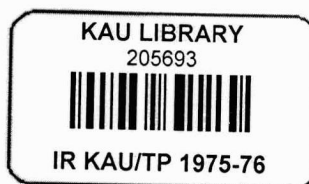


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This brochure embodies the technical programme of the Rice Research Station, Pattambi for the year 1975-76 in brief. The titles of the field experiments and their objectives are given. The focus of our programme is on development of crop production technology under resource constraints and evolution of rice varieties with multiple resistance.





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KAU

VARIETAL IMPROVEMENT

1. Comparative yield trial of ARC and IARI cultures in 'modan' lands:

To identify varieties with high yield potential for rainfed uplands.

(ARC: Assam Rice Collections; IARI: Indian Agricultural Research Institute)

2. Comparative yield trial of new short duration cultures:

To study the performance of new short duration cultures under upland drysown conditions.

3. Trial of two methods of sowing:

To study the possibility of adopting wide spaced flow-line sowing in uplands with the main objective of easy and **thorough** weed control.

4. Pedigree rows:

To study the performance of single plant progenies of selections made from various crosses and to select materials for further trials.

5. Comparative yield trial:

To assess the yield and general performance of new promising early duration cultures in wet lands.

6. Comparative yield trial of new medium duration cultures:

To compare the new promising medium duration cultures with standard varieties for their yield potential.

7. Trial of awnless mutants of Orpandy:

To study the performance of induced awnless mutants of the awned saline resistant variety, Orpandy (trials at Pattambi and Muthukulam)

8. Trial of **cold tolerant cultures:**

To study the performance of cultures evolved from the cross Jaya X Dunghan shali with special reference to cold tolerance.

(trial at Anbalavayal)

Varietal Improvement work under the All India Coordinated Rice Improvement Project

9. Uniform variety trial -1 (a):

To evaluate very early maturing selections from the breeding materials generated in India and abroad.

10. Uniform variety trial-1:

To study the performance of early varieties in advanced stages of breeding.

11. Uniform variety trial-2:

To compare the performance of mid duration varieties in advanced stages of breeding.

12. Preliminary variety trial-1 (a):

To study the comparative performance of very early varieties selected from National Breeding Nursery.

13. Preliminary variety trial-1:

To evaluate the yield potential of early duration selections advanced from initial testing in National Breeding Nursery.

14. Preliminary variety trial-2:

To study the performance of mid duration varieties nominated from National Breeding Nursery.

15. Evaluation of elite selections from International Rice Observation Nursery:

To compare the performance of selected lines from International Rice Observation Nursery for their yield potential and their resistance for various pests under unprotected conditions.

16. Second generation hybrids:

To select single plants having resistance for brown planthopper.

17. First generation hybrids- single, double and top crosses:

To select single plants having resistance to brown planthopper and rice diseases.

AGRONOMY

18. Moderate nitrogen technology:

To find out how far the efficiency of applied nitrogen can be increased by adjusting the time of application.

19. Phosphate and potash manuring of rice:

To ascertain whether phosphate and potash application can be skipped over for one or more seasons without affecting the growth and yield of rice.

20. Response of rice to micronutrients:

To investigate the response of rice to micronutrients.

21. Relative efficacy of different types of oil cakes:
To study the relative efficacy of different types of oil cakes (neem, marotti, rubber, punna, karinkotta) for increasing the efficiency of applied nitrogen.
22. Trial of 'Azo' (azotobacter) a bacterial fertilizer:
To find out the effect of 'Azo' on the growth and yield of upland rice.
23. Efficiency of 'Azo' and supercompost on the growth and yield of transplanted lowland rice.
24. Investigations on 'Sagar' a new fertilizer material:
To study the effect of 'Sagar' on the yield of rice.
25. Observational trial of newer fertilizer materials:
To find out the effect of newer fertilizer materials/soil amendments on the growth and yield of rice.
26. Varietal response to nitrogen:
To study the response of pre-release rice cultures 47-41, 28-26 and 24-20 evolved at the Agricultural College, Vellayani to nitrogen.

Agronomy trials under the All India Coordinated Rice Improvement Project
27. Nitrogen-variety trial - 1 (B):
To study the yield potential of promising short duration transplanted varieties under different nitrogen levels.

28. Nitrogen - variety trial-2:

To find out the yield potential of promising medium duration varieties under different nitrogen levels.

29. Sources and timings of nitrogen application:

To study the efficiency of nitrogen as affected by different sources, rates and timings of nitrogen application (for direct sown crop).

30. Sources, timings and methods of nitrogen application:

To find out the efficiency of nitrogen use as affected by different sources, times and rates of nitrogen application for a short duration variety under transplanted conditions.

31. Management of nitrogen under moderate levels of nitrogen fertilization:

To work out the optimum agronomic practices for obtaining maximum nitrogen use efficiency at a low level of nitrogen application by adjusting the timings, rates and sources of nitrogen for a medium duration rice variety.

32. Weed control trial for direct sown rice in puddled soils:

To study the effectiveness of different methods of weed control in a direct sown crop on puddled soils.

Multiple cropping

33. Multiple cropping experiment:

To study the feasibility of raising 3 crops in the rainfed single crop uplands (modan).

34. Observational trial: Rice-sugarcane-greengram

To find out the possibility of raising paddy and pulses in sugarcane fields.

CHEMISTRY

35. Permanent manurial trial with tall indica rice:

To find out the effect of continuous application of green leaf, cattle manure, ammonium sulphate and their combinations with and without phosphate and potash on the yield of a tall indica rice variety and on soil properties.

36. Permanent Manurial experiment (with dwarf indica variety)

To investigate the effect of continuous application of organic manures and inorganic fertilizers on the yield of a dwarf indica rice variety.

37. Foliar nutrition experiment:

To find out the effect of foliar application of urea on the yield of 'Jaya' rice (compared to soil application)

Physiology studies under the
All India Coordinated Rice Improvement Project.

38. Crop weather studies:

To identify cultivars (varieties) suited to late planting. This trial enables us to find out the performance of varieties when planted at different periods in an year.

39. Observational Trial on the effect of waterlogging on tillering and productivity:

To find out the genotypic reaction of varieties to flooding.

40. Limits of physiological age for planting:

To collect information on : (a) maximum leaved stage for planting and the expected yield compensations; (b) maximum limits of age for transplanting for early, mid and late duration groups and (c) density of population to be maintained (optimum spacing).

41. Relationship between biological yield and harvest Index:

It is increasingly realized that high harvest index at a given level of biological yield is advantageous for stability in performance. Considering this relationship, it was decided to take up this study to identify plants with the desirable combinations.

ENTOMOLOGY

42. Chemical evaluation trial (granules)

To evaluate the efficiency of selected granular insecticides on need basis on the control of major insect pests of rice. The chemicals are applied once at 10-15 days after planting. Thereafter applied only when needed.

43. Chemical evaluation trial (sprays)

To evaluate the efficiency of selected insecticides applied as sprays on need basis on the control of major insect pests of rice. The chemicals are sprayed once at 10-15 days after planting. Thereafter applied only when needed.

44. Chemical evaluation trial of 'Sandoz' Products:

To evaluate the efficiency of different chemicals marketed by M/s. Sandoz (India) Ltd., against brown planthopper. The trial is financed by M/s. Sandoz(India) Ltd.

45. Varietal resistance of cultures/varieties to insect pests.

To evaluate cultures and varieties developed at the different rice research stations against rice stem-borer, gallfly, brown planthopper, green leaf hopper, leaf roller etc.

46. Collaborative Research Project on Biotype of brown planthopper:

To identify possible biotypes of brown planthopper present in Kerala, and also to study the resistance of rice varieties to this pest.

47. Collaborative Research Project on the ecology of brown planthopper:

To study the relation between ecological factors and population build up of brown planthopper.

Coordinated Entomology trials under the
All India Coordinated Rice Improvement Project

48. Maximum protection trial:

To estimate the magnitude of yield loss of selected pre-release varieties resulting from insect pests and to ascertain the reaction of these varieties to the protection afforded by the insecticides.

49. New insecticide trial (granules):

To screen newer chemicals in the form of granules to identify potent chemicals against rice pests.

50. New insecticide trial (sprays)

To screen newer chemicals in the form of sprays to identify potent chemicals compared to parathion.

51. Chemical evaluation trial (granules)

To evaluate the effectiveness of selected insecticides as granules at 3 different doses in controlling insect pests of rice.

52. Chemical evaluation trial (sprays)

To evaluate the effectiveness of selected insecticides in the form of sprays at different doses for controlling insect pests of rice.

53. Seedling dip experiment:

To evaluate the effectiveness of selected insecticides given as seedling dip for the control of early pest attack.

54. Gall-midge biotype study:

To compare resistance in selected gall midge resistant varieties to suspected biological races at the different centres.

PLANT PATHOLOGY

55. Fungicidal trial for the control of blast disease:

To evaluate the efficiency of different fungicides in controlling blast disease.

56. Fungicidal trial for the control of sheath blight:

To screen different fungicides for the control of sheath blight.

57. Yield trial of disease resistant varieties:

To evolve high yielding rice varieties possessing multiple disease resistance.

58. Comparative yield trial of disease resistant varieties:
Varieties/cultures resistant to blast and sheath blight diseases are compared in this trial to assess their potential yield.
59. Breeding blast resistant varieties:
To evolve blast resistant varieties by hybridization.
Donors used: Zenith, Tadukan, Tetep.
60. Germplasm bank:
To maintain a genetic stock for catering gene requirement of future research programmes.
61. Fungicidal trial for the control of brown spot disease:
To evaluate the efficacy of different fungicidal chemicals in controlling brown spot.

Coordinated Pathology Trials
under the All India Coordinated Rice Impr. Project

62. National breeding nursery:
To evaluate breeding materials generated at various cooperative centres for agronomic attributes and pest reactions and to identify promising selections for yield testing.
63. International rice sheath blight nursery:
To screen varieties/cultures for resistance/susceptibility to sheath blight disease.
64. Screening for resistance to bacterial leaf blight disease:
To identify varieties/cultures having resistance to bacterial leaf blight disease:

65. Screening for resistance to 'Tungro' virus:
To rate selections (cultures) and varieties for resistance/tolerance to 'rice tungro virus' (RTV) disease under good field tungro pressure.

PULSES IMPROVEMENT

66. Breeding for improved varieties of cowpea:
To evolve high yielding varieties of cowpea by hybridization and selection.
67. Yield trial of cowpea:
To select high yielding varieties of cowpea suitable for our conditions.
68. Yield trial of green gram:
To identify green gram varieties with good yield potential for cultivation in Kerala.
69. Yield trial of black gram:
To choose a high yielding black gram variety suitable for cultivation under Kerala conditions.
70. Response of cowpea to fertilizer application:
To study the response of cowpea (variety: New Era) to different levels of nitrogen, phosphorus and potash to find out the optimum dose of fertilizers.
71. Maintenance of types:
To maintain different varieties of pulses- cowpea, green gram, black gram, cluster beans, Lab lab and redgram- and soyabean as genetic stock to provide materials for future research programmes.
72. Yield trial of new cowpea cultures:
To study the yield potential of some cowpea crosses in comparison with three improved varieties.

All India Coordinated Agronomic
Research Project, Pattambi

This Project conducts complex trials at the Model Agronomic Research Station, Karamana and simple fertilizer trials in cultivators' fields in selected districts.

At the Model Agronomic Centre, the programme is so oriented as to gather information on multiple cropping and soil fertility and fertilizer use as influenced by soil, climate and management practices. Long term effects of various cultural and manurial practices are also studied in order to develop agronomic practices to sustain high levels of production without deterioration of soil and other resources.

In the experiments conducted in cultivators' fields, emphasis is mainly on the response of high yielding varieties to nitrogen, phosphorus, potash and Lime in order to formulate fertilizer recommendations for the different agro-climatic zones in the state.

Commencement

Simple fertilizer trials in cultivators' fields and fertilizer trials in the Model Agronomic Centre, Karamana were in existence in Kerala from 1953 and 1955, respectively under the 'Fertilizer use and Soil Fertility Project'. The scheme with the present set up started functioning in this state from the second crop season of 1968 under the name 'All India Coordinated Agronomic Experiment Scheme'. The name of this project was re-designated as All India Coordinated Agronomic Research Project (AICARP) with effect from the financial year 1974-75.

Fertilizer trials in cultivators' fields commenced simultaneously during the second crop season of 1968 in Palghat and Alleppey districts. After completion of 3 years' work, the scheme was shifted to Trichur and Quilon districts with effect from the second crop season of 1971. Experiments were conducted in these districts till the completion of the second crop season of 1974-75. The scheme began to operate in Trivandrum and Malappuram districts from the 1st of March, 1975.

Results

A. At the Model Agronomic Research Station:

The investigations conducted at the MARS proved the following:

The suitable cropping system for maximum production of grain annually is to raise 3 medium duration rice crops (variety: Jaya) in succession during the three cropping seasons viz., virippu, mundakan and puncha in an year. Cultivation of a non-cereal crop during summer (puncha season), however, is quite advantageous from the point of view of total production and income. Under the existing conditions in southern Kerala, 2 medium duration rice crops followed by a vegetable Bhindi crop (Lady's finger, var: Pusa savani) is the best cropping system. Farm yard manure effects significant yield increases (direct effect) but its residual and cumulative effect on the soil are inconsistent. Rice crop responded up to 120 kg N/ha at Karanana. Response to P and K was erratic and inconsistent. Complex fertilizers have been found to be as good as straight fertilizers in their effect on yield.

B. Experiments in cultivators' fields:

Presently 4 types of trials are conducted in cultivators' fields- A,B,C and G. In type A, fertilizer requirements of high yielding varieties of rice are studied. Type B trials give comparative performance of new varieties in relation to low and medium levels of fertilizer application. In C type trials, fertilizer requirements of high yielding varieties in relation to soil fertility are investigated. Fertilizer requirement of a fixed single year two crop sequence under resource constraints is studied in G type trials. The G type trial, were included in the programme during 1974-75.

Conclusions drawn from the trials conducted so far are:

Good response to applied nitrogen has been observed in all the blocks. Positive and significant response to N up to 120 kg N/ha was seen in Koipuram, Mallappally, Kulanada and Pandalam blocks in Alleppey district; Pathanapuram, Konni, Parakadavu and Mukhathala blocks in Quilon district; Puzhackal, Kodakara and Anthicad blocks in Trichur district and Sreekrishnapuram and Mannarghat blocks in Palghat district. Response to N even exceeded the 120 kg level in Muthukulam, Bharanicavu (Alleppey), Mullassery (Trichur), Palghat and Ottapalam (Palghat) blocks. Response varied between 40 and 80 kg N/ha in the other blocks.

Response to P was very little in Palghat district while it was moderate in Alleppey district. In the eastern parts of Alleppey district, response to P was as good as that of nitrogen and there was good interaction showing thereby that in these areas combined application of N and P is quite essential for higher yields. In Palghat and

Trichur districts there was no response to K while significant response to K was observed in Alleppey district. Response of rice to these nutrients was seen in some blocks in Quilon and Trichur districts.

Irrespective of the fertility classes chosen, there was good response to P and K in the Kottarakkara block of Quilon district (LL, LM, MM) while it was not observed in Ollukkara block of Trichur district (LL, LM, ML, MM). In the soil of the former block, phosphorus and potash seemed to be the limiting factors in crop production.

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SANCTIONED STRENGTH OF STAFF

Research on Rice

Rice Specialist	= 1
Dy. Director of Research (Rice)	= 1
Research Officer (Breeder)	= 1
Research Officer (Entomology)	= 1
Research Officer (Agronomy)	= 1
Research Officer (Chemistry)	= 1
Research Officer (Statistician)	= 1
Research Officer (Pathology)	= 1
Junior Research Officers	= 12
Agril. Demonstrators (I grade)	= 4
Agril. Demonstrators (II grade)	= 2
Junior Superintendent	= 1
Upper Division Clerks	= 2
Lower Division Clerks	= 3
U.D. Typist	= 1
Laboratory Attenders	= 5
Peons	= 1
Regular mazdoors	= 2

Composite Farms

L.D. Clerks	= 2
L.D. Typist	= 1
Laboratory attender	= 1
Peon	= 1
Permanent mazdoors (Reg. mazdoors)	= 37

Pulses Research Scheme

Junior Research Officer	= 1
Agricultural Demonstrators (II grade)	= 2
L.D. Typist	= 1
Peon	= 1
Watchman (last grade)	= 1

Meteorology Section

Agricultural Demonstrator (I grade)	= 1
Agricultural Demonstrator (II grade)	= 1

Seed Testing Scheme

Junior Research Officer	= 1
Technical Assistants	= 2
Clerk-typist	= 1
Watchman (last grade)	= 1

I.C.A.R. Schemes

All India Coordinated Rice Improvement Project:

Pathologist (Rice Specialist)	=	1
Agronomist	=	1
Breeder	=	1
Entomologist	=	1
Agricultural Demonstrators (I grade)	=	4
Jeep-cum-tractor drivers	=	2

All India Coordinated Agronomic Research Project

Officer-in-charge	=	1
Assistant Chemist	=	1
Statistical Officer	=	1
Chemical Assistant	=	1
Clerk-typist (L.D.)	=	1
Laboratory Attender	=	1

BUDGET 1975-76

Plan Schemes:

	<u>Allotment</u> (RSs)
Research on Rice	7,19,200
All India Co.ord.Rice Imp.Project	1,63,500
All India Co.ord.Agra.Res.Project	66,000

Non-plan schemes

Composit Farm	2,18,400
Seed Development Scheme	31,200
Meteorology scheme	12,000
Research on Pulses	31,800

Total 12,42,100
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