

Response of Low Land Rice to Some Package of Practices

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In the two successive seasons of *Kuruvai* and *Samba* 1975 and 1976 an experiment adopting split plot design was conducted to test the adaptability of some package of practices developed in the Tamil Nadu Agricultural University for low-land rice. When the sowings are delayed the variety Vaigai was found superior to Kannagi in the Kuruvai season. Between the Samba varieties Co.40 was found to be a high yielder when compared to the ruling variety Co.25. Working sheep foot roller was found not helpful in both the seasons in saving either irrigation water or in increasing yield under the heavy soil conditions of Aduthurai. There was very little differences seen in the two methods of fertilization; and there was also no yield advantage for *Azotobacter* treatment in both the seasons.

The selection of suitable crop variety for a particular season is the pre-requisite in successful crop production. It does not stop with the choice of the variety alone. It is also imperative that the around crop management is very essential to exploit the yield potential of the variety. As a result of various studies conducted in the Tamil Nadu Agricultural University certain package of practices have been developed for adoption in lowland rice cultivation, which required to be tested for adaptability to the various tracts in the state. For such testing some of the package of practices trials were conducted both in the *Kuruvai* and *Samba* season of 1975 and 1976 at Aduthurai.

The design of the experiment was split plot replicated four times with varieties, and irrigation treatments constituting the main plot and the seed and fertilizer treatments allotted to the sub plot. The treatmental details are as follows :—

Main plot-varieties	Kuruvai season	Samba
VI	Vaigai	Co.40
V2	Kannagi	Co.25
R1	Irrigating to 5cm depth + working sheep foot roller	
R2	Irrigating to 5cm depth alone-no sheep foot roller working, replenishing before hair line crack develops in both R1 and R2.	
Sub plot: S1	Treatment of seed, seedling and soil with <i>Azotobacter</i> culture	
S2	No <i>Azotobacter</i> treatment	
MI	Fertilization as per soil test	

1 - 4: Rice Research Station, Aduthurai.

	Kuruvai		
	N : P : K		
kg/ha	120 : 45 : 45		In applying fertilizers, P and K were applied in full at basal and N in three splits (<i>ie</i>) 50 per cent at tillering; 25 per cent at panicle initiation and 25 per cent at booting. For weed control Machete was used. The other package of practices were common to both the seasons. The plot size adopted was 80 sq.m. and for computing grain yield the central 1 cent portion was marked, harvested separately and yield recorded. The hills were spaced 20cm x 10cm in both the seasons. Besides grain and straw yield data on number of grains per panicle, 1000 grain weight (gm) and height of plant at maturity (cm) were recorded and are presented in Tables II & III. The rainfall
	120 : 60 : 74		
	Samba		
	N : P : K		
kg/ha	120 : 45 : 45-1975		
	120 : 60 : 60-1976		
M2	fertilization as Blanket recommendation		
	N : P : K		
kg/ha	120: 52 : 40	common for both years and seasons.	

TABLE I Rainfall received during the crop period / (UCORP-Package of practices)

	Rainfall (mm)			
	1975		1976	
	(crop period 15.6.75 to 5.10.75)		(crop period 30 7.76 to 25.11.79)	
	Kuruval season			
1975 June	—	1976 July	—	
July	118.3	August	113.8	
August	137.2	September	110.5	
September	160.2	October	152.4	
October	29.6	November	315.1	
Total	445.3	Total	691.8	
	Samba season			
	(crop period 15.8.75 to 5.2.76)		(crop period 27.8.76 to 19.2.77)	
1975 August	128.8	1976 August	11.6	
September	160.2	September	110.5	
October	319.9	October	152.4	
November	326.7	November	315.1	
December	154.4	December	274.0	
1976 January	3.2	1977 January	3.9	
February	nil	February	25.6	
Total	1093.2	Total	893.1	

TABLE II. Influence of some package of practices on the grain yield and yield contributing factors

KURUVAI SEASON

Treatment	Grain yield	1975					1976					
		Panicles					Panicles					
		No/Sqm	Length cm	Grain No/ panicle	1000 grain weight gm	Plant height at maturity	Grain yield	No. Sq. m	Length cm	Grain No/ panicle	1000 grain weight gm	Plant height at maturity cm.
Main plot treatments												
V1	5192	500	19.2	81.8	28.1	89.5	3541	239	18.0	81.3	27.9	84.3
V2	5497	451	19.9	99.5	27.4	84.4	3183	236	18.3	79.5	27.6	81.3
R1	5151	481	19.3	90.2	27.8	86.7	3391	237	18.2	82.2	27.8	83.2
R2	5537	470	19.8	91.1	27.8	87.1	3345	239	18.2	78.6	27.7	82.6
R1 V1	4934	506	19.1	81.6	28.0	88.7	3615	238	17.9	85.1	27.8	84.3
R1 V2	5369	456	19.6	98.8	27.2	84.8	3143	236	18.4	79.4	27.4	82.0
R2 V1	5451	494	19.3	82.0	28.0	90.1	3467	239	18.1	77.6	27.9	84.8
R2 V2	5626	446	20.2	100.8	27.3	84.1	3323	238	18.3	79.6	27.5	80.5
CD (0.01)	70.89						66.9					
CD (Interaction)	NS						N.S					
Sub Plot treatments												
S1	5401	482	19.4	88.8	28.0	85.6	3288	238	18.1	81.0	28.0	84.3
S2	5289	470	19.6	92.4	28.2	85.8	2444	239	18.3	79.5	28.0	83.2
M1	5367	466	19.6	91.9	27.8	88.6	3326	237	17.9	78.6	27.9	81.3
M2	5322	472	19.4	92.0	28.0	89.0	3403	236	18.0	81.3	27.7	82.0
S1 M2	5473	472	19.4	88.8	28.0	85.6	3307	238	18.2	77.6	28.0	80.5
S1 M1	5330	477	19.6	89.0	27.8	86.0	3345	239	18.0	78.2	27.8	81.2
S2 M1	5262	468	19.6	91.6	28.2	89.0	2885	236	18.2	80.0	28.0	81.3
S2 M2	5314	471	19.6	92.4	28.1	88.2	2923	237	18.1	79.5	27.9	80.5
CD	NS						10.03					
CD (Interaction)	NS						NS					

Test varieties : V1 Vaigai

V2 Kannagi

R1 – Irrigation to 5 cm depth cum sheep foot roller working

S1 – Azotobacter treatment to seed, seedling and soil

M1 – NPK as per soil test

R2 – Irrigation to 5 cm depth without sheep foot roller working

S2 – No Azotobacter treatment

M2 – NPK blanket recommendation

TABLE III. Influence of some package of practices on the grain yield and yield contributing factors

SAMBA SEASON

Treatments	Grain yield	1975				Plant height at maturity	Grain yield	1976				Plant height at maturity cm.
		Panicles			1000 grain weight gm.			Panicles			1000 grain weight gm.	
		No/Sqm	Length cm	Grain No/panicle				No. Sq.m.	Length cm	Grain No/panicle		
Main plot treatments												
V1	6231	268	24.4	192	28.0	116	6890	317	24.2	199	27	115
V2	2444	257	22.7	169	23.0	143	3959	283	23.6	165	24	136
R1	4257	264	23.6	184	25.6	131	5415	301	24.0	186	28	127
R2	4420	260	23.5	178	26.3	128	5435	295	23.8	179	26	122
R1 V1	6051	272	24.5	192	27.0	117	6910	324	24.6	197	28	115
R1 V2	2463	257	22.7	172	22.0	143	3919	279	23.6	175	23	137
R2 V2	6414	264	24.3	195	29.0	114	6869	311	24.1	202	27	112
R2 V2	2426	257	22.8	162	23.0	142	4000	279	23.5	156	25	134
CD (0.01%)	659.5						614					
CD (interaction)	NS						NS					
Sub plot treatments												
S1	4327	260	23.7	186	25.0	130	5486	299	24.0	183	26	122
S2	4364	262	23.5	177	25.0	137	5511	302	23.8	182	26	121
M1	4337	262	23.5	177	25.0	130	5545	300	22.8	179	26	120
M2	4334	264	23.6	186	25.0	129	5503	300	23.9	186	26	125
S1 M1	4363	259	23.6	178	26.0	130	5461	296	23.9	179	27	120
S1 M2	4269	263	23.8	195	26.0	129	5261	301	24.0	187	25	125
S2 M1	4317	265	23.2	176	25.0	129	5424	304	23.8	180	26	120
S2 M2	4422	263	23.3	178	25.0	128	5551	299	23.8	185	25	125
CD	NS											
CD (interaction)	NS											

Test varieties: V1 Co.40

V2 Co.25

R1 - Irrigation to 5 cm depth cum sheep foot roller working

S1 - Azotobacter treatment to seed, seedling and soil

M1 - NPK as per soil test

R2 - Irrigation to 5 cm depth without sheep foot roller working

S2 - No Azotobacter treatment

M2 - NPK blanket recommendation.

data during the crop periods was also recorded (Table I).

Kuruvai season's trial

The general yield level of the 1976 crop season was lower to that of 1975 probably because of late start of the experiment which was delayed by nearly 45 days. It was due to indefiniteness that prevailed in the date of release of canal water. The crop of 1976 Kuruvai also suffered due to excessive rain during the reproductive phase and at harvest time (Table I). During the two crop period a total precipitation of 445.30 mm in 1975 and 691.80 mm in 1976 were recorded. The mean yield recorded for the two varieties in the two years were 5192 and 3541 kg/ha for Vaigai and for Kannagi it was 5497 and 3187 kg/ha respectively.

The grain yield differences due to varietal and irrigation cum sheep foot roller working *Vs* non working treatments alone were found to be significant in 1975. But in the second years trial only the varietal differences attained significance. The variety Kannagi out yielded Vaigai in the first year and in the second year it was Vaigai which was found superior. This behaviour probably is indicative that Vaigai is more suited for late sowing in the Kuruvai season. The effect of sheep foot roller working was found to be of no advantage under Aduthurai soil conditions in both the years. As for quantity of water consumed between the irrigation treatments involving sheep foot roller working and non-working was there very little difference which is evident that by working sheep foot roller no additional compaction could be achieved in the heavy soil condition of

the experimental field resulting in saving in irrigation water. Azotobacter culture treatment was found to be of no beneficial effect in influencing the yield in both the years of trial though the yield differences were found significant in one year in 1976 due to this factor. However there was some initial seedling vigour noticed in both the years which was lost after transplantation.

Srinivasan, (1977) reported that studies at Aduthurai with Azotobacter culture both in the Thaladi and Kuruvai seasons resulted in early seedling vigour in the nursery but the vigour was lost after transplantation. He also found in both the seasons that there was no influence on yield due to azotobacter treatment.

The yield differences due to the fertilizer treatments did not attain the level of significance in both the years. The yield differences could not be seen probably due to very little difference in the level of nitrogen adopted in the soil test and Blank method of application.

There was no serious pest or disease incidence in both the seasons. It was also seen that interactions of main and sub plot treatments were not significant.

Samba season's trial

Data on Rain fall received during the crop seasons of 1975 and 1976 are presented (Table I). The total precipitation of rain was 1093.20 mm and 893.10 mm for 1975 and 1976 respectively. The general mean yield for Co.40 was 6231 and 6890 kg/ha and for Co.25 it was 2444 and 3959 kg/ha for the years 1975 and 1976 respectively.

The differences due to varieties alone attained the level of significance in the both the years of trial and the variety Co. 40 out yielded the ruling strain Co.25 of the tract. The yield of Co.25 is not even half of the yield of Co.40 in 1975 and in 1976 the yield of Co.25 is very low. Reason for low yield may be attributed to the severe Bacterial blight and *Helminthosporium* attack on Co.25 in both the years.

There was no differences either in yield or quantity of water used for irrigation in both the treatments (the irrigation cum sheep foot roller working and non working treatments).

The yield differences due to fertilizer treatments were found to be non significant in both the years. There was no significant response for Azotobacter treatment under Aduthurai soil conditions.

There was no serious pest incidence in both the years of the samba season. Between the test varieties Co.40 and Co.25 there was perceptible difference seen to disease reaction in the samba season. Co.40 was more tolerant to bacterial leaf blight disease than to *Helminthosporium* when compared to Co. 25 (Vide Table IV)

The results of the study are summarised as follows.

Kuruvai Season

The variety Kannagi appears to be not suitable for late season planting. The

TABLE IV. Disease index percentage recorded on Samba varieties Co. 40 and Co. 25 raised in the UCORP - Package of practices-experiment

Disease	Test variety	Samba season	
		1975-76	1976-77
Bacterial leaf blight	Co. 40	11.40	1.80
	Co. 25	14.30	6.27
Helminthosporium	Co. 40	26.00	35.60
	Co. 25	16.73	18.70

working of sheep foot roller is of no advantage either in influencing yield or in the saving of irrigation water under Aduthurai heavy soil conditions.

There was no perceptible difference in the yield of the test crops in both the seasons due to the blanket and soil test recommendations probably due to very little difference in the N levels. Azotobacter treatment is of no advantage in influencing the yield.

Samba Season

The strain Co.40 (Rajarajan) proved its superiority over Co.25 the ruling strain and was found fit for replacing Co.25 in the delta.

As for the other factors of study the trend of results are the same as seen in the Kuruvai season.

REFERENCE

- SRINIVASAN, S. 1977. Azotobacter. Aduthurai reporter of 1977.