

Varietal Response of Rice to Seeding Date

Rice production has been making vast strides in the recent past, mainly due to the evolution of high yielding strains. The progress, however, is hampered to a large extent by the vagaries of monsoon and frequent changes in climatic factors. Ramiah (1937) recognised the impact of seasonal variation and stated that the varietal characters especially, quantitative ones undergo considerable change when grown in seasons other than the ideal one. It is generally known that even slight changes in the time of sowing would alter greatly the yield and duration of rice varieties. Venkataraman (1964) found that flowering duration of the paddy varieties varied with time of planting. Palaniswamy *et al.* (1968) observed that external factors influence the expression of duration and plot yield of rice varieties and also the varieties differ in their degree of sensitivity. The unpredictability of monsoons and their frequent delays necessitate suitable adjustments to be made in the timing of raising paddy crop. Therefore, a correct assessment of varietal sensitivity to seasonal influences assumes importance. In the present study, an attempt has been made to estimate the reaction of ten high yielding strains to time of sowing done at fortnightly intervals all round the year.

In all twenty four sowings were done on the 1st and 15th day of every month starting from 15th July, 1966. The ten varieties were planted in

unreplicated observational plots 6 sq. metre in size adopting a spacing of 20 cm. x 10 cm. Normal manurial schedule was followed (5000 lb green leaf, 75 kg N/ha, 35 kg P₂O₅/ha and 35 kg K₂O/ha). Flowering duration for 50 per cent and grain yield per plot were recorded. Besides, from fifteen plants selected at random, number of productive tillers and plant height were also recorded.

The data were analysed statistically and the results are presented in Tables 1 and 2 for grain yield and flowering duration respectively.

Grain yield of the ten varieties over the different dates of sowing ranged from 300 gm to 3000 gm per plot. It could be seen from the Table that, yield registered a fall in the winter sowing from the normal and a rise during the summer. Five varieties reached a point, sown on the 1st December, when grain yield was at minimum, while five other varieties except CO.32 reached this point in one or two sowings earlier in October or November. A significant fact to note was that most of the varieties performed best when sown in the 2nd fortnight of March, 1st and 2nd fortnights of April and 1st fortnight of May. Most of the varieties taken up for the present study were short statured, developed for the maximum utilization of solar radiation. The maximum yields obtained under the sowings done in hot weather periods might have been due to an efficient utilization of solar energy by these broad leaved strains. The poor yields obtained from the late winter

sowings might be attributed to the lack of availability of the minimum quantum of solar energy. These observations also broadly indicated that both bright sunshine and higher temperature might be necessary only in early stages of plant growth. Though the 20th sowing done on 1st May registered the maximum yield in all the varieties, 2nd and 3rd sowings taken up in August were also found to be on par with summer sowings. When the sensitivity of the varieties were individually considered, IR. 8 and Jaya were found to be more stable by showing minimum range of variation. In this trial both medium and long duration varieties were included and the different varieties expressed their maximum potential at different sowings. It would be of some interest if we could delimit suitable varieties for successive cropping throughout the year on the basis of their performance which in turn might depend upon the presence or absence of sensitivity to weather condition in these varieties. In the light of the present findings it can be suggested that Kanchi with a maximum yield of 4170 kg/ha when sown on 1st June followed by IR. 8 with the maximum yield of 6000 kg/ha when sown on 15th September and C. 4-63 with a maximum yield of 6400 kg/ha when sown on 1st February will form a good sequence for multiple cropping pattern with paddy alone under conditions obtainable at Coimbatore.

In the case of flowering duration, in most of the varieties, a sudden fall was recorded in the sowing done on 1st March. The duration was longer

on either side of this critical point. Though the differences in duration under different sowings were significant, except in the case of CO. 32, the deviation from normal was not so much as to necessitate any alteration in cultivation to adjust for the duration of the crop. These findings are in conformity with those of Palaniswamy *et al.* (1968) though the effect of sowing date did not result in such marked differences in the present study. The varieties taken up for the study were already tested under varying agro-climatic conditions and are well known for their wide adaptability. So, understandably, they are less sensitive to seasonal variations and hence are more suitable.

Besides, data on height and tiller number at harvest were recorded, since they would serve as indices to show whether the growth was normal or not. The differences in the expression of these traits due to sowing dates were significant. They did not show any concomitant variation with yield trend. In general, however, plant height and tiller number exhibited a definite reduction when sown during the winter season. The poor performance of the varieties when sown during October-December could be attributed to the stunted growth observed.

To sum up, the present study broadly indicates that the short statured varieties would be able to express their maximum yield potential when sown during the summer months. However, these varieties could also perform equally well when sown during the 2nd fortnight of August. In regard to the flowering duration also

TABLE 1

Mean Performance - Grain Yield

Sowing Date	Variety									
	Padma	IET. 400	Hamsa	IR. 400	C.4-63	CO. 32	IR. 262	Jaya	IR. 532	IR. 8
15-7-69	1.800	2.150	1.500	2.050	2.050	2.700	2.100	2.750	2.300	2.700
1-8-69	2.050	2.500	2.100	2.550	2.350	2.750	2.500	2.500	2.350	2.850
15-8-69	2.300	3.000	2.600	2.750	2.250	3.250	2.500	2.000	2.050	2.950
1-9-69	1.350	2.000	1.150	2.900	1.950	2.900	2.300	2.550	2.050	3.000
15-9-69	2.000	2.250	1.300	1.950	2.550	2.950	2.050	2.500	2.100	3.600
1-10-69	2.050	1.750	1.500	1.200	1.500	2.500	1.300	1.500	2.300	2.500
15-10-69	1.050	1.300	1.700	1.000	2.250	1.250	1.950	2.050	3.500	3.550
1-11-69	1.000	1.250	1.250	1.000	1.000	0.750	1.750	2.050	1.000	2.200
15-11-69	1.100	1.700	1.750	1.300	1.800	1.050	1.500	2.100	1.350	2.250
1-12-69	0.500	0.750	1.000	1.500	1.550	1.500	0.800	1.500	2.000	2.050
15-12-69	1.250	1.350	1.000	1.600	2.250	1.500	1.250	2.000	2.000	3.000
1-1-70	1.350	2.000	1.500	2.750	3.150	1.750	2.000	2.750	2.300	3.500
15-1-70	2.250	2.600	1.250	3.350	2.800	0.450	2.000	3.600	3.000	3.300
1-2-70	2.350	2.700	1.750	3.000	2.800	0.300	3.250	3.550	2.900	2.250
15-2-70	2.150	2.250	1.200	1.500	2.250	0.400	2.300	2.300	3.300	2.850
1-3-70	1.400	2.050	1.500	1.950	3.100	1.950	2.550	2.000	3.250	2.750
15-3-70	1.600	2.800	1.500	2.000	2.800	3.350	2.700	3.000	3.000	3.000
1-4-70	2.250	1.750	2.000	2.300	3.100	1.600	3.600	3.500	3.750	3.000
15-4-70	2.100	2.400	2.600	3.000	2.250	1.000	3.500	3.000	3.800	3.750
1-5-70	3.100	2.500	2.350	2.850	3.000	3.000	2.900	3.800	3.800	3.250
15-5-70	1.450	0.700	0.750	2.500	2.650	3.500	3.000	2.300	3.000	3.500
1-6-70	2.150	2.500	1.700	2.000	2.250	2.550	2.600	3.500	3.000	2.600
15-6-70	2.200	2.100	0.150	2.000	2.600	0.200	2.050	3.000	2.000	2.650
1-7-70	1.400	1.500	2.250	2.000	2.800	0.450	2.800	2.600	3.000	2.000

TABLE 2
Mean performance — Flowering Duration

Sowing Date	Padma	IET, 400	Hamse	IR, 400	Variety					IR, 8
					C, 4-63	CO, 32	IR, 262	Jaya	IR, 532	
15-7-69	84	83	88	72	79	86	83	91	93	91
1-8-69	86	81	89	81	79	89	89	90	96	101
15-8-69	83	85	89	79	82	88	91	94	89	100
1-9-69	74	74	76	84	73	78	78	73	85	85
15-9-69	74	74	74	84	86	83	84	84	84	82
1-10-69	76	77	77	81	78	78	79	78	89	84
15-10-69	81	74	74	77	77	80	82	82	90	91
1-11-69	78	78	77	77	87	77	77	80	89	99
15-11-69	76	76	73	73	85	73	76	76	76	104
1-12-69	86	87	94	92	97	99	90	98	98	110
15-12-69	92	92	92	98	94	97	95	95	97	102
1-1-70	90	90	90	99	98	103	98	105	100	114
15-1-70	88	85	91	95	97	72	97	95	97	105
1-2-70	82	82	85	98	96	75	91	100	100	106
15-2-70	80	82	80	83	103	180	87	87	105	99
1-3-70	41	41	41	53	87	158	53	42	98	90
15-3-70	68	68	87	82	99	119	80	50	98	91
1-4-70	75	77	82	82	94	111	81	92	94	92
15-4-70	78	78	78	83	96	111	83	92	98	98
1-5-70	84	80	84	94	105	139	100	100	103	103
15-5-70	86	87	87	112	117	114	107	102	107	107
1-6-70	87	81	82	88	115	123	108	99	123	123
15-6-70	93	83	82	96	96	70	94	96	93	98
1-7-70	81	77	81	71	90	98	67	89	85	103

	Plant height (range)	Mean	Tiller number (range)	Mean
Padma	40.7—73.3	58.40 \pm 1.02	6.1—10.2	8.14 \pm 0.08
IET. 400	51.0—79.6	66.34 \pm 0.80	6.3—9.3	7.52 \pm 0.10
Hamsa	97.3—89.5	69.41 \pm 2.00	6.3—10.7	7.39 \pm 0.92
IR. 400	50.0—79.4	65.39 \pm 1.20	5.3—12.2	7.56 \pm 0.09
C. 4-63	64.6—100.7	81.35 \pm 1.50	4.7—10.6	6.56 \pm 0.80
CO. 32	55.6—110.7	92.64 \pm 1.60	4.0—12.2	7.08 \pm 0.84
IR. 262	54.2—82.1	66.36 \pm 0.90	5.2—9.7	6.85 \pm 0.68
Jaya	59.0—84.0	70.88 \pm 0.80	5.2—9.1	6.56 \pm 0.82
IR. 532	63.6—87.0	74.08 \pm 0.92	5.7—9.1	7.56 \pm 0.75
IR. 8	60.5—77.5	69.93 \pm 1.00	4.2—8.7	6.73 \pm 0.08

the varieties varied in their response to seasonal influence. A fall in duration was observed on the 16th sowing done on 1st March, but under other sowings except in the case of CO. 32, none of the varieties varied so much from the normal as to seriously affect the crop plan. It appears that duration is not a major barrier in any attempt to manipulate a multiple cropping programme with paddy with the varieties studied under Coimbatore conditions.

REFERENCES

- PALANISWAMY, S., S. SIVASUBRAMANIAM and T. KALYANIKUTTI, 1968. Time of sowing and its uses on two medium duration varieties of paddy. *Madras agric. J.* 55 : 120-24.
- RAMIAH, K. 1937. *Rice in Madras*. A Monograph. Government Press, Madras.
- VENKATARAMAN, R. 1964. Study on thermo-photo sensitivity of paddy plants under field conditions. *Proc. Indian Acad. Sci.* 58 : 117-36.
- A. SHEIK DAWOOD
S. SIVASUBRAMANIAM
R. SWAMINATHAN
R. H. KRISHNAN
- Tamil Nadu
Agricultural University,
Coimbatore 641003.