

## EFFECT OF SLOW RELEASE NITROGENOUS FERTILIZERS OF RICE

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Field experiments conducted at the Agricultural Research Station, Bhavanisagar to study the effect of slow release nitrogenous fertilizers on rice during kharif and Rabi seasons of 1980-81 and 1981-82 revealed that among the different slow release nitrogenous fertilizers tried, rock phosphate coated urea containing 20% in each of N and P was found to be the best source.

Among the major nutrients nitrogen is required in larger quantities to get higher yields of rice. As nitrogen is a costly input, its efficient and economic management is important. Nitrogen in the form of urea is easily soluble in water and leached out, its use efficiency is low in rice soils. Slow release of N in order to minimise the loss is one approach to increase the efficiency (Beaton *et al.*, 1967). Rice is a poor user of applied N and a considerable amount of residual N is available to the succeeding crop. This residual N is larger when coated materials and nitrification-inhibitor blended-fertilizers are used (Mays and Terman, 1969).

### MATERIAL AND METHODS:

Field experiments were conducted during kharif and rabi seasons of 1980-81 and 1981-82 at the Agricultural Research Station, Tamil Nadu Agricultural University, Bhavanisagar to study the effect of different slow release nitrogenous fertilizers on rice. The soil was red loam with low in available

NPK content. The design adopted was split plot with three replications. In kharif 1980-81 six treatments viz., i) control, ii) urea at planting, iii) urea in split application IV) urea briquettes (0.75 g), v) urea briquettes (2.5g) and Vi) rock phosphate coated urea formed the main plot treatments. During kharif 1981-82 urea briquettes (0.75g) was excluded and instead, urea gypsum and lac coated urea were included. Three levels of N viz., 40, 80 and 120 kg/ha formed the sub plot treatments in both the seasons. Urea in split application was given in three equal doses, the first at planting, second on 25th and the third on 45th day after transplanting. Excepting urea splits, the other nitrogenous fertilizers and P and K (60kg/ha in each) were applied basally. In both the years after the harvest of kharif crop the residual effect was studied in the Rabi season with a uniform application of 50% of the recommended dose of N, P and K.

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## RESULTS AND DISCUSSION :

The results obtained from the kharif 1980-81 crop are presented in Table 1. Among the different source of slow release N materials tried, rock phosphate coated urea recorded the highest grain yield of 5291 kg/ha which was significantly superior to other source. Although application of 120 kg N/ha recorded the maximum grain yield, the difference between 40, 80 and 120 kg N/ha was not statistically significant. In the residual rabi crop, there was no significant difference in yield due to different source and levels of N tried. Experimental results at Bhubaneswar also showed no significant difference in yield of residual crop due to different slow release N materials tried in the previous season (Anonymous, 1978).

During kharif 1981-82, among the sources of N tried, lac coated urea registered the highest grain yield of 6082 kg/ha (Table 2) and it was on par with rock phosphate coated urea, urea gypsum and urea briquettes (2.5g) application. Nitrogen at 120kg/ha was on par with 80kg N/ha and these levels gave significantly higher grain yield than 40kg N/ha. The residual study during Rabi 1981-82 revealed

that among the sources of N, rock phosphate coated urea recorded significantly higher grain yield (4457 kg/ha) and was on par with urea gypsum application. Rock phosphate coated urea was found to be the most efficient source among the slow release nitrogenous fertilizers as could be seen from the highest grain yields obtained in the main as well as residual crops. Here also N at 120kg/ha has given significantly higher grain yield than 40 kg N/ha and was on par with 80 kg N/ha.

## REFERENCES

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TABLE 1 Effect of different sources and levels of N on grain yield of rice.

Treatment	Kharif 1980-81 (Main crop IR. 20)	Rabi 1980-81 (Residual crop CO. 41)
	Grain yield (kg/ha)	Grain yield (kg/ha)
Sources of N:		
Control	3663	1528
Urea at Planting	4681	1653
Urea in split application	4681	1526
Urea briquettes 0.75g	4324	1348
Urea briquettes 2.50g	3968	1425
Rock phosphate coated urea	5291	1628
CD (P=0.05)	463	N.S.
Levels of N (Kgl/ha)		
40k	4487	1480
80k	4487	1419
120k	4792	1648
	CD(P=0.05)	N. S.

TABLE 2. Effect of different source and levels of N on grain yield of rice.

Treatment	Kharif 1981-82 (Main crop IR. 20)	Rabi 1981-2 (Residual Crop CO. 80)
	Grain yield (kg/ha)	Grain yield (kg/ha)
Sources of N		
Control	5226	2737
Urea at planting	5405	3786
Urea in split application	5336	4021
Urea briquettes 2.50g	6044	3511
Urea gypsum	5952	4233
Rock Phosphate coated urea	5947	4457
Lac coated urea	6082	3516
CD(P=0.05)	624	419
Levels of N (kg/ha)		
40	4729	3560
80	5819	3800
120	5931	4369
	CD(p - 0.05)	801