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RESPONSE OF RICE TO TOP DRESSING WITH PHOSPHATE AND POTASH IN KERALA

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The success of fertiliser application for rice is known to depend to a great extent on the time of application. Patnaik *et al* (1967) based on their studies fixed tbe stages of crop growth at which nitrogenous fertilizer must be applied. But information on the timings of P and K fertilization for high yielding varieties of rice is lacking. The general practice is to apply the entire dose of P and K as basal dressing for rice. But beneficial effects of split application of P and K were reported by Gamma and De (1960) and Sahoo and Sahoo (1969). Studies were hence undertaken to determine the effect of top dressing with P and K applied in single doses and in split doses in a sandy clay loam soil of Kerala.

Material and Methods

The experiment was conducted during the third crop seasons (January to May) of the years 1968 to 1970. There were six treatments viz. P and K applied completely basally at planting and at 2, 3 and 4 weeks after planting, 2/3rd of P and K applied as basal and l/3rd as top dressing 3 weeks after planting and l/3rd P and K applied as basal and 2/3rd as top dressing. A randomised block design with four replications was adopted.

Two seedlings of IR 8, 25 days old, were transplanted per hill at a spacing of 22.5 cm X 15 cm in plots of 6.4 m x 6.0 m. N was applied at the rate of 80 kg/ha and P and K applied each at 50 kg/ha as superphosphate and muriate of potash respectively. The sandy clay loam of the plots had 30.48 percent coarse sand, 12.81 percent fine sand, 15.82 percent silt and 31.95 percent clay. Chemically it contained 0.019 total N, 0.125 percent total P_2O_5, 0.058 percent total K_2O, 0.031 percent total GaO, 0.045 percent total MgO, 21.35 percent total sesquioxides, 0.0003 percent available P_2O_5 0.0011 percent available K_2O, 1.40 me per 100 gm of exchangeable Ca, 1.82 me per 100 gm of exchangeable Mg and had a pH of 4.5.

Results and Discussions

Results of two seasons' experiments are presented in Table 1. It is seen that basal application of the full dose of P and K gave significantly higher grain yields than the treatments which received P and K as top dressing. It is also seen that the reduction in grain yield due to the delayed application of P and K was proportionate to the period of delay in their

application. Thus the plots which received P and K four weeks after planting gave the lowest yield of grain. The basal application of P appears to have ensured adequate supply of this element during the first and second months of plant growth while soil P was utilised only during later stages of the growth as shown by Nishizaki *et al* (1958). Patnaik *et al* (1965) also had shown that the P absorbed during the initial growth stages was utilised for optimal grain production. Patnaik and Gaikward (1969) also had stressed the importance of providing adequate available P at early stages to ensure maximum production.

Table !

Mean yield of rice grain in kg/ha under different fertilizer treatments

Treatment	Timing of application f F	1968-69	1969-70	Mean
T1	As basal dressing	5694.25	5204.78	5449.51
T2	2/3rd as basal and l/3rd as top dressing 3 weeks after planting	5376.48	5212.47	5294.47
T3	l/3rd as basal and 2/3rd as top dressing 3 weeks after planting	5599.43	4920.32	5259.87
T4	As top dressing 4 weeks after planting	5053.58	4656.37	4854.97
T5	As top dressing 3 weeks after planting	5102.27	4720.44	4911.35
T6	As top dressing 2 weeks after planting	5297.03	4681.99	4989.51

Conclusion Tl T2 T3 T6 T5 T4

Table 2

Mean yield of rice straw in kg/ha under different fertilizer treatments

Treatment No.	Timing of application of P & K	1968-69	1969-70	Mean
T1	As basal dressing	20719.18	16980.25	18849.71
T2	2/3rd as basal and 1/3rd as top dressing 3 weeks after planting	23594.50	16913.62	20254.06
T3	1/3rd as basal and 2/3rd as top dressing 3 weeks after planting	21554.61	16021.81	18788.21
T4	As top dressing 4 weeks after planting	20442.41	16385.96	18419.18
T5	As top dressing 3 weeks after planting	22044.08	14873.73	18458.90
T6	As top dressing 2 weeks after planting	22997.40	13764.10	18380.75
	F test	N.S	N.S	N.S
	SEM	976.37	1604.23	937.93

In the case of potash also basal applications was reported advantageous as observed in the present study, by Mitsui (1955), Nagai (1959) and Patnaik and Gaikward (1969).

The results given in Table 2 show that the application of full dose of P and K as basal dressing gave more straw yield than their split applications at later stages. The results are not however statistically significant.

Summary and Conclusions

Experiments conducted during the 3rd crop seasons of 1968-69 and 1969-70 at the Agricultural College and Research Institute, Vellayani, on

the timing of application of P and K for rice (IR 8) showed that basal application of the entire dose of P and K gave significantly superior yield than top dressing these nutrients.

Application of P and K as a single basal dose was better than applying them in split doses of basal and top dressing.

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