

Varietal response of rice (*Oryza sativa*) to different irrigation regimes

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Efficient water management is one of the most effective means of increasing rice (*Oryza sativa* L.) production. Intermittent application of irrigation water 1-5 days after disappearance of applied standing water saves 25-50% of irrigation water compared with continuous submergence of fields, without any adverse effects on rice yields (Sandhu *et al.*, 1980). Hence an experiment was conducted to study response of different varieties of rice to different levels of irrigation.

The field experiment was carried out on the Alfisols of Periar district of Tamil Nadu during the summer seasons of (January-April) 1989 and 1990. The soil of the experimental site was a red loam with pH 7.2, low in available N (196 kg/ha) and P (9.2 kg/ha) and medium in available K (220 kg/ha). The experiment was laid out in strip-plot design with 3 replications. The treatments consisted of 4 levels of irrigation with 4 rice varieties (Table 1). The crop was supplied with 100, 50 and 50 kg N, P and K/ha. Recommended package of cultural practices were followed during the crop-

growth period or rice.

Variety 'IR 20' gave significantly higher grain yield than the other varieties under application of 5 cm water a day after disappearance of ponded water with increased water-use efficiency. This was closely followed by that given by 'IR 20' at continuous submergence of 5 ± 2 cm water level. Irrigation a day after disappearance of ponded water saved 25 cm water without reduction in the yield compared with the continuous submergence level. The results confirm the findings of Jha *et al.* (1981).

It was concluded that 'IR 20' rice performs well under limited water supply with increased water-use efficiency.

REFERENCES

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- Sandhu, B. S., Kheva, K. L., Prihar, S. and Singh, B. 1980. Irrigation needs and yield of rice on a sandy loam soils as affected by continuous and intermittent submergence. *Indian Journal of Agricultural Sciences* 50 (6) : 492-496.

Table 1. Effect of irrigation regimes on rice-grain yield, water requirement and water-use efficiency

Irrigation regime	Grain yield (tonnes/ha)					Total water requirement (cm)					Water-use efficiency (kg/ha-cm)				
	'IR 20'	'W Ponni'	'Bha-vani'	'CO 37'	Mean	'IR 20'	'W Ponni'	'Bha-vani'	'Co 37'	Mean	'IR 20'	'W Ponni'	'Bha-vani'	'Co 37'	Mean
T ₁	5.3	4.5	4.3	4.6	4.7	144	171	171	131	154	37	27	25	35	31
T ₂	6.0	3.7	3.8	5.2	4.7	119	144	144	109	129	51	26	26	48	38
T ₃	3.3	2.1	2.3	3.1	2.7	84	99	99	76	90	40	21	23	43	32
T ₄	4.5	2.9	3.0	3.8	3.6	101	121	121	91	109	46	28	28	45	37
Mean	4.8	3.3	3.4	4.2		113	134	134	102		435	25.5	25.5	42.8	
<i>LSD (P = 0.05)</i>															
Irrigation				Grain yield (average)											
				0.39											
Variety				0.53											
Interaction				0.46											

T₁, Continuous submergence of 5 ± 2 cm water; T₂, application of 5 cm water 1 day after disappearance of ponded water; T₃, application of 5 cm water 3 days after disappearance of ponded water; T₄, cyclic submergence of 5 cm water 2 days after disappearance of ponded water during non-critical and shallow submergence of 3 cm water during critical states