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Fertilizer for seed yield potential of BJRI tossa pat-8

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Abstract
The present study was aimed to determine the nutritional requirement of BJRI Tossa pat-8 for seed production. The results indicated significant effect on yield and yield contributing characters over control with different NPKSZn and B levels of BJRI Tossa Pat-8. The highest seed yield (0.88 t/ha) at Monirampur and yield (0.85 t/ha) at manikganj were obtained by the combination dose of N 75 Kg/ha with PKSZn and B 05-20-10-01-01 kg/ha over the control. The highest number of branch/plant (3.83), number of pod/plant (28.42) and number of seed/pod (195.33) also found highest in Monirampur with the same treatment of fertilizer combination. Therefore this combination seemed to be optimum for good growth and high yield potential for BJRI Tossa Pat-8 for seed production in Bangladesh.

Keywords: fertilizer, seed yield, late season, bjri tossa pat-8

Introduction

Jute and allied fibres are natural fibres of commercial importance which play an important role in the economy. The fibre of commerce is extracted from the stem of two cultivated species of jute - tossa jute (*Corchorus olitorius* L.) and white jute (C. *capsularis* L.). *Corchorus olitoriusis* mainly known for its fibre product, jute and for its leafy vegetables [1]. The jute plants need some essential nutrients to complete their life cycle. Nutrition is an important aspect of Jute production system and this includes adequate supply of essential nutrients like nitrogen, phosphorus, potassium, sulfur etc to the plant. The availability of these nutrients to plant contributes a lot to its growth and yield [2, 3]. Therefore adequate amount of nutrients need to be supplied to plant at the right quantity and also at the right time to favour both growth and yield [4]. The application of essential plant nutrients in optimum quantity and right proportion, through correct method and time of application is the key to increased and sustained crop production [5]. NPKS have influence on the growth and yield of fibre crops [6-9] Fertilizer studies showed positive responses of *Corchorus olitorius* to nitrogen [10]. Phosphorus is important in root development and helps hasten maturity of the fruit. Soils require extraneous inputs of phosphorus for optimum *Corchorus olitorius* growth [11-12]. The role of nitrogen and phosphorus in crop fertilization, leading to increased absorption of elements can be attributed to increase top growth particularly as a result of nitrogen absorption [13]. Similarly, application of any essential element should have a marked effect on yield if the soils were deficient in the element. It is, therefore, necessary to determine the growth and yield performance of a *Corchorus olitorius* variety BJRI Tossa pat 8 as affected by NPKS fertilizers application Therefore, this study has been undertaken to know the N, P, K, S, Zn and B fertilizer requirement of released Tossa jute seed production. At the same time, nutritional requirements for seed production of different varieties may be different due to their genetic potentiality. Judicial application of N, P, K, S, Zn and B may increase the seed production of a variety. Since the varieties of a species may differ in their nutritional requirements. Investigation is needed to find a suitable dose for a variety with different levels of nutrients. Therefore, present study was aimed to determine the nutritional requirement of *Corchorus olitorius* variety BJRI Tossa pat 8 for seed production.

Materials and Methods

The experiment was laid out in RCBD with 10 treatments of N, P, K, S, Zn and B (Kg/ha) having three replications of late jute seed production for the variety BJRI Tossa Pat-8 at JAES, Manikganj and Monirampur, Jessore. The following treatments combinations were used in the experiments:

Treatment N - P - K - S - Zn - B kg/ha
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T_1 = 00-00-00-00-00-00	T_6 = 75-10-30-20 -02-02
T_2 = 50-05-20-10- 01-01	T_7 = 75-15-40-30-03-03
T_3 = 50-10-30-20-02-02	T_8 = 100-05-20-10-01-01
T_4 = 50-15-40-30-03-03	T_9 = 100-10-30-20-02-02
T_5 = 75-05-20-10-01-01	T_{10} = 100-15-40-30-03-03

Unit plot size 3.0 m x 3.0 m. Space between plots, block and around the field: 1.0 m. There were 20 cm deep drain around each plot, block and around whole plot to drain out excess rain water. Deepness of drains were maintained up to harvest of crop. Total amount of P K S Zn & B from TSP, MP, Gypsum, Zinc oxide and Boric acid respectively were applied in to the plot at the time of sowing as per treatment. Total amount of N from urea as per treatment were applied in three equal splits-

one at sowing - one at 30-35 DAS (Days after Sowing) and rest at 50-55 DAS. Weeding, thinning, insect pest and disease management were done in time. The plant height, number of branches per plant, number of pods per plant, seeds per pod, and seed yield were recorded from each plot. All collected data were analyzed statistically following the ANOVA technique and the means were adjudged by DMRT [14].

Results and Discussion

The present experiment was undertaken for seed production for the most popular jute variety BJRI Tossa Pat-8. The seed yield and yield contributing characters were affected by different treatment combinations. The plant growth and yield were affected by the different N rates over the control and N @ 75 Kg/ha treatment (T_5) produced highest yield and yield contributing characters.

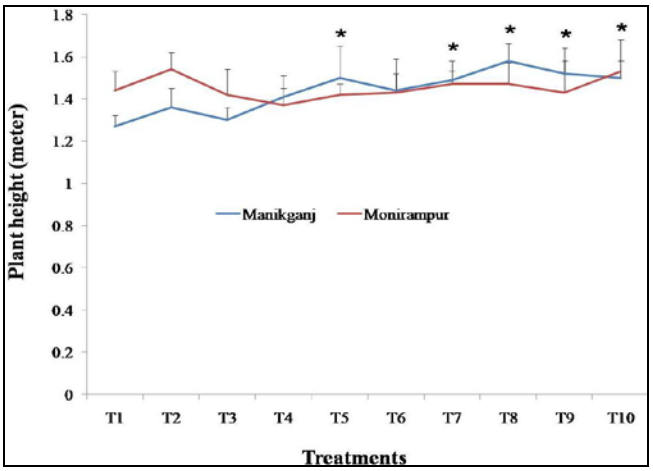

Fig 1: Plant height observation by different treatments. The results are expressed as the mean ± S. E. M.

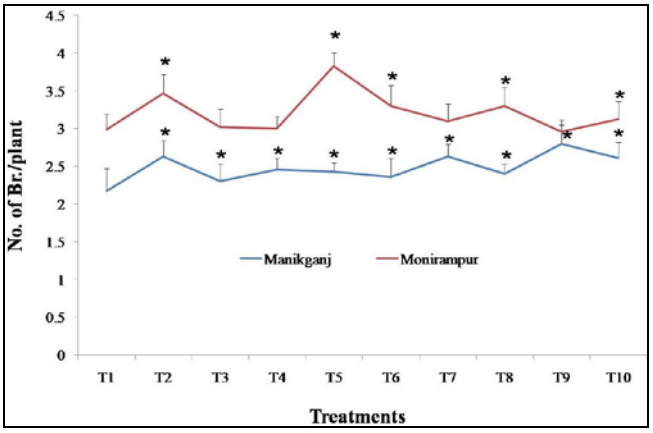

Fig 2: Branch per plant observation by different treatments. The results are expressed as the mean ± S. E. M.

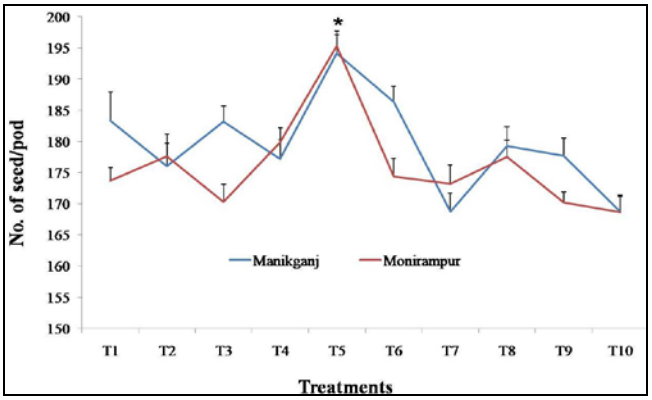

Fig 3: Seeds per pod observation by different treatments. The results are expressed as the mean ± S. E. M.

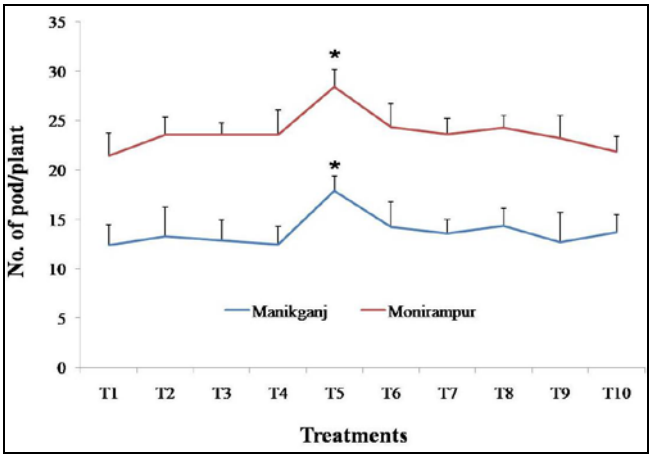

Fig 4: Pod per plant observation by different treatments. The results are expressed as the mean ± S. E. M.

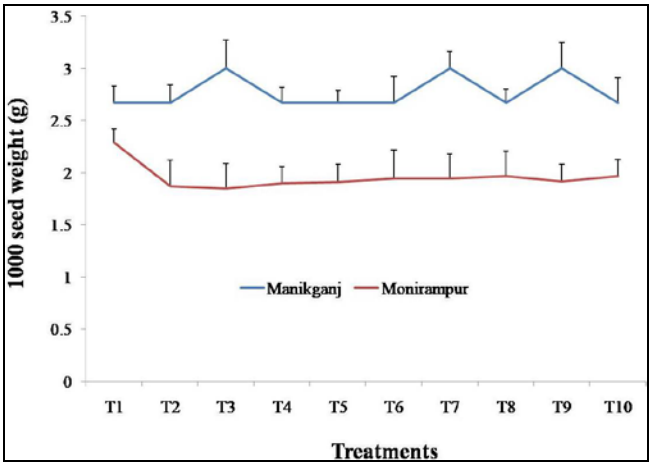

Fig 5: Thousand seed weight (g) observation by different treatments. The results are expressed as the mean ± S. E. M.

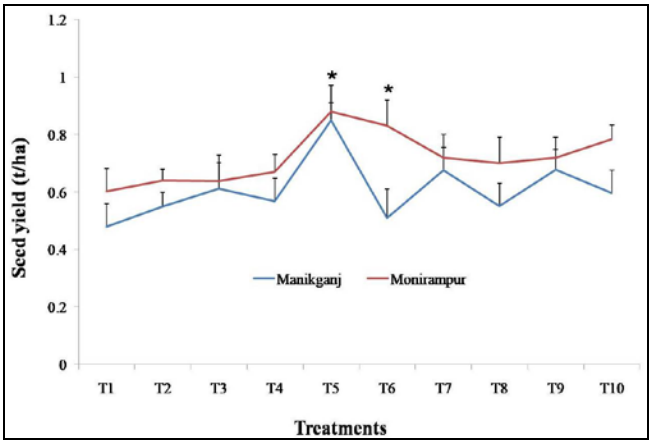

Fig 6: Seed yield observation by different treatments. The results are expressed as the mean ± S. E. M.

Fig 7: Experimental plots and data collection observation

Plant height

Significant effect of increasing dose of fertilizer application on plant height was observed. The highest significant plant height in Manikganj was observed with the application of T_8 ($N_{100}P_5K_{20}S_{10}Zn_1$ B_1 Kg/ha) which was identical with T_5, T_7, T_9, and T_{10}.

Number of Branch/plant

The incremental dose of different fertilizer application affects significantly the number of branch/plant. The significant highest number of branch/plant obtained in Monirampur by the treatments T_5 ($N_{75}P_5K_{20}S_{10}Zn_1$ B_1) which was identical with T_2, T_6, T_8, and T_{10}.

Number of pods/plant

The different fertilizer application affects significantly the number of pods/plant. The significant highest number of branch/plant obtained by the treatments T_5 ($N_{75}P_5K_{20}S_{10}Zn_1$ B_1 Kg/ha). The result suggested by previous reports [15-16].

Number of seeds/pod

Application of increasing doses of chemical fertilizer affect significantly the number of seeds/pod. Application of T5 produced the highest number of seeds/pod. About 127 to 200 seeds in each fruit of C. olitorius L were reported [17].

Seed yield

Significant effect of additional fertilizer application on seed yield was observed. The significantly highest seed yield was observed with T_5 ($N_{75}P_5K_{20}S_{10}Zn_1$ B_1 Kg/ha). The results indicated that the plant height, number of branches per plant, number of pods per plant, number of seeds per pod had influence on seed yield. Higher seed yield from crops having higher number of branches per plant, number of pods per plant, number of seeds per pod and weight of 1000 seeds [18-21].

Conclusion

It may be concluded that the application of combined doses of NPKSZnB fertilizer has significant effect on seed yield and yield contributing characters. However, the highest seed yield may be obtained with the application of treatments T_5 ($N_{75}P_5K_{20}S_{10}Zn_1$ B_1 Kg/ha) in Bangladesh.

Conflict of Interest

The authors declare that they have no competing interests.

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