

EFFECT OF DIFFERENT LEVELS OF AMMONIUM SULPHATE ON THE GROWTH AND N CONTENT OF RICE

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(Received April 4, 1982; revised August 15, 1983)

INTRODUCTION

Nitrogen supply is often the most important nutritional factor affecting the growth and yield of rice. The problem associated with nitrogen application is the selection of a fertilizer for a given variety and environment, when combination with other factors provides an ideal nitrogen nutrition pattern to a growing crop. Resulting of the experiments, undertaken to determine the effect of nitrogen on the growth and yield of rice, are reported below.

MATERIALS AND METHODS

The soil collected from the surface, horizon 0-15 cm depth) of a field under rice cultivation was clay loam in texture containing 0.092% total nitrogen, 1.49% organic carbon, 1.38 ppm available P and had pH 5.01. The soil sample was air-dried, screened and 4 kg lots weighed into glazed pots. Two levels of nitrogen, nominally 60 kg and 120 kg N/ha from ammonium sulphate and basal

dressings of 40 Kg K₂O and 60 kg P₂O₅/ha from KCl and KH₂PO₄ were added to the pots and mixed thoroughly. A blanket treatment of N (control) was also included. Immediately after application of fertilizers, the pots were flooded with water up to about 8 cm. Two 15-day old seedlings (var. Ir-6) were transplanted in each pot. The plants were grown upto maturity and then harvested. Straw and grain were separated and weighed. The total nitrogen contents of the straw and grain were analyzed by the micro-Kjeldahl distillation method [1].

RESULTS AND DISCUSSION

The application of 60 kg N/ha significantly increased the straw yield by 51% and 120 kg N/ha by further 45% over no nitrogen treatment (Table 1). While application of 60 kg N/ha increased grain yield significantly by 15% over no nitrogen treatment, the higher level of N application (120 kg N/ha) did not significantly increase grain yield nor the other plant parameters appreciably or proportionally, indicating limited requirement for this variety. Such

Table 1. Effect of nitrogen application on the growth of different plant parameters

Treatments kg N/ha	Yield of plant components		Average yield of plant paramters					weight of 1000 grain (g)
	Straw-grain yield m.t./ha.	No. of ears/ hill	No. of tillers/ hill	Plant height cm	Ear wt. g	No. of grain/ ear		
0	5.5	3.2	12.3	12.4	114	1.3	106	17.6
60	8.3	3.7	14.9	15.6	152	1.7	102	16.6
120	8.0	3.1	13.6	14.1	155	1.0	91	16.0
LSD 5%	1.5	0.5	2.1	2.4	10.7	0.4	23	1.3

N rates induced more lodging with loss of yield. It has been reported that rice plants grown at low nitrogen levels (120 kg N/ha) utilize the fertilizer most efficiently for grain production during the maximum tillering and flowering stages of growth [2]. Similarly a high nitrogen (120 kg N/ha), application tends to decrease the number of filled grains and the weight of 100 grains.

From the Table 1 it can be observed that the number of tillers and ears per hill increased with the application of 60 kg N/ha over the control by 25% and 21% respectively. This shows that the increase in grain yield was associated with increase in the number of tillers per hill. Application of 60 kg N/ha significantly increased plant height level of N application (120 kg N/ha) did not further increase plant

height significantly nor affected other yield components by the application of 60 or 120 kg N/ha when compared with control.

The present study has shown that the application of 60 kg N/ha has brought the yield levels close to the maximum under the given conditions.

REFERENCES

1. M.L. Jackson, *Soil Chemical Analysis* (Prentice-Hall Inc. Englewood, N.J. 1st ed. (1958), p. 183.
2. A. Tanaka, S. Patnaik and C.T. Abichandani, Proc. Indian, Acad. Sci. Soc-B., 49, 207 (1959).