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CSR SUB-CENTRE (CENTRAL ZONE-KERALA)

Annual Report 2000-'01

CSR Sub-Centre, Vadakkenchery
Palakkad dist, Kerala
Pin - 678 683

**KERALA AGRICULTURAL UNIVERSITY, THRISSUR
&
PROJECT DIRECTORATE OF CROPPING SYSTEMS RESEARCH
MODIPURAM, MEERUT, UP-250 110**



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KERALA AGRICULTURAL UNIVERSITY, THRISSUR

CSR Sub-Centre, Vadakkenchery
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Pin - 678 683
Date: 08-08-01

Annual Report 2000-01

<i>Projects</i>	<i>Sponsors</i>
1. Cropping Systems Research Projects for Participatory Technology Development	PDCSR (ICAR), Meerut
2. Front Line Demonstrations on Oilseeds	PDCSR (ICAR), Meerut
3. Rice Research in Eastern Palakkad	KAU Plan Scheme
4. CREMNET Project	IRRI, Philippines

Prepared by:

1. Dr.I.Johnkutty, Associate Professor (Agron) & Head
2. Dr.K.P.Prasanna, Associate Professor (Hort)

Experiment management

1. Sri.K.V. Natarajan, Farm Supervisor
2. Sri. K.Mohammed Ali, Farm Supervisor
3. Sri.K.Vijayanarayanan, Farm Supervisor
4. Sri.S.Sukumaran Nair, Farm Supervisor
5. Sri.N.R.Rajan, Sel.Gr.Farm Assistant
6. Sri.P.P.Philip, Sr.Gr.Farm Assistant

Mobility support

Sri.C.Balakrishnan, Driver

Desk assistance

1. Ms.P.A.Mumtaz, Sr.Gr. Typist
2. Sri.T.E.Abdul Muthaleef, Class IV

Field support

1. Sri.M.R.Suseel Kumar
2. Sri.G.Sreejith
3. Ms.K.Sreeja
4. Ms. Devu

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INTRODUCTION

The CSR Sub-Centre (earlier known as ECF Unit) is the field testing unit of the Cropping Systems Research Project Network, financed by the ICAR and the KAU; and co-ordinated by the Project Directorate of Cropping Systems Research Project at Modipuram, Meerut, UP. The ECF Unit started in 1971 had functioned in various districts with 3 year duration in the State. The period of operation was fixed as five years from 1988, and area of operation as agro-ecological zone. During 1988-93, it covered the Central Zone with Head Quarters at Mannuthy, during 1993-98 in the Problem zone with Head Quarters at Kayamkulam and at present in the Central zone with HQ at Vadakumchery, Alathur since August 1999.

Mandate

The main mandate of the Unit is to conduct on-farm research under the actual farming situations on location specific problems by researcher-extension workers-farmers participatory research. The area of operation of the Unit is now the Central Zone. The main goal is to evaluate and refine/develop client oriented need based technologies under different bio-physical and socio-economic conditions existing on-farms, and transfer the fully baked technologies for large scale adoption.

Staff position 2000-01 (01.04.2000 to 31.03.2001)

No.	Name and Designation	No. of posts sanctioned	In position	Vacant
A.	Scientific staff			
1.	Dr. I. Johnkutty Associate Professor (Agron) and Head	1	1	Nil
2.	Dr. K.P. Prasanna Associate Professor (Hort)	1	1	Nil
B.	Technical staff (Field Assistants)	6	6	Nil
1	Sri. K.V. Natarajan Farm Supervisor (24.05.2000 to 31.03.2001)			
2	Sri. K. Mohammed Ali Farm Supervisor (Full period)			
3	Sri. S. Sukumaran Nair Farm Supervisor (03.06.2000 to 31.03.2001)			
4	Sri. K. Vijayanarayanan Farm Supervisor (Full period)			
5	Sri. N. R. Rajan Farm Assistant (Sel. Grade) (17.05.2000 to 31.03.2001)			
6	Sri. P.P. Philip Farm Assistant (25.05.2000 to 31.03.2001)			
7	Sri. P. V. Reghunath Farm Supervisor (1.4.2000 to 17.5.2000)			
8	Sri. V.J. Rajmohan Farm Assistant (01.04.2000 to 04.05.2000)			
9	Sri. Girjavallabhan Farm Assistant (01.04.2000 to 04.05.2000)			
10	Sri. D. Prasannakumar Farm Assistant (01.04.2000 to 04.05.2000)			
C	Supporting Staff			
1	Smt. P.A. Mumtaz Typist	1	1	Nil
2	Sri. C. Balakrishnan Driver	1	1	Nil
3	Sri. T.E. Abdul Muthaleef Class IV	1	1	Nil

Financial Utilization 2000-01 (Rs. 1 Lakhs)

I. AICRP on cropping pattern (318-31-6639)

Sl. No.	Item	Allocation (Lakh Rs.)	Utilization (Lakh Rs.)	Per cent Utilization
(i)	Pay and allowances	11.38000	20.49728	188.2
(ii)	Travelling allowances	0.30000	00.29089	96.96
(iii)	Contingencies	0.87500	00.99249	118.43
	Total	12.55500	21.78066	173.48

II. F.L.D. on Oil Seeds (318.31.7721)

Sl. No.	Item	Allocation (Lakh Rs.)	Utilization (Lakh Rs)	Percent Utilization
(i)	Contingencies	0.25000	00.24372	97.49
(ii)	POL and TA	0.05000	0.07496	149.92
(iii)	Field days	0.15000	0.15178	
(iv)	Print/publ. Etc.	0.05000	0.03276	101.19
	Total	0.50000	0.50322	108.64

Research Projects – 2000-01

A. CSR Programme

Sl. No	Title	Block	Cropping system	Seasons	No. of replications
1.	Response of rice to N, P and K	Muvattupuzha	Rice-rice-fallow	Kharif Rabi	4 3 (1 failed)
2.	Response of rice to N, P and K	Koovappady	Rice-rice-rice	Kharif Rabi Summer	4 4 4
3	Response of rice to N, P and K	Wadakkanchery	Rice-rice-sesame	Kharif Rabi Summer	4 4 -
4	Response of rice to N, P and K	Puzhakkal	Water fallow-Rice fallow	Rabi	4
5	Response of rice to N, P and K	Kozhalmannam	Rice-rice fallow	Kharif Rabi Summer	3 (1 failed) 4
6	Response of rice to N, P and K	Kollengode	Rice-rice fallow	Kharif (failed) Rabi	3

2. Agronomic management trial

Sl. No.	Block	Cropping system	Season	Replications
1	Muvattupuzha	Rice-rice-fallow	Kharif Rabi Summer	4 3 (1 failed)
2	Koovappady	Rice-rice-rice	Kharif Rabi Summer	4 4
3	Wadakkanchery	Rice-rice-sesame	Kharif Rabi Summer	3 (1 failed) 4
4	Puzhakkal	Water fallow-rice-fallow	Kharif Rabi Summer	4
5	Kozhalmannam	Rice-rice-fallow	Karif Rabi Summer	Failed 4
6	Kollengode	Rice-rice-fallow	Kharif Rabi Summer	Failed 3 (1 failed)

3. Intensification of cropping system

Sl. No.	Title	Block	Season	No. of replications
(i)	Identification of remunerative tropical vegetables for fringe cropping in paddy field bunds	Wadakkanchery	Kharif	3
		Alathur	Kharif	3
		Kollengode	Kharif	3
(ii)	Identification of suitable vegetable varieties for rabi rice fallows	Puzhakkal	Rabi	3
		Alathur	Rabi	4
(iii)	Identification of suitable vegetable combinations for rabi rice fallows	Puzhakkal	Rabi	4
(iv)	Utilization of summer rice fallows	Wadakkanchery	Summer	3
		Puzhakkal	Summer	3
v	Identification of suitable vegetable varieties for summer rice fallows	Kavassery	Summer	5

Scientific Workshops/Seminars/Summer Institutes

I. Workshops/Seminars attended by scientists

Sl. No.	Name of Scientist	Seminar/Symposium/ Workshop/Summer institute to which deputed	Institute, period of deputation, name and duration of the course etc.
1	Dr. I. Johnkutty and K.P. Prasanna	Zonal Research Extension Workshop	RARS, Pattambi on 6 th June, 2000
2	Dr. I. Johnkutty Associate Professor and Head	Attended the workshop on Globalisation of agriculture, R & D in India	At KAU Headquarters, Vellanikkara from 17 th to 18 th October 2000.
3	-do-	Attended the XXIV Annual Workshop of AICRP on Cropping Systems	At Mahatma Phule Krishi Vidyapeeth, Rahuri from 2 nd to 4 th November 2000
4	-do-	Training programme on "Presentation skills"	At TNAU, Coimbatore from 11 th to 15 th December 2000.
5	Dr. K.P. Prasanna Associate Professor (Hort)	Attended short course on "Advances in Integrated watershed Management Technology in Farming System Perspective"	Central Research Institute for Dry land Agriculture, Hyderabad from 1 st to 10 th August 2000

II. Farmers contact Programmes

Dr. I. Johnkutty, Associate Professor and Head

1. Conducted class to farmers on “Integrated nutrient management for rice” on 14.7.2000 in the Agricultural Seminar held at KMS, Auditorium, Kuzhalmannam.
2. Conducted class on ‘Rice cultivation’ to farmers at Akamala, Wadakkanchery on 29-7-2000.
3. Conducted a class for farmers on different aspects of rice cultivation during farmers day celebrations of Krishibhavan, Kuthanoor on 17-8-2000.
4. Participated in Kissan mela 2000 at RARS, Pattambi from 18th to 19th September 2000.
5. Conducted classes on “Rice cultivation and organic farming” to farmers at RATTC, Malampuzha on 22-11-2000.
6. Took class on rice production technologies to farmers at Palakkad on 24-1-2001 organised by Nel Krishi Vikasana Agency.
7. Took Class on rice production technologies to farmers at Vadakkanchery.
8. Conducted class to farmers at Kizhakkanchery Panchayath on rice cultivation on 23-04-2001.

Dr. K.P. Prasanna, Associate Professor (Hort)

1. Participated in the ‘Farmers scientist interaction’ session agroclimatic zone basis held at RARS, Pattambi on 12-7-2000.
2. Conducted classes to farmers on “Integrated nutrient management for vegetables” on 14-7-2000 in the agricultural seminar held at KMS, Auditorium, Kuzhalmannam.
3. Participated and took classes in the agricultural seminar held at Akamala, Wadakkanchery on 29-7-2000.
4. Conducted classes on “Organic farming in vegetables and vermiculture” to farmers at RATTC, Malampuzha on 21-11-2000.

III. Field days/training programmes conducted

Topic	Location	Date	No. of extension officers and farmers attended
Rice and oil seeds	Kollengode	05-10-2000	77
Rice and oil seeds	Puzhakkal	22-12-2000	86
Rice and oil seeds	Koovappady	05-01-2001	75
Rice and oil seeds	Wadakkanchery	06-01-2001	84
Rice and oil seeds	Nemmara	14-02-2001	65
Rice and oil seeds	Kollengode	20-03-2001	81
Farm mechanization	TNAU, Coimbatore	14-03-2001	11

IV. List of Publications

A. Scientific

1. Johnkutty, I., Gracy M., Thiyagarajan, T.M. and Balasubramanian, V. 2000. Use of leaf colour chart for estimation of crop nitrogen status in rice and deciding in season N side dressing. Progress Report for 1998 and 1999. IRRI-CREMNET, International Rice Research Institute, Laguna, Philippines, pp. 73-75.
2. Johnkutty, I., Gracy, M., Thiyagarajan, T.M. and Balasubramanian, V. 2000. The effect of controlled release urea (CRU) and SPAD-based N application on production efficiency of rice in acid soils of Kerala Progress Report for 1998 and 1999 IRRI-CREMENT, International Rice Research Institute, Laguna, Philippines, pp.100.
3. Johnkutty, I., Gracy M., Thiyagarajan, T.M. and Balasubramanian, V. 2000. Use of chlorophyll meter and leaf colour chart technique for in-situ nitrogen diagnosis and management in rice. Proceedings of National Symposium on Agronomy. Challenges and Strategies for the New Millennium, held at Gujarat Agricultural University, Junagadh, Gujarat, November, 15-18, 2000, p, 31.

4. Johnkutty, I., Kandasamy, O.S. and Palaniappan, SP. 1999. Time course of leaf N concentration in rice under different N application strategies and development of simulation models. *J. Trop. Agric* 37 (1 &2): 40-45.
5. Johnkutty, I., Kandasamy, O.S and Palaniappan, SP. 2000. Natural and predicted time course behaviour of ammonium-N release in lowland rice soils under different green manures and N timings. *J. Trop. Agric.* 38 (1&2): 46-50.
6. Johnkutty, I., Gracy, M., Thiyagarajan, T.B. and Balasubramanian, V. 2000. Relationship among leaf nitrogen content, SPAD and LCC Values in rice. *J Trop. Agric.* 38 (1&2): 97-99.
7. Anju, M.V., Indira, V. and Prasanna, K. P. 1999. Quality evaluation of winged bean seeds of selected genotypes. *J. Trop. Agric.* 37 (1&2): 68-69.

B. Reports

1. Johnkutty, I. and Prasanna, K.P. 2000. Resource characterization, cropping systems, constraints and options in the Central zone, Kerala.
2. Johnkutty, I. And Prasanna, K.P. 2000. Low cost production technologies for small and marginal farmers of Kerala.

C. Popular articles

1. Johnkutty, I. and Prasanna, K.P. 2000. Nel Krishi Vikasanathinu Chila Nirdesangal. Kerala Karshakan, July 2000.
2. Prasanna, K.P. and Johnkutty, I. 2001. Vayal Varambukalil Pachakkarikrishi. (Fringe cropping in paddy field bunds), Kerala Karshakan, January, 2001.
3. Johnkutty, I. and Prasanna, K.P. SPAD meter and Leaf colour chart (leaflet), KAU, Mannuthy, Thrissur.
4. Johnkutty, I. and Prasanna, K.P. Use of seeder and conoweeder – Two methods to lower cost of cultivation in paddy production. (Leaflet) KAU, Mannuthy, Thrissur.

D. News Bulletin

On-Farm paddy research a big success. The Hindu, March, 23, 2001.

V. Important Visitors

Sl. No.	Name	Organizational affiliation	Date	Purpose of visit
1	Dr. K. V. Peter	Director of Research Kerala Agricultural University	22-08-2000	Visiting CSR projects in farmers field
2	Dr. Varadarajan Nair	Assoc. Director of Research, KAU	05-10-2000	Participating in field day at Polpully
3	Dr. P. V. Balachandran	Associate Director of Research, RARS, Pattambi.	05-10-2000	Visiting CSR Projects and also for participating in field day at Polpully
4	Dr. S. Leenakumari	Assoc. Prof. RARS Pattambi	05-10-2000	-do-
5	Dr. K. V. Peter	Director of Research Kerala Agricultural University	17-03-2001	Visited office and had discussion on the projects

VI. Other works

Dr. K.P. Prasanna, Associate Professor (Hort) attended as member in the Evaluation Committee for Karshakaudyan, award by Govt. of Kerala on 20-23/2/2001.

Abstract of expenditure (2000-01) at CSR Sub-Centre, Vadakkanchery

Head of A/c	Pay & Allowances	TA	Contingencies	Total
1. AICRP Cropping Pattern (318-31-6639)	20,49,728	29,089	99,249	21,78,066
2. FLD Oil Seeds (318-31-7721)	--	2,870	47,452	50,322
3. IRRI-Cremnet (318-31-8005)	--	4,030	55,160	59,190
4. Paddy Unit (318-31-2238)	--	7,189	2,33,175	2,40,364
Total	20,49,728	43,178	4,35,036	25,27,942

Response of rice to the nutrients N, P and K in farmers field in the central Zone of Kerala - Kharif 2000.

Objective: To find out the response of N, P and K on farmers fields under different agro-ecological situations.

Treatments

1. Control
2. Recommended N for the component crops in the crop sequence
3. Recommended N and P
4. Recommended N and K
5. Recommended N, P and K
6. 125 per cent of recommended NPK (optional)

Protocol fixed

Number	Treatment
1.	No N
2.	N 90 kg ha ⁻¹
3.	NP 90-45 kg ha ⁻¹
4.	NK 90-45 kg ha ⁻¹
5.	NPK 90-45-45 kg ha ⁻¹
6.	NPK 113-45-56 kg ha ⁻¹

N and K applied in four equal splits at planting, tillering, panicle initiations at heading, P applied full at planting.

Source of nutrients

Nitrogen was applied as urea, P as Rajphos and K as MOP. The management practices were as per Package of Practices Recommendations of KAU.

Yield and response of rice to N, P and K in the Central Zone, Kerala

District and zone-wise

The average data at zone level show that the average response of N, P and K are almost equal during kharif and rabi seasons. The response to N was 9.48 and 10.44 kg grain per kg N in kharif and rabi respectively. The response to P was 12.84 and 12.02 kg grain per kg P and that for K was 13.60 and 12.68 kg grain per kg K during kharif and rabi seasons respectively. Among the locations Rayamangalam had rice-rice-rice sequence while at all other locations rice-rice-fallow sequence was followed.

District-wise average revealed that any definite trend of difference between seasons could not be confirmed. At Palakkad the response to NPK was higher during rabi season whereas in Thrissur district reverse was the trend. In Ernakulam district between kharif and rabi there was not much difference, but during summer it was comparatively poor.

Among the three districts Thrissur ranked first in response to NPK during both kharif and rabi seasons. The response was lowest in Ernakulam district and was invariably lower in all the seasons.

Between locations Wadakkanchery recorded the highest response during kharif and it was lowest in Rayamangalam. During rabi Polppully ranked first and Mulavoor the last.

In general the results revealed that the yield as well as the response of individual nutrients was better at the recommended level of N90 P45 K45.

Grain yield at varying levels of N, P and K in the Central zone, Kerala

Treatments	Yield (kg ha ⁻¹)										
	Palakkad district			Thrissur district			Rayamangalam			Mulavoor	
	Kuzhalmannam		Polppully	Wadakkenchery		Adat	Kharif	Rabi	Summer	Kharif	Rabi
	Kharif	Rabi	Rabi	Kharif	Rabi	Rabi					
T1 N0 P0 K0	4200	3808	4416	3470	2175	3778	3181	2197	2585	2131	1603
T2 N90 P0 K0	4615	4896	5500	3990	2663	4515	3348	2780	2885	2300	1800
T3 N90 P45 K0	4892	4638	5417	4020	2625	4813	3475	2945	2970	2475	1758
T4 N90 P0 K45	4219	5000	5917	5230	3250	4719	3575	2980	3070	2488	2147
T5 N90 P45 K45	4725	4977	6583	5500	3431	5665	3544	2739	3050	2638	2153
T6 N113 P45 K56	4984	4371	6417	5630	3525	5408	3488	2901	2940	2681	2150
CD (0.05)	618	577	801	1030	157	820	382	374	219	189	241

Average response of N, P and K in the central zone, Kerala.

District	Kharif			Rabi			Summer		
	N	P	K	N	P	K	N	P	K
I. Palakkad									
a. Kuzhalmannam	6.53	11.14	3.59	6.18	0.77	0.26			
b. Polppully				19.71	23.66	25.06			
Average	6.53	11.14	3.59	12.95	12.22	12.66			
II. Thrissur									
a. Wadakkanchery	18.14	21.93	32.40	11.44	13.11	18.57			
b. Adat				14.14	22.7	18.53			
Average	18.14	21.93	32.40	12.79	17.91	18.55			
III. Ernakulam									
a. Rayamangalam	2.83	3.76	3.01	6.45	5.86	4.67	3.39	3.94	2.40
b. Mulavoor	4.69	7.16	6.63	4.70	6.00	9.00			
Average	3.76	5.46	4.82	5.58	5.93	6.84			
Zone average	9.48	12.84	13.6	10.44	12.02	12.68	3.39	3.94	2.40

Average soil test data – Kharif – 2000 (Panchayat)

No.	Block	Panchayat	pH	TSS EC (mmohs/cm)	Organic carbon (%)	P (kg ha ⁻¹)	K (kg ha ⁻¹)
1	Wadakkancherry	Wadakkanchery	5.04	0.13	0.266	9.048	155
2	Moovattupuzha	Paipra	5.175	0.058	0.51	9.128	97.5
3	Perumbavoor	Rayamangalam	5.52	0.168	0.506	21.324	164
4	Kollengod	Polpully	5.95	0.29	0.32	12.095	155
5	Alathur	Vadakkenchery	6.04	0.188	0.22	33.6	76

Average soil test data – (panchayat-wise) Rabi – 2000

No.	Block	Panchayat	pH	TSS EC (mmohs/cm)	Organic carbon (%)	P (kg ha ⁻¹)	K (kg ha ⁻¹)
1	Moovattupuzha	Paipra	5.8	0.1	0.522	8.417	136.67
2	Alathur	Puthukkode	5.87	0.1	0.371	11	176.78
3	Alathur	Kavassery	5.4	0.1	0.215	5.05	150
4	Puzhakkal	Adat	5.25	0.15	0.993	9.367	166.25
5	Kuzhalmannam	Kannadi	6.217	0.3	0.26	17.383	191.67
6	Chittoor	Polpully	5.96	0.1	0.212	10.96	124
7	Perumbavoor	Rayamangalam	5.4	0.1	0.616	11.26	181
8	Wadakkanchery	Wadakkanchery	5.762	0.1	0.272	5.367	183.58

Response of rice to the nutrients N, P and K in farmers field

District	-	Palakkad
Block	-	Kuzhalmannam
Panchayat	-	Kannadi
Cropping system in the area	-	Rice-rice-fallow
1. Name of farmer	-	Sri. Gokuldas Kollengottu Parambu House Kadapurissi Kannadi
Season	-	Kharif, 2000
Variety	-	Jyothy
Spacing	-	15 x 10 cm
Plot size	-	40 m ²
Method of crop establishment-		Transplanting
Date of sowing	-	15.05.2000
Date of planting	-	14.06.2000
Date of harvesting	-	17.09.2000
Duration	-	125 days
Plant protection	-	Nil

Soil analysis

Parameters	Values	Rating	Class
pH	6.4	Acidic	5
TSS	0.1	Normal	0
OC (%)	0.18	Low	1
P (kg ha ⁻¹)	26.9	High	7
K (kg ha ⁻¹)	175	Medium	4

Yield and yield characters

Treatments	Total tillers/ sq. m.	No. of panicles/ Sq. m.	Grain yield (kg ha ⁻¹)	Straw yield (kg ha ⁻¹)
T1	265	250	4050	4250
T2	480	460	4613	4000
T3	550	505	4950	3750
T4	780	575	4388	3500
T5	1225	880	5400	3750
T6	1005	875	5805	4125

2. Name of farmer	-	Sri. Ramachandran Kollengottu Parambu House Kadukurissi Kannadi
Season	-	Kharif, 2000
Variety	-	Jyothy
Spacing	-	15 x 10 cm
Plot size	-	40 m ²
Method of crop establishment-		Transplanting
Date of sowing	-	13.05.2000
Date of planting	-	12.06.2000
Date of harvesting	-	15.09.2000
Duration	-	125 days
Plant protection	-	Nil

Soil analysis

Parameters	Values	Rating	Class
pH	6.3	Acidic	5
TSS	0.11	Normal	0
OC (%)	0.17	Low	1
P (kg ha ⁻¹)	25.8	High	7
K (kg ha ⁻¹)	172	Medium	4

Yield and yield contributing characters

Treatments	Total tillers/ sq. m.	No. of panicles/ Sq. m.	Grain yield (kg ha ⁻¹)	Straw yield (kg ha ⁻¹)
T1	420	400	4050	3375
T2	645	600	4613	3750
T3	630	565	4838	3875
T4	930	695	4050	3125
T5	665	580	4050	3250
T6	490	450	4163	2875

3. Name of farmer	-	Sri. Sivadas Kollengottu Parambu House Kadukurissi Kannadi
Season	-	Kharif, 2000
Variety	-	Jyothy
Spacing	-	15 x 10 cm
Plot size	-	40 m ²
Method of crop establishment-		Transplanting
Date of sowing	-	16.05.2000
Date of planting	-	15.06.2000
Date of harvesting	-	15.09.2000
Duration	-	122 days
Plant protection	-	Nil

Soil analysis

Parameters	Values	Rating	Class
pH	6.4	Acidic	5
TSS	0.1	Normal	0
OC (%)	0.19	Low	1
P (kg ha ⁻¹)	26.1	High	7
K (kg ha ⁻¹)	178	Medium	4

Yield and yield characters

Treatments	Total tillers/ sq. m.	No. of panicles/ Sq. m.	Grain yield (kg ha ⁻¹)	Straw yield (kg ha ⁻¹)
T1	343	333	4500	3813
T2	563	530	4600	3875
T3	590	535	4894	3813
T4	855	635	4219	3310
T5	905	730	4725	3500
T6	748	675	4984	3500

Yield and nutrient response of rice to N, P and K
 Location - Kannadi, Kuzhalmannam block, Palakkad district
 Season - Kharif, 2000

Tr. Notn.	Treatments	Yield (kg ha ⁻¹)	N over						P over						K over					
			T1	T2	T3	T4	T5	Av.	T1	T2	T3	T4	T5	Av.	T1	T2	T3	T4	T5	Av.
T1	N0 P0 K0	4200																		
T2	N90 P0 K0	4615	4.61					4.61												
T3	N90 P45 K0	4892	7.69					7.69	15.38	6.16				10.77						
T4	N90 P0 K45	4219	0.21					0.21							0.42	-8.8	-14.96			-7.78
T5	N90 P45 K45	4725	5.83					5.83	11.67	2.44		11.24		8.45	11.67	2.44	-3.71			3.47
T6	N113 P45 K56	4984	6.94	16.04	4.0	33.26	11.26	14.29	17.42	8.2		17.0		14.21	14.0	6.59	1.64	29.55	23.55	15.07
	CD (0.05)	618																		
	Average							6.53						11.14						3.59

Block	-	Alathur
Panchayat	-	Kannadi
1. Name of farmer	-	Sri. Komunny Kannathkadu House Kannadi Kozhalmannam
Season	-	Rabi, 2000
Variety	-	Aiswarya
Spacing	-	15 x 10 cm
Plot size	-	40 m ²
Date of sowing	-	18.09.2000
Date of planting	-	15.10.2000
Date of harvesting	-	16.01.2001
Duration	-	120 days

Plant protection

Pest/disease	Control measures	Date of control
Case worm	Dimecron	25.10.2000
Leaf roller	Ekalux	20.11.2000
Rice bug	Malathion	26.12.2000

Soil analysis

Parameters	Values	Rating	Class
pH	5.2	Acidic	3
TSS	0.1	Normal	0
OC (%)	0.18	Low	1
P (kg ha ⁻¹)	2.2	Low	0
K (kg ha ⁻¹)	275	Medium	6

Yield and yield characters

Treat-ments	Total tillers/ sq. m.	No. of panicles/ sq. m.	Panicle length (cm)	Panicle weight (g)	No. of grains/pa nicle	Grain yield (kg ha ⁻¹)	Straw yield (kg ha ⁻¹)
T1	422	343	18.9	2.0	69	3869	3096
T2	594	548	18.0	2.1	92	5063	4491
T3	548	436	19.0	2.3	94	5233	4098
T4	706	614	19.3	2.1	90	4556	4360
T5	528	456	19.8	2.0	97	5456	4229
T6	594	337	19.5	2.0	97	5063	4316

2. Name of farmer	-	Smt. Rajalakshmi Kannathukadu House Kannadi Kozhalmannam
Season	-	Rabi, 2000
Variety	-	Aiswarya
Spacing	-	15 x 10 cm
Plot size	-	40 m ²
Date of sowing	-	16.09.2000
Date of planting	-	13.10.2000
Date of harvesting	-	14.01.2001
Duration	-	120 days

Plant protection

Pest/disease	Control measures	Date of control
Case worm	Dimecron	25.10.2000
Leaf roller	Ekalux	20.11.2000
Rice bug	Malathion	26.12.2000

Soil analysis

Parameters	Values	Rating	Class
PH	5.3	Acidic	3
TSS	0.11	Normal	0
OC (%)	0.18	Low	1
P (kg ha ⁻¹)	3.1	Low	0
K (kg ha ⁻¹)	280	Medium	6

Yield and yield characters

Treat-ments	Total tillers/ sq. m.	No. of panicles/ sq. m.	Panicle length (cm)	Panicle weight (g)	No. of grains/panicle	Grain yield (kg ha ⁻¹)	Straw yield (kg ha ⁻¹)
T1	416	323	18.8	2.1	79	4163	4316
T2	601	535	20.0	2.3	87	5569	5799
T3	548	548	19.7	2.3	92	5569	4600
T4	528	389	19.6	2.0	92	5569	5319
T5	502	422	19.1	2.2	93	5400	4840
T6	488	376	19.7	2.0	93	5344	5101

3. Name of farmer	-	Sri. Rajasekharan Amoor Padam Kannadi
Season	-	Rabi, 2000
Variety	-	Aiswarya
Spacing	-	15 x 10 cm
Plot size	-	40 m ²
Date of sowing	-	08.10.2000
Date of planting	-	02.11.2000
Date of harvesting	-	06.02.2001
Duration	-	121 days

Plant protection

Pest/disease	Control measures	Date of control
Rice bug	Rogor	10.01.2001
Rice bug	Metacid	20.01.2001

Soil analysis

Parameters	Values	Rating	Class
pH	5.4	Acidic	3
TSS	0.1	Normal	0
OC (%)	0.17	Low	1
P (kg ha ⁻¹)	3.0	Low	0
K (kg ha ⁻¹)	95	Low	1

Yield and yield characters

Treat-ments	Total tillers/ sq. m.	No. of panicles/ sq. m.	Panicle length (cm)	Panicle weight (g)	No. of grains/pa nicle	Grain yield (kg ha ⁻¹)	Straw yield (kg ha ⁻¹)
T1	436	423	18.0	2.1	68	3600	3675
T2	518	485	18.0	2.1	74	4450	4463
T3	459	433	15.9	1.7	69	4000	4025
T4	759	706	17.6	1.8	64	4900	4025
T5	442	409	16.6	1.9	63	4625	4375
T6	423	363	17.6	2.3	67	3700	4900

4. Name of farmer	-	Sri. Chenthamarakshan Amoor Padam Kannadi
Season	-	Rabi, 2000
Variety	-	Aiswarya
Spacing	-	15 x 10 cm
Plot size	-	40 m ²
Date of sowing	-	08.10.2000
Date of planting	-	02.11.2000
Date of harvesting	-	06.02.2001
Duration	-	121 days

Plant protection

Pest/disease	Control measures	Date of control
Rice bug	Rogor	10.01.2001
Rice bug	Metacid	20.01.2001

Soil analysis

Parameters	Values	Rating	Class
pH	5.3	Acidic	3
TSS	0.1	Normal	0
OC (%)	0.14	Low	0
P (kg ha ⁻¹)	5.6	Medium	3
K (kg ha ⁻¹)	75	Low	1

Yield and yield characters

Treat-ments	Total tillers/ sq. m.	No. of panicles/ sq. m.	Panicle length (cm)	Panicle weight (g)	No. of grains/ panicle	Grain yield (kg ha ⁻¹)	Straw yield (kg ha ⁻¹)
T1	436	396	17.0	2.3	68	3600	3675
T2	525	475	17.5	1.9	66	4500	4550
T3	588	538	18.2	2.6	90	3750	4025
T4	456	439	18.7	2.4	81	4975	4113
T5	472	472	17.9	2.1	72	4425	4638
T6	512	478	17.5	2.0	64	3375	4200

Yield and nutrient response of rice to N, P and K
 Location - Kannadi, Kuzhalmannam block, Palakkad district
 Season - Rabi, 2000-01

Tr. Notn.	Treatments	Yield (kg ha ⁻¹)	N over						P over						K over					
			T1	T2	T3	T4	T5	Av.	T1	T2	T3	T4	T5	Av.	T1	T2	T3	T4	T5	Av.
T1	N0 P0 K0	3808																		
T2	N90 P0 K0	4896	12.09					12.09												
T3	N90 P45 K0	4638	9.22					9.22	18.44	-5.73				6.36						
T4	N90 P0 K45	5000	13.24					13.24						26.49	2.31	8.04				12.28
T5	N90 P45 K45	4977	12.99					12.99	25.98	1.8		-0.51		9.09	25.98	1.8	7.53			11.77
T6	N113 P45 K56	4371	4.98	-22.82	-11.61	-27.35	-26.35	-16.63	12.51	-11.67		-13.98		13.14	10.05	-9.38	-4.77	-57.18	-55.09	-23.27
	CD (0.05)	577																		
	Average							6.18						0.77						0.26

Soil analysis data – Kannadi (Kharif, 2000) (Average)

Parameters	Values	Class	Rating
pH	6.37	5	Neutral
TSS	0.1	0	Normal
OC (%)	0.18	0	Low
P (kg ha ⁻¹)	26.3	7	High
K (kg ha ⁻¹)	175	4	Medium

Soil Analysis data – Kannadi, Rabi 2000-01 (Average)

Parameters	Values	Class	Rating
pH	5.3	3	Acidic
TSS	0.1	0	Normal
OC (%)	0.17	0	Low
P (kg ha ⁻¹)	3.48	0	Low
K (kg ha ⁻¹)	181.3	4	Medium

Response of rice to the nutrients N, P & K in farmers field in Central Zone of Kerala

District	-	Palakkad
Block	-	Kollengode
Panchayat	-	Polppully
Cropping system	-	Rice-rice-fallow
Kharif experiments failed due to drought		
Season	-	Rabi, 2000
Variety	-	Pranava
Name of farmer	-	Shri. Jayadevan Chozhan House Polppully
Spacing	-	20 x 10 cm
Plot size	-	40 m ²
Method of crop establishment	-	Transplanting
Date of sowing	-	14.10.2000
Date of planting	-	16.11.2000
Date of harvest	-	05.03.2001
Duration	-	141 days

Plant protection

Pest/disease	Control measures	Date of application
Stem borer	Ekalux	06-12-2000
Rice bug	Metacid	12-02-2001

Soil analysis

Parameters	Values	Rating	Class
pH	5.9	Acidic	4
TSS	0.1	Normal	0
OC (%)	0.14	Low	0
P (kg ha ⁻¹)	17.9	Medium	5
K (kg ha ⁻¹)	125	Medium	3

Yield and contributing characters

Treatments	Total tillers/ sq.m	No. panicles/ sq.m.	Panicle length (cm)	No. grains Panicle	Panicle wt. (g)	Grain (kg ha ⁻¹)	Straw yield (kg ha)
T1	605	590	17.9	105		4000	7200
T2	640	625	19.0	106		5500	7470
T3	585	520	20.9	118		5500	7830
T4	680	655	21.8	120		6000	8100
T5	680	655	21.5	128		6000	7290
T6	650	625	22.2	125		6750	8280

2. Name of farmer - Shri. Gopalan
Raj Nivas
Polppully

Spacing - 20 x 10 cm

Plot size - 40 m²

Method of crop establishment -

Date of sowing - 15.10.2000

Date of planting - 15.11.2001

Date of harvest - 06.03.2001

Duration - 141 days

Plant protection

Pest/disease	Control measures	Date of application
Stem borer	Ekalux	06-12-2000
Rice bug	Metacid	12-02-2001

Soil analysis

Parameters	Values	Rating	Class
pH	6.0	Acidic	4
TSS	0.13	Normal	0
OC (%)	0.15	Low	0
P (kg ha ⁻¹)	17.3	Medium	5
K (kg ha ⁻¹)	120	Medium	3

Yield and contributing characters

Treat-ments	Total tillers/ sq.m	No. of panicles/ sq.m.	Panicle length (cm)	No. of grains/ panicle	Panicle weight (g)	Grain (kg ha ⁻¹)	Straw yield (kg ha ⁻¹)
T1	630	550	19.6	93		4500	6930
T2	650	630	21.3	109		5000	7200
T3	635	610	21.3	110		5750	7380
T4	645	625	22.1	131		5750	7200
T5	645	615	22.3	128		6500	8280
T6	696	660	22.1	124		6000	8100

3. Name of farmer - Shri. Chandran
Jyothis
Polppully

Spacing - 20 x 10 cm

Plot size - 40 m²

Date of sowing - 14.10.2000

Date of planting - 15.11.2001

Date of harvest - 06.03.2001

.Duration - 141 days

Plant protection

Pest/disease	Control measures	Date of application
Stem borer	Ekalux	06-12-2000
Rice bug	Metacid	12-02-2001

Soil analysis

Parameters	Values	Rating	Class
PH	5.9	Acidic	4
TSS	0.14	Normal	0
OC (%)	0.18	Low	0
P (kg ha ⁻¹)	16.9	Medium	5
K (kg ha ⁻¹)	122	Medium	3

Yield and yield attributes

Treatments	Total tillers/sq.m	No. of panicles /sq.m	Panicle length (cm)	No. of grains/panicle	Grain yield (kg ha ⁻¹)	Straw yield (kg ha ⁻¹)
T1	625	605	19.9	94	4000	6660
T2	725	695	21.3	109	6000	7290
T3	710	625	21.0	112	5000	7110
T4	610	580	22.0	126	6000	7920
T5	665	585	21.9	126	7250	7560
T6	660	580	22.4	116	6500	8718
CD (0.05)					801	

Soil analysis data- Polpully, Rabi 2000-01 (Average)

Parameters	Values	Class	Rating
pH	5.93	4	Acidic
TSS	0.12	0	Normal
OC(%)	0.16	0	Low
P(kg ha ⁻¹)	17.4	4	Medium
K(kg ha ⁻¹)	122.3	2	Low

Yield and nutrient response of rice to N, P and K
 Location - Polppully, Kollengode block, Palakkad district
 Season - Rabi, 2000-01

Tr. Notn.	Treatments	Yield (kg ha ⁻¹)	N over						P over						K over						
			T1	T2	T3	T4	T5	Av.	T1	T2	T3	T4	T5	Av.	T1	T2	T3	T4	T5	Av.	
T1	N0 P0 K0	4167																			
T2	N90 P0 K0	5500	14.81					14.81													
T3	N90 P45 K0	5417	13.89					13.89	27.78	-1.84				12.97							
T4	N90 P0 K45	5917	19.44					19.44													
T5	N90 P45 K45	6583	26.84					26.84	53.69	24.07		14.8		30.85	38.89	9.27	11.11			19.76	
T6	N113 P45 K56	6417	19.91	39.86	43.48	21.74	-7.22	23.55	50	20.38		11.11		27.16	53.68	24.07	25.91			34.55	
	CD (0.05)	801													40.18	16.38	17.86	45.45	-15.09	20.96	
	Average							19.71						23.66							25.09

District	-	Thrissur
(i) Block	-	Wadakkanchery
Panchayath	-	Wadakkanchery
Cropping system	-	Rice-rice-sesame
Previous crop in the experiment field-		Sesame
1. Name of farmer	-	Sasidharan Parayil House Akamala Wadakkanchery.
Season	-	Kharif, 2000
Variety	-	Jyothy
Spacing	-	15 x 10 cm
Plot size	-	40 m ²
Method of crop establishment	-	Direct dry sowing
Date of sowing	-	11-5-2000
Date of harvest	-	31-08-2000
Duration	-	112 days

Plant Protection

Pest/disease	Control measures	Date of control
Leaf roller	Ekalux	23-06-2000
Blast	Hinosan	02-07-2000

Soil analysis

Parameters	Value	Rating	Class
PH	5.1	Acidic	3
TSS	0.22	Normal	0
OC (%)	0.28	Low	1
P (kg ha ⁻¹)	12.32	Medium	3
K (kg ha ⁻¹)	250	Medium	6

Yield and Yield characters

Treatments	Total tillers at maturity/sq. m.	Panicle length (cm)	Grain yield (kg ha ⁻¹)	Straw yield (kg ha ⁻¹)
T1	264	19.0	3920	4250
T2	284	20.6	4640	5375
T3	404	22.4	4720	5250
T4	388	22.5	5920	5500
T5	416	22.6	5280	6125
T6	400	22.3	5040	6250

2. Name of farmer : Radhakrishnan
Parayil House
Akamala
Wadakkanchery.

Season - Kharif, 2000
Variety - Jyothy
Spacing - 15 x 10
Plot size - 40 m²
Method of crop establishment - Direct dry sowing
Date of sowing - 13-05-2000
Date of harvest - 01-09-2000
Duration - 112 days

Plant Protection

Pest/disease	Control measures	Date of control
Leaf roller	Ekalux	23-06-2000
Blast	Hinosan	02-07-2000

Soil analysis

Parameters	Value	Rating	Class
pH	5.1	Acidic	3
TSS	0.23	Normal	0
OC (%)	0.29	Low	1
P (kg ha ⁻¹)	12.5	Medium	3
K (kg ha ⁻¹)	248	Medium	6

Treatments	Total tillers at maturity/sq. m.	Panicle length (cm)	Grain yield (kg ha ⁻¹)	Straw yield (kg ha ⁻¹)
T1	264	19.1	3760	4000
T2	268	20.5	4320	5000
T3	412	22.7	4560	5125
T4	396	22.1	4600	5250
T5	420	22.1	4120	5875
T6	400	22.7	4880	6125

3. Name of farmer - Smt. Vijayalakshmi
Parayil House
Akamala
Wadakkanchery

Season - Kharif, 2000

Variety - Jyothy

Plot size - 40 m²

Spacing - 15 x 10 cm

Method of crop establishment - Direct dry sowing

Date of sowing - 13-05-2000

Date of harvest - 31-08-2000

Duration - 110 days

Plant Protection

Pest/disease	Control measures	Date of control
Leaf roller	Ekalux	17-06-2000
Stern borer	Dimecron	24-06-2000
Blast	Hinosan	24-06-2000

Cropping system in the area - Rice-rice-sesame

Previous crop in experiment field - Sesame

Soil analysis

Parameters	Value	Rating	Class
pH	5.4	Acidic	3
TSS	0.1	Normal	0
OC (%)	0.21	Low	1
P (kg ha ⁻¹)	5.15	Low	1
K(kg ha ⁻¹)	140	Medium	3

Yield and Yield Parameters

Treatments	Total tillers at maturity/sq. m.	Panicle length (cm)	Grain yield (kg ha ⁻¹)	Straw yield (kg ha ⁻¹)
T1	324	16.1	3000	3125
T2	344	18.9	3600	3125
T3	348	20.5	3300	2750
T4	380	22.2	4800	4250
T5	384	20.4	5700	4813
T6	356	20.8	6200	4500

4. Name of farmer - Sri. Balakrishnan
Parayil House
Akamala
Wadakkanchery.

Season - Kharif, 2000
Variety - Jyothy
Plot size - 40 m²
Spacing - 15 x 10 cm
Method of crop establishment - Direct dry sowing
Date of sowing - 15-05-2000
Date of harvest - 02-09-2000
Duration - 110 days

Plant Protection

Pest/disease	Control measures	Date of control
Leaf roller	Ekalux	17-06-2000
Stem borer	Dimecron	24-06-2000
Blast	Hinosan	24-06-2000

Cropping system in the are - Rice-rice-sesame
Previous crop in experiment field - Sesame

Soil analysis

Parameters	Value	Rating	Class
PH	5.3	Acidic	3
TSS	0.2	Normal	0
OC (%)	0.25	Low	1
P (kg ha ⁻¹)	5.25	Low	1
K(kg ha ⁻¹)	152	Medium	3

Yield and Yield attributes

Treatments	Total tillers at maturity/sq. m.	Panicle length (cm)	Grain yield (kg ha ⁻¹)	Straw yield (kg ha ⁻¹)
T1	328	17.2	3200	3250
T2	352	19.5	3400	3000
T3	348	20.9	3500	2875
T4	380	21.9	4600	4000
T5	392	20.2	5900	4938
T6	364	19.2	64.00	4757

Yield and nutrient response of rice to N, P and K
 Location - Wadakkanchery, Wadakkanchery block, Thrissur district
 Season - Kharif, 2000

Tr. Notn.	Treatments	Yield (kg ha ⁻¹)	N over						P over						K over						
			T1	T2	T3	T4	T5	Av.	T1	T2	T3	T4	T5	Av.	T1	T2	T3	T4	T5	Av.	
T1	N0 P0 K0	3470																			
T2	N90 P0 K0	3990	5.78					5.78													
T3	N90 P45 K0	4020	6.11					6.11	12.22	0.67											
T4	N90 P0 K45	5230	19.56					19.56						6.45							
T5	N90 P45 K45	5500	22.56					22.56	45.11	33.56		6.0		28.22	39.11	27.56	26.89			31.19	
T6	N113 P45 K56	5630	19.12	-11.30	70	17.39	5.65	36.69	48	36.44		8.89		31.11	45.11	33.56	32.89			37.19	
	Average							18.14						21.93	38.57	29.29	28.75	36.36	11.18	28.83	
	CD (0.05)	1030																			32.40

Response of rice to nutrients N, P and K in farmers field in the Central Zone of Kerala, Rabi, 2000

Block	-	Wadakkanchery
Panchayath	-	Wadakkanchery
1. Name of farmer	-	Sri. Krishnankutty Parayil House Akamala Wadakkanchery
Season	-	Rabi, 2000
Variety	-	Jyothy
Plot size	-	40m ²
Spacing	-	15 x 10 cm
Method of crop establishment	-	Transplanting
Date of sowing	-	29-08-2000
Date of transplanting	-	29-09-2000
Date of harvesting	-	26-12-2000
Duration	-	126 days

Plant protection

Pest/disease	Control measures	Date of application
Blast	Sprayed Hinosan	04-10-2000
Leaf roller	Sprayed Dimecron	14-10-2000
Blast	Sprayed Contaf	04-11-2000

Soil analysis

Parameters	Values	Rating	Class
pH	5.5	Acidic	3
TSS	0.10	Normal	0
OC (%)	0.14	Low	0
P (kg ha ⁻¹)	6.7	Low	2
K(kg ha ⁻¹)	125	Medium	3

Yield and yield attributes

Treatments	Total tillers at maturity/ sq. m.	No. of panicles/ Sq. m.	Panicle length (cm.)	Grain yield (kg ha ⁻¹)	Straw yield (kg ha ⁻¹)
T1	601	528	16.0	2250	3125
T2	726	620	15.2	2875	3500
T3	615	535	15.6	2750	3250
T4	706	502	16.7	3250	3750
T5	627	541	16.5	3625	3500
T6	851	607	16.3	3625	3375

2. Name of farmer - Smt. Santhakumari
Parayil House
Akamala
Wadakanchery

Season - Rabi, 2000

Variety - Jyothy

Plot size - 40m²

Spacing - 15 x 10 cm

Method of crop establishment, - Transplanting

Date of sowing - 31-08-2000

Date of transplanting - 30-09-2000

Date of harvesting - 28-12-2000

Duration - 126 days

Plant protection

Pest/disease	Control measures	Date of application
Blast	Sprayed Hinosan	04-10-2000
Leaf roller	Sprayed Dimecron	14-10-2000
Blast	Sprayed Contaf	04-11-2000

Soil analysis

Parameters	Values	Rating	Class
pH	5.0	Acidic	2
TSS	0.15	Normal	0
OC (%)	0.18	Low	0
P (kg ha ⁻¹)	10.2	Medium	3
K(kg ha ⁻¹)	140	Medium	3

Yield and Yield attributes

Treatments	Total tillers at maturity/ sq. m.	No. of panicles/ Sq. m.	Panicle length (cm.)	Grain yield (kg ha ⁻¹)	Straw yield (kg ha ⁻¹)
T1	588	541	16.2	2125	2875
T2	733	634	16.1	2750	3250
T3	620	541	17.4	2625	3125
T4	647	561	17.3	3375	4000
T5	680	482	16.2	3450	3875
T6	739	568	16.9	3750	3750

3. Name of farmer - Smt. Pushpalatha
Parayil House
Enkakkad
Wadakkanchery

Variety - Jyothy

Season - Rabi, 2000

Spacing - 15 x 10 cm

Plot size - 40 m²

Method of crop establishment - Transplanting

Date of sowing - 07-09-2000

Date of transplanting - 30-09-2000

Date of harvesting - 27-12-2000

Duration - 109 days

Plant protection

Pest/disease	Control measures	Date of control
Blast	Sprayed Hinosan	06-10-2000
Blast	Sprayed Hinosan	15-01-2001

Soil analysis

Parameters	Values	Rating	Class
pH	5.4	Acidic	3
TSS	0.1	Normal	0
OC (%)	0.25	Low	1
P (kg ha ⁻¹)	6.7	Low	2
K(kg ha ⁻¹)	105	Low	2

Yield and Yield attributes

Treatments	Total tillers/ sq. m.	No. of panicles/ Sq. m.	Panicle length (cm.)	Grain yield (kg ha ⁻¹)	Straw yield (kg ha ⁻¹)
T1	350	317	14.3	2250	2600
T2	591	532	16.7	2500	2800
T3	535	480	16.6	2500	2750
T4	555	469	17.2	3125	3100
T5	614	522	17.1	3250	3100
T6	654	525	16.8	3250	3400

4. Name of farmer - Sri. Gopalakrishnan
Parayil House
Enkakkad
Wadakkanchery

Variety - Jyothy
Season - Rabi, 2000
Spacing - 15 x 10 cm
Plot size - 40 m²
Method of crop establishment - Transplanting
Date of sowing - 05-09-2000
Date of transplanting - 29-09-2000
Date of harvesting - 25-12-2000
Duration - 109 days

Plant protection

Pest/disease	Control measures	Date of control
Blast	Sprayed Hinosan	06-10-2000
Blast	Sprayed Hinosan	15-01-2001

Soil analysis

Parameters	Values	Rating	Class
PH	5.3	Acidic	3
TSS	0.1	Normal	0
OC (%)	0.26	Low	1
P (kg ha ⁻¹)	6.7	Low	2
K (kg ha ⁻¹)	103	Low	2

Yield and yield attributes

Treatments	Total tillers/ sq. m.	No. of panicles/ Sq. m.	Panicle length (cm)	Grain yield (kg ha ⁻¹)	Straw yield (kg ha ⁻¹)
T1	357	267	12.3	2075	2800
T2	508	370	14.9	2525	3000
T3	505	429	16.8	2625	2900
T4	558	472	16.9	3250	3200
T5	607	512	16.9	3400	3200
T6	680	545	17.3	3475	3600

Yield and nutrient response of rice to N, P and K
 Location - Wadakkanchery, Wadakkanchery block, Thrissur district
 Season - Rabi, 2000-01

Tr. Notn.	Treatments	Yield (kg ha ⁻¹)	N over						P over						K over						
			T1	T2	T3	T4	T5	Av.	T1	T2	T3	T4	T5	Av.	T1	T2	T3	T4	T5	Av.	
T1	N0 P0 K0	2175																			
T2	N90 P0 K0	2663	5.42					5.42													
T3	N90 P45 K0	2625	5.00					5.00	10.00	-0.84				4.58							
T4	N90 P0 K45	3250	11.94					11.94													
T5	N90 P45 K45	3431	13.96					13.9	27.91	17.07		4.02		16.33	23.89	13.04	13.89			16.94	
T6	N113 P45 K56	3525	11.95	37.48	39.13	11.96	4.09	20.92	30.00	19.16		6.11		18.42	27.91	17.07	17.91			20.96	
	CD (0.05)	157													24.11	15.39	16.07	25.0	8.55	17.82	
	Average							11.44						13.11							18.57

Soil Analysis Data – Wadakkanchery, Kharif, 2000 (Average)

Parameters	Value	Class	Rating
pH	5.23	2	Acidic
TSS	0.19	0	Normal
OC (%)	0.26	1	Low
P (kg ha ⁻¹)	8.81	2	Low
K(kg ha ⁻¹)	197.5	4	Medium

Soil analysis data – Wakakkamchery (Rabi, 2000-01) (Average)

Parameters	Values	Class	Rating
pH	5.3	3	Acidic
TSS	0.11	0	Normal
OC (%)	0.21	0	Low
P (kg ha ⁻¹)	7.58	1	Low
K (kg ha ⁻¹)	118.3	2	Low

Response of rice to the nutrients N, P and K in farmers field

District	-	Thrissur
Block	-	Puzhakkal
Panchayath	-	Adat
Cropping system	-	Water fallow-rice-fallow
Variety	-	Jyothy
Season	-	Rabi, 2000
1. Name of farmer	-	Shri. K. A Achuthan Kolangaraparambil House Chittilappilly
Spacing	-	15 x 10 cm
Plot size	-	40 m ²
Method of crop establishment	-	Transplanting
Date of sowing	-	02.09.2000
Date of planting	-	26.09.2000
Date of harvest	-	27.12.2000
Duration	-	112 days

Plant protection

Pest/disease	Control measures	Date of application
Leaf roller	Dimecron	12.10.2000
Leaf roller	Sevin	16.10.2000
Stem borer	Dimecron	27.10.2000
Sheath blight	Contaf	27.10.2000

Soil analysis

Parameters	Values	Rating	Class
pH	5.1	Acidic	2
TSS	0.12	Normal	0
OC (%)	0.46	Low	2
P (kg ha ⁻¹)	2.20	Low	0
K (kg ha ⁻¹)	180	Medium	4

Yield and yield attributes

Treatments	Total tillers/ sq.m	No. of panicles/ sq.m.	Panicle length (cm)	Grain yield (kg ha ⁻¹)	Straw yield (kg ha ⁻¹)
T1	440	396	17.7	4620	4550
T2	484	440	19.5	5500	5200
T3	440	396	19.2	5500	4550
T4	528	484	19.5	5500	5200
T5	572	484	19.6	5500	2600
T6	704	528	19.4	5940	3900

2. Name of farmer - Shri. Sukumaran
Kolangaraparambil House
Chittilappilly

Season - Rabi, 2000

Spacing - 15 x 10 cm

Plot size - 40 m²

Method of crop establishment - Transplanting

Date of sowing - 04.09.2000

Date of planting - 26.09.2000

Date of harvest - 28.12.2000

Duration - 111 days

Plant protection

Pest/disease	Control measures	Date of application
Leaf roller	Dimecron	12.10.2000
Leaf roller	Sevin	16.10.2000
Stem borer	Dimecron	27.10.2000
Sheath blight	Contaf	27.10.2000

Soil analysis

Parameters	Values	Rating	Class
pH	5.4	Acidic	3
TSS	0.13	Normal	0
OC (%)	0.21	Low	1
P (kg ha ⁻¹)	2.5	Low	0
K (kg ha ⁻¹)	175	Medium	4

Yield and yield attributes

Treatments	Total tillers/ sq.m	No. of panicles/ sq.m.	Panicle length (cm)	Grain yield (kg ha ⁻¹)	Straw yield (kg ha ⁻¹)
T1	484	396	17.4	3740	3250
T2	528	440	18.5	5060	5200
T3	748	528	19.8	5500	4550
T4	616	528	18.7	5500	5200
T5	616	528	19.5	6160	3900
T6	616	484	20.8	5940	3250

3. Name of farmer - Shri. A.V. Jose
Akkaraprambil House
Puranattukara

Season - Rabi, 2000
Spacing - 15 x 10 cm
Plot size - 40 m²
Method of crop establishment - Transplanting
Date of sowing - 28.08.2000
Date of planting - 17.09.2000
Date of harvest - 16.12.2000
Duration - 108 days

Plant protection

Pest/disease	Control measures	Date of application
Leaf roller	Malathion	13.10.2000
Sheath blight	Contaf	30.10.2000
Rice bug	Metacid	05.12.2000

Soil analysis

Parameters	Values	Rating	Class
pH	5.3	Acidic	3
TSS	0.1	Normal	0
OC (%)	0.28	Low	1
P (kg ha ⁻¹)	9.0	Low	2
K (kg ha ⁻¹)	110	Low	2

Yield and yield attributes

Treatments	Total tillers/ sq.m	No. of panicles/ sq.m.	Panicle length (cm)	Grain yield (kg ha ⁻¹)	Straw yield (kg ha ⁻¹)
T1	372	308	18.4	3750	4725
T2	412	396	18.9	3750	5625
T3	376	352	19.2	4500	4050
T4	421	396	19.7	4125	4500
T5	508	484	18.1	4875	3375
T6	510	356	19.6	4875	4500

3. Name of farmer - Smt. Mariamma
Akkaraprambil House
Puranattukara
- Season - Rabi, 2000
- Spacing - 15 x 10 cm
- Plot size - 40 m²
- Method of crop establishment - Transplanting
- Date of sowing - 25.08.2000
- Date of planting - 15.09.2000
- Date of harvest - 15.12.2000
- Duration - 110 days

Plant protection

Pest/disease	Control measures	Date of application
Leaf roller	Malathion	13.10.2000
Sheath blight	Contaf	30.10.2000
Rice bug	Metacid	05.12.2000

Soil analysis

Parameters	Values	Rating	Class
pH	5.4	Acidic	3
TSS	0.13	Normal	0
OC (%)	0.22	Low	1
P (kg ha ⁻¹)	9.4	Low	2
K (kg ha ⁻¹)	115	Low	2

Yield and yield attributes

Treatments	Total tillers/sq.m	No. of panicles/sq.m	Panicle length (cm)	Grain (kg ha ⁻¹)	Straw yield (kg ha ⁻¹)
T1	372	352	18.0	3000	3150
T2	418	352	18.6	3750	4500
T3	502	396	18.7	3750	4275
T4	502	396	18.6	3750	4725
T5	440	352	19.8	4125	3825
T6	502	440	19.6	4875	4725
CD (0.05)				820	

Soil analysis data - Adat, Rabi 2000-01 (Average)

Parameters	Values	Class	Rating
PH	5.3	3	Acidic
TSS	0.11	0	Normal
OC(%)	0.24	0	Low
P(kg ha ⁻¹)	12.3	3	Medium
K(kg ha ⁻¹)	110	2	Low

Yield and nutrient response of rice to N, P and K
 Location - Adat, Puzhakkal block, Thrissur district
 Season - Rabi, 2000-01

Tr. Notn.	Treatments	Yield (kg ha ⁻¹)	N over						P over						K over					
			T1	T2	T3	T4	T5	Av.	T1	T2	T3	T4	T5	Av.	T1	T2	T3	T4	T5	Av.
T1	N0 P0 K0	3778																		
T2	N90 P0 K0	4515	8.19					8.19												
T3	N90 P45 K0	4813	11.5					11.5	23	6.62				14.81						
T4	N90 P0 K45	4719	10.46					10.46						20.91	4.53	-2.09				7.78
T5	N90 P45 K45	5665	20.97					20.97	41.93	25.55		21.02		29.5	41.93	25.56	18.93			28.81
T6	N113 P45 K56	5408	14.42	38.83	25.86	29.96	-11.17	19.58	36.22	19.84		15.31		23.79	29.11	15.95	10.63	62.63	-23.36	18.99
	CD (0.05)	820																		
	Average							14.14						22.7						18.53

Response of NPK to rice

District	-	Thirissur ERNAKULAM
Block	-	Koovappady
Panchayath	-	Rayamangalam
Cropping system	-	Rice-rice-rice
Season	-	Kharif, 2000
1. Name of farmer	-	Sri. K.P. Padmakumar, Karumattathu parackal, Rayamangalam.
Variety	-	Jyothy
Spacing	-	15 x 10 cm
Plot size	-	40 m ²
Method of crop establishment	-	Transplanting
Date of sowing	-	10.06.2000
Date of planting	-	03.07.2000
Date of harvesting	-	02.10.2000
Duration	-	114 days

Plant protection

Pest/disease	Control measures	Date of control
Sheath blight	Hinosan	30.07.2000
Sheath blight	Bavistin	29.08.2000

Soil analysis

Parameters	Values	Rating	Class
pH	5.3	Acidic	3
TSS	0.14	Normal	0
OC (%)	0.43	Low	2
P (kg ha ⁻¹)	20.40	Medium	5
K (kg ha ⁻¹)	175	Medium	4

Yield and yield characters

Treatments	Total tillers/ sq.m	No. of panicles/ sq.m.	Panicle length (cm)	Grain yield (kg ha ⁻¹)	Straw yield (kg ha ⁻¹)
T1	266	255	18.8	2675	2363
T2	422	389	18.8	2550	2290
T3	342	302	18.0	2600	2488
T4	288	268	19.0	3075	2925
T5	281	248	19.0	2675	2430
T6	235	208	19.2	3050	2863

2. Name of farmer	- Sri. Krishnakumar Karumattathu Parackal, Rayamangalam.
Variety	- Jyothy
Spacing	- 15 x 10 cm
Plot size	- 40 m ²
Method of crop establishment	- Transplanting
Date of sowing	- 12.06.2000
Date of planting	- 03.07.2000
Date of harvesting	- 04.10.2000
Duration	- 114 days

Plant protection

Pest/disease	Control measures	Date of control
Sheath blight	Hinosan	30.07.2000
Sheath blight	Bavistin	29.08.2000

Soil analysis

Parameters	Values	Rating	Class
pH	5.2	Acidic	3
TSS	0.15	Normal	0
OC (%)	0.48	Low	2
P (kg ha ⁻¹)	18.60	Medium	5
K (kg ha ⁻¹)	160	Medium	4

Treatments	Total tillers/ sq.m	No. of panicles/ sq.m.	Panicle length (cm)	Grain yield (kg ha ⁻¹)	Straw yield (kg ha ⁻¹)
T1	248	228	18.6	2400	2588
T2	275	261	18.9	2800	2250
T3	255	228	18.4	2900	2768
T4	295	268	19.2	3000	2880
T5	245	235	19.1	2600	2475
T6	281	248	19.2	3150	3060

3. Name of farmer	- Sri. K.C. Muraleedharan Vattakkattu House Rayamangalam.
Variety	- Jyothy
Spacing	- 15 x 10 cm
Plot size	- 40 m ²
Date of sowing	- 13.06.2000
Date of planting	- 05.07.2000
Date of harvesting	- 04.10.2000
Duration	- 113 days
Plant protection	- Nil

Soil analysis

Parameters	Values	Rating	Class
pH	5.6	Acidic	4
TSS	0.2	Normal	0
OC (%)	0.49	Low	2
P (kg ha ⁻¹)	17.92	Medium	5
K (kg ha ⁻¹)	130	Medium	3

Yield and yield characters

Treatments	Total tillers/ sq.m	No. of panicles/ sq.m.	Panicle length (cm)	Grain yield (kg ha ⁻¹)	Straw yield (kg ha ⁻¹)
T1	281	268	19.3	3850	3775
T2	322	315	18.6	4040	4095
T3	235	208	19.1	4100	4693
T4	342	328	18.6	3925	4275
T5	308	302	18.6	4500	4500
T6	281	261	19.2	3600	3848

4. Name of farmer - Smt. Padmaja
Vattakkattu House
Rayamangalam

Variety - Jyothy
Spacing - 15 x10 cm
Plot size - 40 m²
Method of crop establishment - Transplanting
Date of sowing - 15-06-2000
Date of planting - 05-07-2000
Date of harvest - 04-10-2000
Duration - 113 days
Plant Protection - Nil

Soil analysis

Parameters	Values	Rating	Class
pH	5.4	Acidic	4
TSS	0.21	Normal	0
OC (%)	0.46	Low	2
P (kg ha ⁻¹)	19.80	Medium	5
K (kg ha ⁻¹)	129.0	Medium	3

Yield and yield attributes

Treatments	Total tillers/ sq.m	No. of panicles/ sq.m.	Panicle length (cm)	Grain yield (kg ha ⁻¹)	Straw yield (kg ha ⁻¹)
T1	235	215	19.2	3800	4063
T2	261	255	19.0	4000	4478
T3	315	302	19.3	4300	4513
T4	322	315	18.9	4300	4895
T5	308	302	18.6	4400	4783
T6	322	302	19.1	4150	4950

Yield and nutrient response of rice to N, P and K

Location - Rayamangalam, Koovappady block, Ernakulam district

Season - Kharif, 2000

Tr. Notn	Treatments	Yield (kg ha ⁻¹)	N over						P over						K over					
			T1	T2	T3	T4	T5	Av.	T1	T2	T3	T4	T5	Av.	T1	T2	T3	T4	T5	Av.
T1	N0 P0 K0	3181																		
T2	N90 P0 K0	3348	1.86					1.86												
T3	N90 P45 K0	3475	3.27					3.27	6.53	2.82				4.68						
T4	N90 P0 K45	3575	4.38					4.38						8.76	5.04	2.22				5.34
T5	N90 P45 K45	3544	4.03					4.03	8.07	4.36		-0.69		3.91	8.07	4.43	1.53			4.65
T6	N113 P45 K56	3488	2.72	6.09	0.57	-3.78	-2.43	0.63	6.82	3.11		-1.9		2.68	5.48	2.5	0.23	-7.91	-5.09	-0.96
	CD (0.05)	382																		
	Average							2.83						3.76						3.01

Response of rice to nutrients N, P and K

Block	-	Koovappady
Panchayath	-	Rayamangalam
Season	-	Rabi 2000
Variety	-	Jyothy
1. Name of farmer	-	Sri. K.P. Padamakumar Karimattathu Parakkal House Rayamangalam
Spacing	-	15 x 10 cm
Plot size	-	40 m ²
Date of sowing	-	02-10-2000
Date of planting	-	31-10-2000
Date of harvest	-	24-01-2001
Duration	-	112 days

Plant Protection

Pest/disease	Control measures	Date of spraying
Brown spot	Hinosan	26-11-2000
Sheath blight	Hinosan	16-12-2000

Soil analysis

Parameters	Values	Rating	Class
pH	5.2	Acidic	3
TSS	0.1	Normal	0
OC (%)	0.84	Medium	4
P (kg ha ⁻¹)	2.20	Low	0
K (kg ha ⁻¹)	190.0	Medium	4

Yield and yield parameters

Treatments	Total tillers/ sq.m	No. of panicles/ sq.m.	Panicle length (cm)	Grain yield (kg ha ⁻¹)	Straw yield (kg ha ⁻¹)
T1	277	244	15.9	1600	2880
T2	317	264	14.8	1700	2550
T3	284	251	14.9	2150	2400
T4	317	284	16.6	2300	2160
T5	264	231	15.7	1750	2520
T6	257	224	16.5	1900	3200

2. Name of farmer - Sri. K.P. Krishnakumar
Karimattathu Parakkal House
Rayamangalam

Spacing - 15 x 10 cm

Plot size - 40 m²

Date of sowing - 04-10-2000

Date of planting - 31-10-2000

Date of harvest - 24-10-2001

Duration - 110 days

Plant Protection

Pest/disease	Control measures	Date of spraying
Brown spot	Hinosan	26-11-2000
Sheath blight	Hinosan	16-12-2000

Soil analysis

Parameters	Values	Rating	Class
pH	5.3	Acidic	3
TSS	0.11	Normal	0
OC (%)	0.8	Medium	4
P (kg ha ⁻¹)	3.1	Low	0
K (kg ha ⁻¹)	175	Medium	4

Yield and yield contributing characters

Treatments	Total tillers/ sq.m	No. of panicles/ sq.m.	Panicle length (cm)	Grain yield (kg ha ⁻¹)	Straw yield (kg ha ⁻¹)
T1	317	271	16.8	1650	2700
T2	337	304	16.5	1750	2000
T3	375	336	15.0	1750	2200
T4	244	198	17.0	1950	2480
T5	224	198	16.0	1750	2480
T6	290	265	16.7	2250	3000

3. Name of farmer - Sri. M.S. George
Melayil House
Rayamangalam

Spacing - 15 x 10 cm

Plot size - 40 m²

Date of sowing - 07-10-2000

Date of planting - 28-10-2000

Date of harvest - 22-01-2001

Duration - 108 days

Plant Protection

Pest/disease	Control measures	Date of spraying
Case worm	Metacid	16-11-2000
Sheath blight	Bavistin	19-12-2000

Soil analysis

Parameters	Values	Rating	Class
pH	5.0	Acidic	2
TSS	0.2	Normal	0
OC (%)	0.59	Medium	3
P (kg ha ⁻¹)	15.1	Medium	5
K (kg ha ⁻¹)	167	Medium	4

Yield and yield attributes

Treatments	Total tillers/ sq. m	No. of panicles/ sq. m.	Panicle length (cm)	Grain yield (kg ha ⁻¹)	Straw yield (kg ha ⁻¹)
T1	330	303	18.8	2599	3510
T2	337	323	17.7	3962	5580
T3	383	350	17.9	3962	4410
T4	396	396	18.1	3919	4860
T5	403	376	17.7	3791	4680
T6	383	350	16.5	3706	4596

4. Name of farmer - Sri. M.S. Paulose
Maleyil House
Rayamangalam

Spacing - 15 x 10 cm

Plot size - 40 m²

Date of sowing -

Date of planting -

Date of harvest -

Duration -

Plant Protection

Pest/disease	Control measures	Date of spraying
Case worm	Metacid	16-11-2000
Sheath blight	Bavistin	19-12-2000

Soil analysis

Parameters	Values	Rating	Class
pH	4.9	Acidic	2
TSS	0.1	Normal	0
OC (%)	0.63	Medium	3
P (kg ha ⁻¹)	15.6	Medium	5
K (kg ha ⁻¹)	165	Medium	4

Yield and yield attributes

Treatments	Total tillers/ sq.m	No. of panicles/ sq.m.	Panicle length (cm)	Grain yield (kg ha ⁻¹)	Straw yield (kg ha ⁻¹)
T1	304	290	17.7	2939	3960
T2	396	356	19.4	3706	4680
T3	290	271	19.5	3919	4500
T4	337	330	17.0	3749	3870
T5	323	304	18.3	3664	4140
T6	330	297	17.9	3749	4410

Yield and nutrient response of rice to N, P and K
 Location - Rayamangalam, Koovappady block, Ernakulam district
 Season - Rabi, 2000-01

Tr. Notn.	Treat-ments	Yield (kg ha ⁻¹)	N over						P over						K over					
			T1	T2	T3	T4	T5	Av.	T1	T2	T3	T4	T5	Av.	T1	T2	T3	T4	T5	Av.
T1	N0 P0 K0	2197																		
T2	N90 P0 K0	2780	6.54					6.54												
T3	N90 P45 K0	2945	8.31					8.31	16.62	3.67				10.15						
T4	N90 P0 K45	2980	8.7					8.7							17.4	4.44	0.78			7.54
T5	N90 P45 K45	2739	6.06					6.06	12.04	-0.91		-5.36		1.92	12.04	-0.91	-4.58			2.18
T6	N113 P45 K56	2901	6.23	5.35	-1.91	-3.43	7.04	2.66	15.64	2.69		-1.76		5.52	12.57	2.16	-0.79	-7.18	14.72	4.30
	CD (0.05)	374																		
	Average							6.45						5.86						4.67

Soil Analysis Data – Rayamangalam, Kharif, 2000 (Average)

Parameters	Values	Class	Rating
pH	5.38	3	Acidic
TSS	0.18	0	Normal
OC (%)	0.47	2	Low
P (kg ha ⁻¹)	19.2	5	Medium
K (kg ha ⁻¹)	148.5	3	Medium

Soil analysis, Rabi 2000-01 (Average)

Parameters	Values	Class	Rating
PH	5.1	2	Acidic
TSS	0.13	0	Normal
OC (%)	0.72	3	Medium
P (kg ha ⁻¹)	9.0	2	Low
K (kg ha ⁻¹)	174.3	3	Medium

Response of rice to varying levels of N, P and K (Summer, 2001 – Rayamangalam)

Treatments

- T1 - Control N (No nitrogen)
- T2 - Recommended N for the component crops in the crop sequence (N 90 kg ha⁻¹)
- T3 - Recommended N and P (NP 90:45 kg ha⁻¹)
- T4 - Recommended N and K (NK 90:45 kg ha⁻¹)
- T5 - Recommended NPK (NPK 90:45:45 kg ha⁻¹)
- T6 - 125% of recommended NPK (NPK 113:45:56 kg ha⁻¹)

Yield and yield attributes – NPK experiment at Rayamangalam – Summer – 2001

Treatments	No. of tillers at PI stage/m ²	Total tiller at harvest/m ²	No. of panicle/m ²	Panicle length (cm)	Grain yield (kg ha ⁻¹)	Straw yield (kg ha ⁻¹)
T1	595	521	451	17.53	2585	3870
T2	642	596	492	17.6	2885	4418
T3	605	505	431	16.85	2970	4219
T4	585	503	432	17.43	3070	4286
T5	588	513	433	17.48	3050	4339
T6	621	548	445	17.55	2940	4268
CD (0.05)	NS	NS	NS	NS	219	379

Yield and nutrient response of rice to N, P and K
 Location - Rayamangalam, Koovappady block, Ernakulam district
 Season - Summer, 2001

Tr. Notn.	Treatments	Yield (kg ha ⁻¹)	N over					P over					K over							
			T1	T2	T3	T4	T5	Av.	T1	T2	T3	T4	T5	Av.	T1	T2	T3	T4	T5	Av.
T1	N0 P0 K0	2585																		
T2	N90 P0 K0	2885	3.33					3.33												
T3	N90 P45 K0	2970	4.28					4.28	8.55	1.89					5.22					
T4	N90 P0 K45	3070	5.39					5.39							10.78	4.11	2.22			5.70
T5	N90 P45 K45	3050	5.17					5.17	10.33	3.67		-0.44		4.52	10.33	3.67	-0.44			4.52
T6	N113 P45 K56	2940	3.14	2.39	-1.30	-5.65	-4.78	-1.24	7.89	1.22		-2.89		2.07	6.34	0.98	-0.54	-11.82	-10	-3.01
	CD (0.05)	219																		
	Average							3.39						3.94						2.40

Response to NPK-Summer – Rayamangalam

1. Name and address of farmer	Sri.Krishna Panicker, Jyothis, Pulluvazhy, Rayamangalam
2. Method of crop establishment	Broadcasting
3. Date of sowing	06-02-01
4. Date of fertilizer application	
Basal	06-02-01
I top	03-03-01
II top	28-03-01
5. Date of harvest	12-05-01
6. Duration	96 days
6. Plant protection	Metacid against leaf folder Metacid against rice bug Contaf against leaf blast

Yield and yield attributes

Variety: Matta Triveni

Treatments	Tillers at PI stage/m ²	Tillers at harvest/ m ²	Panicles/m ²	Panicle length cm	Grain yield kg ha ⁻¹	Straw yield kg ha ⁻¹
T1	524	472	400	17.6	2500	3225
T2	644	600	508	18.2	3040	3375
T3	608	532	472	16.8	3240	3450
T4	552	476	416	17.3	3200	3780
T5	634	600	508	19.0	3040	3660
T6	662	568	456	16.8	3040	3540

II. 1. Name and address of farmer	Sri.Balan Pillai, Plankudy Pulluvazhy, Rayamangalam
2. Method of crop establishment	Broadcasting
3. Date of sowing	11-02-01
4. Date of fertilizer application	
Basal	11-02-01
I top	12-03-01
II top	29-03-01
5. Date of harvest	18-05-01
6. Duration	96 days
7. Plant protection	Metacid against leaf folder Metacid against rice bug Contaf against leaf blast

Yield and yield attributes

Variety: Matta Triveni

Treatments	Tillers at P1 stage/m ²	Tillers at harvest/ m ²	Panicles/m ²	Panicle length cm	Grain yield kg ha ⁻¹	Straw yield kg ha ⁻¹
T1	630	604	514	17.5	2600	4575
T2	670	636	494	18.1	3080	5490
T3	578	472	398	16.7	3040	4725
T4	564	518	448	17.5	3040	4725
T5	416	386	332	16.3	3400	5460
T6	632	552	436	17.4	3200	5160

III. 1. Name and address of farmer Sri.K.George, Koovappady House
Rayamangalam

2. Method of crop establishment Broadcasting

3. Date of sowing 10-02-01

4. Date of fertilizer application

 Basal 10-02-01

 I top 07-03-01

 II top 28-03-01

5. Date of harvest 16-05-01

6. Duration 95 days

7. Plant protection Metacid against leaf folder

 Hinosan against blast

Yield and yield attributes

Variety; Matta Triveni

Treatments	Tillers at PI stage/m ²	Tillers at harvest/ m ²	Panicles/m ²	Panicle length cm	Grain yield kg ha ⁻¹	Straw yield kg ha ⁻¹
T1	604	556	514	17.5	2600	3225
T2	662	616	500	17.3	2720	3375
T3	576	492	416	16.2	2760	3450
T4	594	486	420	16.9	3160	3780
T5	656	520	432	17.8	2960	3660
T6	600	524	408	17.5	2800	3540

IV 1. Name and address of farmer	Sri.M.S.Poulose, Malielil House Rayamangalam
2. Method of crop establishment	Broadcasting
3. Date of sowing	08-02-01
4. Date of fertilizer application	
Basal	08-02-01
I top	05-03-01
II top	30-03-01
5. Date of harvest	14-05-01
6. Duration	95 days
7. Plant protection	Metacid against leaf folder Contaf against leaf blast

Yield and yield attributes

Variety: Matta Triveni

Treatments	Tillers at PI stage/m ²	Tillers at harvest/ m ²	Panicles/m ²	Panicle length cm	Grain yield kg ha ⁻¹	Straw yield kg ha ⁻¹
T1	620	452	376	17.5	2640	3180
T2	292	532	464	16.8	2700	3405
T3	656	524	436	17.7	2840	3750
T4	628	532	444	18.3	2880	3690
T5	644	544	460	16.8	2800	3525
T6	628	548	480	18.5	2720	3420

Response of rice to nutrients N, P and K

(ii) Block	-	Muvattupuzha
Panchayath	-	Paipara
Season	-	Kharif, 2000
Cropping system in the area	-	Rice-rice-fallow .
Variety	-	Jyothy
1. Name of farmer	-	Sri. P.K. Gopalan Ponnirikkal House Rayamangalam Mulavoor
Spacing	-	15 x 10 cm
Plot size	-	40 m ²
Method of crop establishment	-	Transplanting
Date of sowing	-	05-06-2000
Date of transplanting	-	01-07-2000
Date of harvest	-	01-10-2000
Duration	-	118 days

Plant protection

Pest/disease	Control measures	Date of spraying
Case worm and thrips	Malathion	13-07-2000
Blast	Hinosan	23.07.2000
Blast	Kitazin	29.07.2000
Thrips & Leaf roller	Nuvacron	09.08.2000

Soil analysis

Parameters	Values	Rating	Class
pH	5.4	Acidic	3
TSS	0.06	Low	0
OC (%)	0.53	Medium	3
P (kg ha ⁻¹)	13.22	Medium	3
K (kg ha ⁻¹)	100	Low	2

Yield and yield attributes

Treatments	Total tillers/ sq.m	No. of panicles/ sq.m.	Panicle length (cm)	Grain yield (kg ha ⁻¹)	Straw yield (kg ha ⁻¹)
T1	273	260	16.4	1900	2250
T2	320	280	17.0	2150	2475
T3	340	293	16.5	2250	2475
T4	320	287	16.6	2250	2700
T5	313	293	16.8	2500	2600
T6	340	300	16.8	2500	2825

2. Name of farmer - Smt. Rajamma
Ponnikkal House
Mulavoor.

Spacing - 15 x 10 cm
Plot size - 40 m²
Method of establishment - Transplanting
Date of sowing - 05-06-2000
Date of planting - 02-07-2000
Date of harvest - 25-09-2000
Duration - 112 days

Plant protection

Pest/disease	Control measures	Date of application
Case worm and thrips	Ekalux	13-07-2000
Thrips and blast	Dimecron and Hinosan	23-07-2000
Blast	Kitazin	29-07-2000
Blast and thrips	Kitazin and Nuvacron	09-08-2000

Soil analysis

Parameters	Values	Rating	Class
pH	5.3	Acidic	3
TSS	0.5	Low	0
OC (%)	0.56	Medium	3
P (kg ha ⁻¹)	14.0	Medium	3
K (kg ha ⁻¹)	103	Low	2

Yield and yield attributes

Treatments	Total tillers/ sq.m	No. of panicles/ sq.m.	Panicle length (cm)	Grain yield (kg ha ⁻¹)	Straw yield (kg ha ⁻¹)
T1	435	415	17.8	2425	3375
T2	435	415	19.1	2600	3500
T3	455	408	19.2	2600	3725
T4	495	455	18.7	2700	3250
T5	509	469	19.0	3000	3725
T6	509	462	19.1	3150	4000

3.. Name of farmer - Sri P.P. Joy
Muthiyelil House
Rajamangalam
Mulavoor.

Spacing - 15 x 10 cm
Plot size - 40 m²
Date of sowing - 01-06-2000
Date of planting - 22-06-2000
Date of harvest - 21-09-2000
Duration - 111 days

Plant protection

Pest/disease	Control measures	Date of application
Case worm	Hostathion	09-07-2000
Sheath blight	Hinosan	02-08-2000
Blast	Kitazin	10-08-2000

Soil analysis

Parameters	Values	Rating	Class
pH	5.2	Acidic	3
TSS	0.05	Low	0
OC (%)	0.57	Medium	3
P (kg ha ⁻¹)	13.10	Medium	3
K (kg ha ⁻¹)	90.00	Low	2

Yield and yield attributes

Treatments	Total tillers/ sq. m	No. of panicles/ sq. m.	Panicle length (cm)	Grain yield (kg ha ⁻¹)	Straw yield (kg ha ⁻¹)
T1	307	287	16.5	1800	2250
T2	313	273	16.8	1900	2300
T3	320	273	16.8	2300	2460
T4	300	273	16.6	2400	2250
T5	313	287	16.7	2425	2425
T6	340	287	16.8	2400	2700

4. Name of farmer - Sri. Pailey Pathrose
Muthiyelil House
Mulavoor.

Spacing - 15 x 10 cm

Plot size - 40 m²

Date of sowing - 01-06-2000

Date of planting - 21-06-2000

Date of harvest - 20-09-2000

Duration - 112 days

Plant protection

Pest/disease	Control measures	Date of application
Case worm	Hostathion	09-07-2000
Sheath blight	Hinosan	02-08-2000
Blast	Kitazin	10-08-2000

Soil analysis

Parameters	Values	Rating	Class
pH	5.3	Acidic	3
TSS	0.06	Low	0
OC (%)	0.56	Medium	3
P (kg ha ⁻¹)	12.54	Medium	3
K (kg ha ⁻¹)	90.00	Low	2

Yield and yield attributes

Treatments	Total tillers/ sq.m	No. of panicles/ sq.m.	Panicle length (cm)	Grain yield (kg ha ⁻¹)	Straw yield (kg ha ⁻¹)
T1	422	408	18.1	2400	3150
T2	462	428	18.7	2550	3250
T3	475	428	18.4	2750	3425
T4	475	428	18.7	2600	3300
T5	515	462	19.6	2625	3550
T6	495	462	18.7	2675	3925

Yield and nutrient response of rice to N, P and K
 Location – Mulavoor, Muvatupuzha block, Ernakulam district
 Season – Kharif, 2000

Tr. Notn.	Treatments	Yield (kg ha ⁻¹)	N over						P over						K over					
			T1	T2	T3	T4	T5	Av.	T1	T2	T3	T4	T5	Av.	T1	T2	T3	T4	T5	Av.
T1	N0 P0 K0	2131																		
T2	N90 P0 K0	2300	1.88					1.88												
T3	N90 P45 K0	2475	3.82					3.82	7.64	3.89				5.77						
T4	N90 P0 K45	2488	3.97					3.97						7.8	4.18	0.29				4.09
T5	N90 P45 K45	2638	5.63					5.63	11.27	7.51		3.33		7.37	11.27	7.51	3.62			7.46
T6	N113 P45 K56	2681	4.87	16.56	8.96	8.39	1.87	8.13	12.22	8.47		4.29		8.33	9.82	6.80	3.68	17.55	3.91	8.35
	CD (0.05)	189																		
	Average							4.69						7.16						6.63

Block	-	Muvattupuzha
Panchayat	-	Paipra
Season	-	Rabi, 2000
Variety	-	Jyothy
1. Name of farmer	-	Gigi Chelattu House Paipra
Spacing	-	15 x 10 cm
Plot size	-	40 m ²
Date of sowing	-	21.09.2000
Date of planting	-	25.10.2000
Date of harvest	-	15.01.2001
Duration	-	116 days

Plant protection

Pest/disease	Control measures	Date of application
Stem borer	Dimecron	18-11-2000
Blast	Hinosan	18-11-2000
Rice bug	Metacid	20-12-2000

Soil analysis

Parameters	Values	Rating	Class
pH	5.7	Acidic	4
TSS	0.1	Normal	0
OC (%)	0.56	Medium	3
P (kg ha ⁻¹)	9.0	Low	2
K (kg ha ⁻¹)	125	Medium	3

Yield and yield attributes

Treatments	Total tillers/ sq.m	No. of panicles/ sq.m.	Panicle length (cm)	Grain yield (kg ha ⁻¹)	Straw yield (kg ha ⁻¹)
T1	429	336	16.8	1600	2450
T2	508	382	17.0	1800	3150
T3	422	349	17.0	1720	2450
T4	561	462	17.6	2200	3150
T5	567	455	18.2	2300	3150
T6	508	422	17.9	1900	2800

2. Name of farmer	-	Sri. Jacob C.K. Chelattu House Paipra
Spacing	-	15 x 10 cm
Plot size	-	40 m ²
Date of sowing	-	25.09.2000
Date of planting	-	24.10.2000
Date of harvest	-	15.01.2001
Duration	-	112 days

Plant protection

Pest/disease	Control measures	Date of application
Stem borer	Dimecron	18-11-2000
Blast	Hinosan	22-11-2000
Rice bug	Metacid	20-12-2000

Soil analysis

Parameters	Values	Rating	Class
PH	5.6	Acidic	4
TSS	0.17	Normal	0
OC (%)	0.58	Medium	3
P (kg ha ⁻¹)	9.5	Low	2
K (kg ha ⁻¹)	131	Medium	3

Yield and yield attributes

Treatments	Total tillers/ sq.m	No. of panicles/ sq.m.	Panicle length (cm)	Grain yield (kg ha ⁻¹)	Straw yield (kg ha ⁻¹)
T1	402	323	16.8	1600	2450
T2	448	369	17.1	1800	2975
T3	429	349	17.3	1800	3150
T4	528	435	18.4	2100	2975
T5	567	396	18.3	2000	3150
T6	561	455	18.1	2400	3150

3. Name of farmer - Shri. Shaji
Chelattu House
Paipra

Spacing - 15 x 10 cm
Plot size - 40 m²
Date of sowing - 26.09.2000
Date of planting - 25.10.2000
Date of harvest - 16.01.2001
Duration - 112 days

Plant protection

Pest/disease	Control measures	Date of application
Stem borer	Dimecron	18-11-2000
Blast	Hinosan	22-11-2000
Rice bug	Metacid	18-12-2000

Soil analysis

Parameters	Values	Rating	Class
pH	5.5	Acidic	4
TSS	0.13	Normal	0
OC (%)	0.55	Medium	3
P (kg ha ⁻¹)	9.2	Low	2
K (kg ha ⁻¹)	124	Medium	3

Yield and yield attributes

Treatments	Total tillers/ sq.m	No. of panicles/ sq.m.	Panicle length (cm)	Grain yield (kg ha ⁻¹)	Straw yield (kg ha ⁻¹)
T1	415	330	16.8	1610	2450
T2	475	376	17.0	1800	3065
T3	422	349	17.1	1754	2800
T4	541	448	17.8	2140	3065
T5	567	422	18.1	2158	3150
T6	534	433	18.1	2149	2975

Yield and nutrient response of rice to N, P and K
 Location – Mulavoor, Muvatupuzha block, Ernakulam district
 Season – Rabi, 2000

Tr. Noth.	Treatments	Yield (kg ha ⁻¹)	N over						P over						K over					
			T1	T2	T3	T4	T5	Av.	T1	T2	T3	T4	T5	Av.	T1	T2	T3	T4	T5	Av.
T1	N0 P0 K0	1603																		
T2	N90 P0 K0	1800	2.19					2.19												
T3	N90 P45 K0	1758	1.72					1.72	3.44	-0.93				1.26						
T4	N90 P0 K45	2147	6.04					6.04							12.09	7.71	8.64			9.48
T5	N90 P45 K45	2153	6.11					6.11	12.22	7.84		0.13		6.73	12.22	7.84	8.78			12.95
T6	N113 P45 K56	2150	4.84	15.22	17.05	0.13	-0.13	7.42	12.16	7.78		0.07		10.00	9.77	6.15	7.00	0.27	-0.27	4.58
	CD (0.05)	241																		
	Average							4.70						6.00						9.00

Soil Analysis data (Mulavoor), Kharif 2000 (Average)

Parameters	Values	Class	Rating
pH	5.3	3	Acidic
TSS	0.17	0	Normal
OC (%)	0.56	2	Low
P (kg ha ⁻¹)	13.32	3	Medium
K (kg ha ⁻¹)	96.5	2	Low

Soil Analysis data Paipra - Rabi 2000-01 (Average)

Parameters	Values	Class	Rating
pH	5.6	3	Acidic
TSS	0.13	0	Normal
OC (%)	0.56	2	Low
P (kg ha ⁻¹)	9.23	2	Low
K (kg ha ⁻¹)	126.7	2	Low

Experiment No. II

Title: Agronomic management practices for sustainable production in rice-rice system.

Objective: To develop agronomic practices for sustainable production in rice based cropping system.

Treatments

1. Farmers practice (FP)
2. FP + Recommended technology for most constraint (No. 1) limiting crop productivity in the system.
3. All the recommended package of practices
4. All as in T₃, but 1/3 N as basal and afterwards 30 kg N based at LCC-3.
5. All as in T₃, but 1/3 N as basal and afterwards 30 kg N based at LCC-4.

Treatments

1. Random planting+Factomphos 150Kg./ha⁻¹ + MOP 15Kg./ha⁻¹ at planting and N @ 23 Kg/ha⁻¹ as urea+MOP 15Kg/ha⁻¹ at 20 DT (farmers practice).
2. T₁ + basal application of cow dung @ 5 t ha⁻¹
3. Cow dung 5 t ha⁻¹ + soil application of ZnSo₄ @ 25 kg ha⁻¹+ basal application of Azospirillum @ 2.0 kg + NPK 90-45-45 kg ha⁻¹ (basal N as urea and top dressing N as Ammonium Sulphate) (Urea mixed with neem cake in 5:1 ratio)
4. All as in T³ but 1/3 N as basal, and afterwards N 30 kg ha⁻¹ at LCC-3.
5. All as in T³ but 1/3 N as basal; and afterwards N 30 kg ha⁻¹ at LCC-4.

Design : RBD

Effect of different agronomic management practices on grain yield in Central zone, Kerala

District and zone-wise

In Palakkad district at Kuzhalmannam highest yield was recorded in T3 (cowdung 5 t ha⁻¹ + soil application of ZnSO₄ @ 25 kg ha⁻¹ + basal application of Azospirillum @ 2 kg ha⁻¹ + NPK at 90: 45: 45 kg ha⁻¹ with basal N as urea and top dressing N as ammonium sulphate) during rabi season and at Polppully highest yield was recorded in T5, but it was on par with T3. In Thrissur district (double crop rice) during kharif season, T5 recorded the highest yield which was significantly superior to all other treatments. (All as in T3 but 1/3N as basal; and afterwards N 30 kg ha⁻¹ at LCC-4), but in rabi season highest yield was recorded in T3 which was on par with T5 and both were significantly superior to all other treatments. At Adat kole lands (single crop system) T3 gave the highest yield followed by T5, T2 and T4 which were at par. T3 was significantly superior to farmers practice. In Ernakulam district during kharif season, the yield in all the treatments were at par except T3 which gave significantly lower yield at Rayamangalam. At Paipra also yield was lowest in T3 while T4 and T5 gave significantly higher yield. During rabi season T2 gave the highest yield significantly superior to T1 (farmers practice) and T4 but on par with T3 and T5 at Rayamangalam while at Paipra there was no significant difference in yield between treatments.

In Central Zone, Kerala during kharif season highest yield was recorded in T5 followed by T4. During rabi season also maximum yield was recorded in T5, but it was closely followed by T3. During both the seasons yield was lower in T1 (farmers practice.)

The overall data reveals that application of organic matter (cowdung) @ 5 t ha⁻¹; ZnSO₄ 25 kg ha⁻¹, Azospirillum @ 2 kg ha⁻¹ and fertilizer application of 1/3N, full P and 1/3 K as basal and afterwards LCC-4 based N application and

1/3rd K each at tillering and PI stages is a sustainable technology in rice based system. The same treatment, but top dressing of N at LCC-3 (T4) or recommended fertilizer application at scheduled splits (T3) also were comparable. All these treatments were definitely superior to farmers practice (T1).

Grain yield at different agronomic management practices for sustainable production in central zone , Kerala

No.	Treatments	Yield (kg ha ⁻¹)										
		Palakkad district		Thrissur district			Ernakulam district				Zone average	
		Kozhal- mannam	Polpully	Wadakkanchery		Adat	Rayamangalam		Paipra		Kharif	Rabi
		Rabi	Rabi	Kharif	Rabi	Rabi	Kharif	Rabi	Kharif	Rabi		
T1	Random planting + Factomphos 150 kg ha ⁻¹ at planting and MOP 40 kg ha ⁻¹ at 20 DAT (Farmers practice)	4650	3945	2575	2769	4063	3257	1713	2725	2500	2852	3273
T2	T1 + basal application of cowdung @ 5t ha ⁻¹	4694	5222	2875	3025	4563	3425	2575	2794	2417	3031	3749
T3	Cowdung 5 t ha ⁻¹ + soil application of ZnSO ₄ @ 25 kg ha ⁻¹ + basal application of Azospirillum @ 2 kg + NPK 90-45-45 kg ha ⁻¹ (basal N as urea and top dressing N as ammonium sulphate))	4738	6000	3200	3462	5281	2620	2175	2713	2100	2844	3876
T4	All as in T3 but 1/3N as basal, and afterwards N 30 kg ha ⁻¹ at LCC-3	4300	4556	3183	2962	4281	3215	2013	3075	2150	3158	3377
T5	All as in T3 but 1/3N as basal and afterwards N 30 kg ha ⁻¹ at LCC-4	4169	6111	3392	3362	5094	3350	2400	2925	2483	3222	3937
	CD	NS	525	170	313	1036	240	404	219	NS		

Agronomic management trial

District	-	Palakkad
(i) Block	-	Kozhalmannam
Panchayat	-	Kannadi
Kharif experiments failed		
Season	-	Rabi, 2000
1. Name of farmer	-	Sri. Syamaladasan
	-	Kumar Rice Mill
	-	Vadaparambu
	-	Kannadi
Variety	-	Kanchana
Plot size	-	40m ²
Spacing	-	15 x 10cm
Method of crop establishment	-	Transplanting
Date of sowing	-	08.10.2000
Date of planting	-	05.11.2000
Date of harvest	-	10.02.2001
Duration	-	125 days
Plant protection		

Pest/disease	Control measures	Date of control
Rice bug	Rogor	30-12-2000

Soil analysis

Parameters	Value	Rating	Class
PH	6.8	Neutral	6
TSS	0.1	Normal	0
OC (%)	0.25	Low	1
P (kg ha ⁻¹)	9.00	Low	2
K (kg ha ⁻¹)	100.00	Low	2

Yield and Yield contributing characters

Treat-ments	Total tillers/ sq. m	No. of panicles/ sq. m	Panicle length (cm)	Panicle weight (g)	No. of grains panicles	Grain yield (kg ha ⁻¹)	Straw yield (kg ha ⁻¹)
T1	719	587	16.8	2.0	72	4650	4970
T2	548	416	16.3	1.8	82	5050	4550
T3	627	541	15.8	1.5	77	4850	6230
T4	442	436	14.7	1.3	73	5300	5670
T5	818	640	15.3	1.4	74	4500	5425

2. Name of farmer - Sri. Sivadas,
Kumar Rice Mill
Vadaparmbu
Kannadi

Season - Rabi, 2000

Variety - Kanchana

Spacing - 15 x 10 cm

Plot size - 40 m²

Method of establishment - Transplanting

Date of sowing - 06.10.2000

Date of transplanting - 05.11.2000

Date of harvest - 07.02.2001

Duration - 121 days

Plant protection

Disease	Control measures	Date of control
Rice bug	Rogor	30-12-2000

Soil analysis

Parameters	Value	Rating	Class
PH	6.9	Neutral	6
TSS	0.11	Normal	0
OC(%)	0.24	Low	1
P (kg ha ⁻¹)	9.33	Low	2
K (kg ha ⁻¹)	103.00	Low	2

Yield and yield contributing characters

Treat-ments	Total tillers/ sq. m	No. of panicles/ sq. m	Panicle length (cm)	Panicle weight (g)	No. of grains panicles	Grain yield (kg ha ⁻¹)	Straw yield (kg ha ⁻¹)
T1	680	620	15.8	1.6	73	4850	4725
T2	640	528	15.9	1.8	77	4250	4830
T3	482	429	16.9	1.5	83	4350	5495
T4	554	475	18.3	1.4	84	4000	5530
T5	667	574	17.3	1.5	84	4050	5075

3. Name of farmer - Sri. Chenthamarakshan,
Amoor padam
Kannadi
- Season - Rabi, 2000
- Variety - Kanchana
- Spacing - 15 x 10 cm
- Plot size - 40 m²
- Date of sowing - 08.10.2000
- Date of planting - 02.11.2000
- Date of harvesting - 06.02.2001
- Duration - 121 days

Plant protection

Pest/disease	Control measures	Date of control
Rice bug	Metacid	10.01.2001
Rice bug	Rogor	20.01.2001

Soil analysis

Parameters	Value	Rating	Class
pH	6.7	Neutral	6
TSS	0.1	Normal	0
OC(%)	0.23	Low	1
P (kg ha ⁻¹)	9.80	Low	2
K (kg ha ⁻¹)	102.00	Low	2

Yield and Yield characters

Treatments	Total tillers/ sq. m	No. of panicles/ sq. m	Panicle length (cm)	Panicle weight (g)	No. of grains panicles	Grain yield (kg ha ⁻¹)	Straw yield (kg ha ⁻¹)
T1	627	485	17.4	2.1	56	4950	4550
T2	442	406	17.2	2.1	65	4525	3850
T3	380	350	18.8	2.1	92	4500	3675
T4	330	274	18.7	2.2	98	4150	4025
T5	429	380	19.6	2.2	102	4250	4200

4. Name of farmer	-	Rajalakshmi Amoor padam Kannadi
Season	-	Rabi, 2000
Variety	-	Kanchana
Spacing	-	15 x 10cm
Plot size	-	40 m ²
Date of sowing	-	10.10.2000
Date of planting	-	02.11.2001
Date of harvest	-	06.02.2001
Duration	-	119 days

Plant protection

Pest/disease	Control measures	Date of control
Rice bug	Metacid	10.01.2001
Rice bug	Rogor	20.01.2001

Soil analysis

Parameters	Value	Rating	Class
pH	6.8	Neutral	6
TSS	0.1	Normal	0
OC(%)	0.23	Low	1
P (kg ha ⁻¹)	9.10	Low	2
K (kg ha ⁻¹)	100.8	Low	2

Yield and Yield characters

Treatments	Total tillers/ sq. m	No. of panicles/ sq. m	Panicle length (cm)	Panicle weight (g)	No. of grains/ panicles	Grain yield (kg ha ⁻¹)	Straw yield (kg ha ⁻¹)
T1	677	594	19.0	2.0	62	4150	4025
T2	640	532	18.4	1.8	86	4950	3815
T3	439	406	20.5	2.2	90	5250	3850
T4	449	393	17.8	2.2	78	3750	4113
T5	515	350	20.4	2.0	87	3875	4113

Yield and yield contributes

Kuzhalmannam during Rabi, 2000

Treatments	Total tillers/sq.m	No. of panicles/sq.m.	Length of panicle (cm)	Weight of panicle (g)	No. of grains/panicle	Grain yield (kg ha ⁻¹)	Straw yield (kg ha ⁻¹)
T1	674	572	17.3	1.9	66	4650	4568
T2	569	471	17.0	1.9	72	4694	4261
T3	482	432	18.0	1.8	86	4738	4813
T4	444	382	17.4	1.8	83	4300	4835
T5	607	474	18.2	1.8	87	4169	4763
CD (0.05)	NS						

Soil Analysis Data – Kannadi – Rabi – 2000-01

Parameters	Value	Rating	Class
PH	6.8	Acidic	6
TSS	0.1	Normal	0
OC	0.24	Low	0
P	9.31	Low	2
K	101.5	Low	2

Agronomic management trial

District	-	Thirissur PALHKKAD
Block	-	Kollengode
Panchayath	-	Polpulluy
Cropping system		Rice-rice-fallow
Kharif crop failed due to drought		
Season	-	Rabi, 2000
Variety	-	Ponmany
1. Name of farmer	-	Sri. Chenthamara Polppully
Spacing	-	20 x 10 cm
Plot size	-	40 m ²
Date of sowing	-	10-10-2000
Date of Planting	-	17-11-2000
Date of harvesting	-	27-3-2000
Duration	-	167 days
Plant protection		

Pest/Diseases	Control measures	Date of spraying
Rice bug	Metacid	25.02.2000

Soil analysis

Parameters	Value	Rating	Class
pH	6.4	Acidic	5
TSS	0.1	Normal	0
OC (%)	0.21	Low	1
P (kg ha ⁻¹)	6.7	Low	2
K (kg ha ⁻¹)	115	Low	2

Yield and yield contributing character

Treatments	Total tillers/ sq. m	No. of panicles/ Sq. m.	Length of panicles (cm)	No. of grains/ panicles	Weight of panicle (g)	Grain weight (kg ha ⁻¹)	Straw yield (kg ha ⁻¹)
T1	865	845	19.9	97		4167	5100
T2	895	875	18.9	89		4833	5100
T3	780	755	18.7	108		6000	6100
T4	745	715	19.5	92		4667	5400
T5	775	745	20.9	98		5500	5900

2. Name of farmer - Sri. Rajasekaran
Lotus
Polppully

Spacing - 20 x 10 cm

Plot size - 40 m²

Method of crop establishment - Transplanting

Date of sowing - 9-10-2000

Date of planting - 17-11-2000

Date of harvesting - 26-3-2001

Duration - 167 days

Plant protection

Rice bug attack for which in Metacid was sprayed on 25-2-2000

Soil analysis

Parameters	Value	Rating	Class
PH	6.3	Acidic	5
TSS	0.12	Normal	0
OC (%)	0.20	Low	1
P (kg ha ⁻¹)	6.8	Low	2
K (kg ha ⁻¹)	113	Low	2

Yield and yield contributing character

Treat-ment	Total tillers/ sq. m	No. of panicles/ sq. m.	Length of panicles (cm)	No. of grains/ panicle	Weight of panicle (g)	Grain weight (kg ha ⁻¹)	Straw yield (kg ha ⁻¹)
T1	825	795	20.5	98		3667	4800
T2	885	775	19.9	97		5333	5400
T3	775	740	19.1	86		5667	5500
T4	690	660	18.8	83		4334	5300
T5	830	785	20.8	97		6333	6200

3. Name of farmer - Smt. Sobhana,
Krishnakripa
Polpully.

Spacing - 20 x 10 cm

Plot size - 40 m²

Date of sowing - 11-10-2000

Date of planting - 18-11-2000

Date of harvesting - 27-3-2000

Duration - 167 days

Plant protection

Pest/Disease	Control measures	Date of spraying
Rice bug	Metacid	27.02.2000

Soil analysis

Parameters	Value	Rating	Class
pH	6.0	Acidic	4
TSS	0.1	Normal	0
OC(%)	0.21	Low	1
P (kg ha ⁻¹)	6.4	Low	2
K (kg ha ⁻¹)	114	Low	2

Yield and yield contributing character

Treat-ments	Total tillers/ sq. m	No. of panicles/ Sq. m.	Length of panicles (cm)	No. of grains/ Panicles	Weight of panicle (g)	Grain weight (kg ha ⁻¹)	Straw yield (kg ha ⁻¹)
T1	775	750	20.3	110		4000	5400
T2	815	775	20.9	106		5500	5600
T3	745	700	21.9	110		6333	6300
T4	835	650	19.9	100		4667	5600
T5	795	760	18.1	95		6500	6600

Yield and yield attributes (Polppully in Kollengode block during Rabi, 2000)

Treatments	Total tillers/sq.m	Panicle number/sq.m	Panicle length (cm)	No. of grains/panicle	Grain yield (kg ha ⁻¹)	Straw yield (kg ha ⁻¹)
T1	822	557	20.2	102	3945	5100
T2	865	808	19.9	97	5222	5400
T3	767	732	19.6	101	6000	6000
T4	757	675	19.4	92	4556	5400
T5	800	763	19.9	97	6111	6200
CD	606					

Soil analysis data – Rabi, 2000-01 (Polppully)

Parameters	Value	Class	Rating
pH	6.2	4	Acidic
TSS	0.11	0	Normal
OC (%)	0.21	0	Low
P (kg ha ⁻¹)	6.6	1	Low
K (kg ha ⁻¹)	114	2	Low

Agronomic management trial - Kharif, 2000

District	-	Thrissur
(i) Block	-	Wadakkanchery
Season	-	Kharif 2000
1. Name of farmer	-	Sri. Krishnankutty Parayil House P.O. Akamala Wadakkanchery
Variety	-	Jyothy
Plot size	-	40 m ²
Spacing	-	15 x10 cm
Method of crop establishment-		Direct dry sowing
Date of sowing	-	16.05.2000
Date of harvesting	-	03.09.2000
Duration	-	110 days

Plant protection

Pest/Diseases	Control measures	Date of spraying
Leaf roller	Ekalux	24.06.2000
Leaf roller	Dimecron	02.07.2000
Blast	Hinosan	02.07.2000

Cropping system in the area – Rice-rice- sesame

Previous crop in the experiment field - Sesame

Soil analysis

Parameters	Value	Rating	Class
PH	4.9	Acidic	2
TSS	0.12	Low	0
OC (%)	0.21	Low	1
P(kg ha ⁻¹)	10.75	Medium	3
K (kg ha ⁻¹)	140	Medium	3

Yield and field attributes

Treatments	No. of panicles/ sq. m	Panicle length (cm)	Grain yield (kg ha ⁻¹)	Straw yield (kg ha ⁻¹)
T1	348	20.5	2600	2938
T2	336	21.4	2800	2625
T3	324	22.0	3100	2438
T4	332	20.9	3000	2500
T5	396	21.1	3300	2500

2. Name of farmer - Smt. Santhakumari
Parayil House
Akamala
Wadakanchery.

Season - Kharif, 2000

Variety - Jyothy

Plot size - 40 m²

Spacing - 15 x10 cm

Method of crop establishment- Direct dry sowing

Date of sowing - 14.05.2000

Date of harvesting - 03.09.2000

Duration - 111 days

Plant protection

Pest/Disease	Control measures	Date of control
Leaf roller	Ekalux	24.06.2000
Leaf roller	Dimecron	02.07.2000
Blast	Hinosan	02.07.2000

Soil analysis

Parameters	Value	Rating	Class
PH	5.0	Acidic	2
TSS	0.15	Low	0
OC(%)	0.27	Low	1
P(kg ha ⁻¹)	11.0	Medium	3
K(kg ha ⁻¹)	148	Medium	3

Yield and yield attributes

Treatments	No. of panicles/ sq. m	Panicle Length (cm)	Grain yield (kg ha ⁻¹)	Straw yield (kg ha ⁻¹)
T1	340	19.7	2700	3063
T2	336	20.6	2950	2750
T3	328	21.5	3300	2563
T4	344	21.2	3300	2875
T5	396	21.8	3400	2563

3. Name of farmer - Sri. Sasidharan
Parayil House
Akamala
Wadakanchery.

Season - Kharif, 2000
Variety - Jyothy
Plot size - 40 m²
Spacing - 15 x10 cm
Method of crop establishment- Direct dry sowing
Date of sowing - 15.05.2000
Date of harvesting - 09.09.2000
Duration - 119 days

Plant protection

Pest/Disease	Control measures	Date of control
Leaf roller	Ekalux	24.06.2000
Leaf roller	Dimecron	02.07.2000
Blast	Hinosan	02.07.2000

Cropping system in the area – Rice-rice-sesame

Soil analysis

Parameters	Value	Rating	Class
PH	5.3	Acidic	2
TSS	0.15	Low	0
OC (%)	0.28	Low	1
P (Kg ha ⁻¹)	11.5	Medium	3
K (kg ha ⁻¹)	15.2	Medium	3

Yield and yield attributes

Treatments	No. of panicles/ sq. m	Panicle length (cm)	Grain yield (kg ha ⁻¹)	Straw yield (kg ha ⁻¹)
T1	340	20.1	2425	2950
T2	365	21.0	2875	3050
T3	368	21.8	3200	2500
T4	338	21.0	3250	2685
T5	396	21.5	3475	2650

Season: Rabi, 2000

1. Name of farmer - Smt. Vijayalakshmi
Parayil Bhavan
Akamala
Wadakanchery

Season - Rabi, 2000

Variety - Jyothy

Plot size - 40 m²

Spacing - 20 x 15cm

Method of crop establishment - Transplanting

Date of sowing - 28.08.2000

Date of transplanting - 1.10.2000

Date of harvesting - 20.12.2000

Duration - 113 days

**Plant protection**

Disease	Control measures	Date of control
Blast	Hinosan	06.10.2000
Blast	Hinosan	16.10.2000
Blast	Control	04.11.2000

Pre-experiment soil analysis

Parameters	Value	Rating	Class
pH	5.7	Acidic	4
TSS	0.1	Normal	0
OC (%)	0.18	Low	1
P (kg ha ⁻¹)	6.7	Low	2
K (kg ha ⁻¹)	125	Medium	3

Yield and yield attributes

Treatments	No. of tillers at maturity/ sq. m	No. of panicles/ sq. m.	Length of panicles (cm)	Grain yield (kg ha ⁻¹)	Straw yield (kg ha ⁻¹)
T1	267	251	17.5	2375	3250
T2	324	258	16.9	3000	3375
T3	378	357	16.8	3500	5625
T4	449	374	15.7	2875	4250
T5	378	361	16.4	3375	6000

2. Name of farmer - Sri. Ramachandran .P.
Parayil House
Wadakkanchery

Season - Rabi, 2000
Variety - Jyothy
Plot size - 40 m²
Spacing - 20 x 15cm
Method of crop establishment - Transplanting
Date of sowing - 25.08.2000
Date of transplanting - 28.09.2000
Date of harvesting - 18.12.2000
Duration - 112 days

Plant protection

Disease	Control measures	Date of control
Blast	Hinosan	06.10.2000
Blast	Hinosan	16.10.2000
Blast	Contaf	04.11.2000

Pre-experiment soil analysis

Parameters	Value	Rating	Class
pH	5.6	Acidic	4
TSS	0.1	Normal	0
OC (%)	0.21	Low	1
P (kg ha ⁻¹)	4.5	Low	1
K(kg ha ⁻¹)	130	Medium	3

Yield and yield attributes

Treatments	No. of tillers at maturity/ sq. m	No. of Panicles/ sq. m	Length of panicle (cm)	Grain yield (kg ha ⁻¹)	Straw yield (kg ha ⁻¹)
T1	387	304	18.2	22 50	3125
T2	366	281	17.3	2875	3250
T3	348	334	16.0	3375	5250
T4	387	365	15.5	2750	4125
T5	361	352	16.4	3250	5750

3. Name of farmer - Sri. Sasidharan
Parayil House
Akamala
Wadakkanchery

Season - Rabi, 2000

Variety - Jyothy

Plot size - 40 m²

Spacing - 20 x 15 cm

Date of sowing - 28.08.2000

Date of transplanting - 25.09.2000

Date of harvesting - 24.12.2000

Duration - 118 days

Plant protection

Pest/disease	Control measures	Date of application
Blast	Hinosan	05.10.2000
Leaf roller	Dimecron	10.10.2000
Blast	Contaf	02.11.2000

Pre experiment soil analysis

Parameters	Value	Rating	Class
pH	5.6	Acidic	4
TSS	0.1	Normal	0
OC (%)	0.46	Low	2
P (kg ha ⁻¹)	11.9	Medium	3
K (kg ha ⁻¹)	325	High	8

Yield and yield attributes

Treatments	No. of tillers at maturity/ sq. m	No. of panicles/ sq. m.	Length of panicle (cm)	Grain yield (kg ha ⁻¹)	Straw yield (kg ha ⁻¹)
T1	331	313	17.8	3300	2940
T2	349	331	17.5	3150	3010
T3	396	378	18.3	3524	3220
T4	317	290	18.6	3150	3040
T5	400	370	20.7	3450	3150

4. Name of farmer - Smt. Pushpalatha
Parayil House
Akamala
- Season - Rabi, 2000
- Variety - Jyothy
- Plot size - 40 m²
- Spacing - 20 x 15 cm
- Date of sowing - 26.08.2000
- Date of transplanting - 23.09.2000
- Date of harvesting - 22.12.2000
- Duration - 118 days

Plant protection

Pest/disease	Control measures	Date of application
Blast	Hinosan	05.10.2000
Leaf roller	Dimecron	10.10.2000
Blast	Contaf	02.11.2000

Soil analysis

Parameters	Value	Rating	Class
PH	5.9	Acidic	4
TSS	0.1	Normal	0
OC (%)	0.28	Low	1
P (kg ha ⁻¹)	2.20	Low	0
K(kg ha ⁻¹)	325	High	8

Yield and yield attributes

Treatments	No. of tillers at maturity/ sq. m	No. of panicles/ sq. m	Length of panicles (cm)	Grain yield (kg ha ⁻¹)	Straw yield (kg ha ⁻¹)
T1	320	285	18.1	3150	2800
T2	368	334	18.3	3074	2940
T3	378	365	18.4	3450	3080
T4	356	348	18.1	3074	2940
T5	414	409	18.2	3374	3080

Yield and yield attributes

Treatments	Kharif, 2000				Rabi, 2000				
	No. of panicles/sq.m	Panicle length (cm)	Grain yield (kg ha ⁻¹)	Straw yield (kg ha ⁻¹)	Total tillers/sq.m	No. of panicles/sq.m	Panicle length (cm)	Grain yield (kg ha ⁻¹)	Straw yield (kg ha ⁻¹)
T1	343	20.1	2575	2984	326	288	17.9	2769	3029
T2	346	21.0	2875	2808	352	301	17.5	3025	3144
T3	340	21.8	3200	2500	375	359	17.4	3462	4294
T4	338	21.0	3183	2670	377	332	17.0	2962	3589
T5	396	21.5	3392	2571	388	373	18.0	3362	4495
CD (0.05)	170								

Soil analysis data - Wakakkanchery

Parameters	Kharif, 2000		
	Value	Class	Rating
pH	5.1	2	Acidic
TSS	0.14	0	Normal
OC	0.25	1	Low
P	11.1	2	Low
K	147	3	Medium

Parameters	Rabi, 2000-01		
	Value	Class	Rating
pH	5.7	3	Acidic
TSS	0.1	0	Normal
OC	0.28	1	Low
P	6.3	1	Low
K	226	4	Medium

Agronomic management trial

Block	-	Puzhakkal
Panchayath	-	Adat
Season	-	Rabi, 2000
Cropping system	-	Water fallow-rice fallow
Variety	-	Jyothy
1 Name of farmer	-	Sri. Kunjukuttan Kolangaraparambil Chittilappilly.
Spacing	-	15 x 10 cm
Plot size	-	40 m ²
Method of crop establishment	-	Transplanting
Date of sowing	-	2-9-2000
Date of planting	-	29-9-2000
Date of harvesting	-	26-12-2000
Duration	-	115 days

Plant protection

Pest/disease	Control measures	Date of spraying
Leaf roller	Dimocron	11-10-2000
Stem borer	Dimacron	21-10-2000
Blast	Hinosan	13-11-2000

Soil analysis

Parameters	Value	Rating	Class
pH	5.3	Acidic	3
TSS	0.1	Normal	0
OC(%)	0.21	Low	1
P (kg ha ⁻¹)	15.7	Medium	4
K (kg ha ⁻¹)	115	Low	2

Yield and Yield attributers

Treatment	Total tillers/ m ²	No. of panicles/ sq. m	Panicle length (cm)	Grain yield (kg ha ⁻¹)	Straw yield (kg ha ⁻¹)
T1	484	440	18.2	4000	5000
T2	484	440	18.5	6000	6250
T3	484	396	19.3	6000	6250
T4	572	440	18.7	5000	4375
T5	660	484	20.4	5000	5000

2. Name of farmer	- Sri. Asokan, Kolangaraparambil Chittilappilly.
Season	- Rabi, 2000
Spacing	- 15 x 10 cm
Plot size	- 40 m ²
Method of crop establishment	- Transplanting
Date of sowing	- 4-9-2000
Date of planting	- 30-9-2000
Date of harvesting	- 26-12-2000
Duration	- 113 days

Plant protection

Pest/disease	Control measures	Date of spraying
Leaf roller	Dimecron	11-10-2000
Stem borer	Dimecron	21-10-2000
Blast	Hinosan	13-11-2000

Soil analysis

Parameters	Value	Rating	Class
pH	5.3	Acidic	3
TSS	0.11	Low	0
OC (%)	0.21	Low	1
P (kg ha ⁻¹)	15.2	Medium	4
K (kg ha ⁻¹)	113	Low	2

Yield and Yield attributes

Treatment	Total tillers/ m ²	No. of panicles/ sq. m	Panicle length (cm)	Grain yield (kg ha ⁻¹)	Straw yield (kg ha ⁻¹)
T1	484	440	18.4	4000	3750
T2	528	440	19.4	4000	3725
T3	528	480	19.3	5000	5625
T4	528	490	18.3	5000	5000
T5	572	540	19.1	6000	6250

3. Name of farmer	-	Sri. A.V. Jose Akkaraparambil Puranattukara.
Season	-	Rabi, 2000
Spacing	-	15 x 10 cm
Plot size	-	40 m ²
Method and crop establishment	-	Transplanting
Date of sowing	-	28-8-2000
Date of planting	-	18-9-2000
Date of harvesting	-	16.12.2000
Date of harvesting	-	109 days

Plant protection

Pest/disease	Control measures	Date of spraying
Leaf roller	Malathion	13.10.2000
Sheath blight	Contaf	30-10-2000
Rice bug	Metacid	5-12-2000

Pre experiment soil analysis

Parameters	Value	Rating	Class
pH	5.4	Acidic	3
TSS	0.1	Normal	0
OC (%)	0.28	Low	1
P (kg ha ⁻¹)	9.0	Low	2
K (kg ha ⁻¹)	100	Low	2

Yield and Yield attributes

Treatment	Total tillers/ m ²	No. of panicles/ sq. m	Panicle length (cm)	Grain yield (kg ha ⁻¹)	Straw yield (kg ha ⁻¹)
T1	440	308	18.1	4125	4200
T2	440	440	19.0	4500	4550
T3	572	528	18.4	5625	4025
T4	484	440	18.1	3750	4725
T5	396	396	20.5	4125	4200

4. Name of farmer	-	Smt. Mariamma Akkaraparambil House Puranattukara
Season	-	Rabi, 2000
Spacing	-	15 x 10cm
Plot size	-	40 m ²
Method of crop establishment	-	Transplanting
Date of sowing	-	28-8-2000
Date of planting	-	19.9.2000
Date of harvesting	-	17-12-2000
Duration	-	110 days

Plant protection

Pest/disease	Control measures	Date of spraying
Leaf roller	Malathion	13.10.2000
Sheath blight	Contaf	30-10-2000
Rice bug	Metacid	25-11.2000

Soil analysis

Parameters	Value	Rating	Class
pH	5.2	Acidic	3
TSS	0.11	Normal	0
OC (%)	0.25	Low	1
P (kg ha ⁻¹)	9.2	Low	2
K (kg ha ⁻¹)	109	Low	2

Yield and Yield attributes

Treatment	Total tillers/ m ²	No. of panicles/ sq. m	Panicle length (cm)	Grain yield (kg ha ⁻¹)	Straw yield (kg ha ⁻¹)
T1	396	352	18.2	4125	4375
T2	428	396	18.7	3750	3850
T3	512	484	18.9	4500	2975
T4	352	308	18.5	3375	4300
T5	308	264	19.2	5250	3325

Yield and yield attributes at Adat in Puzhakkal block during Rabi, 2000

Treatments	Total tillers/sq.m.	No. of panicles/ sq.m.	Length of panicle (cm)	Grain yield (kg ha ⁻¹)	Straw yield (kg ha ⁻¹)
T1	451	385	18.2	4063	4331
T2	470	429	18.9	4563	4594
T3	524	472	19.0	4781	4719
T4	484	420	18.4	4281	4600
T5	484	421	19.8	5094	4694
CD (0.05)	1046				

Soil Analysis Data – Adat-Rabi-2000-01

Parameters	Value	Class	Rating
pH	5.3	3	Acidic
TSS	0.11	0	Normal
OC(%)	0.24	0	Low
P(kg ha ⁻¹)	12.3	3	Medium
K(kg ha ⁻¹)	110	2	Low

Agronomic management trial

District	-	Ernakulam
(i) Block	-	Koovappady
Panchayat	-	Rayamangalam
Cropping system		Rice-Rice-Rice
Season	-	Kharif, 2000
Variety	-	Jyothy
1. Name of farmer	-	Sri. P. Krishna Panicker Jyothis Pulluvazhy
Spacing	-	15 x 10 cm
Plot size	-	40 m ²
Crop establishment	-	Transplanting
Date of sowing	-	02.06.2000
Date of planting	-	27.06.2000
Date of harvesting	-	28.09.2000
Duration	-	119 days
Plant protection	-	Nil

Soil analysis

Parameters	Value	Rating	Class
pH	5.3	Acidic	3
TSS	0.16	Normal	0
OC (%)	0.53	Medium	3
P (kg ha ⁻¹)	21.50	Medium	6
K (kg ha ⁻¹)	100	Low	2

Yield and yield attributes

Treatments	Total tillers/ m ²	No. of panicles/ sq. m	Panicle length (cm)	Grain yield (kg ha ⁻¹)	Straw yield (kg ha ⁻¹)
T1	409	389	19.7	3640	3713
T2	429	412	19.2	3680	4095
T3	337	310	19.1	2600	3983
T4	403	343	20.3	3660	4073
T5	337	277	19.8	3600	3960

2. Name of farmer	-	Smt. Bhagyalakshmi, Jyothis Pulluvazhy
Spacing	-	15 x 10 cm
Plot size	-	40 m ²
Crop establishment	-	Transplanting
Date of sowing	-	02.06.2000
Date of planting	-	27.06.2000
Date of harvesting	-	28.09.2000
Duration	-	119 days
Plant protection	-	Nil

Soil analysis

Parameters	Value	Rating	Class
pH	5.2	Acidic	3
TSS	0.15	Normal	0
OC (%)	0.48	Medium	3
P (kg ha ⁻¹)	22.0	Medium	6
K (kg ha ⁻¹)	130	Medium	3

Yield and Yield attributers

Treatments	Total tillers/ m ²	No. of panicles/ sq. m	Panicle length (cm)	Grain yield (kg ha ⁻¹)	Straw yield (kg ha ⁻¹)
T1	236	208	18.9	3164	4275
T2	242	204	19.7	3120	3770
T3	284	264	19.7	2480	4005
T4	396	310	19.2	3000	4023
T5	343	290	19.4	3200	3938

3. Name of farmer	-	K.P. Varkey Kavattu House Rayamangalam
Spacing	-	15 x 10 cm ²
Plot size	-	40 m ²
Date of sowing	-	09.06.2000

Date of planting	-	30.06.2000
Date of harvesting	-	02.10.2000
Duration	-	115 days

Plant protection

Sheath blight – Bavistin was sprayed on 27.07.2000

Soil analysis

Parameters	Value	Rating	Class
pH	5.6	Acidic	4
TSS	0.24	Normal	1
OC (%)	0.53	Medium	3
P (kg ha ⁻¹)	21.95	Medium	6
K (kg ha ⁻¹)	340	High	8

Yield and Yield attributes

Treatment	Total tillers/ m ²	No. of panicles/ sq. m	Panicle length (cm)	Grain yield (kg ha ⁻¹)	Straw yield (kg ha ⁻¹)
T1	268	245	19.0	3150	3500
T2	348	342	18.8	3400	3725
T3	325	275	18.0	2600	3500
T4	368	352	19.6	3200	3775
T5	348	341	19.1	3400	3950

4. Name of farmer	-	Sri. K.P. George, Kavattu House Rayamangalam.
Spacing	-	15 x 10cm
Pot size	-	40 m ²
Date of sowing	-	06.06.2000
Date of planting	-	28.06.2000
Date of harvesting	-	30.09.2000
Duration	-	115 days

Plant protection

Sheath blight – Bavistin was sprayed on 24.07.2000

Soil analysis

Parameters	Value	Rating	Class
PH	5.3	Acidic	4
TSS	0.21	Normal	1
OC (%)	0.48	Medium	3
P (kg ha ⁻¹)	20.8	Medium	6
K (kg ha ⁻¹)	335	High	8

Yield and Yield attributes

Treatments	Total tillers/ m ²	No. of panicles/ sq. m	Panicle length (cm)	Grain yield (kg ha ⁻¹)	Straw yield (kg ha ⁻¹)
T1	308	285	18.6	3075	3825
T2	325	308	19.2	3500	3650
T3	261	255	18.3	2800	3450
T4	302	358	19.0	3000	3600
T5	335	368	19.1	3200	3825

Agronomic management trial, Rabi, 2000

Block	-	Kovappady
Panchayat	-	Rayamangalam
Season	-	Rabi, 2000
Cropping system in the area	-	Rice-rice-rice
Variety	-	Jyothy
1. Name of farmer	-	Sri. K. P. Varkey Kavattu House Rayamangalam
Spacing	-	15 x 10 cm
Plot size	-	40 m ²
Date of sowing	-	07.10.2000
Date of Planting	-	04.11.2001
Date of Harvesting	-	18.01.2001
Duration	-	103 days

Plant protection

Test/disease	Control measure	Date of spraying
Leaf spot	Hinosan	30.11.2000

Soil analysis

Parameters	Value	Rating	Class
pH	5.3	Acidic	3
TSS	0.1	Normal	0
OC (%)	0.56	Medium	3
P (kg ha ⁻¹)	3.40	Low	1
K (kg ha ⁻¹)	105	Low	2

Yield and Yield attributes

Treatment	Total tillers/ m ²	No. of panicles/ sq. m	Panicle length (cm)	Grain yield (kg ha ⁻¹)	Straw yield (kg ha ⁻¹)
T1	462	396	15.8	1550	2880
T2	469	429	15.4	2600	3120
T3	416	376	15.3	1650	2640
T4	383	350	16.2	1700	2920
T5	436	403	16.6	2500	3020

2. Name of farmer - Sri. K.P. George
Kavattu House,
Rayamangalam

Spacing - 15 x 10 cm

Plot size - 40 m²

Date of sowing - 8-10-2000

Date of planting - 5-11-2000

Date of harvesting - 18.01.2001

Duration - 104 days

Plant protection

Disease	Control measures	Date of spraying
Leaf spot	Hinosan	30.11.2000

Soil analysis

Parameters	Value	Rating	Class
pH	5.2	Acidic	3
TSS	0.11	Normal	0
OC (%)	0.52	Medium	3
P(kg ha ⁻¹)	4.10	Low	1
K(kg ha ⁻¹)	101	Low	2

Yield and Yield attributes

Treatments	Total tillers/ m ²	No. of panicles/ sq. m	Panicle length (cm)	Grain yield (kg ha ⁻¹)	Straw yield (kg ha ⁻¹)
T1	343	310	16.2	1600	2800
T2	502	462	15.6	2450	3040
T3	270	251	15.6	1600	2640
T4	336	330	16.6	1650	2800
T5	323	297	16.6	2250	3040

3. Name of farmer	-	Sri. P. Krishana Panicker Jyothis Pulluvazhy
Spacing	-	15 x 10 cm
Plot size	-	40 m ²
Date of sowing	-	25-9-2000
Date of planting	-	26-10-2000
Date of harvesting	-	15-1-2001
Duration	-	112 days
Plant Protection	-	Nil

Soil analysis

Parameters	Value	Rating	Class
PH	5.5	Acidic	3
TSS	0.1	Normal	0
OC (%)	0.49	Low	2
P (kg ha ⁻¹)	6.7	Low	2
K (kg ha ⁻¹)	110	Low	2

Yield and Yield attributes

Treatments	Total tillers/ m ²	No. of panicles/ sq. m	Panicle length (cm)	Grain yield (kg ha ⁻¹)	Straw yield (kg ha ⁻¹)
T1	429	350	17.3	1800	1600
T2	475	416	17.6	2100	1680
T3	449	363	17.7	2250	1800
T4	337	284	17.0	2450	1800
T5	383	310	17.8	2500	2000

4. Name of farmer	-	Smt. Bhagyalakshmi Jyothis Pulluvazhy
Spacing	-	15 x 10 cm
Plot size	-	40 m ²
Date of sowing	-	25-9-2000
Date of planting	-	27-10-2000
Date of harvest	-	12-1-2001
Duration	-	109 days
Plant protection	-	Nil

Soil analysis

Parameters	Value	Rating	Class
PH	5.4	Acidic	3
TSS	0.12	Normal	0
OC (%)	0.51	Low	2
P (kg ha ⁻¹)	6.9	Low	2
K (kg ha ⁻¹)	108	Low	2

Yield and Yield attributes

Treatments	Total tillers/ m ²	No. of panicles/ sq. m	Panicle length (cm)	Grain yield (kg ha ⁻¹)	Straw yield (kg ha ⁻¹)
T1	495	429	17.9	1900	1680
T2	508	459	17.9	2150	1800
T3	436	370	17.6	2200	1760
T4	330	271	15.4	2250	1840
T5	389	277	17.5	2350	2240

Yield and yield attributes (Rayamangalam)

Treat-ments	Kharif, 2000					Rabi, 2000				
	Total tillers/ sq.m	No. of panicle/ sq.m	Panicle length (cm)	Grain yield (kg ha ⁻¹)	Straw yield (kg ha ⁻¹)	Total tillers/ sq.m	No. of panicle/ sq.m	Panicle length (cm)	Grain yield (kg ha ⁻¹)	Straw yield (kg ha ⁻¹)
T1	305	282	19.1	3257	3828	432	371	16.8	1713	2240
T2	336	317	19.2	3425	3810	489	442	16.6	2575	2410
T3	302	276	18.8	2620	3735	393	340	16.6	2175	2230
T4	367	341	19.5	3215	3868	347	309	16.3	2013	2340
T5	341	319	19.4	3350	3918	383	322	17.1	2400	2575
CD	234								402	

Parameters	Kharif, 2000		
	Value	Class	Rating
pH	5.4	3	Acidic
TSS	0.19	0	Normal
OC	0.51	2	Low
P	21.6	5	Medium
K	226	5	Medium

Parameters	Rabi, 2000-01		
	Value	Class	Rating
pH	5.4	3	Acidic
TSS	0.11	0	Normal
OC	0.52	2	Low
P	5.3	1	Low
K	106	2	Low

Agronomic management trial

District	-	Ernakulam
Block	-	Muvattupuzha
Panchayath	-	Paipra
Season	-	Kharif, 2000
Cropping system in the area	-	Rice-rice-fallow
Variety	-	Jyothy
1. Name of farmer	-	Sri. T.K. Narayanan, Thekkumkattil House Paipara.
Spacing	-	15 x 10cm
Plot size	-	4 0m ²
Date of sowing	-	29-5-2000
Date of planting	-	24-6-2000
Date harvesting	-	23-9-2000
Duration	-	117 days

Plant protection

Pest/Disease	Control measures	Date of spraying
Case worm and stem borer	Ekalux	15.07.2000
Blast and Sheath blight	Kitazin	11.08.2000

Soil analysis

Parameters	Value	Rating	Class
pH	4.9	Acidic	2
TSS	0.06	Normal	0
OC (%)	0.42	Low	2
P (kg ha ⁻¹)	6.27	Low	1
K (kg ha ⁻¹)	110	Low	2

Yield and Yield attributes

Treatments	Total tillers/ m ²	No. of panicles/ sq. m	Panicle length (cm)	Grain yield (kg ha ⁻¹)	Straw yield (kg ha ⁻¹)
T1	683	629	20.9	2825	4275
T2	763	676	19.2	2975	4400
T3	529	442	18.5	2700	3450
T4	609	522	18.9	3150	3500
T5	596	502	18.9	3050	3375

2. Name of farmer	-	Sri. Raghavan Thekkumkattil House Paipra
Spacing	-	15 x 10cm
Plot size	-	40 m ^{2D}
Date of sowing	-	28-5-2000
Date of planting	-	23-6-2000
Date of harvesting	-	20-9-2000
Duration	-	115 days

Plant Protection

Parameters	Control measure	Date of spraying
Case worm and stem borer	Ekalux	15-7-2000
Blast and sheath blight	Kitazin	11-8-2000

Soil analysis

Parameters	Value	Rating	Class
PH	5.0	Acidic	2
TSS	0.05	Normal	0
OC (%)	0.47	Low	2
P (kg ha ⁻¹)	6.30	Low	1
K (kg ha ⁻¹)	115	Low	2

Yield and Yield attributes

Treatments	Total tillers/ m ²	No. of panicles/ sq. m	Panicle length (cm)	Grain yield (kg ha ⁻¹)	Straw yield (kg ha ⁻¹)
T1	629	502	19.0	2825	4275
T2	730	676	19.1	2975	4400
T3	542	422	18.8	2700	3450
T4	797	730	18.9	3150	3500
T5	636	542	18.6	3050	3375

3. Name of Farmer - Sri. A.E. Gopalan
Alappat House
Paipara

Spacing - 15 x 10 cm
Plot size - 40 m²
Mode of crop establishment - Transplanting
Date of sowing - 05.06.2000
Date of planting - 30.06.2000
Date of harvesting - 30.09.2000
Duration - 117 days

Plant protection

Pest/disease	Control measures	Date of spraying
Case worm & thrips	Ekalux	14.07.2000
Stem borer	Dimecron	23.07.2000
Leaf roller	Nuvacron	09.08.2000
Blast	Hinosan	14.07.2000
Blast	Kitazin	23.07.2000
Blast	Kitazin	09.08.2000

Soil analysis

Parameters	Value	Rating	Class
pH	5.40	Acidic	3
TSS	0.06	Normal	0
OC(%)	0.53	Medium	3
P (kg ha ⁻¹)	13.22	Medium	3
K (kg ha ⁻¹)	100	Low	2

Yield and Yield attributes

Treatment	Total tillers m ²	No. of panicles/ sq. m	Panicle length (cm)	Grain yield (kg ha ⁻¹)	Straw yield (kg ha ⁻¹)
T1	690	603	16.9	2625	3200
T2	616	549	17.4	2700	2900
T3	475	448	16.9	2450	3300
T4	509	448	17.9	2900	3600
T5	422	382	17.1	2825	3100

4. Name of Farmer - Sri. A.E. Gopalan
Alappat House
Paipara

Spacing - 15 x 10 cm

Plot size - 40 m²

Mode of crop establishment - Transplanting

Date of sowing - 06.06.2000

Date of planting - 30.06.2000

Date of harvesting - 25.06.2000

Duration - 113 days

Plant protection

Pest/disease	Control measures	Date of spraying
Case worm & thrips	Ekalux	14.07.2000
Stem borer	Dimecron	23.07.2000
Leaf roller	Nuvacron	09.08.2000
Blast	Hinosan	14.07.2000
Blast	Kitazin	23.07.2000
Blast	Kitazin	09.08.2000

Soil analysis

Parameters	Value	Rating	Class
pH	5.4	Acidic	3
TSS	0.07	Normal	0
OC(%)	0.60	Medium	3
P (kg ha ⁻¹)	13.50	Medium	3
K (kg ha ⁻¹)	103	Low	2

Yield and Yield attributers

Treatment	Total tillers m ²	No. of panicles/ sq. m	Panicle length (cm)	Grain yield (kg ha ⁻¹)	Straw yield (kg ha ⁻¹)
T1	683	609	16.9	2625	3600
T2	603	529	16.6	2525	3400
T3	428	408	17.6	3000	3200
T4	452	435	16.8	3100	3200
T5	549	523	16.9	2775	3300

Agronomic management trials

Block	-	Muvattupuzha
Panchayat	-	Paipra
Season	-	Rabi – 2000
Variety	-	Jyothy
1. Name of farmer	-	Sri. Raju Jacob Chelattu House Oliyapuram
Spacing	-	15 x 10 cm
Plot size	-	40 m ²
Date of sowing	-	17.09.2000
Date of planting	-	19.10.2000
Date of harvesting	-	12.01.2001
Duration	-	117 days

Plant protection

Pest/disease	Control measures	Date of spraying
Stem borer	Dimecron	14.11.2000
Leaf roller	Dimecron	01.12.2000
Rice bug	Metacid	19.12.2000

Soil analysis

Parameters	Value	Rating	Class
pH	5.60	Acidic	3
TSS	0.10	Normal	0
OC(%)	0.21	Low	1
P (kg ha ⁻¹)	5.60	Low	1
K (kg ha ⁻¹)	90.0	Low	2

Yield and Yield attributes

Treatment	Total tillers/ m ²	No. of panicles/ sq. m	Panicle length (cm)	Grain yield (kg ha ⁻¹)	Straw yield (kg ha ⁻¹)
T1	620	574	18.2	2600	3325
T2	706	554	18.0	2400	2800
T3	607	435	18.0	2000	2625
T4	574	402	18.4	2100	2800
T5	640	468	18.0	3200	2800

2. Name of farmer - Sri. Joseph
Chelattu House
Oliyapuram

Spacing - 15 x 10 cm

Plot size - 40 m²

Date of sowing - 18.09.2000

Date of planting - 20.10.2000

Date of harvesting - 12.01.2001

Duration - 116 days

Plant protection

Pest/disease	Control measures	Date of spraying
Stem borer	Dimecron	14.11.2000
Leaf roller	Dimecron	01.12.2000
Rice bug	Metacid	19.12.2000

Soil analysis

Parameters	Value	Rating	Class
pH	5.30	Acidic	3
TSS	0.10	Normal	2
OC (%)	0.22	Low	1
P (kg ha ⁻¹)	4.90	Low	1
K (kg ha ⁻¹)	90.0	Low	2

Yield and Yield attributes

Treatment	Total tillers/ m ²	No. of panicles/ sq. m	Panicle length (cm)	Grain yield (kg ha ⁻¹)	Straw yield (kg ha ⁻¹)
T1	719	547	18.1	2400	3150
T2	646	455	18.0	2400	2975
T3	600	429	17.7	2200	2800
T4	607	409	18.1	2200	2800
T5	594	422	18.1	2100	3150

3. Name of farmer - Sri. Jacob
Chelattu House
Oliyapuram

Spacing - 15 x 10 cm
Plot size - 40 m²
Date of sowing - 17.09.2000
Date of planting - 19.10.2000
Date of harvesting - 12.01.2001
Duration - 117 days

Plant protection

Pest/disease	Control measures	Date of spraying
Stem borer	Dimecron	14.11.2000
Leaf roller	Dimecron	01.12.2000
Rice bug	Metacid	19.12.2000

Soil analysis

Parameters	Value	Rating	Class
pH	5.30	Acidic	3
TSS	0.12	Normal	0
OC(%)	0.21	Low	1
P (kg ha ⁻¹)	6.00	Low	1
K (kg ha ⁻¹)	92.0	Low	2

Yield and Yield attributes

Treatment	Total tillers/ m ²	No. of panicles/ sq. m	Panicle length (cm)	Grain yield (kg ha ⁻¹)	Straw yield (kg ha ⁻¹)
T1	670	560	18.1	2500	3238
T2	675	500	18.0	2450	2888
T3	610	429	17.8	2100	2713
T4	590	402	18.2	2150	2800
T5	610	445	18.0	2150	2775

Yield and yield attributes (Muvattupuzha Block)

Treat-ments	Kharif, 2000					Rabi, 2000				
	Total tillers/ sq.m	No. of panicle/ sq.m	Panicle length (cm)	Grain yield (kg ha ⁻¹)	Straw yield (kg ha ⁻¹)	Total tillers/ sq.m	No. of panicle/ sq.m	Panicle length (cm)	Grain yield (kg ha ⁻¹)	Straw yield (kg ha ⁻¹)
T1	671	586	18.4	2725	--	670	560	18.1	2500	3238
T2	678	608	18.1	2794	--	676	503	18.0	2417	2888
T3	494	434	18.0	2713	--	606	431	17.8	2100	2713
T4	592	534	18.1	3075	--	590	404	18.2	2150	2800
T5	551	487	17.9	2925	--	615	445	18.0	2483	29.08
CD	258					151				

Parameters	Kharif, 2000		
	Value	Class	Rating
pH	5.2	2	Acidic
TSS	0.06	0	Normal
OC	0.5	2	Low
P	9.82	2	Low
K	107	2	Low

Parameters	Rabi, 2000-01		
	Value	Class	Rating
PH	5.4	3	Acidic
TSS	0.11	0	Normal
OC	0.21	0	Low
P	5.5	1	Low
K	91	1	Low

I. Identification of remunerative tropical vegetables for fringe cropping in paddy field bunds

Objective - To utilize the unproductive bunds of paddy land

Treatments

Crops	Varieties
Cowpea	Pusa Phalguni
	GC-3
	V-240
	Pusa Komal
	Kanakamani
	VS-389
Black gram	T-9
Bhindi	Arka Anamika
	Salkeerthi

Plot size - Field bunds of 30 m length

Locations - Vadakkenchery - Alathur block
 Polppully - Kollengode block
 Wadakkanchery - Wadakkanchery block

Season - Kharif, 2000

Results

Among the crops tested, black gram was found most remunerative with a net profit of Rs.3.18 per metre of field bund and Rs.1431/- per hectare of paddy field. This was followed by cowpea and among different cowpea varieties, VS-389 recorded highest yield (0.644 kg m^{-1}). This cowpea variety was well accepted by farmers due to its better palatability and market preference. Highest benefit cost ratio was recorded in VS 389 (3.29). Fringe cropping with pulses will increase the protein consumption of the farm families. This will provide family labour especially the engagement of women in the family.

Table: Mean yield and economics of fringe cropping in paddy field

Crops	Varieties	Yield (kg m ⁻¹)	Gross return (Rs. m ⁻¹)	Cost of production (Rs. m ⁻¹)	Net return (Rs. m ⁻¹)	B:C ratio	Net income/ha of paddy field (Rs.)	Duration of crop (days)
Cowpea	Pusa Phalguni	0.351	2.11	0.90	1.21	1.34	545	70
	GC-3	0.368	2.21	0.90	1.31	1.46	590	70
	V-240	0.337	2.02	0.90	1.12	1.24	504	70
	Pusa Komal	0.349	2.09	0.90	1.19	1.32	536	82
	Kanakamani	0.556	3.34	0.90	2.44	2.71	1098	90
	VS-389	0.644	3.86	0.90	2.96	3.29	1332	82
Black gram	T-9	0.171 (as pulse)	4.28	1.10	3.18	2.89	1431	95
Bhindi	Arka Anamika	0.31	1.55	1.00	0.55	0.55	248	102
	Salkeerthi	0.458	2.29	1.00	1.29	1.29	581	102

Cowpea – Rs.6/kg, Bhindi – Rs.5/kg, Black gram – Rs.25/kg

It has been estimated that field bunds occupy 7% of the total paddy field in Palakkad district. The average length of bunds per hectare of paddy field comes to about 450 m

-II. Identification of suitable vegetable varieties for Mundakan rice fallows

(a) Varietal trial on okra

Objective

To evaluate different varieties of okra and select the most suitable variety for the location

Treatments

1. Arka Anamika
2. Arka Abhay
3. Salkeerthi
4. Aruna

Design - RBD

Replications - 4

Plot size - 40 m²

Agronomic management practices : As per POP recommendations

Location - Puthucode, Alathur Block

Name of farmers - (1) Sri. K. Govindan
Kodanathu House
South Village
Puthucode

(2) Sri. Jagadeesan
Kayarattu Veedu
Puthucode, Palakkad

Yield of fruits (kg ha⁻¹)

Varieties	R1	R2	R3	R4	Mean
Arka Anamika	3988	3768	3500	3825	3770
Arka Abhay	3810	3500	3375	3300	3496
Salkeerthi	6215	6250	4500	3975	5235
Aruna	5663	6025	3975	3500	4791

The highest yield was recorded for Salkeerthi (5234 kg ha⁻¹) followed by Aruna (4791 kg ha⁻¹). Fruit characters of Salkeerthi and Aruna were appreciated by farmers.

(b) Varietal trial in cowpea (pole type)

Objective

To evaluate different pole type cowpea varieties and find out the most promising variety for Kharif season for different locations.

Treatments - 4 varieties

1. Vyjayanthi
2. Sarika
3. KMV-1
4. VS-90

Design - RBD

Replications - 5

Plot size - 40 m²

Season - Kharif, 2000

Locations - Elthuruth, Puzhakkal block
Puthucode, Alathur block

Name of farmers	Fr. Davis Kachappilly St. Mary's Monastery Elthuruth, Thrissur	Sri. K. Govindan Kodhanattu House South Village Puthucode, Palakkad
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Date of sowing : 26.05.2000

Table Yield of pods (kg ha⁻¹) of different cowpea varieties (pole type)

Varieties	R1	R2	R3	R4	R5	Mean
Vyjayanthi	7670	6350	7218	7738	7988	7393
Sarika	6495	6645	6045	6113	6413	6342
KMV-1	4140	3835	4215	5125	5280	4519
VS-90	3440	3995	3570	5075	5200	4356
CD (0.05)						1049.37

Results

Variety Vyjayanthi gave the highest yield of 7393 kg ha⁻¹ which was significantly superior to the other three varieties. It was followed by Sarika (6342 kg ha⁻¹). Both these varieties were appreciated by farmers.

(c) Varietal trial in cowpea (bush type)

Objective

To evaluate different cowpea (bush type) varieties for kharif season and find out the promising one for the location

Treatments - 6 varieties

T1 - Kanakamani

T2 - Pusa Phalguni

T3 - Pusa Komal

T4 - VS-389

T5 - GC-3

T6 - V-240

Design - RBD

Replications - 3

Plot size - 40 m²

Location - Elavanchery, Nemmara block

Name of farmers	Sri. Somadas Kannankulam Kalam Panangatiri	Sri. Sivadas Gayathri Nivas Thuttipadam Vattekkad .P.O.
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Table. Yield of pods (kg/ha) of different cowpea varieties (bush type)

Treatments	Varieties	R1	R2	R3	Mean
T1	Kanakamani	4167	11467	10365	8666
T2	Pusa Phalguni	4083	7200	7350	6211
T3	Pusa Komal	4133	8700	8400	7078
T4	VS-389	3217	8280	8300	6599
T5	GC-3	2817	7770	7680	6089
T6	V-240	2533	7230	7300	5688
CD					1279

Results

Highest yield was recorded for Kanakamani (8666 kg ha⁻¹) which was significantly superior to all other varieties. This was followed by Pusa Komal (7078 kg ha⁻¹) and then VS-389 (6599 kg ha⁻¹). The other varieties were having grain type characters and lower in yield and hence not appreciated by farmers.

Varieties VS-389, Pusa Komal and Kanakamani were appreciated by farmers. VS-389 was having soft fleshy pods while Kanakamani was liked due to its bold seeds.

(d) Snake gourd

Treatments	-	3 varieties
T1	-	TA 19
T2	-	TA 23
T3	-	Kaumudi

Design	-	RBD
Replications	-	3
Plot size	-	40 m ²
Location	-	Elthuruth, Puzhakkal block
Agronomic management practices	-	As per POP recommendations
Date of sowing	-	09.11.2000
Date of first harvest	-	24.01.2001
Date of final harvest	-	02.04.2001
Name of farmer	-	Fr. Davis Kachappilly St. Mary's Monastery Elthuruth, Thrissur

Yield (kg ha⁻¹) of snake gourd varieties

Varieties	Yield (kg ha ⁻¹)
TA – 23	34,000
TA – 19	28,000
Kaumudi	28,375

Results

Results at Elthuruth recorded highest yield in TA-23 (34,000 kg ha⁻¹). TA-19 and Kaumudi gave more or less equal yield (28,000 kg and 28375 kg ha⁻¹ respectively). TA-23 has the added advantage of having shorter fruits which is preferred in the market. Handling of such fruits is easier as compared to the longer fruits of Kaumudi.

(e) Bittergourd

Treatments	-	3 varieties
T1	-	Priya
T2	-	Preethi
T3	-	Priyanka

Design - RBD
 Replications - 3
 Plot size - 40 m²

Agronomic management practices - As per POP recommendations

Name and address of farmer Fr. Davis Kachappilly
 St. Mary's Monastery
 Elthuruth, Thrissur

Sri. Velayudhan
 Pavizhakkunnil House
 Manalippadam
 Mudappallur

No. of replications - 2 2
 Date of sowing - 09.11.2000 03.11.2000
 Date of first harvest - 22.01.2001 16.01.2001
 Date of final harvest - 28.02.2001 18.02.2001

Yield of bittergourd varieties (kg ha⁻¹) at different locations

Varieties	Yield (kg ha ⁻¹)		
	Elthuruth	Mudappallur	Mean
Priya	6500	7750	7125
Preethi	7250	8000	7625
Priyanka	6625	8875	7750

Results

At Elthuruth highest yield was recorded for the variety Preethi (7250 kg ha⁻¹) while at Mudappallur highest yield was recorded in Priyanka (8875 kg ha⁻¹). Fruit characters of Preethi and Priyanka were more appreciated by farmers and they were having more market demand also.

(f) Pumpkin

Treatments - 2 varieties

1. Suvarna
2. Ambili

Replications - 3
Plot size - 40 m²
Location - Elthuruth, Puzhakkal Block
Name of farmer - Fr. Davis Kachappilly
St. Mary's Monastery
Elthuruth, Thrissur

Agronomic management practices - As per POP recommendations

Date of sowing - 09.11.2000

Date of harvests - 01.03.2001 and 14.03.2001

Yield of pumpkin varieties

Varieties	Yield (kg ha ⁻¹)
Suvarna	24,164 kg ha ⁻¹
Ambili	18,332 kg ha ⁻¹

III. Crop combinations in ashgourd

Objectives:

- (i) to evaluate the productivity of ashgourd when grown along with other vegetables.
- (ii) to find out the most remunerative and viable crop combination in ashgourd.

Treatments

- T1 Ashgourd alone
- T2 Ashgourd + amaranth (sowing and once over harvest)
- T3 Ashgourd + amaranth (transplanting and multicut harvesting)
- T4 Ashgourd + cowpea (Pusa Komal)
- T5 Ashgourd + bhindi (Arka Anamika)
- T6 Ashgourd + chilli (Ujwala)

Design - Split plot design

Replications - 4

Location - Elthuruth

Block - Puzhakkal

Name and address of the farmers - Fr. Davis Kachappilly
St. Mary's Monastery, Elthuruth

Method of planting

All the direct sown intercrops (direct sown amaranth, cowpea and bhindi) were sown along with the sowing of ashgourd. Amaranth and chilli seedlings were transplanted on the same day in which case seedlings were raised previously. All the agronomic management practices were done to individual crops as per POP recommendations.

Results

Results indicated that raising of intercrops did not affect the yield of ashgourd significantly. Monetary benefit was observed by growing intercrops as noted by the increase in gross and net returns. Maximum profit (Rs.71047/ha) was observed in growing transplanted amaranth as intercrop and practising multicut harvesting.

Table: Yield performance of ashgourd and intercrops and gross and net return in ashgourd based cropping system

Treatments	Yield (kg ha ⁻¹)						Gross return (Rs.)	Cost of production (Rs.)	Net return (Rs.)
	Ashgourd	Amaranth (direct sowing)	Amaranth (transplanted)	Cowpea	Bhindi	Chilli			
T1 Ashgourd alone	23996	-	-	-	-	-	71988	30,000	41988
T2 Ashgourd + amaranth (sowing and once over harvest)	23688	6505	-	-	-	-	110094	45,000	65094
T3 Ashgourd + amaranth (transplanting and multicut harvesting)	23629	-	8360	-	-	-	121047	50,000	71047
T4 Ashgourd + cowpea (Pusa Komal)	23755	-	-	2300	-	-	85065	36,000	49065
T5 Ashgourd + bhindi (Arka Anamika)	23684	-	-	-	5395	-	98027	38,000	60027
T6 Ashgourd + Chilli (Ujwala)	23567	-	-	-	-	811	86921	40,000	46921

Sale prices:

Ashgourd – Rs.3/kg, Amaranth – Rs.6/kg, Cowpea – Rs.6/kg, Bhindi – Rs.5/kg and Chilli – Rs.20/kg

IV Identification of suitable crops for summer rice fallow

Year	-	2000-2001
I. Location	-	Adat
Cropping system	-	Water fallow-rice-fallow
Season	-	Summer
Name of farmer	-	Sri. C.R. Jose Chittipappilly House Adat, Thrissur
Design	-	RBD
Replication	-	3
Plot size	-	120 sq m.
Treatments	-	9
Date of sowing	-	22.01.2001

Crop and Variety	Last harvest	Duration (Days)
1. Cowpea (C-152)	16.04.2001	83
2. Cowpea (Kanakamani)	08.04.2001	75
3. Cowpea (GC-3)	12.04.2001	79
4. Blackgram	20.04.2001	87
5. Green gram	--	--
6. Sesame	16.04.2001	83
7. Daincha	20.03.2001	57
8. Kolingi	20.03.2001	57
9. Sunhemp	23.03.2001	60

Table. Plant density of different crops at different periods

Crops	Plant density (No/m ²)				
	5 DAS	10 DAS	15 DAS	20 DAS	30 DAS
1. Cowpea (C-152)	88	102	106	110	100
2. Cowpea (Kanakamani)	50	72	80	88	80
3. Cowpea (GC-3)	76	86	88	92	82
4. Blackgram	16	74	106	108	102
5. Green gram	152	224	230	232	172
6. Sesame	108	176	236	240	140
7. Daincha	206	210	258	260	222
8. Kolingi	40	68	82	88	88
9. Sunhemp	72	70	90	98	88

There was rain on 02.02.2001

Soil moisture

1.	At sowing	-	13.12%
2.	15 DAS	-	8.81%
3.	30 DAS	-	9.24%
4.	45 DAS	-	5.32%
5.	60 DAS	-	8.14% (moisture increased due to water in irrigation canals)

Table Biomass production and yield of different crops

Crops	Biomass at flowering (t ha ⁻¹)		Grain yield (kg ha ⁻¹)
	Wet	Dry	
1. Cowpea (C-152)	12.000	1.840	240
2. Cowpea (Kanakamani)	6.000	1.080	250
3. Cowpea (GC-3)	7.000	1.280	200
4. Blackgram	4.000	0.840	180
5. Green gram	Dried completely at soil moisture of 5.32% (45 DAS)	--	
6. Sesame	17.000	3.560	375
7. Daincha	8.000	1.520	--
8. Kolingi	9.000	2.680	--
9. Sunhemp	12.000	2.920	--

II. Location	-	Wdakkanchery, Thrissur
Cropping system	-	Rice-rice-fallow
Season	-	Summer
Name and address of farmer	-	Sri. Sasidharan, P. Parayil House Akamala, P.O. Enkakkad Wadakkanchery
Design	-	RBD
Replication	-	3
Plot size	-	120 sq m.
Treatments	-	9
Date of sowing	-	01.02.2001

Crop and Variety	Final harvest	Duration (Days)
1. Cowpea (C-152)	20.04.2001	80
2. Cowpea (Kanakamani)	13.04.2001	73
3. Cowpea (GC-3)	13.04.2001	73
4. Blackgram	22.04.2001	82
5. Green gram	22.04.2001	82
6. Sesame	23.04.2001	83
7. Daincha	29.03.2001	57
8. Kolingi	29.03.2001	57
9. Sunhemp	04.04.2001	63

Table Plant density at different period, biomass production and yield of different crops

Crops	Plant density (No/m ²)		Biomass (wet) at flowering (t ha ⁻¹)	Grain yield (kg ha ⁻¹)
	5 DAS	10 DAS		
1. Cowpea (C-152)	24	44	12.5	470.0
2. Cowpea (Kanakamani)	68	72	7.5	470.0
3. Cowpea (GC-3)	72	80	11.3	717.0
4. Blackgram	28	44	4.8	210.0
5. Green gram	116	120	5.6	467.0
6. Sesame	8	56	15.0	433.0
7. Daincha	180	188	8.5	--
8. Kolingi	40	60	6.9	--
9. Sunhemp	160	180	11.2	--

IV. Identification of suitable vegetable varieties for summer rice fallows:

This experiment was laid out at Kavassery in Alathur block. Four farmers co-operated in testing the performance of different varieties of five vegetable crops.

Name and address of farmers

1.	Sri. Kasa Pathanapuram, Kavassery	-	R1
2.	Sri. Krishnan Pathanapuram, Kavassery	-	R2
3.	Sri. Mohammed Cherumcode, Kavassery	-	R3
4.	Sri. Abu Cherumcode, Kavassery	-	R4

Crops and varieties tested

Crop	Varieties
Bittergourd	Priyanka and Preethy
Snakegourd	TA-19, TA-23 and Kaumudi
Amaranth	CO-1, Arun, CO-5, Kannara Local
Bhindi	Arka Anamika, Arka Abhay, Salkeerthi and Aruna
Pumpkin	Ambili, Suvarna

Results

Bittergourd

The yield of bittergourd variety Preethy was highest in all the four trials with a mean yield of 9.72 t ha⁻¹. The average yield of Priyanka was 8.84 t ha⁻¹. Both these varieties had consumer preference in the market.

Snakegourd

The new variety TA-23 out-yielded TA-19 at two locations while TA-19 recorded maximum yield at other two locations. On an average TA-23 gave maximum yield (24.063 t ha⁻¹) and second highest yielder was TA-19 (23.334 t ha⁻¹). The yield of Kaumudi was comparatively low in all the four replications. This variety being a bit late in fruiting, water scarcity occurs towards the end of the cropping season. This can be the reason for lower yield of Kaumudi during this season.

Amaranth

In amaranth the variety CO-1 recorded maximum yield (20.822 t ha⁻¹). There was no significant difference in yield between other varieties tested.

Bhindi

Due to severe jassid attack the experiment failed at two locations. At one location where jassid attack and yellow vein mosaic disease was minimum, maximum yield was recorded in Salkeerthi (17 t ha⁻¹) followed by Arka Anamika (14 t ha⁻¹). In another trial where Salkeerthi and Aruna were affected by yellow vein mosaic disease, the yield of Arka Anamika was maximum (20.75 t ha⁻¹) followed by Arka Abhay (15.5 t ha⁻¹). Hence considering the incidence of yellow vein mosaic disease, the variety Arka Anamika can be recommended for summer season.

Pumpkin

The average yield of both Ambili and Suvarna were almost equal (18.688 t ha⁻¹ and 18.625 t ha⁻¹ respectively). But at two locations the crop loss was heavy due to pumpkin mosaic disease in both the varieties.

Yield performance of different vegetable varieties (yield t ha⁻¹) – Summer 2001, Kavassery

Crops	Varieties	Yield (t ha ⁻¹)					Remarks
		R1	R2	R3	R4	Mean	
Bittergourd	Preethy	10.625	10.000	8.750	9.500	9.720	
	Priyanka	9.625	8.500	8.250	9.000	8.840	
Snakegourd	TA-19	26.460	18.750	17.500	30.625	23.334	
	TA-23	23.750	21.250	25.000	26.250	24.063	
	Kaumudi	20.063	13.500	10.500	17.875	15.485	Late flowering variety water stress affected the crop
Amaranth	CO-1	31.250	18.750	12.500	--	20.833	Due to water scarcity yield in R4 was very low
	CO-5	31.250	13.250	9.000	--	17.833	
	Arun	23.440	15.750	10.000	--	16.397	
	Kannara Local	25.340	16.750	10.800	--	17.630	
Bhindi	Arka Anamika	--	14.000	--	20.750	17.380	Due to jassid attack crop growth and yield was very poor in R1 and R3. Due to YVM, yield was very poor in Salkeerthi and Aruna in R4
	Arka Abhay	--	12.500	--	15.500	14.000	
	Salkeerthi	--	17.000	--	3.000	10.000	
	Aruna	--	11.500	--	5.500	8.500	
Pumpkin	Ambili	--	21.625	15.750	--	18.688	Due to pumpkin mosaic disease the yield was very low in R1 and R4
	Suvarna	--	19.750	17.500	--	18.625	

Package details of demonstration

Crop	:	Sesame (<i>Sesamum indicum</i>)
Seed rate	:	5 kg ha ⁻¹
Variety	:	Kayamkulam-I
Method of sowing	:	Broadcasting, thinning was done at 20 DAS to a spacing of 20 cm between plants
Manures & Fertilizer levels		
FYM	:	5 t ha ⁻¹
NPK	:	30:15:30 kg ha ⁻¹
Schedule of application		
Basal	:	FYM 5 t ha ⁻¹
N	:	22.5 kg ha ⁻¹ as urea
P	:	15 kg ha ⁻¹ as Rock Phosphate
K	:	30 kg ha ⁻¹ as MOP
Top dressing (30 th day) N	:	7.5 kg ha ⁻¹ as urea Foliar spray at 3% concentration at 500 l ha ⁻¹
Biofertilizers	:	Seed treated with Azospirillum @ 1.5 kg ha ⁻¹ mixed with 25 kg dry powered cowdung and broadcasted
Interculture	:	Weed growth was very less and hence no inter-cultural operation was needed
Irrigation	:	15 th day after thinning, and then at 15-20 days interval upto pods beginning to mature
Plant protection	:	Need based
Harvesting	:	Cut the plants above ground level and stacked in bundles for 3-4 days when the leaves started to fall off and the capsules started to turn yellowish. Then it was spread in the sun and beat with sticks to break open the capsules.

II. Crop	-	Ground nut (<i>Arachis hypogea</i>)
Variety	-	CO-2,
Seed rate	-	100 kg ha ⁻¹ kernels
Seed treatment	-	Treated the seeds with Rhizobial culture at 600 g 100 kg ⁻¹ seed
Manures and Fertilizer levels		
Basal	-	FYM at 12.5 t ha ⁻¹
NPK	-	10:75:75 kg ha ⁻¹ as urea, Rajphos and MOP Applied gypsum at 400 kg ha ⁻¹
Irrigation	-	At 15-20 days intervals upto 20 days before harvest
Hoeing, weeding and earthing up	-	30 DAS
Plant protection	-	Need based
Harvesting	-	Harvested by pulling out plants at maturity

Frontline demonstration on oil seeds – 2000-01

Cropping system	-	Rice-groundnut-fallow
Name and address of the farmer	-	Sri. Aruchamy Molanpady House Challappatha, Kozhinjampara
Area	-	0.4 ha
Package details		
Crop	-	Groundnut
Variety		
a. Demonstration variety	-	CO-2
b. Farmers variety	-	Local type
Date of sowing	-	08.01.2001

Abstract on yield and economics of FLD on oil seeds 2000-01

Location	Crop	Yield (kg ha ⁻¹)	Cost of production (Rs. ha ⁻¹)	Gross return (Rs. ha ⁻¹)	Net return (Rs. ha ⁻¹)	B:C ratio
Kozhinjampara, Palakkad Demonstration plot Farmers Practice	Groundnut	1870 (kernel)	9500	29,920	20,420	2.19
		1562 (kernel)	9500	24,992	15,492	1.63
Adat, Thrissur Demonstration plot Farmers practice	Sesame	393 (seeds)	4560	12,576	8016	1.76
		313 (seeds)	4230	10,016	5786	1.37
Akamala, Thrissur Demonstration plot Farmers practice	Sesame	260 (seeds)	3375	8320	4945	1.47
		235 (seeds)	3245	7520	4275	1.32
Paruvassery, Palakkad Demonstration plot Farmers practice	Sesame	355 (seeds)	4320	11,360	7040	1.63
		272 (seeds)	3425	8704	5279	1.55

Date of manures and fertilizers application

Basal	-	8.1.2001
Top dressing	-	12.2.2001
Plant protection	-	Nil
Date of hoeing, weeding and earthing up		15.2.2001
Date of harvest	-	25.4.2001
Duration (days)	-	107 days

Yield and yield attributes

	Demonstration variety (CO-2)	Local variety
Number of pods/plant	17	14
Weight of fresh pods/plant	18 g	15 g
Weight of dry pods/plant	9.8 g	7.7 g
Weight of kernel/plant	6.6 g	5.4 g
Yield (dry pods – kg ha ⁻¹)	2750 kg	2200 kg
Yield (kernel – kg ha ⁻¹)	1870 kg	1562 kg
Cost of production/ha	Rs.9500/-	Rs.9500/-
Gross return/ha	Rs.29920/-	Rs.24992/-
Net return/ha	Rs.20420/-	Rs.15492/-
B:C ratio	2.15	1.63

Cost of kernel – Rs.16/kg

Details of previous crop

Previous crop	-	Rice
Variety	-	Neeraja
Date of sowing	-	20.06.2000
Date of planting	-	25.07.2000

Manures and fertilizers

FYM	-	5 t ha ⁻¹
		NPK @ 50:25:25 kg ha ⁻¹

Date of application		
Basal	-	25.07.2000
Top dressing – 1 st	-	20.08.2000
II nd	-	10.09.2000
Date of harvest	-	23.10.2000
Duration	-	125 days
Grain yield	-	4500 kg ha ⁻¹
Straw yield	-	5550 kg ha ⁻¹
II. Cropping system	-	Water fallow – rice - sesame
Name and address of the farmer	-	Sri. A.V. Jose Akkaraprambil House Adat, Thrissur
Area	-	0.4 ha
Package details		
Crop	-	Sesame
Variety		
a. Demonstration variety	-	Kayamkulam - 1
b. Farmers variety	-	Local
Date of sowing	-	22.01.2001
Date of manures and fertilizers application		
Whole quantity as basal application	-	22.01.2001
Plant protection	-	Nil
Date of harvest	-	28.04.2001
Duration (days)	-	96 days

Yield and yield attributes

	Demonstration variety (CO-2)	Local variety
Height of plant (cm)	80 cm	72 cm
Number of pods/plant	56	45
Weight of dry pods/plant	7.9 g	6.8 g
Yield (kg/ha) of seed	393	313
Cost of production/ha	Rs.4560/-	Rs.4230/-
Gross return/ha	Rs.12,576/-	Rs.10016/-
Net return/ha	Rs.8016/-	Rs.5786/-
B:C ratio	1.76	1.37

Price of 1 kg seed: Rs.32/kg

Details of previous crop

Previous crop	-	Rice
Variety	-	Jyothy
Date of sowing	-	02.09.2000
Date of planting	-	26.09.2000

Manures and fertilizers

FYM	-	5 t ha ⁻¹
		NPK @ 70:35:35 kg ha ⁻¹

Date of application

Basal	-	26.09.2000
Top dressing – 1 st	-	16.10.2000
II nd	-	02.11.2000
Date of harvest	-	27.12.2000
Duration	-	112 days
Grain yield	-	5500 kg ha ⁻¹
Straw yield	-	5200 kg ha ⁻¹

III Cropping system	-	Rice-rice-sesame
Name and address of the farmer	-	Sri. Sasidharan Parayil House Akamala, Wadakkanchery
Area	-	0.4 ha
Package details		
Crop	-	Sesame
Variety		
a. Demonstration variety	-	Kayamkulam - 1
b. Farmers variety	-	Local
Date of sowing	-	01.02.2001
Date of manures and fertilizers application		
Whole quantity as basal application	-	01.02.2001
Plant protection	-	Nil
Date of harvest	-	24.04.2001
Duration (days)	-	83 days

Yield and yield attributes

	Demonstration variety (CO-2)	Local variety
Height of plant (cm)	70 cm	64.6 cm
Number of pods/plant	33	29
Weight of dry pods/plant	5.1 g	4.6 g
Yield (kg/ha) of seeds	260 kg	235 kg
Cost of production/ha	Rs.3375/-	Rs.3245/-
Gross return/ha	Rs.8320/-	Rs.7520/-
Net return/ha	Rs.4945/-	Rs.4275/-
B:C ratio	1.47	1.32

Details of previous crop

Previous crop	Kharif	Rabi
Variety	Kunjukunu	PTB-20
Date of sowing	15.05.2000	02.09.2000
Date of planting	Direct sowing	02.10.2000
Manures and fertilizers		
Quantity – FYM	3 t ha ⁻¹	3 t ha ⁻¹
NPK	90:45:45 kg ha ⁻¹	90:45:45 kg ha ⁻¹
Basal	03.06.2000	02.10.2000
1 st top dressing	20.06.2000	20.10.2000
IInd top dressing	06.07.2000	11.11.2000
Date of harvest	12.09.2000	05.01.2001
Duration	120 days	126 days
Grain yield	3917 kg ha ⁻¹	3225 kg ha ⁻¹
Straw yield	3769 kg ha ⁻¹	3020 kg ha ⁻¹

IV. Cropping system	-	Rice-rice-sesame
Name and address of the farmer	-	Sri. Madhusoodanan Adanchery Veedu Paruvassery, Vadakkanchery
Area	-	0.4 ha
Package details		
Crop	-	Sesame
Variety		
a. Demonstration variety	-	Kayamkulam - 1
b. Farmers variety	-	Local
Date of sowing	-	16.01.2001
Whole quantity as basal application	-	16.01.2001

Plant protection	-	Nil
Date of harvest	-	20.04.2001
Duration (days)	-	94 days

Yield and yield attributes

	Demonstration variety (CO-2)	Local variety
Height of plant (cm)	76 cm	65 cm
Number of pods/plant	48	38
Weight of dry pods/plant	6.8 g	5.9 g
Yield (kg/ha) of seeds	355 kg	272 kg
Cost of production/ha	Rs.4320/-	Rs.3425/-
Gross return/ha	Rs.11,360/-	Rs.8704/-
Net return/ha	Rs.7040/-	Rs.5279/-
B:C ratio	1.63	1.55

Price of 1 kg seed = Rs.32/-

Details of previous crop

	Kharif -----	Rabi -----
Previous crop	Rice	Rice
Variety	Kanchana	Kanchana
Date of sowing	10.05.2000	15.09.2000
Date of planting	Direct sowing	10.10.2000
Manures and fertilizers		
Quantity – FYM	3 t ha ⁻¹	3 t ha ⁻¹
NPK	90:45:45 kg ha ⁻¹	90:45:45 kg ha ⁻¹
Basal	01.06.2000	10.10.2000
I st top dressing	15.06.2000	25.10.2000
II nd top dressing	02.07.2000	15.11.2000
Date of harvest	08.09.2000	12.01.2001
Duration	120 days	119 days
Grain yield	4675 kg ha ⁻¹	4259 kg ha ⁻¹
Straw yield	4925 kg ha ⁻¹	4960 kg ha ⁻¹

V. Cropping system	-	Rice-rice-sesame
Name and address of the farmer	-	Sri. Kannan Pathanapuram Kavassery
Area	-	0.4 ha
Package details		
Crop	-	Sesame
Variety		
a. Demonstration variety	-	Kayamkulam - 1
b. Farmers variety	-	Local type
Date of sowing	-	09.02.2001
Date of manures and fertilizers application	-	Whole quantity applied as basal on 09.02.2001
Plant protection	-	Nil
Date of harvest	-	11.05.2001
Duration (days)	-	92 days

Yield and yield attributes

	Demonstration variety (CO-2)	Local variety
Height of plant (cm)	71.5	64
Number of pods/plant	37.0	28
Weight of dry pods/plant	5.3 g	4.7 g
Yield (kg/ha) of seeds	290 kg	245 kg
Cost of production/ha	Rs.3400/-	Rs.3175/-
Gross return/ha	Rs.9280/-	Rs.7840/-
Net return/ha	Rs.5880/-	Rs.4665/-
B:C ratio	1.73	1.47

Details of previous crop

	Kharif -----	Rabi -----
Previous crop	Rice	Rice
Variety	Kunjukunju	Aiswarya
Date of sowing	11.05.2000	01.10.2000
Date of planting	08.06.2000	22.10.2000
Manures and fertilizers		
Quantity – FYM	2.5 t ha ⁻¹	2.5 t ha ⁻¹
NPK	90:45:45 kg ha ⁻¹	90:45:45 kg ha ⁻¹
Basal	08.06.2000	22.10.2000
I st top dressing	29.06.2000	15.11.2000
II nd top dressing	25.07.2000	06.12.2000
Date of harvest	06.09.2000	28.01.2001
Duration	119 days	120 days
Grain yield	5270 kg ha ⁻¹	4970 kg ha ⁻¹
Straw yield	5360 kg ha ⁻¹	5750 kg ha ⁻¹

Studies on the relative efficiency of SPAD based N management on growth and yield of rice

Objective

To evaluate the nitrogen use efficiency under the various SPAD values and to find out the optimum SPAD threshold value for N application in rice.

The experiment was conducted at Vadakkenchery during kharif 2000.

Treatments

- T1 - No N
- T2 - 70 kg N/ha⁻¹ (recommended N)
- T3 - 70 kg N + 25 kg N at heading
- T4 - 25 kg N basal + 25 kg N at SPAD < 33
- T5 - 25 kg N basal + 25 kg N at SPAD < 35
- T6 - 25 kg N basal + 25 kg N at SPAD < 37

- Design - Randomised block design
- Replication - 3
- Spacing - 15 cm x 10 cm
- Variety - Jyothi
- Plot size - 40 m²

Crop activity Calender

- Location - Vadakkenchery
- Block - Alathur
- Name of farmer - Sri. R.N. Sankaran
Sree Laxmi Nivas
Vadakkenchery
Palakkad
- Method of crop establishment - Direct sowing
- Date of sowing - 30.05.2000
- Date of germination - 05.06.2000

Basal fertilizer application	-	19.06.2000
Ist top dressing in T2 and T3	-	18.07.00 (43 DAS)
IInd top dressing in T2 and T3	-	07.08.00 (63 DAS)
IIIrd top dressing in T3	-	17.08.00 (73 DAS)
Plant protection	-	Nil
Date of harvest	-	30.09.00
Duration	-	118 days
Special information	-	In T6 false smut was severe

Results

Effect of treatments on SPAD values

On 19.06.2000 basal N at the rate of 25 kg ha⁻¹ was applied in all treatments except T1 (control). SPAD was taken on 28.06.2000 (9 days after basal N application). There was no variation in SPAD values between the N treatments. But the SPAD value was significantly lower in control plots at all growth stages. The result was same on 12.07.2000 also. Next N application was on 18.07.00 either as scheduled splits in T2 and T3 or SPAD based N application in other treatments. The observation was taken 7 days after this application (25.07.00). N applied plots did not show any variation in SPAD values. On 25.07.00 N was needed to be applied only in T6. Subsequent observation on 28.07.00 showed that the treatments, 3, 4, 5 and 6 were at par. On 07.08.00 (12 days after top dressing in T6 and 19 days after top dressing in other treatments) also a similar trend was observed. On 07.08.00, 25 kg N each was applied in T2 and T3 (as scheduled) and in T5 and T6 (SPAD based). On 17.08.00 (heading stage) N was applied in T3. When observed on 19.08.00, T6 gave the highest SPAD value which was on par with T5. These two were significantly superior to all other treatments.

Mean SPAD values at different growth stages – var. Jyothy – SPAD based N – Kharif 2000

Treatments	Dates of observations					
	28.06.00 (23 DAS)	12.07.00 (37 DAS)	25.07.00 (50 DAS)	28.07.00 (53 DAS)	07.08.00 (63 DAS)	19.08.00 (75 DAS)
T1	31.7	28.8	28.4	29.2	29.6	28.1
T2	34.2	32.8	34.2	34.2	34.5	32.8
T3	36.9	31.8	35.2	34.8	33.0	34.3
T4	35.6	31.3	36.8	37.5	36.1	34.7
T5	37.5	31.9	35.2	36.3	34.5	37.6
T6	38.2	32.9	36.3	37.5	34.8	37.7
CD(0.05)	3.881	2.344	3.388	3.071	2.696	1.908

Mean LCC values at different growth stages – var. Jyothy – SPAD based N – Kharif 2000

Treatments	Dates of observations					
	28.06.00 (23 DAS)	12.07.00 (37 DAS)	25.07.00 (50 DAS)	28.07.00 (53 DAS)	07.08.00 (63 DAS)	19.08.00 (75 DAS)
T1	3.12	2.83	2.85	2.70	2.83	2.62
T2	3.40	3.27	3.25	3.48	3.45	3.30
T3	3.42	3.33	3.40	3.75	3.40	3.83
T4	3.65	6.22	3.61	3.88	3.53	3.48
T5	3.75	3.25	3.39	3.97	3.62	3.58
T6	3.85	3.45	3.50	3.75	3.55	3.53
CD(0.05)	0.355	0.264	0.336	0.207	0.223	0.310

Effect of treatments on LCC values

LCC values were significantly lower at all growth stages of crops in control. Observations on 28.06.00 and 12.07.00 did not show any significant variation among treatments. On 25.07.00 also the trend was almost same. On 28.07.00, T5 gave the highest value closely followed by and on parity with T4. There was no variation in values on 07.08.00 (12 days after top dressing in T6 and 19 days after top dressing in other treatments). On 19.08.00, T3, T5 and T6 were at par and were higher than other treatments, possibly because T3 received 25 kg N 3 days back and T5 and T6 received 25 kg N 12 days back.

Yield and yield contributing characters

Highest yield (6913 kg ha^{-1}) was observed in T5 (N at SPAD value of 35), but it was on par with T2 (recommended split), T6 (N at SPAD 37) and T3 (recommended split + N at heading).

Grain yield, partial factor productivity (PFP-N) and agronomic efficiency of applied N (AEN) – Jyothy – SPAD based N – Kharif 2000

Treatments	N applied (kg ha^{-1})	Grain yield (q ha^{-1})	PFP-N (grain kg/N)	AEN (grain kg/N)
T1	0	42.80	--	--
T2	75	68.20	90.93	33.87
T3	100	66.27	66.27	23.47
T4	50	58.67	117.34	31.74
T5	75	69.13	92.17	35.11
T6	100	66.93	66.93	24.13

Considering the yield, AEN, T5 was found best. In T5 N application was based on SPAD threshold value of 35. Although the other N treatments (T2, T3 and T6) gave a yield on parity with T5, the yield and N use efficiency were comparatively low. The results revealed that for kharif rice SPAD value of 35 can be taken as the threshold value for N top dressing.

Yield and yield contributing characters – SPAD basal N – Jyothy – Kharif 2000

Treatments	← Number of tillers/m ²										
	50 DAS	75 DAS	Total tillers	Panicle no/m ²	Plant height (cm)	Panicle length (cm)	1000 grain weight (g)	Panicle weight (g)	Grain yield (kg ha ⁻¹)	Straw yield (kg ha ⁻¹)	Chaff weight (kg ha ⁻¹)
T ₁	476	479	492	477	81	19.6	32.80	2.067	4280	4402	173.3
T ₂	527	531	536	513	82	20.4	33.13	2.433	6820	5006	286.7
T ₃	516	509	523	501	83	21.2	33.43	2.200	6627	6410	300.0
T ₄	497	536	536	581	82	21.9	33.17	2.300	5867	4646	273.3
T ₅	529	583	599	512	82	20.0	33.97	2.433	6913	5397	253.3
T ₆	529	484	508	489	82.5	21.4	33.27	2.000	6693	5128	206.7
CD	82.105	64.345	76.656	76.054	1.131	1.405	1.285	0.431	851	1190	80

N Applied kg/ha – SPAD basal N – Jyothy – Kharif 2000

Treatments	19.06.00 Basal (14 DAS)	28.06.00 (23 DAS)	12.07.00 (37 DAS)	18.07.00 (43 DAS 1 st top)	25.07.00 (50 DAS)	28.07.00 (53 DAS)	07.08.00 (2 nd top 63 DAS)	17.08.00 (3 rd top 73 DAS)	19.08.00 (75 DAS)	Total N kg
T ₁	0	0	0	0	0	0	0	0	0	0
T ₂	25	0	0	25	0	0	25	0	0	75
T ₃	25	0	0	25	0	0	25	25	0	100
T ₄	25	0	0	25	0	0	0	0	0	50
T ₅	25	0	0	25	0	0	25	0	0	75
T ₆	25	0	0	25	25	0	25	0	0	100

Studies on the relative efficiency LCC based N management on growth and yield of rice

Objective

To evaluate the N use efficiency under the various LCC values and find out the optimum LCC threshold value for N application in rice.

The experiment was conducted at Vadakkenchery during kharif, 2000 and at Adat during rabi, 2000

Treatments

- T1 - No N (control)
- T2 - 70 kg N (recommended N)
- T3 - 70 kg N + 25 kg Nat heading
- T4 - 25 kg N basal + N 25 kg/ha at LCC <3
- T5 - 25 kg N basal + N 25 kg/ha at <4
- T6 - 25 kg N basal + N 25 kg/ha <5

Design - Randomised block design

Replications - 3

Variety - Jyothi

Spacing - 15 x 10 cm

Plot size - 40 m²

Crop activity calender

Season	Kharif	Rabi
Location	Vadakkenchery	Adat
Block	Alathur	Puzhakkal
Name of farmer	Sri. R.N. Sankaran Sree Laxmi Nivas Vadakkenchery Palakkad	Sri. M. Raman Mathur House Chittilappilly Thrissur
Method of crop establishment	Direct dry sowing	Transplanting

Date of sowing	30.05.2000	02.09.2000
Date of germination	05.06.2000	--
Date of transplanting	--	30.09.2000
Basal fertilizer application	20.06.2000 (15 DAS)	30.09.2000
1 st top dressing in T2 & T3	19.07.2000 (44 DAS)	20.10.2000 (20 DAS)
II nd top dressing in T2 and T3	07.08.2000 (63 DAS)	13.11.2000 (43 DAS)
III rd top dressing in T3	17.08.2000 (73 DAS)	25.11.00 (55 DAS)
Plant protection	Nil	Metacid against leaf roller and case worm on 11.10.00, 20.10.00 and 30.10.00. Bavistin against blast on 25.10.00
Date of harvest	28.09.2000	29.12.2000
Duration	116 days	118 days

KHARIF

Results

Effect of treatments on LCC values

Basal N was applied at the rate of 25 kg N ha⁻¹ in all treatments except T1 (control). At all growth stages LCC values were significantly lowest in control plots (T1) during kharif season. Basal N was applied on 20.06.00. Observations on 28.06.00 (8 days after basal fertilizer application) did not show any definite trend on LCC values. On 28.06.00 (23 DAS) N was applied only in T6 (LCC at 5). Subsequent observation was taken on 12.07.00 (14 days after N application in T6 and 22 days after N application in other treatments). Highest LCC value was observed in T6 (3.93) whereas in other N treatments appreciable difference in LCC values was not seen. On 12.07.00 N was applied in T5 and T6. N was applied on 19.07.00 in T2 and T3 (as per schedule) whereas other treatments did not need any N application. Observations on 25.07.00 (6 days after N application in T2 and T3, 35 days after N application in T4 and 13 days after N application in T5 and T6). T5 and T6 recorded higher values followed by T3 and T2, whereas the values of T1 and T4 did not show any significant difference. The same trend was observed on 29.07.00 (54 DAS) also. On 19.07.00, SPAD based N was needed only in T6. Observations on

07.08.00 (9 days after) T6 showed significantly higher value whereas in other N treatments there was not much variation. On 07.08.00 N was applied in T2, T3 (as scheduled), T5 and T6 (LCC based). On 17.08.00 heading stage N was applied in T3. When observed on 19.08.00, T6 gave the highest value followed by T5. Between other treatments the LCC values did not differ significantly.

Effect of treatments on SPAD values

SPAD values were significantly lower at all growth stages of crop in control plot during kharif season. Observations on 28.06.2000 did not show any significant difference in SPAD values. On 12.07.00 T6 gave significantly higher SPAD value, possibly because it received N on 28.06.00. On 25.07.00 SPAD values were comparatively higher in plots which received N 6 days back, followed by treatments which received N 13 days previously. On 29.07.00 there was not much variation. On 07.08.00 (9 days after N application in T6) T6 gave the highest SPAD value, whereas between other treatments there was not much variation. On 19.08.00 the treatments which received N previously (07.08.00) gave comparatively higher values.

Yield and yield contributing characters

Highest yield (6300 kg ha^{-1}) was observed in T5 (N application at LCC 4) but it was on par with T3 (recommended splits + N at heading), T6 (N at LCC value 5) and T2 (recommended splits only).

Grain yield, partial factor productivity (PFP-N) and agronomic efficiency of applied N (AEN) – LCC based N – Jyothy – Kharif 2000

Treatments	N applied (kg ha^{-1})	Grain yield (q ha^{-1})	PFP-N (kg grain/kg N)	AEN
T1	0	40.33	--	--
T2	75	54.20	72.26	18.50
T3	100	58.33	58.33	18.00
T4	25	49.43	197.72	36.40
T5	75	63.00	84.00	30.23
T6	125	55.67	44.50	12.27

Mean SPAD values at different growth stages – LCC based N – Jyothy – Kharif 2000

Treatments	Dates of observations					
	28.06.00 (23 DAS)	12.07.00 (37 DAS)	25.07.00 (50 DAS)	29.07.00 (54 DAS)	07.08.00 (63 DAS)	19.08.00 (75 DAS)
T1	33.9	28.7	29.9	29.4	30.1	30.2
T2	37.8	32.3	37.1	32.4	33.7	33.3
T3	37.7	32.3	36.4	31.9	32.7	34.5
T4	37.9	31.5	30.8	31.5	30.6	32.3
T5	39.6	32.6	34.0	33.0	32.9	37.9
T6	37.3	36.6	35.4	34.5	39.2	44.2
CD(0.05)	2.247	1.631	2.528	3.248	2.756	1.648

Mean LCC values at different growth stages – LCC based N – Jyothy – Kharif 2000

Treatments	Dates of observations					
	28.06.00 (23 DAS)	12.07.00 (37 DAS)	25.07.00 (50 DAS)	29.07.00 (54 DAS)	07.08.00 (63 DAS)	19.08.00 (75 DAS)
T1	3.03	2.67	2.93	2.93	2.85	3.02
T2	3.33	3.17	3.40	3.55	3.45	3.50
T3	3.82	3.43	3.57	3.32	3.48	3.52
T4	3.65	3.23	2.97	2.43	3.28	3.25
T5	3.85	3.42	3.77	4.00	3.50	4.05
T6	3.98	3.93	3.87	3.92	4.38	5.00
CD(0.05)	0.368	0.223	0.377	0.315	0.276	0.199

Yield and yield contributing characters – LCC based N – Jyothy – Kharif 2000

Treatments	Number of tillers/m ²										
	50 DAS	75 DAS	Total tillers	Panicle no/m ²	Plant height (cm)	Panicle length (cm)	1000 grain weight (g)	Panicle weight (g)	Grain yield (kg ha ⁻¹)	Straw yield (kg ha ⁻¹)	Chaff weight (kg ha ⁻¹)
T ₁	364	384	504	485	70	18.8	31.70	2.27	4033	3186	140
T ₂	431	487	541	519	72	21.2	32.60	2.47	5420	5532	220
T ₃	415	420	535	532	73	20.8	32.50	2.50	5833	3928	187
T ₄	457	418	510	506	75	21.6	32.70	2.27	4943	3621	180
T ₅	433	471	625	597	78	20.1	32.27	2.60	6300	5821	240
T ₆	501	581	553	529	78	21.5	32.40	2.13	5567	4735	227
CD(0.05)	81.945	84.397	50.403	54.429	3.122	1.116	1.371	0.377	1250	547	75

N Applied kg/ha – LCC based N – Jyothy – Kharif 2000

Treatments	20.06.00 (15 DAS)	28.06.00 (23 DAS)	12.07.00 (37 DAS)	19.07.00 (44 DAS)	25.07.00 (50 DAS)	29.07.00 (54 DAS)	07.08.00 (63 DAS)	17.08.00 (73 DAS)	19.08.00 (75 DAS)	Total N kg
T ₁	0	0	0	0	0	0	0	0	0	0
T ₂	25	0	0	25	0	0	25	0	0	75
T ₃	25	0	0	25	0	0	25	25	0	100
T ₄	25	0	0	0	0	0	0	0	0	25
T ₅	25	0	25	0	0	0	25	0	0	75
T ₆	25	25	25	0	0	25	25	0	0	125

Considering the highest yield, and comparatively better PFP-N and AEN, T5 (N application at LCC threshold value of 4) could be the best in kharif season.

RABI

Effect of treatments on LCC values

Basal N was applied on 30.09.00 at planting at the rate of 25 kg ha⁻¹ in all N treatments except control. Observation on 18.10.00 (18 DAT) showed no significant difference in LCC values between treatments. In T2 and T3 first top dressing with N was done on 20.10.00. On the same day LCC based N was applied in T5 and T6. On 30.10.00 (30 DAT). LCC values in T2, T3, T5 and T6 were more or less equal, but higher than that in T1, and T4. Treatments 4, 5 and 6 received 25 kg N ha⁻¹ on 30.10.00. Observations on 13.11.00 indicated higher LCC values in T4, T5 and T6, slightly higher than T2 and T3. In T2, T3 and T6 N at the rate of 25 kg ha⁻¹ was applied on 13.11.00. These three treatments gave comparatively higher LCC values on 22.11.00.

Effect of treatments on SPAD values

On 18 DAT SPAD values did not differ appreciably between treatments. On 30 DAT, T2, T3, T5 and T6 (which received N at 20 DAT) gave higher SPAD values compared to T1 and T4. Observations on 13.11.00 indicated highest SPAD value in T6. Values of T2, T3 and T5 were more or less equal but much higher than T1. The same trend was observed on 22.11.00 also.

Yield

Treatment 5 (N at LCC 4) recorded maximum yield (5764 kg ha⁻¹) but it was on par with T2, T3 and T6. The yield was lowest in the control plot (3878 kg ha⁻¹).

Mean SPAD values at different growth stages – LCC based N–Jyothy–Rabi 2000-01

Treatments	Dates of observations			
	18.10.00 (18 DAT)	30.10.00 (30 DAT)	13.11.00 (43 DAT)	22.11.00 (52 DAT)
T1	41.2	33.1	31.1	29.3
T2	42.5	39.8	37.7	35.1
T3	41.6	39.8	36.7	35.8
T4	42.2	32.8	35.7	35.3
T5	40.4	37.8	35.8	37.8
T6	42.7	39.9	39.4	41.6

Mean LCC values at different growth stages–LCC based N – Jyothy – Rabi 2000-01

Treatments	Dates of observations			
	18.10.00 (18 DAT)	30.10.00 (30 DAT)	13.11.00 (43 DAT)	22.11.00 (52 DAT)
T1	3.95	3.25	3.03	2.83
T2	4.02	4.08	3.83	3.88
T3	3.98	3.80	3.82	3.85
T4	4.18	2.98	4.02	3.43
T5	3.80	3.82	4.02	3.60
T6	3.98	4.10	4.32	4.62

Total N applied kg/ha – LCC based N – Jyothy – Rabi 2000-01

Treatments	Basal 30.09.00	N (20.10.00)	N (30.10.00)	N (13.11.00)	N (25.11.00)	Total
T1	0	0	0	0	0	0
T2	25	25	0	25	0	75
T3	25	25	0	25	25	100
T4	25	0	25	0	0	50
T5	25	25	25	0	0	75
T6	25	25	25	25	0	100

Yield and yield contributing characters – LCC based N – Jyothy – Rabi 2000-01

Treatments	Number of tillers/m ²								
	Tiller (20 DAT)	Total tiller	Panicle number	Panicle height	Panicle length	Panicle weight	1000 grains weight	Grain yield	Straw yield
T ₁	645	631	484	75.5	17.8	2.3	27.8	3878	4538
T ₂	601	631	528	79.0	17.7	2.1	27.1	5477	5213
T ₃	543	572	513	79.1	18.8	2.8	27.3	5079	5588
T ₄	416	431	413	75.1	18.3	2.4	27.7	4954	5175
T ₅	675	689	543	81.3	18.3	2.5	26.6	5764	5288
T ₆	631	660	557	81.1	19.4	2.9	27.1	5477	4913
CD(0.05)	93.192	107.051	74.036	1.339	0.9557	0.467	NS	788	NS

Grain yield, partial factor productivity (PFP-N) and agronomic efficiency of applied N (AEN) – LCC based N – Jyothy -- Rabi, 2000-01

Treatments	N applied (kg ha ⁻¹)	Grain yield (q ha ⁻¹)	PFP-N (kg grain/kg N)	AEN
T1	0	38.78	--	--
T2	75	54.77	73.03	21.32
T3	100	50.79	50.79	12.01
T4	50	49.55	99.08	21.52
T5	75	57.64	76.85	25.15
T6	100	54.77	54.77	15.99

AEN was highest in T5 (25.15) whereas in other treatments it ranged from 12.01 to 21.52. In the case of PEPN, although lower than T4, it was comparatively higher than the other treatments. Considering the efficiency parameters and grain yield N top dressing at LCC value 4 would be more efficient.

LCC based N Management – Kannambra – Rabi 2000-01

Variety	-	Kanchana
Seasons	-	Rabi 2000-01
Location	-	Kannambra, Alathur block
Name of farmer	-	Sri. M.A. Siddique S/o Ahamed Sahib Manappadam
Method of crop establishment	-	Transplanting
Date of sowing	-	25-9-2000
Date of planting	-	24-10-2000
Date harvest	-	25-01-2001
Duration (days)	-	122 days
Basal fertilizer applications	-	24-10-2000
I top dressing in T2 and T3	-	20-11-2000 (26 DAT)
II - do -	-	11-12-2000 (47 DAT)
III top dressing in T3	-	21-12-2000 (57 DAD)

Plant protection

Sprayed Metacid against leaf roller on 15-11-2000

Sprayed Dimecron against leaf roller on 25-11-2000

Sprayed Malathion against rice bug on 10-12-00

and Rogor against rice bug on 28-12-00

Results

Highest yield (4396 kg N/ha) was observed on T3 (Recommended N splits +25kg N at headling), but it was on par with T5 (N at LCC 4) and T6 (N at LCC 5). Yield parameters were also comparatively higher for these treatments.

In terms of N-use efficiency N there was no much N variation between the promising treatments. Considering the yield and N-use efficiency LCC 4 could be taken as the optimum threshold value.

LCC based N management – Kannambra – Rabi 2000-01

Treatments	Total tiller m ²	Panicle No m ²	Height (cm)	Panicle weight (g)	No. of grains per panicle	Panicle length (cm)	Grain yield (kg ha ⁻¹)	Straw yield (kg ha ⁻¹)
T1	640	585	70.8	1.8	66.3	17.7	2353	2375
T2	743	684	77.4	2.0	86.0	18.8	3752	4373
T3	841	782	77.5	1.8	83.0	19.3	4396	4751
T4	695	504	75.6	1.9	80.0	17.4	3329	3662
T5	887	786	79.9	2.2	81.6	18.8	4318	5017
T6	793	734	78.5	2.1	82.0	19.3	4163	4784
CD (0.05)	150.6	85.0	NS	NS	9.924	NS	375	544.3

LCC values – Kannambra – Rabi 2000-01

Treatments	LCC (27 DAT)	LCC (37 DAT)	LCC (47 DAT)	LCC (57 DAT)	N applied (kg ha ⁻¹)	Grain yield (kg ha ⁻¹)	PFP-N grain kg/kg N	AEN grain kg/kg N
T1	3.02	2.38	2.23	2.73	0	2353	-	-
T2	3.21	2.28	3.10	2.88	75	3752	50.03	18.65
T3	3.18	3.38	3.27	2.88	100	4176	41.96	18.43
T4	3.05	3.52	3.58	3.32	25	3329	133.16	39.04
T5	3.48	3.53	3.68	4.52	100	4318	43.18	19.65
T6	3.92	3.50	4.08	4.48	100	4163	41.63	18.10
CD(0.05)	0.27	0.17	0.42	0.43	-	375	-	-

Timing of N application – Kannambra – Rabi 2000-01

Treatment	Basal	20.11.00 (27 DAT) N kg/ha	01.12.00 (37 DAT) N kg/ha	11.12.00 (47 DAT) N kg/ha	21.12.00 (57 DAT) N kg/ha	Total N kg/ha
T1	0	0	0	0	0	0
T2	25	25	0	25	0	75
T3	25	25	0	25	25	100
T4	25	0	0	0	0	25
T5	25	25	25	25	0	100
T6	25	25	25	25	0	100

Studies on the relative efficiency of LCC based N management on growth and yield of rice

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Objective

To evaluate the N use efficiency under the various LCC values and find out the optimum LCC threshold value for N application in rice.

The experiment was conducted at Rayamangalam during summer, 2001.

Treatments

- T1 - No N (control)
- T2 - 90 kg N ha⁻¹ (recommended N)
- T3 - 90 kg N ha⁻¹ + 25 kg N at heading
- T4 - 30 kg N ha⁻¹ as basal + 30 kg N ha⁻¹ at LCC <3
- T5 - 30 kg N ha⁻¹ as basal + 30 kg N ha⁻¹ at LCC <4
- T6 - 30 kg N ha⁻¹ as basal + 30 kg N ha⁻¹ at LCC <5

Design	-	RBD
Replications	-	3
Variety	-	Matta Thriveni
Spacing	-	15 x 10 cm
Plot size	-	40 m ²

Crop activity calender

Season	-	Summer
Location	-	Rayamangalam
Block	-	Koovappady
Name and address of farmer	-	Sri. P. Krishna Panicker Jyothis, Pulluvazhy Rayamangalam
Method of crop establishment	-	Direct wet sowing
Date of sowing	-	12.02.2001
Basal fertilizer application	-	12.02.2001
Ist top dressing in T2, T3, T5 and T6	-	09.03.2001
IInd top dressing in T2 and T3	-	03.04.2001
IIIrd top dressing in T3	-	17.04.2001
Plant protection	-	Sprayed Metacid against leaf eating caterpillar on 02.04.2001
Date of harvest	-	18.05.2001
Duration	-	95 days

Results

Effect of treatments on LCC values

Basal N was applied at the rate of 30 kg ha⁻¹ in all treatments except T1 (control). At all growth stages LCC values were significantly lowest in control plots (T1). Basal N was applied on 12.02.2001. Observations on 09.03.2001 (25 days after basal fertilizer application) did not show any definite trend on LCC values. On 19.03.2001 (35 DAS) N was applied only in T6 (LCC at 5).

N applied (kg ha⁻¹) – LCC based N – Matta Thriveni – Summer, 2001 - Rayamangalam

Treatments	12.02.2001 Basal	09.03.2001 Ist top dressing (25 DAS)	19.03.2001 (35 DAS)	29.03.2001 (45 DAS)	03.04.2001 IInd top dressing (51 DAS)	09.04.2001 (56 DAS)	17.04.2001 IIIrd top dressing (65 DAS)	Total N (kg ha ⁻¹)
T1	0	0	0	0	0	0	0	0
T2	30	30	0	0	30	0	0	90
T3	30	30	0	0	30	0	30	120
T4	30	0	0	30	0	0	0	60
T5	30	30	0	30	0	0	0	90
T6	30	30	30	30	0	30	0	150

Yield and yield contributing characters – LCC based N - Matta Thriveni – Summer 2001 - Rayamangalam

Treatments	No. of tillers/m ²		Number of panicle/m ²	Length of panicle (cm)	Grain yield (kg ha ⁻¹)	Straw yield (kg ha ⁻¹)
	At PI stage	At harvest				
T1	476	440	373	17.10	2053	3086
T2	507	458	394	17.47	2875	3546
T3	475	481	415	17.90	2864	3719
T4	509	460	414	17.53	2879	3786
T5	541	597	438	17.83	3217	4219
T6	544	515	427	17.77	3368	4299
CD	NS	28	34.3	NS	403	

Subsequent observation was taken on 29.03.2001 (10 days after N application in T6, 20 days after N application in T5 and 45 days after N application in T4). Highest LCC value was observed in T6 (3.97). On 29.03.2001 N was applied in T4, T5 and T6. On 03.04.2001 second top dressing was done in T2 and T3 (as per schedule). Observations on 09.04.2001 (6 days after N application in T2 and T3 and 12 days after N application in T4, T5 and T6) recorded higher LCC values in T5 and T6 (4.03 and 4.4 respectively) and T1 recorded significantly lower value (3.12). On 09.04.2001 N was applied in T6 only. On 17.04.2001 N was applied in T3 as per schedule.

Yield and yield contributing characters

Highest yield (3368 kg ha⁻¹) was observed in T6 (N application at LCC 5) which was on par with T5 (N application at LCC 4). The trend was similar in the case of straw yield also.

Grain yield, partial factor productivity (PFP-N) and agronomic efficiency of applied N (AEN) – LCC based N – Matta Thriveni – Summer, 2001, Rayamangalam

Treatments	N applied (kg ha ⁻¹)	Grain yield (kg ha ⁻¹)	PFP-N (kg grain/kg N)	AEN
T1	0	2053	--	--
T2	90	2875	31.94	9.13
T3	120	2864	23.87	6.75
T4	60	2879	47.98	13.77
T5	90	3217	35.74	12.93
T6	150	3368	22.45	8.77

It could be noted that both PFP-N and AEN was highest in the treatment which received N at LCC 3 (47.98 and 13.77 respectively). But yield was lower in this treatment. When N was applied at LCC 4 (T5), the yield, PFP-N and AEN were also higher.

KHARIF

Treatments – 9 varieties

- T1 - Ahalya
- T2 - Matta Thriveni
- T3 - Kanchana
- T4 - Kairali
- T5 - Panchamy
- T6 - Remya
- T7 - Karishma
- T8 - Athira
- T9 - Kunjukunju

Location - Vadakkenchery, Alathur block

Season - Kharif 2000

Design - RBD

Replications - 3

Plot - 40 m²

Name of farmer - V.K. Ramakrishnan
Sree Krishna Vihar
Vadakkenchery

Method of crop establishment - Direct sowing

Date of sowing - 31.05.2000

(P at the rate of 45 kg ha⁻¹ as Rajphos was applied at sowing)

Basal fertilizer application - 19.6.2000 (25 kg ha⁻¹ N, 15 kg ha⁻¹ K)

Ist top dressing of K - K at the rate of 15 kg ha⁻¹ on 19.07.2000 as MOP

IInd top dressing of K - K at the rate of 15 kg ha⁻¹ on 07.08.2000 as MOP

SPAD metre readings were taken regularly from 27 DAS onwards and N top dressing was done @ 25 kg ha⁻¹ at a SPAD threshold value of 33.

Dates of harvests - 10.09.2000 to 30.09.2000

Plant protection - Nil

Special features

In Ahalya false smut incidence was high.

Results - SPAD and LCC values

Basal dressing of N was done on 19.06.00 (19 DAS). SPAD values at 27 DAS (8 days after basal N application) indicated that in Kanchana, Karishma and Athira SPAD values fell down below the threshold value of 33. N at the rate of 25 kg ha⁻¹ were applied to these varieties. In observations on 10.07.2000 (40 DAS and 13 days after previous N application), Ahalya, Kairaly, Panchamy, Remya and Kunjukunu gave values less than 33 and they were given N top dressing at the rate of 25 kg ha⁻¹. On 18.07.00 (48 DAS) all varieties gave values less than 33 and hence they required N application. On 28.07.2000 (58 DAS) varieties like Ahalya, Red Thriveni, Kanchana, Kairaly and Remya showed SPAD values less than 33 and N was again applied for these varieties. The last N split was applied on 07.08.00 (68 DAS) in all varieties since the SPAD values were less than 33. In subsequent observations on 80 DAS and 91 DAS SPAD values were higher than the threshold level in all varieties.

Yield

Yield was highest in Kanchana (T3 – 6525 kg ha⁻¹) followed by Panchamay (6513 kg ha⁻¹) and they were on par and significantly superior to all other varieties. The third position was occupied by Kairaly which was on par with Athira, Ahalya and Matta Thriveni.

Yield ranging from 5756 to 6031 kg ha⁻¹.

Mean SPAD values at different growth stages – Vadakkenchery – Kharif 2000

Treatments	Varieties	Dates of observations							
		27.06.00 (27 DAS)	10.07.00 (40 DAS)	18.07.00 (48 DAS)	28.07.00 (58 DAS)	04.08.00 (65 DAS)	07.08.00 (68 DAS)	19.08.00 (80 DAS)	30.08.00 (91 DAS)
T ₁	Ahalya	34.6	26.7	25.4	32.6	30.2	30.3	33.8	33.4
T ₂	Red Thriveni	36.1	33.2	28.3	32.3	31.5	31.5	36.2	33.7
T ₃	Kanchana	31.1	33.1	32.2	32.4	32.5	32.5	35.3	33.1
T ₄	Kairaly	33.7	29.1	29.4	32.2	32.3	32.3	34.5	33.2
T ₅	Panchami	34.0	31.1	29.2	34.6	31.4	31.5	34.8	34.0
T ₆	Ramya	33.4	31.8	30.7	32.7	33.6	32.2	33.8	33.7
T ₇	Karishma	32.7	33.3	30.1	34.3	33.1	31.6	35.2	33.8
T ₈	Athira	31.4	33.0	31.2	33.8	30.3	30.3	33.9	33.1
T ₉	Kunjukunju	33.5	30.6	30.9	33.8	32.3	32.3	35.5	33.3
CD(0.05)		1.10	2.63	1.224	2.94	2.368	2.557	1.17	1.341

Mean LCC values at different growth stages – Vadakkenchery – Kharif 2000

Treatments	Varieties	Dates of observations							
		27.06.00 (27 DAS)	10.07.00 (44 DAS)	18.07.00 (48 DAS)	28.07.00 (58 DAS)	04.08.00 (65 DAS)	07.08.00 (68 DAS)	19.08.00 (80 DAS)	30.08.00 (91 DAS)
T ₁	Ahalya	3.52	2.75	2.78	3.83	3.35	5.03	3.43	3.30
T ₂	Red Thriveni	3.47	2.83	2.85	3.52	3.27	3.27	3.60	3.52
T ₃	Kanchana	3.47	3.58	3.48	3.30	3.23	3.27	3.42	3.38
T ₄	Kairaly	3.65	3.05	2.97	3.58	3.23	3.23	3.37	3.37
T ₅	Panchami	3.57	3.20	2.97	3.38	3.23	3.25	3.40	3.52
T ₆	Ramya	3.42	3.07	2.88	3.58	3.35	3.07	3.48	3.30
T ₇	Karishma	3.07	3.58	2.95	3.57	3.52	3.23	3.43	3.58
T ₈	Athira	3.22	3.00	3.22	3.48	3.20	3.20	3.32	3.30
T ₉	Kunjukunju	3.60	2.98	3.05	3.63	3.22	3.22	3.58	3.40
CD(0.05)		0.239	0.268	0.205	0.173	0.164	1.572	0.232	0.155

Yield and yield attributes – Vadakkenchery – Kharif 2000

Treatments	Varieties	Number of tillers/m ²										
		Tiller (54 DAS)	Tiller (75 DAS)	Total tiller	Panicle no./m ²	Plant height (cm)	Panicle length (cm)	1000 grain weight (g)	Panicle weight (g)	Grain yield (kg ha ⁻¹)	Straw yield (kg ha ⁻¹)	Chaff weight (kg ha ⁻¹)
T ₁	Ahalya	533	529	546	514	79	21.8	29.23	2.30	5792	3557	278
T ₂	Red Thriveni	515	525	545	518	78	22.6	26.77	2.37	5756	4119	312
T ₃	Kanchana	592	595	602	580	76	20.6	30.53	2.68	6526	4896	388
T ₄	Kairaly	580	575	619	587	68	19.8	28.67	2.60	6031	4019	415
T ₅	Panchami	526	544	568	544	74	22.4	26.03	2.70	6513	5246	345
T ₆	Ramya	578	532	597	567	77	18.8	29.47	2.13	4912	5598	409
T ₇	Karishma	609	603	612	586	72	22.4	25.70	2.47	5324	4271	292
T ₈	Athira	487	484	492	466	97	21.3	27.63	2.80	5982	3465	417
T ₉	Kunjukunju	509	500	539	512	95	21.3	27.90	2.37	3900	2107	202
CD (0.05)		65.542	76.983	61.39	59.558	1.645	1.472	2.885	0.448	380.308		

N applied (kg ha⁻¹)

Treatments	Varieties	Basal	N 27 DAS	40 DAS	48 DAS	58 DAS	68 DAS	Total N
T ₁	Ahalya	25	0	25	25	25	25	100
T ₂	Red Thriveni	25	0	0	25	25	25	100
T ₃	Kanchana	25	25	0	25	25	25	125
T ₄	Kairaly	25	0	25	25	25	25	125
T ₅	Panchami	25	0	25	25	0	25	100
T ₆	Ramya	25	0	25	25	25	25	125
T ₇	Karishma	25	25	0	25	0	25	100
T ₈	Athira	25	25	0	25	0	25	100
T ₉	Kunjukunju	25	0	25	25	0	25	100

Grain yield and partial factor productivity (PFP-N) of different varieties –
Vadakkenchery – Kharif 2000

Treatments	Varieties	N applied (kg ha ⁻¹)	Grain yield (q ha ⁻¹)	PFP-N (kg grain/kg N)	Duration (days)	Kg grain/ kg N per day
T1	Ahalya	100	57.92	57.92	102	0.57
T2	Red Thriveni	100	57.56	57.56	102	0.56
T3	Kanchana	125	65.26	52.21	112	0.47
T4	Kairaly	125	60.31	48.25	112	0.43
T5	Panchamy	100	65.13	65.13	119	0.55
T6	Remya	125	49.12	39.30	119	0.33
T7	Karishma	100	53.24	53.24	119	0.45
T8	Athira	100	59.82	59.82	112	0.53
T9	Kunjukunju	100	39.00	39.00	107	0.36

Although the variety Kanchana gave the highest yield, the grain production per kg N applied was comparatively low (52.21). The highest PFP-N was observed in Panchamy and also the yield was on par with Kanchana. Hence in terms of yield and N-use efficiency, Panchamy holds the first position.

Athira, Ahalya and Matta Thriveni could be the next choice if both yield and N-use efficiency are considered. In terms of grain production per kg N per day, Ahalya ranks first (0.57) followed by Matta Thriveni (0.56), Panchamy (0.55) and Athira (0.53).

RABI

Efficiency of varieties – Set I

Treatments

1. Jyothy
2. Kairaly
3. Kanchana
4. Athira
5. Aiswarya

6. Cul-A4-4-2
7. Bhadra
8. Pavizham
9. Remya
10. Pranava
11. Basumathy

Season	-	Rabi, 2000
Location	-	Adat, Puzhakkal block
Design	-	RBD
Replications	-	3
Plot size	-	40 m ²
Spacing	-	15 x 15 cm
Name of farmer	-	Sri. B.D. Paul Brahmakulam House Chittilappilly Adat, Thrissur
Method of crop establishment	-	Transplanting
Date of sowing	-	29.08.00
Date of transplanting	-	22.09.00
Basal fertilizer application (25 kg N ha ⁻¹ , 45 kg P ha ⁻¹ and 15 kg K ha ⁻¹)	-	22.09.2000
1 st top dressing	11.10.2000	(K at the rate of 15 kg ha ⁻¹)
II nd top dressing	13.11.2000	(K at the rate of 15 kg ha ⁻¹)

Top dressing of N

SPAD meter readings were taken regularly from 27 DAT onwards and N top dressing was done at the rate of 25 kg ha⁻¹ at a SPAD threshold value of 35.

Date of harvests	-	24.12.00 to 05.01.01
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Plant protection

1. Sprayed Metacid against leaf roller on 06.10.00 except for Basumathy.
2. Sprayed Malathion against leaf roller on 12.10.00 and 30.10.2000.
3. Sprayed Bavistin against blast on 07.11.00.
4. Sprayed Metacid against rice bug on 08.11.00.

Special features

Rice bug attack was severe in Pranava and Remya (due to longer duration). BPH attack was severe in Basumathy and Pranava.

Results

At planting and 18 DAT N at the rate of 25 kg ha⁻¹ was applied in all treatments without taking the SPAD values. Since the leaves were very narrow SPAD could not be taken. On 27 DAT the SPAD values were above the threshold level 35 except in variety Athira (since kole soils are highly responsive to N and also the N recommendation is higher than that in other regions, the SPAD threshold value was taken as 35 instead of 33). Hence N was applied to Athira only at the rate of 25 kg ha⁻¹. On 37 DAT N at the rate of 25 kg ha⁻¹ was applied to all varieties since the SPAD values were below 35. On 50 DAT N was needed to be applied for Jyothy, Kairaly, Aiswarya, Bhadra, Pavizham, Remya, Pranava and Basumathy. The SPAD values were above threshold level at 62 DAT and 70 DAT in some varieties and hence N was not applied. Other varieties were of maturity phase and hence N was not applied to them also.

Yield and N use efficiency

Among the varieties highest yield was observed in Culture A4-4-2 (5920 kg ha⁻¹) followed by Bhadra (5550 kg ha⁻¹) and Kanchana (4687 kg ha⁻¹) and these three were at par. Performance of other varieties were comparatively poor.

In terms of N efficiency (PFPN) Cul A4-4-2 recorded the highest value (78.93 kg grain per kg N) followed by Kanchana (62.5) and Bhadra (55.50). The trend was similar in the case of per day grain production per kg N applied.

Considering the yield, PFPN and per day production Cul A4-4-2 would be the best followed by Kanchana and Bhadra.

Grain yield and partial factor productivity (PFP-N) of different varieties – Rabi Set I

Varieties	N applied (kg ha ⁻¹)	Grain yield (q ha ⁻¹)	PFP-N	Duration	Kg grain per kg N per day
Jyothy	100	29.60	29.60	115	0.26
Kairaly	100	27.13	27.13	113	0.24
Kanchana	75	46.88	62.50	115	0.54
Athira	100	30.83	30.83	121	0.25
Aiswarya	100	34.53	34.53	119	0.29
Cul.A4-4-2	75	59.20	78.93	107	0.74
Bhadra	100	55.50	55.50	121	0.46
Pavizham	100	23.81	23.81	129	0.18
Remya	100	16.03	16.03	129	0.12
Pranava	100	43.17	43.17	127	0.34
Basumathy	100	9.72	9.72	106	0.09

N applied (kg ha⁻¹) – Rabi Set I – Efficiency of varieties

Treatments	Varieties	23.09.00 (0 DAT)	11.10.00 (18 DAT)	19.10.00 (27 DAT)	01.11.00 (39 DAT)	12.11.00 (50 DAT)	24.11.00 (62 DAT)	02.12.00 (70 DAT)	Total N applied
T ₁	Jyothy	25	25	0	25	25	0	0	100
T ₂	Kairaly	25	25	0	25	25	0	0	100
T ₃	Kanchana	25	25	0	25	0	0	0	75
T ₄	Athira	25	25	25	25	0	0	0	100
T ₅	Aiswarya	25	25	0	25	25	0	0	100
T ₆	Cul A4-4-2	25	25	0	25	0	0	0	75
T ₇	Bhadra	25	25	0	25	25	0	0	100
T ₈	Pavizham	25	25	0	25	25	0	0	100
T ₉	Remya	25	25	0	25	25	0	0	100
T ₁₀	Pranava	25	25	0	25	25	0	0	100
T ₁₁	Basumathi	25	25	0	25	25	0	0	100

SPAD mean value -- Efficiency -- Set I Rabi 2000-01

Treatments	Varieties	Dates of observation				
		19.10.00 (27 DAT)	01.11.00 (37 DAT)	12.11.00 (50 DAT)	24.11.00 (62 DAT)	02.12.00 (70 DAT)
T1	Jyothy	42.1	34.9	32.8	41.9	-
T2	Kairaly	38.2	33.7	33.6	36.7	-
T3	Kanchana	37.2	32.8	35.3	35.4	-
T4	Athira	34.6	33.8	35.2	36.7	-
T5	Aiswarya	37.2	34.8	34.5	38.4	-
T6	Cul. A4-4-2	42.1	33.9	35.3	Maturity	-
T7	Bhadra	38.3	34.9	34.8	38.5	35.7
T8	Pavizham	38.0	32.6	33.7	39.4	35.8
T9	Remya	36.7	32.9	34.1	38.1	35.8
T10	Pranava	39.7	34.0	34.5	37.4	36.4
T11	Basumathy	40.0	34.9	34.4	44.2	-

LCC mean value -- Efficiency -- Set I Rabi 2000-01

Treatments	Varieties	Dates of observation				
		19.10.00 (27 DAT)	01.11.00 (37 DAT)	12.11.00 (50 DAT)	24.11.00 (62 DAT)	02.12.00 (70 DAT)
T1	Jyothy	4.33	3.37	3.10	4.00	-
T2	Kairaly	3.92	3.45	3.37	3.62	-
T3	Kanchana	3.88	3.30	3.43	3.32	-
T4	Athira	3.53	3.32	3.35	3.77	-
T5	Aiswarya	3.72	3.45	3.57	3.78	-
T6	Cul. A4-4-2	4.23	3.38	3.55	-	-
T7	Bhadra	3.80	3.47	3.50	3.60	3.57
T8	Pavizham	4.02	3.40	3.50	3.87	3.65
T9	Remya	3.83	3.37	3.32	3.65	3.53
T10	Pranava	4.12	3.38	3.42	3.67	3.62
T11	Basumathy	3.98	3.45	3.48	4.55	-

Yield and yield attributes – Efficiency – Rabi Set I

Treat-ments	Varieties	Tiller/m ² (30 DAS)	Tiller/m ² (55 DAS)	Total tiller/m ² maturity	Panicle no./m ²	Plant height (cm)	Panicle length (cm)	Panicle weight (g)	1000 grain weight (g)	No. of grains (kg ha ⁻¹)	Grain yield (kg ha ⁻¹)	Straw yield (kg ha ⁻¹)
T ₁	Jyothy	631	484	513	455	76.6	18.0	1.6	25.0	65	2960	2430
T ₂	Kairaly	572	587	587	499	76.8	18.9	1.8	22.9	79	2713	2363
T ₃	Kanchana	645	543	528	484	74.9	18.5	1.7	22.6	64	4688	3240
T ₄	Athira	543	572	572	513	100.7	22.8	2.7	23.9	113	3083	3848
T ₅	Aiswarya	557	543	572	484	91.7	18.9	2.1	27.0	78	3453	2768
T ₆	Cul A4-4-2	543	543	528	469	70.6	21.0	2.1	27.4	79	5920	4455
T ₇	Bhadra	719	557	528	484	84.8	18.8	1.7	22.4	76	5550	4725
T ₈	Pavizham	528	557	587	499	85.8	18.6	2.0	21.1	95	2381	2633
T ₉	Remya	587	616	631	557	91.1	22.2	2.0	26.6	74	1603	8303
T ₁₀	Pranava	557	675	675	557	86.3	23.0	3.1	22.0	141	4317	6413
T ₁₁	Basumathi	513	616	601	557	86.8	25.3	1.7	20.6	81	972	5477
CD (0.05)		128.946	63.375	76.511	58.487	2.547	1.201	0.646	1.223	27.423	1242.0	1413.55

Efficiency of varieties – Set II

Treatments – 7 Varieties

T1	Pavithra
T2	Panchamy
T3	Remanika
T4	Uma
T5	Karishma
T6	Krishnanjana
T7	Jaya

Season – Rabi, 2000

Design	–	RBD
Location	–	Adat, Puzhakkal block
Replications	–	3
Plot size	–	40 m ²
Spacing	–	15 x 15 cm
Name of farmer	-	Sri. M. Raman Mathoor House Adat, Thrissur

Method of crop establishment- Transplanting

Date of sowing - 05.09.2000

Date of transplanting - 01.10.2000

Basal fertilizer application - 01.10.2000

(25 kg N ha⁻¹, 45 kg P ha⁻¹ and 15 kg K ha⁻¹)

Ist top dressing - 21.10.00 (K at the rate of 15 kg ha⁻¹)

IInd top dressing - 03.11.00 (K at the rate of 15 kg ha⁻¹)

Top dressing of N

SPAD meter readings were taken regularly from 19 DAT onwards and N top dressing was done at the rate of 25 kg N ha⁻¹ at a SPAD threshold value of 35.

Dates of harvests - 05.01.01 to 10.01.01

Plant protection

1. Sprayed Metacid against leaf roller on 11.10.00 and 30.10.00
2. Sprayed Bavistin against blast and blight on 20.10.00 and 20.11.00
3. Sprayed Metacid against rice bug on 15.12.00

Special features

In Remanika blight was severe. Rice bug was comparatively high in Pavithra, Panchamy, Uma and Karishma.

Results

Basal N at the rate of 25 kg ha⁻¹ was applied to all varieties. On 19 DAT only Karishma recorded a SPAD value below 35. Hence N was applied to this variety only (25 kg ha⁻¹). On 03.11.00 N @ 25 kg ha⁻¹ was applied to all varieties since SPAD values recorded were below 35. On 10.11.00, 22.11.00 and 02.12.00 (41 DAT, 53 DAT and 63 DAT respectively) all varieties showed SPAD values above 35.

Yield and N use efficiency

Yield was highest in the variety Uma (69.40 q ha⁻¹) followed by Krishnanjana (68.25 q ha⁻¹), Pavithra (68.25 q ha⁻¹) and Panchami (57.75 q ha⁻¹). These four varieties were at par. The same trend was observed in PFP-N and kg grain per kg N per day.

Grain yield and partial factor productivity in different varieties – Efficiency Set II - Rabi

Varieties	N applied (kg ha ⁻¹)	Grain yield (q ha ⁻¹)	PFP-N (kg grain/kg N)	Duration (days)	Kg grain/kg N per day
Pavithra	75	68.25	91	127	0.72
Panchamy	75	57.75	77	124	0.62
Remanika	75	55.15	74	125	0.59
Uma	75	69.40	93	127	0.73
Karishma	100	44.65	45	127	0.35
Krishnanjana	75	68.25	90	125	0.73
Jaya	75	51.58	69	125	0.56

SPAD mean values – Efficiency Set II - Rabi

Treatments	Varieties	Dates of observations				
		19.10.00 (19 DAT)	03.11.00 (34 DAT)	10.11.00 (41 DAT)	22.11.00 (53 DAT)	02.12.00 (63 DAT)
T1	Pavithra	38.2	32.9	35.3	35.7	35.3
T2	Panchami	38.9	30.8	35.8	35.4	35.1
T3	Remanika	38.5	33.6	37.7	39.3	36.7
T4	Uma	41.2	34.5	36.6	36.0	35.2
T5	Karishma	34.8	32.5	35.5	35.8	35.4
T6	Krishnanjana	37.9	32.5	38.7	38.2	35.6
T7	Jaya	39.6	34.3	36.3	37.0	35.5

LCC mean values – Efficiency Set II - Rabi

Treatments	Varieties	Dates of observations				
		19.10.00 (19 DAT)	03.11.00 (34 DAT)	10.11.00 (41 DAT)	22.11.00 (53 DAT)	02.12.00 (63 DAT)
T1	Pavithra	3.60	3.28	3.55	3.60	3.38
T2	Panchami	3.78	3.28	3.78	3.53	3.55
T3	Remanika	3.78	3.25	3.75	3.48	3.53
T4	Uma	3.90	3.43	3.75	3.58	3.60
T5	Karishma	3.40	3.18	3.60	3.55	3.50
T6	Krishnanjana	3.65	3.28	3.73	3.73	3.78
T7	Jaya	3.63	3.45	3.68	3.60	3.55

Yield and yield attributes – Efficiency – Set II Rabi

Treatments	Varieties	Number of tillers/m ²									
		Tiller (20 DAS)	Tiller (50 DAS)	Total tiller	Panicle no./m ²	Plant height (cm)	Panicle length (cm)	Panicle weight (g)	1000 grain weight (g)	Grain yield (kg ha ⁻¹)	Straw yield (kg ha ⁻¹)
T ₁	Pavithra	816	788	551	469	88.5	20.8	3.5	26.7	6825	4380
T ₂	Panchami	727	793	549	455	88.9	22.0	4.2	25.6	5775	4082
T ₃	Ramanika	639	682	528	499	93.8	20.8	3.3	24.4	5515	4517
T ₄	Uma	660	659	572	499	87.6	19.8	3.5	25.5	6940	4620
T ₅	Karishma	551	667	550	484	85.5	21.6	3.6	25.9	4465	2940
T ₆	Krishnanjana	597	639	631	499	90.8	21.5	4.4	25.7	6825	5108
T ₇	Jaya	553	631	550	513	89.1	23.6	4.4	27.1	5158	2700
CD(0.05)		71.417	107.918	35.688	52.17	2.659	1.271	0.45	0.683	1230.396	794.406

Nitrogen applied (kg ha⁻¹) – Efficiency Set II - Rabi

Varieties	01.10.00 (Basal)	19.10.00 (19 DAT)	03.11.00 (34 DAT)	10.11.00 (41 DAT)	Total N applied
Pavithra	25	0	25	0	50
Panchami	25	0	25	0	50
Remanika	25	0	25	0	50
Uma	25	0	25	0	50
Karishma	25	25	25	0	75
Krishnanjana	25	0	25	0	50
Jaya	25	0	25	0	50

Evaluation of effect of controlled Release Urea – N management

Objectives

To study the efficiency of Controlled Release Urea (CRU) on growth and yield of rice in comparison with prilled urea under different management levels.

The experiment consisted of treatments with prilled urea under different timings and CRU-N as basal. The CRU-N material used was of with 4.5 per cent or 6.0 per cent polymer coating. The N content of both material was 42 per cent. The level of N by CRU-N was fixed as 60 per cent of the standard N recommendation. Thus it was required to apply 100 kg CRU-N against 70 kg N as PU; and 128 kg CRU against 90 kg N as PU. The entire quantity of CRU-N was applied as basal single dose.

Treatments

- T1 - No N
- T2 - 70 kg N (1/3 basal, 1/3 at active tiller and 1/3 at panicle initiation)
- T3 - 70 kg N (1/3 basal, 1/3 at active tiller and 1/3 at panicle initiation) + 25 kg N ha⁻¹ at heading
- T4 - CRU-N (4.5%) 60% of 70 kg N ha⁻¹ = 98 kg CRU basal
- T5 - CRU-N (6.0%) 60% of 70 kg N ha⁻¹ = 98 kg CRU basal
- T6 - Cowdung 5 t ha⁻¹ + 70 kg N (1/6 at 7 DAT, 2/6 at 21 DAT, 2/6 at PI and 1/6 at heading)
- T7 - Urea + Neem cake (5:1) 70 kg N (1/3 basal, 1/3 at tillering, 1/3 at PI)

- Season - Rabi, 2000
- Location - Adat, Puzhakkal Block
- Design - RBD
- Replications - 3
- Plot size - 40 m²
- Spacing - 15.x 15 cm

Name of farmer	-	Sri. K.K. Asokan Kolangara Parambil House Chittilappilly, Thrissur
Method of crop establishment		Transplanting
Date of sowing	-	02.09.00
Date of transplanting	-	29.09.00
Basal fertilizer application	-	29.09.2000 (N as per treatments, P @ 45 kg ha ⁻¹ and K @ 15 kg ha ⁻¹)
1 st top dressing	-	20.10.2000 (N as per treatments and K @ 15 kg ha ⁻¹)
Ind top dressing	-	05.11.2000 (N as per treatments and K@ 15 kg ha ⁻¹)
Date of harvest	-	26.12.2000

Plant protection

1. Malathion was sprayed against leaf roller on 10.10.00
2. Dimecron was sprayed against stem borer on 20.10.00
3. Sevin was sprayed against leaf roller on 2.11.00
4. Bavistin was sprayed against blast on 12.11.00

Results

Highest yield (6093 kg ha⁻¹) was recorded in T2 followed by T5, T4 and T3. All these treatments were at par. The control plot with out any nitrogen recorded significantly lower yield.

Grain yield, partial factor productivity (PEP-N) and agronomic efficiency of applied nitrogen (AEN)

Treatments	N applied (kg ha ⁻¹)	Grain yield (q ha ⁻¹)	PEP-N (kg grain/kg N)	AEN
T1	0	35.50	-	-
T2	70	60.93	101.33	36
T3	95	61.39	64.62	27
T4	42	61.72	146.95	62
T5	42	62.38	148.52	64
T6	70	55.14	78.77	28
T7	70	51.87	74.10	23
CD (0.05)		545		

Response of rice variety Aiswarya to varying levels of nitrogen

Objectives

1. To study the response of dwarf indica rice to nitrogen under on-farm situation.
2. To work out optimum nitrogen requirement for rice
3. To work out threshold values of SPAD and LCC for dwarf indica varieties

The study was conducted in farmers field at Vadakkencherry during kharif, 2000 and at Adat (kole lands) during rabi, 2000.

Technical programme

Treatments

T¹ Control (O N)

T² - 30 kg N ha⁻¹

T³ - 60 kg N ha⁻¹

T⁴ - 90 kg N ha⁻¹

T⁵ - 120 kg N ha⁻¹

T⁶ - 150 kg N ha⁻¹

Design - Randomised Block Design

Replications - 3

Spacing - 20 x 15 cm

Plot size - 40 m²

Methodology

Observations on SPAD and LCC were taken from the upper most fully expanded leaves upto the heading stage and on flag leaf from heading onwards. Five leaves from each plot were selected for measurements. Three SPAD meter readings were taken around the mid-point of each leaf blade, 30 mm apart on one side of the mid-rib. The average of fifteen readings represented the SPAD value of each plot.

Leaf Colour Chart consists of six green colour shades – from light yellowish green (No.1) to dark green (No.6). LCC cannot indicate smaller differences in leaf greenness as the chlorophyll or SPAD meter does. The difference between adjacent shades in the chart is equal to 3 to 4 SPAD values. LCC can be compared with the chlorophyll meter to determine their relative accuracy in assessing the leaf N status of rice plants. The rice leaf colour is compared with the standard LCC under the same environmental conditions. If the colour of a rice leaf is judged to fall between two colour shades, the mean of the two values is taken as the reading. For example, if the colour of a rice leaf lies between No.3 and No.4, it is noted as 3.5. The leaf colour was compared with the LCC and the average of readings of five leaves formed the LCC value of each plot.

Among the fertilizers, N (aurea) was applied in three equal splits, i.e., as basal, at tillering stage and at panicle initiation stage. Phosphorus (P) and potash (K) were applied at a common dose of 45:45 kg ha⁻¹ as Rajphos and MOP respectively. The entire quantity of P was applied at sowing/planting and K was applied in three equal splits along with N.

Season	Kharif 2000	Rabi 2000
Location	Vadakkenchery	Adat
Block	Alathur	Puzhakkal
Name of farmer	Sri. R.N. Sankaran Sree Laxmi Nivas Vadakkenchery Palakkad	Sri. M.G. Sasikumar Mathur House Chittilappilly, Adat Thrissur
Method of crop establishment	Direct dry sowing	Transplanting
Date of sowing	30.05.2000	06.09.2000
Date of germination	05.06.2000	--
Date of transplanting	--	01.10.2000
Basal fertilizer application	19.06.2000	01.10.2000
1 st top dressing	19.07.2000	21.10.2000
IInd top dressing	07.08.2000	06.11.2000
Plant protection	Nil	30.10.2000 - Malathion against leaf roller 4.11.00 – Metacid against leaf roller

Date of harvest	29.09.2000	03.01.2001
Duration	117 days	119 days
Special information	In the treatments 5 and 6 false smut was severe. In T6 crop lodged at maturity	Lodging observed in T5 and T6

Effect of N on SPAD values (Kharif)

At 28 DAS, i.e., 9 days after basal N application T₆ gave the highest SPAD value followed by T₄ and T₅ and these three were at par. T₄, T₅ and T₃ were also on par. At 44 DAS treatments 5, 6, 4 and 3 were at par. That is at about 25 days after first N application, the variation in SPAD values between various N regimes was very narrow. It was also found that the SPAD values fell down by 3-4 points at 44 DAS as compared to 28 DAS. At 55 DAS i.e. 6 days after first top dressing of N treatment. T₄ recorded the highest SPAD value (35.7) but it was on par with treatments 5, 3 and 6. At 60 DAS (11 days after first N top dressing) T₆ gave the highest value, which was on par with treatments 5, 4 and 3. Same trend was observed at 68 DAS (19 days after first top dressing of N). The third split of N was applied on 7.8.00. Observation on SPAD values at 73 DAS (5 days after second top dressing of N) gave highest value for T₆ but it was on par with treatments 5, 4, 3 and 2. The trend was almost same at 78 and 83 DAS also.

In general it was observed that the SPAD values got increased when the observations were taken 5 days after N application, but it got deflected subsequently. Much difference was not recorded between T₆, T₅ and T₄. Invariably at all observations control plots recorded the lowest SPAD value.

Effect on LCC

At 28 DAS T₆ give the highest LCC value (3.77). But it was on par with treatments 5 and 4. At 44 DAS (25 days after basal application of N) T₅ gave the highest value but it was on par with T₆ and T₄. At 55 DAS also (5 days after first top dressing) T₄ gave the highest value, but was on par with T₅ and T₆. At 60 DAS

Mean SPAD values at different growth stage in var. Aiswarya at Vadakkenchery (R.N. Sankaran), Kharif 2000

Treatments	Dates of observation							
	28.06.00 (28 DAS)	14.07.00 (44 DAS)	25.07.00 (55 DAS)	30.07.00 (60 DAS)	07.08.00 (68 DAS)	12.08.00 (73 DAS)	17.08.00 (78 DAS)	22.08.00 (83 DAS)
T ₁	29.0	26.6	28.3	27.3	28.9	29.2	36.3	28.7
T ₂	31.1	28.2	30.1	30.7	33.6	34.1	35.9	28.2
T ₃	32.5	29.5	33.6	33.4	32.8	34.9	38.3	34.0
T ₄	34.9	30.4	35.7	31.5	33.8	35.6	40.4	40.0
T ₅	34.4	31.3	33.7	34.3	34.1	37.7	41.5	36.3
T ₆	36.4	30.7	33.3	35.2	36.8	37.9	39.3	38.3
CD(0.05)	3.261	2.755	3.697	4.538	4.855	4.568	4.536	3.657

Mean LCC values at different growth stage in var. Aiswarya at Vadakkenchery (R.N. Sankaran), Kharif 2000

Treatments	Dates of observation							
	28.06.00 (28 DAS)	14.07.00 (44 DAS)	25.07.00 (55 DAS)	30.07.00 (60 DAS)	07.08.00 (68 DAS)	12.08.00 (73 DAS)	17.08.00 (78 DAS)	22.08.00 (83 DAS)
T ₁	2.87	2.77	2.83	2.65	2.75	2.90	3.83	2.92
T ₂	3.13	2.88	3.07	3.18	3.28	3.33	3.72	3.37
T ₃	3.37	2.90	3.30	2.83	3.38	3.53	3.82	3.23
T ₄	3.52	3.00	3.82	4.10	3.63	3.70	4.30	3.53
T ₅	3.55	3.23	3.45	3.97	3.62	3.75	4.32	3.40
T ₆	3.77	3.05	3.53	4.27	3.87	3.92	3.98	3.50
CD(0.05)	0.386	0.407	0.427	0.561	0.620	0.386	0.709	0.373

Yield and yield contributing characters in var. Aiswarya at Vadakkenchery (R.N. Sankaran), Kharif 2000

Treatments	Number of tillers/m ²										
	50 DAS	75 DAS	Tiller m ⁻² at maturity	Panicle no./m ²	Plant height (cm)	Panicle length (cm)	Panicle weight (g)	100 grain weight (g)	Grain yield (kg ha ⁻¹)	Straw yield (kg ha ⁻¹)	Chaff weight (kg ha ⁻¹)
T ₁	376	428	428	412	83	19.5	2.333	31.033	4155	3968	247
T ₂	462	469	465	445	82	20.9	2.333	32.067	5576	4841	333
T ₃	485	499	495	471	83	21.7	2.400	31.700	5722	5208	360
T ₄	511	508	517	495	83	21.7	2.167	31.600	5892	5745	447
T ₅	559	573	556	541	85	21.5	2.067	30.633	6164	6685	540
T ₆	580	585	589	563	87	20.8	1.900	30.867	4586	6520	700
CD(0.05)	108.72	91.362	100.557	94.486		2.043	0.481	1.812	430.9	938.94	210.179

(11 days after 1st top dressing of N) T₆ gave to highest value but was on par with T₅ and T₄. The trend was same at 68 DAS also (19 days after first top dressing).

On 5th day after second top dressing (73 DAS) T₆ gave the highest value (3.92), but was on par with T₅, T₄ and T₃. There was no significant difference between T₆, T₅ and T₄ at 78 DAS and also at 83 DAS.

As in the case of SPAD value, LCC values also got increased immediately after N application, but it got deflected subsequently. There was not much difference in LCC values between T₆, T₅ and T₄. So also at all observations the control plots recorded the lowest LCC values.

Effect on yield and yield contributing characters

Highest yield (6164 kg ha⁻¹) was recorded in T₅ (120 kg N ha⁻¹). However it was on par with T₄ (5892 kg ha⁻¹). (90 kg N ha⁻¹). The percentage of chaff as well as incidence of false smut was highest in T₆ followed by T₅. Lodging was also comparatively high in T₆ and T₅. This indicates that N level beyond 90 kg ha⁻¹ increases floral sterility and disease incidence and the crop succum to lodging during kharif season .

In the case of tiller numbers at various growth stages and also in the case of panicle number, T₆ gave the highest value followed by T₅ and T₄, but were at par. In the case of panicle length, panicle weight and thousand grain weight, any conspicuous difference could not be observed between treatments.

Rabi

M.G. Sasikumar
Mathoor House
Chittilappilly
Thrissur

Date of sowing - 06.09.2000

Date of transplanting - 01.10.2000

Date of harvest	-	03.01.2001
Plot size	-	40 m ²
Variety	-	Aiswarya

Treatments

T1	- 0	N kg ha ⁻¹
T2	- 30	N kg ha ⁻¹
T3	- 60	N kg ha ⁻¹
T4	- 90	N kg ha ⁻¹
T5	- 120	N kg ha ⁻¹
T6	- 150	N kg ha ⁻¹

Effect of N on SPAD value

Observations on SPAD started at 20 days after transplanting the crop. Highest value was observed in T6. But much difference was not observed between the SPAD values of T5, T4 and T3. Five days after first top dressing, T4, T5 and T6 gave comparatively higher values than the other treatments. At 31 DAT (11 days after first top dressing) values were higher in T5 and T6. Between other treatments there was not much difference. But on 36 DAT (16 days after first top dressing) values were higher in T6. But the other treatments were almost similar. At 41 DAT (5 days after second top dressing) SPAD values got increased over the previous stages with highest SPAD in T6 (40.5) followed by T4, T5 and T3 (values ranging from 34.2 to 36.3). The trend was almost similar at 11, 18 and 27 days after second top dressing.

At all days of observation the highest values were observed in T6 followed by T5 and T4. However between T3, T4 and T5 there was not much variation in SPAD values. SPAD values immediately after N application got suddenly increased, but decreased with successive stages till the next application. The values in control with no nitrogen application were invariably low at all stages of crop growth and remained almost static throughout the crop growth.

Mean SPAD values at different growth stage in var. Aiswarya at Chittilappilly (M.G. Sasikumar), Rabi 2000-01

Treatments	Dates of observations							
	20.10.00 (20 DAT)	25.10.00 (25 DAT)	31.10.00 (31 DAT)	5.11.00 (36 DAT)	10.11.00 (41 DAT)	16.11.00 (46 DAT)	23.11.00 (53 DAT)	02.12.00 (62 DAT)
T ₁	31.4	29.8	30.2	28.4	28.2	29.6	28.8	29.1
T ₂	35.8	32.7	30.8	30.2	33.0	33.4	33.5	32.3
T ₃	37.6	33.4	34.2	32.2	34.2	35.8	35.6	33.6
T ₄	36.7	36.2	32.9	31.5	36.3	36.9	36.1	34.8
T ₅	37.0	38.1	35.3	32.9	35.7	38.5	36.4	35.4
T ₆	38.3	38.3	36.9	35.2	40.5	39.3	38.5	36.9

Mean LCC values at different growth stage in var. Aiswarya at Chittilappilly (M.G. Sasikumar), Rabi 2000-01

Treatments	Dates of observations							
	20.10.00 (20 DAT)	25.10.00 (25 DAT)	31.10.00 (31 DAT)	5.11.00 (36 DAT)	10.11.00 (41 DAT)	16.11.00 (46 DAT)	23.11.00 (53 DAT)	02.12.00 (62 DAT)
T ₁	3.12	-	2.68	2.42	2.53	2.85	2.62	2.68
T ₂	3.42	-	2.88	2.80	2.83	3.30	3.17	3.12
T ₃	3.38	-	3.05	3.12	3.10	3.57	3.48	3.27
T ₄	3.53	-	3.25	3.07	3.53	3.73	3.50	3.43
T ₅	3.62	-	3.35	3.13	3.62	3.75	3.75	3.73
T ₆	3.67	-	3.43	3.53	4.03	3.95	4.05	3.78

Yield and yield contributing characters in var. Aiswarya at Chittilappilly (M.G. Sasikumar), Rabi 2000-01

Treatments	No. of tillers/m ²							
	Total tiller at harvest	No. of panicle/m ²	Plant height (cm)	Panicle length (cm)	Panicle weight (g)	Grain yield (kg ha ⁻¹)	Straw yield (kg ha ⁻¹)	1000 grain weight (g)
T ₁	557	513	88.5	21.5	2.8	3992	4025	26.0
T ₂	572	543	89.0	21.8	3.1	4130	4025	26.4
T ₃	572	572	91.0	21.6	3.1	4878	5005	25.8
T ₄	616	572	91.5	22.5	3.1	5900	6370	27.9
T ₅	587	543	91.5	22.3	3.0	6313	6778	27.0
T ₆	645	601	92.5	22.7	2.8	5428	6825	27.4
CD(0.05)	NS	81.368	0.992	1.507	0.488	1410.205	1168.496	NS

Effect of N on LCC values

The trend of LCC values at various growth stages were almost similar to that of SPAD. At all observations highest value was observed in T6 closely followed by T5 and T4. As in the case of SPAD, LCC values got increased when observed at 5 days after N application but decreased subsequently till next N application. Invariably at all stages the LCC values were lowest in control plot and remained almost static throughout the crop growth.

Effect on yield and yield contributing characters

Highest yield (6313 kg ha^{-1}) was recorded in T5 (120 kg N ha^{-1}), but it was on par with T4 and T6. The trend was similar in the case of straw yield also.

The number of panicles per square metre and panicle length were highest in T6. Any definite trend of difference between other treatments could be observed. The overall results indicate that though the highest yield was observed at 120 kg N ha^{-1} , it was on par with 90 and 150 kg N ha^{-1} . The lodging tendency and high disease incidence at N levels beyond 90 kg ha^{-1} indicate that 90 kg ha^{-1} would be the optimum N level and SPAD and LCC values at 90 kg N ha^{-1} can be taken as threshold values at respective growth stages.

Response of rice variety Athira to varying levels of nitrogen

Objectives

1. To study the response of dwarf indica rice to nitrogen under on-farm situation.
2. To work out optimum nitrogen requirement for rice
3. To work out threshold values of SPAD and LCC for dwarf indica varieties

The study was conducted in farmers field at Vadakkencherry during kharif 2000 and at Adat (kole lands) during rabi, 2000.

Technical programme

Treatments

T¹ Control - 0 N

T² - 30 kg N ha⁻¹

T³ - 60 kg N ha⁻¹

T⁴ - 90 kg N ha⁻¹

T⁵ - 120 kg N ha⁻¹

T⁶ - 150 kg N ha⁻¹

Design - Randomised Block Design

Replications - 3

Spacing - 20 x 15 cm

Plot size - 40 m²

Season	Kharif	Rabi
Location	Vadakkenchery	Adat
Block	Alathur	Puzhakkal
Name of farmer	Sri. V.K. Ramakrishnan Sree Krishna Vihar Thekke Kalam Vadakkenchery	Sri. M.G. Krishnan Mathur House Chittilappilly, Adat Thrissur
Method of crop establishment	Direct dry sowing	Transplanting

Mean SPAD values at different growth stages in var. Athira at Vadakkenchery (V.K. Ramakrishnan), Kharif - 2000

Treatments	Dates of observation							
	27.06.00 (28 DAS)	14.07.00 (44 DAS)	25.07.00 (55 DAS)	30.07.00 (60 DAS)	07.08.00 (68 DAS)	12.08.00 (73 DAS)	16.08.00 (78 DAS)	20.08.00 (83 DAS)
T ₁	29.4	25.5	24.5	25.0	26.9	29.6	31.4	29.2
T ₂	29.6	26.2	30.6	27.0	27.7	31.4	32.7	33.6
T ₃	32.6	26.0	29.5	30.8	27.7	34.4	34.4	31.5
T ₄	35.0	28.0	32.4	32.7	31.9	35.2	36.1	33.2
T ₅	34.9	27.2	34.3	33.4	32.7	35.3	35.8	33.3
T ₆	36.0	28.9	35.2	33.0	35.1	36.2	37.2	35.3
CD(0.05)	1.826	2.451	3.826	3.032	4.014	2.821	3.006	2.432

Mean LCC values at different growth stages in var. Athira at Vadakkenchery (V.K. Ramakrishnan), Kharif - 2000

Treatments	Dates of observation							
	27.06.00 (28 DAS)	14.07.00 (44 DAS)	25.07.00 (55 DAS)	30.07.00 (60 DAS)	07.08.00 (68 DAS)	12.08.00 (73 DAS)	16.08.00 (78 DAS)	20.08.00 (83 DAS)
T ₁	3.07	2.55	2.42	2.78	2.87	2.82	3.17	2.67
T ₂	3.37	2.63	3.15	2.90	3.05	3.25	3.47	3.42
T ₃	3.55	2.58	3.30	3.50	3.18	3.68	3.50	3.22
T ₄	4.05	2.85	3.58	3.60	3.38	3.67	3.83	3.45
T ₅	3.85	2.82	3.60	3.65	3.45	3.60	3.98	3.37
T ₆	4.10	2.90	4.02	3.97	4.18	3.83	4.33	3.43
CD(0.05)	0.377	0.326	0.495	0.345	0.304	0.251	0.310	0.182

Yield and yield contributing characters in var. Athira at Vadakkenchery (V.K. Ramakrishnan), Kharif – 2000-01

Treatments	Number of tillers/m ²										
	50 DAS	75 DAS	Total tillers at harvest	Panicle no./m ²	Plant height (cm)	Panicle length (cm)	1000 grain weight (g)	Panicle weight (g)	Grain yield (kg ha ⁻¹)	Straw yield (kg ha ⁻¹)	Chaff weight (kg ha ⁻¹)
T ₁	404	400	413	395	93	20.2	30.93	1.73	3207	4400	473.33
T ₂	459	473	531	511	102.5	22.0	32.07	2.37	4514	4721	473.33
T ₃	484	499	519	478	104	22.4	32.00	2.43	4673	5317	700.00
T ₄	485	488	489	461	109	22.5	30.10	2.23	4896	5042	613.33
T ₅	521	535	516	521	112	22.8	30.89	1.93	56.89	5133	720.00
T ₆	501	525	548	497	109	22.8	30.40	1.93	4256	5850	866.67
CD(0.05)	59.764	58.876		58.31	5.545	1.047	2.00	0.508	738.454	462.941	246.436

Date of sowing	30.05.2000	06.09.2000
Date of germination	05.06.2000	--
Date of transplanting	--	01.10.2000
Basal fertilizer application	19.06.2000	01.10.2000
1 st top dressing	19.07.2000	21.10.2000
2 nd top dressing	07.08.2000	06.11.2000
Plant protection	Rice bug – sprayed metacid on 03.09.2000	Sprayed malathion against leaf roller on 30.10.00. Metacid on 4.11.00, Karatte on 7.11.00
Date of harvest	24.09.2000	03.01.2001
Duration	112 days	119 days
Special information	In the treatments 5 and 6 there was high incidence of leaf roller. Lodging noted in T5 and T6	Here also high incidence of leaf roller in T5 and T6. Lodging noted in T5 and T6.

Effect of N on SPAD values

At 28 DAS, i.e., 9 days after basal N application T6 gave the highest value (36) followed by T4 and T5 and these three were on par. The trend was similar at 44 DAS also. The N was first top dressed on 19.07.2000 (49 DAS). At 55 DAS, 60 DAS and 68 DAS (6, 11 and 17 days after first top dressing) there was not much variation in SPAD values between treatments 6, 5 and 4 with highest values mostly recorded in T6. On 73 DAS (five days after second top dressing) the highest value was recorded in T6 and also during subsequent observations (78 and 83 DAS). There was no appreciable difference in values between T6, T5 and T4, the highest value mostly recorded in T6 followed by T4 and T5 in most of the days.

The influence of N in increasing the SPAD value could be observed only upto 5-10 days after application. The SPAD values gradually deflects with days after application.

At all days of observations, the SPAD values were lowest in control plots (0 kg N), but it got increased with crop stages.

Effect of N on LCC values

The trend of difference in LCC values as influenced by N application and crop growth stages was almost same as observed in SPAD.

Effect of N on yield and yield contributing characters

Treatment 5 gave the highest yield (5689 kg ha⁻¹) and was significantly superior to all other treatments. Between other N regimes there was no significant difference. In control plot (No N) the yield was significantly lower. The better yield performance in T5 is possible due to high tiller production, higher number of productive tillers and long panicles. Though T6 was better in tiller production and panicle number, it did not reflect in yield. The lodging at maturity, high chaff percentage and poor panicle weight may be the reasons. Results indicate that 120 kg N would be the optimum dose for Athira during kharif season. The SPAD values and LCC values observed in T5 could be considered as threshold values.

RABI

Effect of N on SPAD values

The first SPAD observation was recorded at 20 days after basal N application (20-10-00). Any definite influence on SPAD values by N application could be made when observed at this stage. Five days after first top dressing of N, the SPAD value was highest in T4, closely followed by T6 and T5 (values ranging from 42.3 to 40.2) and the values in other treatments were very much lower. At 11 days after first top dressing (31.10.00) and also on 16 days after first top dressing (5.11.00) values were highest in T6. But between various N regimes any appreciable difference could not be observed. Second top dressing was done on 6.11.00. Here the influence of N could be observed at 41 DAT, 46 DAT, 53 DAT and 62 DAT. The highest value was noted in T6 in all observations followed by T5 and T4. The values in T3, T2 and T1 were comparatively lower. As usual the effect of SPAD value was not evident after 10 days of N application.

Mean SPAD values at different growth stage in var. Athira at Chittilappilly (M.G. Krishnan), Rabi 2000-01

Treatments	Dates of observations							
	20.10.00 (20 DAT)	25.10.00 (25 DAT)	31.10.00 (31 DAT)	5.11.00 (36 DAT)	10.11.00 (41 DAT)	16.11.00 (46 DAT)	23.11.00 (53 DAT)	02.12.00 (62 DAT)
T ₁	38.0	36.6	32.4	30.2	31.0	29.9	29.4	29.5
T ₂	40.3	38.7	37.7	35.7	33.8	34.2	32.8	32.3
T ₃	43.7	38.3	35.1	34.9	35.3	35.5	35.5	35.0
T ₄	39.6	42.3	36.3	34.7	37.4	38.2	37.0	36.7
T ₅	39.9	40.2	37.7	34.4	37.8	39.2	39.4	38.6
T ₆	37.9	41.7	38.3	36.4	39.1	41.3	40.1	39.3

Mean LCC values at different growth stages in var. Athira at Chittilappilly (M.G. Krishnan), Rabi 2000-01

Treatments	Dates of observations						
	20.10.00 (20 DAT)	31.10.00 (31 DAT)	5.11.00 (36 DAT)	10.11.00 (41 DAT)	16.11.00 (46 DAT)	23.11.00 (53 DAT)	02.12.00 (62 DAT)
T ₁	3.45	3.15	2.80	2.78	2.90	2.80	2.85
T ₂	3.73	3.67	3.18	3.07	3.50	3.25	3.20
T ₃	3.82	3.42	3.32	3.23	3.65	3.38	3.52
T ₄	3.82	3.50	3.45	3.67	3.77	3.58	3.68
T ₅	3.82	3.45	3.48	4.17	3.97	3.82	3.78
T ₆	3.78	3.55	3.73	4.28	4.32	3.95	3.97

But observations on flag leaf (on 23.11.00 and 02.12.00) indicated that the effect of N is sustained by high SPAD values.

Effect of N on LCC values

As in the case of SPAD values LCC values were lowest in T1 at all stages of crop growth. On 20th day after basal N application there was not much difference between treatments. On 11 and 16 days after first top dressing T6 gave the highest values closely followed by T5 and T4. Second top dressing was done on 6.11.00. Subsequent observations on 10.11.00, 16.11.00, 23.11.00 and 2.12.00 recorded the same trend as in the case of first top dressing. It could be observed that as in the case of SPAD values LCC values also got decreased with period after N application during vegetative phase, but the effect was found sustained during reproductive phase as indicated by higher values in flag leaves.

Yield and yield contributing characters

Highest yield (6254 kg ha^{-1}) was observed in T4 (90 kg N ha^{-1}). But it was on par with T5 (120 kg N ha^{-1}) and T6 (150 kg N ha^{-1}).

The number of tillers was highest in T6 but T4 and T5 were at par. The number of productive tillers was highest in T4. Appreciable difference in other yield parameters between treatments could not be observed.

Results indicate that application of 90 kg N ha^{-1} would be sufficient for rice variety Athira during rabi season to achieve maximum yield. The observed SPAD and LCC values on T4 could be considered as threshold values.

Abstract

The studies on the response of dwarf indica rice varieties Athira and Aiswarya to varying levels of nitrogen (0, 30, 60, 90, 120 and 150 kg N ha^{-1}) were

conducted during kharif (at Vadakkenchery) and rabi (at Adat) 2000. Application of 90 kg N ha⁻¹ was found optimum for Aiswarya during both kharif and rabi seasons.

For Athira application 120 kg N ha⁻¹ was found optimum during kharif season and 90 kg N ha⁻¹ during rabi season.

Yield and yield contributing characters of Athira at Chittilappilly (M.G. Krishnan), Rabi 2000-01

Treatments	Number of tillers/m ²									
	Tiller 25 DAT	Tiller 48 DAT	Total tiller	Panicle number (m ²)	Panicle height (cm)	Panicle length (cm)	Panicle weight (g)	1000 grain weight (g)	Grain yield (kg ha ⁻¹)	Straw yield (kg ha ⁻¹)
T ₁	484	550	572	550	89	18.3	2.4	26.3	3540	3150
T ₂	572	601	616	528	92	19.2	2.8	26.8	4897	5528
T ₃	572	601	601	572	96	19.7	2.5	28.0	5487	5075
T ₄	631	645	660	631	100	19.1	2.5	26.4	6254	5705
T ₅	616	631	631	572	101	19.2	2.7	26.8	5841	7700
T ₆	652	675	675	557	106	19.1	2.7	26.8	5546	7070
CD(0.05)	40.091	39.7999	45.447	57.998	3.823	1.342	NS	NS	960.11	1383.478

Site-specific identification and recommendation of rice varieties for group management in rice cropping systems in the central zone

Use of high yielding varieties and better crop management technologies are the two best options to increase productivity. Although HYV opened up new vistas in rice production in Kerala three decades ago we could not make the full advantage out of it. By the efforts of 30 years or more we could cover HYVs only to a meager extent of 43% in *virippu* and 37% in *mundakan* (FIB, 2000). Despite the fact that the Central zone accounts for 54% of the gross rice area in the State, the HYV coverage is only 38% of the area, lower than the State average. Similarly Palakkad district, which accounts for 31% of the State area, is having dismally low HYV coverage (22% of the area). Another important aspect needs attention is that in Ernakulam district, though the HYV coverage is very high in all the three crop seasons (78, 90 and 100 per cent in *virippu*, *mundakan* and *punja*, respectively) thanks to better irrigation facilities, the productivity is poor (1608 kg ha^{-1}) compared to the State average (1975 kg ha^{-1}) or other regions.

The major lacunae for HYV coverage are (i) lack of standardization of suitable varieties specific to the on-farm locations/farming situations to suit the cropping systems, (ii) lack of identification/availability of tall and high yield potential varieties for double crop sequences, (iii) lack of suitable and efficient variety pattern to fit into the single crop and double crop systems in the kole area and (iv) lack of identification of high yield potential variety recommendation for three-crop sequences in the irrigated belt, as in Ernakulam.

The varieties released from research stations, promising pre-release cultures and also the locally predominant ones (both descript and non-descript) have to be locally tested and standardized. The most appropriate one or two varieties in each cropping season have to be identified, considering all aspects on seasonal suitability, system suitability, farmers preference, quality aspects, market preference etc.

On-farm studies conducted at various locations in the Central zone during 1999-00 and 2000-01 led to identification of some promising varieties suitable for rice cropping systems at various regions. The relevant results are presented in this section.

Testing of varieties - Set I - Kharif - Kannadi

Objective

To identify suitable varieties during kharif season for the location.

Technical Programme

Treatments - 10 Varieties

- T1 - Kairaly
- T2 - Kanchana
- T3 - Red Thriveni
- T4 - ASD-16
- T5 - ASD-19
- T6 - ASD-38
- T7 - ADT-43
- T8 - Cul-A4-4-2
- T9 - Cul-210-25
- T10 - ADT-39

Location - Kannadi
 Block - Kozhalmannam
 Name of farmer - Sri. Syamaladasan
 Kumar Rice Mill
 Vadaparamba
 Thirunellayi
 Kannannoor

Design - RBD
 Replications - 3
 Plot size - 40 m²
 Spacing - 20 x 10 cm
 Fertilizers - 90:45:45 kg ha⁻¹ of NPK
 Application as per recommended splits.

Mode of crop establishment - Transplanting

Yield and yield attributes of varieties – Set I – Kannadi – Kharif 2000

Varieties	Total tillers/m ² at maturity	Panicle no./m ²	Plant height (cm)	No. of grains/panicle	Panicle length (cm)	Grain yield (kg ha ⁻¹)	Straw yield (kg ha ⁻¹)	Duration (days)*
Kairaly	739	557	98.6	76	22.8	7215	4439	120
Kanchana	689	689	99.0	102	20.7	7215	4439	120
Red Thriveni	631	609	102.2	79	22.8	6302	5578	120
ASD-16	613	565	107.0	132	19.5	6727	4519	120
ASD-19	575	571	117.5	98	20.7	5109	5021	138
ADT-38	850	726	112.3	125	27.4	5283	4791	138
ADT-43	736	737	99.3	102	20.5	5181	4012	120
Cul.A-4-4-2	609	610	98.6	114	19.5	6703	6417	120
Cul.210-25	740	711	109.8	84	17.0	6493	4359	120
ADT-39	605	578	112.7	92	22.9	6571	3687	138
CD(0.05)	75.05	79.09	3.12	0.929	0.416	648.397	455.966	

* Duration extended due to drought

Date of sowing	-	11.5.2000
Date of planting	-	14.6.2000
Plant Protection	-	Sprayed Malathion against rice bug
Harvesting	-	08.09.2000 to 26.09.2000

Special features - Three was drought during the cropping period and hence the duration was extended by 10-15 days.

Results

Among the different varieties tested, Kanchana recorded maximum yield (7215 kg ha⁻¹) However it was on par with Kairaly, ASD - 16, Cul A4-4-2 and ADT - 39 (yield ranging from 6571 to 6793 kg ha⁻¹).

Straw yield was highest in Cul A4-4-2 (6417 kg kg ha⁻¹) followed by Red Thriveni, ASD-19 and ADT-38 is not appreciated by farmers due to its white colour and less market value. Similarly ADT-39 having more duration (138 days) may result in delayed establishment of rabi crop and also being a white rice variety it fetches less price. Hence considering the yield, duration and bran colour, the varieties Kairialy, Kanchana, or Cul-A4-4-2 would be the ideal choice for kharif season at this location.

Testing of varieties - Set II (Kharif)

Technical Programme

Treatments - 6 varieties

T1 - Athira

T2 - Pranava

T3 - Jaya

T4 - Aiswarya

T5 - Pavithra

T6 - Jyothy

	Trial -I	Trial - II
Location	Kannadi	Kannadi
Block	Kozhalmannam	Kozhalmannam
Name of farmer	Sri. Gokuldas Kollengottu Parambu House Kadamkurissi Kannannoor	Sri. Viswanatha Menon Sree Vihar Kannannoor
Design	RBD	RBD
Replication	3	3
Plot size	40 m ²	40 m ²
Spacing	20 x 10 cm	20 x 10 m ²
Fertilizers	90:45:45 kg ha-1 of NPK	Same

Fertilizers applied as per recommended splits

Mode of crop establishment	Transplanting	Direct dry sowing
Date of sowing	15.05.2000	05.05.00
Transplanting	16.06.2000	
Plant protection	Sprayed Malathion against rice bug	Sprayed Malathion against rice bug
Harvesting	25.09.2000	31.08.00 to 11.09.00

Special features

Trial I - There was intermediate drought during the cropping period, and hence duration was extended by 10-15 days. The maturity of Pranava was very much delayed due to long duration (about 160 days), rice bug attack was severe and hence did not get any yield.

Trial II - Jaya, Pranava and Pavithra were affected by severe rice bug attack due to longer duration (130-140 days) and hence did not give any yield. Here also duration was prolonged due to drought.

Yield and yield attributes – Trial I – Set II – Kannadi – Kharif 2000

Varieties	Total tillers at maturity/m ²	Panicle No./m ²	Panicle length (cm)	No. of grains/panicle	Plant height (cm)	Grain yield (kg ha ⁻¹)	Straw yield (kg ha ⁻¹)	Duration (days)
1. Athira	688	617	21.9	79	98.5	6099	8163	133
2. Pranava	887	753	18.9	61	109.9	2617	6517	160
3. Jaya	993	780	24.6	103	81.7	6212	8577	133
4. Aiswarya	932	740	21.4	67	102.4	7196	6891	133
5. Pavithra	747	613	23.2	116	102.1	6460	9433	133
6. Jyothy	722	622	21.2	103	87.7	6200	8398	133
CD(0.05)	91.775	63.795	0.848	1.486	0.904	716.05	570.44	--

Results

Trial I

Variety Aiswarya recorded highest yield (7196 kg ha⁻¹) which was significantly superior to all other varieties. Varieties Pavithra, Jaya, Jyothi and Athira were at par but lesser in yield than Aiswarya.

Trial II

Since the varieties Pranava, Jaya and Pavithra did not give any considerable yield the data were not subjected to statistical analysis. However it can be inferred that the performance of Aiswarya was comparatively better, considering the higher yield (4590 kg ha⁻¹) and lesser duration (118 days).

Thus trials conducted at revealed that variety Aiswarya would be an ideal choice for kharif season if medium duration varieties are preferred.

Yield and yield attributes – Trial II, Set II – Kannadi – Kharif 2000

Treatments	Varieties	Grain yield (kg ha ⁻¹)	Straw yield (kg ha ⁻¹)	Duration (days)
T1	Athira	2688	3162	129
T2	Pranava	Yield was negligible due to severe rice bug attack		
T3	Jaya	" " "		
T4	Aiswarya	4590	3450	118
T5	Pavithra	Negligible yield due to severe rice bug attack		
T6	Jyothy	3743	3528	129

Testing of varieties - Set I (Kharif) - Puthucode

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Objective

Technical Programme

Treatments - 14 varieties

- T1 - Kairaly
- T2 - Kanchana
- T3 - Red Thriveni
- T4 - ASD -16
- T5 - ASD 19
- T6 - ADT 38
- T7 - ADT 43
- T8 - Cut A4-4-2
- T9 -Cut 210-25
- T10 -ADT -39
- T11 - Ahalya
- T12 - Remya
- T13 - Panchamy
- T14 - Karishma

Design - RBD

Replications - 3

Plot size - 40 m²

Spacing - 20 x 10 cm

Location Puthucode, Alathur block

Name of farmer Sri. M.A. Siddique
Thachanadi, Manappadam
Palakkad

Method of crop establishment Dry broadcasting

Fertilizers 90:45:45kg ha⁻¹ of N P K
Application as per recommended splits.

Date of sowing	20.05.2000
Date of harvests	16.9.00 to 8.10.00
Plant protection	Sprayed Malathion against rice bug

Special information

Rice bug attack was heavy in ASD-19, AD8-38 and ADT-39 due to long duration (137 days) as compared to other varieties (116 days).

Results

The variety Red Thriveni recorded the highest yield (3478 kg ha⁻¹) which was on par with Kanchana (3256 kg ha⁻¹) and Ahalya (3237 kg⁻¹) Karishma and Cul. 210-25 and Kairaly, gave comparable yields, but they were on par with variety Kanchana and Ahalya. Considering the grain yield, bran colour and duration the variety Red Thriveni ranks First during kharif season but Kanchana, and Ahalya were also equally good. The performance of Karishma Cul. 210-25 and Kairaly were comparable to Kanchana and Ahalya but lower than Red Thriveni varieties ASD-19, ADT-38 ADT-39 Remya and Panchamy were proved to be unsuitable to this location during kharif season. The variety Karishma although gave better yield, its longer duration is a limiting factor.

Testing of varieties – Set I – Puthucode – Kharif 2000

Treatments	Varieties	Grain yield (kg ha ⁻¹)	Straw yield (kg ha ⁻¹)	Duration (days)
T1	Kairaly	2973	3546	116
T2	Kanchana	3256	3694	116
T3	Red Thriveni	3478	4120	116
T4	ASD-16	2270	4233	116
T5	ASD-19	1303	3899	131
T6	ADT-38	1425	3528	131
T7	ADT-43	2877	3460	116
T8	Cul.A-4-4-2	2713	3857	116
T9	Cul.210-25	3017	4133	116
T10	ADT-39	1595	3548	131
T11	Ahalya	3237	5202	117
T12	Remya	1952	6159	134
T13	Panchami	2434	5392	134
T14	Karishma	3040	3522	134
CD(0.05)	2.767	350.505	440.394	

Testing of varieties - Set II - Puthucode – Kharif 2000

Treatments - 6 varieties

T1 - Athira

T2 - Pranava

T3 - Jaya

T4 - Aiswarya

T5 - Pavithra

T6 - Kanchana

Design - RBD

Replications - 3

Plot size - 40 m²

Spacing - 20 x 10 cm

Location - Puthucode, Alathur block

Name of farmer - Sri Ismail
Janatha Manzil,
Manappadam.

Fertilizers - 90:45:45kg ha⁻¹ of NPK
Application as per recommended splits

Method of crop establishment - Transplanting

Date of sowing - 27-5-2000

Date of transplanting - 22-6-2000

Date of harvest - 30.9.2000 to 12.10.2000

Plant Protection - Sprayed Dimecron against leaf roller on 30-7-2000,
Sprayed Malathion against rice bug.

Special features

In Pranava the rice bug attack was severe due to longer duration and hence yield was very poor.

Results

Yield was highest in Kanchana (4698 kg ha⁻¹) and it was on par with Aiswarya (4027 kg ha⁻¹). Both these varieties had a duration of 126 days. If medium duration varieties are preferred Kanchana or Aiswarya could be selected. The varieties, Athira, Jaya, and Pavithra not only took more duration for maturity, but also the yield was very poor. Pranava took about 150 days, and as a result rice bug attack was severe and yield was negligible. So it is not suited for kharif season.

Yield and yield attributes of different varieties - Set II – Puthucode – Kharif 2000

Varieties	Total tillers/m ² at harvest	Panicle No./m ²	Height (cm)	Panicle length (cm)	Grain yield (kg ha ⁻¹)	Straw yield (kg ha ⁻¹)	Duration (days)
1. Athira	568	533	117	23.8	2971	6048	126
2. Pranava	490	437	129	19.7	850	4380	150
3. Jaya	628	550	108	25.3	2064	2576	138
4. Aiswarya	588	550	126	21.8	4027	6888	126
5. Pavithra	515	467	113	22.7	2668	6282	138
6. Kanchana	807	633	111	23.6	4698	4928	126
CD(0.05)		169.483	4.465	0.215	705	1305.84	

Testing of medium duration varieties - Set I – Kannadi – Rabi 2000-01

Treatments - 9 varieties

- T1 - Pavithra
- T2 - Panchami
- T3 - Ramanika
- T4 - Uma
- T5 - Krishnanjana
- T6 - Jaya
- T7 - Remya
- T8 - Athira
- T9 - Pavizham

Location - Kannady, Kozhalmannam block

Method of crop establishment - Transplanting

Name of farmer - Sri. Syamaladasan,
Kumar Rice Mill,
Vadaparamba
Kannannoor,
Palakkad.

Date of sowing - 8-10-2000

Date of transplanting - 5-11-2000

Date of harvesting - 10-2-01 to 21-02-01

Agronomic practices - As per POP

Plant Protection - Sprayed Rogor against rice bug on 15/1/01

Result

Highest yield was recorded by Athira (5000 kg ha⁻¹) followed by Jaya (4875 kg ha⁻¹) and both were at par. The performance of other varieties were significantly lower.

Varieties – Set I – Kannadi – Rabi 2000-01

Varieties	Tiller No.	Panicle No.	Panicle length (cm)	Panicle weight (g)	No. of grains	Height (cm)	Grain yield (kg ha ⁻¹)	Straw yield (kg ha ⁻¹)	Duration (days)
Pavithra	695	623	19.0	1.4	87	72.3	3000	4725	134
Panchamai	423	408	18.4	1.95	70	77.1	3500	4813	134
Ramanika	383	370	19.2	2.0	92	80.0	3500	6178	134
Uma	550	500	18.4	1.35	86	67.0	4000	4270	134
Krishnanjana	383	363	18.9	1.75	75	72.4	3500	4953	134
Jaya	385	353	18.0	1.85	71	57.5	4875	4900	134
Remya	578	544	19.3	1.45	94	66.1	2875	5495	134
Athira	377	334	20.5	2.3	71	94.0	5000	6055	124
Pavizham	633	568	18.1	1.75	78	72.7	4000	5740	134
CD (0.05)	78.9	58	0.98	0.28	5.1	3.9	531	463	

Testing of medium duration varieties - Set II – Erimayur – Rabi 2000-01

Treatments

T1 - Aiswarya

T2 - Matta Thriveni

T3 - Kairaly

T4 - Jyothy

T5 - ADT-43

Design - RBD
 Replications - 3
 Plot size - 40 m²
 Spacing - 20 x 10cm

Method of crop establishment : Transplanting

Name of farmer - Sri. Chenthamarakshan,
 Amoor padam,
 Erimayoor
 Date of sowing - 8-10-2000
 Date of transplanting - 16-11-2000
 Date of harvesting - Second and Third week of February

Agronomic management practices - As per POP recommendation

Plant Protection

Sprayed Dimacron against leaf roller on 11/12/00.
 Roger against rice bug on 10/1/01 and 15/01/01

Results

Aiswarya gave the highest yield of 6450 kg ha⁻¹ which was significantly superior to all other varieties.

Varieties, Set II – Erimayur – Rabi 2000-01

Varieties	Tiller No.	Panicle No.	Panicle length (cm)	Panicle weight (g)	No. of grains	Height (cm)	Grain yield (kg ha ⁻¹)	Straw yield (kg ha ⁻¹)	Duration (days)
Aiswarya	871	799	19.0	2.3	63.0	76.8	6450	5616	120
Matta Thriveni	858	746	18.8	2.5	77.7	65.6	3363	5265	118
Kairaly	1020	871	19.4	1.95	87.5	65.9	3347	5031	120
Jyothy	1165	1046	15.9	1.95	68.4	64.6	4962	4797	118
ADT-43	832	746	18.1	1.55	85.9	63.8	4029	4680	115
CD (0.05)	259	210	1.9	0.15	12.0	4.19	698	154	

Testing of medium duration varieties Set I – Puthucode – Rabi 2000-01

Treatments

- T1 - Pavithra
- T2 - Panchami
- T3 - Ramanika
- T4 - Uma
- T5 - Krishnanjana
- T6 - Pavizham
- T7 - Kanchana

Design - RBD

Replication. - 3

Spacing - 20 x 10cm

Plot size - 40m²

Location - Puthucode, Alathur block

Method of crop establishment - Transplanting

Name of farmer - Sri. Ismail
Janatha House
P.O. Manappadam,
Palakkad

Date of sowing - 13/10/00

Date of transplanting - 4/11/00

Date of harvesting - 05/02/01 to 25/02/01

Plant protection - Sprayed Dinecron against case worm 20/11/00
Metacid against rice bug on 10/01/01 and 25/01/01

Results

Uma recorded the highest yield (4654 kg ha⁻¹) followed by Pavizham (3951 kg ha⁻¹) and Kanchana (3885 kg ha⁻¹) and these three were at par. Kanchana matured by 122 days, and hence it would better suited than the other two varieties which took 135 days.

Varieties – Set I – Puthucode – Rabi 2000-01

Varieties	Tiller No.	Panicle No.	Panicle length (cm)	Panicle weight (g)	No. of grains	Height (cm)	Grain yield (kg ha ⁻¹)	Straw yield (kg ha ⁻¹)	Duration (days)
Pavithra	403	390	18.1	2.0	83	64.8	3441	5359	135
Panchami	385	365	18.5	1.9	91	72.1	3463	5048	135
Ramanika	380	338	18.3	1.9	86	74.6	3441	5825	135
Uma	383	347	19.3	2.0	95	71.4	4654	7347	135
Krishnanjana	446	403	19.1	2.3	96	70.4	3619	5771	135
Pavizham	406	380	19.2	2.0	92	64.8	3951	4748	135
Kanchana	452	422	18.9	1.7	88	66.3	3885	3761	122
CD (0.05)	NS	NS	NS	0.26	NS	6.17	547	1010	

Testing of varieties – Set I – Polpully – Kharif 2000

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Treatments – 6 varieties

T1 - Jyothy

T2 - Aiswarya

T3 - Athira

T4 - Pranava

T5 - Jaya

T6 - Pavithra

Location - Polppully
Block - Kollengode
Design - RBD
Replications - 3
Plot size - 40 m²
Spacing - 20 x 15 cm

Yield and yield attributes of varieties – Set I – Polpully – Kharif 2000

Varieties	Plant height (cm)	No. of tiller/sqm	No. of panicle/sqm	Panicle length (cm)	No. of grains/panicle	Grain yield (kg ha ⁻¹)	Straw yield (kg ha ⁻¹)	Duration (days)
Jyothi	64.6	660	580	16.9	64.9	4069	4925	114
Aiswarya	78.9	639	573	16.9	78.6	4162	5068	114
Athira	107.4	601	596	19.6	90.8	3778	4802	124
Pranava	120.0	644	570	22.1	127.8	3590	5383	140
Jaya	69.8	573	490	19.0	84.7	1811	5280	140
Pavithra	86.4	615	535	20.6	92.2	2198	5037	140
CD(0.05)	4.83	63.576	60.186	0.886	16.701	615.0	709.381	

Name of farmer	Sri. Jayadevan Chozhan House P.O. Polppully Palakkad	Sri. Vasudevan Chembrood Kalam Polppully Palakkad
Method of crop establishment	Transplanting	Transplanting
Date of sowing	05.06.2000	03.06.2000
Date of transplanting	04.07.2000	04.07.2000
Date of harvests	28.09.2000 to 18.10.2000	25.09.2000 to 21.10.2000
Plant protection	Nil Mild attack of rice bug observed in Pranava, Jaya and Pavithra	Nil Mild attack of rice bug in Pranava, Jaya and Pavithra

Results

Variety Aiswarya recorded highest yield (4162 kg ha⁻¹) followed by Jyothy (4069 kg ha⁻¹). Athira (3778 kg ha⁻¹) and Pranava (3590 kg ha⁻¹). All these were on par. Jaya and Pavitra recorded significantly poor yield. In Pranava eventhough the yield was comparatively good, its long duration will cause problems in cropping pattern. For the variety Aiswarya, Jyothy or Athira would be the best for the location for kharif season.

Testing of varieties – Set II – Polpully – Kharif 2000

Objectives

Technical programme

Treatments – 7 varieties

T1 - Karishma

T2 - Panchami

T3 - Remya

T4 - Kairaly

T5 - Kanchana

T6 - Matta Thriveni

T7 - Ahalya

Yield and yield attributes of varieties – Set II – Polpully – Kharif 2000

Varieties	No. of tillers/m ²	Plant height/hill	No. of panicle/sqm	Panicle length (cm)	No. of grains/panicle	Grain yield (kg ha ⁻¹)	Straw yield (kg ha ⁻¹)	Duration (days)
Karishma	596	100.8	539	23	120	4449	5478	135
Panchami	553	79.4	476	19.5	105	4160	5018	133
Remya	682	86.2	597	20.8	107	2655	5068	134
Kairaly	600	72.7	514	17.6	65	2893	4383	112
Kanchana	597	66.8	526	15.7	53	3228	3553	118
Matta Triveni	657	63.9	578	17.5	80	3294	5727	107
Ahalya	561	67.5	470	18.3	67	3462	4187	107
CD(0.05)	74.580	6.583	62.997	0.705	13.489	454	1540	

Location - Polppully
 Block - Kollengode
 Season - Kharif 2000
 Design - RBD
 Replications - 3
 Plot size - 40 m²
 Spacing - 20 x 15 cm
 Method of crop establishment - Transplanting

Name of farmers	Sri. Jayadevan Chozhan House Polppully Palakkad	Sri. Vasudevan Chembroad Kalam Polppully Palakkad
Date of sowing	14.06.2000 12.07.2000	03.06.2000 05.07.2000
Date of harvests	Third and fourth week of September	Last week of September to third week of October
Plant protection	Sprayed Malathion against rice bug in all the replications	

Results

Highest yield was recorded for the variety Karishma (4449 kg ha⁻¹) followed by Panchami (4160 kg ha⁻¹) which were at par. The performance of other varieties were comparatively poor. In this region farmers generally adopt long duration varieties (150-160 days) during kharif season. Use of long duration varieties during kharif season results in delaying the second crop, which in turn leads to drought at the end of the season. Due to lesser duration (130-135 days) but not much reduction in yield. Karishma and Panchami could replace the long duration varieties prevalent in the region. Straw yield is also better in Karishma and Panchami.

Testing of varieties – Set III – Polpully – Kharif 2000

Treatments

T1 - ASD-16

T2 - ASD -19

T3 - ADT-38

T4 - ADT-39

T5 - ADT-43

T6 - Cul.1026 (Vytila)

T7 - Cul.1735 (Vytila)

T8 - Cul.2006

T9 - V-1-20

T10 – Vytila – 5

Design - RBD

Replication - 3

Plot size - 40 m²

Spacing - 20 x 15 cm

Location - Polpully

Block - Kollengode

Name of farmers	Sri. Jayadevan Chozhan House Polpully Palakkad	Sri. Vasudevan Chembroad Kalam Polpully Palakkad
Date of sowing	14.06.2000	03.06.2000
Date of transplanting	12.07.2000	05.07.2000
Dates of harvests	First week of October to fourth week of October	First week of October to last week of October

Plant protection

Sprayed Malathion against rice bug.

Special features

Cul.1026, Cul.2006 and Vytila-5 lodged at maturity.

Result

ASD-19 recorded the highest yield (4388 kg ha⁻¹) following by Cul.1026 from RRS, Vyttila (4284 kg ha⁻¹), ADT-38 (4093 kg ha⁻¹) and ADT-43 (3994 kg ha⁻¹) which were at par. Among these Cul.1026 due to lodging, will not be preferred by farmers. ASD-19 or ADT-38 or ADT-43 are suitable for the location during Kharif season. The performance of other varieties were poor.

Testing of varieties – Set III - Polpully – Kharif 2000

Varieties	No. of tillers/sqm	Plant height/hill	No. of panicle/m ²	Panicle length (cm)	No. of grains/panicle	Grain yield (kg ha ⁻¹)	Straw yield (kg ha ⁻¹)	Duration (days)
ASD-16	436	78.3	407	19.1	88	3473	5997	109
ASD-19	556	93.9	492	20.7	109	4388	5055	129
ADT-38	473	105.9	486	20.6	83	4093	6344	131
ADT-39	549	94.2	522	18.6	91	2859	5344	131
ADT-43	562	73.5	229	18.6	87	3994	4969	109
Cul.1026	549	113.4	572	23.4	91	4284	5810	131
Cul.1734	594	138.6	565	19.1	95	3579	5684	124
Cul. 2006	559	92.6	528	21.9	135	3171	5047	129
V-1-20	501	72.7	484	18.3	73	3470	4628	129
Vyttila-5	461	173.9	391	21.8	115	3475	4557	127
CD(0.05)	80.131	2.829	82.318	1.393	18.392	785.443	992	

Testing of varieties - tall indica – Polppully – Rabi 2000-01

Treatments - 9 varieties

- T1 - Neeraja
- T2 - Nila
- T3 - Payyoore-I
- T4 - Ponmany
- T5 - Karuna
- T6 - Ponni
- T7 - IET-14735
- T8 - Pranava
- T9 - ADT-44

Location - Polppully, Kollengode block

Method of crop establishment - Transplanting

Name of farmer - Sri. Vasudevan,
Chemproad kalam
Polppully,
Palakkad

Date of sowing - 16-10-2000

Date of transplanting - 29-11-00

Date of Harvest - 9-3-01 to 28-3-01

Fertilizer recommendations - As per POP recommendations

Plant Protection - Nuvacron against stem borer on 30/1/01
Metacid against rice bug on 22-2-01

Special features

Varieties Payyur -1, Karuna, Nila and Ponny lodged at ripening. In Ponmany rice bug attack was severe (due to very long duration). In ADT-44 attack of stem borer was more.

Yield and yield attributes – Varieties – Tall indica – Polpully, Rabi 2000-01

No.	Varieties	Tiller count	Panicle No.	Panicle length	No. of grains	Height	Grain yield (kg/ha)	Straw yield	Duration (days)
1	Neeraja	368	347	20.7	96	101.3	5917	10250	143
2	Nila	339	326	23.1	113	145.9	4833	10250	155
3	Payyoore-I	329	317	21.4	122	128.0	4917	9250	155
4	Ponmany	345	349	20.0	118	118.2	5500	10650	162
5	Karuna	369	342	23.6	102	140.8	5417	10200	157
6	Ponni	342	320	19.9	112	131.4	4417	900	152
7	IET-14735	315	300	18.8	103	109.9	6583	9350	155
8	Pranava	437	413	20.8	107	119.2	4917	8650	138
9	ADT-44	362	351	20.6	106	113.2	5583	10550	152
CD (0.05)							950		

Result

The highest yield was observed IET-14735 (6583 kg ha⁻¹) followed by Neeraja (5917 kg ha⁻¹) and ADT-44 (5583 kg ha⁻¹) and these three were at par. The predominant local varieties Ponmany gave 5500 kg ha⁻¹ and Ponni 4417 kg ha⁻¹.

It has to be emphasised that Neeraja is a promising variety with lesser duration (143 days) and better yield than the predominant varieties, Ponmany and Ponni which have durations of 162 and 152 days respectively. Although the yield of Pranava was comparatively low (4917 kg ha⁻¹), its lesser duration (138 days) is an advantage.

Testing of varieties - tall indica – Chittoor – Rabi 2000-01

Treatments

T1 - Neeraja

T2 - Nila

T3 - Payyoore-I

T4 - Ponmany

T5 - Karuna

T6 - Ponni

T7 - IET-14735

T8 - Pranava

T9 - ADT-44

T10 - Mashuri

Location	- Chittoor, Chittoor block
Method of crop establishment	- Transplanting
Name of farmer	- Sri. Chellamani Karingali Pallom Kalam Chittoor
Date of sowing	- 12-10-000
Date of transplanting	- 25-11-2000

Date of harvests	- 6-3-01 to 25-3-01
Fertilizers	- As per POP recommendations
Plant Protection	- Bavistin against foot rot on 12/12/00 Nuvacron against case worm and stem borer on 23/12/00 Metacid against rice bug on 10-2-01

Special features

Varieties Nila, Payyoor-1, IET-14735 and Karuna lodged at flowering stage. Neeraja, Ponmany, Ponny and Mushoori lodged at dough stage (in general the vegetative growth of crop was more). In ADT-44 and Pranava stem borer attack was more.

Results

The variety Pranava gave the highest yield (6800 kg ha^{-1}) and it was on par with Mushoori (6000 kg ha^{-1}), the pre-dominant variety in the location. The yield of Ponni, another locally predominant variety was very low (3733 kg ha^{-1}) ADT-44 also gave a yield equal to that of Ponmani.

For the location Pranava is a promising variety due to higher yield and lesser duration (136 days). ADT-44 with a duration of 142 days is also suitable to replace Ponmani and Ponni with a duration of 163 and 155 days respectively.

Yield and yield attributes – Tall indica – Chittur, Rabi 2000-01

No.	Varieties	Tiller count	Panicle No.	Panicle length	No. of grains	Height	Grain yield (kg/ha)	Straw yield	Duration (days)
1	Neeraja	441	409	21.0		127.4	3733	9600	148
2	Nila	401	380	22.3		128.0	933	6960	155
3	Payyoore-I	401	381	21.3		129.7	3933	9680	153
4	Ponmany	451	429	19.8		126.2	5600	9360	163
5	Karuna	441	406	23.9		151.2	3933	10320	155
6	Ponni	453	421	22.1		137.6	3733	10480	155
7	IET-14735	454	429	20.1		126.3	2867	9920	153
8	Pranava	344	328	22.6		117.3	6800	1000	136
9	ADT-44	339	328	22.7		111.0	5200	9840	142
10	Mashuri	401	378	20.3		134	6000	7320	144
CD (0.05)							975		

Demonstration Programme of rice variety Pranava – Polpully

In Chittoor-Kollengode region, long duration varieties such as Ponny and Mashoori are predominant during kharif season and Ponny, Mushoori, Ponmany etc. are predominant during rabi season. These varieties take 135 to 160 days for crop maturity and often the rabi crop is prolonged upto the middle of April. Trials conducted earlier revealed the Pranava having a duration of 135 days could replace the other varieties respectively during rabi season and enable the rabi harvest earlier. To confirm the performance of Pranava macroplot trials were conducted at Polppully during kharif and rabi seasons.

Kharif season

Variety	Date of sowing	Date of planting	Date of harvest	Duration (days)	Yield (kg/ha)
Ponny	03.06.00	07.07.00	20.10.00	137	3940
Mushoori	03.06.00	07.07.00	20.10.00	137	3280
Pranava	03.06.00	07.07.00	15.10.00	132	4875

Testing of varieties – Set I – Elavanchery – Kharif 2000

Treatment – 6 varieties

T1 - Jyothy

T2 - Aiswarya

T3 - Athira

T4 - Pranava

T5 - Jaya

T6 - Pavithra

Design - RBD
 Plot size - 40 m²
 Spacing - 20 x 15 cm
 Location - Elavanchery
 Block - Nemmara

Name of farmer	-	Sri. Haridas Kannamkulam Kalam Panangattiri Elavancherry Palakkad
Method of crop establishment	-	Transplanting
Date of sowing	-	13.06.2000
Date of transplanting	-	09.07.2000
Date of harvesting	-	Third week of September to Fourth week of October
Fertilizers	-	90:45:45 kg ha ⁻¹ . Application as per POP recommendations
Plant protection	-	Sprayed Malathion against rice bug

Testing of varieties – Set I – Elavanchery – Kharif 2000

Varieties	No. of tillers/sqm	No. of panicle/m ²	Plant height (cm)	Panicle length (cm)	No. of grains/panicle	Grain yield (kg ha ⁻¹)	Straw yield (kg ha ⁻¹)	Duration (days)
Jyothi	357	320	69.3	17.4	73.2	3840	4600	117
Aiswarya	400	327	38.8	15.7	54.2	3360	3800	106
Athira	353	303	99.4	21.3	104.3	2400	6400	131
Pranava	383	333	123	21.0	125.8	1920	6000	140
Jaya	457	380	67.4	18.1	79.7	1280	5800	140
Pavithra	413	353	87.8	20.8	101.4	1920	7400	140
CD(0.05)								

Special features

Varieties Pranava, Jaya and Pavithra took about 140 days for maturity and hence rice bug attack was severe.

Results

Results indicate that the performance of Jyothy and Aiswarya were better than other varieties tested (duration 106 and 117 days respectively). Variety Athira took 131 days and the yield was comparatively poor. Varieties Pranava, Jaya and Pavithra (140 days) were affected by drought and rice bug attack. As a result the performance of these varieties were poor.

Testing of varieties – Set II – Elavanchery – Kharif 2000

Treatments – 7 varieties

T1 - Karishma

T2 - Panchamy

T3 - Remya

T4 - Kairaly

T5 - Kanchana

T6 - Matta Triveni

T7 - Ahalya

Design - RBD

Plot size - 40 m²

Spacing - 20 x 15 cm

Location - Elavanchery

Block - Nemmara

Name of farmer - Sri. Haridas
Kannamkulam Kalam
Panangattiri
Palakkad

Method of crop establishment - Transplanting

Date of sowing	-	13.06.2000
Date of transplanting	-	09.07.2000
Date of harvesting	-	Third week of September to last week of November
Plant protection	-	Sprayed Malathion against rice bug
Special features	-	Crop was affected by drought at maturity stage

Results

Kairaly (110 days) gave the highest yield followed by Karishma and Panchamy (132 days). The performance of other varieties were poor. Although in Matta Thriveni and Ahalya duration was short (110 days), the yield was poor.

Varieties – Set II – Elavanchery – Kharif 2000

Varieties	No. of panicle	No. of litters m ²	Panicle length (cm)	No. of grains/panicle	Panicle height (cm)	Grain yield (kg ha ⁻¹)	Straw yield (kg ha ⁻¹)	Duration (days)
Karishma	373	430	21.9	128	100	2560	7400	132
Panchami	357	400	163	105	79.5	2400	6700	132
Remya	390	383	19.9	104	87.0	1920	7800	132
Kairaly	357	403	17.4	79	64.4	2880	6200	110
Kanchana	320	383	17.0	147	78.9	2240	5800	128
Matta Triveni	380	403	19.7	84	81.7	1920	6400	110
Ahalya	334	380	19.9	78	66.3	1920	5400	110

Testing of varieties - Set -III – Elavanchery – Kharif 2000

Treatments - 9 Varieties

- T1 - ASD 16
- T2 - ADT 38
- T3 - ADT 39
- T4 - ADT 43
- T5 - Cul 1026
- T6 - Cul 1734
- T7 - Cul 2006
- T8 - V-1 20
- T9 - Vyttila 5

Design - RBD
 Plot size - 40 m²
 Spacing - 20 x 15cm
 Location - Elavanchery
 Block - Nemmara

Name of farmer - Sri. Haridasan,
 Kannankulam Kalam,
 Panangattitri,
 Elavanchery,
 Palakkad.

Method of crop establishment - Transplanting

Date of harvests - First week of October to last week of October.

Plant Protection - Sprayed Malathion against rice bug.

Special feature

Crop was affected by drought towards fag end of crop. Varieties Cul. 1026, 2006 and Vyttila -5 lodged at maturity.

Results

Although the highest yield was recorded by Vyttila-5 followed by Cul-2006, being lodging varieties, are not suited to the location during Kharif season. Among other varieties ASD-16 gave the highest yield and the duration was also less (110 days) for this variety .

Abstract of varietal trials at Elavanchery

Nemmara region is predominantly an irrigated belt coming under the ayacut of Pothundy dam. It is a regular phenomenon that both kharif and rabi season crops are frequently affected by drought due to either shortage of irrigation water or absence of adequate rainfall. The overall results of varietal trials indicate that the varieties of duration less than 120 days are best suited for kharif season. Varieties Aiswarya (111 days) Jyothy (106 days), Kairaly (110 days) and ASD-16 (110 days) were found to be promising ones. If the crop could be dry sown well in advance, varieties having duration upto 135 days can also be included in the variety cafeteria. Among the varieties tested Karishma and Panchamy (around 132 days) were found promising.

Varieties Set III – Elavanchery – Kharif 2000

Varieties	No. of tillers/sqm	No. of panicle/sqm	Plant height (cm)	Panicle length (cm)	No. of grain/panicle	Grain yield (kg ha ⁻¹)	Straw yield (kg ha ⁻¹)	Duration (days)
ASD-16	350	297	73.7	22.9	135	2240	6400	110
ADT-38	447	383	105.9	20.3	83	1600	6300	137
ADT-39	460	387	72.4	19.6	97	1920	2400	137
ADT-43	433	363	86.3	18.9	91	1760	6300	110
Cul.1026	453	447	108	20.1	94	1280	5000	137
Cul.1734	463	397	129.8	18.6	87	2080	7700	124
Cul. 2006	420	363	90.9	20.9	89	2240	7000	137
V-1-20	527	473	85.8	19.3	71	1760	6000	137
Vyttila-5	513	380	172	21.6	100	2560	6900	124

Testing of Varieties - dwarf indica - Set I – Elavanchery – Rabi 2000-01

Treatments - 6 varieties

T1 - Pranava

T2 - Athira

T3 - Aiswarya

T4 - Remya

T5 - Jyothy

T6 - Pavizham

Upto plot size - Same as earlier

Spacing - 20 x 10cm

Method of crop establishment - Transplanting

Name of farmer - Sri. T.M. Haridas,
Tharavanthrath House,
Vattekkad P.O.,
Elavanchery.

Date of Sowing - 23-10-2000

Date of transplanting - 18 -11-2000

Date of harvests - 24-02-01 to 28-02-01

Fertilizers - as per POP recommendations

Plant Protection

Sprayed Hinosan against foot rot on 14/12/01

Nuvacron against stem borer 28-1-2001

Metacid against rice bug on 3/2/01

Special feature

Crop was very poor due to intermittent drought, especially during the reproductive phases

Varieties – dwarf indica – Set I – Elavanchery – Rabi 2000-01

No.	Varieties	Tiller count	Panicle No.	Panicle length	No. of grains	Height	Grain yield (kg/ha)	Straw yield	Duration (days)
1	Pranava	552	560	19	80	97	3000	4900	135
2	Athira	440	440	19	102	73	3000	4550	123
3	Aiswarya	506	476	17.3	76	74.7	2333	4083	123
4	Remya	478	437	19.7	100	86.7	3167	4375	125
5	Jyothy	462	463	20	92	63.3	3333	3617	118
6	Pavizham	435	435	20.7	96	95	3250	3675	120
CD (0.05)							350		

Results

In general the yield was very poor. Among the varieties Jyothi recorded the highest yield (3333 kg ha⁻¹) followed by Pavizham (3250 kg ha⁻¹). The varieties Remya, Athira and Pranava also gave yield comparable to that of Jyothi.

Testing of Varieties -dwraft indica - Set II – Elavanchery – Rabi 2000-01

Treatments- 7 Varieties

T1 - Panchami

T2 - Pavithra

T3 - ADT-39

T4 - ADT-38

T5 - Uma

T6 - Ramanika

T7 - Karishma

Design - RBD

Replications - 3

Plot size - 40m²

Spacing - 20 x 15cm

Method of crop establishment - Transplanting

Name of farmer - Sri. T.M. Haridas,
Tharavanthrath House,
Vattekkad P.O.,
Elavanchery.

Date of sowing - 23-10-2000

Date of transplanting - 18-11-2000

Date of harvesting - 24-2-01 to 3-3-01

Fertilizer recommendations - As per POP recommendations

Varieties – dwarf indica – Set II – Elavanchery, Rabi 2000-01

No.	Varieties	Tiller count	Panicle No.	Panicle length	No. of grains	Height	Grain yield (kg/ha)	Straw yield	Duration (days)
1	Panchami	528	511	21.3	107	85.3	2000	4083	130
2	Pavithra	525	479	19.3	97	82	1917	4083	123
3	ADT-39	526	496	19.7	94	80	2333	5047	123
4	ADT-38	550	518	19.7	97	88.7	2000	4842	130
5	Uma	563	520	20.3	111	77	2917	4200	123
6	Ramanika	493	467	20.7	110	80	3500	5250	130
7	Karishma	464	437	20.7	106	65	3417	4317	123
CD (0.05)							685		

Plant protection

Sprayed Hinosan against foot rot on 14-12-00

Nuvacron against stem borer on 28-1-01

Metacid against rice bug on 3-2-01

Spécial features

Due to drought at reproductive phase growth and yield was very poor.

Results

Among the varieties Remanika gave the highest yield (3500 kg ha^{-1}) followed by Karishma and Uma (2917 kg ha^{-1})

Abstract

Although the region is better in terms of soil fertility, occurrence of drought due to scarcity of water is a serious problem, especially towards the fag end of the rabi season. Hence it is necessary to identify suitable short duration varieties for the region.

Among the varieties tested Jyothi gave comparatively higher yield mainly because of lesser duration.

Testing of varieties Set – 1 – Wadakkanchery – Kharif 2000

Treatments - 6 varieties

T1 - Athira

T2 - Pranava

T3 - Jaya

T4 - Aiswarya

T5 - Pavithra

T6 – Jyothy

Design	-	RBD
Replications	-	4
Ploy size	-	40m ²
Spacing	-	20 x 15 cm
Crop establishment	-	Dry sowing
Location	-	Akamala
Block	-	Wadakkanchery

Name of farmers	Sri. Sasidharan Parayil Veedu, Akamala, P.O. Enkakkad	Smt. Vijayalakshmi, Parayil House, Akamala, P.O. Enkakkad.
Date of sowing	12.05.00	15.05.00
Date of harvest	04.09.00 to 23.09.00	31.08.00 to 24.09.00
Fertilizers	90:45:45 kg ha ⁻¹ applied as per POP recommendations	90:45:45 kg ha ⁻¹ applied as per POP recommendations

Special features

Slight rice bug attack and heavy rain during the flowering period of Pranava, Jaya and Pavitra resulted in poor yield of these varieties.

Results

The highest yield was recorded by Aiswarya (4400 kg ha⁻¹) followed by Jyothy (3917 kg ha⁻¹) and Athira (3900 kg ha⁻¹) and these three varieties were at par.

Varieties Pavithra, Jaya and Pranava took about 131 days for maturity and yield was poor due to rice bug attack. So the varieties Aiswarya, Jyothy and Athira are found suitable for this dry sown tract during kharif season.

Varieties – Wadakkanchery – Kharif 2000

Varieties	Height (cm)	Panicle length (cm)	Grain yield (kg ha ⁻¹)	Straw yield (kg ha ⁻¹)	Duration (days)
Athira	89	23.8	3900	3900	112
Pranava	92	22.8	3917	2900	131
Jaya	87	22.7	4400	2667	131
Aiswarya	103	23.3	2783	4400	112
Pavithra	98	22.8	2667	2783	131
Jyothy	95	22.0	2900	3917	112
CD(0.05)	10.558	1.091	896	601	

Testing of varieties - Set II – Wadakkancherry – Kharif 2000

Treatments 7 varieties

T1 - Ahalya

T2 - Red Thriveni

T3 - Kairaly

T4 - Kanchana

T5 - Panchami

T6 - Remya

T7 - Karishma

Design - RBD

Replication - 3

Plot size - 30 m²

Spacing - 20 x 15 cm

Location - Akamala

Block - Wadakkanchery

Name of farmer Sri. Krishnankutty,
Parayil House,
Akamala,
Wadakkanchery,
Thrissur.

Date of sowing - 16/5/00

Method of planting - Direct dry sowing

Fertilizers - As per POP recommendation

Plant protection	23.06.00 sprayed Ekalux against leaf roller 02.07.00 sprayed Dimecron against stem borer 02.07.00 sprayed Hinosan against blast	Sprayed Ekalux against leaf roller Sprayed Dimecron against stem borer Sprayed Hinosan against blast
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Result

The highest yield was recorded by Panchamy (3939 kg ha⁻¹). It was significantly superior to other varieties. Matta Thriveni held second rank in yield, but it was significantly superior to other varieties except Panchamy. Kanchana and Ahalya occupied the third and fourth positions but both were at par. Although Panchamy gave the highest yield, its high duration (131 days) will be a disqualification Matta Thriveni, Kanchana or Ahalya (all with 110 days duration) should be the order of preference for recommendation during kharif season in this dry sown tract.

Varieties – Wadakkenchery – Set II – Kharif 2000

Varieties	Height (cm)	Panicle length (cm)	Grain yield (kg ha ⁻¹)	Straw yield (kg ha ⁻¹)	Duration (days)
Ahalya	81.4	21.6	3207	3006	110
Red Thriveni	82	21.6	3739	4170	110
Kairaly	74.8	20.9	1335	2750	110
Kanchana	76.1	20.5	3338	3172	110
Panchami	91.8	20.2	3939	4259	131
Remya	102.0	21.2	2804	3841	131
Karishma	86.1	20.5	1736	5010	131
CD(0.05)	1.554	0.932	147	168	

Testing Varieties Set – III – Wadakkenchery – Kharif 2000

Treatments - II varieties

T1 - Kairlay

T2 - Kanchana

T3 - Matta Thriveni

T4 - ASD-16

T5 - ASD-19

T6 - ADT-38

T7 - ADT-43

T8 - Cul.A-4-4-2

T9 - Cul.210-25

T10 - ADT-39

T11 - Kunjukunju

Design - RBD
 Replication - 4
 Plot size - 40 m²
 Spacing - 20 x 15cm
 Location - Akamala
 Block - Wadakkanchery
 Fertilizers - As per POP recommendation

Plant protection

Sprayed Ekalux against leaf roller on 23/6/00 and 2/7/2000

Sprayed Hinosan against blast on 2/7/2000

Name of farmers	Sri. Sasidharan Parayil House Akamala Wadakkanchery	Sri. Abdutty, K.P. Kuttiyil House Kamranellur Wadakkanchery
Date of sowing	12.05.2000	12.05.2000
Harvesting	Last week of August to third week of September	Last week of August to second week of Sept.

Result

Result Cul.A-4-4-2 gave the highest yield (4979 kg ha⁻¹) which was significantly superior to all other varieties. There was not much variation among other varieties. However ADT-39 was very poor to indicated by lowest yield (2682 kg ha⁻¹). The second, third and fourth positions were occupied by Matta Thriveni, Cul-210-25, ASD -19 and Kanchana respectively without much yield difference (4061 to 3595 kg ha⁻¹).

Varieties -- Wadakkenchery -- Set III -- Kharif 2000

Varieties	Height (cm)	Panicle length (cm)	Grain yield (kg ha ⁻¹)	Straw yield (kg ha ⁻¹)	Duration (days)
Kairaly	87.9	21.7	3248	2652	111
Kanchana	80.9	22.0	3595	2923	111
Matta Thriveni	76.0	22.7	4061	2952	105
ASD-16	93.1	23.6	3373	3278	110
ASD-19	95.4	22.6	3803	3382	120
ADT-38	95.0	22.8	3582	4342	120
ADT-43	84.6	22.6	3590	2944	112
Cul.A-4-4-2	90.5	24.4	4979	3424	112
Cul-210-25	95.4	23.3	3870	2923	112
ADT-39	95.4	22.5	2652	3591	120
Kunjukunju	85.4	21.5	3538	2819	112
CD(0.05)	10.2	1.319	883	587	

Testing of varieties – Tall indica – Wadakkanchery – Rabi 2000-01

(i) Trial I

Treatments – 7 varieties

T1 - Mushoori

T2 - Karuna

T3 - Kumbham

T4 - Sagara

T5 - Nila

T6 - PTB-20

T7 - PTB 20-D-1

Design - RBD

Replication - 4

Plot size - 40 m²

Spacing - 20 x 10 cm

Location - Wadakkanchery, Wadakkanchery block

Name of farmers	Smt. Vijayalakshmi Parayil House Akamala Wadakkanchery	Sri. Sasidharan Parayil House Akamala Wadakkanchery
Date of sowing	29.08.2000	28.08.2000
Date of planting	01.10.2000	02.10.2000
Dates of harvesting	10.01.2001	30.12.2000 to 10.01.2001

Fertilizers - As per POP recommendations

Plant protection - Sprayed Hinosan against blast on 16.10.2000

Special features

Variety Sagara, PTB-20 and PTB 20-D-1 lodged at ripening stage

Kumbham and Nila took about 150-160 days for maturity and hence dried up due to water scarcity and found unsuitable for the location.

Crab attack was severe

Yield and yield attributes -Wadakkanchery – Trial I – Rabi 2000-01

Treatments	Varieties	Tiller PI/m ²	Total no./m ²	Panicle no./m ²	Panicle length (cm)	Plant height (cm)	Grain (kg ha ⁻¹)	Straw (kg ha ⁻¹)	Duration (days)
T1	Mashoori	353	437	396	20.4	96.1	2756	3941	135
T2	Karuna	400	454	440	23.4	104.6	3401	5380	135
T3	Kumbham	489	511	511	22.1	108.2	1275	3563	155
T4	Sagara	428	464	375	20.0	110.6	3060	5618	135
T5	Nila	454	478	459	21.6	110.4	1263	3559	155
T6	PTB-20	449	479	463	17.6	102.0	2963	4455	135
T7	PTB-20-D-1	475	496	484	17.1	98.8	3510	5293	135
CD(0.05)		70.274	80.827	113.307	1.5	5.3	373	938	

Yield and yield attributes -Wadakkanchery – Trial II – Rabi 2000-01

Treatments	Varieties	Tiller PI/m ²	Total tiller/m ²	Panicle no./m ²	Panicle height (cm)	Panicle length (cm)	Grain yield (kg ha ⁻¹)	Straw yield (kg ha ⁻¹)	Duration (days)
T1	Mashoori	287	433	387	110.8	21.8	3370	3652	134
T2	Karuna	323	408	378	112.2	23.4	3628	4455	137
T3	Kumbham	412	428	427	119.4	22.0	1267	3607	160
T4	Sagara	338	498	367	122.8	21.5	3377	4659	137
T5	Nila	402	437	393	118.2	21.5	1475	2933	160
T6	PTB-20	408	457	423	113.6	18.6	3225	3046	137
T7	PTB-20-D-1	432	448	423	107.5	17.6	3870	3920	137
T8	Neeraja	422	395	363	86.9	22.5	3823	4765	132
T9	IET-14735	380	423	402	86.4	18.5	3267	3139	137
T10	Payyor-I	440	457	423	106.2	21.4	2183	4653	137
T11	Chitterni	458	485	442	108.7	18.6	3083	3791	137
CD(0.05)		49.28	67.533	42.009	2.591	1.841	164.344	165.399	

Plant protection - Hinosan was sprayed against blast on 16.10.2000

Special features

Variety Sagara, PTB-20 and PTB 20-D-1 lodged at ripening stage

Kumbham and Nila took about 150-160 days for maturity and hence dried up due to water scarcity and found unsuitable for the location.

Crab attack was severe

Results

PTB 20-D-1 gave the highest yield (3870 kg ha⁻¹) and it was on par with Neeraja (3823 kg ha⁻¹). These varieties were significantly superior to all other varieties. The third position was occupied by Karuna (3628 kg ha⁻¹) and fourth position by Sagara (3377 kg ha⁻¹) and these were on par.

The overall results of the two trials indicated that PBT-20-D-1, Neeraja, Karuna and Sagara are best suited for the location during rabi season, which gave higher yield than the predominant variety, PTB-20.

Testing of varieties – dwarf indica – Wadakkanchery - Rabi 2000-01

Treatments – 8 varieties

T1 - Pavithra

T2 - Panchami

T3 - Ramanika

T4 - Uma

T5 - Karishma

T6 - Krishnanjana

T7 - Jaya

T8 - Deepthi

Design - RBD

Replication - 4

Plot size - 40 m²

Yield and yield attributes – dwarf indica - Wadakkenchery – Rabi 2000-01

Varieties	Tiller PI/m ²	Total tiller/m ²	Panicle No.	Panicle length (cm)	Panicle height (cm)	Grain yield (kg ha ⁻¹)	Straw yield (kg ha ⁻¹)	Duration (days)
Pavithra	589	609	546	17.5	64.2	3138	4439	130
Panchami	646	696	625	17.5	67.2	2558	3356	130
Remanika	629	654	613	17.0	63.0	3175	3678	120
Uma	620	650	605	17.6	69.0	3480	4277	130
Karishma	650	693	603	17.4	68.2	2788	3877	120
Krishnanjana	645	626	551	18.0	70.9	3413	3740	125
Jaya	646	663	554	18.6	67.6	2750	3056	130
Deepthi	644	688	643	18.5	114.5	2569	3848	115
CD(0.05)	NS	NS	NS	NS	5.553	NS	852.534	

Spacing - 20 x 10 cm

Location - Wadakkanchery, Wadakkanchery block

Name of farmers	Sri. Krishnankutty Parayil House Akamala Wadakkanchery	Pushpalatha Parayil House Akamala Wadakkanchery
Date of sowing	29.08.2000	07.09.2000
Date of planting	29.09.2000	30.09.2000
Dates of harvesting	31.12.2000 to 10.01.2000	30.12.2000 to 10.01.2001

Fertilizers - As per POP recommendations

Plant protection - Sprayed Hinosan against blast on 14.10.2000
 Sprayed Centaf against blast on 04.11.2000
 Sprayed Metacid against leaf roller on 04.11.2000

Results

There was no significant difference in yield between varieties. However, Uma gave highest yield (3480 kg ha⁻¹) followed by Krishnanjana (3413 kg ha⁻¹), Remanika (3175 kg ha⁻¹) and pavithra (3138 kg ha⁻¹).

Observation trial on performance of Basumathi

Name of farmer	Sri. Sasidhran Parayil House Akamala, Wadakkanchery Wadakkanchery Block
Date of sowing	28.08.2000
Date of transplanting	02.10.2000
Plot size	30 m ²
Date of harvest	30.12.2000
Duration	111 days
Number of tillers/m ² at PI stage	362
Number of tillers/m ² at maturity	435
Number of panicles/m ²	400

Plant weight at harvest	75 cm	278
Panicle length	22.2 cm	
Grain yield	3067 kg ha ⁻¹	
Straw yield	1064 kg ha ⁻¹	

Pest and diseases

Comparable with other dwarf indica varieties

Inference

Basumathy gave a yield comparable with that of promising dwarf indica varieties in the location.

Testing of varieties – Set I – Adat – Rabi 2000-01

Treatments – 8 varieties

- T1 - Jyothy
- T2 - Kairaly
- T3 - Kanchana
- T4 - Athira
- T5 - Aiswarya
- T6 - Bhadra
- T7 - Pavizham
- T8 - Remya

Design - RBD

Replication - 4

Plot size - 40 m²

Spacing - 15 x 10 cm

Location - Adat, Puzhakkal block

Name of farmers	Sri. K.A. Achuthan Kulangaraparambil House Adat, Thrissur	Sri. C.R. Jose Chittilappillyil House Adat, Thrissur
Date of sowing	02.09.2000	30.08.2000
Date of transplanting	26.09.2000	22.09.2000
Dates of harvesting	26.12.2000 to 10.01.2001	26.12.2000 to 03.01.2001

Fertilizers - As per POP recommendations

Plant protection

Dimecron against leaf roller on 12.10.2000 and 16.10.2000

Contaf against sheath blight on 27.10.2000

Dimecron against stem borer on 27.10.2000

Metacid against rice bug on 17.12.2000

Special features

Due to longer duration rice bug attack was severe in Remya and Pavizham.
Athira showed slight lodging tendency at maturity.

Results

Highest yield was observed in Bhadra (5469 kg ha⁻¹) followed by Aiswarya (5031 kg ha⁻¹). Third position was occupied by Kairaly (4813 kg ha⁻¹) followed by kanchana (4681 kg ha⁻¹) and then Pavizham (4638 kg ha⁻¹). All these varieties were at par. The predominant variety Jyothy was significantly lower in yield than Bhadra whereas it was on par with other varieties.

Pavizham and Remya took comparatively more days for maturity and hence rice bug attack was severe. Varieties Bhadra and Aiswarya were appreciated by farmers.

Medium duration varieties – I – Adat – Rabi 2000-01

Treatments	Varieties	Height (cm)	Total tiller/m ²	Panicle no./m ²	Panicle length (cm)	Panicle weight (cm)	Grain yield (kg ha ⁻¹)	Straw yield (kg ha ⁻¹)	Duration (days)
T1	Jyothi	81.6	484	440	19.7	2.9	4594	4813	115
T2	Kairaly	89.2	517	495	20.2	2.6	4813	5363	115
T3	Kanchana	86.4	539	474	20.2	2.9	4681	5225	115
T4	Athira	108.7	570	429	22.5	3.1	4506	7150	118
T5	Aiswarya	105.7	506	484	19.9	2.9	5031	5913	118
T6	Bhadra	89.4	605	506	18.8	2.0	5469	4565	121
T7	Pavizham	94.3	572	473	18.6	2.4	4638	5170	124
T3	Remya	92.4	528	440	21.5	2.7	4506	6463	126
CD(0.05)		5.276	NS	NS	1.431	0.400	840	1719.356	

Testing of varieties – Set II – Adat – Rabi 2000-01

Treatments -- 6 varieties

T1 - Pavithra

T2 - Panchami

T3 - Remanika

T4 - Uma

T5 - Karishma

T6 - Krishnanjana

Design - RBD

Replication - 4

Plot size - 40 m²

Spacing - 15 x 10 cm

Location - Adat, Puzhakkal Block

Name of farmers	Sri. Padmanabhan Nair Chittilappilly Thrissur	Sri. C.R. Jose Chittilappillyil House Adat, Thrissur
Date of sowing	02.09.2000	30.08.2000
Date of planting	29.09.2000	23.09.2000
Dates of harvesting	31.12.2000 to 04.01.2001	26.12.2000 to 03.01.2001
Plant Protection	Sprayed Dimecron against leaf roller on 16.10.2000 Contaf against blast on 27.10.2000 Dimecron against stem borer on 27.10.2000 Hinosan against blast on 13.11.2000	Sprayed Dimecron against stem borer on 14.10.2000 Contaf against sheath blight on 28.10.2000 Metacid against rice bug on 17.12.2000

Fertilizers - As per POP recommendations

Yield and yield attributes – Varieties Set II – Adat – Rabi 2000-01

Treatments	Varieties	Height	Total tiller	Panicle no.	Panicle length (cm)	Panicle weight (cm)	Grain yield (kg ha ⁻¹)	Straw yield (kg ha ⁻¹)	Duration (days)
T1	Pavithra	92.4	451	407	20.2	2.8	5294	5225	124
T2	Panchami	98.0	495	440	21.0	3.3	5294	5693	124
T3	Remanika	97.5	506	451	19.3	3.1	5425	4840	119
T4	Uma	95.1	539	473	19.3	2.8	6956	5828	124
T5	Karishma	100.5	517	473	21.4	2.4	5250	5748	120
T6	Krishnanjana	95.5	517	473	21.1	3.2	4419	5033	121
CD(0.05)		5.179	NS	NS	0.652	0.444	1265.664	NS	

Variety Uma gave the highest yield (6956 kg ha⁻¹) which was significantly superior to all other varieties. Among the other varieties, Remanika was the highest yielder followed by pavizham, panchami and Karishma and they were at par.

The overall results of trials at Adat (Kole lands) during rabi season show that the varieties Uma, Bhadra and Aiswarya are better suited than the predominant variety Jyothy for the region.

Testing of varieties Set I - Rayamangalam – Kharif 2000

Treatments - 7 Varieties

T1 - Athira

T2 - Pranava

T3 - Jaya

T4 - Aiswarya

T5 - Pavithra

T6 - Jyothy

T7 - Ponmani (Local, non-descript)

Design - RBD

Replication - 4

Plot size - 40 m²

Spacing - 20 x 15 cm

Season - Kharif 2000

Location - Rayamangalam, Koovappady block

Name of farmer	Balan Pillai Plankudy Veedu Rayamangalam	K.P. Padmakumar Karimattathu Parackal Rayamangalam
Replications	2 Nos.	2 Nos.
Date of sowing	09.06.2000	10.06.2000
Date of transplanting	01.07.2000	04.07.2000
Fertilizer application	90:45:45 kg/ha of NPK as per POP	Same
Dates of harvest	08.10.2000 to 19.10.2000	30.09.2000 to 01.11.2000
Plant protection	Sprayed metacid against rice bug	Sprayed Ekalux against thrips on 21.07.2000 to 28.07.2000

Results

Variety Jyothy recorded the highest yield of 3613 kg ha⁻¹. The yield given by Aiswarya, Ponmani and Athira (3197 to 3280 kg ha⁻¹) were on par with Jyothy. Among these varieties the straw yield was better in Aiswarya and Athira compared

Yield and yield attributes of different varieties – Set I – Rayamangalam – Kharif 2000

Varieties	Tillers at PI/m ²	Total tiller/m ²	Panicle No./m ²	Panicle length (cm)	Grain yield (kg ha ⁻¹)	Straw yield (kg ha ⁻¹)	Duration (days)
1. Athira	234	205	194	21.7	3197	4425	120
2. Pranava	234	214	201	21.1	2006	5212	136
3. Jaya	192	177	164	21.8	2906	3956	118
4. Aiswarya	240	227	212	18.9	3280	4631	117
5. Pavithra	252	225	213	21.0	2739	4308	118
6. Jyothy	253	238	225	19.0	3613	3882	115
7. Ponmany	209	196	186	19.4	3222	4092	118
CD(0.05)	30.988	29.235	28.947	0.379	528.905	714.342	

to other varieties. Although the yield of Ponnani was better, being a non-descript one stability in yield cannot be assured. Jyothy is not much preferred by the farmers of the region. Hence Athira or Aiswarya would be the better choice for the region.

Testing of varieties – Set II - Rayamangalam – Kharif 2000

Objectives

To identify suitable varieties during kharif season for the location.

Treatments – 7 varieties

T1 - Ahalya

T2 - Matta Thriveni

T3 - Kairaly

T4 - Kanchana

T5 - Panchamy

T6 - Remya

T7 - Karishma

Design - RBD

Replications - 4

Plot size - 40 m²

Spacing - 20 x 15 cm

Season - Kharif, 2000

Location - Rayamangalam, Koovappady block

Name of farmer	Krishnapanicker Jyothish Pulluvazhi	Balan Pillai Plankudy Veedu Rayamangalam
Replications	2 Nos.	2 Nos.
Date of sowing	14.06.2000	02.06.2000
Date of transplanting	07.07.2000	28.06.2000
Fertilizer application	90:45:45 kg ha ⁻¹ of NPK as per POP	Same
Date of harvests	10.10.2000 to 19.10.2000	14.09.2000 to 10.10.2000
Plant protection	Sprayed Ekalux against leaf roller on 5.8.2000. Sprayed Metacid against rice bug on 20.09.2000	Sprayed Metacid against rice bug on 16.09.2000

Yield and yield attributes of different varieties – Set II – Rayamangalam – Kharif 2000

Varieties	Tillers at PI/m ²	Total tiller/m ²	Panicle No./m ²	Panicle length (cm)	Grain yield (kg ha ⁻¹)	Straw yield (kg ha ⁻¹)	Duration (days)
1. Ahalya	223	196	149	21.4	2862	2731	103
2. Matta Thriveni	206	192	168	21.0	3135	2738	110
3. Kairaly	242	203	180	19.2	2831	2511	110
4. Kanchana	204	183	164	19.4	3205	2664	110
5. Panchami	206	186	166	19.8	3055	2974	128
6. Remya	199	175	160	22.4	2259	4648	128
7. Karishma	257	237	206	23.7	2939	4682	128
CD(0.05)	59.503	55.625	30.186	2.625	638.257	679.088	

Results

Kanchana recorded the highest yield (3205 kg ha⁻¹). Varieties Matta Thriveni, Panchamy, Karishma, Ahalya and Kairaly also gave yield comparable to Kanchana. The performance of Remya was very poor mainly due to its longer duration. Among these varieties Panchamy and Karishma took 128 days for maturity whereas Matta Thriveni, Kairaly and kanchana matured by 110 days. The variety Ahalya although gave a comparable yield, the crop appearance was not much appreciated by farmers. The susceptibility to pests and diseases was also more in this variety. So far this location Kanchana is the most preferred one followed by Matta Thriveni and Kairaly

Testing of varieties – dwarf indica varieties – Set I

Treatments – 6 varieties

T1 - Athira

T2 - Pavizham

T3 - Aiswarya

T4 - Remya

T5 - Pranava

T6 - Local Ponmany

Design - RBD

Replication - 3

Plot size - 40 m²

Spacing - 20 x 10 cm

Location - Rayamangalam, Koovappady block

Name of farmers Sri. Balan Pillai
Plankudy House
Rayamangalam

Date of sowing 09.10.2000

Date of planting 03.11.2000

Date of harvests 19.01.2001 to 31.01.2001

Fertilizers - As per POP recommendations

Plant protection - Nil

Results

Highest yield was recorded by Aiswarya (3578 kg ha⁻¹) followed by Athira (3465 kg ha⁻¹) and local Ponmani (3506 kg ha⁻¹) which were at par. The local Ponmany is a non-descript variety predominant in the region. Athira or Aiswarya (110 days) are two high yielding medium duration varieties suitable for the region during rabi season.

Yield and yield attributes – Rayamngalam – Rabi 2000-01

Treatments	Varieties	No. of tillers/m ² PI stage	Total tillers at harvest/m ²	No. of panicle	Panicle length (cm)	Grain yield (kg ha ⁻¹)	Straw yield (kg ha ⁻¹)	Duration (days)
T1	Athira	278	262	335	21.1	3465	3730	110
T2	Pavizham	413	293	365	20.4	2856	3955	114
T3	Aiswarya	295	273	348	20.5	3578	3154	110
T4	Remya	243	320	397	21.2	2802	5158	114
T5	Pranava	255	235	315	23.2	2963	5162	120
T6	Local Ponmany	350	312	380	17.8	3306	3486	98
CD(0.05)		39	40	37	0.30	368	491	

Testing of medium duration dwarf indica varieties – Set II

Treatments – 5 varieties

T1 - Pavithra

T2 - Ramanika

T3 - Karishma

T4 - Panchami

T5 - Krishnanjana

Design - RBD

Replication - 3

Plot size - 40 m²

Spacing - 20 x 10 cm

Location - Rayamangalam, Koovappady Block

Name of farmers Sri. K.P. Varkey
Kavatty House
Rayamangalam

Date of sowing 06.10.2000

Date of planting 05.11.2000

Date of harvesting 18.01.2001 to 02.02.2001

Fertilizers - As per POP recommendations

Plant protection - Hinosan was sprayed against leaf spot on 30.11.2000

Result

Variety Pavithra gave the highest yield (3067 kg ha⁻¹) which was significantly superior to all other varieties.

The overall results indicate that Aiswarya, Athira and Pavithra are suitable for the location for rabi season.

Yield and yield attributes – Rayamangalam – dwarf indica Set II – Rabi 2000-01

Treatments	Varieties	No. of tillers/ sqm PI stage	Total tillers at harvest/sqm	No. of panicle	Panicle length (cm)	Grain yield (kg ha ⁻¹)	Straw yield (kg ha ⁻¹)	Duration (days)
T1	Pavithra	422	400	352	20.3	3067	5104	111
T2	Ramanika	455	437	387	20.5	2897	5408	118
T3	Karishma	442	420	265	19.6	2613	4608	111
T4	Panchami	375	352	312	20.3	2878	5615	118
T5	Krishnanjana	365	352	320	21.0	2899	5152	118
CD(0.05)		78	84	NS	1.7	130	224	

Testing of varieties – tall indica varieties – Rayamangalam – Rabi 2000-01

Treatments – 5 varieties

T1 - Makaram

T2 - PTB-20

T3 - Karuna

T4 - Nila

T5 - PTB-20-D-1

Name of farmer	Sri. Krishna Panicker Pulluvazhi .P.O. Rayamangalam
Date of sowing	07.09.2000
Date of transplanting	23.10.2000
Design	RBD
Replications	3
Plot size	40 m ²
Location	Rayamangalam, Koovappady Block
Date of harvests	15.01.2001 to 28.01.2001
Fertilizers	As per POP recommendations
Plant protection	Sprayed Metacid against rice bug on 16.12.2000 and 30.12.2000

Special features

Makaram and Nila, due to longer duration, was severely affected by rice bug.

Results

Makaram gave the highest yield (3500 kg ha⁻¹), Karuna (3180 kg ha⁻¹) and PTB-20 (2650 kg ha⁻¹). All varieties lodged at ripening stage. Farmers are of the opinion that although Makaram affected by rice bug the variety could be cultivated suitably by agronomic management. High straw yield of this varieties is also appreciated by the farmers of this region. Karuna is another promising variety for the region, which give higher yield than PTB-20.

Yield and yield attributes – Rayamangalam – Rabi 2000-01

Treatments	Varieties	No. of tillers/ sqm PI stage	Total tillers at harvest/m ²	No. of panicle/m ²	Panicle length (cm)	Grain yield (kg ha ⁻¹)	Straw yield (kg ha ⁻¹)	Duration (days)
T1	Makaram	370	340	295	25.5	3500	7005	143
T2	PTB-20	382	335	305	19.1	2650	3495	130
T3	Karuna	335	292	250	23.2	3180	4986	139
T4	Nila	338	260	228	22.6	2033	6474	143
T5	PTB-20-D-1	445	397	355	19.2	2320	3223	130
CD(0.05)		64	55	58	1.71	950	609	

Testing of varieties – Summer, 2001 - Rayamangalam

Objective

To identify suitable varieties during summer for the location.

Technical programme

Treatments – 6 varieties

- T1 - Cul-210-25
 T2 - Cul-4^A 4-2
 T3 - Ahalya
 T4 - Matta Thriveni
 T5 - Aiswarya
 T6 - Ponmany

Location - Rayamangalam

Block - Koovappady

	Trial I	Trial II
Name and address of farmer	Sri. Balan Pillai Plankudy Rayamangalam	Sr. K.P. Padmakumar Karimattathupurakkal P.O. Rayamangalam
Mode of crop establishment	Direct wet sowing	Direct wet sowing
Design	RBD	RBD
Replications	2	2
Plot size	40 m ²	40 m ²
Fertilizers	90:45:45 kg ha ⁻¹ of NPK	90:45:45 kg ha ⁻¹ of NPK
	Fertilizers applied as per recommended splits	
Date of sowing	11.02.2001	09.02.2001
Plant protection	1. Sprayed Metacid against leaf eating caterpillar on 12.03.2001 2. Sprayed Contaf against leaf spot on 17.03.2001 3. Sprayed Metacid against rice bug on 15.04.2001	1. Sprayed Hinosan against leaf spot on 14.03.2001 2. Sprayed Metacid against rice bug on 12.04.2001 3. Sprayed Metacid against rice bug on 21.04.2001
Harvesting	09.05.2001 to 15.05.2001	12.05.2001 to 17.05.2001

Yield and yield contributing characters – testing varieties – Summer, 2001 - Rayamangalam

Varieties	Tillers at PI/m ²	Total tillers/m ²	Panicle No/m ²	Panicle length (cm)	Grain yield (kg ha ⁻¹)	Straw yield (kg ha ⁻¹)	Duration (days)
T1- Cul-210-25	530	445	385	19.75	3373	5399	90
T2-Cul-A4-4-2	525	434	376	22.7	3313	5080	91
T3-Ahalya	516	437	343	20.5	2706	4620	90
T4-Matta Thriveni	582	466	389	18.5	3120	4580	95
T5-Aiswarya	524	376	324	18.7	2684	4746	101
T6-Ponmany	409	429	374	20.5	3304	4916	95
CD(0.05)	44.39	31.34	33.65	1.60	273.5	682	

Results

Among the different varieties tested for summer season, Cul. 210-25 recorded the highest yield (3373 kg ha⁻¹) closely followed by Cul-A4-4-2 (3313 kg ha⁻¹). However, they were on par with Matta Thriveni and Aiswarya also. Varieties Ahalya and Ponmany gave significantly lower yields.

Straw yield also was highest in Cul-210-25 (5399 kg ha⁻¹) followed by Cul-A4-4-2 (5080 kg ha⁻¹). Significantly lower straw yield was observed in Ahalya and Matta Thriveni. Hence considering the yield performance, both grain yield and straw yield, Cul-210-25 and Cul-A4-4-2 can be recommended for the region for summer season.

Testing of varieties – Set I - Paipra – Kharif 2000

Objective

To identify suitable varieties during kharif season for the location.

Treatments – 6 varieties

T1 - Athira

T2 - Pranava

T3 - Jaya

T4 - Aiswarya

T5 - Pavithra

T6 - Jyothy

Location - Paipra, Muvattupuzha block

Design - RBD

Replications - 4

Plot size - 40 m²

Spacing - 20 x 15 cm

Fertilizers - 90:45:45 kg ha⁻¹ of NPK applied as per POP

Name of farmer	Sri. P.K. Gopalan Ponnirakkal House Mulavoor	Sri. Paily Pathrose Muthiyechil House Mulavoor
Method of crop establishment	Transplanting	Transplanting
Date of sowing	05.06.2000	01.06.2000
Date of transplanting	03.07.2000	22.06.2000
Dates of harvests	01.10.00 to 09.10.00	20.09.00 to 08.10.00
Plant protection	Sprayed Hinosan against blast on 13.07.00, 23.07.00. Sprayed Kitazin against blast on 29.07.00 and 09.08.00 Sprayed Ekalux against thrips on 13.07.00 Sprayed Dimecron against leaf roller and thrips on 29.07.00 and 09.08.00	Sprayed the following Hostahion against case worm on 09.07.00 Hinosan against sheath blight on 02.08.00 Kitazin against blast and sheath blight on 10.08.00

Results

Jaya recorded the highest yield (2897 kg ha⁻¹). Varieties Pavithra, Athira and Aiswarya gave yield comparable to Jaya. Since Jaya is a white rice variety it is not much appreciated by farmers. In this location Aiswarya would be the ideal choice considering less duration (115 days) compared to Athira (120 days) and Pavithra (125 days).

Yield and yield attributes – Paipra 2000

Varieties	Tiller No/m ²	Panicle no./m ²	Panicle length (cm)	Grain yield (kg ha ⁻¹)	Straw yield (kg ha ⁻¹)	Duration (days)
1. Athira	280	244	21.1	2814	4046	120
2. Pranava	351	291	22.0	1395	4104	138
3. Jaya	290	225	20.9	2897	3338	122
4. Aiswarya	316	284	18.7	2730	3413	115
5. Pavithra	281	201	20.7	2833	3521	125
6. Jyothy	226	193	17.3	2164	2997	115
CD(0.05)	36.753	30.878	1.412	450	608.735	

Testing of varieties – Set II – Paipra – Kharif 2000

Treatments – 10 varieties

T1 - Ahalya

T2 - Red Thriveni

T3 - Kairaly

T4 - Kanchana

T5 - Panchami

T6 - Remya

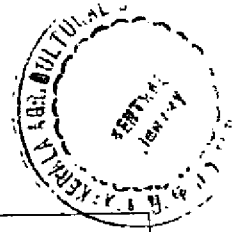
T7 - Ponmani

T8 - Karishma

Design - RBD

Replications - 4

Spacing - 20 x 15 cm
 Plot size - 40 m²
 Location - Paipra, Muvattupuzha Block



Name of farmers	Sri. T.K. Narayanan Thekkumkattil House Mulavoor	Sri. A.E. Gopalan Alappattu House Mulavoor
Method of crop establishment	Transplanting	Transplanting
Date of sowing	29.05.2000	05.06.2000
Date of transplanting	26.06.00	30.06.00
Dates of harvests	12.09.00 to 06.10.00	20.09.00 to 10.10.00
Fertilizers	90:45:45 kg ha ⁻¹ of NPK	
Plant protection	Sprayed the following Ekalux for case worm and stem borer on 15.07.00 Kitazin for blast and sheath blight on 11.8.00	Sprayed the following Ekalux for case worm and thrips on 4.07.00 Hinosan against blast on 14.07.00 Kitazin against blast on 23.07.00 and 09.08.00 Dimecron against stem borer on 23.07.00 Dimecron against leaf roller on 09.08.00

Results

The variety Ahalya gave the highest yield. Kanchana and Kairaly also gave comparable yields. The performance of other varieties were comparatively poor. Farmers are of the opinion that Kanchana and Kairaly are the two varieties to this location. Ahalya although gave better yield, it is not preferred due to various reasons. For Kharif, varieties with more than 120 days duration will not suit for the location.

Yield and yield attributes – Paipra – Kharif 2000

Varieties	Tiller No/m ²	Panicle no./m ²	Panicle length (cm)	Grain yield (kg ha ⁻¹)	Straw yield (kg ha ⁻¹)	Duration (days)
Ahalya	271	253	21.1	3022	3221	107
Red Thriveni	262	236	20.3	2273	2863	107
Kairaly	338	302	19.3	2822	3172	117
Kanchana	336	317	19.3	3005	3330	106
Panchami	310	263	21.1	2530	3646	124
Remya	377	320	23.5	1740	4554	130
Karishma	381	347	24.4	1777	4312	128
Ponmani	273	248	19.4	2522	3305	116
CD(0.05)	38.377	32.235	2.621	397	358	

Testing of varieties – Tall indica – Thirumarady – Rabi 2000-01

Treatments -- 6 varieties

T1 - Karuna

T2 - Makaram

T3 - Nila

T4 - PTB-20

T5 - PTB-20-D-1

T6 - Pranava

Design - RBD

Replication - 3

Plot size - 40 m²

Spacing - 20 x 10 cm

Location - Thirumarady, Piravom Block

Name of farmer Sri. Johny K. Veorge
Koonumadathil House
Mannathoor .P.O.

Date of sowing 17.09.2000

Date of transplanting 17.10.2000

Date of harvesting 11.01.2001 to 12.02.2001

Fertilizers - As per POP recommendations

Plant protection

Contaf against blast on 04.11.2000

Dimecron against case worm on 04.11.2000

Dithane M-45 against blast on 10.11.2000

Metacid against rice bug on 11.12.2000 and 15.01.2001

Special features - All varieties lodged except Pranava

Yield and yield attributes – Tall indica – Thirumarady – Rabi 2000-01

No.	Varieties	Tiller PI/m ²	Total tiller/m ²	Panicle No.	Panicle length (cm)	Grain yield (kg ha ⁻¹)	Straw yield (kg ha ⁻¹)	Duration (days)
1	Karuna	455	482	367	25.1	3100	6658	134
2	Makaram	363	460	358	23.5	2880	7794	148
3	Nila	375	475	377	20.9	2200	5798	148
4	PTB-20	540	540	433	18.2	4900	5092	116
5	PTB-2-D-I	571	473	358	17.6	2500	4778	116
6	Pranava	653	677	647	21.6	3150	4583	131
CD(0.05)		62.849	52.833	30.942	0.531	277	1122	

Yield and yield attributes – dwarf indica -- Set I – Thirumarady – Rabi 2000-01

Treatments	Varieties	No. of tillers/ m ² PI stage	Total tillers m ²	No. of panicle	Panicle length (cm)	Grain yield (kg ha ⁻¹)	Straw yield (kg ha ⁻¹)	Duration (days)
T1	Kairaly	453	498	360	16.9	3600	4230	109
T2	Kanchana	438	467	342	17.1	3000	3290	111
T3	Aiswarya	308	407	312	18.5	2500	3525	117
T4	Bhadra	502	452	335	18.1	3200	3995	117
T5	Pavizham	402	442	325	17.9	2800	3525	129
CD(0.05)		87.655	59.419	NS	0.352	713.735	673.628	

Plant protection

Dimecron against stem borer on 14.11.2000

Methacid against rice bug on 5.12.2000 and 14.12.2000

Special features - Non toxicity is a serious problem in the region.

Result

The highest yield was observed in Kairaly (93600 kg ha⁻¹) and it was on par with Bhadra (3200 kg ha⁻¹) and Kanchana (3000 kg ha⁻¹).

Testing of varieties – Dwarf indica – Set II – Thirumarady – Rabi 2000-01

Treatments

T1 - Panchami

T2 - Remanika

T3 - Uma

T4 - Karishma

T5 - Krishnanjana

Design - RBD

Replication - 4

Plot size - 40 m²

Spacing - 20 x 10 cm

Location - Thirumarady, Piravom Block

Name of farmer Sri. Gigi
 Chelattu House
 Mannathoor .P.O.
 Thirumavady

Date of sowing 21.09.2000

Date of transplanting 25.10.2000

Date of harvesting 21.01.2001 to 25.01.2001

Yield and yield attributes – dwarf indica – Set II – Thirumarady – Rabi 2000-01

Treatments	Varieties	No. of tillers/ PI stage/m ²	Total tillers/m ²	No. of panicle/m ²	Panicle length (cm)	Grain yield (kg ha ⁻¹)	Straw yield (kg ha ⁻¹)	Duration (days)
T1	Panchami	505	490	418	19.1	2520	2669	121
T2	Remanika	515	522	433	18.7	2976	3920	126
T3	Uma	468	512	398	19.8	3960	5761	126
T4	Karishma	602	567	458	19.5	3600	4415	121
T5	Krishnanjana	493	555	473	19.0	3420	3995	121
CD(0.05)		64.648	28.717	22.284	0.146	370.525	451.884	

Fertilizers - As per POP recommendations

Plant protection

Sprayed Hinosan against blast on 18.11.2000

Dimecron against stem borer on 18.11.2000

Metacid against rice bug on 20.12.2000 and 28.12.2000

Results

Highest yield was given by Uma (3960 kg ha⁻¹) and it was followed by Karishma (3600 kg ha⁻¹) and both were at par. The third position was occupied by Krishnanjana (3420 kg ha⁻¹) which was on par with Karishma.

Overall results indicate that the varieties Kairaly or Kanchana would be better for rabi season if the cropping system is about 110 days. If 120-130 days are available varieties like Uma or Karishma could be selected for the region.

Grain yield and cooking quality of promising rice varieties

No.	Variety	Duration (days)	Habit	Grain colour and boldness (visual)	Milling percentage	Expansion ratio	Softness	Stickiness	Appearance	Taste
1	Kairaly	113	Semi tall	Red bold	71	5	Soft	No	Average	Average
2	Kanchana	115	Semi tall	Red bold	72	5	Hard	No	Average	Average
3	Red Triveni	100	Dwarf	Red bold	74	5	Hard	No	Average	Average
4	ASD-16	115	Dwarf	White bold	68	5	Soft	No	Good	Good
5	ADT-43	115	Dwarf	White slender	70	5	Soft	No	Average	Average
6	Cul.A4-4-2	115	Dwarf	Red bold	79	5	Soft	No	Average	Good
7	Cul.210-25	115	Dwarf	Red bold	72	5	Soft	No	Average	Average
8	IET 14735			White bold	68	5	Soft	No	Average	Average
9	Krishnanjana	125	Semi tall	Red bold	73	5	Hard	No	Average	Average
10	Uma	130	Semi tall	Red bold	74	5	Hard	No	Average	Average
11	Nila	150-160	Tall	Red bold	72	5	Hard	No	Average	Average
12	Neeraja	140-150	Tall	White slender	64	5	Soft	No	Average	Good
13	Sagara	140-150	Tall	Red bold	67	5	Hard	No	Good	Average
14	Kumbham	150-160	Tall	Red bold	72	5	Hard	No	Average	Average
15	Mashoori	130-140	Tall	White slender	67	5	Soft	No	Average	Average
16	Payoor-I	135-145	Tall	White slender	71	5	Soft	No	Good	Good
17	Ramanika	125	Semi tall	Red bold	76	5	Soft	Yes	Average	Good
18	PTB-20	130-140	Tall	Red bold	70	5	Soft	No	Good	Good
19	Athira	120	Semi tall	Red bold	73	5	Soft	No	Good	Good

Characteristics and cooking qualities of promising varieties

	Variety	Duration (days)	Habit	Grain	Milling percentage	Expansion ratio	Softness rice	Appearance	Stickiness	Taste
20	Jyothy	117	Dwarf	Long bold red	74	1:5	Very soft	Average	No	Good
21	Aiswarya	115	Dwarf	Long bold red	74	1:4.8	Soft	Good	No	Good
22	Kanakam	123	Semi tall	Short bold red	71	1:4.8	Soft	Average	No	Good
23	Pavizham	124	Dwarf	Med. bold red						
24	Panchami	126	Dwarf	Med. bold red	69	1:5	Very soft	Average	No	Good
25	Karishma	128	Dwarf	Short bold red	73	1:5	Soft	Average	No	Average
26	Krishnanjana	125	Semi dwarf	Med. bold red						
27	Jaya	129	Dwarf	Long bold red	74	1:5	Hard	Average	No	Average
28	Pranava	122	Semi dwarf	White bold	75	1:5	Soft	Good	No	Good
29	ASD-19	123	Dwarf	Short slender white	71	1:5	Soft	Average		Average
30	TKM-19	113	Semi dwarf	Short bold red						
31	ADT-43	113	Semi dwarf	Med. slender white						
32	ADT-38	130	Semi dwarf	Med. slender white	73	1:5	Very soft	Average	No	Average
33	Ponmany	160	Tall	Short bold white	70	1:4	Soft	Good	No	Average
34	CR 1009	160	Tall	Short bold white	73	1:4.5	Soft	Good	No	Very good
35	Ponni	143	Tall	Slender white	70	1:5	Soft	Good	No	Very good
36	Karuna	144	Tall mundakan	Long bold red	70	1:5	Hard	Good	Average	Average
37	Makaram	149	Tall mundakan	Short bold red						

Performance of Basmati rice at various locations in the Central zone districts during rabi 2000-01

Location	Akamala Wadakkanchery Thrissur	Polpully Kollengode Palakkad	Chittilappilly- Kole Adat, Thrissur	Puthucode Kannambra Palakkad
Dt of sowing	28-08-00	27-10-00	06-09-2000	15-09-2000
Dt of planting	02-10-00	17-11-00	22-09-2000	07-10-2000
Spacing	20 cm x 10 cm	20 cm x 10 cm	20 cm x 10 cm	20 cm x 10 cm
Dt of harvest	30-12-00	02-03-00	24-12-2000	10-01-2001
Duration (days)	111	125	108	115
Tillers PI (m ²)	362			
Tillers Maturity (Planted single seedling /hill)	435 / m ²	15 / hill	462 / m ²	
Panicles (m ²)	400	13 / hill		
Height (cm)	75 cm	90 cm	87 cm	
Panicle length (cm)	22.2 cm	23 cm	25.4 cm	
No of grains/panicle		109	81	
Grain yield (kg/ha)	3067	3700	975	1950
Straw yield (kg/ha)	1064	5100	1250	3750
Pests and diseases	Comparabvle with other dwarf inidca (Blast,leaf roller etc)	No pests and diseases	High incidence of BPH	No serious pests and diseases

Direct sowing of rice by Tractor drawn Seed Drill during kharif season

Objective: To evolve cost effective and efficient mechanised direct sowing technique for crop establishment and mechanical weed control in kharif season.

In Palakkad district, especially in Alathur and Palakkad taluks direct - dry broadcasting is the predominant method for crop establishment in paddy. Although the cost on sowing is very less, high intensity of weed infestation is an inherent problem associated with dry direct sowing. The weed control by hand weeding requires much labour and thereby increases the cost of production. Use of herbicides for effective weed control is often limited by the lack of conducive conditions (eg. unpredictable showers, high temperature, lack of adequate soil moisture during sowing etc.).

This experiment was conducted to study the efficiency of tractor drawn seed drill for sowing paddy seeds (TNAU tractor drawn seed drill) and weed incorporation by conoweeder (IRRI-TNAU conoweeder). Tractor drawn seed drill consists of an ordinary cultivator with some special additional attachments. In this drums are provided on the cultivator to contain dry paddy seed. When the tractor moves forward, seeds are placed in the furrows (formed by the cultivator) which comes down through conveyor tubes. Then the furrows are covered by rear cultivator tynes.

Seeds get placed in lines at a spacing of 23 cm. Normally at the time of weeding (about 30 DAS) the field gets flooded by the receipt of south west monsoon. At that time the weeds can be incorporated by working the conoweeder in between the paddy lines.

Treatments

- T1 - Broadcasting + hand weeding twice
 T2 - Broadcasting + chemical weed control (pre-germination spray of refit, followed by 2,4-D).
 T3 - Broadcasting paddy + cowpea @ 12.5 kg ha⁻¹ and hand weeding
 T4 - Seeding by TNAU seed drill + chemical weed control as in T2
 T5 - Seeding by TNAU seed drill + weed incorporation by conoweeder.
 T6 - Seeding by TNAU seed drill + hand weeding twice.

Location	-	Kannambra, Alathur Block
Plot size	-	200 m ²
Name of farmer	-	Sri. M.A. Siddique M.A. House Manappadam
Variety	-	Kanchana
Date of sowing	-	18.05.2000
Date of germination of paddy	-	30.05.2000 (due to non-receipt of rain)
Date of germination of cowpea	-	23.05.2000
Date of harvest	-	15.09.2000
Duration	-	120 days
Fertilizers	-	As per POP recommendations
Plant protection Malathion	-	Slight incidence of rice bug attack – sprayed

Special features

In plots in which refit was applied germination of paddy seed was affected. Tillering was less and general yellowing of plants upto flowering observed.

Cost of sowing and weeding

Treatments	Sowing (ha)		Weed control (ha)		Total cost (Rs.)
	Labour	Cost (Rs.)	Labour	Cost (Rs.)	
T1	2 men	200	45 women	2250	2450
T2	2 men	200		1275	1475
T3	2 men	200	25	1250	1450
T4	2 hours	450		1275	1725
T5	2 hours	450	5 men	500	950
T6	2 hours	450	45 women	2250	2700

Treatments	Plant population /m ² at 18 DAG	Weed population/m ² at 18 DAG	Grain yield (kg ha ⁻¹)	Straw yield (kg ha ⁻¹)
T1	215	42	3500	5075
T2	192	0	3250	4200
T3	224	53	3875	4550
T4	100	(53 weeds + 32 cowpea)	3250	4025
T5	126	35	3500	4280
T6	130	42	3500	4550

Results

The yield of plots in which chemical weed control was adopted was very low. Between other treatments any appreciable difference in yield could not be observed.

Placement of seeds by seed drill and weed control by conoweeding (T5) resulted in a saving of Rs.1500/- compared to broadcasting + hand weeding (T1) and Rs.525 compared to broadcasting and chemical weed control.

Considering the savings on crop establishment and weed control, ecosafe crop management and alleviation of scarcity of labour availability, direct sowing by TNAU seed drill and weed control by conoweeder is a promising technology.

Studies on crop establishment systems for rabi rice

Objective

Evolve cheap and efficient establishment method for replacing transplanting/broad casting of sprouted seeds by placement of seeds by wet seeders.

Rationale

Transplanting which is predominant method of crop establishment, especially during rabi season in Kerala, demands more labour which increase the cost of production and often results in delay of planting due to non-availability of labourers. Uncertainly in release of canal water, scarcity of labour in peak planting period, and escalating wages make transplanting less profitable. In some areas farmers resort to contract transplanting and also direct wet seeding by broadcasting. Contract transplanting may results in low plant stand, whereas in direct broadcasting over population may be the results. In both these methods weeding has to be done by manual or chemical methods. Trails conducted elsewhere have revealed that sprouted seeds could be placed at fixed spacing in lines by seed drums without sacrifice in yield. Major advantage of this method is reported to be the possibility of weed or green manure incorporation by mechanical weeders.

Location on-farm at Polppully, Palakkad district

Season : Kharif, 2000 and rabi 2000-01

Treatments

(i) Kharif 2000 (Six)

T1 Direct wet seeding by broadcasting sprouted seeds + hand weeding

T2 “ “ + chemical weeding

T3 Placement of sprouted seeds by TNAU wet seeder + hand weeding

T4. Placement of sprouted seeds by TNAU wet seeder + chemical weed control.

T5. Placement of sprouted seeds and *S. aculeata* by TNAU combined seed drum + *S. aculeata* incorporation by conoweeder.

6. Transplanting seedlings at random + hand weeding

(ii) Rabi 2000-01 (five)

1. Direct wet seeding by broadcasting sprouted seeds + hand weeding
2. “ + chemical weed control
3. Placement of sprouted seeds and *S. aculeata* by TNAU combined seed drum + incorporation of *S. aculeata* and weeds by cono-weeder.
4. Placement of sprouted seeds and *S. rostrata* by TNAU combined seed drum + incorporation of *S. rostrata* and weeds by cono-weeder.
5. Transplanting seedlings at random + hand weeding.

Replication: 3

Methodology

For seeding with wet seeder drums paddy seeds with plumule just emerged were used. Seeds soaked in water for 24 hours followed by incubation for 8-10 hours.

The TNAU seed drum is a combined seeder by which sprouted paddy seeds are placed in alternate rows. Paddy seeds with plumule just emerging is used. Green manure seeds and paddy seeds are placed in hoppers alternately fixed. The seeder has one ground wheel in the centre with 318 mm diameter. Two floats are provided to facilitate smooth sliding of the seeder on soft puddled mud. It is light and easy to pull manually by one person. The paddy seed hoppers are provided with large holes and green manure holes are with small holes. On pulling the seeder paddy seeds are placed at a spacing of 25 cm between two paddy rows with one row of green-manure in the middle of the paddy rows.

For direct broadcasting, it required 110 kg seed ha⁻¹. Seeds soaked in water for 24 hours, and incubated for 24 hours, broadcasted over puddled soil. For transplanting, nursery was sown the same day of seeding the treatments and transplanted on 25th day. For drum seeding the seed requirement was less (65 kg

Other details

Biomass of daincha at 20 DAS = 3.36 t ha⁻¹ during kharif
and 0.62 t ha⁻¹ during rabi season.

S. rostrata at 20 DAS = rabi 0.98 t

On application of refit slight scorching was observed during kharif, but during rabi such scorching was not observed.

Yield and yield attributes – Kharif 2000

Treatments	No. of panicle/sqm	No. of grains per panicle	Grain yield (kg ha ⁻¹)	Straw yield (kg ha ⁻¹)
T1	538	105	4753	4397
T2	580	119	5161	4101
T3	555	127	5297	4589
T4	515	114	4516	4413
T5	523	89	4962	4404
T6	493	115	3913	4664
CD(0.05)	21.723	11.711	350	209.397

Yield and yield attributes – Rabi 2000

Treatments	No. of panicle/sqm	No. of grains per panicle	Grain yield (kg ha ⁻¹)	Straw yield (kg ha ⁻¹)
T1	605	85	5833	6125
T2	620	84	5677	5541
T3	580	98	6150	5975
T4	590	97	6225	6050
T5	420	101	4950	5025
CD(0.05)	0.05		675	

In Kharif (Table) T3, T2, T5 were on par. Treatments 1, 4 and 6 were inferior. Method of weed control or incorporation of green manure did not have any appreciable effect on yield. The yield reduction in T4 may be due to the scorching effect of weedicide and hence poor growth of the crop.

Yield and yield attributes – Rabi 2000-01

Treatments	No. of panicles/m ²	No. of grains/panicle	Grain yield (kg ha ⁻¹)	Straw (kg ha ⁻¹)
T1 Direct broadcasting sprouted seeds + hand weeding	705	70	5833	5805
T 2 Direct broadcasting sprouted seeds + Chemical weeding	700	75	5277	5541
T3 Placement of sprouted seeds by TNAU seed drum + <i>S. aculeata</i> + conoweeding	700	91	6750	5486
T4 P of S.S. TNAU seed drum + <i>S. rostrata</i> + conoweeding	705	92	6833	5663
T5 Transplanting seedlings at random + hand weeding	482	102	6444	5972
CD (0.05)	35	11	575	375

Cost on crop establishment and weed control (per hectare)

Treatments	Cost of seed		Seed preparation and sowing			Transplanting			Weed control			Cono weeding		Hand weeding		Total	Cost savings over	
	Qty. (Rs.)	Cost (Rs.)	Men	Women	Cost (Rs.)	Men	Women	Cost (Rs.)	Chemical (Rs.)	Appli- cation (Rs.)	Total (Rs.)	Men	Rs.	Women	Rs.	Cost (Rs.)	Wet broad- casting	Transp lanting
Wet broadcasting	110	880	0.75	0.5	85									65	3250	4215		1335
Broadcasting & chemical weeding	110	880	0.75	0.5	85				515	200	715			20	1000	2680		
TNAU drum seeding + conoweeder	75	600	5.0		400							6.0	480	5	250	1730	2485	3820
Transplanting (including nursery raising)	75	600				15	60	4200						15	750	5550		

In rabi season (Table) T3, T4, T1 and T2 (different methods of direct seeding) and T5 were on par. The yield level in transplanted plot was inferior possibly due to less tillering and poor growth. Green manure incorporation did not result in yield increase. In direct sown plots the population was very high and so tiller production and number of panicles also. However, it did not result in increased yield due to short panicle and more chaff. There was no difference in yield between conoweeding or hand weeding.

The results reveal that the grain yield by drum seeding method was better than direct sowing and transplanting, and hence, direct drum seeding can be safely introduced as a substitute for transplanting without sacrificing productivity. It would be a cheaper method of crop establishment where effective water control is possible. The weed menace associated with direct seeding system could be overcome by chemical weed control or more safely by working with conoweeder. The better avenue for in situ green manure production by using TNAU combined seed drum would be well appreciated. The incorporation of green manure on 20-25 days after seeding results in organic enrichment of soil through it would be manifested by continuous application only.

Considering the advantages of getting adequate desired population desired crop geometry and easy and safe weed control etc, the placement of seeds by 'wet seeder' would be a better and cheap technology than transplanting. In Kerala especially during rabi season, when the intensity of NE monsoon is very less and better drainage possible, direct seeding by wet seeder would be suitable technology to reduce cost of production and avoid the constraint of labour scarcity, with out reduction in yield.

Objective

To evolve cheap and efficient crop establishment method for replacing transplanting|broadcasting of sprouted seeds by placement of seeds by wet seeders.

Technical programme

Treatments

- T1 : Broadcasting sprouted seeds + hand weeding 25 DAS
- T2 : Broadcasting sprouted seeds + chemical weed control (pre and post emergent)
- T3 : TNAU seeder (paddy only) + hand weeding 25 DAS

- T4 : TNAU seeder (paddy only) + chemical weed control (pre and post emergent)
- T5 : TNAU seeder (paddy + *Sesbania aculeata*) + conoweeding 25 DAS
- T6 : TNAU seeder (paddy + *S. rostrata*) + conoweeding 25 DAS

Location - Rayamangalam

Block - Koovappady

	Trial I	Trial II
Name and address of farmers	Sri. K.P. Padmakumar Karimattathupurakkal P.O. Rayamangalam	Sri. K.P. Varkey Kavathu House Rayamangalam
Design	RBD	RBD
Replications	1	2
Plot size	60 m ²	60 m ²
Variety	Matta Thriveni	Matta Thriveni
Fertilizers	90:45:45 kg ha ⁻¹	90:45:45 kg ha ⁻¹
Date of sowing	09.02.2001	09.02.2001
Plant protection	1. Sprayed metacid against leaf eating caterpillar on 12.04.2001 2. Sprayed metacid against rice bug on 21.04.2001	Sprayed metacid against rice bug on 21.04.2001
Date of harvest	16.05.2001	17.05.2001
Duration	97 days	98 days

For direct broadcasting it required 100 kg seed ha⁻¹. For drum seeding, the seed requirement was only 81 kg ha⁻¹.

Labour requirement

- Broadcasting - 0.6 man and 0.5 women/ha
i.e. Rs.60 + Rs.40 = Rs.100/-
- Hand weeding in T1 and T3 - 65 women/ha i.e., Rs.5200/-
- Cost of chemicals and application in T2 and T4 - Rs.765/ha

Cost of hand weeding in T2 and T4	-	15 women/ha (15 x 80 i.e. Rs.1200/-)
Cost of hand weeding in T5 x T6	-	5 women/ha i.e. Rs.5 x 80 = Rs.400/-
Cost of drum seeding in T3, T4, T5 and T6	-	18 hours/ha i.e. 3 men @ Rs.100 i.e. Rs.300/ha
Conoweeding in T5 and T6	-	32 hours/ha i.e. 4 men x 100.00 Rs.400/ha

Other details

Biomass of *Sesbania aculeata* (Daincha) at 20 DAS = 3.75 t ha⁻¹

Biomass of *S. rostrata* at 20 DAS = 2.4 t ha⁻¹

The yield in all the treatments were on par. Method of weed control or incorporation of green manure did not have any appreciable effect on yield. Direct drum seeding can be safely introduced as a substitute for direct wet sowing without sacrificing productivity. The weed problem associated with direct seeding could be overcome by chemical weed control or working with conoweeder. The better avenue for in situ green manure production by using TNAU combined seed drum would be well appreciated. The incorporation of green manure on 20-25 days after seeding, results in organic enrichment of soil. In Kerala, during summer season when better drainage is possible direct seeding by wet seeder would be a suitable technology to reduce cost of production and avoid the constraint of labour scarcity without reduction in yield.

Yield and yield contributing characters – Wet seeder – Summer, 2001 - Rayamangalam

Treatments	No. of plants/sq.m (15 DAS)	Tillers/sq.m at PI stage	Total tillers/sq.m at harvest	No. of panicles/sq. m	Length of panicle (cm)	Grain yield (kg/ha)	Straw yield (kg/ha)
T1	329	550	485	429	17.9	2891	4879
T2	274	574	531	470	17.37	2477	4871
T3	358	546	484	422	18.57	2503	4899
T4	277	624	548	485	18.63	2790	5084
T5	309	577	489	413	18.93	2913	5395
T6	275	501	471	403	19.03	2928	5471
CD(0.05)	36.32	59.58	38.9	29.14	NS	NS	NS

Cost of crop establishment and weed control (per hectare) – Wet seeder – Summer –2001 – Rayamangalam

Treat-ments	Cost of seed		Seed prep. & sowing			Weed control			Cono weeding		Hand weeding		Total cost (Rs.)	Cost savings over wet broad-casting and hand weeding
	Qty. (kg)	Cost (Rs.)	M	W	Cost	Chem. (Rs.)	Appl. (Rs.)	Total (Rs.)	M	Amt. (Rs.)	W	Amt. (Rs.)		
T1	100	800	0.6	0.5	100	--	--	--	--	--	65	5200	6100	
T2	100	800	0.6	0.5	100	515	250	765	--	--	15	1200	2865	3235
T3	81	648	3	--	300	--	--	--	--	--	65	5200	6148	--
T4	81	648	3	--	300	515	250	765	--	--	15	1200	2913	3187
T5	81	648	3	--	300	--	--	--	4	400	5	400	1748	4352
T6	81	648	3	--	300	--	--	--	4	400	5	400	1748	4352

performance of

Trial on manual transplanter**Objective**

To evaluate the efficiency of manual transplanter in comparison with traditional transplanting method.

Treatments

- T1 - Transplanting mat seedlings with manual transplanter
- T2 - Line planting ordinary seedlings at 20 x 10cm spacing
- T3 - Transplanting mat nursery seedlings manually at random
- T4 - Transplanting ordinary seedlings at random

Location - Polppully, Kollengode block

- Design - RBD
- Plot size - 80 m²
- Variety - Jyothy
- Date of sowing mat nursery - 2-11-2000
- Date of sowing ordinary nursery - 2-11-2000
- Date of Planting - 17-11-2000
- Other agronomic management practices - As per POP

- Plant protection - Sprayed Bavistin against blast on 16-12-00
- Nuvacron against stem borer on 10-2-01
- Metacid against rice bug on 23-2-01

Special features

The mat nursery has to be raised carefully. Special training on operation of manual transplanter is required.

Cost for transplanting

Treatments	Cost of nursery preparation		Uprooting and transplanting		Total
	Labour	Cost (Rs.)	Labour	Cost (Rs.)	
T1 Manual Transplanting	2 men 3 women	200 150 ----- 350	6 men 2 women	600 100 ----- 700	1050
T2 Line planting ordinary seedlings	5 men 1 women	500 50 ----- 550	6 men 42 women	600 2100 ----- 2700	3250
T3 Transplanting mat seedlings at random	2 men 3 women	200 150 ----- 350	40 women	2000	2350
T4 Transplanting ordinary seedlings	5 men 1 women	550	35 women	1750	2300

Result

Planting by manual transplanter gave the highest yield (6245 kg ha^{-1}). About 13% higher yield than planting ordinary seedlings at random and about 5% yield higher than line planting. There was no difference in yield between planting with mat seedlings or ordinary seedlings.

Transplanting by manual transplanter resulted in a savings of Rs. 1250/ha by reducing the cost of labour.

The results of the trial indicate that

- (i) use of manual transplanter which is a very simple machine which can be operated by a single man saves much labour and cost of production.
- (ii) if necessary mat seedlings can be used for transplanting without sacrificing yield. Mat nursery requires only 1/100th of main plot area instead of 1/10th for ordinary nursery.

Growth and yield characters – Trial on manual transplanter – Polpully,

Treatments	No. of hills/m ² (48 DAT)	No. of hills/m ² (85 DAT)	Plant height at maturity (cm)	No. of panicles/m ²	Length of panicle (cm)	No. of grains/panicle	Grain yield (kg ha ⁻¹)	Straw yield (kg ha ⁻¹)
T1	53	40	78	640	20	102	6245	6575
T2	49	36	76	576	19	96	5970	6325
T3	39	39	79	663	19	91	5510	6400
T4	42	42	80	756	19	96	5510	6285

Effect of planting density

Objective

To study the yield performance of transplanted rice under varying densities and work out the optimum planting.

Treatments

T1 - Random planting

T2 - 15 x 10 cm (recommended spacing)

T3 - 10 cm x 7.5 cm (50% of recommended spacing)

T4 - 18 cm x 13 cm (150% of recommended spacing)

T5 - Random planting with 30 cm space at 2 m interval

Design - RBD

Replications - 3

Plot size - 40 m²

Season - Kharif 2000

(i) Puthucode and Kannadi

	Trial I	Trial II
Varieties	Kanchana	Jyothy
Locations	Puthucode Alathur Block	Kannadi Kozhalmannam Block
Name of farmer	Ismail .P.A. Janatha Manzil Manappadam Puthucode	Syamaladasan Kumar Rice Mill Vadaparamba Kannannoor
Fertilizers applied	Application as per POP	Application as per POP
Date of sowing	27.05.2000	11.05.2000
Date of planting	21.06.2000	15.06.2000
Date of harvesting	31.08.2000	10.08.2000
Duration	126 days	126 days
Plant protection	First sprayed Malathion against rice bug	Nil

Result

Trial I: There was no appreciable difference in yield between T3, T4 and T2. The number of panicles was also similar in these treatments. The yield in random planted plots (T1 and T5) were low.

Yield and yield attributes in Trial I – Effect of planting density – Puthucode – Kharif 2000

Treatments	Total tiller no./m ²	Panicle no. /m ²	Plant height (cm)	Grain yield (kg ha ⁻¹)	Straw yield (kg ha ⁻¹)
T1	425	410	99.9	4893	3325
T2	560	500	98.7	5033	3150
T3	458	425	100.4	5278	4062
T4	685	522	100.2	527.2	4133
T5	430	405	100.2	4970	3350
CD(0.05)	103.073	74.969	NS	285	389

Trial II: T3 (50% of recommended spacing), T5 (random planting with 30 cm space at 2 m interval) and T2 (recommended spacing) did not show any significant difference yield. When the spacing was increased to 150%, the yield got reduced.

Yield and yield attributes – Trial II – Effect of planting density – Kannadi – Kharif 2000

Treatments	Total tiller no./m ²	Panicle no. /m ²	Plant height (cm)	Grain yield (kg ha ⁻¹)	Straw yield (kg ha ⁻¹)
T1	348	310	99.9	5594	4469
T2	375	355	100.6	5907	4282
T3	393	360	104.2	6132	4688
T4	360	350	101.4	5538	4094
T5	325	295	102.4	6019	4407
CD(0.05)	56.257	62.746	4.104	370.387	280.686

Effect of planting density

Treatments

T1 - Random planting

T2 - 15 cm x 10 cm

T3 - 11 cm x 8 cm

T4 - 18 cm x 13 cm

T5 - Random planting with 30 cm space at 2 m intervals

Season	-	Rabi 2000-01
Design	-	RBD
Replications	-	4
Variety	-	Jyothy
Location	-	Kannadi, Kuzhalmannam block
Name of farmer	-	Sri. K. Sivaraman, Kannannur, Kannadi
Fertilizer applied	-	as per POP recommendations
Date of sowing	-	20-10-2000
Date of planting	-	13-11-2000
Date of harvesting	-	20-2-2001
Duration	-	122 days

Plant protection

Sprayed Dimecron against rice hispa on 10-12-2000 and against leaf roller on 25-12-2000, sprayed metacid against rice bug on 20-1-2001.

Result

There was no significant difference in yield or yield contributing characters.

Effect of planting density- yield and yield characters – Kannannoor – Rabi 2000-01

Treatments	Total tiller/m ²	Panicle no./m ²	Panicle length (cm)	Panicle weight (g)	Height (cm)	Grain no./panicle	Grain yield (kg ha ⁻¹)	Straw yield (kg ha ⁻¹)
T1	752	713	16.3	1.7	55.5	73.0	4395	4608
T2	735	733	16.2	2.0	59.0	74.7	4222	3908
T3	775	720	16.2	2.0	57.0	74.7	4147	4083
T4	810	785	16.3	2.2	56.0	73.7	4260	4316
T5	770	728	17.2	1.7	58.2	72.7	4230	4025
CD(0.05)	NS	NS	NS	NS	NS	NS	306	155

(ii) Rayamangalam, Koovappady Block

Name of farmers	Sri. Balan Pillai Plankudy Veedu Rayamangalam	Sri. K.C. Muraleedharan Vattekkattu Rayamangalam
Date of sowing	14.06.2000	13.06.2000
Date of transporting	03.07.2000	06.07.2000
Fertilizer application	70:35-35 kg ha ⁻¹ of NPK as per POP	Same
Date of harvest	13.10.2000	04.10.2000
Duration	121 days	113 days

Result

The treatments did not show any significant difference in yield. The reason can be attributed to adjustment of tiller and panicle production and also panicle length due to variation in spacing.

Table Yield and yield attributes - Rayamangalam – Kharif 2000

Treatments	Tiller at PI/m ²	Total tiller/m ²	Panicle no./m ²	Panicle length (cm)	Grain yield (kg ha ⁻¹)	Straw yield (kg ha ⁻¹)
T1	270	248	231	18.8	3946	3887
T2	330	304	277	19.3	3851	3971
T3	505	466	426	18.5	3965	4104
T4	294	277	261	19.0	4046	4081
T5	264	253	226	19.0	3913	3362
CD(0.05)					NS	604.847

Management of iron toxicity in rice

Objective

To evolve agronomic management technology for alleviating iron toxicity problems in irrigated rice.

Season - Rabi, 2000

Location - Rayamangalam, Koovappady Block

Treatments

1. Recommended practice (Lime 350 kg/ha as basal and 250 kg at 30 DT + NPK 70-35-35 kg/ha)
2. Recommended practice (Lime 350 kg/ha as basal and 250 kg at 30 DT + NP 70-35 kg/ha + K 120)
3. Lime 150 basal + N 25 kg basal as urea + I and II top N 25 kg each as A. sulphate + P 35 kg + K 120
4. Lime 150 basal + sodium silicate 250 kg basal + 25 kg N as urea + I and II top N 25 kg each as A. sulphate + P 35 kg + K 120
5. Zn 25 kg basal + recommended practice (Lime 350 kg/ha as basal and 250 kg at 30 DT + NPK 70-35 kg/ha)
6. Rec lime 600 kg basal + Zn 25 kg + 25 kg N basal + P rec + K rec + LCC 4 based N 25 kg at 15 days interval.

Design - RBD

Replication - 4

Plot size - 40 m²

Spacing - 20 x 10 cm

Variety - Jyothy

Yield and yield attributes – Management of iron toxicity – Rayamangalam – Rabi 2000-01

Treatments	No. of tillers/m ² PI stage	Total tillers/m ² at harvest	No. of panicle/sqm	Length of panicle	Grain yield (kg ha ⁻¹)	Straw yield (kg ha ⁻¹)
T1	345	325	301	17.9	2829	3320
T2	353	331	310	17.7	2909	3070
T3	333	315	293	17.5	2838	2900
T4	350	334	304	17.0	2852	3770
T5	313	295	269	17.5	2980	3730
T6	309	288	261	17.7	2869	3460
CD(0.05)	NS	NS	NS	NS	NS	705

Name of farmers	Sri. M.S. Paulose Malichil House Rayamangalam (2 rep.)	Sri. K. Padmakumar Karimattathu Parackal Rayamangalam (2 rep.)
Date of sowing	07.10.2000	02.10.2000
Date of planting	29.10.2000	01.11.2000
Dates of harvesting	23.01.2001	24.01.2001
Plant protection	Sprayed Metacid against case worm on 16.11.2000 Bavistin against sheath blight on 19.12.2000	Hinosan against leaf spot on 26.11.2000 Hinosan against sheath blight on 16.12.2000

Duration - 107

Fertilizers - As per POP recommendations

Results

Iron toxicity was severe in the experiment site as evidenced by reddish grey appearance continuously and also iron coating on the plant roots at all stages of growth.

The results of the experiment show no significant difference in yield between treatments. The problem calls for in depth studies on iron management in rice by on site experimentation in the region.

Management of iron toxicity in rice – Summer, 2001 – Rayamangalam

Objective

To evolve agronomic management technology for alleviating iron toxicity problems in irrigated rice.

Season - Summer, 2001
 Location - Rayamangalam, Koovappady block

Treatments

- T1 : Recommended practices (Lime 350 kg ha⁻¹ as basal and 250 kg ha⁻¹ at 30 DAS + NPK at 70:35:35 kg ha⁻¹).
- T2 : Recommended practices (Lime 350 kg ha⁻¹ as basal and 250 kg ha⁻¹ at 30 DAS + NP at 70:35 kg ha⁻¹ + K @ 120 kg ha⁻¹).
- T3 : Lime 150 kg ha⁻¹ basal + N 25 kg ha⁻¹ basal as urea + 1st and IInd top dressing of N @ 25 kg ha⁻¹ as Ammonium sulphate + P at 35 kg ha⁻¹ + K at 120 kg ha⁻¹).
- T4 : Lime 150 kg ha⁻¹ basal + sodium silicate 250 kg ha⁻¹ as basal + 25 kg N as urea as basal + 1st and IInd top dressing of N @ 25 kg ha⁻¹ on Ammonium sulphate + Pat 35 kg ha⁻¹ + K at 120 kg ha⁻¹.
- T5 : Zinc 25 kg ha⁻¹ as basal + Recommended Practices (Lime 350 kg ha⁻¹ as basal and 250 kg ha⁻¹ at 30 DAS + NPK 70:35:35 kg ha⁻¹).
- T6 : Recommended lime 600 kg ha⁻¹ as basal + Zn 25 kg ha⁻¹ as basal + 25 kg ha⁻¹ N as basal + Recommended P + Recommended K + LCC – 4 based N at 25 kg ha⁻¹ at 15 days interval.

	Trial I	Trial II
Design	RBD	RBD
Name and address of farmer	Sri. M.S. Poullose Malielil Rayamangalam P.O. Koovappady block	Sri. P. Krishna Panicker Jyothis Pulluvazhy P.O. Koovappady block
Replications	2	2
Plot size	40 m ²	40 m ²
Variety	Matta Thriveni	Matta Thriveni
Date of sowing	08.02.2001	12.02.2001
Date of harvest	14.05.2001	16.05.2001
Duration	95 days	93 days
Plant protection	Sprayed matacid against leaf eating caterpillar on 06.03.2001	Sprayed metacid against leaf eating caterpillar on 01.04.2001

Results

The results of the experiment showed no significant difference in yield between treatments. Hence it has to be continued with further modifications in treatments.

Yield and yield contributing characters – Iron management – Matta Thriveni, Summer 2001

Treatments	No. of tillers/m ²		Number of panicle/m ²	Length of panicle (cm)	Grain yield (kg ha ⁻¹)	Straw yield (kg ha ⁻¹)
	At PI stage	At harvest				
T1	510	427	387	18.18	3218	4579
T2	572	486	450	17.43	3338	4439
T3	557	482	452	17.15	3071	4600
T4	585	490	452	17.28	3312	4689
T5	580	483	442	17.3	3058	4340
T6	537	471	436	17.78	3252	4310
CD	NS	44.43	38.4	NS	NS	NS

Management of African Payal – Rayamangalam – Rabi 2000-01

Objective

To find out appropriate weedicide combination for effective control of African payal.

Treatments

1. Farmers method of manual control
2. Gramaxone 5 ml/litre with surf 5 g/litre
3. Glyphosate 10 ml/litre with surf 5 g/litre
4. Gramaxone 5 ml/litre with surf 5 g/litre + fb 2,4-D 2.5 g/litre at 3 weeks.
5. Glyphosate 10 ml/litre with surf 5 g/litre + fb 2,4-D 2.5 g/litre at 3 weeks spray 2 litre/40 sqm.

Location - Rayamangalam, Koovappady block

Design - RBD

Replications - 3

Plot size - 120 m²

Name of farmers Sri. K.O. Ouseph
Kruppeli House
Rayamangalam

Variety - Kochumundakan

Plot size - 120 m²

Sowing - 20.09.00

Transplanting - 01.11.2000

Date of application of weedicides : 20.10.2000

Date of harvest - 04.02.2000

	Duration	-	137 days	342
2	Name of farmer	-	K.P. Padmakumar Karimattathu Parackal Rayamangalam	
	Variety	-	Kochumundakan	
	Plot size	-	200 m ²	
	Date of sowing	-	16.09.2000	
	Date of transplanting	-	30.10.2000	
	Date of application of weedicides	-	25.10.2000	
	Date of harvest	-	02.02.2000	
	Duration	-	139 days	

Result

Observations on initial weight of African payal revealed that about 4.5 t of payal get accumulated in one hectare of paddy field. To remove these about 50-60 labourers are required which increased the cost of production per unit area. Moreover these weeds are washed down to irrigation canal which creates ecological problems and also again recycled to the paddy fields on irrigation. Control of weeds by chemical weedicides could be an effective method for management of payal at a cheapest cost.

Weedicides as per treatments were applied 5-10 days before planting.

Observations revealed that Grammerone @ 5 ml/l was more effective for killing the weeds. Glyphosate @ 10 ml/l was found less effective as evident from less control at planting. This may be probably due to less time gap after weedicide application.

Detailed investigations are to be conducted on chemical weed control of African payal.

Control of African payal – Rayamangalam – Rabi, 2000-01

Treatments	Initial weight of African payal (t ha ⁻¹)	Per cent of control at planting	Grain yield (kg ha ⁻¹)		Straw yield (kg ha ⁻¹)	
			R1	R2	R1	R2
T1	4.5	100 (Manual)	3405	3450	3976	4200
T2	4.5	95	3450	3150	4126	3900
T3	4.5	65	3750	2850	4500	3300
T4	4.5	95	3600	3465	4200	3750
T5	4.5	65	3945	3736	4876	3750

Management of African Payal – Summer, 2001, Rayamangalam

Objective

To find out appropriate weedicide combination for effective control of African Payal.

Treatments

- T1 - Farmers method of manual control
- T2 - Gramaxone 5 ml/litre with surf 5 g/litre
- T3 - Glyphosate 10 ml/litre with surf 5 g/litre
- T4 - Gramaxone 5 ml/litre with surf 5 g/litre + fb 2,4-D at 2.5 g/litre at 3 weeks
- T5 - Glyphosate 10 ml/litre with surf 5 g/litre + fb 2,4-D at 2.5 g/litre at 3 weeks spray 2 litre/40 sq.m.

The herbicides were first sprayed on 31.01.2001 and the plots were left as such. After 15 days (14.02.2001) second spray was given. Puddling and ploughing was done after 5 days of second spray and transplanting done on 23.02.2001.

Location - Rayamangalam
Koovappady block

Design - RBD

Plot size - 4 cents

Variety - Ponmany

Name and address of farmer - Mohanan
Kiliyara
Pulluvazhy .P.O.

Date of sowing - 02.02.2001

Date of transplanting - 23.02.2001

Date of harvest - 11.05.2001

Duration - 98 days

Results

Since it was not a replicated trial, statistical analysis was not done. However, it is observed that the plots where manual removal of payal was effected gave the highest yield and the plots where glyphosate was sprayed, gave the lowest yield.

The data on weed biomass indicate that spraying of Gramaxone @ 5 ml/l was effective in killing of African payal by which initial biomass was brought down to 34% at 8 days after 2nd spray. Glyphosate @ 10 ml/l was also equally effective which brought the biomass to 39%. The resurgence of payal during crop growth as well as after harvest was less in these treatments compared to other herbicide treatments and hand weeded control.

It is necessary to conduct detailed investigations to bring out definite result.

Wet weight of African payal at different intervals - Summer-2001

Treatments	Wet weight of African payal (t ha ⁻¹)				
	Just before spraying (30.1.01)	14 days after 1 st spraying (13.2.01)	8 days after II spraying (22.2.01)	68 days after II spraying (22.4.01)	After harvesting (1.6.01)
T1	16.50	0	0	13.00 (78)	11.50 (70)
T2	15.00	13.50 (90)	13.50 (90)	9.00 (60)	13.50 (90)
T3	25.50	13.00 (51)	12.00 (47)	6.00 (24)	12.50 (49)
T4	46.50	35.00 (75)	16.00 (34)	7.00 (15)	14.00 (30)
T5	43.50	23.00 (53)	17.00 (39)	5.00 (11)	7.00 (16)

Figures in parenthesis indicate percentage biomass over initial biomass

Yield and yield attributes – African payal management – Summer – 2001- Rayamangalam

Treatments	No. of tillers at PI stage/m ²	Total tiller at harvest/m ²	No. of panicle/m ²	Panicle length (cm)	Grain yield (kg ha ⁻¹)	Straw yield (kg ha ⁻¹)
T1	352	336	272	20.5	2875	5250
T2	320	368	284	18.9	2281	3938
T3	332	322	256	21.0	2344	3812
T4	284	312	276	20.3	2094	4000
T5	288	356	248	20.9	1906	3750

■ Integrated nutrient management for okra

Objective

To find out the effect of biofertilizers on the performance and yield of okra.

Treatments - 7

- T1 - Recommended FYM + NPK as per POP recommendations, KAU, 1996
- T2 - Azospirillum (2 kg ha⁻¹) + full dose of FYM + NPK as per POP recommendations
- T3 - Azotobacter (2 kg ha⁻¹) + full dose of FYM + NPK as per POP recommendations
- T4 - VAM (2 kg ha⁻¹) + full dose of FYM + NPK as per POP recommendations
- T5 - Azospirillum (2 kg ha⁻¹) + full dose of FYM + $\frac{3}{4}$ NPK as per POP recommendations
- T6 - Azotobacter (2 kg ha⁻¹) + full dose of FYM + $\frac{3}{4}$ NPK as per POP recommendations
- T7 - VAM (2 kg ha⁻¹) + full dose of FYM + $\frac{3}{4}$ NPK as per POP recommendations

Design - RBD

Replications - 3

Location - Kannambra, Alathur Block

Plot size - 40 m²

Method of application of biofertilizers – Basal application at the time of sowing

Name of farmer Sri. Siddique
 Manappadam
 Kannambra

Results

Significant difference was not noted in yield between treatments. Highest yield (12123 kg ha⁻¹) was recorded by the treatment which received Azospirillum at

the rate of 2 kg ha⁻¹ along with full dose of FYM and NPK fertilizers as per POP recommendations. This was followed by the treatment which received Azotobacter instead of Azospirillum.

Table: Yield of okra (kg ha⁻¹)

Treatments	R1	R2	R3	Mean
T1	12675	11100	10800	11525
T2	10450	11118	14800	12123
T3	9513	11675	13800	11663
T4	10685	11775	10525	10995
T5	9125	11088	9993	10068
T6	11513	10050	11300	10954
T7	8713	11013	12188	10638
CD (0.05)				NS

❏ Effect of growth regulators on yield and earliness of cucurbits

Objective

To find out the effect of growth regulators and their concentrations on the yield and earliness of cucurbits.

I. Crop	-	Salad cucumber (<i>Cucumis sativus</i>)
Variety	-	Seethal
Design	-	RBD
Treatments	-	7
Replications	-	3
Plot size	-	18 sq.m
Location	-	Kavassery
Block	-	Alathur

Treatments

T1	-	Ethrel at 200 ppm
T2	-	Ethrel at 300 ppm
T3	-	Ethrel at 400 ppm
T4	-	CCC at 100 ppm
T5	-	CCC at 200 ppm
T6	-	CCC at 300 ppm
T7	-	Control (water spray)

Method of application - As foliar spray

Number of applications	-	2
Time of application	-	1. At 2-4 true leaf stage 2. 15 days after first spraying
Name and address of farmer	-	Sri. Abu Pathanapuram, Kavassery
Date of sowing	-	10.02.2001

Rationale

The experiment was conducted in the paddy field during summer season after the harvest of second crop. During this season shortage of water is a serious problem. Hence it will be appreciable if the vegetative phase of the crop can be reduced and the yield can be increased. With this point in view this experiment was initiated.

Results

The highest yield (18,334 kg ha⁻¹) was recorded in T3 (Ethrel at 400 ppm) followed by T6 (CCC at 300 ppm) with a yield of 15,833 kg ha⁻¹ and these two were at par. Number of fruits was also maximum in T3 (44,445 nos/ha) followed by T6 (40,000 nos/ha). Minimum days for first female flower opening and first harvest was recorded in T5 (22 days and 34 days respectively). It was eight days prior to flowering and harvest in control (30 days and 42 days respectively). In T3 and T6 it took 26 days for first female flower opening and 38 days for first harvest.

Effect of growth regulators on earliness and yield of cucumber

Treatments	Days to first female flower opening	Days to first harvest	Number of fruits/ha	Yield (kg/ha)
T1	26	38	31667	11,111
T2	27	39	28334	10000
T3	26	38	44445	18334
T4	24	35	35000	14445
T5	22	34	26667	12222
T6	26	38	40000	15833
T7	30	42	18334	7500
CD (0.05)			4067	2584

