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Response of Rice to Foliar and Soil Application of Nitrogen

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The response of rice IR 20 and Ponni to foliar *vs.* soil application of nitrogen was studied for two years. Five treatment combinations of nitrogen were tried with soil and foliar applications. In both paddy varieties foliar application was significantly superior to the other treatments.

It has been well established that by means of foliar nutrition all the plant nutrients are absorbed through the leaves of plants and this absorption is remarkably rapid andcomplete especially with nitrogen. Among the several forms of nitrogen, urea is considered to be versatile fertiliser which dissolves easily and also has higher nitrogen content. Subramanian (1959) reported that foliar application of 34 kg N/ha in two equal doses to rice had given a maximum yield increase of 9.4 per cent over control. Narayanan and Vasudevan (1957) found that foliar spray of urea at 1 per cent level increased grain yield of paddy by 6 per cent. By resorting to foliar application, the fertilizer cost can be saved by 25 per cent (Ramakrishnan, 1974).

MATERIALS AND METHODS

The experiment was conducted during the first and second seasons of 1972-73 and 1973-74 with two paddy varieties viz. IR 20 and Ponni respectively. The treatments are given in Table. The experimental design adopted was randomised block design replicated five times. The spacing adopted was 20 x 10 cm. Commercial urea was used as a source of nitrogen. The foliar spray of urea adopted was 3 per cent concentration with a few drops of tinopal added as adhesive. The foliar spray was given during the morning hours when the dilation of the stomatal opening would be maximum. The plots other than the foliar spray treatments were given water spray. No scorching effect was noticed in the sprayed plots. All the plots received 60 kg in each of P_2O_5 and K_2O per hectare as basal at the time of planting.

RESULTS AND DISCUSSION

The grain yields of IR 20 and Ponni were analysed for both the years. IR 20 gave significant result in one year while Ponni recorded significant result in another year. Hence the grain yield data for both the years were pooled. In the pooled analysis, grain yield differences were significant for both the varieties.

In the case of IR 20, treatment 60 kg N/ha as basal application and 30

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TABLE. Effect of soil Vs foliar application of nitrogen on grain yield and economics of rice varieties

Treatments			Grain yield					
N application			IR 20			Ponni		
Basal kg/ha	30th day after planting kg/ha	One week prior to flowering kg/ha	72-73	73-74 kg/ha	Mean	72-73	73-74 kg/ha	Mean
60 (S)	30 (S)	30 (S)	3523	5589	4556	5598	3523	4560
60 (S)	30 (F)	30 (F)	3750	5362	4556	5666	4144	4905
60 S	15 (F)	15 (F)	3514	5743	4629	5779	3854	4816
60 S	30 (F)	—	3705	6069	4887	5394	3696	4545
60 S	—	30 F	3052	5625	4339	5566	3569	4568
	C. D. (P=0.05)				117.75			140.35

kg N/ha as foliar application on 30th day after planting recorded significantly higher grain yield than rest of the treatments. The results clearly indicate that even the lower level of nitrogen through foliar spray increase the yield and saves the cost of fertiliser by 25 per cent. This is in conformity with the findings of Rajat De and Mot (1967) as well as Mahapatra and Bedekar (1968) in rice.

In the case of Ponni treatment 60 kg N/ha as basal + 30 kg N/ha as foliar applications on 30th day after planting and one week prior to flowering and the treatment 60kg N/ha as basal + 15kg N/ha as foliar applications on 30th day after planting and one week prior to flowering were on par and significantly superior to rest of the treatments. In this case also treatment number 3 reduces the cost of fertiliser application by 25 per cent.

From the table it is seen that treatment 2 and 3 recorded significantly higher yield for IR 20 and Ponni rice and incidentally these treatments reduced the cost of fertilizer by 25 per cent.

Thus, overall findings indicate that foliar application saves the fertilizer cost by 25 per cent and also increases the profit margin to a greater extent (Ramakrishnan, 1974).

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