Effect of different sources of nitrogen on the yield and yield component of rice

Report

Submitted by

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Title: Effectiveness of management of Nitrogen to increase yield of rice

Investigation issue: Hampered fertilizer management (on time) due to climate change.

Model: Effectiveness of management of nitrogen to increase yield of rice.

Objectives: To identify the best management options of nitrogen.

Materials and Methods: An experiment was conducted in 3 SAFBIN projects sites namely Paba, Baraigram and Patnitolaupozillas of greater Rajshahi, to study the effectiveness of management of nitrogen to increase yield of rice.

Cultiver: Relatively short duration drought tolerant and drought escaping variety BINA dhan 7 was selected for this trial.

Experimental Design: The trial was laid out in RCBD with 2 replications. Individual plot size was 6 m x 4 m with 4 border rows alongside the whole experimental field. 21 – 25 days old seedlings were transplanted having 3-4 seedlings per hill with spacing 20 cm X 15 cm.

Fertilizer Management: Granular urea + Guti ureawere used:

Urea: 180 kg/ha applied in 3 equal splits (1st split 10 days after transplanting (DAT) + 2nd split 25 days DAT and 3rd split at the panicle initiation stage.

TSP: 75 kg/ha applied before final land preparation.

MOP: 90 Kg (½ at the basal + ½ with the 2nd top dress of urea)

Gypsum: 60 Kg/ha

Pest Menagement: Perching and judicious pesticide were used. In case of stem borer attack Virtako were applied. When rice bug infestation noticed at the flowering stage then any

melathion sprayed avoiding pollination time (10 AM-14 AM). Rat infestation controlled by using bait, watering or put carefully Phostoxin tablet inside hole and blocked hole with mud.

Data Recording: Name of the cultivar, date of seeding, date of transplanting, seedling age, flowering date, number of productive tiller per hill, date of Maturity, date of harvest, yield and yield components harvested 10 m2 for each variet and replication.

Data Analysis: All the recorded data were compiled, tabulated and subjected to statistical analysis. Analysis of variance (ANOVA) was done with the help of computer package programme IBM SPSS Statistics v20 software. The mean differences among the treatments were tested with Duncan's New Multiple Range Test (DMRT) (Gomez and Gomez, 1984). Simple correlation co-efficient was done to determine the relationships between grain yield and its components.

Results:

All data of present investigation obtained from baby trail viz. growth duration, fertile tiller, total grain weight and yield of the rice variety BINA -7 are presented in (Figure 1 and Table 1).Growth duration varied significantly among the location. Similarly Urea types (granular and guti urea) had significant effect on growth duration so was interaction effect between location and urea type (Table 1).The result indicate that higher growth duration was found in Paba and the lower one was found in Patnitala. Similar result was found in urea types, i.e; higher growth duration was found in guti urea and the lower one was found in granular urea.

Fertile tiller/hill varied significantly among the location. Similarly urea types (granular and guti urea) had significant effect on fertile tiller/hill, so interaction effect between location and urea type (Table 1). The result indicates that fertile tiller production differed among the urea types but location was not significant. Fertile tiller/hill had significant but not varied due to interaction effect of location and urea types. The highest fertile tiller/hill (19.000) was found at Baraigram usingGuti urea and the lowest number was recorded at Patnitala applied granular

urea one (13.667). Guti urea was significant and produced maximum number of fertile tiller/hill in case of all location.

Total grain weight/panicle analysis revealed that location, urea type and interaction of location and urea type were significantly varied (Table 1).Guti urea was better than granular urea to produce rice grain. Among the three locations with the interaction to urea type significantly different and highest grain weight was produced at Baraigram. Yield (ton/ha) varied significant among the locations and urea type but there was no differences was observed among them. The highest yield (ton/ha) was recorded at Baraigram location.Guti urea was better than granular urea in case of yield of BINA-7 rice variety.

The number of fertile tiller number was not similar for all location. However, the average number of fertile tiller and yield using guti urea was greater than granular urea. Tiller numbers were positively correlated with yield (Figure 2). Some significant relationships occurred among the treatment at thee location.
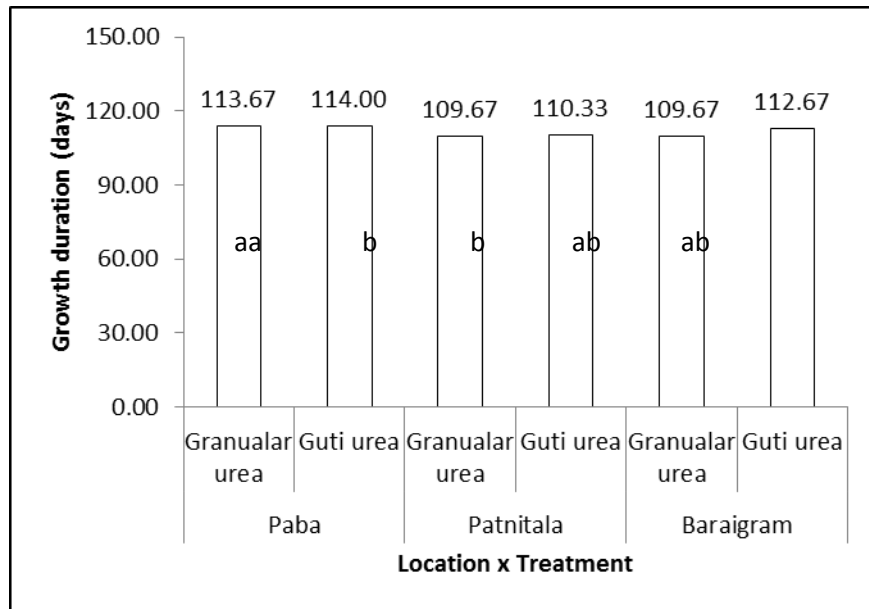
Figure 1. Effect of location and urea types on growth duration of BINA-7 rice varieties.Data presents mean value with standard error. Differences within locationby LSD at 5% level.

Table 1. Influence of granular and guti urea on yield components of BINA-7 rice variety grown in three location. Data presents mean value with standard error. Differences within location × urea types by LSD at 5% level.

Location	Urea types	Yield components		
		Fertile tiller/hill	Total grain weight (gm)	Yield (ton/ha)
Paba	Granular	14.333±1.459 a	21.000±0.185 b	4.683±0.271 a
	Guti	17.000±1.459 a	21.067±0.185 b	4.890±0.271 a
Baraigram	Granular	15.667±1.459 a	22.333±0.185 a	4.343±0.271 a
	Guti	19.000±1.459 a	23.000±0.185 a	5.100±0.271 a
Patnitala	Granular	13.667±1.459 a	20.733±0.185 b	4.600±0.271 a
	Guti	14.667±1.459 a	20.867±0.185 b	4.900±0.271 a
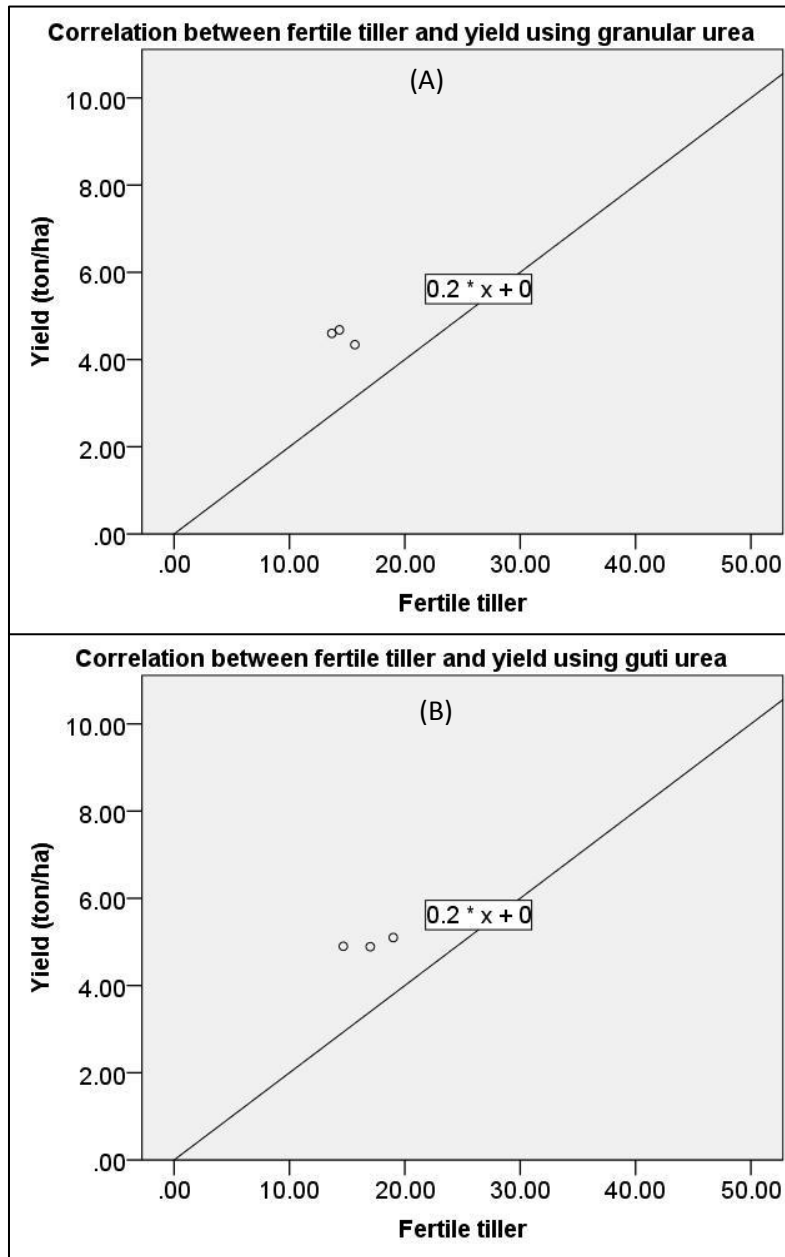
Figure 2. Correlation between fertile tiller/hill and yield (ton/ha) using system granular (A) and guti urea (A) in three locations of Rajshahi Division.