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RESPONSE OF MAHSURI TO MAJOR NUTRIENTS AND SCHEDULE OF NITROGEN APPLICATION

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Abstract: Experiments conducted at the Regional Agricultural Research Station, Pattambi during the three consecutive wet seasons from 1982-83 to 1984-85 revealed that under transplanted condition, a fertilizer dose of 50:25:25 kg NPK/ha is sufficient for Mahsuri. The best schedule of application of nitrogen is 50% as basal, 25% at 40 DAT and the remaining 25% at 60 DAT.

INTRODUCTION

Rice variety Mahsuri is a progeny of the Japonica x Indica hybridization programme. Due to its semitall stature, cosmopolitan behaviour and good quality rice, it is widely accepted by the farmers of Kerala and Tamil Nadu. The large scale adoption of Mahsuri may also be due to its better performance under low fertilizer management conditions. In the absence of the correct fertilizer recommendation for the variety, an arbitrary level of 70:45:45 NPK kg/ha was being recommended (Anon., 1981). Hence, the present investigation was undertaken to provide a specific fertilizer schedule for this variety which has gained popularity among the farmers.

MATERIALS AND METHODS

Experiments were conducted at the Regional Agricultural Research Station, Pattambi, Kerala, during the wet season (June-October) of 1982-83, 1983-84 and 1984-85 in split plot design with three replications. The treatments consisted of six levels of nutrients as main plot treatments i.e., 70:45:45 (l_1), 70:35:35 (l_2), 60:35:35 (l_3), 60:25:25 (l_4), 50:35:35 (l_5), 50:25:25 (l_6) NPK kg/ha and three timings of application of nitrogen as subplot treatments i.e., 50% as basal, 25% at 20 days after transplanting (DAT), 25% at 40 DAT fa), 50% as basal, 25% at 40 DAT, 25% at 60 DAT (t_2), 25% each as basal, at 20, 40 and 60 DAT (t_3). Nutrients were supplied as urea, single superphosphate and muriate of potash. Phosphorus and potash were given completely as basal.

Thirty day old seedlings were transplanted at a spacing of 20 cm x 15 cm. Cultural operations as per the package of practices recommendations of the Kerala Agricultural University were followed (Anon., 1981).

RESULTS AND DISCUSSION

Data on growth and yield charactristics of Mahsuri during the three years are presented in Table 1 and Table 2.

Height of plants (Table 1) showed no significant difference between treatments during all the three years. This revealed that different levels of fertilizer nutrients as well as different timings of nitrogen application could not bring about any significant influence on the growth of Mahsuri.

Different levels of nutrients as well as different timings of nitrogen application also did not influence the yield attributes of Mahsuri (Table 1) such as number of panicles per m^2 in all the three years and weight of thousand grains during 1983-84 and 1984-85. But during 1982-83, timings of nitrogen application significantly influenced the

Table 1. Effect of nutrient levels and nitrogen timings on height, number of panicles and test weight of Mahsuri

Treatments	1982-83			1983-84			1984-85		
	(H)	(P)	(W)	(H)	(P)	(W)	(H)	(P)	(W)
Levels of nutrients									
l_1	107.2	209	16.6	121.8	263	17.4	117.6	224	17.3
h	106.7	223	16.7	119.0	263	17.6	120.9	238	17.7
l_3	107.6	211	16.7	119.3	264	17.4	118.8	242	17.2
l_4	105.8	209	16.6	120.1	267	17.2	119.9	248	17.5
l_5	106.0	216	16.6	116.6	259	17.6	115.9	220	17.2
l_6	104.7	205	16.7	119.5	266	17.4	117.1	242	17.0
CD (0.05)	NS	NS	NS	NS	NS	NS	NS	NS	NS
Time of application of nitrogen									
t_1	105.4	207	16.5	118.0	264	17.5	117.8	245	17.1
t_2	106.5	208	16.6	119.1	262	17.7	117.8	223	17.2
t_3	107.1	222	16.8	121.1	265	17.2	119.6	239	17.7
CD (0.05)	NS	NS	0.215	NS	NS	NS	NS	NS	NS

(H) - Height of plants at harvest, cm **(P) - Number of panicles per m^2** (W) - Weight of 1000 grains, g

Table 2. Effect of nutrient levels and nitrogen timings on the yield of Mahsuri

Treatments	1982-83		1983-84		1984-85		Pooled grain yield (kg/ha)
	Grain yield (kg/ha)	Straw yield (kg/ha)	Grain yield (kg/ha)	Straw yield (kg/ha)	Grain yield (kg/ha)	Straw yield (kg/ha)	
Levels of nutrients							
l_1	2086	4630	3277	4861	2764	4389	2709
l_2	1773	4808	3178	4754	2821	4861	2591
l_3	1896	4273	3208	4745	2641	4283	2582
l_4	1661	4434	3186	4852	2604	4656	2484
l_5	1565	4318	3285	4603	2481	3971	2444
l_6	1915	4078	3526	4630	2633	4309	2691
CD (0.05)	NS	NS	NS	NS	NS	NS	NS
Time of application of nitrogen							
t_1	1666	4371	3138	4696	2597	4283	2467
t_2	1906	4403	3406	4790	2602	4469	2638
t_3	1876	4496	3287	4737	2774	4483	2646
CD (0.05)	158.7	NS	NS	NS	NS	NS	92.4

weight of thousand grains. Highest weight was recorded by the treatment receiving nitrogen in four equal split doses (t_3) and it was significantly superior to the order two timings of nitrogen application.

Grain yield of Mahsuri (Table 2) was also not significantly influenced by the different levels of nutrients during the wet seasons of all the three years. Moreover, during 1983-84, highest grain yield was obtained from the treatment receiving a fertilizer dose of 50:25:25 NPK kg/ha. Pooled grain yield data presented under Table 2 also showed that different levels of nutrients could not assert any significant influence on the yield of Mahsuri. This suggested that for Mahsuri under transplanted condition during wet season, a fertilizer dose of 50:25:25 NPK kg/ha is sufficient to exhibit maximum production potential. De Datta (1988) has identified similar rice genotypes that support maximum grain production with a minimum input of fertilizer. Broadbent *et al.* (1987) has also identified IR-42 as a variety that perform well under low fertility levels.

With regard to timings of nitrogen application, during 1982-83, application of nitrogen in three splits (t_2) i.e., 50% as basal, 25% each at 40 and 60 DAT recorded the highest yield which was on par with application of nitrogen in four equal splits (t_3) i.e., 25% each as basal, at 20, 40 and 60 DAT but significantly superior to t_1 (50% as basal, 25% each at 20 and 40 DAT). During 1983-84 and 1984-85 there was no significant difference in grain yield due to different timings of nitrogen application. Pooled data (Table 2) showed that the highest grain yield was obtained from the treatment receiving nitrogen in four equal splits (t_3) and it was on par with t_2 but significantly superior to t_1. Since the difference in grain yield between t_3 and t_2 is negligible and in t_2 the cost of application is less (three splits) compared to t_3 (four splits), t_2 (50% as basal, 25% at 40 DAT and 25% at 60 DAT) can be recommended for Mahsuri under transplanted condition during wet season. Appropriate timing of nitrogen application might have resulted in better utilization of nitrogen and contributed to higher grain yield.

Straw yield of Mahsuri (Table 2) also showed no significant difference either due to levels of fertilizer or due to timings of nitrogen application during the wet seasons of all the three years. The investigation revealed that Mahsuri performed equally well under all nutrient levels tried in the experiment. The results also called for similar studies for the identification of genetic materials of rice for low fertilizer management

REFERENCES

Anonymous, 1981. *Package of Practices Recommendations.* Kerala Agricultural University, Trichur, p 15

Broadbent, F.E., De Datta, S.K. and Laureles, E.V. 1987. Measurement of nitrogen utilization efficiency genotypes. *Agron. J.* **79** : 786-791

De Datta, S.K. 1988. Integrated nutrient supply in relation to soil fertility and fertilizer management in low land rice. Paper presented at the All India Rice Workshop on 26-29 April 1988, Coimbatore, India, p 5-10

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