In each selected field an unreplicated trial was laid out.(iii) N.A.
(iv) Yes.

4. GENERAL:

(i) Normal (ii) Nil (iii) Yield data (iv, a) 1953-56 (b) No. (e) N.A. (v) N.A. (vi) Nil (vii) Nil.

5. RESULTS

<table>
<thead>
<tr>
<th>Treatments</th>
<th>Av. yield in lb/ac.</th>
</tr>
</thead>
<tbody>
<tr>
<td>O</td>
<td>1650</td>
</tr>
<tr>
<td>P</td>
<td>2004</td>
</tr>
<tr>
<td>N₁P</td>
<td>2096</td>
</tr>
<tr>
<td>N₁₁P</td>
<td>2550</td>
</tr>
<tr>
<td>G.M.</td>
<td>2075</td>
</tr>
<tr>
<td>S.E/mean</td>
<td>137.4</td>
</tr>
<tr>
<td>No. of expts.</td>
<td>9</td>
</tr>
</tbody>
</table>

Crop: Paddy (2nd crop)  
Centre: Chalkudy (Kerala)  
Ref: Simple trials on cultivators fields (T.C,M.)  
Year 1953  
Type: M

Object: (i) (b) (ii) To study the effect of different levels and types of N, and P

BASAL CONDITIONS:

(i) (a) N.A. (b) N.A. (c) N.A. (ii) Laterite—loam—pH 5.5 (iii) G.M. applied in most trials (iv) N.A. (v) N.A. (vi) Sept.-Oct. (vii) Irrigated (viii) N.A. (ix) 60° (x) January-February

2. TREATMENTS:

O = Control
P = 20 lb P₀₂/ac. Super
N₁P = A/S at 20 lb N/ac. + 20 lb P₀₂/ac. as Super
N₁₁P = A/S at 40 lb N/ac. + ....
P and K applied before the last puddling while N applied at sowing.

3. DESIGN:

(i) & (ii) Eleven community project centres, representing the entire paddy growing tract of the country; were selected. From each community project centre, one development block was selected. Villages were selected at random from the selected block and a list of cultivators growing paddy for each selected village was prepared. From this list, two cultivators were selected at random and one field each belonging to them was taken for trial. In each selected field an unreplicated trial was laid out (iii) N.A.
(iv) Yes.

4. GENERAL:

(i) Normal (ii) Nil (iii) Yield data (iv, a) 1953-56 (b) No. (c) N.A. (v) N.A. (vi) Nil (vii) Nil.

5. RESULTS:

<table>
<thead>
<tr>
<th>Treatments</th>
<th>Av. yield in lb/ac.</th>
</tr>
</thead>
<tbody>
<tr>
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<td>1650</td>
</tr>
<tr>
<td>P</td>
<td>2004</td>
</tr>
<tr>
<td>N₁P</td>
<td>2096</td>
</tr>
<tr>
<td>N₁₁P</td>
<td>2550</td>
</tr>
<tr>
<td>G.M.</td>
<td>2075</td>
</tr>
<tr>
<td>S.E/mean</td>
<td>137.4</td>
</tr>
<tr>
<td>No. of expts.</td>
<td>9</td>
</tr>
</tbody>
</table>
Crop: Paddy (2nd crop)  Ref: Simple trials on cultivators' fields (T.C.M.)
Centre: Chalkudy (Kerala) Year: 1953; Type: M
Object: To study the effect of manures (N,P,K.)

1. BASAL CONDITIONS:
(i) (a) N.A. (b) N.A. (c) N.A. (ii) Laterite—loam—P.H.: 5.5. (iii) G.M. applied in most trials (iv) N.A.

2. TREATMENTS:
O = Control
N = A/S at 27 lb N/ac.
NP = A/S at 20 lb N/ac. + Super at 20 lb P₂O₅/ac.
N⁺P = Urea... + ... ...
P and K fertilizers applied before the last puddling while N fertilizer applied at tillering.

DESIGN:
(i) & (ii) Eleven community project centres, representing the entire paddy growing tract of the country, were selected. From each community project centre, one development block was selected. Villages were selected at random from the selected block and a list of cultivators growing paddy for each selected village was prepared. From this list, two cultivators were selected at random and one field each belonging to them was taken for trial. In each selected field an unreplicated trial was laid out (iii) N.A. (iv) Yes.

4. GENERAL:
(i) Normal (ii) Nil (iii) Yield data (iv) (a) 1953-56 (b) No (c) N.A. (v) N.A. (vi) Nil (vii) Nil.

5. RESULTS:

<table>
<thead>
<tr>
<th>Treatments</th>
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</thead>
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<tr>
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<tr>
<td>N</td>
<td>1651</td>
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<td>1841</td>
</tr>
<tr>
<td>N⁺P</td>
<td>1911</td>
</tr>
<tr>
<td>G.M.</td>
<td>1719</td>
</tr>
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<td>S.E./mean</td>
<td>73.23</td>
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<td>8</td>
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</table>

Crop: Paddy (2nd crop)  Ref: Simple trials on cultivators' fields (T.C.M.)
Centre: Chalkudy (Kerala) Year: 1953; Type: M
Object: (b) (ii) To study the effect of different levels and types of N, and P

1. BASAL CONDITION:
(i) (a) N.A. (c) N.A. (ii) Laterite—loam—pH: 5.5. (iii) G.M. applied in most trials (iv) N.A. (v) N.A.
(vi) Sept.-Oct. (viii) Irrigated (viii) N.A. (ix) 90° (x) January-February

2. TREATMENT:
O = Control
P = 20 lb P₂O₅/ac. as Super
N₂P = A/S at 20 lb N/ac. + 20 lb P₂O₅/ac. as Super
N⁺P = A/S at 40 lb N/ac. + ...
N⁺⁺P = Urea at 20 lb N/ac. + ...
N⁺⁺⁺P = 40 ...
P and K fertilizers applied before the last puddling while N fertilizer applied at tillering.

3. DESIGN:
(i) & (ii) Eleven community project centres, representing the entire paddy growing tract of the country, were selected. From each community project centre, one development block was selected. Villages were selected at random from the selected block and a list of cultivators growing paddy for each selected village was prepared. From this list, two cultivators were selected at random and one field each belonging to them was taken for trial. In each selected field an unreplicated trial was laid out (iii) N.A. (iv) Yes.

4. GENERAL:
(i) Normal (ii) Nil (iii) Yield data (iv) (a) 1953-56 (b) No (c) N.A. (v) N.A. (vi) Nil (vii) Nil.
5. RESULTS:

<table>
<thead>
<tr>
<th>Treatments</th>
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</thead>
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<tr>
<td>O</td>
<td>1753</td>
</tr>
<tr>
<td>P</td>
<td>2214</td>
</tr>
<tr>
<td>N&lt;sub&gt;1&lt;/sub&gt;P</td>
<td>2385</td>
</tr>
<tr>
<td>N&lt;sub&gt;2&lt;/sub&gt;P</td>
<td>2435</td>
</tr>
<tr>
<td>N&lt;sub&gt;1&lt;/sub&gt;*P</td>
<td>2548</td>
</tr>
<tr>
<td>N&lt;sub&gt;2&lt;/sub&gt;*P</td>
<td>2311</td>
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<tr>
<td>G.M.</td>
<td>2274</td>
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<tr>
<td>S.E./mean</td>
<td>107.8</td>
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<td>No. of expts.</td>
<td>8</td>
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</tbody>
</table>

Crop : Paddy (3rd crop)
Centre : Chalkudy (Kerala)

Ref : Simple trials on cultivators fields (T.C.M.)
Year 1953; Type : M

Object : (b) (i) To study the effect of different levels and types of N and P.

1. BASAL CONDITIONS:

(i) (a) N.A. (b) N.A. (c) N.A. (ii) Laterite loam PH 5.5 (iii) G.M. applied in most trials (iv) N.A. (v) N.A. (vi) Dec.-January (vii) Irrigated (viii) N.A. (ix) 90° (x) March-April.

2. TREATMENTS:

O = Control.
P = Super at 30 lb P<sub>2</sub>O<sub>5</sub>/ac.
N<sub>1</sub>P = A/S at 20 lb N/ac. + 20 lb P<sub>2</sub>O<sub>5</sub>/ac. as super.
N<sub>2</sub>P = A/N at 20 lb N/ac. + 20 lb P<sub>2</sub>O<sub>5</sub>/ac. as super.
N<sub>1</sub>*P = A/N at 20 lb N/ac. + 20 lb P<sub>2</sub>O<sub>5</sub>/ac. as super.
P and K applied before the last puddling while N applied at tillering.

3. DESIGN:

(i) & (ii) Eleven community project centres, representing the entire paddy growing tract of the country, were selected. From each community project centre, one development block was selected. Villages were selected at random from the selected block and a list of cultivators growing paddy for each selected village was prepared. From this list, two cultivators were selected at random and one field each belonging to them was taken for trial. In each selected field an unreplicated trial was laid out (iii) N.A. (iv) Yes.

4. GENERAL:

(i) Normal (ii) Nil (iii) Yield data (iv) (a) 1953-56 (b) No (c) N.A. (v) N.A. (i) Nil (vii) Nil.

5. RESULTS:

<table>
<thead>
<tr>
<th>Treatments</th>
<th>Av. yield in lb/ac.</th>
</tr>
</thead>
<tbody>
<tr>
<td>O</td>
<td>1284</td>
</tr>
<tr>
<td>P</td>
<td>1290</td>
</tr>
<tr>
<td>N&lt;sub&gt;1&lt;/sub&gt;P</td>
<td>1729</td>
</tr>
<tr>
<td>N&lt;sub&gt;2&lt;/sub&gt;P</td>
<td>1980</td>
</tr>
<tr>
<td>N&lt;sub&gt;1&lt;/sub&gt;*P</td>
<td>1520</td>
</tr>
<tr>
<td>N&lt;sub&gt;2&lt;/sub&gt;*P</td>
<td>1557</td>
</tr>
<tr>
<td>G.M.</td>
<td>1560</td>
</tr>
<tr>
<td>S.E./mean</td>
<td>104.5</td>
</tr>
<tr>
<td>No. of expts.</td>
<td>5</td>
</tr>
</tbody>
</table>

Crop : Paddy (3rd crop)
Centre : Chalkudy (Kerala)

Ref : Simple trials on cultivators fields (T.C.M.)
Year, 1953. Type : M

Object : (b) (iii) To study the effect of different levels and types of N and P.

1. BASAL CONDITIONS:

(i) (a) N.A. (b) N.A. (c) N.A. (ii) Laterite loam PH 5.5 (iii) G.M. applied in most trials (iv) N.A. (v) N.A. (vi) Dec.-January (vii) Irrigated (viii) N.A. (ix) 90° (x) March-April.
2. TREATMENTS:

\[ O = \text{Control.} \]
\[ P = 20 \, \text{lb. } P_2O_5/\text{ac. as super.} \]
\[ N_1P = A/S \text{ at } 20 \, \text{lb } N/\text{ac} + 20 \, \text{lb. } P_2O_5/\text{ac. as super.} \]
\[ N_2P = A/S \text{ at } 40 \, \text{lb. } \]
\[ N_1^*P = \text{Urea at } 20 \, \text{lb. } \]
\[ N_2^*P = \text{at } 40 \, \text{lb. } \]

P and K applied before the last puddling while N applied at tillering.

3. DESIGN:

(i) & (ii) Eleven community project centres, representing the entire paddy growing tract of the country, were selected. From each community project centre, one development block was selected. Villages were selected at random from the selected block and a list of cultivators growing paddy for each selected village was prepared. From this list, two cultivators were selected at random and one field each belonging to them was taken for trial. In each selected field an unreplicated trial was laid out (iii) N.A. (iv) Yes.

4. GENERAL:

(i) Normal (ii) Nil (iii) Yield data (iv) (a) 1953-1956 (b) No (c) N.A. (v) N.A. (vi) Nil (vii) Nil.

5. RESULTS:

<table>
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<tr>
<th>Treatments</th>
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</tr>
</thead>
<tbody>
<tr>
<td>O</td>
<td>1082</td>
</tr>
<tr>
<td>P</td>
<td>1139</td>
</tr>
<tr>
<td>N_1P</td>
<td>1394</td>
</tr>
<tr>
<td>N_2P</td>
<td>1630</td>
</tr>
<tr>
<td>N_1^*P</td>
<td>1520</td>
</tr>
<tr>
<td>N_2^*P</td>
<td>1292</td>
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<tr>
<td>G.M.</td>
<td>1343</td>
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<td>S.E./mean</td>
<td>111.1</td>
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</table>

Crop :- Paddy (3rd crop)  
Centre :- Chalkudy (Kerala)  
Ref :- Simple trials on cultivators fields (T.C.M.)  
Year, 1953; Type :- 'M'

Object :- (i) (b) (iii) To study the effect of different levels and types of N and P.

1. BASAL CONDITIONS:

(i) (a) N.A. (b) N.A. (c) N.A. (ii) Laterite loam PH 5.5 (iii) G.M. applied in most trials (iv) N.A. (v) N.A. (vi) Dec.-January (vii) Irrigated (viii) N.A. (ix) 90° (x) March-April.

2. TREATMENT:

\[ O = \text{Control.} \]
\[ P = 20 \, \text{lb. } P_2O_5/\text{ac. as super.} \]
\[ N_1P = A/N \text{ at } 20 \, \text{lb. } N/\text{ac} + 20 \, \text{lb. } P_2O_5/\text{ac. as super.} \]
\[ N_2P = \text{at } 40 \, \text{lb. } \]
\[ N_1^*P = \text{Urea at } 20 \, \text{lb. } \]
\[ N_2^*P = \text{at } 40 \, \text{lb. } \]

P and K applied before the last puddling while N applied at tillering.

3. DESIGN:

(i) & (ii) Eleven community project centres, representing the entire paddy growing tract of the country, were selected. From each community project centre one development block was selected. Villages were selected at random from the selected block and a list of cultivators growing paddy for each selected village was prepared. From this list, two cultivators were selected at random and one field each belonging to them was taken for trial. In each selected field an unreplicated trial was laid out (iii) N.A. (iv) Yes.

4. GENERAL:

(i) Normal (ii) Nil (iii) Yield data (iv) (a) 1953-56 (b) No (c) N.A. (v) N.A. (vi) Nil (vii) Nil.
5. RESULTS:

<table>
<thead>
<tr>
<th>Treatments</th>
<th>Av. yield in lb./ac.</th>
</tr>
</thead>
<tbody>
<tr>
<td>O</td>
<td>922</td>
</tr>
<tr>
<td>P₁</td>
<td>903</td>
</tr>
<tr>
<td>N₁P</td>
<td>1213</td>
</tr>
<tr>
<td>N₂P</td>
<td>1155</td>
</tr>
<tr>
<td>N₁₁P</td>
<td>1053</td>
</tr>
<tr>
<td>N₂₁P</td>
<td>1249</td>
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<tr>
<td>G.M.</td>
<td>1083</td>
</tr>
<tr>
<td>S. E./mean</td>
<td>75.70</td>
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</table>

No. of expts. = 5

Crop : Paddy (3rd crop)  
Centre : Chalkudy (Kerala)  
Ref : Simple trials on cultivator's fields (T.C.M.)  
Year 1953; Type = 'M'

Object : III To study the effects of manures (N. P. K.)

1. BASAL CONDITIONS:
   (i) (a) N.A. (b) N.A. (c) N.A.  
   (ii) Laterite loam P.H. 5.5  
   (iii) G.M. applied in most trials  
   (iv) N.A.  
   (v) N.A.  
   (vi) Dec.-January.  
   (vii) Irrigated  
   (viii) N.A. (ix) 90° (x) March-April.

2. TREATMENTS:
   O = Control.  
   N₁ = A/S at 20 lb. N/acre.  
   N₁P₁ = A/S at 20 lb. N/acre + Super at 20 lb. P₂O₅/ac.  
   N₁₁P₁₁ = Urea  
   P and K applied before the last puddling while N applied at tillering.

3. DESIGN:
   (i) & (ii) Eleven community project centres, representing the entire paddy growing tract of the country, were selected. From each community project centre, one development block was selected. Villages were selected at random from the selected block and a list of cultivators growing paddy for each selected village was prepared. From this list, two cultivators were selected at random and one field each belonging to them was taken for trial. In each selected field an unreplicated trial was laid out. (iii) N.A.  
   (iv) Yes.

4. GENERAL:
   (i) Normal  
   (ii) Nil  
   (iii) Yield data  
   (iv) (a) 1953-55  
   (b) No  
   (c) N.A.  
   (vi) Nil  
   (vii) Nil.

5. RESULTS:

<table>
<thead>
<tr>
<th>Treatments</th>
<th>Av. yield in lb./acre</th>
</tr>
</thead>
<tbody>
<tr>
<td>O</td>
<td>1170</td>
</tr>
<tr>
<td>N</td>
<td>1405</td>
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<tr>
<td>N₁P</td>
<td>1570</td>
</tr>
<tr>
<td>N₁₁P</td>
<td>1350</td>
</tr>
<tr>
<td>N₂₁P</td>
<td>1487</td>
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<tr>
<td>G.M.</td>
<td>1396</td>
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<tr>
<td>S. E./mean</td>
<td>78.99</td>
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</table>

No. of Expts. = 5

Crop : Paddy (3rd crop)  
Centre : Chalkudy (Kerala)  
Ref : Simple trials on cultivator's fields (T.C.M.)  
Year 1953; Type = 'M'

Object : III To study effect of A/S with different sources of P

1. BASAL CONDITIONS:
   (i) (a) N.A. (b) N.A. (c) N.A.  
   (ii) Laterite loam P.H. 5.5  
   (iii) G.M. applied in most trials  
   (iv) N.A.  
   (v) N.A.  
   (vi) Dec.-January.  
   (vii) Irrigated  
   (viii) N.A. (ix) 90° (x) March-April.

2. TREATMENTS:
   O = Control  
   N₁ = A/S at 20 lb. N/acre.
3. DESIGN:
(i) & (ii) Eleven community project centres, representing the entire paddy growing tract of the country, were selected. From each community project centre one development block was selected. Villages were selected at random from the selected block and a list of cultivators growing paddy for each selected village was prepared. From this list, two cultivators were selected at random and one field each belonging to them was taken for trial. In each selected field an unreplicated trial was laid out (iii) N.A. (iv) Yes.

4. GENERAL:
(i) Normal (ii) Nil (iii) Yield data (iv) (a) 1953-56 (b) No. (c) N.A. (v) N.A. (vi) Nil (vii) Nil.

5. RESULTS

<table>
<thead>
<tr>
<th>Treatments</th>
<th>Av. yield in lb./ac.</th>
</tr>
</thead>
<tbody>
<tr>
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<td>1065</td>
</tr>
<tr>
<td>N</td>
<td>1401</td>
</tr>
<tr>
<td>NP</td>
<td>1476</td>
</tr>
<tr>
<td>NP'</td>
<td>1490</td>
</tr>
<tr>
<td>NP''</td>
<td>1602</td>
</tr>
<tr>
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<td>1389</td>
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<td>S.E./mean</td>
<td>93.30</td>
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<td>No. of expts.</td>
<td>5</td>
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</tbody>
</table>

Crop : Paddy (3rd) crop  
Centre : Chalkudy (Kerala)  
Year : 1953; Type 'M'  
Ref : Simple trials on cultivators fields (T.C.M.)

Object : (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) Laterite loam P.H. 5.5 (iii) G.M. applied in most trials (iv) N.A. (v) N.A. (vi) Dec.-January (vii) Irrigated (viii) N.A. (ix) 90° (x) March-April.

2. TREATMENTS:
O=Control  
N=A/S at 40 lb. N/ac.  
NP = ... +Super at 20 lb. P₂O₅/ac.  
NP' = ... + 40  
NP'' = ... + Nitro. Phos at 20 lb. P₂O₅/ac.  
P and K applied before the last puddling while N applied at tillering.

3. DESIGN:
(i) & (ii) Eleven community project centres, representing the entire paddy growing tract of the country, were selected. From each community project centre, one development block was selected. Villages were selected at random from the selected block and a list of cultivators growing paddy for each selected village was prepared. From this list, two cultivators were selected at random and one field each belonging to them was taken for trial. In each selected field an unreplicated trial was laid out (iii) N.A. (iv) Yes.

4. GENERAL:
(i) Normal (ii) Nil (iii) Yield data (iv) (a) 1953-56 (b) No. (c) N.A. (v) N.A. (vi) Nil (vii) Nil.

5. RESULTS

<table>
<thead>
<tr>
<th>Treatments</th>
<th>Av. yield in lb./ac.</th>
</tr>
</thead>
<tbody>
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</tr>
<tr>
<td>N</td>
<td>1454</td>
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<tr>
<td>NP₁</td>
<td>1316</td>
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<tr>
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<td>1566</td>
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<td>1334</td>
</tr>
<tr>
<td>NP₄</td>
<td>1550</td>
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<tr>
<td>G.M.</td>
<td>1384</td>
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<tr>
<td>S.E./mean</td>
<td>80.63</td>
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<td>No. of expts.</td>
<td>5</td>
</tr>
</tbody>
</table>
Crop: Paddy (3rd crop)  
Centre: Chalkudy (Kerala)  
Year: 1953 'Type 'M''

Object: —IV (ii) To study the effect of types and levels of P and N.

1. BASAL CONDITIONS:
   (i) N.A. (b) N.A. (c) N.A. (ii) Laterite loam; PH 5.5 (iii) G.M. applied in most trials (iv) N.A. (v) N.A. (vi) Dec-January (vii) Irrigated (viii) N.A. (ix) 9J' (x) March-April.

2. TREATMENTS:
   O = Control
   N1 = A/S at 40 lb. N/ac.
   N2 = + Nitrophos at 20 lb. P2O5/ac.
   P and K applied before the last puddling while N applied at tillering.

3. DESIGN:
   (i) & (ii) Eleven community project centres, representing the entire paddy growing tract of the country, were selected. From each community project centre, one development block was selected. Villages were selected at random from the selected block and a list of cultivators growing paddy for each selected village was prepared. From this list, two cultivators were selected at random and one field each belonging to them was taken for trial. In each selected field an unreplicated trial was laid out (iii) N.A. (iv) Yes.

4. GENERAL:
   (i) Normal (ii) Nil (iii) Yield data (iv) (a) 1953-56 (b) No. (c) N.A. (v) N.A (vi) Nil (vii) Nil.

5. RESULTS:
   
<table>
<thead>
<tr>
<th>Treatments</th>
<th>Av. yield in lb.</th>
<th>Exp</th>
<th>S.E./mean</th>
<th>No. of Expts.</th>
</tr>
</thead>
<tbody>
<tr>
<td>O = Control</td>
<td>1130</td>
<td></td>
<td></td>
<td>5</td>
</tr>
<tr>
<td>N1 = A/S</td>
<td>1265</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>N2 =</td>
<td>1545</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>N3 =</td>
<td>1320</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>N4 =</td>
<td>1720</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>N5 =</td>
<td>1799</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>G.M.</td>
<td>1463</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>S.E./mean</td>
<td>114.4</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Crop: Paddy (3rd crop)  
Centre: Chalkudy (Kerala)  
Year: 1953 'Type 'M''

Object: —IV (iii) To study the effect of types and levels of P and N.

1. BASAL CONDITIONS:
   (i) N.A. (b) N.A. (c) N.A. (ii) Laterite loam; PH 5.5 (iii) G.M. applied in most trials (iv) N.A. (v) N.A. (vi) December-January (vii) Irrigated (viii) N.A. (ix) 9J' (x) March-April.

2. TREATMENTS:
   O = Control
   N1 = A/S at 40 lb. N/ac.
   N2 = + Nitrophos at 20 lb. P2O5/ac.
   P and K applied before the last puddling while N applied at tillering.

3. DESIGN:
   (i) & (ii) Eleven community project centres, representing the entire paddy growing tract of the country, were selected. From each community project centre, one development block was selected. Villages were selected at random from the selected block and a list of cultivators growing paddy for each selected village was prepared. From this list, two cultivators were selected at random and one field each belonging to them was taken for trial. In each selected field an unreplicated trial was laid out (iii) N.A. (iv) Yes.
4. GENERAL:
(i) Nil
(ii) Nil
(iii) Yield data
(iv) 1953-55
(b) No
(c) N.A.
(v) N.A.
(vi) Nil
(vii) Nil

5. RESULTS:

<table>
<thead>
<tr>
<th>Treatments</th>
<th>Av. yield in lb./ac.</th>
</tr>
</thead>
<tbody>
<tr>
<td>O</td>
<td>1410</td>
</tr>
<tr>
<td>N</td>
<td>1699</td>
</tr>
<tr>
<td>NP₁</td>
<td>1790</td>
</tr>
<tr>
<td>NP₂</td>
<td>1739</td>
</tr>
<tr>
<td>NP₃</td>
<td>1730</td>
</tr>
<tr>
<td>NP₄</td>
<td>1634</td>
</tr>
<tr>
<td>G.M.</td>
<td>1670</td>
</tr>
<tr>
<td>S.E./mean</td>
<td>117.7</td>
</tr>
<tr>
<td>No. of exps.</td>
<td>5</td>
</tr>
</tbody>
</table>

Crop: Paddy (1st crop)
Site: Agri. Res. Stn. Pattambi
Ref: 51 (33)
Type: MV

Object: To evaluate how far morphological differences like differences in the intensity of green colour are associated with qualitative factors affecting yield with two light green cultures in the variety Chornali under manured and manured conditions.

1. BASAL CONDITIONS:
(i) (a) Nil (b) Paddy (c) About 200 to 400 lb./ac. green leaf + 50 to 75 lb./ac. A/S
(ii) (a) Laterite loam
(b) Refer soil analysis
Pattambi
(iii) 25.5.51 - 30.7.1951.
(iv) (a) Puddling 6 times levelling 3 times
(b) Seedlings transplanted from wet nursery
(c) One week after planting
(d) 6" x 6" one (v) NIL (vi) As under treatments
(vii) Rainfed
(viii) One

2. TREATMENTS:
2 Main plot treatments:
(1) No manure
(2) G.L. 2000 lb./ac. + 400 lb./ac. G.N.C.
4 Sub-plot treatments:
(1) Variety 8792 dark green cultures
(2) 8789
(3) 8769 Light green cultures
Leaf applied at time of puddling and G.N.C. one week after planting as top dressing

3. DESIGN:
(i) Split plot
(ii) (a) 2 main plots and 4 subplots main plot.
(b) N.A.
(iii) 4
(iv) (a) 5' x 30' (sub)
20' x 30' (main)
(v) NIL (vi) Yes.

4. GENERAL:
(i) Satisfactory.
(ii) NIL
(iii) Grain, Straw weight; productive tillers weight of 10 ear heads.
(iv) (a) 1951
(b) Nil (c) Nil (v) (a) (b) Nil (vi) & (vii) Nil

5. RESULTS:
(i) 2518 lb./ac.
(ii) (a) 202
(b) 1-6
(iii) No manure vs manure is significant.
Varieties are highly not significant. Interaction significant.
(iv) (Grain weight in lbs/ac.)

<table>
<thead>
<tr>
<th>Cultures</th>
<th>8792</th>
<th>8789</th>
<th>8769</th>
<th>8773</th>
<th>Mean</th>
</tr>
</thead>
<tbody>
<tr>
<td>No Manure</td>
<td>2382</td>
<td>2350</td>
<td>2505</td>
<td>2323</td>
<td>2390</td>
</tr>
<tr>
<td>Manure</td>
<td>2809</td>
<td>2586</td>
<td>2804</td>
<td>2387</td>
<td>2646</td>
</tr>
<tr>
<td>Mean</td>
<td>2595</td>
<td>2468</td>
<td>2654</td>
<td>2355</td>
<td>2518</td>
</tr>
</tbody>
</table>

S.E. of difference of two marginal means (main plot) = 72 lb./ac.
S.E. of diff. of two mainplot means for the same sub plot = 83
S.E. of diff. of two sub plot means for the same main plot = 97
Crop : Paddy (2nd Crop)  
Site : Paddy Breeding Station, Kayamkulam  
Ref : K. 53 (22)  
Type : ‘C’

Object : To find-out the best spacing and optimum number of seedlings per hole.

1. BASAL CONDITIONS :
   (i) (a) Nil (b) Paddy (c) B M. 1½ cwts/ac. + Mill Ash 750 lb./ac. (ii) (a) Sandy loam (b) Refer soil analysis  
   (iii) 27.6.1953, 20.8.1953. (iv) (a) 4 ploughings with country plough and one with iron plough (b) Raising  
   seedlings in a nursery; planting in lines (c) (d) & (e) as under treatments (v) 24 cwts (approximately) of Cow dung/sac. + 1½ cwts of B.M./ac. + 3/4 cwt G.N.C./ac. Manures spread and ploughed in before planting. Cow dung at the time of ploughing as basal dressing. B. M. and G.N.C. just before transplanting as basal dressing. (vi) U.R. 19. Late, Improved (vii) Not irrigated. (viii) Two weedings 30 days and 60 days  
   after planting. (ix) About 50” (21.6.53 to 11.1.54) (x) 11.1.1954.

2. TREATMENTS :
   Main plot treatments :—
   3 spacing : 6", 9" & 12” way.
   Sub plot treatments :—
   No. of seedlings hole :—1, 2 & 4

3. DESIGN :
   (i) Split plot (ii) (a) 3 main plots block and 3 sub-plots main plot (b) 9’x54’ (iii) 4 (iv) (a) (b) 9’x6’  
   (sub-plot) 18’x 9’ (main-plot) (v) Nil (vi) Yes.

4. GENERAL :
   (i) Good, No lodging. (ii) Nil (iii) Grain and Straw weight. (iv) (a) No. (b) No (c) N.A. (v) (a,b) Nil  
   (vi) & (vii) Nil.

5. RESULTS :
   (i) 3752 lb./ac.  
   (ii) (a) 752.0 lb./ac. (b) 528.0 lb./ac.  
   (iii) None of the treatment effects is significant.  
   (iv) Average grain yield in lb./ac.

<table>
<thead>
<tr>
<th>Spacing</th>
<th>6”</th>
<th>9”</th>
<th>12”</th>
<th>Mean</th>
</tr>
</thead>
<tbody>
<tr>
<td>Seedlings/hole</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1.</td>
<td>4172</td>
<td>3101</td>
<td>3706</td>
<td>3659</td>
</tr>
<tr>
<td>2.</td>
<td>4021</td>
<td>3970</td>
<td>3416</td>
<td>3893</td>
</tr>
<tr>
<td>4122</td>
<td>3357</td>
<td>3403</td>
<td>3794</td>
<td></td>
</tr>
<tr>
<td>Mean</td>
<td>4105</td>
<td>3643</td>
<td>3598</td>
<td>3752</td>
</tr>
</tbody>
</table>

1. S.E. of diff. between two spacing means = 307.0 lb./ac.
2. S.E. of diff. between two seedling means = 215.0 lb./ac.
3. ————do———spacing means = 433.0 lb./ac.
4. ————do———seedling means = 373.0 lb./ac.

Crop : Paddy (2nd Crop)  
Site : Paddy Breeding Station, Monkumpu  
Ref :K. 53(3)  
Type : ‘C’

Object : To compare transplanting with local methods of sowing.

1. BASAL CONDITIONS :
   (i) (a) Nil (b) Paddy (c) Nil (ii) (a) Purely clayey in nature (b) Refer soil analysis (iii) 18.11.1953;  
   28.11.1953. (iv) (a) The field is ploughed (dry and wet ploughing) and levelled before planting (b)  
   (c), (d) & (e) As under treatments (v) Nil (vi) MO4 Variety early improved (vii) Irrigated (viii) 2 weedings  
   (ix) No. (18.11.53 to 21.2.54) (x) 21.2.1954.

2. TREATMENTS :
   P1—Local method of sowing, by broad casting sprouted seeds at 130 lb./ac.  
   P2—Transplanting in lines 6”x6”; 3 seedlings/hole
3. DESIGN
(i) L. S. (ii) (a) 2 (b) N.A. (iii) 6 (iv) (a) 37' × 13' (b) 34' × 13' (v) one foot border around the plot (vi) Yes.

4. GENERAL:
(i) Partial lodging on 15.1.1954. (ii) Nil (iii) Grain weight (iv) 1953 to 1955 (b) Yes. (c) N.A. (v) (a) (b) Nil (vi) & (vii) Nil

5. RESULTS:
(ii) 1205 lb./ac.
(ii) 118.0 lb.
(iii) Treatments differ significantly.
(iv) Av. grain yield in lb./ac.

<table>
<thead>
<tr>
<th>Treatment</th>
<th>Mean</th>
<th>S.E. of treatment mean</th>
</tr>
</thead>
<tbody>
<tr>
<td>P1</td>
<td>1051</td>
<td>= 48 lb. /ac.</td>
</tr>
<tr>
<td>P2</td>
<td>1358</td>
<td></td>
</tr>
</tbody>
</table>

Crop : Paddy (2nd crop)  
Object : To compare broadcasting with dibbling & transplanting.

1. BASAL CONDITIONS:
(i) (a) Nil (b) Paddy (c) About 5,000 lb. G.L./ac.+100 lb. of A/S/ac. (ii) (a) Laterite Loam (b) Refer soil analysis (iii) 6.9.48/11.10.1948. (iv) (a) 6 ('b) 7 ploughings (b), (c), (d) & (e) As per treatments (v) Nil (vi) PTB 4. Medium. Improved. (vii) Rainfed (viii) One or two weeding if required at the intervals of one month from sowing (ix) 15.44" (6.9.48 to 29.1.1949) (x) 29.1.1949.

2. TREATMENTS:
1. Dibbling sprouted seeds at 3 seeds/hole. 6" × 6" either way along plough furrows.
2. Dibbling with powdered cowdung, along plough furrows.
3. Seed broadcast.
4. Transplanting 10" × 6" spacing ; 3 to 4 seedlings/hole.

For treatments (2) & (3) seed rate was 80 lb./ac.

3. DESIGN:
(i) R.B.B. (ii) 4 (b) N.A. (iii) 6 (iv) (a) (b) 10" × 22" (v) Nil : About 1½ to 2 feet interspace between plots. (vi) Yes.

4. GENERAL:
(i) Satisfactory (ii) Nil (iii) Grain weight (iv) (a) Nil (b) Nil (c) Nil (v) (a) Nil (b) Nil (vi) Nil (vii) Nil.

5. RESULTS:
(i) 2235 lb./ac.
(ii) 148 lb./ac.
(iii) The treatments differences are highly significant
(vi) Mean grain yield in lb./ac.

<table>
<thead>
<tr>
<th>Treatment</th>
<th>Mean yield</th>
<th>S.E. of treatment mean</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>2194</td>
<td>= 61 lb./ac.</td>
</tr>
<tr>
<td>2.</td>
<td>2162</td>
<td></td>
</tr>
<tr>
<td>3.</td>
<td>2095</td>
<td></td>
</tr>
<tr>
<td>4.</td>
<td>2491</td>
<td></td>
</tr>
</tbody>
</table>

Crop : Paddy (1st crop)  
Object : To assess the effect of intercultivating broadcast crop of paddy by working 'dantalu' when the ground is wet.
1. **BASAL CONDITIONS:**
   (i) (a) Nil (b) Paddy (c) About 500 lb./ac. G.L. +100 to 150 lb./ac. A/S. (ii) (a) Laterite loam. (b) Refer soil analysis Pattambi (iii) 2. 5. 1948 (iv) (a) Six dry ploughings (b) Broadcast (c) 70 lbs./ac. (d) (e) (f) Nil (vi) PTB 2, Medium, Improved. (vii) Rainfed (viii) One or two weedicings if required at intervals of one month from sowing. (ix) 77.73" (25.48 to 25.9.1948) (x) 25.9.1948.

2. **TREATMENTS:**
   1. Usual broadcast sowing & covering by country plough.
   2. (i) (i) (a) passing dantalu when the ground is wet.
   3. (i) (i) (a) 4 (b) N.A. (iii) 4 (iv) (a) (b) 35' x 58' (v) Nil. About 1½ to 2 feet interspace between plots. (vi) Yes.

3. **DESIGN:**
   (i) R.B.D. (ii) (a) 4 (b) N.A. (iii) 4 (iv) (a) (b) 35' x 58' (v) Nil. About 1½ to 2 feet interspace between plots. (vi) Yes.

4. **GENERAL:**

5. **RESULTS:**
   (i) 2707 lb./ac.
   (ii) 170 lb. ...
   (iii) The treatments are not significantly different.
   (iv) Mean grain yield in lb./ac.

<table>
<thead>
<tr>
<th>Treatment</th>
<th>Mean</th>
<th>S.E. of treatment means</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>2202</td>
<td>= 85 lb./ac.</td>
</tr>
<tr>
<td>2.</td>
<td>2263</td>
<td></td>
</tr>
<tr>
<td>3.</td>
<td>2181</td>
<td></td>
</tr>
<tr>
<td>4.</td>
<td>2181</td>
<td></td>
</tr>
</tbody>
</table>

Crop :- Paddy (1st crop)  
Ref :- K. 49 (24)  
Type :- 'C'

Object :- To find-out if intercultivation of broadcast crop by passing dantalu would give better yield (broadcast crop wet lands).

1. **BASAL CONDITIONS:**
   (i) (a) Nil (b) Paddy (c) 5 tons F.Y.M./ac.+1000 lb. ash/ac.+100 lb. A/S./ac. (ii) (a) Laterite loam (b) Refer soil analysis Pattambi (iii) 10.5.49. (iv) (a) 10 to 12 puddlings (b) Seeds, sown by broadcast (c) 70 lb./ac (d), (e), (f) (v) 5 tons F.Y.M./ac. at the time of puddling+1000 lb. ash/ac. before sowing and 100 lb. A/S./ac. one month after planting. (vi) PTB 2, Medium 4 to 5 months Improved. (vii) Rainfed. (viii) One weeding three to four weeks after sowing (ix) 38.07" in 89 rainy days (10.5.1949 to 25.9.1949) (x) 25.9.1949.

2. **TREATMENTS:**
   1. Usual broadcast sowing & covering by counting plough.
   2. (i) (i) (a) passing dantalu after monsoon sets in.
   3. (i) (i) (a) 4 (b) N.A. (iii) 4 (iv) (a, b) 72' x 72' (v) Nil. (vi) Yes.

3. **DESIGN:**
   (i) R.B.D. (ii) (a) (b) N.A. (iii) 4 (iv) (a, b) 72' x 72' (v) Nil (vi) Yes.

4. **GENERAL:**
   (i) Satisfactory. (ii) Nil. (iii) Grain weight. (iv) (a) 1948-1st crop & 1949-1st crop (Single crop/year) (b) No (c) N.A. (v) (a, b) Nil. (vi) & (vii) Nil.

5. **RESULTS:**
   (i) 1487 lb./ac.
   (ii) 159.0 lb./ac.
   (iii) The treatments do not differ significantly.
Crop: Paddy (1st crop)  
Object: To find out the best method of sowing paddy (broadcast crop wetlands).

1. BASAL CONDITIONS:
   (i) (a) Nil (b) Paddy (c) 5 tons F.Y.M./ac.+1000 lb. ash./ac.+100 to 150 lb. A/S./ac. (ii) (a) Laterite loam (b) Refer soil analysis Pattambi (iii) 10.5.1949. (iv) (a) 10 to 12 puddlings (b) As under treatments (c) 75 to 100 lb./ac. (d) & (e) (c) & (e) 5 tons F.Y.M./ac. as basal at the time of puddling, 1000 lb. ash./ac. just before sowing+100 to 150 lb. A/S./ac. as top dressing one month after sowing. (vi) PTB 2, Medium 4 to 5 months, Improved. (vii) Rainfed (viii) One weeding three to four weeks after sowing. (ix) 88.07" in 89 rainy days. (10.5.1949 to 25.9.1949) (x) 25.9.1949.

2. TREATMENTS:
   1. Sowing by drill, levelling by plank, working Karvaram (A toothed implement used for intercultivation).
   2. Broadcasting, levelling by plank and working dantalu.
   3. Usual broadcasting.

3. DESIGN:
   (i) R.B.D. (ii) (a) 3 (b) N.A. (iii) 4 (iv) (a, b) 32' x 32' (v) Nil (vi) & (vii) Nil

4. GENERAL:
   (i) Satisfactory (ii) Nil (iii) Grain weight (iv) (a) Not repeated (b) No (c) Nil. (v) (a, b) Nil (vi) & (vii) Nil

5. RESULTS:
   (i) 1673 lb./ac.
   (ii) 132.0 lb./ac.
   (iii) The treatments differ significantly.
   (iv) (Grain weight in lb./acre.)
   Treatment | Mean |
   -----------|------|
   1          | 1456 |
   2          | 1490 |
   3          | 1474 |
   4          | 1528 |
   S.E. of treatment means : = 81 lb./ac.

Crop: Paddy (1st Crop)  
Object: To find out the best method of sowing paddy (single crop lands).

1. BASAL CONDITIONS:
   (i) (a) Nil (b) Paddy (c) 5 C.L./ac. F.Y.M.+1000 lb. ash./ac.+100 to 150 lb. A/S./ac. (ii) (a) Laterite loam (b) Refer soil analysis Pattambi (iii) 11.5.1949. (iv) (a) 10 to 12 ploughings (b) As under treatments (c) 75 to 100 lb./ac. (d) & (e) (c) & (e) 5 C.L. F.Y.M./ac. at time of 1st ploughing and 1000 lb./ac. ash just before sowing. (vi) Kattamodan, Improved, Medium. 125 days duration. (vii) Rainfed. (viii) One weeding three to four weeks after planting. (ix) 77.05 in 70 rainy days. (11.5.1949 to 29.9.1949) (x) 2.9.1949.

2. TREATMENTS:
   1. Sowing by drill, levelling by plank and passing dantalu.
   2. Sowing by broadcast, levelling by plank and passing dantalu
   3. Sowing by broadcast (usual method), seed rate 75 to 100 lb./ac.

3. DESIGN:
   (i) R.B.D. (ii) (a) 3 (b) N.A. (iii) 6 (iv) (a, b) 40' x 33' (v) Nil ; (vi) Yes.
GENERAL:
(i) Low yield. Not satisfactory (ii) Nil (iii) Grain weight (iv) (a), (b) No (c) N.A. (v) (a) (b) Nil.
(vi) & (vii) Nil.

5. RESULTS:
(i) 693 lb./ac.
(ii) 181 lb./ac.
(iii) The treatments do not differ significantly.
(iv) Grain weight in lb./ac.

<table>
<thead>
<tr>
<th>Treatment</th>
<th>Mean</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>594</td>
</tr>
<tr>
<td>2</td>
<td>759</td>
</tr>
<tr>
<td>3</td>
<td>725</td>
</tr>
</tbody>
</table>

S.E. of treatment means: = 74.0 lb./ac.

Crop: Paddy. (1st crop).
Site: Agri. Res. Stn. Pattambi
Ref.: K. 48 (30).
Type: 'CM'.

Object: To find out the optimum seedrate for broadcast crop of paddy.

1. BASAL CONDITIONS:
(i) (a) Nil (b) Paddy (c) 2000 lb./ac. G.L. +2 cwt/ac.G.N.C. +56 lb. A/S/ac. (ii) (a) Laterite loam,
(b) Refer soil analysis Pattambi. (iii) 2.5.1948. (iv) (a) 8 to 10 ploughings (b) Broadcasting (c) As per
(treatments (d)-(e)=(f) Nil. (v) P.T.B. 25 Improved Medium. (vi) Rainfed. (vii) Two weedings at
intervals of one month from sowing (ix) N.A. (x) 21.8.1948.

2. TREATMENTS:
2 Main plot treatment:—
(1) No manure.
(2) 2000 lb. of Ash+2 cwt of G.N.C.+50 lb. of A/S per acre.

5 Sub-treatments:—
Seed rates:
(1) 40 lb./ac.
(2) 60 ,
(3) 80 ,
(4) 100 ,
(5) 120 ,
Ash and G.N.C. at the time of sowing and A/S one month after sowing.

3. DESIGN:
(i) Split plot. (ii) (a) 2 main-plots and 5 sub-plots/main plot (b) N.A. (iii) 4 (iv) (a), (b) Main-plot
N.A. Net sub-plot. 33'x23' (v) Nil (vi) Defective randomisation in main-plots.

4. GENERAL:
(i) Satisfactory. (ii) Nil (iii) Grain weight. (iv) (a) 1948—1st crop to 1949—1st crop (one crop/year)
(b) No (c) N.A. (v) (a, b) Nil (vi) & (vii) Nil.

5. RESULTS:
(i) 1554 lb./ac.
(ii) (a) 255 lb./ac.
(b) 267 lb./ac.
(iii) Main plot treatments alone differ significantly.
(iv) Grain weight lb./ac.

<table>
<thead>
<tr>
<th>Manures</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
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<td>1</td>
<td>1320</td>
<td>1212</td>
<td>1342</td>
<td>1442</td>
<td>1374</td>
<td>1338</td>
</tr>
<tr>
<td>2</td>
<td>1539</td>
<td>1793</td>
<td>1940</td>
<td>1894</td>
<td>1686</td>
<td>1770</td>
</tr>
</tbody>
</table>

Mean. 1430 1503 1641 1668 1530 1554

S.E. of difference of two marginal means (mainplot).
= 80 lb./ac.
S.E. of two main-plot means for the same level of sub-plot. = 188 ,
S.E. of difference of two sub-plot means for the same main-plot. = 189 lb./ac.
Crop :— Paddy (1st crop)  

Object :— To find out the optimum seed rate for broadcast paddy (single crop lands)

1. BASAL CONDITIONS:  
   (i) (a) Nil (b) Paddy (c) 5 ton/ac. F.Y.M.+1000 lb./ac. ash +100 lb./ac. A/S  
      (ii) (a) Laterite loam (b) Refer soil analysis, Pattambi. (iii) 11.5.1949.  
      (iv) (a) 10 to 12 puddlings (b) Seeds sown by broadcasting  
      (c) As under treatments (d) (e)—(v) Nil (vi) P.T.B. 2 Improved  
  (vii) Rainfed.  
  (viii) One weeding 3 to 4 weeks after planting. (ix) 86.09" in 89 rainy days (11.5.1949 to 28.9.1949).

2. TREATMENTS:  
   Main plot treatments  
   (1) Unmanured.  
      (Ash applied before sowing. G.N.C. one month after sowing. A/S 2 months after sowing as top dressing).  
   Sub-plot treatments.  
   1. Seed rate 40 lb./ac.  
   2. 60  
   3. 80  
   4. 100  
   5. 120

3. DESIGN:  
   (i) Split plot (ii) (a) 2 main-plots and 5 sub-plots/main plot. (b) N.A. (iii) 4 (iv) (a, b) Compact block 45'x16' (sub plot) (v) Nil (vi) Yes.

4. GENERAL:  
   (i) Satisfactory.  
   (ii) Nil (iii) Grain & Straw weight.  
   (iv) (a) 1948 1st crop & 1949-1st crop (b) No (c) N.A.  
      (v) (a, b) Nil (vi) & (vii) Nil.

5. RESULTS:  
   (i) 1782 lb./ac.  
   (ii) (a)=2540 lb./ac.  
      (b)=1.65" lb./ac.  
   (iii) Neither main plot treatments nor sub-plot treatments differ significantly. Interaction is not significant.  
   (iv) Grain weight in lb./ac.

<table>
<thead>
<tr>
<th>Manure</th>
<th>1</th>
<th>2</th>
<th>Seedrate 3</th>
<th>4</th>
<th>5</th>
<th>Mean</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>1830</td>
<td>1785</td>
<td>1860</td>
<td>1800</td>
<td>1860</td>
<td>1827</td>
</tr>
<tr>
<td>2</td>
<td>1649</td>
<td>1785</td>
<td>1770</td>
<td>1724</td>
<td>1754</td>
<td>1736</td>
</tr>
<tr>
<td>Mean.</td>
<td>1739</td>
<td>1785</td>
<td>1815</td>
<td>1762</td>
<td>1807</td>
<td>1782</td>
</tr>
</tbody>
</table>

S.E. of difference of two main plot-means. = 79.0 lb./ac.
S.E. of difference of two sub-plot means. = 73.0  
S.E. of difference of two sub-plot means for the same mainplot treatment. = 103.0 lb./ac.
S.E. of difference of two main-plot means for the same sub-plot treatment. = 121.0  

Crop :- Paddy (1st crop)  
Site :- Agri. Res. Stn. Pattambi

Object :-To compare the Japanese method of cultivation and the Farm method of cultivation.

1. BASAL CONDITIONS:  
   (i) (a) Nil (b) Paddy (c) 5000 lb./ac. G.L.+100 to 150 lb./ac. A/S  
      (ii) (a) Laterite loam (b) Refer, soil analysis, Pattambi (iii) 2.6.51; 5.7.1951.  
      (iv) Japanese Method. Planting 9" in lines and 1" between lines  
      (v) 3 to 4 seedling/hood Weeding and raking every 15 days. Super and A/S applied in furrows at the root zone 3" to 4" below soil. Local method. Planting in bulk 6"x6" two seedlings/hood Super applied before final ploughing and A/S broadcast.  
      (vii) Nil (vi) PTB 2 Improved. Medium (4 to 5 months) (vii) Rainfed  
      (viii) One weeding 3 to 4 weeks after planting. (ix) 50-25" (2.6.1951 to 20.10.1951) (x) 20.10.1951.
2. TREATMENTS:
All combinations of (a) & (b)
(a) Two methods of cultivation viz. (1) Japanese and (2) Farm method
(b) 4 levels of manures:
(1) No manure
(2) Leaf 4000 lb./ac. + Super 45 lb./ac. P$_4$O$_5$
(3) Leaf 4000 lb./ac. + Super 45 lb./ac. P$_4$O$_5$ + A/S 20 lb./ac. N at planting + 10 lb./ac. N as A/S one month later.
(4) Leaf 4000 lb./ac. + Super 45 lb./ac. P$_4$O$_5$ + A/S 30 lb./ac. N at planting + 15 lb./ac. N as A/S one month later.

3. DESIGN:
(i) 4x2 Factorial in R.B.D. (ii) (a) Yes (b) N.A. (iii) 4 (iv) (a) 13'x20' (b) Nil (v) Nil (vi) Yes.

4. GENERAL:
(i) Satisfactory. (ii) Nil (iii) Grain weight
(iv) (a) 1951-1st crop to 1952-2nd crop (b) Yes. (c) N.A. (v) (a) (b) Nil (vi) Nil.

5. RESULTS:
(i) 2229 lb./ac.
(ii) 162 lb./ac.
(iii) Only the levels of manure differ highly significantly.
(iv) Grain weight in lb./ac.

<table>
<thead>
<tr>
<th>b/a</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>Mean</th>
</tr>
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<tbody>
<tr>
<td>1</td>
<td>1919</td>
<td>2100</td>
<td>2422</td>
<td>2436</td>
<td>2219</td>
</tr>
<tr>
<td>2</td>
<td>2023</td>
<td>2142</td>
<td>2345</td>
<td>2443</td>
<td>2238</td>
</tr>
</tbody>
</table>

S.E. of body of table = 81 lb./ac.
S.E. of marginal mean (levels of manure) = 57
S.E. of marginal mean (Japanese vs. local) = 40

Crop :-Paddy (1st crop)  
Ref :-K. 50 (17)  
Type :- CV

Object :-To find-out the feasibility of adopting 'Udu' Cultivation in Wynaad to utilize the water available in portions of the valleys till about March and thus increasing the yield of paddy per acre.

1. BASAL CONDITIONS:
(i) (a) Nil (b) Paddy (c) 5000 lb./ac.of G.L.+150 lb. Super. 75 to 150 lb./ac. of A/S (ii) (a) Brown red clayey soil (b) Refer soil analysis, Ambalavayal (iii) 5.5.1950; 8.6.1950. (iv) (a) 4 ploughings two after harvest and two after 5&6 months and 4 more ploughings to cover G.L. and two after decomposition of leaf and final two ploughings just before planting, the field levelled and prepared for planting (b) Planting in lines (c) (d) 6" between plants and 8"-11" between rows. (e) 3 to 4 (v) N.A. (vi) ADT 3; ADT 6; PTB 23; PTB 15 Velumpala (vii) Rainfed. (viii) One weeding 1 to 2 months after planting. (ix) 7108* (5.5.1950 to 17.3.1951) (x) Short duration varieties harvested on 18.9.1950; Velumpala harvested on 2.12.1950. Long duration varieties harvested on 16.2.1951 and 17.3.1951.

2. TREATMENTS:
1. (Short) ADT 3+ADT 6 (Long)—Improved.
2. (Short) ADT 3+PTB 15 (Long)—Improved.
3. (Short) PTB 23+ADT 6 (Long)—Improved.
4. (Short) PTB 23+PTB 15 (Long)—Improved.
5. (Long) Velumpala—Local (Control).
(Details under Results).

3. DESIGN:
(i) R.B.D. (ii) (a) 5 (b) N.A. (iii) 4 (iv) (a), (b) 2 cells (v) Nil (vi) Yes.

4. GENERAL:
(i) ADT 3 grown in combination with ADT 6 and PTB 15 was very badly affected by helminthosporium and pircicularia. (ii) PTB 23 grown in combinations with ADT 6 and PTB 15 was also affected but the incidence was less severe in comparison to that of ADT 3 Both ADT 6 and PTB 3 tillered very well and developed earheads satisfactorily. But the development of grain on both the strains was extremely poor due to the severe incidence of Helminthosporium. (iii) Grain weight (iv) (a) & (b) No (c) Nil (v) (a) (b) Nil (vi) Nil (vii) Raw data N.A.
5. RESULTS:
(i) 118 lb./ac.
(ii) N.A.
(iii) The experiment revealed that ‘Udu’ Cultivation is not suitable for the tract.
(iv) Grain weight in lb./ac.

<table>
<thead>
<tr>
<th>Treatment</th>
<th>Mean</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>190</td>
</tr>
<tr>
<td>2.</td>
<td>197</td>
</tr>
<tr>
<td>3.</td>
<td>1275</td>
</tr>
<tr>
<td>4.</td>
<td>1103</td>
</tr>
<tr>
<td>5.</td>
<td>3038</td>
</tr>
</tbody>
</table>

S.E. per treatment mean N.A.

Note on ‘Udu’ Cultivation. Seeds of a short duration and long duration varieties will be mixed in the ratio 3:1 and sown by broadcast in a nursery. The seedlings will be transplanted. When the short duration variety matures, a harvest is done in the whole field. The long duration variety will be harvested when matured. Here the preliminary cultural operations and transplanting are done only once instead of twice when the crops are grown separately.

Crop :- Paddy. (2nd crop)  Site :- Paddy Breeding Station, Morlcompu.  Ref :- K. 48(2)  Type :- ‘C V’

Object—To ascertain the optimum seed rate for the broadcast crop of paddy

1. BASAL CONDITIONS:
(i) (a) Nil (b) Paddy (c) Nil (ii) (a) Clayey soil rich in acid (b) N.A. (iii) 17.12.1948. (iv) (a) 2 ploughings (wet & dry) and levelling (b) Broadcasting sprouted seeds (c) As per treatments (d)—(e)—(v) Nil (vi) As per treatments. (vii) Rainfed (viii) One weeding one month after sowing (ix) 107° (17.12.1948 to 18.3.1949) (x) 18.3.1949.

2. TREATMENTS:
Main plot treatments :
\[ V_1 = \text{variety MO}_1 \text{ short, improved.} \]
\[ V_2 = \text{variety MO}_2 \text{ short, improved.} \]

Sub plot treatments :
\[ S_1 : \text{Seed rate } 150 \text{ lb./ac.} \]
\[ S_2 : \text{ } \]
\[ S_3 : \text{ } \]
\[ S_4 : \text{ } \]
\[ S_5 : \text{ } \]

3. DESIGN:
(i) Split plot (ii) (a) 2 main plots & 5 sub plots/main plot (b) Compact (iii) 6 (iv)(a) main plot N.A. sub plot 32×16 (iv)(b) main plot 70×30 sub plot 30×14 (v) border plant left on all sides of each sub-plot. (vi) Yes.

4. GENERAL:
(i) Stand good—No lodging (ii) Nil (iii) Grain weight (iv) (a) Nil (b) N.A. (c) Nil (v) (a) Nil (vi) Nil (vii) MO\(_1\) and MO\(_2\) are two improved strains evolved from local varieties of “Chettivitippu & Kallade Samba” respectively.

5. RESULTS:
(i) 1819 lb./ac.
(ii) (a) 308 lb./ac.
(b) 308
(iii) Seeds rates and “Seedrate×Variety” interaction are highly significant.
(iv) Mean yield in lbs./ac.

<table>
<thead>
<tr>
<th>Variety</th>
<th>S(_1)</th>
<th>S(_2)</th>
<th>S(_3)</th>
<th>S(_4)</th>
<th>S(_5)</th>
<th>Mean</th>
</tr>
</thead>
<tbody>
<tr>
<td>V(_1)</td>
<td>1775</td>
<td>1856</td>
<td>1770</td>
<td>1713</td>
<td>1830</td>
<td>1789</td>
</tr>
<tr>
<td>V(_2)</td>
<td>2046</td>
<td>1945</td>
<td>2082</td>
<td>2010</td>
<td>1163</td>
<td>1849</td>
</tr>
</tbody>
</table>

Mean of difference of two variety marginal means = 79 lb./ac.

S.E. of difference of two variety means for the same seedrate = 126

S.E. of difference of two seedrate means for the same variety = 173

S.E. of difference of two seedrate means for the same variety = 348
Crop: Paddy (1st crop)  

Object: To find out whether the period of sowing has any effect on the yield of paddy.

1. BASAL CONDITIONS:
   (i) (a) Nil (b) Paddy (c) About 5000 lb. of G.L./ac. +100 to 150 lb./ac. A/S  
   (ii) (a) Laterite loam (b) Refer soil analysis, Pattambi.  
   (iii) As per treatments  
   (iv) (a) 6 ploughings, 2 puddlings (b) Transplanted in lines  
   (c)–(d) 4" to 6" between plants & about 10" between rows (e) 13 to 4 (v) N.A.  
   (vi) As per treatments  
   (vii) One or two weedings at intervals of one month from planting if required (ix) 8L2t  
   (v) Nil: About 1' to 2' interspace between plots (vi) Yes.

2. TREATMENTS:  
   All possible combinations of (I) & (2)
   
3. DESIGN:  
   (i) 3 x 3 Factorial in R.B.D.  
   (ii) (a) 9 (b) N.A.  
   (iii) 4 (iv) (a) 3' x 30' (b) 5' x 30'  
   (v) Nil: About 1' to 2' interspace between plots  
   (vi) Nil  

5. RESULTS:  
   (i) 2077 lb./ac.
   (ii) 389 lb./ac.
   (iii) Main effects and interaction are not significant.
   (iv) Mean yield in lb./ac.

<table>
<thead>
<tr>
<th>Dates of Sowing</th>
<th>V₁</th>
<th>V₂</th>
<th>V₃</th>
<th>Mean</th>
</tr>
</thead>
<tbody>
<tr>
<td>D₁</td>
<td>2413</td>
<td>2413</td>
<td>2050</td>
<td>2292</td>
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<tr>
<td>D₂</td>
<td>2088</td>
<td>2033</td>
<td>1888</td>
<td>2003</td>
</tr>
<tr>
<td>D₃</td>
<td>2050</td>
<td>2033</td>
<td>1725</td>
<td>1936</td>
</tr>
<tr>
<td>Mean</td>
<td>2184</td>
<td>2160</td>
<td>1888</td>
<td>2277</td>
</tr>
</tbody>
</table>

S.E. of body of table = 195 lb./ac.  
S.E. of marginal means = 133 lb./ac.

---

Crop: Paddy (1st crop)  

Object: To test the belief that early sowing secures the best yield in the 1st crop season.

1. BASAL CONDITIONS:
   (i) (a) Nil (b) Paddy (c) 5000 lb./ac G.L. + 100 to 150 lb./ac. A/S  
   (ii) (a) Laterite loam (b) Refer soil analysis, Pattambi.  
   (iii) As under treatments (iv) (a) 6 ploughings, 3 levellings (b) Transplanted in bulk  
   (c)–(d) 4" to 6" (e) 3 to 4 (v) 5000 lb. G.L./ac. +100 to 150 lb./ac. A/S  
   (vi) As under treatments (vii) Rainfed.  
   (viii) One weeding three to four weeks after planting. (ix) 92.5°  
   (x) 20.10.1948  

2. TREATMENTS:  
   All combinations of (I) & (2)
   (I) 3 Varieties—
   V₁ = PTB 1  
   V₂ = PTB 2  
   V₃ = PTB 5
3. DESIGN:
(i) 3x3 L.S.D. (ii) (a) 9 (b) N.A. (iii) 4 (iv) (a,b) 4x20' (v) Nil (vi) Yes.

GENERAL:
(i) Satisfactory (ii) Nil (iii) grain weight (iv) (a) 1546—1st crop & 1549 1st crop only during 1st crop season. (b) No. (c) Nil. (v) (a,b) Nil (v) & (vi) Nil.

5. RESULTS:
(i) 2223 lb./ac.
(ii) 208.5 lb./ac.
(iii) The main effect of varieties is significant. Main effect of dates of sowing highly significant. Interaction is not significant.
(iv) (Grain weight 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>2246</td>
<td>1293</td>
<td>1770</td>
<td>1770</td>
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<tr>
<td>D2</td>
<td>3131</td>
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<td>2881</td>
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<tr>
<td>D3</td>
<td>2995</td>
<td>2722</td>
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</tr>
<tr>
<td>Mean</td>
<td>2791</td>
<td>2223</td>
<td>2337</td>
<td>2450</td>
</tr>
</tbody>
</table>

S.E. for marginal means = 125.0 lb./ac.
S.E. for body of table = 220.5
Crop : Paddy (1st crop)  
Ref : K. 51 (23)  
Type : "CV"  

Object : To compare the advantage of growing two varieties, a long duration second crop variety mixed with a medium duration first crop variety in the proportion 1:3 with two crops following one another.

1. BASAL CONDITIONS:
(i) (a) Nil (b) Paddy (c) 5000 lb. ac. G.L. + 100 to 150 lb. A/S.ac. (ii) (a) Laterite loam (b) Refer soil analysis, Pattambi. (iii) 7.5.51; 27.7.51. (iv) (a) Puddling 6 times, levelling 3 times, (b) Seedlings transplanted from wet nursery. Average age of seedlings is about one month. (c) — (d) Planted in bulk. (e) 2 to 3 (f) Nil (v) As under treatments. All improved. (vi) - Rainfed. (vii) One weeding 3 to 4 weeks after planting. (viii) 50.25" (7.5.1951 to 5.10.1951) (a) PTB 53 on 19.9.51; PTB 8 on 5.10.51.

TREATMENTS:
All combinations of (a) & (b)
(a) Combinations of (1), (2)
(1) Two varieties of medium duration: \( V_1 = PTB\ 23 \)
\( V_2 = PTB\ 8 \)
(2) Two " " long " \( V_1' = PTB\ 15 \)
\( V_2' = PTB\ 4 \)
(b) Two methods of growing \( M_1 = \) followed by other
\( M_2 = \) mixed together

3. DESIGN:
(i) 4 x 2 fact. in RBD. (ii) (a) 8 (b) N.A. (iii) 4 (iv) (a) (b) 18'x25' (v) Nil (vi) Yes.

4. GENERAL:
(i) Satisfactory. (ii) Nil (iii) Grain and straw weight. (iv) (a) 1951-1st crop to 1951 2nd crop (b) Yes (c) N.A. (v) (a) (b) Nil. (vi) & (vii) Nil.

5. RESULTS:
(i) 1949 lb./ac.
(ii) 200 lb./ac.
(iii) The variety combinations differ highly significantly and the best combination is PTB 8 followed by PTB 15. The methods also differ highly significant. Growing crops one followed by the other is better than growing them together. The interaction is not significant.
(iv) Grain weight in lb./ac.

<table>
<thead>
<tr>
<th>Methods</th>
<th>( V_1V_1' )</th>
<th>( V_2V_1' )</th>
<th>( V_1V_2' )</th>
<th>( V_2V_2' )</th>
<th>Mean.</th>
</tr>
</thead>
<tbody>
<tr>
<td>( M_1 )</td>
<td>2086</td>
<td>2643</td>
<td>2049</td>
<td>2474</td>
<td>2313</td>
</tr>
<tr>
<td>( M_2 )</td>
<td>1388</td>
<td>1879</td>
<td>1528</td>
<td>1546</td>
<td>1585</td>
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<tr>
<td>Mean</td>
<td>1737</td>
<td>2261</td>
<td>1788</td>
<td>2010</td>
<td>1949</td>
</tr>
</tbody>
</table>

S. E. of body of table = 100 lb./ac.
S. E. of marginal means (varieties) = 71 "
S. E. of marginal means (method) = 50 "

Crop : Paddy (2nd crop)  
Ref : K. 51(24)  
Type : "CV"  

Object : To compare the advantage of growing two varieties, a long duration second crop variety mixed with a medium duration first crop variety in the proportion 1:3 with two crops following one another.

1. BASAL CONDITIONS:
(i) (a) Nil (b) Paddy (c) Nil (ii) (a) Laterite loam (b) Refer soil analysis, Pattambi. (iii) 27.9.51; 1.11.51. (iv) (a) Puddling 6 times, levelling 3 times (b) Seedlings transplanted from wet nursery. Average age of seedlings is about one month (c) — (d) Planted in bulk. (e) 2 to 3 (f) Nil (v) As under treatments, all improved (vi) - Rainfed (vii) N.A. (ix) 23.76" (27.9.51 to 28.2.1952) (x) 24.1.52 and 28.2.52

2. TREATMENTS:
All combinations of (a) and (b)
12.4
(a) Combinations of (1), (2)
(1) Two varieties of medium duration: \( V_1 = \text{PTB 23} \)
\[ \begin{align*} 
V_2 & = \text{PTB 8} \\
V_3 & = \text{PTB 15} \\
V_4 & = \text{PTB 4} 
\end{align*} \]
(b) Two methods of growing: 
\[ \begin{align*} 
M_1 & = \text{followed by other} \\
M_2 & = \text{mixed together} 
\end{align*} \]

3. DESIGN:
(i) \( 4 \times 2 \) fact in RBD (ii) (a) 8 (b) N.A. (iii) 4 (iv) (a), (b) 18'×25' (v) Nil (vi) Yes.

4. GENERAL:
(i) Satisfactory. (ii) Nil (iii) Grain and straw weight (iv) (a) 1951 1st crop to 1952-2nd crop (b) Yes (c) N.A. (v) (a) (b) Nil (vi) & (vii) Nil.

5. RESULTS:
(i) 2354 lb./ac.
(ii) 356 lb./ac.
(iii) The two methods are not significantly different. Variety combinations differ significantly. Interaction is highly significant.
(iv) Grain weight lb./ac.

<table>
<thead>
<tr>
<th>Variety Combinations</th>
<th>( V_1 V_4' )</th>
<th>( V_2 V_4' )</th>
<th>( V_1 V_5' )</th>
<th>( V_4 V_5' )</th>
<th>Mean</th>
</tr>
</thead>
<tbody>
<tr>
<td>( M_1 )</td>
<td>2837</td>
<td>2837</td>
<td>1451</td>
<td>2055</td>
<td>2298</td>
</tr>
<tr>
<td>( M_2 )</td>
<td>2268</td>
<td>2061</td>
<td>2607</td>
<td>2704</td>
<td>2410</td>
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<tr>
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<td>24/9</td>
<td>2034</td>
<td>2379</td>
<td>2354</td>
</tr>
</tbody>
</table>

S. E. of body of table = 178 lb./ac.
S. E. of marginal means (varieties) = 126
S. E. of marginal means (methods) = 89

Ref: K. 52 (35) Type: CMV

Object: To evaluate how far differences in morphological characters like intensity of green colour are associated with quantitative factors affecting yield.

1. BASAL CONDITIONS:
(i) (a) Nil (b) Paddy (c) 4030 lb. G.L./ac.+75 lb. A/S/ac. (ii) (a) Laterite loam (b) Refer soil analysis Pattambi. (iii) 18.7.1952. (iv) (a) 6 ploughings and levelling (b) Transplanting in lines. (c)—(d) 6'×6' (e) 2. (v) Nil. (vi) As under treatment; 1st batch sown on 4.6.52, 2nd batch sown on 18.6.1952. (vii) Rainfed. (viii) 2 weedicings at intervals of one month from planting. (ix) 57.89" in 75 rainy days. (18.7.52 to 22.10.1952) v) 22.10.1952.

2. TREATMENTS:
Main treatments:—2 levels of manures
\[ M_0 = \text{No manure} \]
\[ M_1 = \text{C.M. at 30 lb. N/ac. as basal at puddling.} \]
Sub treatments:—Combinations of (1), and (2)
(1) Two ages of seedling: \( A_1 = \text{Normal 30 days} \)
\[ A_2 = \text{Aged 45 days} \]
(2) Two varieties: \( V_1 = \text{8769 improved} \)
\[ V_2 = \text{8792} \]
both of medium duration.

3. DESIGN:
(i) Split plot. (ii) (a) 2 mainplots and 4 sub-plots/mainplot. (b) N.A. (iii) 4 (iv) (a,b) 16'×24' (main-plot) 4'×24' (sub-plot) (v) Nil. (vi) Yes.

4. GENERAL:
(i) Satisfactory. (ii) Nil (iii) Grain & straw weight, Productive tillers, length of panicles. (iv) (a) 1951 to 1953 (Only during 1st crop). (b) No. (c) N.A. (v) (a,b) Nil (vi) & (vii) Nil.
5. RESULTS:
(i) 1820 lb./ac.
(ii) (a) 69 lb./ac.
(b) 198 lb./ac.
(iii) Manures, Age of seedlings and interaction variety x Age of seedlings are highly significant
(iv) Grain Weight lb./ac.

<table>
<thead>
<tr>
<th></th>
<th>M₀</th>
<th>M₁</th>
<th>Mean</th>
</tr>
</thead>
<tbody>
<tr>
<td>V₁</td>
<td>1985</td>
<td>1592</td>
<td>1788</td>
</tr>
<tr>
<td>V₂</td>
<td>1939</td>
<td>1762</td>
<td>1851</td>
</tr>
<tr>
<td>A₁</td>
<td>2077</td>
<td>1840</td>
<td>1959</td>
</tr>
<tr>
<td>A₂</td>
<td>1846</td>
<td>1514</td>
<td>1680</td>
</tr>
<tr>
<td>Mean</td>
<td>1962</td>
<td>1677</td>
<td>1820</td>
</tr>
<tr>
<td>V₁</td>
<td>2056</td>
<td>1861</td>
<td>1959</td>
</tr>
<tr>
<td>V₂</td>
<td>1521</td>
<td>1840</td>
<td>1680</td>
</tr>
<tr>
<td>Mean</td>
<td>1788</td>
<td>1851</td>
<td>1820</td>
</tr>
</tbody>
</table>

S. E. of diff. of marginal means (manures) = 25 lb./ac.
S. E. of diff. of two manure means for the same variety or age = 70
S. E. of diff. of two variety or age of seedling means for the same manure = 99

Crop : Paddy (1st crop)  Ref : K. 53(37)
Site : Agri. Res. Stn. Pattambi.  Type : 'CVM'

Object : A trial to find out how far quantitative factors associated with depth of colour of leaf are influenced by difference in cultural and manurai practices.

1. BASAL CONDITIONS:
(i) (a) Nil (b) Paddy (c) 4000 lb./ac. G.L.+ 75 lb./ac. A/S. (ii) (a) Laterite loam (b) Refer soil analysis, Pattambi. (iii) 1st batch sowing 28.5.1953; 2nd 12.6-53 and planting 13.7.1953. (iv) (a) 7 ploughings (b) Transplanting. (c)——(d) 6" x 6" (e) 2 (v) Nil (vi) 8769, 8792, Improved, medium. (vii) Not-irrigated (viii) 2 weedings. (ix) 61.74" in 67 rainy days (28.5.1953 to 21.10.1953) (x) 21.10.1953.

TREATMENTS:
2 Main Plot treatments.
1. Manure (C.M. 30 lb N/ac) = M₁
2. No. manure = M₃
4 Sub Plot treatments:
1. Normal 33 days old (No. 8769 Variety)
2. Normal 33 (No. 8792)
3. Aged 48 (No. 8769)
4. Aged 48 (No. 8792)
Cattle manure applied at puddling.

3. DESIGN:
(i) Split plot. (ii) 2 main plots, 4 sub-plots/main plot. (b) N.A. (iii) 4 (iv) (a,b) 4' x 24' (sub-plot) 16' x 24' (main-plot) (v) Nil (vi) Yes.

4. GENERAL:
(i) Satisfactory. (ii) Nil (iii) Grain and straw yield. (iv) (a) 1952 and 1953 (1st crop only) (b) No. (c) N.A. (v) (a,b) Nil (vi) & (vii) Nil.
5. RESULTS:

(i) 2010 lb./ac.
(ii) Only main treatment differences are highly significant.
(iii) Paddy crop yield in lb./ac.

<table>
<thead>
<tr>
<th>Main</th>
<th>Sub</th>
<th>M1</th>
<th>M2</th>
<th>Mean</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td></td>
<td>2212</td>
<td>1928</td>
<td>2070</td>
</tr>
<tr>
<td>2.</td>
<td></td>
<td>2063</td>
<td>2084</td>
<td>2074</td>
</tr>
<tr>
<td>3.</td>
<td></td>
<td>2190</td>
<td>1709</td>
<td>1950</td>
</tr>
<tr>
<td>4.</td>
<td></td>
<td>2134</td>
<td>1758</td>
<td>1946</td>
</tr>
<tr>
<td></td>
<td></td>
<td>2150</td>
<td>1870</td>
<td>2010</td>
</tr>
</tbody>
</table>

(1) S.E. of difference of two main treatment means = 46.6 lb./ac.
(2) sub treatment means = 114.3
(3) sub treatment means at the same level of main treatment = 161.6
(4) main treatment means at the same level of sub-treatment = 147.5

Crop: Paddy. (1st. crop)  
Type: 'IC'.

Objecj:- To ases the influence of irrigation on the growth of broadcast crop paddy.

1. BASAL CONDITIONS:

(i) (a) Nil (b) Paddy (c) 4000 lb./ac. G.L+200 lb./ac. G.N.C.+50 lb./ac. A/S (ii) Refer soil analysis Pattambi (iii) 13.4.1949; 9.5.1949. (iv) As under treatments (v) 3000 lb./ac. G.L. at the time of puddling as basal. (vii) PTB 2; Medium Improved. 4 to 5 months. (viii) One weeding three to four weeks after planting (ix) N.A. (x) 12, 20.9.1949.

2. TREATMENTS:

2 Main plot treatments:
L = Un-irrigated.
I = Irrigated.
3 Sub plot treatments:
S = Sown on 13.4.49  
= 9.5.49
S = Transplanted on 6.7.49
Quantity of Irrigation= N.A. Seedrate= 80 lb./ac. Transplanted 6" X 6"; 2 seedling/hole.

3. DESIGN:

(i) Split plot (ii) 2 main plot; 3 sub-plots (b) N.A. (iii) 4 (iv) (a) (b) Sub. 50' X 13'; Main 50' X 39'. (v) Nil (vi) Randomisation defective.

4. GENERAL:

(i) Satisfactory. (ii) Nil (iii) Grain weight. (iv) (a) Not repeated (b) No (c) Nil. (v) (a, b) Nil. (vi) Nil. (vii) Nil.

5. RESULTS:

(i) 1930 lb./ac.  
(ii) (a) 354 lb./ac.  
(b) 212 lb./ac.
(iii) Interaction alone is significant.

<table>
<thead>
<tr>
<th>S1</th>
<th>S2</th>
<th>S3</th>
<th>Mean</th>
</tr>
</thead>
<tbody>
<tr>
<td>I1</td>
<td>2111</td>
<td>2170</td>
<td>1977</td>
</tr>
<tr>
<td>I2</td>
<td>1759</td>
<td>1486</td>
<td>2078</td>
</tr>
<tr>
<td>Mean</td>
<td>1935</td>
<td>1828</td>
<td>2027</td>
</tr>
</tbody>
</table>
Object: To study whether weed growth can be prevented by spraying agroxone.

1. BASAL CONDITIONS:
   (i) (a) Nil (b) Paddy (c) 5 C.L./ac. F.Y.M. +1000 lb ash./ac.  
   (ii) (a) Laterite loam (b) Refer soil analysis Pattambi. 
   (iii) 11.5.1949. 
   (iv) (a) 10 to 12 ploughings (b) seeds sown by broadcast (c) Seed rate varied from 75 to 100 lb./ac. (d)- (e) (v) Nil (vi) Kattamodan, Improved, 125 days duration. 
   (vii) Rainfed (viii) Nil (ix) 77.05" in 70 rainy days (11.5.49) to 1.9.1949. 
   (x) 1.9.1949.

2. TREATMENTS:
   1. Agroxone 5% 
   2. Agroxone 10%. 
   3. Control. 
   Agroxone applied as dust by spraying on 4.6.1949.

3. DESIGN:
   (i) R.B.D.  
   (ii) (a) 3 (b) N.A. (iii) 8 (iv) (a,b) 8'×54' (v) Nil (vi) Yes.

4. GENERAL:
   (i) Satisfactory. 
   (ii) Nil (iii) Grain weight (iv) A modified study was made during 1950 1st crop. 
   (b) No (c) Nil (v) (a,b) Nil. (vi) & (vii) Nil.

5. RESULTS:
   (i) 697 lb./ac.
   (ii) 75 lb./ac. 
   (iii) The treatment differences are highly significant. Agroxine 5% appears to be the best Agroxine 10% is in excess and hence it effects the crop also.
   (iv) (Grain weight in lb./ac.)
   
<table>
<thead>
<tr>
<th>Treatment</th>
<th>Mean</th>
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</thead>
<tbody>
<tr>
<td>1</td>
<td>869</td>
</tr>
<tr>
<td>2</td>
<td>571</td>
</tr>
<tr>
<td>3</td>
<td>649</td>
</tr>
<tr>
<td>S.E. of treatment means</td>
<td>26 lb./ac.</td>
</tr>
</tbody>
</table>

Object: To study whether weed growth can be prevented by spraying agroxone.

1. BASAL CONDITIONS:
   (i) (a) Nil (b) Paddy (c) 5 C.L./ac. of C.M.+1000 lb/ac. ash.+50 lb/ac. A/S.  
   (ii) (a) Laterite loam. (b) Refer soil analysis Pattambi. 
   (iii) 30.5.1950. 
   (iv) (a) 3 or 4 ploughings. (b) broadcast and covered by a shallow ploughing (c) About 80 lb./ac. 
   (d)—(e)—(v) 5 C.L./ac. C.M. at the time of puddling +1000 lb./ac. ash just before sowing +50 lb./ac. A/S as top dressing one month after planting. 
   (vi) Improved Medium (125 days) (vii) Rainfed. (viii) Nil (ix) 96.42" (36.5.50 to 20.9.1950). (x) 20.9.1950.

2. TREATMENTS:
   1. Agroxone 10% liquid at 1 gallon/ac. applied once. 
   2. do applied twice. 
   3. Agroxone 5% dust at 40 lb./ac. applied once. 
   4. do ... applied twice.
5. Hand weeded one month after planting.
6. Control (no weeding).
Agroxone applied by spraying first application made one month after planting and 2nd one month after 1st.

3. DESIGN:
(i) R.B.D. (ii) 6 (b) N.A. (iii) 4 (iv) (a) 18' x 12' (v) No : 2 feet interspace between plots.
(vi) Yes.

4. GENERAL:
(i) Poor (ii) Nil (iii) Grain weight (iv) (a) No. (b) No (c) Nil (v) (a) (b) Nil (vi) & (vii) Nil.

5. RESULTS:
(i) 330.2 lb./ac.
(ii) 94.4 lb./ac.
(iii) The treatments are not significantly different.
(iv) Grain weight in lb./ac.

<table>
<thead>
<tr>
<th>Treatment</th>
<th>Mean.</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>365.5</td>
</tr>
<tr>
<td>2</td>
<td>277.3</td>
</tr>
<tr>
<td>3</td>
<td>291.4</td>
</tr>
<tr>
<td>4</td>
<td>306.4</td>
</tr>
<tr>
<td>5</td>
<td>467.1</td>
</tr>
<tr>
<td>6</td>
<td>273.4</td>
</tr>
</tbody>
</table>

S.E. of treatment means = 47.1 lb./ac.

Crop : Paddy (2nd crop)  Ref : K. 51 (19)
Site : Agri. Res. Stn., Pattambi.  Type 'D'

Object : To find whether treating the crop with DDT and BHC in different strengths would prevent infestation of Kodu.

1. BASAL CONDITIONS:
(i) (a) Nil (b) Paddy (c) 5000 lb./ac. G.L. and 100 to 150 lb./ac. A/S (ii) (a) Laterite loam (b) Refer soil analysis, Pattambi. (iii) 22.9.1951. (iv) (a) Puddling 6 times, levelling 3 times. (b) seedlings transplanted from wet nursery. Average age of seedling is about one month. (c)–(d) Planted in bulk. (e) 2 to 3 (v) Nil. (vi) PTB 12 Improved Short 120 days. (vii) Rainfed. (viii) One weeding 3 to 4 weeks after planting. (ix) 23.76" (18.9.1951 to 18.1.1952). (x) 18.1.1952.

2. TREATMENTS:
1. DDT 5% dust.
2. BHC 5%
3. BHC 10%
4. Control.
Dusted on 19.10.1951 and 12.11.1951.

3. DESIGN:
(i) R.B.D. (ii) 4 (b) N.A. (iii) 6 (iv) (a) (b) 7 cents (v) Nil (vi) Yes.

4. GENERAL:
(i) Satisfactory. (ii) Infestation of Kodu. No control measures other than treatments taken. (iii) Grain weight and %infection. (iv) (a) 1951 2nd crop to 1953 1st crop (Both crops in a year). (d) No (c) N.A. (v) (a), (b) Nil. (vi) & (vii) Nil.

5. RESULTS:
(i) 2311 lb./ac.
(ii) 168 lb./ac.
(iii) The treatments differ significantly.
(iv) (Grain yield in lb./ac.)

<table>
<thead>
<tr>
<th>Treatment</th>
<th>Mean.</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>2357</td>
</tr>
<tr>
<td>2</td>
<td>2143</td>
</tr>
<tr>
<td>3</td>
<td>2286</td>
</tr>
<tr>
<td>4</td>
<td>2457</td>
</tr>
</tbody>
</table>

S.E. of treatment means = 68 lb./ac.
Crop: Paddy (1st crop)  
Site: Agri. Res. Stn. Pattambi,  
Object: To find out whether treating the crop with DDT and BHC in different strengths would prevent infestation of Kadu.

1. BASAL CONDITIONS:
   (i) (a) Nil (b) Paddy (c) 4000 lb./ac. G.L. + 75 lb./ac. A/S. (ii) (a) Laterite loam (b) Refer soil analysis Pattambi. (iii) 26.5.1952; 9.7.1952 (iv) (a) 6 puddlings, 3 levellings (b) Transplanting in lines (c) 6\(^2\) x 6\(^2\) (e) 2. (v) 4000 lb. GL/ac. at the time of pudding 75 lb. A/S/ac. top dressed one month after planting. (vi) PTB 2, Improved, 135 days duration. (vii) Rainfed (viii) 2 weedings at intervals of one month from planting. (ix) 20.6.52 in 26 rainy days (20.8.52 to 19.1.1953) (x) 19.1.1953.

2. TREATMENT:
   1. DDT. 5%
   2. BHC. 5%
   3. BHC. 10%

3. DESIGN:
   (i) R.B.D. (ii) (a) 4 (b) N.A. (iii) 6 (iv) (a, b) 6 cents (v) NIL (vi) Yes.

4. GENERAL:
   (i) Satisfactory (ii) As under treatments (iii) % infection and Grain weight (iv) (a) 1951-2nd crop to 1953-1st crop (b) No (c) N.A. (v) (a, b) Nil (vi) & (vii) Nil.

5. RESULTS:
   (i) 260 lb./ac.
   (ii) 184 lb./ac.
   (iii) The treatments are highly significant.
   (iv) (Grain weight in lb. lb./ac)
<table>
<thead>
<tr>
<th>Treatment</th>
<th>Mean</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>2994</td>
</tr>
<tr>
<td>2</td>
<td>2611</td>
</tr>
<tr>
<td>3</td>
<td>2403</td>
</tr>
<tr>
<td>4</td>
<td>2397</td>
</tr>
</tbody>
</table>
   S.E. of treatment mean = 75 lb./ac.

Crop: Paddy (2nd crop)  
Object: To find whether treating the crop with DDT and BHC in different strengths would prevent infestation of Kadu.

1. BASAL CONDITIONS:
   (i) (a) NIL (b) Paddy (c) 4000 lb GL/ac. + 75 lb. A/S/ac (ii) (a) Laterite loam (b) Refer soil analysis Pattambi. (iii) 20.8.52: 1.10.52 (iv) (a) 6 puddlings, 3 levellings (b) Transplanting in lines (c) 6\(^2\) x 6\(^2\) (e) 2. (v) 4000 lb. GL/ac. at the time of pudding 75 lb. A/S/ac. top dressed one month after planting. (vi) PTB 12 Improved 120 days duration. (vii) Rainfed (viii) 2 weedings at intervals of one month from planting. (ix) 20.6.52 in 26 rainy days (20.8.52 to 19.1.1953) (x) 19-1-1953.

2. TREATMENTS:
   1. DDT. 5%
   2. BHC. 5%
   3. BHC. 10%
   4. Control. Dusting on 24.10.1952 and 25.11.52 when the infection was noticed.

3. DESIGN:
   (i) R.B.D. (ii) (a) 4 (b) N.A. (iii) 6 (iv) (a, b) 7 cents (v) NIL (vi) Yes.

4. GENERAL:
   (i) Satisfactory (ii) Infestation of Kodu “No control measures other than those mentioned under”
treatments" taken. (iii) % infection and Grain yield, (iv) (a) 1951 2nd crop to 1953 1st crop to (b) No. (c) N.A. (v) (a, b) Nil (vi) & (vii) Nil.

5. RESULTS:
(i) 2327 lb/ac.
(ii) 211 lb/ac.
(iii) The treatments are significant.
(iv) (Grain yield in lb/ac.)

<table>
<thead>
<tr>
<th>Treatment</th>
<th>Mean</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>2517</td>
</tr>
<tr>
<td>2.</td>
<td>2250</td>
</tr>
<tr>
<td>3.</td>
<td>2162</td>
</tr>
<tr>
<td>4.</td>
<td>2379</td>
</tr>
</tbody>
</table>

S.E. of treatment means = 86 lb/ac.

Crop: Paddy (1st crop)  
Ref: K. 53 (49)  
Type: 'D'

Object: To find out whether dusting of the crop with DDT and B.H.C. in different strengths would prevent the infestation of "Kodu".

1. BASAL CONDITIONS:
(i) (a) Nil (b) Paddy (c) 4000 lb. G.L./ac. + 75 lb. A/S/ac. (ii) (a) Laterite loam (b) Refer soil analysis Pattambi, (iii) 10.6.1953; 10.7.1953 (iv) (a) 6 puddlings, 3 levellings (b) Transplanting (c) - (d) 6" x 6" (e) 3 (f) 4000 lb. G.L./ac. at the time of puddling + 75 lb. A/S/ac. top dressed one month after planting (v) PTB 2. Improved 125 days duration. (vi) Rainfed (vii) 2 weedings at intervals of one month from planting. (x) 72.61" in 75 rainy days (10.6.1953 to 21.10.53) (x) 21.10.1953

2. TREATMENTS:
1. DDT dust 5%
2. B.H.C. dust 5%
3. B.H.C. dust 10%
4. Control.
Dusted on 15.8.1953.

3. DESIGN:
(i) R.B.D. (ii) (a) 4 (b) N.A. (iii) 6 (iv) (a, b) 6 cents (v) Nil (vi) Nil.

4. GENERAL:
(i) Satisfactory. (ii) As under treatments. (iii) % weight and % infection. (iv) (a) 1951-2nd crop to 1953-1st crop (b) No (c) N.A. (v) (a, b) Nil (vi) & (vii) Nil.

5. RESULTS:
(i) 2169 lb/ac.
(ii) 168.0 .. ..
(iii) Treatments differ significantly.
(iv) Grain weight in lb/ac.

<table>
<thead>
<tr>
<th>Treatment</th>
<th>Mean</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>2352</td>
</tr>
<tr>
<td>2.</td>
<td>2185</td>
</tr>
<tr>
<td>3.</td>
<td>2124</td>
</tr>
<tr>
<td>4.</td>
<td>2017</td>
</tr>
</tbody>
</table>

S.E. of treatment means = 69.0 lb./ac.

Crop: Paddy (2nd crop)  
Ref: K. 53 (48)  
Type: 'D'

Object: To find out how far spraying with insecticides would prevent the incidence of pests and diseases (stemborer).

1. BASAL CONDITIONS:
(i) (a) Nil (b) Paddy (c) 4000 lb. G.L./ac + 75 lb. A/S/ac. (ii) (a) Laterite loam (b) Refer soil analysis Pattambi (iii) 14.9.1953: 24.10.1953 (iv) (a) 6 puddlings. 3 levellings (b) Transplanting (c) - (d) 6" x 6"
(e) 2 (v) 4000 lb. G.L./ac. at the time of puddling + 75 lb. A/S/ac. top dressed one month after planting. (vi) PTB 21 Improved 125 days duration. (vii) Rainfed. (viii) One weeding one month after planting. Another weeding if required one month after 1st weeding. (ix) 17.06" in 14 rainy days (14.9.1953 to 28.1.1954) (x) 28.1.1954.

2. TREATMENTS:

1. Spraying of B.H.C. 0.1%
2. ....... do ............... 0.05%
3. ....... do ...... D.D.T. 0.2%
4. ....... do ............... 0.1%
5. Control (light trap)

Spraying was done at the nursery stage on 5.10.1953 and 18.10.1953 and after transplanting on 11.1.1953. 17.12.53

3. DESIGN:

(i) R.B.D. (ii) (a) 5 (b) N.A. (iii) 6 (iv) (a, b) 6 cents (v) Nil (vi) Yes.

4. GENERAL:

(i) Satisfactory. (ii) Under investigation. (iii) Grain weight and % infection. (iv) (a) 1950-2nd crop to 1953-2nd crop (2nd crop only) (b) No (c) N.A. (v) (a, b) Nil (vi) & (vii) Nil.

5. RESULTS:

(i) 1069 lb./ac.
(ii) 67.0 lb./ac.
(iii) The treatments differ highly significantly
(iv) Av. grain yield in lb./ac.

<table>
<thead>
<tr>
<th>Treatment</th>
<th>Mean</th>
<th>S.E. of treatment means</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>1436</td>
<td>27.0 lb./ac.</td>
</tr>
<tr>
<td>2.</td>
<td>1231</td>
<td></td>
</tr>
<tr>
<td>3.</td>
<td>1540</td>
<td></td>
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<tr>
<td>4.</td>
<td>1036</td>
<td></td>
</tr>
<tr>
<td>5.</td>
<td>1052</td>
<td></td>
</tr>
</tbody>
</table>

Crop :- Paddy (2nd crop)  
Site :- Agri. Re. Stn., Pattambi.  
Ref :- K. 52 (40)  
Type :- 'D'  
Object :- To investigate whether treatment of seedlings with insecticides would prevent pests and diseases (Stemborer) on transplanted crop.

1. BASAL CONDITIONS:

(i) (a) Nil (b) Paddy (c) 4000 lb. G.L./ac. 75 lb. A/S/ac. (ii) (a) Laterite loam (b) Refer soil analysis Pattambi. (iii) 27.9.1952; 18.11.1952. (iv) (a) 6 puddlings, 3 levellings (b) Transplanting in lines (c) — (d) 6' x 6'. (e) 2 (v) 4000 lb. G.L. at the time of puddling 75 lb. A/S/ac top dressed one month after planting. (vi) PTB 21 Improved 120 days. (vii) Rainfed. (viii) 2 weedicings at intervals of one month from planting. (ix) 16.01" in 18 rainy days. (27.9.52 to 11.2.1953) (x) 11.2.1953.

2. TREATMENTS:

1. BHC : 0.1%
2. BHC 0.05 %
3. DDT : 0.2%
4. DDT 0.1%
5. Control (light trap)

3 sprayings given to the nursery crop on 20.10.52; 3.11.52 and 15.11.1952. 2 sprayings given to the transplanted crop on 10.12.1952 and 26.12.1952.

3. DESIGN:

(i) R.B.D. (ii) (a) 5 (b) N.A. (iii) 6 (iv) (a, b) 3045 Sq. ft. (v) Nil (vi) Yes.

4. GENERAL:

(i) Satisfactory (ii) "Stemborer attack" No control measures other than those under "Treatments" taken (iii) % infection, Grain weight (iv) (a) 1950-2nd crop to 1953-2nd crop (b) No (c) N.A. (v) (a, b) Nil (vi) & (vii) Nil

5. RESULTS:

(i) 1222 lb./ac.
(ii) 163 """
(iii) The treatments differ highly significantly
(iv) Yield of grain in lb./ac.
Crop: Paddy (2nd crop)  Ref: K. 51 (18)  Type ‘D’
Site: Agri. Res. Stn., Pattambi

Object: To investigate whether treatment of seedlings with insecticides would prevent incidence of pests and diseases (Stemborer) on transplanted crop.

1. BASAL CONDITIONS:
(i) (a) Nil (b) Paddy (c) 5000/lb. G.L./ac. and 100 to 150 lb. A/S /ac.  (ii) (a) Lateritic loam (b) Refer Soil analysis Pattambi. (iii) 5.9.51; 17.10.51. (iv) (a) Puddling 6 times, leveling 3 times (b) Seedlings transplanted from wet nursery Average age of seedlings is about one month.  (c) (d) Planted in bulk (e) 2 to 3 (v) Nil (vi) PTB 21- Improved-Short 120 days. (vii) Rainfed. (viii) One weeding 3 to 4 weeks after planting (ix) 23.76” (5.9.1951 to 26.1.1952) (x) 26.1.1952.

2. TREATMENTS:
(I) BHC = 0.1%
(2) BHC = 0.05%
(3) DDT = 0.2%
(4) DDT = 0.1%
(5) Control

Date of spraying
Nursery crop.
1. 22.9.1951.  Transplanted crop.
2. 6.10.1951.  1. 15.11.1951.
3. 10.10.1951.  2. 30.11.1951.

3. DESIGN:
(i) R.B.D. (ii) (a) 5 (b) N.A. (iii) 6 (iv) (a), (b) 6.5 cents (v) Nil (vi) Yes.

4. GENERAL:
(i) Satisfactory. (ii) Stemborer attack-no control measures other than treatments taken. (iii) Grain yield
(iv) (a) 1950-2nd [crop to 1953-2nd crop only] (b) same plots for 1950-2nd crop and 1951 1st crop-another set of plots for 1951-2nd crop and 1952 second crop. (c) N.A. (v) (a), (b) Nil (vi) & (vii) Nil

5. RESULTS:
(i) 1893 lb. /ac.
(ii) 162 lb. /ac.
(iii) Treatments are significantly different.
(iv) Grain weight in lb. per ac.

<table>
<thead>
<tr>
<th>Treatments</th>
<th>Mean</th>
</tr>
</thead>
<tbody>
<tr>
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<tr>
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</tr>
<tr>
<td>4</td>
<td>1895</td>
</tr>
<tr>
<td>5</td>
<td>1572</td>
</tr>
</tbody>
</table>

S.E. of treatment mean. = 66 lb./ac.

Crop: Paddy (1st crop)  Ref: K. 51(8)  Type ‘D’

Object: To investigate whether treatment of seedlings with insecticides would prevent incidence of pests and diseases (Stemborer) on transplanted crop.
1. BASAL CONDITIONS:
   (i) (a) Nil (b) Paddy (c) N.A. (ii) (a) Laterite loam (b) Refer soil analysis Pattambi. (iii) 3.5.1951.
   (iv) (a) Puddling 6 times, levelling 3 times. (b) Seedlings transplanted from wet nursery. Average
   age of seedlings is about one month. (c)—(d) Planted in bulk (e) 2 to 3 (v) 5000 lb.G.L./ac. + 100 to
   150 lb. A/S/ac. (vi) PTB 26-Medium-125 days. Improved (vii) Rainfed (viii) One weeding 3 or 4 weeks
   after planting and another weeding if necessary. (ix) 50.25° (3.5.1951 to 23.8.1951) (x) 23.8.1951.

2. TREATMENTS:
   (1) Gammaxene 0.05%
   (2) Gammaxene 0.025%
   (3) DDT. (550) 0.25%
   (4) DDT. (550) 0.16%
   (5) Fish oil soap (1 lb. in 8 gallons of water)
   (6) Crude oil emulsion
   (7) Bordeaux mixture 20%
   (8) Control.
   All treatments applied at the time of planting by dipping the seedlings.

3. DESIGN:
   (i) R.B.D. (ii) (a) 8 (b) N.A. (iii) 4 (iv) (a), (b) 4'x30' (v) Nil (vi) Yes.

4. GENERAL:
   (i) Satisfactory; seedlings treated with crude oil emulsion and gammaxene 0.05% showed poor survival due
   to the deterioratory effect of the insecticides. Seedlings treated with Bordeaux mixture showed greatest
   resistance to stemborer attack compared to DDT and Control. (ii) Nil (iii) Grain yield (iv) (a) 1951
   (1st crop) (b) No. (c) Nil (v) (a) (b) Nil (vi) & (vii) Nil

5. RESULTS:
   (i) 2415 lb./ac.
   (ii) 163 lb./ac.
   (iii) The treatment differences are highly significant
   (iv) Grain yield in lb./ac.

<table>
<thead>
<tr>
<th>Treatment</th>
<th>Mean</th>
</tr>
</thead>
<tbody>
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</tr>
<tr>
<td>7</td>
<td>2599</td>
</tr>
<tr>
<td>8</td>
<td>2727</td>
</tr>
</tbody>
</table>

   S.E. of treatment means = 82 lb./ac.

Crop := Paddy (1st crop)
Ref := K. 51 (29)
Type := 'D'

Object := To find-out the effect of using the weed killer (Viz Dicotox) on the modan paddy as against hand
weeding.

1. BASAL CONDITIONS:
   (i) (a) Nil (b) Paddy (c) 5 C.L. CM./ac.+1000 lb. ash/ac. +50 lb. A/S/ac. (ii) (a) Laterite loam (b) Refer
   soil analysis Pattambi. (iii) 3.5.1951. (iv) (a) 4 to 5 ploughings (b) seeds broadcast (c) 75 lb./ac. (d) — (e) —
   (v) 5 C.L. of C.M./ac. at the times of a 1st ploughing 1000 lb. ash/ac. just before sowing, 50 lb. A/S/ac. one
   month after sowing. (vi) PTB 29. Improved (vii) Rainfed (viii) As under treatments. (ix) 50.25° (3.5.1951
to 23.8.1951) (x) 23.8.1951.

2. TREATMENTS:
   All combinations of (1) & (2):
   (1) 2 levels of Dicotox: \( D_0 = \frac{1}{50} \) th, \( D_1 = \frac{1}{100} \) th, \( D_2 = \frac{1}{500} \) th part of water \( D_3 = \) Hand weeding
   (2) 2 times of application: \( T_1 = \) One month after sowing
   \( T_2 = \) Two months after sowing.
   For hand weeding (\( D_3 \) the two times are:
   \( T_1 = \) at the time of 1st spraying,
   \( T_2 = \) 1st & 2nd spraying.

3. DESIGN:
   (i) 2x4 Fact in RBD. (ii) (a) 8 (b) N.A. (iii) 4 (iv) (a) (b) 4'x25' (v) Nil (vi) Yes.
4. GENERAL:
(i) Satisfactory. (ii) Nil (iii) Grain and straw. (iv) (a) Not repeated. (b) Nil (v) (a), (b) Nil (vi) & (vii) Nil

5. RESULTS:
(i) 991 lb./ac.
(ii) 146 lb./ac.
(iii) Levels of Dicotox as compared to Hand weeding are not significantly different. Weeding twice has not appreciably changed the yield as compared to a single weeding.
(iv) (Grain weight in lb./ac.)

<table>
<thead>
<tr>
<th>Treatment</th>
<th>D₁</th>
<th>D₂</th>
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<th>D₄</th>
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<td>1104</td>
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<td>T₂</td>
<td>997</td>
<td>919</td>
<td>914</td>
<td>1074</td>
<td>953</td>
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</table>

S.E. of body of table = 73 lb./ac.
S.E. of marginal means (for D) = 51 lb./ac.
S.E. of marginal means (for T) = 36 lb./ac.

Crop: Tapioca.
District: Trivandrum, Quilon and Kottayam and Trichur.

Object: To demonstrate the use or complete and balanced NPK fertilizers.

1. BASAL CONDITIONS:
(i) (a) N.A. (b) In most of the cases Tapioca. (c) N.A. (ii) Laterite. (iii) Applying about 3000 lb. C.M./ac. mixed with 1000 lb. wood ash/ac. if the latter is available at the time of forming mounds and ridges. (iv) Aryan or Nedumangadan, Local. (v) (a) & (b) Preparing the land by digging the field with a spade to a depth of about a foot and half or ploughing twice or thrice to obtain proper tilth. Forming small heaps or mounds or making ridges and furrows. (c)-(d) three to four feet for planting sets with the receipt of good pre-monsoon showers. (e) 1. (vi) March, 1953 (vii) Irrigated. (viii) Interplanting and weeding three or four times depending upon weed growth and rainfalls. Harvesting by lifting the tubers as the crop matures after nine to fifteen months of planting depending upon the variety and local needs. (ix) N.A. (x) January, 1954.

2. TREATMENTS:
(I) Control (Untreated)
(2) 105 lb. N + 135 lb. P + 150 lb. K.

In the control plot, the owners applied their own manures mostly ashes but some of them also used chemical fertilizers. In the N.P.K. plots half of the mixture was given before planting; half at the time of 1st intercultivation and the balance at the time of 2nd intercultivation.

3. DESIGN:
(i) No randomisation was adopted but care was taken to select a field, which could be considered as representing local tract conditions. (ii) Eleven fields. (iii) On an average of about 2400 sq. ft. It may be mentioned that the number of plants was different according to the spacing which changed from one field to another and even from one plot to another. Usually the control plots were narrowly planted than NPK plots. (iv) N.A.

4. GENERAL:
(i) Normal (ii) Nil. (iii) Weight of Tapioca Tubers. (iv) (a) No (b) & (c) N.A. (v) (a) (b) N.A. (vi) Nil.
(vii) Nil

5. RESULTS:
(i) 24458 lb./ac.
(ii) 2671 lb./ac.
(iii) Treatment differences are highly significant.
(iv) Weight of green tapioca tubers in lb./ac.

<table>
<thead>
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<th>Treatment</th>
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<tbody>
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<td>Control</td>
<td>20051</td>
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<tr>
<td>NPK</td>
<td>28864</td>
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</table>

S.E. of treatment mean = 805.5 lb./ac.
Crop : Tapioca.


Object: To find out the effect of applying borax on the yield of Tapioca.

1. **BASAL CONDITIONS**:
   (i) (a) Nil (b) Paddy. (c) 10 C.L. of C.M./ac.+1000 lb. of Wood ash./ac.+2 cwt of G.N.C./ac. (ii) (a) Laterite loam (b) Refer soil analysis Pattambi. (iii) 2.8.1948. (iv) (a) 6 ploughings (b) forming ridges and planting cuttings of 1 foot length along the ridges (c)---(d) 24 feet between ridges and 9" between plants (e) Single cutting. (v) Nil (vi) Valencia local variety, one year duration. (vii) Rainfed. (viii) 2 ‘mamathy’ weeding and earthing up whenever weed growth is found. (ix) 101.29" in 113 rainy days. (2.8.48 to 3.8.49) (x) 3.8.1949.

2. **TREATMENTS**:
   (1) 0 lb. Borax/ac.
   (2) 7½ lb. " "
   (3) 15 lb. " "
   (4) 22 lb. " "
   (5) 30 lb. " "
   Applied in plough furrows and covered up during last plough.

3. **DESIGN**:
   (i) R.B.D. (ii) (a) 5 (b) N.A. (iii) 4 (iv) (a) (b) 6'×15' (v) Nil (vi) Yes.

4. **GENERAL**:
   (i) Satisfactory. (ii) Nil (iii) Tuber weight. (iv) (a) 1947 to 1953 (b) Yes (c) N.A. (v) (a) (b) Nil. (vi) & (vii) Nil.

5. **RESULTS**:
   (i) 11019 lb./ac.
   (ii) 3775 lb./ac.
   (iii) The treatments differences are significant
   (iv) Tuber weight in lb./ac.

<table>
<thead>
<tr>
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</thead>
<tbody>
<tr>
<td>1</td>
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<td>4</td>
<td>9680</td>
</tr>
<tr>
<td>5</td>
<td>5808</td>
</tr>
</tbody>
</table>

S.E. of treatment means =1887 lb./ac.

---

Crop : Tapioca.


Object: To find out whether application of borax will increase the tuber yield of Tapioca.

1. **BASAL CONDITIONS**:
   (i) (a) Nil (b) Paddy (c) Same experiment was in these plots. (ii) (a) Laterite loam (b) Refer soil analysis, Pattambi. (iii) 12.8.1949. (iv) (a) Ploughing 2 or 3 times. Making Ridges 3' apart (b) Planting setts of length 9" to 12" (c)---(d) 1 foot. (e) Single sett per hole. (vi) Valencia, local, late (vii) Rainfed. (viii) 1st weeding one month after planting. 2nd weeding 4 months after planting. (ix) 153.41" (12.8.1949 to 16.8.1950) (x) 16.8.1950.

2. **TREATMENTS**:
   (1) 0 lb./ac borax
   (2) 20 " "
   (3) 30 " "
   (4) 40 " "
   Applied two to three weeks before planting.

3. **DESIGN**:
   (i) R.B.D. (ii) (a) 4 (b) N.A. (iii) 6 (iv) (a), (b) 10'×12' (v) Nil (vi) Yes.

4. **GENERAL**:
   (i) Satisfactory. (ii) Nil (iii) Tuber weight. (iv) (a) 1949 to 1952 (b) Yes (c) N.A. (v) (a) (b) Nil (vi) & (vii) Nil.
5. RESULTS:
   (i) 13417 lb./ac.
   (ii) 3663 lb./ac.
   (iii) The treatments are not significantly different.
   (iv) (Tuber weight in lb./ac.)

<table>
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<th>Mean</th>
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<tbody>
<tr>
<td>1</td>
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<td>2</td>
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</tr>
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<td>3</td>
<td>13856</td>
</tr>
<tr>
<td>4</td>
<td>13311</td>
</tr>
</tbody>
</table>

S.E. of treatment means = 1496 lb./ac.

Crop: Tapioca
Object: To study the effect of borax on the yield of Tapioca.

1. BASAL CONDITIONS:
   (i) (a) Nil (b) Paddy (c) Same exp. was in these plots.
   (ii) (a) Laterite loam (b) Refer soil analysis Pattambi (iii) 2.8.1951 (iv) (a) 3 ploughings; ridges formed 3 feet apart; (b) 9” cuttings with 3 nodes planted on the ridges. (c) Nil.
   (d) Nil.
   (e) Nil. (f) Valencia local variety, 11 months long. (vii) Unirrigated.
   (viii) Rainfed. (ix) 3 weedings at intervals of one month beginning from 1st month after planting. Earthing up during 2nd and 4th month. (x) 24.7.1952.

2. TREATMENTS:
The following doses of Borax/ac.
   (i) 0 lb/ac. (2) 20 lbs/ac. (3) 30 lb/ac. (4) 40 lb/ac. Applied one month before planting in the form of borax.

3. DESIGN:
   (i) R.B.D. (ii) (a) 4 (b) N.A. (iii) 6 (iv) (a) (b) 12’x15’ (v) Nil (vi) Yes.

4. GENERAL:
   (i) Poor (ii) Nil (iii) Tubers weight (iv) (a) 1949 to 1952 (b) Yes (c) N.A. (v) (a) (b) Nil (vi) & (vii) Nil.

5. RESULTS:
   (i) 6224 lb./ac.
   (ii) 3432 lb./ac.
   (iii) The treatments differences are not significant.
   (iv) Tuber weight in lb./ac.

<table>
<thead>
<tr>
<th>Treatment</th>
<th>Mean</th>
</tr>
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<tbody>
<tr>
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<td>3</td>
<td>4942</td>
</tr>
<tr>
<td>4</td>
<td>4830</td>
</tr>
</tbody>
</table>

S.E. of treatment means = 1491 lb./ac.

Crop: Tapioca
Site: Agri. Res. Sta., Pattambi
Object: To investigate the optimum dose of borax for Tapioca to give maximum yield.

1. BASAL CONDITIONS:
   (i) (a) Nil (b) Paddy (c) Same exp. was in these plots.
   (ii) (a) Laterite loam (b) Refer soil analysis Pattambi (iii) 2.8.1951 (iv) (a) 3 ploughings; ridges formed 3 feet apart; (b) 9” cuttings with 3 nodes (c) Nil.
   (d) Nil.
   (e) Nil. (f) Valencia local variety, 11 months long. (vii) Unirrigated.
   (viii) Rainfed. (ix) 3 weedings at intervals of one month beginning from 1st month after planting. Earthing up during 2nd and 4th month. (x) 24.7.1952.
2. **TREATMENTS:**

The following doses of borax applied

(1) 0 lb/ac.
(2) 20 lb/ac.
(3) 30 lb/ac.
(4) 40 lb/ac.

Applied one month before planting in the form of Borax on 31.7.1951.

3. **DESIGN:**

(i) R.B.D. (ii) (a) 4 (b) N.A. (iii) 6 (iv) (a), (b) 15'×12' (v) Nil (vi) Yes.

4. **GENERAL:**

(i) Satisfactory (ii) Nil (iii) Tuber weight (iv) (a) 1949 to 1952 (b) Yes (c) N.A. (v) (e) (b) Nil (vi) & (vii) Nil.

5. **RESULTS:**

(i) 7018 lb/ac.
(ii) 1967 lb/ac.
(iii) The treatments differences are highly significant.
(iv) (Tuber weight in lb/ac.)

<table>
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<tr>
<th>Treatments</th>
<th>Mean</th>
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<tbody>
<tr>
<td>1</td>
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</tr>
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<td>3</td>
<td>5525</td>
</tr>
<tr>
<td>4</td>
<td>3509</td>
</tr>
</tbody>
</table>

S.E. of treatment means = 803 lb/ac.

---

_Crop :- Tapioca._  
_Site :- Agri. Res. Stn. Pattambi._  
_Object :- To study the effect of Borax on the yield of Tapioca._  
_Ref. :- K. 52 (25)  
_Type :- ‘M’

1. **BASAL CONDITIONS:**

(i) (a) Nil (b) Tapioca. (c) same expt. was in these fields. (ii) (a) Laterite loam (b) Refer soil analysis Pattambi (iii) 31.7.1953 (iv) (a) 3 ploughing; forming ridges 3 feet apart. (b) planting along ridges (c)—(d) 1 foot (e) 1 (v) Nil (vi) Local variety (vii) Unirrigated. (viii) one weeding (ix) 89.8" in 95 rainy days (31.7.1952 to 23.7.1953) (x) '23.7.1953.

2. **TREATMENTS:**

1. Control
2. 20 lb/ac. Borax
3. 33 lb/ac. Borax
4. 40 lb/ac. Borax

Borax applied on 31.5.1952.

3. **DESIGN:**

(i) R.B.D. (ii) (a) 4 (b) N.A. (iii) 6 (iv) (a) 14'×16' (b) 12'×15' (v) 1 row on all round the net plot (vi) Yes.

4. **GENERAL:**

(i) Poor. (ii) Nil (iii) Weight of tubers. (iv) (a) 1949 to 1952 (b) Yes (c) N.A. (v) (e) (b) Nil (vi) & (vii) Nil.

5. **RESULTS:**

(i) 6917 lb/ac.
(ii) 2892 lb/ac.
(iii) The treatments do not differ significantly.
(iv) (Tuber weight in lb/ac.)

<table>
<thead>
<tr>
<th>Treatments</th>
<th>Mean</th>
</tr>
</thead>
<tbody>
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</tr>
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<td>4</td>
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</tbody>
</table>

S.E. per treatment mean = 1181 lb/ac.
Crop :- Tapioca.
Site :- Tapioca Res. Stn. Tiruvalla

Object :- To find out responses to different doses of N, P, and K singly and in combinations.

1. BASAL CONDITIONS:
(i) (a) Nil (b) Tapioca (c) 2000 lb. of F.Y.M./ac. (ii) Laterite (b) Refer soil analysis (iii) 27.5.1953, (iv) Ploughed two rounds before planting (b) Erect Planting of fresh cuttings of uniform length (4") on small mounds in lines (c)----(d)3’ x 3’ (e) one cutting per hole. (v) Applied 3240 lb./ac. F.Y.M. equally distributed in the different plots one month before planting. Cowdung procured from different cattle sheds dried and powdered. Weighed quantity applied uniformly in shallow pits over which small mounds for planting the cuttings raised, according to local practice. (vi) Aryan—Medium—Local (vii) Un-irrigated. (viii) Inter culturing three times at an interval of two months from planting. Weeding along with interculture. (ix) 80’ (27.5.1953 to 11.3.1954) (x) 11.3.1954.

2. TREATMENTS:
Main plots:
All combinations of (1) x (2) where
(1) A/S at N1=0 lb. N/ac.  
   N2=50 lb. N/ac.  
   N3=100 lb. N/ac.
(2) Muriate of potash at 
   /K1=0 lb. K/ac.  
   K2=80 lb. K/ac.  
   K3=160 lb. K/ac.
Super plots:
Super at  
P1=0 lb. P2O5/ac.  
P2=80 lb. P2O5/ac.

3. DESIGN:
(i) Split plot (ii) 9 main plots per block and 2 sub-plots/main plot. (b) N.A. (iii) 6 (iv) (a) main-plot 30’x18’ sub-plot 30’x9’ (b) main-plot 24’x12’ sub-plot 24’x3’. (v) One row round each sub-plot. (vi) Yes.

4. GENERAL:
(i) Growth very good in N3P2 plots and poor in control and K1 plots. (ii) Termite attack in many of the plots. Sprinkling of gammaxane and watering reduced severity of attack and it stopped with heavy rains. (iii) Tuber weight. Height of plants and number of sprouts. (iv) N.A., (v) Yes (a) Tapioca Res. Stn. Trivandrum; Tapioca and Sweet Potato Res. Stn. Mannuthy. (b) Nil (vi) Replanting had to be done twice in some of the plots to fill up gaps caused by termite attack. (vii) Nil.

5. RESULTS:
(i) 17922 lb./ac.  
(ii) (a) 5427 lb./ac.  
(b) 4356 lb./ac. (iii) Main effect of N alone is highly significant (iv) Tuber weight in lb. per acre.

<table>
<thead>
<tr>
<th>N1</th>
<th>N2</th>
<th>N3</th>
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<tr>
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<td>22763</td>
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<td>K1</td>
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<tr>
<td>Mean</td>
<td>13180</td>
<td>17822</td>
<td>22763</td>
</tr>
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</table>
Object: To study the effect of root inducing hormone "Hortomone-A" on yield and drought resistance.

1. BASAL CONDITIONS:
   (i) (a) Nil (b) Tapioca (c) Nil
   (ii) (a) Laterite (b) Refer soil analysis
   (iii) 7.10.1953
   (iv) (a) Ploughed two rounds (b) Erect planting of fresh cuttings of uniform length on small mounds in line
   (v) Applied 1000 lb. of F.Y.M./ac. equally distributed in the plots one month before planting
   (vi) Cowdung procured from different cattle sheds dried and powdered. Measured quantity of it applied uniformly in shallow pits over which small mounds for planting raised according to local practice.
   (vii) Aryan—local—Medium. (viii) Un-irrigated. (ix) Interculturing 3 times at 2 months interval, weeding along with interculture.
   (x) 80° (25.9.1952 to 16.9.1953). (x) 16.9.1953

2. TREATMENTS:
   All Combinations of (1), (2)
   (1) 3 Hortomone dilutions:—1, 2 and 3
   (2) 3 durations of application:—8, 14 and 20 days
   and one Control (seeds not treated)

3. DESIGN:
   (i) R.B.D. (ii) (a) 10 (b) N.A. (iii) 5
   (iv) (a) 33'×12' (b) 27'×6' (v) one row all round each plot (vi) Yes.

4. GENERAL:
   (i) Almost uniform growth in all the plots. (ii) Nil
   (iii) Tuber weight. Height of plants and number of sprouts.
   (iv) (a) 1952 to 1953 (b) Yes. (c) N.A. (v) (a) (b) Nil (vi) & (vii) Nil.

5. RESULTS:
   (i) 13315 lb./ac.
   (ii) 1197 lb./ac.
   (iii) The different dilutions alone are significant.
   (iv) Mean yield in lb./ac.

Control=13767 lb./ac.

<table>
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<td>1258</td>
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Mean: 13218 13919 13157 13265

S.E. for any marginal mean =309 lb./ac.
S.E. for the body of table =525
S.E. for the diff. control and any other mean =742 lb./ac.

Crop: Tapioca
Site: Tapioca Res. Stn. Tiruvalla

Ref: K. 52 (1)
Type: 'M'

Object To study the effect of the root inducing hormone "Hortomone A" on yield and drought resistance.

1. BASAL CONDITIONS:
   (i) (a) Nil. (b) Tapioca. (c) 100 lb. F.Y.M./ac.
   (ii) (a) Laterite (b) Refer soil analysis
   (iii) 7.10.1953
   (iv) (a) Ploughing two rounds before planting (b) Erect planting of fresh cuttings of uniform length on
small mounds in line, after dipping basal ends of cuttings in solutions (as per treatments); (c)–
(d) 3 × 3 (e) One cutting/hole (v) Applied 1500 lb. F.Y.M./ac. equally distributed in the different plots one
month before planting. Cowdung procured from different cattle sheds dried and powdered. Measured
quantity of it applied uniformly in shallow pits over which small mounds for planting were raised according
to local practices. (vi) Arjyali, Medium, Local. (vii) Un-irrigated. (viii) Intercultivating, three times at two

2. TREATMENTS:
All combinations of (1) & (2).
(1) 3 Hartonome dilutions:— 1, 2 and 3
(2) 3 durations of application:— 8, 14 and 20 days
and one control (no treatment)

3. DESIGN:
(i) R.B.D. (ii) (a) 10 (b) N.A. (iii) 5 (iv) (a) 33’ × 12’ (b) 27’ × 6’ (v) One row discarded around net plot
(vi) Yes.

4. GENERAL:
(i) Almost uniform growth in all plots (b) Nil (iii) Tuber weight, height of plants and number of sprouts (iv)
(a) 1952-1953 (b) Yes (c) N.A. (v) (a;b) Nil (vi) & (vii) Nil.

5. RESULTS:
(i) 15276 lb./ac.
(ii) 1447 lb./ac.
(iii) Main effects, interaction and Control vs others are not significant.
(iv) (Mean yield in lb./ac.)

<table>
<thead>
<tr>
<th>Durations</th>
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<td>20</td>
<td>14466</td>
<td>16375</td>
<td>15327</td>
<td>15318</td>
</tr>
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</table>

S.E. of the marginal means = 374 lb./ac.
S.E. of the body of table = 648 lb./ac.
S.E. of diff. of control vs any other mean = 915 lb./ac.

Crop: Tapioca
Site: Tapioca Res. Stn: Trivandoned
Object:—To determine the optimum doses of NPK manures for tapioca.

Ref: 48(14)
Type: ‘M’

1. BASAL CONDITIONS:
(i) (a) Nil (b) Tapioca (c) 2 tons of cow dung/ac. (ii) (a) Laterite soil (b) Refer soil analysis Trivandoned.
(iii) 21.4.1948. (iv) (a) Soil tilled to 18” depth (b) Cuttings of length 8” planted erect (c)–(d) 3’ spacing (e)
Single cutting/hole. (v) Two tons of cow dung/ac. during tillage operations. (vi) Variety No. 32 Local
medium. (vii) Partially irrigated. (viii) Intercultivated after 14 months. Weeding done after 3 months. (ix)
About 67” (21.4.1948 to 27.2.1949). (x) 27.2.1949.

2. TREATMENTS:
All combinations of two levels of N, two levels of P and two levels of K.
Levels of N
N0 = 0
N1 = 4 cwt A/S/ac. 2 months after planting by broadcast.
Levels of P
P0 = 0
P1 = 2 Cwt/ac. as super liquid manure at planting
Levels of K
K0 = 0
K1 = 2 tons/ac. of ash in two equal doses, at planting and 2 months after planting.
3. **DESIGN:**

(i) 2x2x2 Factorial partially confounded. Confounding NPK in 1st replication. PK in 2nd replication. NK in 3rd replication and NP in 4th replication. (ii) (a) 2 blocks/replication. 4 plots 1 block (b) N.A.

(iii) 4 (iv) (a)(b) 9'x12'. (v) Nil (vi) Yes.

4. **GENERAL:**

(i) Good (ii) Nil (iii) Tuber/weight (iv) (a) 1947 to 1950 (b) Yes (c) N.A. (v) (a) Nil (b) Nil. (vi) & (vii) Nil.

5. **RESULTS:**

(i) 2052 lb./ac.

(ii) 4626 lb./ac.

(iii) K alone is highly significant

(iv) Av. Tuber weight in lb/ac.

<table>
<thead>
<tr>
<th></th>
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<td>K1</td>
<td>24361</td>
<td>26519</td>
<td>25440</td>
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</table>

Mean 20530 20520 20525

S.E. of body of table = 1638 lb./ac.

S.E. of marginal means = 1158 lb./ac.

Crop: Tapioca

Site: Tapioca Res. Stn. Trivandrum.

Ref: K. 49(17)/48(14)

Type: 'M'

Object: To determine the optimum doses of N, P, K; manures for Tapioca.

1. **BASAL CONDITIONS:**

(i) (a) Nil (b) Tapioca (c) As per treatments (ii) (a) Laterite soil (b) Refer soil analysis Trivandrum. (iii) 3.5.1949 (iv) (a) Tilled the soil to a depth of 18' by digging shallow pits were taken according to design (b) Cuttings planted; length 8'. Erect planting. (c) (d) 3' (e) Single cutting per hole. (v) Two tons of Cowdung/ac. as basal dressing applied during tilling operation by broadcast. (vi) "Kalikalan" - Variety 97-locus-Medium (vii) Partially irrigated, hand watering. (viii) Intercultivation after 14 months and weeding done after 31 months of planting. (ix) 66 to 67 inches (3.5.1949 to 2.3.1950) (x) 2.3.1950.

2. **TREATMENTS:**

All combinations of N, P and K each at two levels.

Levels of N:

N0=No A/S

N1=4 cwt/ac. as A/S

Levels of P:

P0=No Super

P1=2 cwt super/ac.

Levels of K:

K0=No ash

K1=2 tons of ash/ac.

A/S applied two months after planting. Super as liquid measure at the time of planting. Ash in two doses at planting and two months after planting.

3. **DESIGN:**

(i) 3 2 factorial with partial confounding. Confounding NPK in replication I, PK in replication II, NK in replication III and NP in replication IV. (ii) (a) 2 blocks/replication 4 plots/block (b) N.A. (iii) 4 (iv) (a) (b) 12'x9' (v) Nil (vi) Yes.

4. **GENERAL:**

(i) Good (ii) Nil (iii) Tuber weight (iv) (a) 1947 to 1950 (b) Yes. (c) N.A. (v) (a, b) Nil (vi) & (vii) Nil.
5. RESULTS:

(i) 24982 lb./ac.
(ii) 2476 lb./ac.
(iii) K alone is highly significant.
(iv) Tuber weight in lb./ac.

<table>
<thead>
<tr>
<th></th>
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<tr>
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<td>24982</td>
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</tbody>
</table>

S.E. of body of table = 870 lb./ac.
S.E. of Marginal Means = 621 lb./ac.

Crop: Tapioca.  
Site: Tapioca Res. Stn. Trivandrum.  
Ref.: K. 50 (34)/49(17)/48(14)  
Type: 'M'

Object: To determine the optimum doses of N, P, K manures for Tapioca.

1. BASAL CONDITIONS:

(i) (a) Nil (b) Tapioca (c) As per treatments and basal dressing of previous year.
(ii) (a) Laterite soil (b) Refer soil analysis Trivandrum.
(iii) 24.4.1950.
(iv) (a) Soil tilled to a depth of 18" by digging (b) 8" cuttings planted erect in shallow pits (c) single cuttling/plot. (v) 2 tons of Cowdung/ac. applied during tilling by broadcast. (vi) Variety No. 97, Local Medium. (vii) Partially irrigated. (viii) Inter- 
cultivation after 14 months and weedings after 4 months of planting. (ix) 66 to 67" (24.4.50 to 17.5.1951) (x) 17.5.1951.

TREATMENTS:

All combinations of N, P, K each at two levels.

Levels of N

N₀ = No A/S  
N₁ = 4 cwt/ac. A/S

Levels of P

P₀ = No super  
P₁ = 2 cwt of super/ac.

Levels of K

K₀ = No ash  
K₁ = 2 tons of ash/ac.

N as A/S by broadcasting two months after planting.

P₀, P₁ as Super in the form of liquid manure at the time of planting.

K as ash in two doses at the time of planting and two months after planting.

3. DESIGN:

(i) 2² partial confounding. NPK in the 1st Repl. KP in the 2nd Repl. NK in the 3rd Repl. NP in the 4th Repl. (ii) 2 blocks/Repl. 4 plots block (b) N.A. (iii) 4 (iv) (a) (b) 9' x 12' (v) Nil (vi) Yes.

4. GENERAL:

(i) Good. (ii) Nil (iii) Tuber weight (iv) (a) 1947-1950 (b) Yes. (c) N.A. (v) (a) (b) Nil. (vi) & (vii) Nil.

5. RESULTS:

(i) 27924 lb./ac.
(ii) 2357 lb./ac.
(iii) N and NK are significant. K is highly significant. Others are not significant.
[iv] Tuberc weight in lb/ac.

<table>
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S.E. of body of table = 891 lb/ac.
S.E. of Marginal means = 629 lb/ac.

Crop: Tapioca.
Site: Tapioca Res. Stn. Trivandrum.

Object: To find the optimum dose of N,P,K manure for Tapioca to give the best yield.

1. BASAL CONDITIONS
(i) (a) Nil (b) Tapioca (c) Basal dressing of equal proportion of Cow dung and compost at 5 tons/ac and top dressing of ash (4% K2O) at 1 ton/ac. (ii) (a) Laterite soil. (b) Refer soil analysis Trivandrum. (iii) 17.5.1952. (iv) (a) The soil is brought to a fine tilting. Shallow pits of 3’ spacing are taken. (b) 8’ length cuttings of uniformly good condition planted erect in lines. (c)–(d) 3’. (e) 1 cutting hole. (v) Night soil compost 3 tons/ac. broadcast uniformly before the 1st tilting. (vi) No : 97 (KaliKalan) Medium (9 to 10 months) local variety. (vii) Partially irrigated. (viii) After intercultivation on 12.5.1952. Super was worked in to the Sub-plot. One week after A/S and Muriate of Potash were also applied and worked into the soil. Weeded twice after intercultivation. (ix) 67.3 (17.5.52 to 5.3.1953). (x) 5.3.1953.

2. TREATMENTS:
   All possible combinations of 3 levels N, 3 levels of K applied in main plots and 2 levels of P applied in sub-plots.
   N is applied in the form of A/S, K in the form of M.O.P. and P in the form of super.
   Main plot: All combinations of (1) × (2)
   (1) 3 levels of N
   N1 = A/S at 0 lb N/ac.
   N2 = A/S at 50 lb N/ac.
   N3 = A/S at 100 lb N/ac.
   (2) 3 levels of K2O
   K1 = Muriate of Potash at 0 lb K/ac.
   K2 = 80 lb K/ac.
   K3 = 160 lb K/ac
   Sub plot: 2 levels of P2O5
   P1 = Super at 0 lb P2O5/ac
   P2 = 80 lb P2O5/ac

3. DESIGN:
(i) Split plot. (ii) (a) 9 main plots 2 Sub plot/main plot (b) N.A. (iii) 6 (iv) (a) 30’×18’ (main plot) 30’×9’ (sub-plot) (b) 24’×12’ (main plot) 24’×3’ (sub-plot) (v) One row all round the net sub-plot. (vi) Yes.

4. GENERAL:
(i) Vigorous growth in treated plots. (ii) Nil. (iii) Tuberc weight and weight of vegetative parts per sub-plots. (iv) 1952 to 1955 (b) Yes (c) N.A. (v) (a) Tapioca Res. Stn. Trivualla, Tapioca and Sweet Potato Res. Stn. Mannuthy. (b) N.A. (vi) & (vii) Nil.
5. RESULTS:

(i) 19228 lb./ac.
(ii) (a) 4404 lb./ac.
(b) 3243 lb./ac.
(iii) N alone is significant.
(iv) Tuber weight in lb./ac.

<table>
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<tr>
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</table>

S.E. of body of NK table = 1270 lb./ac.
S.E. of difference of two N or K marginal means = 1041 lb./ac.
S.E. of difference of two P marginal means = 623 lb./ac.
S.E. of difference of two N or K means for the same level at P1: = 1289 lb./ac.
S.E. of difference of two P means for the same level of N or K: = 1081 lb./ac.

Crop: - Tapioca
Site: - Tapioca Res. Strn. Trivandrum.
Object: - To determine the optimum dose of N, P, K manures singly and in combinations.

1. ASAL CONDITIONS:

(i) (a) Nil (b) Tapioca (c) As under basal dressing K 52 (9) and as per treatments. (ii) (a) Laterite soil. (b) Refer soil analysis Trivandrum. (iii) 1.5.1953. (iv) (a). The soil well tilled, levelled. (b) Erect planting of cuttings (8" length) in shallow pits. (c)—(d) 3' spacing (e) single cutting/hole. (v) Night soil at the rate of 3 tons/ac. broadcast uniformly before tilling. (vi) No: 97-medium (matures at 9 to 10 months). (vii) Partially irrigated with pipe water. (viii) Intercultivated on 22.6.53 and 24.6.53 before and after applying the manures. The surface soil well raked for mixing the manures with the soil. Two weedings before harvest: (ix) 67.53" (1.5.1953 to 2.2.54). (x) 2.2.1954.

2. TREATMENTS:

Main plot: All combinations of (1)&(2)
(1) 3 levels of N
   N1 = A/S at 0 lb N/ac.
   N2 = A/S at 50 lb N/ac
   N3 = A/S at 100 lb N/ac
145

\[ K_2 = \text{Muriate of Potash at 0 lb K/ac} \]

\[ K_3 = \ldots \quad \text{at 80 lb K/ac} \]

\[ K_4 = \ldots \quad \text{at 160 lb K/ac} \]

Sub plot, 2 levels of \( P_2O_5 \)

\[ P_1 = \text{Super at 0 lb P}_2O_5/\text{ac} \]

\[ P_2 = \text{Super at 80 lb P}_2O_5/\text{ac} \]

3. DESIGN:

(i) Split plot (ii) (a) 9 main plots/block; 2 sub-plots/main-plot. (b) N.A. (iii) 6 (iv) (a) 27' x 18' main-plot 27' x 9' sub-plot. (b) 21' x 12' main-plot 21' x 3' sub-plot. (v) One row all round the sub-plot. (vi) Yes.

4. GENERAL:

(i) General growth good, vegetative growth vigorous in treated plots as compared to control. (ii) Nil. (iii) Weight of tubers and vegetative parts. (iv) (a) 1952 to 1955. (b) Yes (c) N.A. (v) (a) Tapioca and Sweet Potato Res. Stn. Mannuthy; Tapioca Res. Stn., Tiruvalla (b) N.A. (c) N.A. (vi) Nil (vii) Mentioned in full in the "Report on the Combined Scheme of Research on Tapioca and Potato" (July 1st, '53 to June 30, 1954).

5. RESULTS:

(i) 18388 lb./ac.

(ii) (a) 5224 lb./ac.

(b) 3970 lb./ac.

(iii) N & P are highly significant.

(iv) Tuber weight in lb./ac.

<table>
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<tr>
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<th>N₃</th>
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</table>

<table>
<thead>
<tr>
<th></th>
<th>P₁</th>
<th>P₂</th>
<th>P₃</th>
<th>Mean</th>
</tr>
</thead>
<tbody>
<tr>
<td>( P_1 )</td>
<td>14780</td>
<td>17256</td>
<td>18561</td>
<td>16865</td>
</tr>
<tr>
<td>( P_2 )</td>
<td>16968</td>
<td>20576</td>
<td>22189</td>
<td>19911</td>
</tr>
</tbody>
</table>

Crop := Tapioca.

Site := Tapioca Res. Stn. Trivandrum.

Object := To determine the intake of potash by the tapioca plant at various stages of growth.

Ref := K. 52 (27).

Type := 'M'.
1. BASAL CONDITIONS:
   (i) (a) Nil. (b) Tapioca. (c) 3 ton of compost and half a ton ash/ac. as basal dressing. (ii) (a) Laterite soil. (b) Refer soil analysis Trivandrum. (iii) 12.6.1952. (iv) (a) Tilled the ground well to a depth of 15"; shallow pits were taken. (b) Stem cuttings (8" long) were planted. (c) (d) 3' spacing. (e) Single cutting/hole. (v) Cowdung and compost at the rate of 2 ton/ac. Also Mur. of Pot. to supply K\(\text{\textsubscript{2}}\)O/ac. applied before planting. (vi) Kalikalan. (No 97) Medium. (vii) Partially irrigated. (viii) First intercultivation was done after 1\(\frac{1}{2}\) months of planting. Weeding and earthling up were done after 3 months of growth. (ix) 67.5°. (x) 22.6.1953.

2. TREATMENTS:
   Each block was treated with Mur.of Pot. to supply 100 lb. K\(\text{\textsubscript{2}}\)O/ac. to supply the rate of 2 ton/ac. Also Mur. of Pot. to supply 100 lb. K\(\text{\textsubscript{2}}\)O/ac. applied before planting. At the end of each month potash was applied at 50 lb/ac. K\(\text{\textsubscript{2}}\)O until harvest. It was applied 6 inches away from plant base.

3. DESIGN:
   (i) R.B.D. (ii) (a) Each block contains 64 plants out of which 11 plants out of which 11 plants were selected at random one each at the end of every month beginning from August and ending with June. (iii) 4. (iv) Single plant. (v) Marginal plants in each block were discarded from selecting. (vi) Yes.

4. GENERAL:
   (i) Good (ii) Nil. (iii) One plant from each block was selected at random at intervals of one month and the tuber, stem and leaves were analysed separately to estimate the % of potash: (iv) (a) 1952 Repeated during 1954. (b) No (c) Nil. (v) (a,b) Nil. (vi) & (ii) Nil.

5. RESULTS:
   (i) 1.026 (\%K\(\text{\textsubscript{2}}\)O expressed as on dry matter).  
   (ii) 0.131
   (iii) It is observed that at the age of 4 months the tubers absorb largest quantity of potash and hence may be regarded as the best period of applying potassic fertilisers. The treatments (age in months) are highly significant different.
   (iv) Percentage of potash (K\(\text{\textsubscript{2}}\)O) in tuber. (Expressed as percent on dry matter).

<table>
<thead>
<tr>
<th>Age in months</th>
<th>Mean</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>1.250</td>
</tr>
<tr>
<td>2</td>
<td>1.288</td>
</tr>
<tr>
<td>3</td>
<td>1.568</td>
</tr>
<tr>
<td>4</td>
<td>1.033</td>
</tr>
<tr>
<td>5</td>
<td>0.828</td>
</tr>
<tr>
<td>6</td>
<td>0.936</td>
</tr>
<tr>
<td>7</td>
<td>0.866</td>
</tr>
<tr>
<td>8</td>
<td>0.740</td>
</tr>
<tr>
<td>9</td>
<td>0.789</td>
</tr>
<tr>
<td>10</td>
<td>0.990</td>
</tr>
<tr>
<td>11</td>
<td>0.998</td>
</tr>
</tbody>
</table>

S.E. of month means 0.065 per cent of K\(\text{\textsubscript{2}}\)O expressed as on dry matter.

---

**Crop:** Tapioca.  
**Ref:** K. 53 (12).  
**Type:** 'M'.

**Object:** To find the effect of organic nitrogen on the hydrocyanic acid content of tapioca.

**BASAL CONDITIONS:**
(i) (a) Nil. (b) Tapioca. (c) Compost at 3\(\text{\textsubscript{\text{ton}}}\)/ac. + ash at one ton/ac. (ii) (a) Laterite soil (b) Refer soil analysis Trivandrum. (iii) 10.8.1953. (iv) (a) Soil well tilled. (b) Erect planting of cuttings (8" length) in shallow pits. (c) (d) 2' between plants. (e) Single cutting/hole. (v) Ash at the rate of 10 cwts/ac. after tilling the plot and before planting. Applied to each pit and mixed with the soil. (vi) Kalikalan (No: 97) Medium variety; matures at 9-10 months. (vii) Partially irrigated. Hand watering twice a week up to two months when there is no rain. Source pipe water intensity : Sufficient to promote good growth till the ensuing monsoon (June to July). (viii) After intercultivation, manures were applied. Weeded once before harvesting. (ix) 67.23°. (x) No harvest.

2. TREATMENTS:
   A: — Control.  
   B: ←A/S to provide 40 lb. N/ac. (The 7 months from Nov. to May during which H.C.N. content was estimated have been taken as sub-plots for analysis).  
   C: ← 60  
   D: ← 80  
   E: ← G.N.C .. 60  
   F: ← Cowdung to supply 60 lb. N/ac.  
   Applied on 29.10.1953 around plant base.
3. DESIGN:
(i) Split plot. L. Sq. (ii) 6 (b) N.A. (iii) 6 (iv) (a), (b) 7' x 7' (9 plants plot) Seven plants formed the main plot and single plant formed the subplot (v) Nil. (vi) Yes.

4. GENERAL:
(i) General growth good in all plots except the control plots. (ii) Nil. (iii) One plant to be collected at random from each plot of all the blocks and H.C.N content estimated separately in the leaves and fibers. Samples collected from the third month onwards. (iv) (a) & (b) No (c) Nil. (v) (a,b) Nil. (vi) Nil. (vii) Mentioned fully to the report on the combined scheme of Research on Tapioca and sweet potato (July 1st, 53 to June 30th 1954).

5. RESULTS:
(i) 8.27
(ii) (a) ~ 1.44 (b) ~ 1.79
(iii) Main treatments and Sub-treatments differ highly significantly. Interaction is highly significant.

### Treatments:

<table>
<thead>
<tr>
<th>Treatments</th>
<th>A</th>
<th>B</th>
<th>C</th>
<th>D</th>
<th>E</th>
<th>F</th>
<th>Mean</th>
</tr>
</thead>
<tbody>
<tr>
<td>November</td>
<td>6.20</td>
<td>6.98</td>
<td>7.10</td>
<td>7.48</td>
<td>6.74</td>
<td>6.56</td>
<td>6.84</td>
</tr>
<tr>
<td>January</td>
<td>5.53</td>
<td>4.99</td>
<td>8.80</td>
<td>8.43</td>
<td>6.43</td>
<td>4.72</td>
<td>6.48</td>
</tr>
<tr>
<td>February</td>
<td>6.36</td>
<td>7.28</td>
<td>6.48</td>
<td>7.77</td>
<td>9.17</td>
<td>5.98</td>
<td>7.17</td>
</tr>
<tr>
<td>March</td>
<td>11.09</td>
<td>10.37</td>
<td>8.15</td>
<td>7.75</td>
<td>7.22</td>
<td>11.59</td>
<td>9.36</td>
</tr>
<tr>
<td>April</td>
<td>6.81</td>
<td>9.53</td>
<td>8.34</td>
<td>7.70</td>
<td>7.42</td>
<td>7.54</td>
<td>7.89</td>
</tr>
<tr>
<td><strong>Mean</strong></td>
<td>7.55</td>
<td>8.52</td>
<td>8.46</td>
<td>8.94</td>
<td>7.82</td>
<td>8.33</td>
<td>8.27</td>
</tr>
</tbody>
</table>

S.E. of the difference between two.
(1) treatment means. = 0.32
(2) month means. = 0.42
(3) month means for the same treatment. = 1.03
(4) treatments means for the same month. = 1.00

Crop :- Tapioca
Site :- Tapioca And Sweet Potato
Res. Stn. Mannuthy.

Object :- To determine the best spacing and method of cultivation of Tapioca.

1. BASAL CONDITIONS:
(i) (a) Nil (b) tapioca (c) same exp was in these plots (ii) (a) Gravelly and laterite soil. (b) Refer soil analysis Mannuthy (iii) 19·6.1953. (iv) (a) Two rounds of ploughing before planting (b) As under treatments (c) as per treatments (d) Single cutting/hole (6" length) (e) 5C.L./ac. of Cowdung applied before ploughing and 50 lb of ash per acre at the time of planting. (vi) Local (No: 97) Medium. (vii) Unirrigated. (viii) First intercultivation and weeding one month after planting. 50 tins of ash applied and intercultivation effected during the 4th month. (ix) N.A.(x) 26.3.1954

2. TREATMENTS:
All combinations of (1) & (2):
(1) Planting methods :- (a) On Ridges, (b) on Mounds
(2) Spacings :- 2', 4', 6' (both ways)

3. DESIGN:
(i) 3 x 2 factorial in R.B.D. (ii) 6 (b) N.A. (iii) 6 (iv) (a) 16' x 30' (2' spacing) ; 20' x 30' (4' spacing) ; 24' x 30' (6' spacing) (b) 12' x 24' (c) one row all round the net plot (vi) Yes.

4. GENERAL:
(i) Good (ii) Nil (iii) Tuber Yield (iv) (a) 1952 to 1957 Expt failed in 1952. (b) Yes. (c) N.A. (v) (a) Trivandrum and Tiruvalla (b) Nil (vi), (vii) Nil.
5. RESULTS:
(i) 10604 lb./ac.
(ii) 1440 lb./ac.
(iii) Spacings are significant.
Methods and their interaction with spacings are significant.
(iv) Yield in lb./ac.

<table>
<thead>
<tr>
<th>Method</th>
<th>2'</th>
<th>4'</th>
<th>6'</th>
<th>Mean</th>
</tr>
</thead>
<tbody>
<tr>
<td>(1)</td>
<td>10620</td>
<td>5992</td>
<td>11514</td>
<td>10709</td>
</tr>
<tr>
<td>(2)</td>
<td>11715</td>
<td>8770</td>
<td>9815</td>
<td>10100</td>
</tr>
</tbody>
</table>

Mean: 11168 9380 10665 10404

S.E. of body of the table = 587 lb./ac.
S.E. of marginal means (spacings) = 415 lb./ac.
S.E. marginal means (methods) = 340 lb./ac.

Crop: Tapioca.
Object: To determine the best portion of the Tapioca stem to be used for planting purposes.

1. BASAL CONDITIONS:
(i) (a) Nil (b) Dry Paddy (c) 10 C.L. of C.M./ac. + 1000 lb. wood ash/ac.
(ii) (a) Late rice loam (b) Refer soil analysis Pattambi
(iii) 24.5.1951
(iv) (a) 10 to 12 dry ploughings. Forming ridges 3 feet apart (b) planting cutting of length 9" to 1 foot along the ridges.
(c) — (d) 1' (e) one (v) 10 C.L. of C.M. manure/ac. at the time of ploughing + 1000 lb. wood ash/ac. before ploughing
(vi) Valencia, Local variety of one year duration.
(vii) Rainfed
(viii) 3 weedings at intervals of one month from planting. Earthing up during 2nd and 4th month.

2. TREATMENTS:
1. Planting cutting obtained from the top portion of the stem.
2. ... do..........................middle
3. ... do..........................basal

3. DESIGN:
(i) R.B.D. (ii) (a) 3 (b) N.A. (iii) 4 (iv) (a) (b) 60'x60' (v) Nil (vi) Yes.

4. GENERAL:
(i) Satisfactory (ii) Nil (iii) Tuber weight (iv) (a) Not repeated (c) Nil (v) (a) (b) Nil (vi) & (vii) Nil.

5. RESULTS:
(i) 8712 lb./ac.
(ii) 282 lb./ac.
(iii) The treatments are not significantly different.
(iv) Tuber weight in lb./ac.

<table>
<thead>
<tr>
<th>Treatment</th>
<th>Mean</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>8561</td>
</tr>
<tr>
<td>2.</td>
<td>10315</td>
</tr>
<tr>
<td>3.</td>
<td>7260</td>
</tr>
</tbody>
</table>

S.E. of treatment means = 140 lb./ac.

Crop: Tapioca.
Ref: K. 51 (35)
Site: Tapioca Res. Stn. Tiruvalla.
Type: 'C'

Object: To find-out the best spacing and best method of cultivation for Tapioca.

1. BASAL CONDITIONS:
(i) (a) Nil (b) Tapioca (c) Nil (ii) (a) Late rice (b) N.A. (iii) 31.5.1952
(iv) (a) 2 ploughings before planting (b) Erect planting of fresh cuttings of uniform length (7") on Ridges and Mounds (c) — (d) As under treatments (c)
Single cutting per hole (v) Applied 2880 lb of F.Y.M./ac. : Dried and powdered Cowdung measured out and applied uniformly in shallow pits over which mounds and ridges are prepared. (vi) Ariyan—Medium local (vii) Un-irrigated (viii) Interculturing three times at 2 months interval. Weeding was done along with interculturing. (ix) 80º (31.5.1952 to 20.2.1953) (x) 20.2.1953.

2. TREATMENTS:
All combinations of (1) & (2)
(1) Two methods of planting (a) on Ridges. (b) On mounds.
(2) Three spacings viz 2', 4', 6' (both ways)

3. DESIGN:
(i) 2 x 3 Fact in R.B.D. (ii) (a) 6 (b) N.A. (iii) 6 (iv) (a) & (b) 24' x 12' (v) Nil (vi) Yes.

4. GENERAL:
(i) Growth poor in 2' plots. (ii) Nil (iii) Tuber weight ; height of plants and number of sprouts. (iv) (a) 1952 to 1955 (b) yes (c) N.A. (v) (a) Tapioca Res. Stn. Trivandrum; Tapioca and Sweet Potato Res. Stn. Mannuthy. (b) nil. (vi) & (vii) Nil.

5. RESULTS:
(i) 16784 lb./ac.
(ii) 1664 lb./ac.
(iii) Spacing differences are highly significant. Method and its interaction with spacing are not significant.
(iv) Yield in lb./ac.

<table>
<thead>
<tr>
<th>Methods</th>
<th>2' Spacings 4'</th>
<th>6'</th>
<th>Mean</th>
</tr>
</thead>
<tbody>
<tr>
<td>(a)</td>
<td>19636</td>
<td>19252</td>
<td>12684</td>
</tr>
<tr>
<td>(b)</td>
<td>19089</td>
<td>17226</td>
<td>12809</td>
</tr>
<tr>
<td>Mean</td>
<td>19363</td>
<td>18239</td>
<td>12747</td>
</tr>
</tbody>
</table>

S.E. of body of the table = 680 lb./ac.
S.E. of marginal means (methods) = 392 lb./ac.
S.E. of marginal means (spacings) = 480 lb./ac.

Crop :- Tapioca.
Site :- Tapioca Res. Stn. Tiruvalla.

Ref :- K. 53 (13)/52 (7)
Type :- 'C'

Object :- To study the effect of planting on mounds and on ridges at different spacings between plants (2', 4' and 6').

1. BASAL CONDITIONS:
(i) (a) Nil (b) Tapioca (c) 2880 lb. F.Y.M./ac. (ii) (a) Laterite soil (b) N.A. (iii) 21.4.1953. (iv) (a) Ploughed two rounds before planting of fresh cutting (b) Erect planting of uniform length (7") (c)—(d) As under treatment (e) N.A. (v) Applied 2880 lb. F.Y.M./ac. Dried and powdered cowdung in measured quantity applied uniformly in shallow pits over which mounds and ridges are made. (vi) Ariyan-Medium, local (vii) Unirrigated. (viii) Interculturing three times at two months interval. Weeding was done along with interculturing. (ix) 80º (21.4. 53 to 10.3.1954) (x) 10.3.1954.

2. TREATMENTS:
All Combinations of (1) and (2)
(1) Two methods of planting (a) On Ridges. (b) On mounds.
(2) Three spacings, 2', 4', 6' (both ways)

3. DESIGN:
(i) 2 x 3 Fact in R.B.D. (ii) (a) 6 (b) N.A. (iii) 6 (iv) (a) & (b) 24' x 12' (v) Nil (vi) Yes.

4. GENERAL:
(i) Growth poor in 2' plots. (ii) Nil (iii) Tuber weight. Height of plants and number of sprouts. (iv) (a) 1952 to 1955 (b) yes (c) N.A. (v) (a) Tapioca Res. Stn. Trivandrum, Tapioca and Sweet Potato Res. Stn. Mannuthy. (b) Nil. (vi) & (vii) Nil.

5. RESULTS:
(i) 16784 lb./ac.
(ii) 1664 lb./ac.
Only differences in yield due to spacings are highly significant.

Av. yield of tubers in lb./ac.

<table>
<thead>
<tr>
<th>Spacing</th>
<th>Method</th>
<th>2'</th>
<th>4'</th>
<th>6'</th>
<th>Mean</th>
</tr>
</thead>
<tbody>
<tr>
<td>(a)</td>
<td>26972</td>
<td>27696</td>
<td>20794</td>
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<td>25154</td>
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<tr>
<td>(b)</td>
<td>28690</td>
<td>28092</td>
<td>23264</td>
<td></td>
<td>26582</td>
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<tr>
<td>Mean</td>
<td>27831</td>
<td>27894</td>
<td>21880</td>
<td></td>
<td>25868</td>
</tr>
</tbody>
</table>

S.E. of body of the table = 1247 lb./ac.
S.E. of marginal means (methods) = 719 lb./ac.
S.E. of marginal means (spacings) = 882 lb./ac.

Crop: — Tapioca
Site: — Tapioca Res. Stn. Trivandum
Ref: — K.52 (8)
Type: — 'C'.

Object: — To ascertain the best method of planting and the optimum spacing between plants.

1. BASAL CONDITIONS:
   (i) Nil (b) Tapioca (c) Cowdung at the rate of 5 tons/ac. and Ash at 1 ton/ac. (Available K₂O in ash was about 4%) (ii) (a) Laterite soil (b) Refer soil analysis Trivandum (iii) 16.4.1952 (iv) (a) The soil is brought to a fine tilth by digging. Mounds and ridges taken at particular spacings (as per treatments) (b) planting of 8" cuttings from good stem of uniform nature. (c) —— (d) as per treatments (e) (v) Cowdung and compost manure (in equal proportion) were broadcast as basal dressing at the rate of 5 tons/ac. before tilling (Top dressing of ash at the rate of one ton/ac. was also given) (vi) 97 medium (9 to 10 months) (Kailakalam) local variety. (vii) Partially irrigated (viii) Inter-cultivation on 20.5.52 after giving a top dressing of ash. Weeding twice before harvest. (ix) About 67" (61.4.1952 to 27.2.53) (x) 27.2.1953.

2. TREATMENTS:
   All combinations of (1) and (2)
   (1) Two methods of planting: (a) On Ridges (b) On mounds.
   (2) Three spacings: 2', 4', 6' (both ways)

3. DESIGN
   (i) 2 x 3 fact. R.B.D. (ii) (a) 6 (b) N.A. (iii) 6 (iv) (a) 16" x 27" (2' spacing) 20" x 27" (4' spacing) 24" x 21" (6' spacing) (b) 12" x 21" (v) One row all round the net sub-plot (vi) Yes.

4. GENERAL:
   (i) Uniformly good growth. (ii) Nil (iii) Weight of tuber (iv) (a) 1952 to 1955 (During 1955 a slight modification in spacing was made) (b) Yes. (c) N.A. (v) (a) Tapioca Res. Stn Tiruvalla; Tapioca and Sweet Potato Res. Stn. Manuthy. (b) NA (vi) & (vii) Nil

5. RESULTS:
   (i) 39007 lb./ac.
   (ii) 5930 lb./ac.
   (iii) Main effect of spacings alone is significant; others are not significant.
   (iv) Tuber yield in lb./ac.

<table>
<thead>
<tr>
<th>Spacing</th>
<th>Method of planting</th>
<th>2'</th>
<th>4'</th>
<th>6'</th>
<th>Mean</th>
</tr>
</thead>
<tbody>
<tr>
<td>(a)</td>
<td>46624</td>
<td>39820</td>
<td></td>
<td>28491</td>
<td>36445</td>
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<tr>
<td>(b)</td>
<td>42658</td>
<td>42788</td>
<td></td>
<td>33851</td>
<td>39569</td>
</tr>
<tr>
<td>Mean</td>
<td>44346</td>
<td>41304</td>
<td></td>
<td>31707</td>
<td>39007</td>
</tr>
</tbody>
</table>

S.E. of treatment means = 2422 lb./ac.
S.E. of marginal means (methods) = 1398 lb./ac.
S.E. of marginal means (spacings) = 1713 lb./ac.
Crop — Tapioca


Object: — To ascertain the best method of planting and the optimum spacing between plants.

1. BASAL CONDITIONS:

(i) (a) Nil (b) Tapioca (c) Same experiment was in these plots (ii) (a) Laterite (b) Refer soil analysis, Trivandrum. (iii) 19.5.1953 (iv) (a) Soil well tilled (b) planting cuttings of 8" length on mounds and ridges at spacings given under "Treatments" viz 2', 4' and 6'. Erect planting (c)—(d) As under treatment (e) Single cutting per hole. (v) Night soil compost at 3 ton/ac by broadcasting uniformly before tilling. (vi) 97 (Medium); matures at 9 to 10 months (vii) Partially irrigated with pipe water. (viii) Intercultivated on 22.6.1953 after applying ash. General weeding of the plots twice before harvesting.

2. TREATMENTS:

All combinations of (1) & (2)

(1) Method of planting: (a) On ridges (b) On mounds
(2) Spacing 2', 4', 6' (both ways)

3. DESIGN:

(i) 2 x 3 Fact in R.B.D. (ii) (a) 6 (b) N.A. (iii) 6 (vi) (a) 27' x 16' (2' spacing), 27' x 20' (4' spacing) 27' x 24' (6' spacing) (b) 21' x 12' (v) one row all round plot (vi) Yes.

4. GENERAL:

(i) Growth good. (ii) Nil (iii) Weight of tubers (iv) 1952 to 1954 (b) Yes. (c) N.A. (v) (a) Tapioca and Sweet Potato Res. Stn. Mannuthy, Tapioca Res. Stn. Tiruvalla. (b) N.A. (vi) & (vii) Nil

5. RESULTS:

(i) 22634 lb./ac.
(ii) 3872 lb./ac.
(iii) Neither main effects nor their interaction is significant.
(iv) Tuber yield in lb./ac.

<table>
<thead>
<tr>
<th>Method</th>
<th>2' Spacing</th>
<th>4'</th>
<th>6'</th>
<th>Mean</th>
</tr>
</thead>
<tbody>
<tr>
<td>(a)</td>
<td>23931</td>
<td>21222</td>
<td>19995</td>
<td>21716</td>
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<tr>
<td>(b)</td>
<td>24710</td>
<td>24898</td>
<td>21049</td>
<td>23552</td>
</tr>
</tbody>
</table>

S.E. of body of the table = 1581 lb./ac.
S.E. of marginal means (methods) = 913 lb./ac.
S.E. of marginal means (spacings) = 1118 lb./ac.

Crop: — Tapioca

Site: — Tapioca Res. Stn., Trivandrum

Object: — To find out the optimum length of seed canes for planting.

1. BASAL CONDITIONS:

(i) (a) Nil (b) Tapioca (c) Same exp. was in these plots (ii) (a) Laterite (b) Refer soil analysis Trivandrum (iii) 10.4.1948. (iv) (a) Soil tilled to 15" depth by digging. (b) Cuttings of lengths as under 'Treatment' planted erect. (c)—(d) 31' (e) Single cutting per hole. (v) 3 ton of Cowdung and 1 ton of ash/ac. applied by broadcast during tilling & 1 ton of ash/ac. as top dressing applied during intercultivation after 2 months. (vi) 38 local (Medium) (vii) Partially irrigated (viii) Intercultivated 2 months after and weeded 4 months after planting. (ix) About 67" (10.4.1948 to 25.2.1949) (x) 25.2.1949.

2. TREATMENTS:

Planting Cuttings of length
1. 4'
2. 5'
3. 6'
4. 8'
5. 10'

3. DESIGN:

(i) 5 x 5 L. Sq. (ii) (a) 5 (b) N.A. (iii) 5 (iv) (a) (b) 10' x 10' (v) Nil (vi) No.
4. GENERAL:
(i) Good. (ii) Nil. (iii) Tuber weight. (iv) (a) 1947-1950 (b) Yes. (c) N.A. (v) (a), (b) Nil (vi) & (vii) Nil.

5. RESULTS:
(i) 13860 lb./ac.
(ii) 1940
(iii) The treatment differences are highly significant.
(iv) Tuber weight in lb./ac.

<table>
<thead>
<tr>
<th>Treatment</th>
<th>Mean</th>
<th>S.E. of treatment means</th>
</tr>
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<tbody>
<tr>
<td>1</td>
<td>10273</td>
<td>~859 lb./ac.</td>
</tr>
<tr>
<td>2</td>
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<tr>
<td>3</td>
<td>17222</td>
<td></td>
</tr>
<tr>
<td>4</td>
<td>13986</td>
<td></td>
</tr>
<tr>
<td>5</td>
<td>16989</td>
<td></td>
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</table>

Crop: Tapioca
Site: Tapioca Res. Stn., Trivandrum.
Object: To find out the optimum length of seed canes for planting.

1. BASAL CONDITIONS:
(i) (a) Nil (b) Tapioca (c) Same expl. was in these plots. (ii) (a) Laterite soil (b) Refer soil analysis Trivandrum. (iii) 30.4.1949. (iv) (a) Tilled the soil to a depth of 15". Shallow pits were taken by digging (b) cuttings planted erect. (c) (d) 3' (e) Single cutting per hole. (v) 3-ton of Cowdung and 1 ton of ash/ac. as basal dressing during tilling applied by broadcast. Amo. plus 2 cwt/ac. applied as top dressing during intercultivation 1½ months after planting. (vi) "Kalikalan" 97 local, Medium. (vii) Partially irrigated. Hand watering twice a week till the one set of monsoon. (viii) Intercultivated 1½ months after and weeded 1½ months after planting. (ix) 66 to 67° (30.4.1949 to 25.1.1950) (x) 25.1.1950.

2. TREATMENTS:
Planting cuttings of length
1. 4'
2. 5'
3. 6'
4. 8'
5. 10'

3. DESIGN:
(i) 5x5 L. Sq. (ii) (a) 5 (b) N.A. (iii) 5 (iv) (a.b) 10x10 x (v) Nil (vi) No.

4. GENERAL:
(i) Good. (ii) Nil. (iii) Tuber weight. (iv) (a) 1947 to 1950 (b) Yes. (c) N.A. (v) (a),(b) Nil (vi) & (vii) Nil.

5. RESULTS:
(i) 22379 lb./ac.
(ii) 3034 lb./ac.
(iii) The treatment differences are not significant.
(iv) Tuber weight in lb./ac.

<table>
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<td>3</td>
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<td>4</td>
<td>25998</td>
</tr>
<tr>
<td>5</td>
<td>22955</td>
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</table>

S.E. of treatment means =1359 lb./ac.
1. BASAL CONDITIONS:
   (i) Nil (ii) Tapioca (c) Same exp. was in these plots. (ii) (a) Laterite soil (b) Refer soil analysis
   Trivandrum. (iii) 1948. (iv) (a) soil tilled to a depth of 25" by di-Eing. (b) Shallow pits were taken and
cuttings of 8" length planted erect. (c) Single cutting/ho1e. (v) 2 ton of Cowdung and 1 ton of ash/ac. applied
   during tilling. 2 cwt of Amophos as basal dressing and 1 ton of ash/ac. applied during intercultivation 1½
   months after planting as top dressing. (vi) Variety No. 26 Local, Medium. (vii) Partially irrigated. (viii) Inter-cultivation
   1½ months after planting and weeding 3½ months after planting. (ix) About 67" (3.4.1948 to 5.2.1949) (x) 5.2.1949.

2. TREATMENTS:
   Planting cuttings of length
   1. 4"
   2. 5"
   3. 6"
   4. 8"
   5. 10"

3. DESIGN:
   (i) 5 x 5 L. Sq. (ii) (a) Nil. (b) Tapioca. (i) (a) (b) 5 x 5 10' x 10' (c) Nil (vi) No.

4. GENERAL:
   (i) Good. (ii) Nil (iii) Tuber weight. (iv) (a) 1947-1950 (b) Yes. (c) N.A. (v) (a) Nil (vi) &
   (vii) Nil.

5. RESULTS:
   (i) 22603 lb./ac.
   (ii) 3275 lb./ac.
   (iii) The treatments differences are significant
   (iv) Tuber weight in lb./ac.
      Mean
      1. 18551
      2. 21612
      3. 22797
      4. 26867
      5. 23587
      S.E. of treatment means =1466 lb./ac.

Object:—To determine the optimum number of buds to be retained in a plant.

1. BASAL CONDITIONS:
   (i) (a) Nil. (b) Tapioca. (c) Same exp. was in these plots. (ii) (a) Laterite soil (b) Refer soil analysis
   Trivandrum. (iii) 1948. (iv) (a) Soil tilled to a depth of 25" by di-Eing. (b) Shallow pits were taken and
cuttings of, 8" length planted erect. (c) Single cutting/ho1e. (v) 2 ton of Cowdung and 1 ton of ash/ac. as
   basal dressing and 1 ton of ash/ac. applied during intercultivation as top dressing. (vi) Variety No. 26 Local, Medium. (vii) Partially irrigated. (viii) Inter-cultivation two months after
   planting and weeding 3½ months after planting. Unwanted buds were removed at early stages of
development. (ix) About 67" (3.4.1948 to 5.2.1949) (x) 5.2.1949.

2. TREATMENTS:
   1. Allowed only one bud to develop.
   2. Allowed only two buds to develop.
   3. Allowed only three buds to develop.

3. DESIGN:
   (i) 4x4 L. Sq. (ii) (a) 4 (b) N.A. (iii) 4 (iv) (a) Nil (v) Yes.

4. GENERAL:
   (i) Good. (ii) Nil (iii) Tuber weight. (iv) (a) 1947-1950 (b) Yes. (c) N.A. (v) (a) Nil (b) Nil. (vi) &
   (vii) Nil.

5. RESULTS:
   (i) 2094 lb./ac.
   (ii) 2193 lb./ac.
   (ii) The treatment differences are highly significant
   (vi) Tuber weight in lb./ac.
Crop :- Tapioca.  
Site : Tapioca Res. Stn. Trivandrum.  
Ref : K. 49(28)/48 (16)  
Type : 'C'  

Object : To determine the optimum number of buds to be retained in a plant.

1. BASAL CONDITIONS:
(i) (a) Nil (b) Tapioca (c) S consequence of the plots.  
(ii) (a) Laterite (b) Refer soil analysis Trivandrum (iii) 29.4.1919.  
(iv) (a) Soil tilled to a depth of 15" by digging. Shallow pits were taken as per design (b) 8" cuttings planted erect. (c) (d) 3' (e) single cutting/hole. (v) 3 ton of Cowdung and 1/4 ton of ash/ac. applied as basal dressing during tilling. Amo-phos 2 cwt/ac. applied during intercultivation month after plants as top dressing. (vi) H 105 Medium Improved (vii) Partially irrigated, hand watering (viii) Intercultivation one month after planting and weeding 3 months after planting were done. Unwanted buds were removed at early stages of development. (ix) 66 to 67" (29.4.1949 to 2.2.1950) (x) 2.2.1950.

2. TREATMENTS:
1. Allowed one bud to develop. 
2. Allowed two buds to develop. 
3. Allowed three buds to develop. 
4. Control—Non-removal of buds

3. DESIGN:
(i) 4x4 Latin Square (ii) (a) 4 (b) N.A. (iii) 4 (iv) (a), (b) 12' x 12' (v) Nil (vi) No.

4. GENERAL:
(i) Good. (ii) Nil (iii) Tubber weight (iv) 1947 to 1950 (b) Yes (c) N.A. (v) (a,b) Nil (vi) & (vii) Nil.

5. RESULTS:
(i) 3028 lb./ac.  
(ii) 1882 lb./ac. 
(iii) The treatment differences are highly significant. 
(iv) Tubber weight in lb./ac.

<table>
<thead>
<tr>
<th>Treatment</th>
<th>Mean</th>
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<tbody>
<tr>
<td>1.</td>
<td>26393</td>
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<tr>
<td>2.</td>
<td>29872</td>
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<td>3.</td>
<td>31838</td>
</tr>
<tr>
<td>4.</td>
<td>33614</td>
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</tbody>
</table>

S.E. of treatment means = 911 lb./ac.
2. TREATMENTS:
1. Allowed one bud to develop.
2. " two buds to develop.
3. " three buds to develop.
4. (Control) Non removal of buds

3. DESIGN:
(i) 4 x 4 L. Sq. (a) 4 (b) N.A. (iii) 4 (iv) (a), (b) 12' x 12' (v) Nil (vi) Yes.

4. GENERAL:
(i) Good. (ii) Nil (iii) Tuber weight (iv) (a) 1947-1950 (b) Yes. (c) N.A. (v) (a) Nil. (b) Nil. (vi) & (vii) Nil.

5. RESULTS:
(i) 292491 lb./ac.
(ii) 2329 lb./ac.
(iii) The treatment differences are slightly significant.
(iv) Tuber weight in lb./ac.

<table>
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<tr>
<td>1.</td>
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<td>3.</td>
<td>32972</td>
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<td>4.</td>
<td>32141</td>
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</table>

S.E. of treatment means = 1165 lb./ac.

Crop :- Tapioca
Site :- Tapioca Res. Stn. Trivandrum.
Object :- To find out the best portion of Tapioca stem for planting.

1. BASAL CONDITIONS:
(i) (a) Nil (b) Tapioca (c) 2 1/2 ton of compost and 1 ton of ash./ac. (ii) (a) Laterite Soil (b) Refer soil analysis Trivandrum (iii) 9.4.1948. (iv) (a) Soil tilled to a depth of 15" by digging (b) Cuttings of 8" length planted erect in shallow pits. (c) (d) 3' (e) Single cutting/hole. (v) 3 ton of Cowdung and 1 ton of ash./ac. as basal dressing applied during tilling and 1 ton ash/ac. applied as top dressing during intercultivation after 2 months of planting. (vi) H 105; Medium, Improved. (vii) Partially irrigated. (viii) Intercultivated two months after planting. Earthing up and weeding 4 months after planting. (ix) About 67" (9.4.48 to 3.2.1949) (x) 3.2.1949.

2. TREATMENTS:
1. Planting top portion of the stem.
2. Planting middle portion of the stem.
3. Planting basal portion of the stem.

3. DESIGN:
(i) 3 x 3 L. Sq. (ii) (a) 3 (b) N.A. (iii) 3 (iv) (a), (b) 9' x 9' (v) Nil (vi) Yes.

4. GENERAL:
(i) Good. (ii) Nil (iii) Tuber weight (iv) (a) 1948-1950. (b) Yes. (c) N.A. (v) (a) Nil (b) Nil. (vi) & (vii) Nil.

5. RESULTS:
(i) 30773 lb./ac.
(ii) 1086 " 
(iii) The treatment differences are not significant.
(iv) Tuber weight in lb./ac.

<table>
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<tr>
<th>Treatment</th>
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<tbody>
<tr>
<td>1.</td>
<td>29938</td>
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<tr>
<td>2.</td>
<td>30293</td>
</tr>
<tr>
<td>3.</td>
<td>32089</td>
</tr>
</tbody>
</table>

S.E. of treatment means = 629 lb./ac.
Crop :- Tapioca.

Site :- Tapioca Res. Stn. Trivandrum.

Object :- To find-out the best portion of the tapioca stem for planting purposes.

1. BASAL CONDITIONS :
   (i) (a) Nil (b) Tapioca (c) Same exp. was in these plots (ii) Laterite soil (b) Refer soil analysis Trivandum (iii) 3.5.1949. (iv) (a) Soil tilled to a depth of 15" by digging (b) Cuttings of 8" length planted erect in plots (c) (d) 3½' (e) Single cutting/hole. (v) 3 cwt of Cowdung and 1 ton of ash/ac. basal dressing applied during tilling. 2 cwt of Amophos/ac. applied one month after planting during intercultivation as top dressing. (vi) "Maryetal" Variety No : 77 local medium. (vii) Partially irrigated. Hand watering (viii) Intercultivation was done one month after planting and weeding and earthing up 3½ months after planting (ix) 66 to 67 inches (3.5.1949 to 3.3.1950) (x) 3.3.1950.

2. TREATMENTS :
   1. Planting top portion of stem.
   2. Planting middle portion of stem.
   3. Planting basal portion of stem.

3. DESIGN :
   (i) 3 x 3 L. Sq. (ii) (a) 3 (b) N.A. (iii) 3 (iv) (a,b) 101' x 101' (v) Nil (vi) No.

4. GENERAL :
   (i) Good. (ii) Nil (iii) Tuber weight (iv) (a) 1948 to 1950 (b) Yes (c) N.A. (v) (a,b) Nil (vi) & (vii) Nil.

5. RESULTS :
   (i) 23398 lb./ac.
   (ii) 1079 lb./ac.
   (iii) The treatment differences are not significant.
   (iv) (Tuber weight in lb./ac.) Treatment. Mean
   1. 22521
   2. 24101
   3. 29576
   S.E. of treatment means =620 lb./ac.

Crop :- Tapioca. Ref :- K. 50 (27)/49 (18)/48 (11)

Site :- Tapioca Res. Stn. Trivandrum. Type :- 'B'

Object :- To determine the best portion of stem for planting.

1. TREATMENTS :
   (i) (a) Nil (b) Tapioca (c) Same exp. was in these plots (ii) (a) Laterite soil (b) Refer soil analysis Trivandum (iii) 23.5.50. (iv) (a) Soil tilled to a depth of 15" by digging (b) Cutting of 8" length planted in pits. (c) (d) 3½' (e) Single cutting/hole. (v) 3 ton of Cowdung and 1 ton of ash/ac. during tilling and 2 cwt of Amophos/ac. during intercultivation one month after planting as top dressing. (vi) Variety No. 77 local (vii) Partially irrigated. Hand watering (viii) Intercultivation one month after planting and earthing up & weeding 3½ months after planting. (ix) 66 to 67" (23.3.50. to 26.3.51.) (x) 26.3.1951.

1. BASAL CONDITIONS :
   1. Planting top portion of the stem.
   2. Planting middle portion of the stem.
   3. Planting basal portion of the stem.

3. DESIGN :
   (i) L. Sq. (ii) (a) 3 (b) N.A. (iii) 3 (iv) (a) 13½' x 101' (v) Nil (vi) No.

4. GENERAL :
   (i) Good. (ii) Nil (iii) Tuber weight (iv) 1948-1950 (b) Yes (c) N.A. (v) (a) Nil (b) Nil (vi) & (vii) Nil.

5. RESULTS :
   (i) 23969 lb./ac.
   (ii) 822 lb./ac.
   (iii) The treatment differences are highly significant.
Object: To investigate the effect of topping tapioca plants at different periods of growth.

1. BASAL CONDITIONS:
   (i) (a) Nil (b) Tapioca (c) Same exp. was in these plots. (ii) Laterite soil (b) Refer soil analysis Trivandrum. (iii) 30.4.1949. (iv) (a) Tilled the soil to a depth of about 15" by digging. (b) Cuttings of length 8" planted erect in shallow pits (c) (d) (e) Single cutting/hole (v) 3 tons of Cowdung and 1 ton of ash/ac applied during tilling and 1 ton of ash/ac applied as top dressing during intercultivation 2 months after planting. (vi) Variety No: 26. Local Medium. (vii) Partially irrigated. (viii) Intercultivation 2 months after planting, weeding and earthing up done 4 months after planting. (ix) About 6'10" (10.4.48 to 3.3.1949) (x) 3.3.1949.

2. TREATMENTS:
   1. Topping at 2nd month.
   2. at 3rd
   3. at 4th
   4. at 5th
   5. at 6th
   6. at 7th
   7. at 8th
   8. No topping-Control.

3. DESIGN:
   (i) R.B.D. (ii) (a) 8 (b) N.A. (iii) 5 (iv) (a) (b) 5'x6' (v) Nil (vi) Yes.

4. GENERAL:
   (i) Good (ii) Nil (iii) Tuber weight. (iv) 1947-1950 (b) Yes. (c) N.A. (v) (a) Nil (b) Nil (vi) & (vii) Nil.

5. RESULTS:
   (i) 3031 lb/ac.
   (ii) 5929 lb/ac.
   (iii) The treatment differences are not significant.
   (iv) Tuber weight in lb/ac.

<table>
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<td>29847</td>
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<td>31621</td>
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<td>8.</td>
<td>32670</td>
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</tbody>
</table>

S.E. of treatment means =2654 lb/ac.
Cowdung and 4 ton of ash/ac. applied as basal dressing during tilling. 2 cwt of compost/ac. applied one month after planting during interculturating as top dressing. (v) H. 105. Medium Improved. (vi) Partially irrigated. Hand watering. (vii) Intercultivated one month after planting, weeding and earthing up done 3 months after planting. (ix) 65 to 67° (33.4.1949 to 3.2.1950) (x) 3.2.1950.

2. TREATMENTS:
1. Topping at 2nd Month
2. " at 3rd "
3. " at 4th "
4. " at 5th "
5. " at 6th "
6. " at 7th "
7. " at 8th "
8. No topping. (Control)

3. DESIGN:
(i) R.B.D. (ii) (a) 8 (b) N.A. (iii) 5 (iv) (a.b) 6'X10' (v) Nil (vi) Yes.

4. GENERAL:
(i) Good (ii) Nil (iii) Tuber weight (iv) 1947 to 1950 (b) Yes (c) N.A. (v) (a.b) Nil (vi) & (vii) Nil.

5. RESULTS:
(i) 23747 lb./ac.
(ii) 3554 lb./ac.
(iii) The treatment differences are highly significant.
(iv) Tuber weight in lb./ac.

<table>
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<td>8.</td>
<td>29593</td>
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</tbody>
</table>

S.E. of treatment means: *1590 lb./ac.*

Crop: Tapioca
Site: Tapioca Res. Stn. Trivandrum
Ref: K. 50(28)/49(16)/48(12)
Type: 'C'

Object:—To find out the effect of topping at different periods of growth.

1. BASAL CONDITIONS:
1. (a) Nil (b) Tapioca (c) Same except was in these plots (ii) (a) Laterite soil (b) Refer soil analysis Trivandrum (iii) 21.4.1950 (iv) (a) soil tilled to a depth of 15' by digging (b) 8' cuttings planted erect in shallow pits (c) 3'X3' (d) single cutting/hole: (v) 3 ton of Cowdung and 4 ton of ash/ac. applied during tilling. Amophos 2 cwt/ac. applied during interculturating one month after planting (vi) H 105. Medium. Improved (vii) Partially irrigated (viii) Intercultivated one month after planting and weeding done 3 months after planting. (ix) 65 to 67° (11.4.50 to 12.2.51) (x) 12.2.1951.

2. TREATMENTS:
1. Topping at 2nd month
2. " 3rd "
3. " 4th "
4. " 5th "
5. " 6th "
6. " 7th "
7. " 8th "
8. No topping (Control)

3. DESIGN:
(i) R.B.D. (ii) (a) 8 (b) N.A. (iii) 5 (iv) (a), (b) 6'X10' (v) Nil (vi) Yes.

4. GENERAL:
(i) Good. (ii) Nil (iii) Tuber weight. (iv) 1947-1950 (b) Yes. (c) N.A. (v) (a) Nil (b) Nil (vi) & (vii) Nil.
RESULTS

(i) 29187 lb./ac.
(ii) 3208 lb./ac.
(iii) The treatments differ highly significantly.
(iv) Tuber weight in lb./ac.

<table>
<thead>
<tr>
<th>Treatment</th>
<th>Mean</th>
<th>S.E. of treatment means</th>
</tr>
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<tbody>
<tr>
<td>1.</td>
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<td>=1438 lb./ac.</td>
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<td>7.</td>
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<td></td>
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<td>8.</td>
<td>33119</td>
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</tbody>
</table>

Crop : Tapioca
Site : Tapioca Res. Stn. Trivandrum
Object : To find out the optimum number of plants per pit.

1. BASAL CONDITIONS:
(i) (a) Nil. (b) Tapioca (c) Same experiment was in these plots.
(ii) (a) Laterite soil. (b) Refer soil analysis Trivandrum.
(iii) 8.4.1948.
(iv) (a) Soil tilled to a depth of 15" by digging (b) cuttings of 8" length planted in shallow pits, erect planting (c) (d) 3' (e) As per treatments. (v) 3 ton of cowdung and 1/2 ton of ash/ac. applied during tilling, 1/2 ton of ash/ac. applied during intercultivation 2 months after planting as top dressing. (vi) Variety No. 26 Local, Medium (vii) Partially irrigated. (viii) Intercultivation after applying ash. 2 months after planting and weeding during the 4th month of planting (ix) 66" to 67" (8.4.48. to 3.2.1949) (a) 3.2.1949.

2. TREATMENTS:
1. Single cutting per pit. 25 plants per plot.
2. Two 50
3. Three 75

3. DESIGN:
(i) L. Sq. (ii) (a) 3 (b) N.A. (iii) 3 (iv) (a) (b) 15' x 15' (v) Nil (vi) Yes.

4. GENERAL:
(i) Good. (ii) Nil (iii) Tuber weight (iv) (a) 1547 to 1550 (b) Yes. (c) N.A. (v) (a) Nil. (b) Nil (vi) & (vii) Nil.

5. RESULTS:
(i) 22630 lb./ac.
(ii) 2937
(iii) The treatments are not significantly different.
(iv) Tuber weight in lb./ac.

<table>
<thead>
<tr>
<th>Treatment</th>
<th>Mean</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>22909</td>
</tr>
<tr>
<td>2.</td>
<td>22845</td>
</tr>
<tr>
<td>3.</td>
<td>22134</td>
</tr>
</tbody>
</table>

S.E. of treatment means : = 1696 lb./ac.

Crop : Tapioca
Site : Tapioca Res. Stn. Trivandrum
Object : To find out the optimum number of plants per pit.

1. BASAL CONDITIONS:
(i) (a) Nil (b) Tapioca (c) same expl. was in these plots (i) (a) Laterite soil (b) Refer soil analysis, Trivandrum.
(ii) 3.3.1949 (iv) (a) Soil tilled to a depth of 15" by digging (b) Cuttings of length 8" planted erect in shallow pits (c) (d) 33" (e) under "treatments" (v) 3 ton of Cowdung and 1 ton of ash/ac. as basal dressing applied by broadcast during tilling Amo plough at the rate of 2 cwt/ac. applied one month after
planting during intercultivation as top dressing. (vi) "Kalikalan" Variety No: 97. local medium (vii) Partially irrigated, Hand watering (viii) Intercultivation one month after planting and weeding 3 months after planting. (ix) 66 to 67° (3.5.1949 to 1.3.1950) (x) 1.3.1950.

2. TREATMENTS:
   1. Single cutting per pit.
   2. Two cuttings per pit.
   3. Three cuttings per pit.

3. DESIGN:
   (i) 3 x 3 L.sq. (ii) (a) 3 (b) N.A. (iii) 3 (iv) (a), (b) 17' x 17' (v) Nil (vi) yes.

4. GENERAL:
   (i) Good. (ii) Nil (iii) Tuber weight. (iv) (a) 1947 to 1950 (b) Yes (c) N.A. (v) (a), (b) Nil (vi) & (vii) Nil.

5. RESULTS:
   (i) 22081 lb./ac.
   (ii) 370 lb./ac.
   (iii) The treatment differences are not significant.
   (iv) Tuber weight in lb./ac.
   Treatment Mean S.E. of treatment mean
   1. 21614 213 lb./ac.
   2. 21828
   3. 23799

Crop: Tapioca
Site: Tapioca Res. Stn. Trivandrum
Ref: K.50 (24) 49 (14) 48 (9)
Type: 'C'

Object: To find the optimum number of plants per pit.

1. BASAL CONDITIONS:
   (i) (a) Nil (b) Tapioca (c) 3 tons/cowdung 1 tons/ash Amophos 2 cwt/ac. (ii) (a) Laterie (b) Refer soil analysis, Trivandrum (iii) 20.4.50. (iv) (a) Soil tilled to a depth of 15" by digging (b) Cuttings of uniform length of 8" planted erect in shallow pits (c)—(d) 3' (e) As per treatments. (v) 3 tons of Cowdung and 1 ton of ash/ac. applied during tilling. Amophos at the rate of 2 cwt/ac. applied 1 month after planting during intercultivation as top dressing. (vi) Kali Kalan Variety No: 97, (vii) Partially irrigated (viii) Intercultivation after applying amophos and weeding after 3 months of planting (ix) 66-67° (20.4.50 to 17.3.51) (x) 1.3.1951.

2. TREATMENTS:
   1. 1 cutting per pit.
   2. 2
   3. 3

3. DESIGN:
   (i) L.sq. (ii) (a) 3 (b) N.A. (iii) 3 (iv) (a) (b) 17' x 17' (v) No. (vi) Nil.

4. GENERAL:
   (i) Good. (ii) Nil (iii) Tuber weight (iv) (a) 1947 to 1950 (b) Yes (c) N.A. (v) (a) Nil (b) Nil (vi) & (vii) Nil.

5. RESULTS:
   (i) 22372 lb./ac.
   (ii) 1485 lb./ac.
   (iii) The treatments do not differ significantly.
   (iv) Tuber weight in lb./ac.
   Treatment Mean
   1. 21377
   2. 22301
   3. 23439
   S.E. of treatment means —558 lb./ac.
Crop: Tapioca
Site: Tapioca Res. Stn. Trivandrum.

Object: To study the best method of planting tapioca.

1. BASAL CONDITIONS:
   (i) (a) Nil (b) Tapioca (c) Cowdung 2 ton/ac. + ash 1 ton/ac. (ii) (a) Laterite soil (b) Refer soil analysis Trivandrum. (iii) 8.4.1949. (iv) (a) Soil tilled to a depth of 15" by digging (b) As per treatments. (c) - (d) 3" (e) One cutting per hole. (v) Cowdung 3 ton/ac. and ash 1 ton/ac. before planting by broadcast. Ash 1 ton/ac. as top dressing 2 months after planting. (vi) No. 78 medium local. (vii) Partially irrigated. (viii) Intercultivated after 2 months of planting; another weeding 4 months after planting. (ix) About 61" (8.4.49 to 25.2.50) (x) 25.2.49.

2. TREATMENTS:
   Three methods of planting.
   1. Completely burying in the soil.
   2. Planting in shallow pits.
   3. Planting on mounds.

3. DESIGN:
   (i) L.Sq. (ii) 3 (b) N.A. (iii) 3 (iv) (a) 17½ x 17½ (v) Nil (vi) yes.

4. GENERAL:
   (i) Good. (ii) Nil (iii) Tuber weight (iv) (a) 1946-1950. (b) No. (c) N.A. (v) (a) Nil (b) Nil. (vi) & (vii) Nil.

5. RESULTS:
   (i) 32026 lb./ac.
   (ii) 3150 lb./ac.
   (iii) The treatments are not significantly different.
   (iv) Tuber weight in lb./ac.

   Treatment Mean
   1. 29909
   2. 32564
   3. 33606
   S.E. of treatment means = 1936 lb./ac.

Crop: Tapioca
Site: Tapioca Res. Stn. Trivandrum.

Object: To study the best method of planting Tapioca.

1. BASAL CONDITIONS:
   (i) (a) Nil (b) Tapioca (c) Cowdung 3 tons/ac. + ash ½ ton/ac. (ii) (a) Laterite soil (b) Refer soil analysis Trivandrum. (iii) 29.4.1949. (iv) (a) Soil tilled to a depth of 15" by digging (b) As per treatments (c) - (d) 3½ (e) One cutting hole. (v) 3 ton of cowdung and one ton of ash/ac. as basal dressing before planting by broadcast. Ammonium phosphate at the rate of 2 cwt/ac. was applied as top dressing 2 months after planting. (vi) Hybrid No: 105 Medium Improved. (vii) Partially irrigated. Hand watering (viii) Intercultivation two months after planting. Another weeding 4 months after planting (ix) About 67" (29.4.1949 to 2.3.1950) (x) 2.3.1950.

2. TREATMENT:
   Uniform cuttings of 8" planted as below.
   Three methods of planting.
   1. Buried completely under the soil.
   2. Planting erect in shallow pits.
   3. Planting erect on raised mounds.

3. DESIGN:
   (i) L.Sq. (ii) 3 (b) N.A. (iii) 3 (iv) (a,b) 17½ x 17½ (v) Nil (vi) yes.

4. GENERAL:
   (i) Good (ii) Nil (iii) Tuber weight (iv) (a) 1946 to 1950 (b) No (c) N.A. (v) (a,b) Nil (vi) & (vii) Nil.
5. RESULTS;
   (i) 26854 lb/ac.
   (ii) 1676 lb/ac.
   (iii) The treatment differences are not significant.
   (iv) Tuber weight in lb/ac.

<table>
<thead>
<tr>
<th>Treatment</th>
<th>Mean</th>
<th>S.E. of treatment means.</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>24625</td>
<td>968 lb/ac</td>
</tr>
<tr>
<td>2.</td>
<td>23927</td>
<td></td>
</tr>
<tr>
<td>3.</td>
<td>24008</td>
<td></td>
</tr>
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</table>

Crop: Tapioca.  
Site: Tapioca Res. Stn. Trivandrum.  
Object: To study the best method of planting Tapioca.

1. BASAL CONDITIONS:
   (i) (a) Nil (b) Tapioca (c) 3 ton of Cowdung and 1 ton of ash/ac. and Amm. Phos. at the rate of 2 cwt/acre. (ii) (a) Laterite soil (b) Refer to soil analysis, Trivandrum—(iii) 21.4.50 (iv) (a) Soil tilled to a depth of 15' by digging (b) As per treatments (c)-(d) 3' (e) One cutting/hole (vi) 3 ton of Cowdung and 1 ton of ash/ac. as basal dressing before planting by broadcast. Amm-Phos at the rate of 2 cwt/ac. was applied as top dressing 2 months after planting. (vi) Hy'brid 105. Medium. Improved (vii) Partially irrigated. (viii) Interculturing two months after planting. Another weeding 4 months after planting. (ix) 67° 21.4.50 to 16.3.51, (x) 16.3.51

2. TREATMENTS:
   Three methods of planting.
   1. Completely buried under the soil
   2. Planting erect in pits.
   3. Planting erect in mounds.
   Direct planting of uniform cuttings of 8' length.

3. DESIGN:
   (i) L. Sq. (ii) (a) 3 (b) N.A. (iii) 3 (iv) (a) 17' x 17' (v) Nil (vi) yes.

   GENERAL:
   (i) Good. (ii) Nil (iii) tuber weight. (iv) (a) 1946-1950 (b) No. (c) N.A. (v) (a) (b) Nil (vi) & (vii) Nil.

5. RESULTS:
   (i) 26307 lb/ac.
   (ii) 1570 lb/ac.
   (iii) The treatments are not significantly different.
   (iv) Tuber yield in lb/ac.

<table>
<thead>
<tr>
<th>Treatment</th>
<th>Mean</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
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<td>2.</td>
<td>29624</td>
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<tr>
<td>3.</td>
<td>25501</td>
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</tbody>
</table>

S.E. of treatment means: 968 lb/ac.

Crop: Tapioca.  
Site: Tapioca Res. Stn. Trivandrum.  
Object: To investigate the effect of removal and non-removal of flower buda on yield of 4 varieties of tapioca.

1. BASAL CONDITIONS:
   (i) (a) Nil (b) Tapioca (c) Same expt. was in these fields (ii) (a) Laterite soil (b) Refer soil analysis Trivandrum. (iii) 20.4.1948. (iv) (a) soil tilled to a depth of 15' by digging. (b) shallow pits were taken and cuttings of length 8' planted erect (c) - (d) 3' (e) Single cutting/hole. (v) 3 ton of cowdung and 1 ton of ash/ac. as basal dressing during tilling by broadcasting 4 ton of ash/ac, during intercultivation 2 months after planting as top dressing. (vi) Variety No: 38, 54, 63 and 97 Local Medium. As per treatments
(vii) Partially irrigated (viii) Intercultivated 2 months after planting. Weeding and earthing up done after 4 months of planting. (ix) About 67" (20.4'48 to 5.3.1949 (a) 5.3;1949.-

2. TREATMENTS :
4. Main plot treatments :
(1) Variety No. 38
(2) " 54
(3) " 63
(4) " 97
2 Sub plot treatments :
(1) Removal of flower buds.
(2) Non removal.

3. DESIGN :
(i) Split plot. Main plots: L. Sq. (a) 4 main plots and two sub plots in each main plot (b) NA
(ii) (a) Main plot 10'×12' Subplot 12'×6', (v) Nil (vi) Yes.

4. GENERAL :
(i) Good. (ii) Nil (iii) Tuber Weight. (iv) (a) 1947-1948 (b) Yes. (c) N.A. (v) (a) Nil (b) Nil. (vi) & (vii) Nil.

5. RESULTS :
(i) 25958 lb/ac.
(ii) (a) 8349 ..
(b) 7950 lb/ac.
(iii) Main, Sub and interaction “main×sub” are not significant.
(iv) Tuber weight in lb/ac.

<table>
<thead>
<tr>
<th>Variety</th>
<th>38</th>
<th>54</th>
<th>63</th>
<th>97</th>
<th>Mean.</th>
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</thead>
<tbody>
<tr>
<td>Treatment</td>
<td>28738</td>
<td>29191</td>
<td>15428</td>
<td>26015</td>
<td>24843</td>
</tr>
<tr>
<td>Removal</td>
<td>32821</td>
<td>27830</td>
<td>24502</td>
<td>32141</td>
<td>27074</td>
</tr>
<tr>
<td>Mean</td>
<td>28070</td>
<td>28510</td>
<td>19965</td>
<td>24578</td>
<td>25958</td>
</tr>
</tbody>
</table>

S.E. of difference between two treatment means. = 2807 lb/ac.
S.E. of difference between two variety means = 4174 ..
S.E. of difference of two treatment means for the same variety. = 5620 ..
S.E. of difference of two variety means for the same treatment. = 5766 ..

Crop :- Sugarcane.

Tehsil or Taluk :- Tiruvalla (Alleppy)

Ref :- K. 53 (41).

Object:- To find-out the response to NPK manuring on the yield of Sugarcane.

1. BASAL CONDITIONS :
(i) (a) Nil (b) Sugarcane (c) Parry's alluvial mixture. (53 N+40 P+100 K (lb./ac.) in two doses one month and 2 months after planting applied by placement. (ii) (a) Alluvial. (b) Refer soil analysis. Sugarcane Farm, Tiruvalla. (iii) Nil; (iv) Co.349, Improved Medium. (v) (a) Digging Removing stubbles (b) Planting cane sets in furrows (c) About 15000 sets/ac. (d) end to end planting 3' spacing between furrows. (e) 2 or 3 nodes/cutting. (vi) Jan. 1933. (vii) Irrigated. (viii) Earthing up about 3 months after planting. (ix) 108.41" (x) Jan; 1954.

2. TREATMENTS :
1. N 100 lb/ac.
2. N 100 lb./ac. + P 100 lb/ac.
3. N 100 lb./ac. + K 100 lb/ac.
4. N 100 lb./ac. + P 100 lb./ac. + K 100 lb./ac.

All applied as Parry’s alluvial mixture 50% N applied one month after planting in the form of mixture containing ‘A/S’ G.N.C. in the ratio 2:1. Rest was applied as 2nd dose 2months after planting.
3. DESIGN:
(i) No particular method was adopted for selection. (ii) 36 cultivator's fields selected (iii) Varied from cultivator to cultivator (iv) Yes.

4. GENERAL:
(i) Satisfactory. (ii) Nil. (iii) Cane weight in ton/ac. (iv) (a) Nil. (b) Nil. (v) Nil. (vi) Nil. (vii) Nil
(iv) Raw data N.A.

5. RESULTS:
(i) 35.70 ton/ac.
(ii) N.A.
(iii) The treatments are not significantly different.
(iv) Cane weight in ton/ac.

<table>
<thead>
<tr>
<th>Treatment</th>
<th>Mean</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>33.48</td>
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<tr>
<td>2</td>
<td>34.94</td>
</tr>
<tr>
<td>3</td>
<td>37.29</td>
</tr>
<tr>
<td>4</td>
<td>37.06</td>
</tr>
</tbody>
</table>

Crop: Sugarcane. 
Ref: K. 53(42). 
Tehsil or Taluk: Tiruvalla (Alleppy) 
Type: 'M' 
(Experiment on cultivators fields) 

Object: To find out the response to NPK manuring on the yield of Sugarcane.

1. BASAL CONDITIONS:
(i) (a) Nil. (b) Sugarcane. (c) Parry's alluvial mixture. 50 (N+40 P+100 K) lb/ac. in two doses one and two months after planting applied by placement. (ii) (a) Loam. (b) Refer soil analysis Sugarcane farm Tiruvalla. (iii) Nil. (iv) Co. 349. Improved. Medium. (v) (a) Digging. Removing stubbles (b) planting canesets along furrows. (c) About 13000 sets/ac. (d) End to end planting with 3' spacing between furrows; (e) 2 or 3 nodes/cutting. (f) Jan. 1953. (g) Irrigated. (h) Earthing up done about 3 months after planting. (ix) 103.41 (x) Jan. 1954.

2. TREATMENTS:
1. 50 N lb/ac.
2. do + 100 P lb/ac.
3. do + 100 K lb/ac.
4. 50 N+100 P+100 K lb/ac.

All applied as Parry's alluvial mixture 50% 'N' applied one month after planting in the form of a mixture containing 'A/S' and G.N.C. in the ratio 2:1 Rest was applied as second dose 2 months after planting.

3. DESIGN:
(i) No particular method of selection was adopted. (ii) 32 cultivator's fields selected. (iii) Varied from cultivator to cultivator; (iv) N.A.

4. GENERAL:
(i) Satisfactory. (ii) Nil. (iii) Cane weight in ton/ac. (iv) (a) to (c) Nil. (v) (a) (b) Nil. (vi) Nil. (vii) Nil
(iv) Raw data N.A.

5. RESULTS:
(i) 30.90 ton/ac.
(ii) N.A.
(iii) The treatments are not significantly different.
(iv) Cane weight in tons/ac.

<table>
<thead>
<tr>
<th>Treatment</th>
<th>Mean</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>29.85</td>
</tr>
<tr>
<td>2</td>
<td>30.48</td>
</tr>
<tr>
<td>3</td>
<td>32.21</td>
</tr>
<tr>
<td>4</td>
<td>31.06</td>
</tr>
</tbody>
</table>
Crop: Chilies.  
Ref: K. 49(11)/48(5).  
Type: ‘M’

Object: To find the effect of C.M., G.N.C. applied alone and in combinations & the combination of C.M. with ‘A/S’.

1. BASAL CONDITIONS:
   (i) (a) Nil. (b) Chilies. (c) As per treatments & basal dressing of previous year. (ii) (a) Red laterite. (b) Refer, soil analysis, Taliparamba. (iii) 2nd week of May 1948/15.6.42. (iv) (a) 3 ploughings; forming ridges & furrows. (b) Transplanting seedlings raised from nursery on ridges. (c) (d) Spacing between rows, 2 ft & between plants 1 ft. (e) 1 (f) Nil. (g) South Malabar; Improved. (v) Soil classification according to duration. (vi) Rainfed. (vii) Data N.A. All details obtained from annual reports.

2. TREATMENTS:
   1. No manure.
   2. 5 ton/ac of C.M.
   3. 1400 lb./ac of G.N.C.
   4. (2) + 500 lb/ac of G.N.C.
   5. (2) + 1000 lb./ac of G.N.C.
   6. (2) + 200 lb./ac. A/S
   7. (2) + 400 lb./ac. of ‘A/S’.

Cattle manure applied at the time of ploughing. G.N.C. applied as basal dressing before planting. ‘A/S’ top dressed in two doses two months and three months after planting.

3. DESIGN:
   (i) R.B.D. (ii) (a) 7 (b) N.A. (iii) 6 (iv) (a), (b) 5% cent. (dimensions N.A.) (v) Nil. (Nil) Yes.

4. GENERAL:
   (i) Satisfactory. (ii) Nil. (iii) Chillies weight. (iv) (a) 1945-1950. (b) Yes. (c) N.A. (v) (a) (b) Nil. (vi) N.A. (vii) Data N.A. All details obtained from annual reports.

5. RESULTS:
   (i) 1504 lb./ac.
   (ii) 416.1 ...
   (iii) The treatments are significantly different.
   (iv) Mean yield in lb./ac.

   Treatment | Mean yield |
   ------- |---------- |
   1       | 766      |
   2       | 1353     |
   3       | 1453     |
   4       | 1661     |
   5       | 1498     |
   6       | 1569     |
   7       | 2226     |

S.E. of treatment mean = 170.0 lb./ac.

Crop: Chilies.  
Ref: K. 49(11)/48(5).  
Type: ‘M’

Object: To find the effect of C.M., G.N.C. and their combinations and the combination of C.M. with A/S.

1. BASAL CONDITIONS:
   (i) (a) Nil. (b) Chilies. (c) As under treatments and basal dressing of K 48(5). (ii) (a) Red laterite. (b) Refer soil analysis, Taliparamba. (iii) 27.6.1949. (iv) (a) Ploughing three times; forming ridges and furrows. (b) Planting seedlings raised from nursery on the ridges. (c) (d) 2 ft between rows and 1 ft between plants. (e) 1 (f) Nil. (g) South Malabar; Improved. (h) No classification according to duration. (h) Rainfed. (vii) Two weedings and two earthings; 1st : 3 or 4 weeks after planting and 2nd : 8 weeks after planting. (ix) About 140° (27.6.1949 to 15.12.1949). (x) 15th, 25th Oct., 14th, 27th Nov. and 15th Dec. generally planted; one month after sowing.

2. TREATMENTS:
   1. No Manure.
   2. 5 ton/ac of C.M.
   3. 1400 lb./ac. of G.N.C.
4. (2) +500 lb./ac. G.N.C.
5. (2) +1000 lb./ac. G.N.C.
6. (2) +200 lb./ac. A/S.
7. (2) +400 lb./ac. A/S.

C.M. applied at the time of ploughing.
G.N.C. as basal dressing before planting; A/S as basal dressing before planting when plants are weak
A/S is top dressed.

3. DESIGN:
(i) R.B.D. (ii) (a) 7 (b) N.A. (iii) 10 (iv) (a) 0.178 cent (b) 0.172 cent (v) One row all round the net
plot. (vi) Yes.

4. GENERAL:
(i) N.A. (ii) Nil (iii) weight of chillies. (iv) (a) 1945 to 1950. The experiment appears to have failed
during 1946. (b) Yes (c) N.A. (v) (a,b) Nil (vi) Nil (vii) No original data could be traced out from the
station. All details are collected from the annual reports. Hence no standard errors could be calculated.

5. RESULTS:
(i) 292 lb./ac.
(ii) N.A.
(iii) The treatment differences are not significant.
(iv) Weight of chillies in lb./ac.

<table>
<thead>
<tr>
<th>Treatment</th>
<th>Mean</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>161</td>
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<tr>
<td>2.</td>
<td>261</td>
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<td>370</td>
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<td>4.</td>
<td>272</td>
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<td>5.</td>
<td>286</td>
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<td>6.</td>
<td>354</td>
</tr>
<tr>
<td>7</td>
<td>343</td>
</tr>
</tbody>
</table>

S.E. of treatment mean. N.A.

Crop : Chillies.    Ref : K.S50 (9)/49 (11)/48 (5)
Site : Agri. Res. Stn. Taliparamba    Type : 'M'
Object : To test the effect of C.M., G.N.C. and their combinations and combination of C.M. with A/S.

1. BASAL CONDITIONS:
(i) (a) Nil (b) Chillies (c) Same exp. was in these plots (ii) (a) Red laterite (b) Refer soil analysis
Taliparamba (iii) Sowing by the end of April; planting by the end of May or beginning of June one month
after sowing. (iv) (a) Ploughing 2 times; forming ridges and furrows (b) Planting seedlings raised
from nursery on the ridges (c)—(d) 2 1/2 between rows and 1 1/2 between plants (e)—(v) Nil (vi) South
Malabar; Improved (vii) Rainfed (viii) Two weeding s and two earthings ; 1st : three or four
weeks after planting; 2nd : 8 weeks after planting (ix) About 125° (x) 21st Sep. 9th, 15th, 23rd and
30th Oct. 10th, 18th Nov. 1950.

2. TREATMENTS:
1. No manure
2. 5 tons/ac. of C.M.
3. 14:0 lb./ac. of G.N.C.
4. (2) +500 lb./ac. of G.N.C.
5. (2) +1000 lb./ac. of G.N.C.
6. (2) +200 lb./ac. of A/S
7. (2) +400 lb./ac. of A/S

C.M. applied at the times of ploughing; G.N.C. as basal dressing just before planting; A/S as basal
dressing just before planting but when the plants are weak A/S was top dressed.

3. DESIGN:
(i) R.B.D. (ii) (a) 7 (b) N.A. (iii) 6 (iv) (a) 0.178 cents (b) 0.173 cents (v) One row all round the
net plot discarded (vi) Yes.

4. GENERAL:
(i) Satisfactory (ii) Nil (iii) Yield of Chillies (iv) (a) 1945-50 (b) Yes (c) N.A. (v) (a),(b) Nil (vi)
Nil (vii) Raw data N.A.
RESULTS:
(i) 716 lb./ac.
(ii) 215 lb./ac.
(iii) The treatment differences are significant.
(iv) Yield in lb./ac.

<table>
<thead>
<tr>
<th>Treatment Mean</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>1. 319</td>
<td></td>
</tr>
<tr>
<td>2. 712</td>
<td></td>
</tr>
<tr>
<td>3. 392</td>
<td></td>
</tr>
<tr>
<td>4. 1093</td>
<td></td>
</tr>
<tr>
<td>5. 846</td>
<td></td>
</tr>
<tr>
<td>6. 748</td>
<td></td>
</tr>
<tr>
<td>7. 904</td>
<td></td>
</tr>
</tbody>
</table>

S.E. of treatment means. = 88 lb./ac

Crop : Chillies.
Ref : K. 48 (6)
Type : 'C'

Object : To compare the performances of seedlings planted after nipping off the top shoot to about 3" with those without removing top shoots.

1. BASAL CONDITIONS:
(i) (a) Nil (b) Chillies (c) N.A. (ii) (a) Red laterite (b) Refer soil analysis—Taliparamba
(ii) (a) Red laterite (b) Refer soil analysis—Taliparamba (iii) 2nd week of May 1948/15.6.1948 (iv) (a) 3 ploughings; forming ridges & furrows (b) Transplanting seedlings raised from nursery on ridges (c)—(d) 1/2" between plants; 21/2" between rows (e) (f) 5 tons per ac. of F.Y.M. at the time of ploughing (vi) South Malabar; Improved. (vii) Rainfed (viii) Two weeding & two carthing 1st : 1 to 4 weeks after planting & 2nd : 8 weeks after planting (xi) About 100" (2nd week of May 48 to Jan. 1949). (x) September 1948 to January 1949.

2. TREATMENTS:
1. Topped i.e. planting seedlings after nipping off the top shoot to about 3".
2. Untopped.

3. DESIGN:
(i) Three 2 x 2 L. Sq. (ii) (a) 1/2 (b) N.A. (iii) 6 (iv) (a) (b) 5/13 cents. (Dimensions N.A.) (v) No (vi) Yes

4. GENERAL:
(i) Satisfactory (ii) Nil (iii) Chillies weight (iv) (a) 1945-1950 (b) Yes (c) N.A. (v) (a) Nil (b) Nil (vi) Nil (vii) Rainfed N.A.

5. RESULTS:
(i) 2016 lb./ac.
(ii) 392.4 lb./ac.
(iii) The treatments are not significantly different.
(iv) Mean yield of chillies in lb./ac.

<table>
<thead>
<tr>
<th>Treatments Mean</th>
<th>Mean</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. 319</td>
<td></td>
</tr>
<tr>
<td>2. 712</td>
<td></td>
</tr>
<tr>
<td>3. 392</td>
<td></td>
</tr>
<tr>
<td>4. 1093</td>
<td></td>
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<tr>
<td>5. 846</td>
<td></td>
</tr>
<tr>
<td>6. 748</td>
<td></td>
</tr>
<tr>
<td>7. 904</td>
<td></td>
</tr>
</tbody>
</table>

S.E. of treatment means = 160.2 lb./ac.
the time of earthing up. (vi) South Malabar; Improved, No classification according to duration. (vii) Rainfed. (viii) Two weedings and two earthings 1st: 3 or 4 weeks after planting. 2nd: 8 weeks after planting. (x) About 140° (25.6.1949 to 15.12.1949) (x) Harvested on 15th, 23th Oct, 14th, 27th Nov. and 15th Dec. (Sown generally in a nursery and planted one month afterwards.)

2. TREATMENTS:
1. Topped i.e. planting seedlings after nipping off the top shoot to about 3"
2. Untopped,

3. DESIGN:
(i) Three 2x2 L. Sq. (ii) 2 (b) N.A. (iii) 6 (iv) (a) 0.178 cent (b) 0.172 cent (v) one row a round the net plot (vi) Yes.

4 GENERAL:
(i) Satisfactory. (ii) Nil (iii) weight of chillies (iv) (a) 1945 to 1950 (b) Yes (c) N.A. (v) (a), (b) Nil (vi) Nil (vii) Raw data N.A.

5. RESULTS:
(i) 672 lb./ac. (ii) 22 ... (iii) The treatments are significantly different. (iv) Chillies weight in lb./ac.

<table>
<thead>
<tr>
<th>Treatment</th>
<th>Mean</th>
<th>S.E. of treatment means</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>606</td>
<td>-9 lb./ac.</td>
</tr>
<tr>
<td>2.</td>
<td>737</td>
<td></td>
</tr>
</tbody>
</table>

Crop :-Chillies    Site :-Agri. Res. Strn. Taliparamba
Ref :-K. 50 (10), 49 (9), 48 (6)   Type :- 'C'

Object :-To compare the performance of seedlings planted after nipping off the top shoot to about 3" with those without removing the top shoot.

1. BASAL CONDITIONS:
(i) (a) Nil (b) Chillies (c) As per basal dressing in K 49 (9) (ii) (a) Red laterite. (b) Refer soil analysis, Taliparamba (iii) 12.6.50 (iv) (a) Ploughing 3 times; forming ridges and furrows (b) Planting seedlings raised from nursery on the ridge (c)—(d) 24' between rows and 14' between plants (e) 1 (v) 5 tons/ac. Compost applied at the time of ploughing+230 lb./ac. of G.N.C+500 lb./ac. Ash+50 lb./ac. Super applied in 2 doses at the time of earthings as top dressing. (vi) South Malabar; Improved (vii) Rainfed (viii) Two weedings and two earthing. 1st: weeding and earthing 3 or 4 weeks after planting and 2nd: 8 weeks after planting. (ix) About 129° (12.6.50 to 18.11.1950) (x) 21st Sep. 9th. 16th 23rd and 30th Oct. and 10th and 18th Nov. 1950.

2. TREATMENTS:
1. Topped i.e. planting seedlings after nipping off the top shoot to about 3"
2. No topping

3. DESIGN:
(i) Three 2x2 L. Sq. (ii) 2 (b) N.A. (iii) 6 (iv) (a) 0.178 cent (b) 0.172 cent. (v) One row all round the net plot. (vi) Yes.

4. GENERAL:
(i) Satisfactory (ii) Nil (iii) chillies weight (iv) (a) 1945—1950 (b) Yes (c) N.A. (v) (a) Nil (b) Nil (vi) Nil (vii) Raw data N.A.

5. RESULTS:
(i) 2274 lb./ac. (ii) N.A. (iii) The treatments are not significantly different. (iv) Mean yield in lb./ac.

<table>
<thead>
<tr>
<th>Treatment</th>
<th>Mean</th>
<th>S.E. per treatment mean</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>2296</td>
<td></td>
</tr>
<tr>
<td>2.</td>
<td>2251</td>
<td></td>
</tr>
</tbody>
</table>
Object: To test the possibility of increasing the yield by planting more than one seedling per hole.

1. BASAL CONDITIONS:
   (i) (a) Nil (b) Chillies (c) N.A.
   (ii) (a) Red Laterite (b) Refer soil analysis Taliparamba
   (iii) 15.5.43; 15.6.48. (iv) (a) 3 ploughings; forming ridges & furrows (b) planting seedlings raised from nursery on the ridges (c) (d) between rows & between plants (e) As per treatments (v) 5 tons/ac. F.Y.M. at the time of planting + 500 lb./ac. of Ash + 50 lb./ac. Super in two equal doses at the time of earthing up.
   (vi) South Malabar; Improved (vii) Rainfed (viii) Two weedings & two earthings; 1st: three or four weeks after planting and 2nd: 8 weeks after planting. Weeding & earthing up done together (ix) About 100° (May 48 to November 48). (x) During the months of September, October & November 1948.

2. TREATMENTS:
   1. Seedling/hole
   2. 2
   3. 3

3. DESIGN:
   (i) R.B.D. (ii) (a) 3 (b) N.A. (iii) 6 (iv) (a) N.A. (b) Super
   (v) One row all round the net plot. (vi) Yes

4. GENERAL:
   (i) Satisfactory (ii) Nil (iii) Chillies weight (iv) (a) 1946—1950. (b) Yes (c) N.A. (v) (a) Nil (b) Nil (vi) (vii) Raw data N.A.

5. RESULTS:
   (i) 2005 lb./ac. (ii) 453.2 lb./ac.
   (iii) Mean yield of Chillies in lb./ac. (iv) The treatments are not significantly different.
   Treatment | Mean
   -----------|------
   1.         | 1945
   2.         | 1926
   3.         | 2104
   S.E. of treatment mean = 160.2 lb./ac.
5. RESULTS:
(i) 798 lb./ac.
(ii) N.A.
(iii) The treatment differences are not significant.
(iv) Chillies weight in lb./ac.

<table>
<thead>
<tr>
<th>Treatment</th>
<th>Mean</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>665</td>
</tr>
<tr>
<td>2.</td>
<td>847</td>
</tr>
<tr>
<td>3.</td>
<td>883</td>
</tr>
</tbody>
</table>

S.E. — N.A.

Crop :- Chillies          Ref :- K. 50 (8)/49 (10)/48 (7)
Site :- Agri. Res. Stn. Taliparamba      Type :- ‘C’

Object — To test the possibility of increasing the yield by planting more than one seedling per hole.

1. BASAL CONDITIONS:
(i) (a) Nil (b) Chillies (c) As per basal dressing in K 49 (10) (ii) (a) Red laterite (b) Refer soil analysis Taliparamba (iii) Planted on 12.6.1950.
(iv) (a) Ploughing 3 times, forming ridges and furrows (b) Planting seedlings raised from nursery on the ridges (c) — (d) 2½’ between rows and 1½’ between plants (e) As under treatments (v) 5 tons/ac. F.Y.M. at the time of planting +250 lb/ac. of G.N.C + 500 lb/ac. Ash + 50 lb/ac. Super in two equal doses at the time of earthing up; top dressed. (vi) South Malabar ; Improved (vii) Rainfed (viii) Two weeding and two earthing. 1st : 3 or 4 weeks after planting and 2nd : 8 weeks after planting (ix) About 129° (12.6.1950 to 18.11.1950) (x) 18.11.1950.

2. TREATMENTS:
   1. 1 seedling/hole.
   2. 2
   3. 3

3. DESIGN:
(i) R.B.D. (ii) (a) 3 (b) N.A. (iii) 8 (iv) (a) 0.178 cents (b) 0.172 cents (v) One row all round the net plot discarded. (vi) Yes.

4. GENERAL:
(i) Satisfactory (ii) Nil (iii) Chillies weight (iv) (a) 1946-50 (b) Yes (c) N.A. (v) (a) (b) Nil (vi) Nil (vii) The experiment appears to have failed during 1947. Raw data N.A.

5. RESULTS:
(i) 1983. lb/ac.
(ii) N.A.
(iii) The treatments are not significantly different.
(iv) Chillies weight in lb/ac

<table>
<thead>
<tr>
<th>Treatment</th>
<th>Mean</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>1785</td>
</tr>
<tr>
<td>2.</td>
<td>2117</td>
</tr>
<tr>
<td>3.</td>
<td>2046</td>
</tr>
</tbody>
</table>

S.E. of treatment mean : N.A.

Crop :- Chillies.          Ref :- K. 52 (17)
Site :- Agri. Res. Stn. Taliparamba      Type :- ‘D’

Object — To find out the best chemical to control the fruit-rot of chillies.

1. BASAL CONDITIONS:
(i) (a) Nil (b) Chillies (c) 5 tons/ac. of Compost (ii) (a) Red laterite (b) Refer soil analysis Taliparamba (iii) 24.4.52 ; 27.6.1952 (iv) (a) Ploughing 3 times; formed ridges and furrows (b) Planting seedlings raised from nursery on the ridges (c) — (d) 2½’ between rows and 1½’ between plants (e) 1 (v) 5 tons/ac. compost applied at the time of ploughing. (vi) South Malabar ; Improved (no classification according to duration.) (vii) Rainfed: (viii) Two weeding and two earthing. 1st : 3 or 4 weeks after planting and 2nd : 8 weeks after planting. (ix) About 101° (24.4.52 to 27.6.1952) (x) Harvests begin from Sept. and end in Dec. at intervals of about 10 days.
2. **TREATMENTS:**
   1. Gybamate
   2. Bitox
   3. Coppesan
   4. Copper sandoz
   5. Dithane Z 78
   6. Dithane D 14+Zinc sulphate
   7. Bordeaux mixture
   8. Perenox
   9. Control.

   All chemicals sprayed.

   First spraying on 29.7.1952 and second on 1.10.1952.

3. **DESIGN:**
   (i) R.B.D. (ii) (a) 9 (b) N.A. (iii) 4 (iv) (a,b) 20'X20' (v) Nil (vi) Yes.

4. **GENERAL:**
   (i) Satisfactory (ii) No (iii) % infection (=total no. of affected plants x 100/total no. of plants) (iv)
   (a) No (b) No (c) Nil (v) (a),(b) Nil (vi) Nil (vii) Raw data N.A.

5. **RESULTS:**
   (i) 9.0% infection.
   (ii) 3.8%
   (iii) The treatments differ significantly.
   (iv) % of infection

<table>
<thead>
<tr>
<th>Treatment</th>
<th>Mean % infection.</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>10.3</td>
</tr>
<tr>
<td>2.</td>
<td>13.7</td>
</tr>
<tr>
<td>3.</td>
<td>6.0</td>
</tr>
<tr>
<td>4.</td>
<td>4.9</td>
</tr>
<tr>
<td>5.</td>
<td>9.5</td>
</tr>
<tr>
<td>6.</td>
<td>15.1</td>
</tr>
<tr>
<td>7.</td>
<td>4.8</td>
</tr>
<tr>
<td>8.</td>
<td>5.6</td>
</tr>
<tr>
<td>9.</td>
<td>11.2</td>
</tr>
</tbody>
</table>

   S.E. of treatment means = 1.9% infection.

---

**Crop:** Sweet Potato.  
**Site:** Tapioca and Sweet potato Res. Stn. Mannuthy.  
**Object:** To determine the optimum requirements of N, P and K for sweet potato.

1. **BASAL CONDITIONS:**
   (i) (a) Nil (b) Previously the area was used as a grazing field. (c) N.A. (ii) (a) Loamy (b) Refer soil analysis Mannuthy (iii) 16.7.1952 (iv) (a) 4 rounds of ploughings and removing of weeds before laying out the experiment (b) Vines are cut with 3 nodes and planted at a depth of 3" on ridges (c) — (d) 3'X3' (e) One cutting per groove. (v) Nil (vi) Local ; Medium. (vii) Un-irrigated. (viii) Weeding once, Interplanting once at the time of application of N and K one month after planting. (ix) N.A. (16.7.1952 to 11.11. 1952) (x) 11.11-1952.

2. **TREATMENTS:**
   1 Main-plot treatments:

   All combinations of (1) & (2)
   (1) Three levels of N : N₀=0, N₁=50 lb/ac. N₂=100 lb/ac.
   (2) Three levels of K₂O : K₀=0, K₁=80 lb/ac. K₂=160 lb/ac.

   2 Sub-plot treatments:

   Two levels of P₂O₅ : P₀=0, P₁=80 lb/ac.

   K as Muriate of potash one month after planting.

   P as Super before planting.

3. **DESIGN:**
   (i) Split plot (ii) (a) 9 man-plots/block ; 2 sub-plots/main plot. (b) N.A. (iii) 6 (iv) (a) Main plot 24'X60'  
   Sub plot 60'X12' (b) Sub-plot 54'X6' (v) One row around the net plot discarded (vi) Yes.
4. GENERAL:

(i) Good (ii) Nil (iii) Tuber yield (iv) (a) 1952 to 1957. Experiment failed in 1953. (b) Yes (c) N.A (v) (a),(b) Nil (v) Nil (vii) These were some attack on the crop from wild boars and stray animals due to want of proper fencing. As it is reported that there was some attack to the crop by wild animals and hence the results are likely to be vitiated and the significant interactions need not be attached any importance. The significant interaction N may also be due to this fact.

5. RESULTS:

(i) 3237 lb./ac.
(ii) (a) 563 lb./ac.
(b) 434
(iii) N.K, NK and NP are highly significant.
(iv) Mean tuber weight 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>K₀</td>
<td>1707</td>
<td>2783</td>
<td>3455</td>
<td>2648</td>
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<td>K₁</td>
<td>3139</td>
<td>3334</td>
<td>2988</td>
<td>3157</td>
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<tr>
<td>K₂</td>
<td>3274</td>
<td>4403</td>
<td>4040</td>
<td>3906</td>
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<tr>
<td>P₀</td>
<td>2348</td>
<td>3554</td>
<td>3558</td>
<td>3153</td>
</tr>
<tr>
<td>P₁</td>
<td>3065</td>
<td>3460</td>
<td>3437</td>
<td>3221</td>
</tr>
</tbody>
</table>

Mean: 2707, 3153, 3321, 3237

S.E. of body of (NK) table 162 lb./ac.
S.E. of difference of two N or K marginal means 133
S.E. of difference of two P marginal means 84
S.E. of difference of two N or K means for the same level of P 168
S.E. of difference of two P means for the same level of N or K 145

Crop: Sweet potato.

Object: To find out the effect of application of Borax on the yield of sweet potato.

1. BASAL CONDITIONS:

(i) (a) Nil (b) Modan Paddy (c) 10 C.L./ac. of F.Y.M. + 1000 lb./ac. Wood Ash + 2 cwt/ac. of G.N.C. (ii) (a) Laterite loam (b) Refer Soil analysis Pattambi (iii) July 1948. (iv) (a) 6 ploughings; forming ridges. (b) Planting in ridges (c) — (d) 12" between rows and 9" between plants (e) single cuttings per hole of length 9". (v) Nil. (vi) Local (vii) Rainfed. (viii) Two weedings and earthing up. (ix) About 90". (July 1948 to 20.7.1949) (x) 19, 20.7.1949.

2. TREATMENTS:

1. 0 lb./ac. of Borax
2. 20
3. 30
4. 40

Applied before planting

3. DESIGN:

(i) R.B.D. (ii) (a) 4 (b) N.A. (iii) 6 (iv), (a), (c) 101'×21' (v) 4' inter spaced between plots. (vi) Yes.
4. GENERAL:
   (i) Satisfactory. (ii) Nil (iii) Weight of tubers. (iv) (a) 1947-1949 (b) No (c) N.A. (v) (a, b) Nil. (vi) & (vii) Nil.

5. RESULTS:
   (i) 1.995 ton/ac.
   (ii) 0.615 ton/ac.
   (iii) The treatments do not differ significantly.
   (iv) Tuber weight in tons/ac.
   Treatment          Mean
   1.                     1.970
   2.                     2.087
   3.                     1.793
   4.                     2.131
   S.E. of treatment means = 0.168 ton/ac.

Crop:—Sweet Potato  
Site:—Tapioca and Sweet Potato Res. Stn. Mannuthy.  
Ref:—K.52 (6)  
Type:—'C'
Object:—To determine the best spacing for Sweet Potato and to find-out the best method of planting.

1. BASAL CONDITIONS:
   (i) (a) Nil (b) Previously the area was used as a grazing field. (c) N.A. (ii) (a) Loamy (b) Refer soil analysis Mannuthy (iii) 23-7-1952 (iv) (a) 4 rounds of ploughing before laying out the experiment. Removed the weeds and prepared the field for planting (b) Vines are cut with 3 nodes and planted at a depth of 3" (c) —(d) As per treatments (e) one cutting per groove. (v) 5 C.L./ac. of Cowdung + 100 tins/ac. of Ash. Cowdung applied before ploughing, and ash at the time of planting. (vi) Local Medium (vii) Un-irrigated (viii) Weeding once. (ix) N.A. (x) 26.11.1952.

2. TREATMENTS:
   All combinations (I) & (2):
   1. Two methods of planting (i) on ridges and (ii) on flat beds
   2. 4 spacings 1', 2', 3' & 4'

3. DESIGN:
   (i) 2 x 4 fact. in R.B.D. (ii) (a) 8 (b) N.A. (iii) 6 (iv) (a) N.A. (b) 12' x 24' (v) Nil (vi) Yes.

4. GENERAL:
   (i) Good (ii) Nil (iii) Tuber yield (iv) (a) 1952—1957; failed in 1953 (b) Yes (c) N.A. (v) (a), (b) Nil (vi) There was some attack on the crop from stray animals due to want of fencing. (vii) Nil.

5. RESULTS:
   (i) 2050 lb./ac.
   (ii) 143 lb./ac.
   (iii) Spacings, methods of planting and interaction are highly significant.
   (iv) Average Tuber yield in lb./ac.

<table>
<thead>
<tr>
<th>Method of Planting</th>
<th>1' Spacing</th>
<th>2'</th>
<th>3'</th>
<th>4'</th>
<th>Mean</th>
</tr>
</thead>
<tbody>
<tr>
<td>On ridges</td>
<td>2448</td>
<td>1377</td>
<td>1007</td>
<td>856</td>
<td>1422</td>
</tr>
<tr>
<td>On flat beds</td>
<td>4310</td>
<td>2579</td>
<td>2492</td>
<td>1573</td>
<td>2739</td>
</tr>
<tr>
<td>Mean</td>
<td>3319</td>
<td>1978</td>
<td>1749</td>
<td>1214</td>
<td>2090</td>
</tr>
</tbody>
</table>

S.E. of the body of table = 59 lb./ac.
S.E. of marginal means (spacing) = 41,, "
S.E. of marginal means (method) = 29,, "

---
Crop: Coconut.
Site: Agri. Res. Stn. Nileshwar III.

Object: To find out the best manure for the Coconut in the sandy soil in addition to regular cultivation and the better method of applying the manure.

1. BASAL CONDITIONS:
   (i) The trees were under uniform manurial and cultural operations. (ii) (a) Sandy, (b) Refer soil analysis Nileshwar III (iii) Seedlings. (iv) Ordinary tall westcoast. (v) Date N.A. Triangular method of planting; 25' spacing. (vi) One year old. (vii) Nil. (viii) 2 ploughings in Sept. & Dec. cultivator worked in Dec. (ix) A green manure crop of Crotolaria was raised and applied to the trees. (x) Rainfed. (xi) 151.06° in 132 rainy days. (xii) Monthly harvests.

2. TREATMENTS:
   All combinations of
   3 Manures × 2 Methods of application.
   Manures: (1) 41 lb. A/S/tree.
   (2) 15 lb. F.M.
   (3) 134 lb. G.N.C/tree.
   Methods: (1) Broadcast in circular basins around trees.
   (2) In trenches 3' deep dug in between row of trees.
   General dose common to all trees.

3. DESIGN:
   (i) 2 × 3 Fact. in R.B.D. (ii) (a) 6 (b) N.A. (iii) 3 (iv) 2 (v) Nil (vi) Yes.

4. GENERAL:
   (i) Satisfactory (ii) Beetles regularly searched and killed (iii) (1) No. of functioning leaves. (2) No. of days between the production of two successive leaves. (3) No. of female flowers. (4) Yield of nuts.
   (iv) (a) 1912-50 (modified during 1943) (b) N.A. (v) (a), (b) Nil. (vi) & (vii) Nil.

4. RESULTS
   (i) (1) 12.64 (2) 42.58 (3) 2.33 (4) 0.92
   (ii) N.A.
   (iii) For characters (1) & (2), treatments are not significantly different. For character (3) data not statistically analysed as all trees had not produced female flowers. For character (4) data not statistically analysed as all the trees had not come to bearing.
   (iv) (1) Mean no. of functioning leaves in the crown/tree/year.

<table>
<thead>
<tr>
<th>G.N.C.</th>
<th>A/S</th>
<th>F.M.</th>
<th>Mean.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Broadcast</td>
<td>14.33</td>
<td>11.66</td>
<td>12.16</td>
</tr>
<tr>
<td>Trenches.</td>
<td>8.83</td>
<td>15.50</td>
<td>13.33</td>
</tr>
<tr>
<td>Mean.</td>
<td>11.58</td>
<td>13.58</td>
<td>12.75</td>
</tr>
<tr>
<td>S.E.s</td>
<td>N.A.</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

   (2) Mean no. of days between the production of successive leaves/tree/year.

<table>
<thead>
<tr>
<th>G.N.C.</th>
<th>A/S</th>
<th>F.M.</th>
<th>Mean.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Broadcast</td>
<td>39.15</td>
<td>47.33</td>
<td>46.66</td>
</tr>
<tr>
<td>Trenches.</td>
<td>40.00</td>
<td>40.33</td>
<td>42.50</td>
</tr>
<tr>
<td>Mean</td>
<td>39.58</td>
<td>43.83</td>
<td>44.33</td>
</tr>
<tr>
<td>S.E.s</td>
<td>N.A.</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

   (3) Mean no. of female flowers produced/tree/year.

<table>
<thead>
<tr>
<th>G.N.C.</th>
<th>A/S</th>
<th>F.M.</th>
<th>Mean.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Broadcast</td>
<td>2.66</td>
<td>3.00</td>
<td>1.66</td>
</tr>
<tr>
<td>Trenches.</td>
<td>3.50</td>
<td>0.50</td>
<td>2.16</td>
</tr>
<tr>
<td>Mean</td>
<td>3.08</td>
<td>1.75</td>
<td>2.16</td>
</tr>
</tbody>
</table>
Object: To find out the best manure for coconut in sandy soil in addition to the regular cultivation and the better method of applying the manure.

1. BASAL CONDITIONS:
   (i) The trees were under uniform manural and cultural operations. (ii) (a) Pure sandy soil. (b) Refer soil analysis, Nileshwar III. (iii) By seed nuts. (iv) Ordinary tall west coast. (v) Date N.A.; Triangular method of planting; 25' spacing. (vi) one year. (vii) Nil (viii) 2 ploughings in Sept. & Dec. and cultivator worked in Dec. (ix) G.M. of Crotolaria straita was raised and applied to the trees. The G.M. crop did not come up well. (x) Rainfed. (xi) 147.83" in 109 rainy-days.

2. TREATMENTS:
   All combinations of:
   3 Manures x 2 Methods of application.
   Manures (1) 41 lb. A/S/tree
   (2) 31 lb. G.N.C./tree
   (3) 15 lb. F.M.
   Methods (1) In circular basins of 8 feet radius and 1 foot depth.
   (2) In trenches dug between trees.

3. DESIGN:
   (i) R.B.D. (ii) (a) 6 (b) N.A. (iii) 3 (iv) 2 (v) Nil (vi) Yes.

4. GENERAL:
   (i) Satisfactory (ii) Rhinocerous Beetle regularly searched and killed. (iii) (1) No. of leaves in the crown (2) Rate of production of leaves (3) No. of female flowers (4) No. of nuts/tree. (iv) (a) 1942-50 (modified during 1948) (b) N.A. (v) (a), (b) Nil (vi) & (vii) Nil.

5. RESULTS:
   (i) (1) 12.28 (2) 37.39 (3) 20.1 (4) 5.2
   (ii) N.A.
   (iii) For characters (1) & (2) treatments are not significantly different. For character (3) data not statistically analysed, as some of the trees did not produce female flowers. For character (4) data not statistically analysed, as some of trees did not start yielding.
   (iv) (1) Mean no. of functioning leaves on the crown/tree/year.

<table>
<thead>
<tr>
<th></th>
<th>basins</th>
<th>trenches</th>
<th>Mean</th>
</tr>
</thead>
<tbody>
<tr>
<td>G.N.C.</td>
<td>12.31</td>
<td>12.34</td>
<td>12.33</td>
</tr>
<tr>
<td>A/S</td>
<td>12.23</td>
<td>12.28</td>
<td>12.26</td>
</tr>
<tr>
<td>F.M.</td>
<td>12.28</td>
<td>12.23</td>
<td>12.26</td>
</tr>
<tr>
<td>Mean</td>
<td>12.27</td>
<td>12.28</td>
<td>12.28</td>
</tr>
</tbody>
</table>

(2) Mean no. of days between the production of successive leaves/tree/year.

<table>
<thead>
<tr>
<th></th>
<th>basins</th>
<th>trenches</th>
<th>Mean</th>
</tr>
</thead>
<tbody>
<tr>
<td>G.N.C.</td>
<td>37.53</td>
<td>37.57</td>
<td>37.55</td>
</tr>
<tr>
<td>A/S</td>
<td>37.27</td>
<td>37.00</td>
<td>37.14</td>
</tr>
<tr>
<td>F.M.</td>
<td>37.37</td>
<td>37.57</td>
<td>37.47</td>
</tr>
<tr>
<td>Mean</td>
<td>37.39</td>
<td>37.38</td>
<td>37.39</td>
</tr>
</tbody>
</table>
**Crop:** Coconut  
**Site:** Agri. Res. Stn. Nileshwar. III  
**Object:** To find out the best manure for coconut in the sandy soil in addition to cultivation and best method of applying manure.

1. **BASAL CONDITIONS:**
   (i) The trees were under uniform manurial and cultural operations.  
   (ii) (a) Sandy (b) Refer soil analysis Nileshwar III.  
   (iii) By seedlings  
   (iv) ordinary  
   (v) Date N.A.; Triangular method; 25' spacing.  
   (vi) one year old.  
   (vii) Type: 'M'  
   (viii) Crop of Crotolaria striata was raised and applied to the trees.  
   (ix) Rainfall: 169.72" in 123 rainy days.  
   (x) Monthly harvests.

2. **TREATMENTS:**
   All combinations of:
   3 manures x 2 methods of application.
   
   **Manures:**
   (1) 4 lb. of A/S each
   (2) 15 lb. G.N.C./tree
   (3) 1/4 lb. F.M./tree

   **Methods**:
   (1) Applying in circular basins 8" radius and 1 foot depth.
   (2) In trenches dug in between rows of trees.

   **Common dose:** 30 lb. Ash and 2 lb. B.M./tree/year, Ash in June and others in Aug.

3. **DESIGN**
   (i) 2 x 3 Factorial.
   (ii) 2 x 3 Fact, in R.B.D.
   (iii) (a) 6 (b) N/A (c) 1 (d) 2 (e) Niger (f) Yes.

4. **RESULTS:**
   (i) (1) 13.18 (2) 40.71 (3) 8.72 (4) 1.00 (5) N.A.
   (ii) For characters (1) & (2), the treatments are not significantly different. For character (3) data not statistically analysed as all the trees had reached flowering stage. For character (4) data not statistically analysed as all the trees had not come to bearing.
   (iv) Mean no. of functioning leaves/tree/year.

<table>
<thead>
<tr>
<th></th>
<th>A/S</th>
<th>G.N.C.</th>
<th>F.M.</th>
<th>Mean</th>
</tr>
</thead>
<tbody>
<tr>
<td>basins</td>
<td>13.25</td>
<td>13.64</td>
<td>12.66</td>
<td>13.18</td>
</tr>
<tr>
<td>trenches</td>
<td>12.83</td>
<td>13.28</td>
<td>17.42</td>
<td>13.18</td>
</tr>
<tr>
<td>Mean</td>
<td>13.04</td>
<td>13.46</td>
<td>13.04</td>
<td>13.18</td>
</tr>
</tbody>
</table>
(2) Interval between the production of two consecutive leaves (days/tree/year).

<table>
<thead>
<tr>
<th></th>
<th>A/S</th>
<th>G.N.C.</th>
<th>F.M.</th>
<th>Mean.</th>
</tr>
</thead>
<tbody>
<tr>
<td>basins</td>
<td>41.62</td>
<td>40.28</td>
<td>41.82</td>
<td>41.24</td>
</tr>
<tr>
<td>trenches</td>
<td>40.46</td>
<td>39.84</td>
<td>40.24</td>
<td>40.18</td>
</tr>
<tr>
<td>Mean</td>
<td>41.04</td>
<td>40.06</td>
<td>41.03</td>
<td>40.71</td>
</tr>
</tbody>
</table>

(3) Mean no. of female flowers/tree/year.

<table>
<thead>
<tr>
<th></th>
<th>A/S</th>
<th>G.N.C.</th>
<th>F.M.</th>
<th>Mean.</th>
</tr>
</thead>
<tbody>
<tr>
<td>basins</td>
<td>8.46</td>
<td>9.00</td>
<td>8.80</td>
<td>8.75</td>
</tr>
<tr>
<td>trenches</td>
<td>8.38</td>
<td>8.58</td>
<td>9.10</td>
<td>8.69</td>
</tr>
<tr>
<td>Mean</td>
<td>8.42</td>
<td>8.79</td>
<td>8.95</td>
<td>8.72</td>
</tr>
</tbody>
</table>

(4) Mean no. of nuts/tree/year.

<table>
<thead>
<tr>
<th></th>
<th>A/S</th>
<th>G.N.C.</th>
<th>F.M.</th>
<th>Mean.</th>
</tr>
</thead>
<tbody>
<tr>
<td>basins</td>
<td>1.00</td>
<td>0.90</td>
<td>1.10</td>
<td>1.00</td>
</tr>
<tr>
<td>trenches</td>
<td>0.88</td>
<td>1.12</td>
<td>0.98</td>
<td>0.99</td>
</tr>
<tr>
<td>Mean</td>
<td>0.94</td>
<td>1.01</td>
<td>1.04</td>
<td>1.00</td>
</tr>
</tbody>
</table>

Crop: Coconut.  Ref.-R. 48 (44/49 (55)/50 (49)/51 (45).

Object: To determine the optimum depth at which coconut husks and leaves have to be buried as manures to the crop.

1. BASAL CONDITIONS:
   (i) Uniform manurial and cultural operations given to this block, 3 ploughings and two intercultivations. Ash 20 lb./A/S 3 lb. + 100 lb. G.M./tree/year in Aug.—Sept. (ii) (a) Gravely laterite, (b) Refer soil analysis, Pilicode. (iii) By seedling. (iv) Ordinary tall west coast. (v) 24.10.1922, surface planted by triangular method; 30' spacing; trees were lowered by 3' in June 1926. (vi) One year. (vii) Nil.
(viii) & (ix)

<table>
<thead>
<tr>
<th>Year</th>
<th>G.M. raised.</th>
<th>Cultural operations</th>
<th>Manurial operations</th>
</tr>
</thead>
<tbody>
<tr>
<td>1942</td>
<td>Kolinji</td>
<td>2 ploughings and</td>
<td>9 lb. G.N.C./tree in</td>
</tr>
<tr>
<td></td>
<td></td>
<td>2 intercultivations.</td>
<td>basins round the tree</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>in Aug.—Sept. and</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>20 lb. Ash/tree broad-</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>cast in Oct.</td>
</tr>
<tr>
<td>1943</td>
<td>Kolinji</td>
<td>2 ploughings and</td>
<td>9 lb. G.N.C./tree + 20</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Sept.</td>
</tr>
<tr>
<td>1944</td>
<td>Samb.-hemp.</td>
<td>1 ploughing and</td>
<td>3 lb. A/S + 20 lb. Ash</td>
</tr>
<tr>
<td></td>
<td></td>
<td>4 hoeings.</td>
<td>/tree in Aug.—Sept.</td>
</tr>
<tr>
<td>1945</td>
<td>Kolinji</td>
<td>3 ploughings and</td>
<td>5 lb. G.N.C.+2 lb. A/S</td>
</tr>
<tr>
<td></td>
<td></td>
<td>2 intercultivations.</td>
<td>+ 20 lb. Ash tree in</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Aug.—Sept.</td>
</tr>
<tr>
<td>1946</td>
<td>Crotolaria</td>
<td>2 Ploughings and</td>
<td>5 lb. G.N.C.+2 lb. A/S</td>
</tr>
<tr>
<td>straita.</td>
<td></td>
<td>2 intercultivations.</td>
<td>+ 2 of lb:B.M. 20 lb.</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>/tree in Aug.-Sept.</td>
</tr>
<tr>
<td>1947</td>
<td>Do.</td>
<td>Do.</td>
<td>5 lb. G.N.C.+2 lb. A/S</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>+ 21 lb. Mur. Pot./tree</td>
</tr>
<tr>
<td>1948</td>
<td>Do.</td>
<td>2 ploughings.</td>
<td>5 lb. G.N.C.+2 lb. A/S + 2</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>2 lb. B.M./tree in Aug.</td>
</tr>
<tr>
<td>(x)</td>
<td>Rainfed. (xi)</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
| (xii) Monthly harvested
2. **TREATMENTS**:
   Burying husks and coconut leaves in linear trenches.
   1. 7' wide and 1' 3" deep.
   2. 6' wide and 3' deep.
   Rate: 500 husks+50 leaves/ tree/year.

3. **DESIGN**:
   (i) Paired plot. (ii) 2 (iii) 7 (iv) 4 (v) Nil. (vi) No.

4. **GENERAL**:
   (i) Satisfactory. (ii) Nil (iii) Girth, height, No. of leaves, length, of petiole length of leaf, No. of spathes, No. of female flowers. No. of female flowers shed. No. of male flowers shed. No. of female flowers. No. of female flowers shed. No. of green nuts, etc. (iv) (a) 1942—1951 (b) N.A. (v) & (vii) Nil.

5. **RESULTS**:
   Average no. of nuts/tree.

<table>
<thead>
<tr>
<th>Treatment</th>
<th>1948</th>
<th>1949</th>
<th>1950</th>
<th>1951</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>47.00</td>
<td>16.85</td>
<td>32.30</td>
<td>4.10</td>
</tr>
<tr>
<td>2.</td>
<td>37.30</td>
<td>21.43</td>
<td>24.85</td>
<td>5.86</td>
</tr>
</tbody>
</table>

S.E. of diff. of two means: 7.58
Significance: N.S.

N.S. :- Not significant.

Crop :-Coconut.  

Object :- To find out the best potassic fertilizer that can effectively replace ash which is not available in sufficient quantities.

1. **BASAL CONDITIONS**:
   (i) The experiment was conducted to compare G.N.C. with A/S in this block during 1942—1948. The treatments were (1) 3 lb. A/S+2 lb. ash per tree per year. (2) 9 lb. G.N.C.+20 lb. ash/tree/year applied by broadcast and ploughed in during Aug.—Sept. Three ploughings with iron plough given annually. (ii) (a) Gravelly laterite. (b) Refer soil analysis Pilicode (iii) One year old seedling planted on 23.5.1948 before the onset of S.W. monsoons. (iv) West coast tall variety. (v) In pits 3'x3'x3' by the triangular method—30' spacing. (vi) one year. (vii) Nil.

   (viii) Cultural operations
   (ix) Crotalaria straita was raised. (x) Rainfed. (xi) 139.23". (xii) Monthly harvests.

2. **TREATMENTS**:
   1. Potassium Sulphate.  
      On equivalent K₂O basis to supply 1 lb. of K₂O/tree/year.
   2. Muriate of Potash.
   3. Ash.  
      Applied in Aug.—Sept.

3. **DESIGN**:
   (i) R.B.D. (ii) 3 (iii) 5 (iv) 9 (v) Nil. (vi) Yes.

4. **GENERAL**:
   (i) Satisfactory. (ii) Nil (iii) Girth, height, No. of leaves, length, of petiole length of leaf, No. of spathes, No. of female flowers. No. of female flowers shed. No. of green nuts, No. of barren nuts, etc. (iv) (a) 1951 to 1953: (b) N.A. (v) (a) (b) N.A. (vii) Nil, (vii) Treatments are not significantly different for the years 1951 & 1952. Results not given for 1951 & 1952.
5. RESULTS: (1953)

Average no. of nuts/tree (adjusted).

<table>
<thead>
<tr>
<th>Year</th>
<th>Treatment</th>
<th>1950</th>
<th>1951</th>
<th>1952</th>
<th>1953</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>37-72</td>
<td>35-00</td>
<td>45-80</td>
<td>33-00</td>
<td></td>
</tr>
<tr>
<td>2.</td>
<td>35-64</td>
<td>35-00</td>
<td>53-60</td>
<td>27-00</td>
<td></td>
</tr>
<tr>
<td>3.</td>
<td>35-00</td>
<td>35-00</td>
<td>49-00</td>
<td>25-00</td>
<td></td>
</tr>
</tbody>
</table>

Mean 35-45 18-04 49-80 28-33

S.E. of difference 2-82 3-24 2-13 2-20

Significance N.S. N.S. Significant

The treatments do not differ significantly.

Crop: Coconut.


Type: 'M'

Object: To find out the best method of applying manures to coconut trees in laterite gravelly soil.

1. BASAL CONDITIONS:


During 1952, 2 ploughings in Apr-May & Aug-Sept. and hoeing in summer.


2. TREATMENTS:


(1) In circular basin around each tree to a radius of 8' and depth 1' towards the periphery.

(2) Broadcast over the entire area and ploughed in.

(3) In linear trenches 2' wide and 1' deep.

3. DESIGN:

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

4. GENERAL:

(i) Satisfactory. (ii) During 1950, beetles regularly watched and killed; mild attack of Neppantis; severe attack of shoot-rot- 1% Bordeaux mixture sprayed twice, April-May & June-July. During 1951 there was serious Neppantis attack and was controlled by 0.2% wettable D.D.T. and release of parasities. During 1952 and 53 there was no serious incidence of pests. Regular search was made for Rinocerous Beetle (iii) Girth height, No. of leaves, length of petiole, length of leaves, No. of spathes, No. of female flowers, No. of female flowers set, No. of green nuts & No. of barren nuts etc. (iv) (a) 1948-1953. Data analysed for 1950 to 1953 period. (b) Nil (v) (a), (b) Nil. (vi) & (vii) Nil.

5. RESULTS:

Av. no. of nuts/tree (adjusted).

<table>
<thead>
<tr>
<th>Year</th>
<th>Treatment</th>
<th>1950</th>
<th>1951</th>
<th>1952</th>
<th>1953</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>37-72</td>
<td>35-00</td>
<td>45-80</td>
<td>33-00</td>
<td></td>
</tr>
<tr>
<td>2.</td>
<td>35-64</td>
<td>35-00</td>
<td>53-60</td>
<td>27-00</td>
<td></td>
</tr>
<tr>
<td>3.</td>
<td>35-00</td>
<td>35-00</td>
<td>49-00</td>
<td>25-00</td>
<td></td>
</tr>
</tbody>
</table>

Mean 35-45 18-04 49-80 28-33

S.E. of difference 2-82 3-24 2-13 2-20

Significance N.S. N.S. Significant

The treatments do not differ significantly.
Crop: Coconut
Site: Central Coconut Res. Stn. Kasaragod

Object: To study the germination capacity of nuts of different maturity.

1. BASAL CONDITIONS:
(i) Virgin land
(ii) (a) Red loam (b) Refer soil analysis, Kasaragod
(iii) By seednuts}
(iv) Ordinary tall West coast
(v) 2.652 in nursery
(vi) As per treatments
(vii) Nil
(viii) Nil
(ix) Nil
(x) Rainfed
(xi) 3086.3 mms in 118 rainy days
(xii) Nursery study

2. TREATMENTS:
Seednuts aged:
1. 11 months
2. 12
3. 13
4. 14

3. DESIGN:
(i) R.B.D.
(ii) (a) 4  (b) N.A.
(iii) 6 (iv) 5 (v) Nil (vi) Yes

4. GENERAL:
(i) Satisfactory
(ii) Nil
(iii) No. of days taken for germination; girth at collar & seedlings (mm.)
(iv) (a) 1952—not repeated
(b) Nil
(v) (a), (b) Nil
(vi) Nil

5. RESULTS:
Character: No. of days taken for germination
(i) 120.27
(ii) 110.07
(iii) The treatments do not differ significantly
(iv) Treatment Mean
1. 121.91
2. 120.90
3. 122.18
4. 116.30
S.E. of treatment means = 4.52

Character: Girth at collar (mm.)
(i) 102.8
(ii) 7.82
(iii) The treatments do not differ significantly
(iv) Treatment Mean
1. 101.0
2. 102.2
3. 104.3
4. 105.8
S.E. of treatment means = 3.19

Character: Height of seedlings (cm.)
(i) 111.0
(ii) 11.16
(iii) The treatments do not differ significantly
(iv) Treatment Mean
1. 106.2
2. 109.8
3. 109.0
4. 109.9
S.E. of treatment means = 4.56

Character: No. of functioning leaves on the crown
(i) 5.0
(ii) 0.00
(iii) The treatment do not differ significantly
(iv) Treatment Mean
1. 5.0
2. 4.9
3. 4.9
4. 5.3
S.E. of treatment means = 0.163
Object:—To find out the proper depth at which coconut seedlings are to be planted in pure littoral sand.

1. BASAL CONDITIONS:
   (i) Virgin land. (ii) (a) Purely sandy generally met with in the west coast area and is found to a depth of 20' or more. (b) Refer soil analysis Nileshwar—III. (iii) By seednuts. (iv) Ordinary tall west coast variety. (v) 6.7.1939, Triangular method 25' spacing. (vi) About one year. (vii) Nil (viii) G.N.C. 5 lb./tree+ A/S 2 lb./tree+ Ash 29 lb./tree+ G.M. 200 lb./tree. Manures generally applied in Aug.—Sept. after heavy rains by broadcast. (b) A basal dressing of 20 lb. of ash/ac. to give a start to the G.M. crop sown in May—June in the poor sandy soils. G.M. crop ploughed in situ during Sept. Burial of coconut husks and leaves occasionally done to improve the organic content of the soil. (c) Ploughed in Jan. and Oct. and cultivated worked in Feb. The seedling pits cleaned of weeds and excess of soil removed from pits. (ix) Nil. (x) Rainfed. (xi) Nil. (xii) The trees have not come to bearing.

2. TREATMENTS:
   1. Planting seedlings in 3' deep pits.
   2. Planting seedlings in 6' deep pits.

3. DESIGN:
   (i) Three 2 x 2 L. Sq. (ii) (a) 2 (b) N.A. (iii) 6 (iv) 12 (v) Nil. (vi) No.

4. GENERAL:
   (i) Satisfactory. (ii) The crown of palms sprayed with zinc Bordeaux mixture during the year. (iii) Rate of production of leaves: Number of functioning leaves on the crown. (iv) (a) 1939, being continued (b) N.A. (v) (a), (b) Nil (vi) & (vii) Nil.
5. RESULTS:

(i) 6.08 leaves/tree
(ii) 0.05 leaves/tree
(iii) The treatments are significantly different.
(iv) No. of leaves produced/tree during the year.

<table>
<thead>
<tr>
<th>Treatment</th>
<th>Mean</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>6.19</td>
</tr>
<tr>
<td>2</td>
<td>5.97</td>
</tr>
</tbody>
</table>

S.E. of treatment means = 0.021 leaf/tree.

Crop: Coconut
Type: ‘C’

Object: To find out the proper depth at which coconut seedlings are to be planted in pure littoral sand.

1. BASAL CONDITIONS:

(i) Virgin land. (ii) (a) Purely sandy generally met with in the West Coast area and is found up to a depth of 20 feet or more. (b) Refer soil analysis, Nileshwar-III. (iii) By seednuts. (iv) Ordinary tall west coast variety. (v) 6.7.1939, Triangular method, 25' spacing. (vi) About one year. (vii) Nil. (viii) 2 C. ft. red soil; G.N.C. 7 1/2 lb, A/S 3 lb, Super 2 lb, Ash 30 lb. per tree. Manures generally applied in Aug. & Sept. after the heavy rains by broadcast. The basal dressing of 20 lb. of ash/tree to give a start to G.M. crop on the poor sandy soils. The G.M. crop ploughed in situ during Sept. Burial of coconut husks and leaves occasionally done to improve the organic content of the soil. 2 C. ft. Red soil/tree applied to improve the soil condition. Ploughed in Jan. and Oct. and cultivator worked in Feb. The seedling pits weeded, cleaned and excess soil removed. (ix) Nil (x) Rainfed. (xi) 172.55" (xii) The trees have not come to bearin.

2. TREATMENTS:

1. Planting seedlings in 3' deep pits.
2. " " " " 6' " " 

Planted on 6.7.1939.

3. DESIGN:

(i) Three 2 x 2 L. Sq. (ii) (a) 2 (b) N.A. (iii) 6 (iv) 12 (v) Nil. (vi) No.

4. GENERAL:

(i) Satisfactory. (ii) Palms searched for beetles and Nephantis serinopa. Spraying with Zinc Bordeaux mixture during Sept. (iii) Rate of production of leaves; Number of functioning leaves on the crown. (iv) (a) 1939 being continued. (b) N.A. (v) (a), (b) Nil. (vi) & (vii) Nil.

5. RESULTS:

(i) 5.82 leaves/tree
(ii) 0.112 leaves/tree.
(iii) The treatment differences are highly significant.
(iv) Number of leaves produced/tree during the year.

<table>
<thead>
<tr>
<th>Treatment</th>
<th>Mean</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>6.20</td>
</tr>
<tr>
<td>2</td>
<td>5.44</td>
</tr>
</tbody>
</table>

S.E. of treatment means = 0.046 leaves/tree

Crop: Coconut
Type: ‘C’

Object: To find out the proper depth at which coconut seedlings are to be planted in pure littoral sand.

1. BASAL CONDITIONS:

(i) Virgin land. (ii) (a) Purely sandy generally met with in the West Coast area and is found up to a depth of 20 feet or more. (b) Refer soil analysis, Nileshwar-III. (iii) By seednuts. (iv) Ordinary tall west coast variety. (v) 6.7.1939, Triangular method; 25' spacing (vi) About one year. (vii) Nil. (viii) 2 Crotalaria striata was sown in May at 15 lb/ac., pulled out and applied in Oct. The palms received 7 1/2 lb G.N.C., A/S, 2 lb. Super and 30 lb. ash/tree. (b) basal dressing of 24 lb. ash/tree to give a start to the G.M
crop on the poor sandy soils. The G.M. crop ploughed in situ during Sept. Burial of coconut husks and leaves occasionally done to improve the organic content of the soil. (c) The area received two ploughings in May and Dec. (x) Nil. (x) Rainfed. (xi) 118.21° (xii) The trees have not yet started bearing.

2. TREATMENTS:
1. Planting seedlings in 3' deep pits.
2. " " " 6' " "
   Planted on 6.7.1939.

3. DESIGN:
   (i) Three 2 x 2 L.Sq. (ii) (a) 2 (b) N.A. (iii) 6 (iv) 12 (v) Nil (vi) No.

4. GENERAL:
   (i) Satisfactory. (ii) A regular search maintained for beetles and nephantis throughout the year. Zinc Bordeaux mixture sprayed in Oct. (iii) Rate of production of leaves. Number of functioning leaves on the crown. (iv) (a) 1939, being continued. (b) N.A. (v) (a) & (b) Nil. (vi) & (vii) Nil.

5. RESULTS:
   (i) 6.64 leaves/tree
   (ii) 0.479 leaves/tree
   (iii) The treatments are not significantly different.
   (iv) Number of leaves produced/tree during the year.

   Treatment Mean
   1. 6.79
   2. 6.43

   S.E. of treatment means = 0.195 leaves/tree.

---

Crop : Coconut. Ref : K. 52 (16)/51 (20)/50 (4) /49 (5)/48 (4)
Site : Agri. Res. Stn. Nileshwar III. Type : 'C'.
Object : To find-out the proper depth at which coconut seedlings are to be planted in pure littoral sand.

1. BASAL CONDITIONS:
   (i) Virgin land. (ii) (a) Purely sandy generally met with in the west coast area and is found to a depth of 20 feet or more. (b) Refer soil analysis, Nileshwar-III. (iii) By seednutt. (iv) Ordinary tall west coast variety. (v) 6.7.1939. Triangular method, 25’ spacing. (vi) About one year. (vii) Nil (viii) Ash 5 lb./ac: broadcast and Crotolaria Straita seed broadcast in May at 15 lb./ac. All the palms received 5 lb. G.N.C. 2 lb. A/S & 2 lb. B.M./acre. (b) The basal dressing of ash to give a start to the G.M. crop on the poor sandy soils. G.M. crop ploughed in situ during Sept. Burial of coconut husks and leaves occasionally done to improve the organic content of the soil. One ploughing in Oct.-Nov. Unploughed areas dug well. The seedling pits cleaned in Aug. Jun or hoe worked in Dec. (ix) Nil. (x) Rainfed. (xi) 127.71° (xii) The trees have not come to bearing.

2. TREATMENTS:
1. Planting seedlings in 3' deep pits.
2. " " " 6' " "
   Planted on 6.7.1939.

3. DESIGN:
   (i) Three 2 x 2 L.Sq. (ii) (a) 2 (b) N.A. (iii) 6 (iv) 12 (v) Nil (vi) No.

4. GENERAL:
   (i) Satisfactory. (ii) Palms regularly searched for pests and diseases. Zinc Bordeaux mixture sprayed in April. (iii) Rate of production of leaves. No. of functioning leaves on the crown. (iv) (a) 1939, being continued. (b) N.A. (v) (a) & (b) Nil. (vi) & (vii) Nil.

5. RESULTS:
   (i) 6.77 leaves./tree.
   (ii) 0.184 leaves./tree
   (iii) The treatments are significantly different.
   (iv) Number of leaves produced/tree during the year.

   Treatment Mean
   1. 7.57
   2. 5.97

   S.E. of treatment mean = 0.124 leaves/tree.
Crop :- Coconut. Ref :- K. 53 (25/52 (16)/51 (20)/50 (4)/49 (5)/48 (4))  
Site :- Agri. Res. Stn. Nilesawar-III. Type :- 'C'  
Object :- To find out the optimum depth at which coconut seedlings have to be planted in sandy soils.

1. BASAL CONDITIONS:  
(i) Virgin land. (ii) (a) Purely sandy, generally met with in the west coast region and is found to a depth of 20 feet or more. (b) Refer soil analysis, Nilesawar-III. (iii) By seed nuts (iv) Ordinary tall west coast variety. (v) 6.7.1939 Triangular method, 25 cet. (vi) About one year. (vii) Nil. (viii) 3 lb. A/S, 20 lb. ash and 200 lb. G.L. and decaying coconut leaves/tree. Ash applied by broadcast with the receipt of premonsoon shower in two doses in July and Aug. 'A/S' applied in Sept. after the application of ash. G.M. crop sown and covered by working a country plough or a cultivator in May, June and ploughed in situ during Sept. (b) basal dressing of 20 lb. of ash/tree to give a start to the G.M. crop in the poor sandy soils. G.M. crop ploughed in situ during Sept. Burial of coconut husks and leaves occasionally done to improve the organic content of the soil. (c) Two ploughings in Jan. and Sept. Unploughed areas dug in Sept. Seeding pits cleaned and filled up with rotten coconut leaves and green leaves in Aug. (ix) Nil. (x) Rainfed (xi) 128.76" (xii) The trees have not come to bearing.

2. TREATMENTS:  
1. Planting seedlings 3' deep in pits.  
2.  
3. DESIGN:  
(i) Three 2 x 2 L. Sq. (ii) (a) 2 (b) N.A. (iii) 6 (iv) 12 (v) Nil. (vi) No.

4. GENERAL:  
(i) Satisfactory. (ii) The palms regularly searched for pests and diseases (iii) Number of functioning leaves on the crown. Rate of production of leaves (iv) (a) 1939, being continued, (b) N.A. (v) (a), (b) Nil. (vi) & (vii) Nil.

5. RESULTS:  
(i) 5.50 leaves/tree.  
(ii) 0.284 leaves/tree.  
(iii) The treatment differences are significant.  
(iv) Number of leaves produced/tree during the year  

<table>
<thead>
<tr>
<th>Treatment</th>
<th>Mean</th>
<th>S.E. of treatment means</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>6.02</td>
<td>0.116 leaves/tree.</td>
</tr>
<tr>
<td>2.</td>
<td>4.97</td>
<td></td>
</tr>
</tbody>
</table>

Object :- To find-out the proper depth to which the soil has to be ploughed and cultivated in coconut gardens in sandy soil.

1. BASAL CONDITIONS:  
(i) The trees received uniform manurial and cultural operations (ii) (a) Sandy soil (b) Refer soil analysis, Nilesawar-III. (iii) By seed nuts (iv) Ordinary tall, west coast variety. (v) Date N.A. Triangular method of planting; 25' spacing. (vi) one year. (vii) Nil. (viii) *Manures* : 30 lb. ash+74 lb. G.N.C.+3 lb. 'A/S'+2 lb. B.M.+50 to 100 lb. G.L./tree in Aug. & Sept. (ix) G.M. crop of *Crotolaria Striata* raised and applied to the trees. (x) Rainfed. (xi) 147.83" in 109 rainy days (xii) Monthly.

2. TREATMENTS:  
1. Ploughing in July, Sept. and Nov. with Cooper plough to a depth of 4".  
2. Digging 5' deep and forming mounds or piling in June and levelling in Sept.  
3. Ploughing with Cooper plough in July, Sept. and Nov. to a depth of 6"  

3. DESIGN:  
(i) R.B.D. (ii) (a) 3 (b) N.A. (iii) 6 (iv) 2 (v) Nil (vi) Yes.

4. GENERAL:  
(i) Satisfactory. (ii) Rhinoceros beetles regularly searched and killed. (iii) No. of functioning leaves. Rate of production of leaves, No. of female flowers, No. of nuts. (iv) (a) 1948 to 1953. (b) N.A. (v) (a), (b) Nil. (vi) & (vii) During 1948, no results were presented as it was too early to draw any conclusion
5. RESULTS:
(i) As in table below
(ii) & (iii) Data not statistically analysed as it was too early to get any conclusion.
(iv) Treatment not significantly different for any character.

<table>
<thead>
<tr>
<th>Character</th>
<th>1.</th>
<th>2.</th>
<th>3.</th>
<th>Mean</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mean No. of functioning leaves/</td>
<td>21.1</td>
<td>21.8</td>
<td>21.8</td>
<td>21.6</td>
</tr>
<tr>
<td>Interval between production of</td>
<td>32.9</td>
<td>31.4</td>
<td>31.6</td>
<td>32.0</td>
</tr>
<tr>
<td>two successive leaves</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>No. of female flowers/tree</td>
<td>37.3</td>
<td>35.9</td>
<td>38.8</td>
<td>37.7</td>
</tr>
<tr>
<td>No. of nuts/tree</td>
<td>6.2</td>
<td>6.5</td>
<td>6.5</td>
<td>6.4</td>
</tr>
</tbody>
</table>

Crop: Coconut.
Site: Agri. Res. Stn. Nileshwar III
Ref: K. 50 (57)/49 (68)
Type: 'C'.

Object: To find out the depth to which the soil has to be ploughed or cultivated in the coconut gardens in sandy soil.

1. BASAL CONDITIONS:
(i) The trees received uniform manorial & cultural operations
(ii) (a) Sandy, (b) Refer soil analysis, Nileshwar--III.
(iii) By seedling
(iv) Ordinary tall, west coast variety
(v) Date N.A.
Triangle method, 25' spacing.
(vi) One year old.
(vii) Nil.
(ix) G.M. crop of Crotalaria straita raised and applied to the trees.
(x) Rainfed.
(xi) 169.72" in 123 rainy days.
(xii) Monthly harvests.

2. TREATMENTS:
(1) Ploughing 4' deep with 'Cooper 26' plough thrice a year roughly at 2 months interval in July, Sept. & Nov.
(2) Ploughing 6' deep with 'Cooper 34' plough as in (1).
(3) Digging 5' deep and forming mounds in Sept. and levelling them in Nov.

3. DESIGN:
(i) R.B.D. (ii) (a) 3 (b) N.A. (iii) 6 (iv) 2 (v) Nil. (vi) Yes.

4. GENERAL:
(i) Satisfactory.
(ii) Beetles regularly searched and killed.
(iii) No. of functioning leaves on the crown.
Interval of production of two successive leaves.
Production of female flowers.
No. of nuts.
(iv) (a) 1948-1953
(b) N.A.
(v) (a), (b), Nil. (vi) & (vii) Nil.

5. RESULTS:
(i) As in table below
(ii) N.A.
(iii) Treatments not significantly different for any character.
(iv)

<table>
<thead>
<tr>
<th>Character</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>Mean</th>
</tr>
</thead>
<tbody>
<tr>
<td>No. of functioning leaves/</td>
<td>28.4</td>
<td>29.4</td>
<td>28.8</td>
<td>28.9</td>
</tr>
<tr>
<td>Rate of leaf production/tree</td>
<td>38.9</td>
<td>37.4</td>
<td>38.4</td>
<td>38.2</td>
</tr>
<tr>
<td>No. of female flowers/tree</td>
<td>21.8</td>
<td>20.4</td>
<td>21.6</td>
<td>21.3</td>
</tr>
<tr>
<td>No. of nuts/tree</td>
<td>7.8</td>
<td>8.2</td>
<td>7.2</td>
<td>7.7</td>
</tr>
</tbody>
</table>

Crop: Coconut.
Site: Agri. Res. Stn. Nileshwar III
Ref: K 51 (49)/50 (57)/49 (68)
Type: 'C'.

Object: To find out the depth to which the soil has to be ploughed or cultivated in the coconut gardens in sandy soil.

1. BASAL CONDITIONS:
(i) The trees received uniform manorial & cultural operations
(ii) (a) Sandy, (b) Refer soil analysis, Nileshwar--III.
(iii) By seedling
(iv) Ordinary tall, west coast variety
(v) Date N.A.
Triangle methods, 25' spacing.
(vi) One year old.
(vii) Nil.
(ix) Ash & Super broadcast, others applied in trenches during Aug.-Sept.
(x) Nil.
(xi) Rainfed.
(xii) 111.63" in 114 rainy days.
(xiii) Monthly harvest.

2. TREATMENTS:
(i) Ploughing 4' deep with 'Cooper 26' plough thrice a year roughly at 2 months interval in July, Sept. & Nov.
(2) Ploughing 6" deep with ‘Cooper 34’ plough’ as in (1).
(3) Digging 3" deep and forming mounds in Sept. and levelling them in Nov.

3. DESIGN:
(i) R.B.D. (ii) (a) 3 (b) N.A. (iii) 6 (iv) 2 (v) Nil. (vi) Yes.

4. GENERAL:
(i) Satisfactory. (ii) Beetles regularly searched and killed. (iii) No. of functioning leaves, rate of production of leaves, No. of female flowers & No. of nuts. (iv) (a) 1948-1953. (b) N.A. (v) (a) (b) Nil. (vi) & (vii) Nil.

5. RESULTS:
(i) & (ii) As in table below
(iii) Treatments are not significantly different for any character.
(iv) For none of the characters the treatment effects are significantly different.

| Character                  | (1) | (2) | (3) | Mean | S.E. of | S.E. of |
|----------------------------|-----|-----|-----|------|        |        |
|                            |     |     |     |      | expt   | treatment mean |
| No. of functioning leaves/tree | 21.2 | 21.8 | 21.7 | 21.6 | 1.07   | 0.45   |
| Rate of production of leaves/tree | 38.5 | 38.3 | 38.4 | 38.4 | 1.24   | 0.51   |
| No. of female flowers/tree | 20.8 | 21.1 | 21.2 | 21.0 | 3.45   | 1.41   |
| No. of nuts/tree | 1.6  | 1.7  | 1.5  | 1.6  | 0.84   | 0.34   |

Crop :-Coconut.  
Site :- Agri. Res. Stn. Nilleshwar. III  
Type :- 'C'  
Object :-To find-out the depth to which the soil has to be ploughed or cultivated in the coconut gardens in sandy soil.

1. BASAL CONDITIONS:

2. TREATMENTS:
(1) Ploughing 4" deep with ‘Cooper 26’ plough thrice a year roughly at 2 months interval in July, Sept. & Nov.
(2) Ploughing 6" deep with “Cooper 34” plough as in (1).
(3) Digging 5" deep and forming mounds in Sept. and levelling them up in Nov.

3. DESIGN:
(i) R.B.D. (ii) (a) 3 (b) N.A. (iii) 6 (iv) 2 (v) Nil (vi) Yes.

4. GENERAL:
(i) Satisfactory. (ii) Beetles regularly searched and killed. (iii) No. of functioning leaves, No. of female flowers and No. of nuts. (iv) (a) 1948-1953 (b) N.A. (v) (a), (b) Nil. (vi) & (vii) Nil.

5. RESULTS:
(i) & (ii) As in table below
(iii) For none of the characters the treatment effects are significantly different.

| Character                  | 1    | 2    | 3    | Mean | S.E. of | S.E. of |
|----------------------------|------|------|------|------|        |        |
|                            |      |      |      |      | expt   | treatment mean |
| No. of functioning leaves/tree | 15.2 | 15.8 | 15.5 | 15.5 | 4.14   | 1.69   |
| No. of female flowers/tree | 11.5 | 13.4 | 5.8  | 10.2 | 5.58   | 2.28   |
| No. of nuts/tree | 4.3  | 5.6  | 2.9  | 4.2  | 2.25   | 0.92   |
Crop :-Coconut.  
Ref :-K. 53 (60)/52 (53)/51 (40) 50 (57)/49 (68)

Site :-Agri. Res. Stn. Nileshwar-III.  
Type :-'C'

Object :-To find-out the depth to which soil has to be ploughed or cultivated in the coconut gardens in sandy soil.

1. BASAL CONDITIONS :
   (i) The trees received uniform manural and cultural operations (ii) (a) Sandy (b) Refer soil analysis, Nileshwar-III. (iii) By seedlings. (iv) Ordinary tall west coast variety. (v) Date N.A. Triangular method 25’ spacing, (vi) One year old. (vii) Nil (viii) 20 lb. Ash/tree in equal doses in May & Oct. 3 lb. A/S in Sept. with 100 lb. G.L.tree. (ix) G.M. crop of Crotolaria straita raised and applied to the trees. (x) Rainfed. (xi) 165.63"—121 days (xii) Monthly harvests.

2. TREATMENTS :
   (1) Ploughing 4" deep with "Cooper 26" plough thrice a year roughly at 2 months interval in July, Sept. & Nov. (2) Ploughing 6" deep with "Cooper 34" plough as in (1). (3) Digging 5" deep and froming mounds in Sept. and levelling them up in Nov.

3. DESIGN :
   (i) R.B.D. (ii) 3 (b) N.A. (iii) 6 (iv) 2 (v) Nil. (vi) Yes.

4. GENERAL :
   (i) Satisfactory. (ii) Beetles regularly searched and killed (iii) No. of functioning leaves, No. of female flowers and No. of nuts. (iv) 1948-1953. (v) N.A. (vi) (a), (b) Nil. (vii) & (viii) Nil.

5. RESULTS :
   (i)  & (ii) As in table below (iii) The treatments are not significantly different for any character. (iv)

<table>
<thead>
<tr>
<th>Character</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>S.E. of expt</th>
<th>S.E. of treat mean</th>
</tr>
</thead>
<tbody>
<tr>
<td>No. of functioning leaves/tree</td>
<td>18.0</td>
<td>17.8</td>
<td>19.4</td>
<td>18.4</td>
<td>2.41</td>
</tr>
<tr>
<td>No. of female flowers produced/ tree</td>
<td>17.5</td>
<td>23.5</td>
<td>27.0</td>
<td>22.7</td>
<td>16.28</td>
</tr>
<tr>
<td>No. of nuts/tree</td>
<td>6.1</td>
<td>7.4</td>
<td>8.8</td>
<td>7.4</td>
<td>6.09</td>
</tr>
</tbody>
</table>

Crop :-Coconut.  
Ref:- K. 48(36), 49(47), 50(41), 51(37), 52(42) & 53(50)

Type :-'C'.

Object :- To find-out (1) the effect of ploughing with monsoon plough and digging the soil with mannatty on the yield & (2) minimum number of ploughings to get the best yield.

1. BASAL CONDITIONS :
2. TREATMENTS:
2. Ploughing with monsoon plough twice in June & Sept.

3. DESIGN
(i) R.B.D. (ii) 4 (b) N.A. (iii) 5 (iv) Varied from 7 to 15 (v) Nil (vi) Yes.

4. GENERAL:
(i) Satisfactory. (ii) During 1948 beetles regularly searched and killed. Mild attack of nephantis. 1% Bordeaux mixture applied against shoot rot in April, May & June-July. Rhinoceros beetles regularly searched and killed in 1949. During 1950 a mild attack of nephantis was noticed. A severe attack of shoot rot was controlled by 2 sprays with 1% Bordeaux mixture. Beetles regularly searched & killed. During 1951 a serious nephantis attack was controlled by 0.2% wettable D.D.T. and also by release of parasites. Rhinocerous Beetles regularly searched and killed. During 1952 there was no incidence of pests or disease. Beetles watched and destroyed. During 1953 all trees were regularly searched for beetles. (iii) Girth height, No. of leaves. Length of petiole, Length of leaf, No. of spathes, No. of female flowers, No. of female flowers set, No. of green nuts, & No. of barren nuts. (iv) (a) 1942—being continued. (b) Nil (v) (a) (b) Nil. (vi) & (vii) Nil.

5. RESULTS:
No. of nuts/tree. (adjusted)

<table>
<thead>
<tr>
<th>Year</th>
<th>Treatment 1</th>
<th>Treatment 2</th>
<th>Treatment 3</th>
<th>Treatment 4</th>
<th>Mean</th>
</tr>
</thead>
<tbody>
<tr>
<td>1943</td>
<td>53.25</td>
<td>53.39</td>
<td>58.93</td>
<td>47.23</td>
<td>53.19</td>
</tr>
<tr>
<td>1949</td>
<td>18.73</td>
<td>17.48</td>
<td>22.54</td>
<td>22.00</td>
<td>20.19</td>
</tr>
<tr>
<td>1950</td>
<td>36.13</td>
<td>35.76</td>
<td>46.96</td>
<td>32.55</td>
<td>37.85</td>
</tr>
<tr>
<td>1951</td>
<td>14.93</td>
<td>13.93</td>
<td>14.24</td>
<td>15.69</td>
<td>14.70</td>
</tr>
<tr>
<td>1952</td>
<td>36.34</td>
<td>34.59</td>
<td>41.99</td>
<td>38.66</td>
<td>37.89</td>
</tr>
<tr>
<td>1953</td>
<td>23.64</td>
<td>20.29</td>
<td>24.89</td>
<td>20.64</td>
<td>22.36</td>
</tr>
</tbody>
</table>

Av. S.E. of diff. of two means.

<table>
<thead>
<tr>
<th>S.E.</th>
<th>Significance</th>
</tr>
</thead>
<tbody>
<tr>
<td>3.57</td>
<td>N.S.</td>
</tr>
<tr>
<td>2.80</td>
<td>N.S.</td>
</tr>
<tr>
<td>2.60</td>
<td>N.S.</td>
</tr>
<tr>
<td>2.30</td>
<td>N.S.</td>
</tr>
<tr>
<td>4.62</td>
<td>Significant.</td>
</tr>
<tr>
<td>5.31</td>
<td>N.S.</td>
</tr>
</tbody>
</table>

6. Crop: Coconu(. 
Ref: K. 50 (43), 51(40), 52(46) & 53(55).
Site: Agri.Res. Sta. Pilidade. Type: 'C'.
Object: To find-out the correct depth to which the soil has to be tilled in a Coconut garden.

1. BASAL CONDITIONS:
(i) 3 ploughings. 3 lb A/S + 2 lb, B.M. + 102 lb. G.L. or compost/tree per year. Cultivator worked once, or twice in a year. (ii) (a) Gravelly laterite soil. (b) Refer-soil analysis-Pilidade. (iii) By seedlings. (iv) West coast exotic varieties and self progenies of Kasargod parent. (v) 1926-27 Triangular method of planting with 32 feet spacing. (vi) One year. (vii) Nil. (viii) Nil.

1950

1951

1952
1953


(ix) A green manure crop of crotolaria straita raised. (x) Rainfed. (xi) 50 (148.69"), 51(107.74"), 52 (121.83") ; 53(139.23"). (xii) Monthly harvests.

2. TREATMENTS:
   (1) Digging 5" deep with manmatty, forming mounds in Aug.—Sep. and mounds levelled during Dec.—Jan.
   (2) Ploughing thrice 4" deep with monsoon plough.
   (3) Ploughing thrice 6" deep with 'Cooper No : 34 plough.' The three ploughings were given at intervals of two months from July.

3. DESIGN:
   (i) R.B.D. (ii) 3 (iii) 5 (iv) 6 (v) Nil. (vi) Yes.

4. GENERAL:
   (i) Satisfactory. (ii) In 1951 serious nephanris-0. 2% wettable D.D.T. sprayed & parasite released. (iii) Girth, Height, No of leaves, Length of petiole length of leaf No. of spathes, No of female flowers, No of female flowers set, No of green nuts & No of barren nuts etc. (iv) (a) 1948—1953. (b) N.A. (v) (a), (b) Nil. (vi) & (vii) Nil.

5. RESULTS:
   (i) to (iv) see table below.
   Average No. of nuts per tree (adjusted).

<table>
<thead>
<tr>
<th>Treatment</th>
<th>1950</th>
<th>1951</th>
<th>1952</th>
<th>1953</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>32.90</td>
<td>16.75</td>
<td>34.45</td>
<td>15.80</td>
</tr>
<tr>
<td>2.</td>
<td>41.10</td>
<td>11.70</td>
<td>50.82</td>
<td>16.78</td>
</tr>
<tr>
<td>3.</td>
<td>38.10</td>
<td>12.40</td>
<td>35.74</td>
<td>17.56</td>
</tr>
</tbody>
</table>

S.E. of diff. of any two means: 3.70. 3.37. 6.73. 3.34.

Significance: —

<table>
<thead>
<tr>
<th></th>
<th>N.S.</th>
<th>N.S.</th>
<th>N.S.</th>
<th>N.S.</th>
</tr>
</thead>
</table>

Crop:—Cashewnut.
Site:—Agri. Res. Stn. Nileshwar-III.
Type:—'M'.

Object:—To find-out the best manure for cashewnut in addition to regular cultivation.

1. BASAL CONDITIONS:
   (i) Virgin land. (ii) (a) Pure sandy. (b) Refer soil analysis-Nileshwar-III. (iii) By seedlings. (iv) Local. (v) 1942. Square method. 20" spacing. (vi) About one year. (vii) Nil. (viii) Digging pits and cleaning weeds. (ix) Nil. (x) Nil. (xi) 151.05" in 132 rainy days. (xii) N.A.

2. TREATMENTS:

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>5</td>
<td>+</td>
<td>1</td>
<td>+</td>
<td>10</td>
<td>+</td>
<td></td>
</tr>
<tr>
<td>2.</td>
<td>5</td>
<td>+</td>
<td>0</td>
<td>+</td>
<td>0</td>
<td>+</td>
<td></td>
</tr>
<tr>
<td>3.</td>
<td>0</td>
<td>+</td>
<td>1</td>
<td>+</td>
<td>0</td>
<td>+</td>
<td></td>
</tr>
<tr>
<td>4.</td>
<td>0</td>
<td>+</td>
<td>0</td>
<td>+</td>
<td>10</td>
<td>+</td>
<td></td>
</tr>
<tr>
<td>5.</td>
<td>0</td>
<td>+</td>
<td>0</td>
<td>+</td>
<td>0+</td>
<td>+</td>
<td></td>
</tr>
</tbody>
</table>

6. No Manure + No cultivation.
Cultivation consisted of digging pits and weeding. manures applied in Aug.—Sept.

3. DESIGN:
   (i) R.B.D. (ii) 6 (b) N.A. (iii) 4 (iv) 8 (Net) (v) Yes, one row all round each plot. (vi) Yes.

4. GENERAL:
   (i) Satisfactory. (ii) Cashew bettle was regularly searched and killed. (iii) Yield of nuts, (iv) (a) 1942—1951 (b) Nil. (v) (a) (b) Nil. (vi) & (vii) Nil.

5. RESULTS:
   (i) See table below.
   (ii) N.A.
   (iii) The yield data were not statistically analysed as all the trees have not come to bearing.
<table>
<thead>
<tr>
<th>Treatment</th>
<th>No. of flowers</th>
<th>Yield of nuts in lb/tree lb. ozs.</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>40</td>
<td>14-8</td>
</tr>
<tr>
<td>2.</td>
<td>39</td>
<td>3-10</td>
</tr>
<tr>
<td>3.</td>
<td>39</td>
<td>0-4</td>
</tr>
<tr>
<td>4.</td>
<td>36</td>
<td>0-½</td>
</tr>
<tr>
<td>5.</td>
<td>33</td>
<td>Nil</td>
</tr>
<tr>
<td>6.</td>
<td>39</td>
<td>2-0</td>
</tr>
</tbody>
</table>

Crop: Cashewnut.  
Ref: K. 49(45)/48(53)  
Type: 'M'.

Object: To find-out the best manure for Cashewnut in addition to regular cultivation.

1. **BASAL CONDITIONS**:
   (i) Virgin land. (ii) (a) Sandy  
   Refer soil analysis-Nileshwar-III. (iii) By seedling. (iv) Local (v) 
   (viii) Clearing pits and digging. (ix) Nil. (x) Rainfed. (xi) 147.88' 
   in 1949 rainy days. (xii) monthly.

2. **TREATMENTS**:
   2. + 0 + 0 + 0 +  
   3. + 1 + 1 + 0 + 0 +  
   4. + 0 + 0 + 10 + 0 + 0 +  
   5. + 0 + 0 + 0 + 0 + 0 +  
   6. No manure + No cultivation.  
   Manures applied in Aug. & Sept. Cultivation consisted of one or two diggings and cleaning pits.

3. **DESIGN**:
   (i) R.B.D. (ii) (a) 6 (b) N.A. (iii) 4 (iv) 8 (net) (v) Yes, one row all round the plot (vi) Yes.

4. **GENERAL**:
   (i) Satisfactory (ii) Rhinoceros beetle was regularly searched and killed. (iii) Yield of nuts. (iv) 
   1942-1951 (b) Nil. (v) (a) (b) Nil. (vi) & (vii) Nil.

5. **RESULTS**:
   (i) (1) 38.33 (2) 3.67  
   (ii) N.A.  
   (iii) Yield data not statistically analysed as all trees had not come to bearing.

<table>
<thead>
<tr>
<th>Treatment</th>
<th>No. of trees flowered.</th>
<th>Yields of nuts in lb/tree</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>40</td>
<td>14½</td>
</tr>
<tr>
<td>2</td>
<td>40</td>
<td>5½</td>
</tr>
<tr>
<td>3</td>
<td>39</td>
<td>1½</td>
</tr>
<tr>
<td>4</td>
<td>37</td>
<td>1½</td>
</tr>
<tr>
<td>5</td>
<td>35</td>
<td>Nil</td>
</tr>
<tr>
<td>6</td>
<td>39</td>
<td>Nil</td>
</tr>
</tbody>
</table>

Crop: Cashewnut.  
Ref: K. 50 (60)/49 (45)/48 (53)  
Type: 'M'.

Object: To find-out the optimum manurial requirements of cashewnut.

1. **BASAL CONDITIONS**:
   (i) Virgin land. (ii) (a) Sandy  
   Refer soil analysis, Nileshwar-III. (iii) By seedling. (iv) Local variety. (v) 
   (viii) Digging the pits to clean weeds. (ix) Nil. (x) Rainfed (xi) 169/72'-123 rainy days. (xii) N.A.
2. TREATMENTS:

Treatment

<table>
<thead>
<tr>
<th></th>
<th>5 lb G.N.C. + 1 lb B.M. + 10 Ash Cultivations/tree/year.</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td></td>
</tr>
<tr>
<td>2</td>
<td></td>
</tr>
<tr>
<td>3</td>
<td></td>
</tr>
<tr>
<td>4</td>
<td></td>
</tr>
<tr>
<td>5</td>
<td></td>
</tr>
<tr>
<td>6</td>
<td>No manure + No cultivation</td>
</tr>
</tbody>
</table>

Manures applied in Aug.-Sept. Cultivation consisted of one or two diggings and cleaning pits.

3. DESIGN:

(i) R.B.D. (ii) 6 (b) N:A. (iii) 4 (iv) 8 (net) (v) Yes, one row all round the plot. (vi) Yes.

4. GENERAL:

(i) Some of the trees died during the year (ii) Cashew beetle regularly watched & killed. (iii) Weight of nuts. (iv) (a) 1942 to 1951 (b) N.A. (v) (a) (b) N.A. (vi) & (vii) Nil.

5. RESULTS:

(i) 38.15 (2) 2.67
(ii) N.A.
(iii) Data not analyzed as some of the trees died due to beetle attack.

<table>
<thead>
<tr>
<th>Treatment</th>
<th>No. of trees flowered</th>
<th>Yields of nuts in lb/trees</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>40</td>
<td>4 lb</td>
</tr>
<tr>
<td>2</td>
<td>40</td>
<td>3 lb</td>
</tr>
<tr>
<td>3</td>
<td>39</td>
<td>2</td>
</tr>
<tr>
<td>4</td>
<td>36</td>
<td>1 lb</td>
</tr>
<tr>
<td>5</td>
<td>35</td>
<td>Nil</td>
</tr>
<tr>
<td>6</td>
<td>39</td>
<td>Nil</td>
</tr>
</tbody>
</table>

Crop :- Banana.
Ref :- K. 52 (55).
Type :- 'M'.

Object:-To find out the effect of N.P.K. manures each at two levels alone and in combinations.

1. BASAL CONDITIONS:

(i) Banana manuring : 10 lb. G.L. + 25 lb. Wood + Ash/tree (ii) Laverite loam (b) Refer soil analysis Pattambi. (iii) by suckers. (iv) Nendran, local, one year duration. (v) 30.4.x2, 5' apart in pits of size 15' x 15'. Planting rhizomes ; single per pit. (vi) Not applicable. (vii) Nil. (viii) Earthing up 2,3,4 months after planting. (ix) Nil. (x) Rainfed. (xi) 70.04 in 101 rainy days. (xii) 10 to 24.4.1953

2. TREATMENTS:

1. Control.
2. G.L. 1 lb. N/plant as basal.

3. DESIGN:

(i) R.B.D. (ii) 6 (b) N:A. (iii) 4 (iv) 8 (net) (v) Yes. (vi) Yes.

4. GENERAL:

(i) Severe drought affected the crop. (ii) Nil. (iii) Weight of bananas. (iv) Not repeated. (b) Nil. (v) (a) (b) Nil. (vi) & (vii) Nil.

5. RESULTS:

(i) 4970 lb./ac.
(ii) 402...
(iii) The treatments are significantly different.
(iv) Mean yield in lb./ac.
Treatment Mean yield.
1.  4736
2.  4764
3.  4935
4.  4793
5.  4906
6.  4821
7.  5360
8.  5445
S.E. of treatment mean: $\bar{y} = 201$ lb./ac.

Crop: Banana
Site: Agri. Res. Stn. Pattambi
Ref: K. 52 (56)
Type: 'M'

Object: To verify and scientifically examine the rationale of the local practice of crushing the nendran suckers before planting.

1. **BASAL CONDITIONS**
   - (ii) Laterite loam (b) Refer soil analysis, Pattambi.
   - (iii) By suckers.
   - (iv) Nendran, local, one year duration.
   - (v) 26.4.52, 8' apart in pits of 14 x 2' planting rhizomes, single per pit.
   - (vi) Not applicable.
   - (vii) Nil.
   - (viii) Earthing up 2, 3, & 4 months after planting.
   - (ix) Nil.
   - (x) Rainfed.
   - (xi) 70.01' in 101 rainy days:
   - (xii) 10 to 22.4.1953.

2. **TREATMENTS**
   - 1. Suckers to be cut back to 6" from the rhizome and planted at once.
   - 2. Suckers to be cut back as in (1), dried in the sun for 2 days and then planted.
   - 3. Corn to be collected after the bunch is harvested from the parent plant and planted out.
   - 4. Corn to be collected from the 1st daughter sucker of the same clump soon after the harvest of the bunch of the parent plant.
   - 5. (2) + crushing the shoot portion before planting.
   - 6. (2) + crushing the shoot portion when the shooting starts after planting.
   - 7. (2) + crushing the shoot once before planting and once after planting.
   - 8. Sword suckers without any treatment (Control).

3. **DESIGN**
   - (i) R.B.D. (ii) A (a) B (b) N.A. (iii) 4 (iv) 6 (v) Nil; (vi) Yes.

4. **GENERAL**
   - (i) Severe drought affected the crop.
   - (ii) Nil.
   - (iii) Weight of banana.
   - (iv) (a) Not repeated.
   - (b) Nil.
   - (c) Nil.
   - (d) Nil.

5. **RESULTS**
   - (i) 3924 lb./ac.
   - (ii) 629
   - (iii) The treatments are not significantly different.
   - (iv) Banana weight in lb./ac.

<table>
<thead>
<tr>
<th>Treatment</th>
<th>Mean</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>3885</td>
</tr>
<tr>
<td>2.</td>
<td>3942</td>
</tr>
<tr>
<td>3.</td>
<td>3857</td>
</tr>
<tr>
<td>4.</td>
<td>4236</td>
</tr>
<tr>
<td>5.</td>
<td>3942</td>
</tr>
<tr>
<td>6.</td>
<td>3856</td>
</tr>
<tr>
<td>7.</td>
<td>3855</td>
</tr>
<tr>
<td>8.</td>
<td>3800</td>
</tr>
</tbody>
</table>
S.E. of treatment mean: $\bar{y} = 315$ lb./ac.
Crop: Banana.  Ref: K. 52 (57).

Object: To find out the best combination of G.N.C. & 'A/S' in the presence and absence of lime.

1. BASAL CONDITIONS:
   (i) Banana. manuring—10 lb. G.L. + 45 lb. wood ash/tree. (ii) Laterite loam (b) Refer soil analysis Pattambi. (iii) By suckers. (iv) Nendran local. One year duration. (v) 24.4.52, 8' apart in pits of size 1' x 2'. planting rhizomes single/plant. (vi) Not applicable. (vii) 1.1.57. (viii) Earthing up 2,3, and 4 months after planting. (ix) Nil. (xi) Rainfed. (xii) 39"-40" in 100 rainy days. (xii) 7 to 15.4.1953.

2. TREATMENTS:
   All possible combinations of (1) & (2).
   (1) 2 levels of lime: 0, ± lb/plant.
   (2) 10 manures:
   1. No manure.
   2. G.N.C. 2 lb/plant.
   3. A/S 1 lb/plant.
   5. G.N.C : A/S 3 lb/plant.

   G.N.C & A/S applied in two doses 2 months & 4 months after planting. Lime applied immediately after planting.

3. DESIGN:
   (i) 2 x 10 Factor in R.B.D. (ii) (a) 20 (b) N.A. (iii) 2 (iv) 6 (v) Nil. (vi) Yes.

4. GENERAL:
   (i) Severe drought affected the crop. (ii) Nil. (iii) Yield of Banana. (iv) (a) Not repeated. (b) Nil. (v) (a) (b). Nil. (vi) Nil (vii) Raw data N.A.

5. RESULTS:
   (i) 5966 lb/ac.
   (ii) 566 lb/ac.
   (iii) Main effects and interaction not significant.
   (iv) Weight of Banana in lb./ac.

<table>
<thead>
<tr>
<th>Other Manure</th>
<th>1.</th>
<th>2.</th>
<th>Mean</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>4878</td>
<td>6239</td>
<td>5538</td>
</tr>
<tr>
<td>2.</td>
<td>5615</td>
<td>5842</td>
<td>5728</td>
</tr>
<tr>
<td>3.</td>
<td>6409</td>
<td>5729</td>
<td>6069</td>
</tr>
<tr>
<td>4.</td>
<td>7147</td>
<td>6466</td>
<td>6806</td>
</tr>
<tr>
<td>5.</td>
<td>5105</td>
<td>6239</td>
<td>5672</td>
</tr>
<tr>
<td>6.</td>
<td>6012</td>
<td>5842</td>
<td>5927</td>
</tr>
<tr>
<td>7.</td>
<td>6069</td>
<td>5785</td>
<td>5927</td>
</tr>
<tr>
<td>8.</td>
<td>6333</td>
<td>5558</td>
<td>5956</td>
</tr>
<tr>
<td>9.</td>
<td>5735</td>
<td>5722</td>
<td>5757</td>
</tr>
<tr>
<td>10.</td>
<td>6750</td>
<td>5785</td>
<td>6268</td>
</tr>
</tbody>
</table>

Mean. 6012 5921 5966

S.E. of the body of table. = 393 lb/ac.
S.E. of marginal means (Lime) = 124
S.E. of marginal means (other manures) = 278

Site: Agri. Res. Stn. Taliparamba.  Type: 'M'.

Object: To test the effect on yield of Ginger of different doses of C.M. and G.N.C. and their combinations.

1. BASAL CONDITIONS:
   (i) (a) Paddy, Ginger, Chillies. (b) Modan Paddy (c) Basal dressing of 5 C.L./ac. of F.Y.M. (ii) (a) Red laterite (b) Refer soil analysis, Taliparamba (iii) 7.6.1949. (iv) (a) Digging, levelling (b) Planting in raised beds (c) 11 tola hole (d) 4" to 6" spacing (e) Single rhizome/hole. (v) Nil: (vi) Ernad, Imported. No
classification according to duration. (vii) Rainfed (viii) Two mulchings and two earthings. 1st two months after planting and 2nd, three months after planting. (ix) About 150° (7.6.1949 to 18.2.1950) (x) 18.2.1950.

2. TREATMENTS:—
1. 5 ton/ac. of C.M.
2. 10 ton/ac. of C.M.
3. (1) + 500 lb./ac. of G.N.C.
4. (1) + 1000 lb./ac. of G.N.C.
5. 1400 lb./ac. of G.N.C.
6. 2800 lb./ac. of G.N.C.
C.M. applied in small pits after forming beds at the time of planting. G.N.C. top dressed in two doses 60 and 90 days after planting.

3. DESIGN:
(i) R.B.D. (ii) (a) 6 (b) N.A. (iii) 10 (iv) (a) 0.101 cent (b) 0.069 cent (v) One row all round the plot. (vi) Yes.

4. GENERAL:
(i) Satisfactory (ii) Nil. (iii) Weight of Ginger. (iv) (a) 1945 to 1950 The experiment failed during 1948. (b) No. (c) N.A. (v) (a), (b) Nil. (vi) Nil. (vii) Original data N.A.

5. RESULTS:
(i) 1600 lb./ac.
(ii) 833 lb./ac.
(iii) Treatment differences are highly significant.
(iv) Weight of Ginger in lb./ac.

<table>
<thead>
<tr>
<th>Treatment</th>
<th>Mean</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>1944</td>
</tr>
<tr>
<td>2.</td>
<td>1207</td>
</tr>
<tr>
<td>3.</td>
<td>1897</td>
</tr>
<tr>
<td>4.</td>
<td>2523</td>
</tr>
<tr>
<td>5.</td>
<td>1171</td>
</tr>
<tr>
<td>6.</td>
<td>862</td>
</tr>
</tbody>
</table>
S.E. of treatment means ±279 lb./ac.

Crop: Ginger. Ref: K.50(5)
Site: Agri. Res. Stn. Taliparamba. Type: 'M'

Object: To test the effect of different doses of C.M. and G.N.C. and their combinations on the yield of Ginger.

1. BASAL CONDITIONS:
(i) (a) Modan Paddy, Ginger, Chillies. (b) Modan Paddy (c) Basal dressing of 5 C.L. F.Y.M./ac. (ii) (a) Red laterite. (b) Refer soil analysis, Taliparamba. (iii) 26.5.1950 (iv) (a) Digging, levelling (b) planting in raised beds (c) ½ tola/hole (d) 4" to 6" (e) Single rhizome/hole. (v) Nil. (vi) Ernad imported. (vii) Rainfed (viii) Two mulchings and two earthings 1st : two months after planting and 2nd three months after planting (ix) About 140° (26.5.1950 to 24.2.1951) (x) 24.2.1951.

2. TREATMENTS:
1. 5 ton/ac. of C.M.
2. 10 ton/ac. of C.M.
3. 5 ton/ac. + 500 lb./ac. of G.N.C.
4. 5 ton/ac. + 1000 lb./ac. of G.N.C.
5. 1400 lb./ac. of G.N.C.
6. 2800 lb./ac. of G.N.C.
C.M. applied in small pits after forming beds G.N.C. top dressed in two doses two months and three months after planting.

3. DESIGN:
(i) R.B.D. (ii) (a) 6 (b) N.A. (iii) 10 (iv) (a) 0.101 cent (b) 0.069 cent (v) One row all round the plot (vi) Yes.

4. GENERAL:
(i) Satisfactory (ii) Nil. (iii) Weight of ginger. (iv) (a) 1945—1950. (b) No. (c) N.A. (v) (a), (b) Nil. (vi) Nil. (vii) Raw data N.A. Experiment seems to have failed during 1948.
5. RBSUSTS

(i) 2760 lb./ac.
(ii) 1101 lb./ac.
(iii) The treatment differences are significant.
(iv) Weight of ginger in lb./ac.

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<tr>
<td>5</td>
<td>1978</td>
</tr>
<tr>
<td>6</td>
<td>1765</td>
</tr>
</tbody>
</table>

S.E. of treatment means = 348 lb./ac.

Crop: Ginger
Site: Agri. Res. Stn. Taliparamba
Ref: K. 49(7)
Type: 'C'

Object: To test the effect on yield of ginger by reducing the seed-rate to 1 tola and ½ tola per hole from the local seed-rate of 2 tola/hole.

1. BASAL CONDITIONS:

(i) (a) Modan Paddy, Ginger, Chillies (b) Modan Paddy (c) Basal dressing of 5 C.L./ac. of F.Y.M. (ii) (a) Red laterite (b) Refer soil analysis, Taliparamba (iii) 7.6.1949. (iv) (a) Digging, levelling. (b) Planting in raised beds (c) As per treatment (d) 4" to 6" (e) single rhizome hole. (v) 5 ton./ac. F.Y.M. compost applied in small pits after forming beds at the time of planting (vi) Ernad, Imported. No classification according to duration. (vii) Rainfed. (viii) Two mulchings and two earthings 1st: two months after planting and 2nd: three months after planting. (ix) About 150° (7.6.1949 to 1.2.1950) (x) 1.2.1950.

2. TREATMENTS:

1. Seed material weighing 1½ tolas/hole
2. " " 1
3. " " ½

4. DESIGN:

(i) R.B.D. (ii) (a) 3 (b)/N.A. (iii) 10 (iv) (a) 0.101 cent (b) 0.069 cent (v) one row all round the plot. (vi) Yes.

4. GENERAL:

(i) Satisfactory (ii) Nil. (iii) Weight of ginger. (iv) (a) 1945 to 1950. The experiments seem to have failed during 1948. (b) No (c) N.A. (v) (a), (b) Nil. (vi) Nil. (vii) Original data N.A.

5. RESULTS:

(i) 1597 lb./ac.
(ii) 212 lb./ac.
(iii) The treatment differences are significant.
(iv) Weight of Ginger in lb./ac.

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<td>2</td>
<td>1171</td>
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<tr>
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<td>826</td>
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</table>

S.B. of treatment means = 67 lb./ac.

Crop: Ginger
Site: Agri. Res. Stn. Taliparamba
Ref: K. 50(6)
Type: 'C'

Object: To test the effect on yield by reducing the seed-rate to 1 tola and ½ tola/hole from the local seed-rate of 2 tola/hole.

1. BASAL CONDITIONS:

(i) (a) Modan Paddy, Ginger, Chillies. (b) Modan Paddy (c) Basal dressing of 5 C.L./ac. of P.Y.M.
(ii) (a) Red laterite (b) Refer soil analysis, Taliparamba (iii) 26.5.1950 (iv) (a) Digging; levelling
planting in raised beds (c) As per treatments (d) 4" to 6" (e) Single/rhizome hole (v) 5 ton of F.Y.M. or compost applied in small pits after forming beds (vi) Ernad, Imported, No classification according to duration, (vii) Rainfed (viii) Two mulching, and two earthings 1st one month after planting and 2nd three months after planting (ix) About 140" (26.5.1950 to 24.2.1951) (x) (24.2.1951).

2. TREATMENTS:
   1. Seed material weighing 1½ tola/hole
   2. " " 1
   3. " " ½

3. DESIGN:
   (i) R.B.D. (ii) (a) 3 (b) N.A. (iii) 6 (iv) (a) 0.101 cent (b) 0.069 cent. (v) One row all round each plot (vi) Yes.

4. GENERAL:
   (i) Satisfactory (ii) Nil (iii) Ginger weight. (iv) (a) 1945—1950 (b) No. (c) N.A. (v) (a) (b) Nil. (vi) Nil. (vii) Raw data N.A. Experiment seems to have failed during 1948.

5. RESULTS:
   (i) 1229 lb./ac. (ii) 1085 lb./ac.
   (iii) The treatment differences are not significant.
   (iv) Weight of Ginger in lb/ac.
   Treatment
   Mean. 1883
   2. 942
   3. 862
   S.E. of treatment means =443

Crop :- Ginger
Ref :- K. 49 (8)
Type :- 'D'

Object :-To test the incidence of 'soft rot' diseases on ginger by treating the seed material with different fungicides before planting.

1. BASAL CONDITIONS:
   (i) (a) Modan Paddy, Ginger, Chillies. (b) Modan Paddy. (c) About 5 C.L. of F.Y.M./ac. (ii) (a) Red laterite (b) Refer Soil analysis (iii) 8.6,1949 (iv) (a) Digging levelling (b) planting in raised beds (c) 1½ tons/hole (d) 4" to 6" (e) Single rhizome/hole. (f) 5 ton/ac. F.Y.M. or Compost applied in small pits after forming beds at the time of planting. (vi) Ernad, Imported, No classification according to duration. (vii) Rainfed. (viii) Two mulchings and two earthings. 1st : two months after planting and 2nd: three months after planting. (ix) About 150 inches, (8.6.1949 to 1.2.1950) (x) 1.2.1950.

2. TREATMENTS:
   1. Steeping ginger seed for 1½ hours in ½% mercuric chloride solution.
   2. Steeping ginger seed for 1½ hours in ½% mercuric chloride solution + planting in soil to which super at ½ oz./hole is added.
   3. Steeping ginger seed for 1½ hours in ½% mercuric chloride solution + planting in soil to which A/P at ½ oz./hole is added.
   4. Planting in soil to which Super at ½ oz./hole is added.
   5. Planting in soil to which A/P at ½ oz./hole is added.
   6. Control.

3. DESIGN:
   (i) R.B.D. (ii) (a) 6 (b) N.A. (iii) 5 (iv) (a) 0.101 cent (b) 0.069 cent (v) One row all round the plot. (vi) Yes.

4. GENERAL:
   (i) Satisfactory. (ii) Nil (iii) % Incidence/plot. (iv) (a) 1949 to 1950 (b) No. (c) N.A. (v) (a), (b) Nil. (vi) Nil (vii) Original data N.A.

5. RESULTS:
   (i) 100.0 % incidence of pests.
   (ii) 66.2 " "
   (iii) The treatment differences are significant.
   (iv) % general mean of incidence/plot
Crop : Ginger

Object : To test the incidence of 'soft rot' disease of ginger by treating the seed material with different fungicides and manure before planting.

1. BASAL CONDITIONS:
   (i) (a) Modan Paddy, Ginger, Chilies. (b) Modan paddy (c) Basal dressing of 5 C.L./ac. F.Y.M. (ii) (a) Red laterite (b) Refer soil analysis Taliparamba (iii) 7.6.1950 (iv) (a) Digging, levelling (b) Planting in raised beds (c) 1½ tola./hole (d) 4 to 6 inches (e) Single rhizome/hole. (v) 5 tons/ac. at C.M. the time of planting applied in small pits after forming beds. (vi) Ernad, Imported (vii) Rainfed (viii) Two mulchings and two earthing up's 1st : two months after planting and 2nd three months after planting. (ix) About 140" (7.6.1950 to 26.2.1951) (x) 26.2.1951.

2. TREATMENTS:
   (1) Steeping ginger seed for one and a half hours in 0.01% marcuric chloride solution.
   (2) Steeping ginger seed for 14 hours in 0.01% M/C solution and planting in soil to which super at ½ oz/hole is added.
   (3) Steeping ginger seed for 1½ hours in 0.01% M/C solution and planting in soil to which A/P at ½ oz/hole is added.
   (4) Planting in soil to which super at ½ oz/hole is added.
   (5) Planting in soil to which A/P at ½ oz/hole is added.
   (6) Control.

3. DESIGN:
   (i) R.B.D. (ii) (a) 6 (b) N.A. (iii) 5 (iv) (a) 0.101 cents (b) 0.069 cents (v) One row all round the plot (vi) Yes.

4. GENERAL:
   (i) Satisfactory (ii) Nil (iii) % of infection (iv) (a) 1949 to 1950 (b) No (c) N.A. (v) (a), (b) Nil (vi) Nil (vii) basic data not available.

5. RESULTS:
   (i) 100% infected plants
   (ii) N.A.
   (iii) The treatment differences are not significant.
   (iv) % general mean of incidence/plot.

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<td>2.</td>
<td>42.3</td>
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<tr>
<td>3.</td>
<td>105.5</td>
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<td>4.</td>
<td>97.2</td>
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<td>5.</td>
<td>81.5</td>
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<td>6.</td>
<td>106.6</td>
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</table>

S.E. of treatment means = 29.6

Crop : 'Lemon Grass'.
Site : Lemon Grass Res. Stn. Odakkali.

Object : To study the effect of different combinations of N, P & K on yield and quality of oil on Lemon Grass.

1. BASAL CONDITIONS:
   (i) Fallow land. (ii) (a) typical laterite—Lime is one of the principal requirements. (b) Refer soil analysis (iii) By seeds (iv) Red stemmed grass-local variety. (v) 28.4.53. 9.8.53. Sowing by broadcast in a nursery.
seed rate 15 lb./ac. The plants were transplanted along raised bed separated by furrows. Spacing 12", plant to plant and 15" between rows. Single plant/hole. (vi) 103 days. (vii) Nil (viii) 3 weedings (ix) Nil. (x) Unirrigated. (xi) 100 to 120", (xii) 8.12.1953. Generally 4 to 5 harvests/year. Only one harvest on 8.12.53 has been reported for analysis.

2. TREATMENTS:
   All combinations of (1), (2) & (3).
   (1) A/S at (i) N₀ = 0 lb./plot (ii) N₁ = 1 lb./plot of N
   (2) Super at (i) P₀ = 0 lb./plot (ii) P₁ = 1.2 lb./plot of P₀₃
   (3) Muriate of Potash at (i) K₀ = 0 lb./plot (ii) K₁ = 0.4 lb./plot of K₀₃.

3. DESIGN:
   (i) R.B.D. (ii) (a) 8 (b) N.A. (iii) 4 (iv) 75-120 (v) 2 feet furrow between plots and a footpath between blocks. (vi) Yes.

4. GENERAL:
   (i) Growth very good in NPK plots, (ii) Nil (iii) fresh of weight Grass; yield of oil and citral content.
   (iv) (a) 1953, continuing. (b) Nil. (v) (a), (b) Nil (vi) Nil. (vii) The experiment commenced with 120 plants per plot; but many plants died afterwards. The analysis is based on 120 plants per plot of size 20’x6’.

5. RESULTS:
   (i) Mean weight of fresh grass in lb/plot of 120 plants
   (ii) 13.6 lb./plot
   (iii) 4.12 lb./plot
   (iv) (weight of fresh grass in lb./plot of 120 plants)
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<tr>
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<td>14.4</td>
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<tr>
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<td></td>
</tr>
<tr>
<td>Mean.</td>
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</table>

S.E. of the table means = 1.46 lb./plot
S.E. of marginal means = 1.03 lb./plot
(2) Mean yield of oil in c.c./plot of 120 plants
   (i) 16.44
   (ii) 4.44
   (iii) K alone is significant.
   (iv) (Yield of oil in c.c./plot of 120 plants)
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<tr>
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<tr>
<td>P₁</td>
<td>17.88</td>
<td>25.26</td>
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S.E. of body of table $= 1.57$
S.E. of Marginal Means. $= 1.11$

(3) (Citeral %)
(i) 84 3.
(ii) 0.04
(iii) N, NP, K, NK and PK are highly significant while P is significant
(iv)

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S.E. of body of the table $= 0.14$
S.E. of marginal means $= 0.10$

---

Crop : - Crotalaria Straita.
Object : - To find-out whether application of lime will increase the yield of G. M. from Crotalaria Straita.

2. BASAL CONDITIONS:
   (i) (a) Nil (b) Paddy (c) About 5000 lb./ac G.L. + 100 to 150 lb./ac. of A/S. (ii) (a) Laterite loam (b) Refer soil analysis Pattambi (iii) 9.2, 1951 (iv) (a) 4 to 5 ploughings (b) seeds sown by broadcast (c) 25 lb./ac. (d) (e) (v) Nil (vi) Local, 4 to 5 months (vii) Rainfed (viii) Nil (ix) About 16 inches (9.2.51 to 21.6.1951) (x) 21.6.1951.

2. TREATMENTS:
   Lime at
   1. 0 lb./acre.
   2. 1000
   3. 2000
   4. 3000
   Applied one month before sowing.

3. DESIGN:
   (i) R.B.D. (ii) (a) 4 (b) N.A. (iii) 6 (iv) (a), (b) 12' x 9' (v) Nil (vi) Yea.

4. GENERAL:
   (i) Satisfactory (ii) Nil (iii) Weight of grass (iv) A Not repeated (b) No (c) Nil (v) (a) (b) Nil (vii) Nil.

5. RESULTS:
   (i) 20351 lb./ac.
   (ii) 4380
   (iii) The treatments are not significantly different.
   (iv) Weight of G. L. in lb./ac.
   Treatment. Mean.
   1. 18150
   2. 21913
   3. 22655
   4. 18686
   S.E. of treatment means $= 1787$ lb./ac.
Crop: Crotolaria Straita  
Ref: K. 51 (27)  
Type: 'C'

Object: To find-out the optimum seed rate which will give the maximum G.M. from Crotolaria straita.

1. BASAL CONDITIONS:
   (i) (a) Nil. (Grown in paddy lands) (b) Paddy (c) About 5000 lb./ac. of G.L. + 100 lb./ac. A/S. (ii) (a) Laterite loam (b) Refer soil analysis Pattambi (iii) 25.1.1951. (iv) (a) 4 to 5 ploughings (b) seeds broadcast. (c) As per treatment (d) (e) (f) Nil. (vii) Local; (iv) 4 to 5 months duration. (viii) Nil. (ix) About 16° (25.1.1951 to 19.6.1951) (x) 19.6.1951.

2. TREATMENTS:
   Seed rate at
   1. 5 lb./ac.
   2. 15 lb./ac.
   3. 25 lb./ac.
   4. 35 lb./ac.
   5. 45 lb./ac.

3. DESIGN:
   (i) R.B.D. (ii) (a) 5 (b) N.A. (iii) 5 (iv) (a), (b) 12' x 11' (v) Nil. (vi) Yes.

4. GENERAL:
   (i) Satisfactory (ii) Nil. (iii) Weight of G.L. (iv) (a) Not repeated. (b) No (c) Nil. (v) (a) (b) Nil. (vi) & (vii) Nil.

5. RESULTS:
   (i) 15246 lb./ac.
   (ii) 3199 lb./ac.
   (iii) The treatments are significantly different.
   (iv) Weight of G.L. in lb./ac.

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<tr>
<td>5</td>
<td>17589</td>
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</tr>
</tbody>
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Crop: Vettivert.  
Ref: K. 51(53).  
Type: 'M'

Object: To find-out the influence of C.M., Wood ash and B.M. on the production of roots and oil content.

1. BASAL CONDITIONS:
   (i) (a) Nil. (b) Dry paddy. (c) 10 C.L. of C.M. +1000 lb. wood ash/ac. (ii) (a) Laterite loam (b) Refer Soil analysis Pattambi. (iii) 4.8.1951. (iv) (a) 2 to 3 ploughing (b) planting in strips on ridges of depth 1' 3" semi idiom between ridges; and 1' to 2' between [strips. (c) (d) 1' to 2' (e) 1 (vi) Nil. (vii) No classification. (viii) Nil. (ix) One weeding one month after planting. (ix) 16.36" =111 days for 1st harvest (10.93" = 144 days for 2nd harvest (4.9.1952 to 4.2.53), 104.45" in 150 days for 3rd harvest. (x) Harvest in three batches 4.8.52; 4.11.1952; and 4.2.1953.

2. TREATMENTS:
   All combinations of (1), (2) & (3)
   (1) C.M. @ N = 0 ton./ac.  
   (2) Wood Ash @ K = 0 lb./ac.  
   (3) B.M. @ P = 0 cwt./ac.
   All applied before planting.
3. DESIGN:
(i) R.B.D. (ii) (a) 8 (b) N.A. (iii) 6 (iv) (a,b) 16' x 24' (v) Nil. (vi) Yes.

4. GENERAL:
(i) Satisfactory. (ii) Nil. (iii) (a) Yield in lb. (iv) (a) not repeated. (b) No (c) Nil (v) (v) N.A. (vii) Data N.A.

5. RESULTS:
(Harvested on 4.8.52)
(i) 2000 lb./ac.
(ii) 256 "
(iii) The treatments are not significantly different.
(iv) Mean field in lb./ac. of the crop harvested on 4.8.52

Mean Yield in lb./ac.

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<th></th>
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<th>N₁</th>
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<tr>
<th></th>
<th>P₀</th>
<th>P₁</th>
<th>Mean.</th>
</tr>
</thead>
<tbody>
<tr>
<td>K₀</td>
<td>1986</td>
<td>2084</td>
<td>2035</td>
</tr>
<tr>
<td>K₁</td>
<td>2056</td>
<td>1872</td>
<td>1964</td>
</tr>
<tr>
<td>Mean.</td>
<td>2021</td>
<td>1978</td>
<td>2000</td>
</tr>
</tbody>
</table>

S.E. of body of table = 74 lb./ac.
S.E. of marginal means = 52 lb./ac.

Harvested on 4.11.1952
(i) 5130 lb./ac.
(ii) 1102 "
(iii) The treatment differences are significant. Main effects of C.M. & Wood ash are significant.
(iv) Mean yield 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>4694</td>
<td>5290</td>
<td>4992</td>
</tr>
<tr>
<td>P₁</td>
<td>4835</td>
<td>5700</td>
<td>5268</td>
</tr>
<tr>
<td>K₀</td>
<td>4324</td>
<td>5275</td>
<td>4800</td>
</tr>
<tr>
<td>K₁</td>
<td>5204</td>
<td>5714</td>
<td>5459</td>
</tr>
<tr>
<td>Mean.</td>
<td>4764</td>
<td>5495</td>
<td>5133</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th></th>
<th>P₀</th>
<th>P₁</th>
<th>Mean.</th>
</tr>
</thead>
<tbody>
<tr>
<td>K₀</td>
<td>4764</td>
<td>4835</td>
<td>4800</td>
</tr>
<tr>
<td>K₁</td>
<td>5218</td>
<td>5700</td>
<td>5459</td>
</tr>
<tr>
<td>Mean.</td>
<td>4991</td>
<td>5263</td>
<td>5133</td>
</tr>
</tbody>
</table>

S.E. of body of table = 319 lb./ac.
S.E. of the marginal means. = 225 lb./ac.

Harvested on 4.2.1953.
(i) 3258 lb./ac.
(ii) 830 "
(iii) The treatment are not significantly different.
(iv) Mean yield in lb./ac.
Crop : Sesbania (2nd crop season of paddy).  
Object : To determine the optimum spacing for sesbania.

1. BASAL CONDITIONS:
(i) (a) Nil (b) Paddy (c) G.L. 4,000 lb/ac. 75 lb/ac. A/S (ii) (a) Laterite loam (b) Refer Soil analysis Pattambi (iii) 20.9.1952/13.11.1952. (iv) (a) Nil (b) Field bunds (c) — (d) As per treatments (e) Single cutting/hoie. (v) Nil (vi) Sesbania speciosae. (vii) Rainfed. (viii) Nil. (ix) 16.10" in 20 rainy days (20.9.52 to 9.3.1953.) (x) 9.3.1953.

2. TREATMENTS:
Following spacings. 
1. 2"
2. 3"
3. 4"
4. 6"

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

4. GENERAL:
(i) Satisfactory. (ii) Nil (iii) Weight of green leaf. (iv) (a) Not repeated. (b) No (c) Nil (v) (a), (b) Nil (vi) Nil (vii) Raw data N.A.

5. RESULTS:
(i) 505 lb/ac.
(ii) 92 lb/ac.
(iii) Treatments are not significantly different.
(iv) Weight of G.L. in lb/ac.

<table>
<thead>
<tr>
<th>Treatment</th>
<th>Mean.</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>500</td>
</tr>
<tr>
<td>2.</td>
<td>463</td>
</tr>
<tr>
<td>3.</td>
<td>632</td>
</tr>
<tr>
<td>4.</td>
<td>426</td>
</tr>
</tbody>
</table>

S.E. of treatment means = 46 lb/ac.
Object:—To determine the optimum seedrate (size of seed bits) for planting of Yam.

1. BASAL CONDITIONS:
   (i) Virgin land. (ii) Laterite loam. (b) Refer soil analysis Pattambi. (iii) Through rhizomes (iv) No classification, Elephant yam local. (v) 15.5.51 (planted) Single rhizome/hole, planted in 4' square pits (vi) Not applicable. (vii) Wood ash applied before planting quantity N.A. (viii) 1 digging and earthing up 6 months after planting. (ix) Nil. (x) Purely rainfed. (xi) About 150 inches during the crop season i.e. 1951–53. (xii) 23.4.1953.

2. TREATMENTS:
   Seed bits of sizes. 1. \( \frac{1}{4} \) lb./pit
   2. 1 lb./pit
   3. \( \frac{1}{2} \) lb./pit
   4. 2 lb./pit

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

4. GENERAL:
   (i) Satisfactory. (ii) Nil (iii) Weight of tuber (iv) (a) Not repeated. (b) Nil. (v) (a) (b) Nil (vi) & (vii) Nil.

5. RESULTS:
   (i) 3.65 ton/ac.
   (ii) 0.73 ton/ac.
   (iii) The treatment differences are highly significant.
   (iv) Tuber weight ton/ac.
   Treatment Mean.
   1. 2.27
   2. 3.01
   3. 4.17
   4. 5.14
   S.E. of treatment means : \(-0.30\) ton/ac.

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Crop :-Gingelly.
Ref :-K. 51 (22)
Type :-‘CV’

Object:—To find-out the best time of sowing for three different varieties of Gingelly.

1. BASAL CONDITIONS:
   (i) (a) Nil (b) Paddy (c) 5 C.L. of C.M./ac. 1000 lb. ash/ac + 50 lb. A/S/ac. (ii) (a) Laterite loam (b) Refer soil analysis Pattambi (iii) As per treatments (iv) (a) 3 or 4 ploughings (b) seeds broadcast and covered by shallow ploughing. (c) 5 lb./ac. (d) (e)–(v) C.M. at 5 C.L./ac. applied at the time of ploughing. (vi) As per treatments (vii) Rainfed. (viii) Weeded whenever required. (ix) About 25° (3.8.52 to about 100 days) (x) Harvested about 10 days after sowing.

2. TREATMENTS:
   All combinations of (1) & (2):
   (1) 3 varieties viz. (1) Local, (2) TMV₁ and (3) TMV₂
   (2) Three dates of sowing viz. (1) 3.8.51 (2) 10.9.51 and (3) 19.9.1951.
   Note:—TMV₁ and TMV₂ are improved and short.

3. DESIGN:
   (i) 4 x 3 Factorial in R.B.D. (ii) (a) 9 (b) N.A. (iii) 2 (iv) (a) (b) 8' x 40' (v) Nil (vi) Yes.

4. GENERAL:
   (i) Satisfactory. (ii) Nil (iii) Weight of gingelly (iv) (a) 1949 to 1951 (b) Yea (c) N.A. (v) (a) (b) Nil (vi) & (vii) Nil.

5. RESULTS:
   (i) 4175 lb./ac.
   (ii) 1189 lb.
(iii) Main effects of varieties and dates of sowing are highly significant. Their interaction is no significant.
(iv) Weight of Glaucol in lb./ac.

<table>
<thead>
<tr>
<th>Variety</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>Mean.</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>1</td>
<td>2</td>
<td>3</td>
<td></td>
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<tr>
<td>Date of sowing</td>
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<td></td>
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<td></td>
</tr>
<tr>
<td>1.</td>
<td>3638</td>
<td>1179</td>
<td>2471</td>
<td>2429</td>
</tr>
<tr>
<td>2.</td>
<td>7415</td>
<td>5440</td>
<td>4964</td>
<td>5946</td>
</tr>
<tr>
<td>3.</td>
<td>5179</td>
<td>4125</td>
<td>3151</td>
<td>4152</td>
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<tr>
<td>Mean.</td>
<td>5417</td>
<td>3181</td>
<td>3528</td>
<td>4175</td>
</tr>
</tbody>
</table>

S.E. of body at table = 841 lb./ac.
S.E. of marginal mean = 480 lb./ac.