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SPLIT APPLICATION OF POTASSIUM IN RICE

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ABSTRACT

Field experiments were conducted to study the effect of potassium and its methods of application in rice. Application of potassium resulted in 33 and 26 per cent increase in grain yield over control for IR 50 and ADT 36 respectively. Positive influence on growth and yield parameters was observed when the recommended dose of potassium was applied in split doses equally at active tillering and panicle initiation stages.

KEY WORDS : Potassium, split application, uptake

Potassium (K), is one of the major plant nutrients. the application of which to rice as well as other field crops has received least attention albeit the quantities of K removed by crop plants. The present cultivation of high yielding varieties may result in depletion of soil K resources. The method of application of fertilizer and its efficiency are largely governed by the differences in the uptake pattern of the plant at different stages of growth (Sing *et al.* 1983). Sekhan *et al.* (1973) observed two peaks of K absorption rate, one at active tillering and second at flowering stages of rice. Therefore, a continuous availability of K in growing medium of the plant should be maintained. The present study was made with the objective to study the effect of K and its method of application to rice.

MATERIALS AND METHODS

Field experiments were conducted at the Agricultural Research Station, Aliyar Nagar, Tamil Nadu during 1992-93. The treatments included T_1 : blanket recommendation of 50 Kg K_2O/ha all basal ; T_2 : 50 Kg K_2O/ha at panicle initiation (PI) stage : T_3 : 25 Kg K_2O/ha each at basal and PI stages ; T_4 : 25 Kg K_2O/ha each at active tillering (AT) and PI stages ; T_5 : 12.5 Kg K_2O/ha each at AT and PI stages and T_6 : control (NO K_2O). The commonly cultivated varieties IR 50 (June to September) and ADT 36 (January to April) were raised. The seedlings were transplanted at 15x10 cm spacing. The experimental field was clay loam in texture with a pH of 7.2 and low in available N and K and medium in available P.

RESULTS AND DISCUSSION

There was no positive influence of K on the height of the plant in both the seasons. Split application of the K @ 25 Kg K_2O/ha each at AT and PI stages found to increase the yield and K uptake over other methods of K application. Application of K significantly increased the number of panicles per m^2. Significantly higher number of panicles per m^2 were obtained when the K was top dressed @ 25 Kg K_2O/ha each at AT and PI stages. Singh *et al.* (1983) observed a similar trend of increased number of panicles per m^2 when K was top dressed at AT and PI stages.

Positive influence on panicle length was observed for K application. In both the seasons, application of 50 Kg K_2O/ha all basal resulted in

Table 1. Growth and yield parameters as influenced by treatments

Treatments	Plant height (cm)		Number of panicles per m^2		Panicle length (cm)		No. of matured grains per panicle		1000 grain weight (g	
	IR 50	ADT 36	IR 50	ADT 36	IR 50	ADT 36	IR 50	ADT 36	IR 50	ADT 36
50 Kg K_2O/ha all basal	73.2	89.2	488	528	21.6	21.6	69	87	19.0	20.0
50 Kg K_2O/ha at PI stage	63.6	88.6	528	501	19.0	19.4	73	86	20.0	21.0
25 Kg K_2O/ha each at basal and PI stage	67.6	95.0	528	554	19.8	19.0	74	91	20.0	21.0
25 Kg K_2O/ha each at AT and PI stages	70.4	83.0	594	580	19.0	20.8	82	108	20.3	21.0
12.5 Kg K_2O/ha each at AT and PI stages	64.4	85.6	514	483	19.8	21.2	68	84	20.0	20.5
Control (NO K_2O)	70.6	88.8	462	475	18.0	19.0	61	73	20.5	20.5
SED	1.6	1.1	21	20	1.1	0.8	3	3	0.8	0.9
CD at 5%	3.5	2.3	45	22	2.3	1.7	6	6	1.7	2.0

PI : Panicle initiation stage ; AT : Active tillering stage

Table 2. Potassium uptake and yield of rice as influenced by treatments

Treatments	K uptake at harvest (Kg/ha)		Grain yield (t/ha)		Straw yield (t/ha)	
	IR 50	ADT 36	IR 50	ADT 36	IR 50	ADT 36
50 Kg K_2O/ha all basal	111.3	123.7	4.7	5.8	5.2	6.5
50 Kg K_2O/ha at PI stage	124.3	125.3	5.1	5.8	5.3	6.7
25 Kg K_2O/ha each at basal and PI stage	126.2	132.2	5.3	5.9	5.9	6.9
25 Kg K_2O/haeach at AT and PI stages	137.5	145.3	5.6	6.3	6.2	7.1
12.5 Kg K_2O/ha each at AT and PI stages	116.5	120.2	4.8	5.8	5.2	6.7
Control (NO K_2O)	83.7	86.5	4.2	5.0	4.9	5.7
SED	3.3	5.2	0.12	0.14	0.08	0.07
CD at 5%	8.2	11.0	0.26	0.30	0.17	0.15

PI Panicle initiation stage ; AT : Active tillering stage

longer panicles. Significantly more number of matured grains per panicle were obtained for application of K over control. Split application of K at 25 Kg K_2O/ha each at AT and PI stages significantly increased the number of matured grains per panicle over other methods of application. But thousand grain weight of the rice was not altered by the treatments in both the seasons.

Application of K significantly improved the K uptake at harvest in both the seasons. Higher K uptake was obtained with split application of 25 Kg K_2O/ha each at AT and PI stages. Significant increase in grain and straw yields of rice in both the seasons was observed for the application of K. Among the methods of application, split application of 25 Kg K_2O/ha each at AT and PI stages resulted in high grain and straw yields in both the seasons. The increase in grain yield was 33 and 26 per cent in IR 50 and ADT 36 respectively over control. The beneficial effect was a reflection of increase in the number of panicles per m^2 and number of matured grains per panicle as observed by Singh *et al.* (1983).

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