

INFLUENCE OF NITROGEN ON THE YIELD AND N CONTENT OF RICE

S.M. Alam

Atomic Energy Agricultural Research Centre, Tandojam, Pakistan

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INTRODUCTION

When fertilizer nitrogen is applied to a flooded rice soil its utilization and uptake by the rice plant is limited as a result of fixation by soil and/or losses through leaching, denitrification and volatilization. One of the best ways of increasing the utilization of added nitrogen by the rice plant is by timing and methods of nitrogen application to synchronize with the demand of the crop. The experiment described below was to study the effect of nitrogen sources on the yield and N-content of straw and grain by rice plant.

MATERIALS AND METHODS

The experiment was carried out on a red soil with pH 5.1, total N 0.092 %, available P 1.4 ppm, organic matter 1.49, Exch. K 1.170 me/100 g. The soil was silty loam in texture. Ammonium sulphate and urea fertilizers were used as nitrogen sources. The crop was fertilized with 120 kg N/ha separately from the both N-sources. A basal dose of 80 kg P₂O₅/ha was also applied alongwith the salts before transplantation. All the treatments were imposed in triplicate. The individual plot size was of 2x1.5 m. Nitrogen fertilizers were applied in a single dose application at the time of transplanting. Four weeks old rice (*Oryza sativa* L. cv. IR-6) seedlings were transplanted at the rate of one seedling per hill. There were 12 hills in each plot. The plots were kept flooded throughout the course of the experiment. The plants were harvested at maturity. After drying all measurements for grain and straw weight were made.

Rice grain (un-hulled) and straw were ground separately in a Wiley mill to pass a 20-mesh sieve and stored for laboratory analysis. Total nitrogen in plant tissues was determined by the micro-kjeldahl's method [1].

RESULTS AND DISCUSSION

The application of nitrogen fertilizers significantly increased the straw and grain yield (Table 1). Among the sources, ammonium sulphate proved slightly superior to urea. This indicates that rice plants prefer ammonium

fertilizer. The increase of straw and grain in the ammonium fertilizer being 46 and 23 % respectively over that in the control, while for urea being 36 and 21 %. It seems that greater volatilization losses in case of urea may be contributory factor in lowering its effectiveness.

Table 1. Effect of N-sources on the yield and N content of grain and straw of rice.

Treatments	Straw	Grain	Straw	Grain
	(kg/ha)		% N	
No Nitrogen (Control)	2304	2984	0.773	1.08
Ammonium Sulphate	3377	3657	0.921	1.35
Urea	3148	3610	0.904	1.33
LSD (.05)	149	142	0.062	0.056

The nitrogen content in straw and grain from fertilizer treatments was increased significantly over that of no fertilizer treatment (Table 1), but the differences in nitrogen sources were not reflected in significant differences in the nitrogen content of the yield components. However, an increase in N content both in straw and grain was recorded from ammonium than from urea fertilizer. Several authors [3] have recorded increased N contents of grain due to application of N. The substantial increase in N content of grain probably resulted from the greater uptake of N by plants [4].

REFERENCES

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