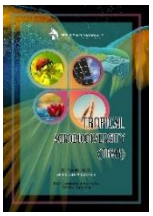
ZIBELINE INTERNATIONAL™ PUBLISHING

ISSN: 2716-7046 (Online)
CODEN: TARGCA

Tropical Agrobiodiversity (TRAB)

DOI: http://doi.org/10.26480/trab.01.2023.27.29



RESEARCH ARTICLE

EFFECT OF GEOGRAPHIC LOCATION ON YIELD AND QUALITY OF SEED OF BJRI TOSSA PAT-8

Mohammad Saiful Alam Sarker*, Ariful Islam, Md. Moniruzzaman, Muhammad Delwar Hossain Sarker and Md. Zablul Tareq

Jute Agriculture Experimental Station, Bangladesh Jute Research Institute, Jagir, Manikganj, Bangladesh
Corresponding Author Email: saiful.barj@gmail.com

ARTICLE DETAILS

Article History:

Received 20 March 2023
Revised 22 April 2023
Accepted 24 May 2023
Available online 29 May 2023

ABSTRACT

The experiment was conducted in two locations namely Manikganj and Noakhali to evaluate the effect of geographic position on the performance of seed yield and yield contributing characters of BJRI Tossa Pat-8. The result of data analysis revealed that the seed yield of BJRI Tossa Pat-8 in Manikganj (7.30g) was higher than the yield of Noakhali (5.63g). On the basis of morphology such as plant height, top diameter, base diameter, capsule length, number of seeds/pod, number of pods/plant & number of branches/plant, superior performance of Manikganj was observed to Noakhali. It was worth noticing that germination percentage of seeds of Manikganj (95%) was overwhelmingly higher than the seeds of Noakhali (84%). Geographic position also exerts significant effect on seed emergence and 1000 seed weight. Seeds harvested from Manikganj witnessed 90% of field emergence in contrast to only 72% in Noakhali. Similarly, a significant difference in 1000 seed weight was observed, 1000-seed weight of the seeds of Manikganj and Noakhali were 2.098g and 1.892g respectively.

1. INTRODUCTION

Jute (*Corchorus* sp.) under the genus of *Corchorus* and family of Malvaceae, predominantly a self-pollinated natural fiber crop after cotton. It is an important cash crop in Bangladesh and India, which together accounts for about 84% of world production of jute fibre (Islam, 2009). It is considered as a most eco-friendly crop because of its easy bio-degradability and contribution to soil health improvement. Jute is highly revered to environmental scientists as compared to synthetic fiber it does not exert any detrimental effects on the environment. Unlike synthetic fiber jute leaves and other waste of jute crops which left out in the fields after harvesting are transformed into organic materials and curtail the usages of chemical fertilizer for subsequent crops. Jute-based cropping pattern helps to boost agricultural production because of its soil fertility enhancing contribution to crop field (Singh and Ghosh, 1999). In recent times, the demand of jute has been increased manifold not only for its beneficial environmental contribution but also for its diversified usages, such as raw material for paper industry, geotextile, fiberglass alternatives, particleboards, packaging materials etc. Bangladesh, for its suitable soil and climatic condition, is in second position regarding total production, area and yield of jute in the world (Islam and Alauddin, 2012). In terms of fiber quality, Bangladesh secured an invincible position and leads the export market (Islam and Uddin, 2019).

Jute is mainly grown for fibre rather than seed which causes extreme shortage of quality seed every year during sowing season. Seed shortage appeared prominent after recent release of an unrivaled high-yielding Tossa jute variety developed by Bangladesh Jute Research Institute (BJRI) termed as BJRI TossaPat-8. Bangladesh requires about 5500-6000 tons jute seeds in every year to cultivate 0.8 million hectares of land while only about 10% - 15% quality jute seeds are produced and supplied by Bangladesh Agricultural Development Corporation and to meet the requirement rest amount of seed need to export from abroad (Ali et al., 2003; Al-Mamun and Saha, 2017). Unfortunately, imported seeds have no guarantee of its quality and are one of the major causes of low yield, while quality seed is the basic requirement for crop production which can augment 20% additional yield of the crop (Hossain et al., 1994; Islam, 2009). In terms of quality, seeds produced in the month of August-September is very low, for this reason, to ensure higher seed yield and economic return, Bangladesh Jute Research Institute recommends off season jute seed production usually sown in the month of August-September and harvested in December- January (Hossain et al, 1994). However, farmers in Bangladesh are extremely reluctant to occupy their land to grow jute seed by sacrificing high value winter crops which is the ultimate cause of lower availability of jute seed in Bangladesh.

To maximize the coverage of production area and mitigate seed shortage problem, cultivation of jute seed in the coastal zones can be an appropriate initiative. The coastal zone of Bangladesh covers about 20% of the country and over 30% of the total cultivable lands (Hasan et.al., 2019). About 0.83 million hectares land is affected by varying degrees of soil salinity (Karim et al., 1990). This study was undertaken to evaluate the feasibility of coastal zones in terms of performance of seed yield and quality of BJRI Tossa Pat-8 in two geographic location namely Manikganj and Noakhali.

2. MATERIALS AND METHODS

The experiment was conducted in two different geographical locations namely Jute Agriculture Experimental Station, Jagir, Manikganj (Latitude: 23° 54' 8" N and Longitude: 90° 0' 39" E) and Boyer Char, Hatia, Noakhali (Latitude: 22.3667°N and Longitude: 91.1250°E) from August 2018 to January 2019. The altitude of Manikganj and Noakhali were 4.0m and 0.0m in the Old Brahmaputra-Jamuna flood plain (AEZ-8) and Young Meghna Estuarine flood plain (AEZ-18) with a silt loam soil and silty clay soil respectively. The experimental plots were designed according to Randomized Complete Block Design (RCBD) with three replications. The plot size were 2m x 2.1m. The soil were ploughed in two directions and smoothed. Recommended fertilizers were applied to the soil. During the final land preparation, half of the urea and all other fertilizers were applied and the remaining urea was applied as top dressing. Before sowing the seed, seed was treated with Vitavax 200® (0.04%). All the cultural operations (weeding, watering, pesticide applications etc) were conducted properly. Data were collected after harvesting the crop and analyzed by using Statistix10.

Quick Response Code	Access this article online	
	Website: www.trab.org.my	**DOI:** 10.26480/trab.01.2023.27.29

Cite the Article: Mohammad Saiful Alam Sarker, Ariful Islam, Md. Moniruzzaman, Muhammad Delwar Hossain Sarker and Md. Zablul Tareq (2023). Effect of Geographic Location on Yield and Quality of Seed of Bjri Tossa Pat-8. *Tropical Agrobiodiversity, 4(1): 27-29*.

3. Result and Discussion

3.1 Effect of Location on Seed Yield and Yield Contributing Characters of Jute

Effect of location on seed yield and yield contributing characters of jute is presented in table 1. Analysis of variance revealed that non-significant variance were observed in plant height in two different location. There were also non-significant difference found in yield contributing other characters namely capsule length, number of seeds/ capsule. On the other hand, there were significant difference of geographic location found on top diameter, base diameter, number of pods in a plant, number of branches/plant (Figure 1) and seed yield/plant.

Seed yield/plant of Manikganj location were higher than seed yield/plant of Noakhali. Performance of BJRI Tossa Pat-8 in case of seed yield and yield contributing characters were better in Manikganj rather than Noakhali. It may be happen due to salinity effect in Noakhali region. A research from found that the performance of tossa jute in saline area were not remarkable (Al-Mamun et.al., 2017).

3.2 Effect of Location on Seed Quality of Jute

Effect of location on seed quality of jute is presented in Table 2. Quality seed is the basic requirement for crop production. That's why quality test of any seed is needed. After analyzing the data, in the case of germination test researchers found the significant difference between seed of Manikganj and Noakhali. Similar results were observed in both cases of field emergence and thousand seed weight. In table 2 analysis of variance revealed that, the quality of seed of Manikganj was better than seed of Noakhali. An experiment conducted also revealed that the quality of seed was deteriorated in saline prone areas by (Tareq et.al., 2018).

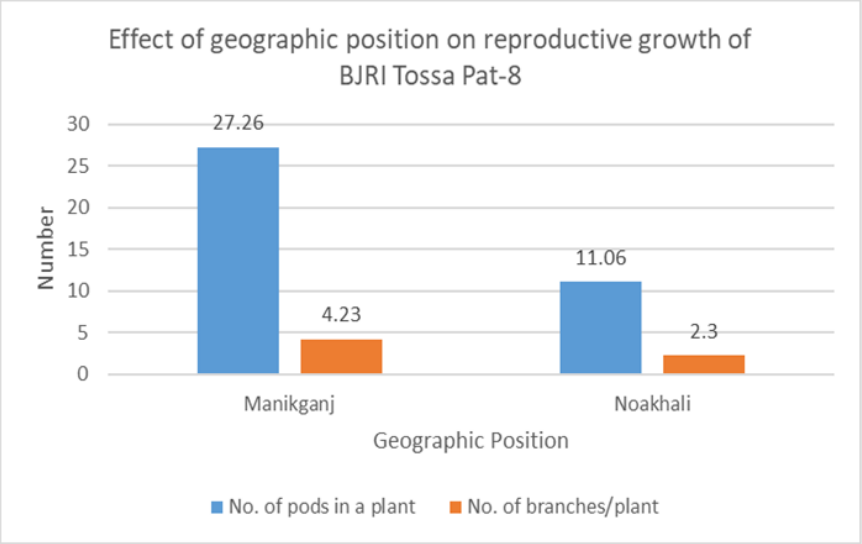


Figure 1: Effect of geographic position on reproductive growth of BJRI Tossa Pat-8

Table 1: Effect of Location on Seed Yield and Yield Contributing Characters of Jute

Location	Plant Height (cm)	Top Diameter (mm)	Base Diameter (mm)	Capsule length (cm)	No.of Seeds/ capsule	Seed yield/plant (g)
Manikganj	170.00a	81.95a	9.35 a	6.98a	192.33a	7.30a
Noakhali	130.95a	5.11b	6.87b	6.78a	167.67a	5.63b
CV%	10.6	10.21	2.26	2.72	7.04	7.38
LSD(0.05)	56.008	68.97	0.6441	0.6583	44.53	1.082

Table 2: Effect of Location on Seed Quality of Jute

Location	Germination%	Field emergence%	1000-seed weight
Manikganj	95a	90 a	2.098 a
Noakhali	84b	72 b	1.892 b
CV%	0.79	0.56	2.73
LSD(0.05)	2.4841	2.123	0.1913

4. Conclusion

BJRI Tossa pat-8 is the latest variety of tossa jute of BJRI of which production is 15-20% higher than any other tossa variety released in Bangladesh. The demand of tossa jute seed for fibre production is increasing. This research was conducted to observe the performance of BJRI Tossa Pat-8 in two different geographic locations namely Manikganj and Noakhali. The performance of BJRI Tossa pat-8 for seed production was significantly different in two different locations. Seed yield and yield contributing characters of Manikganj were superior to the seed yield and yield contributing characters of Noakhali.

References

Ali, S. M., Haque, M. M., Siddique, A. B., Mollah A. F., and Islam. M. N., 2003. Phenology growth and seed yield of tossa jute (Corchorus olitorius L.) in late sown technology. Bangladesh Journal of Agriculture, 27 and 28; Pp. 91-97.

Al-Mamun, M. and Saha, C. K., 2017. BJRI udbavito Pat, Kenaf o Mesta Phosoler Procholito Jaat. First Edition. Bangladesh Jute Research Institute. Dhaka.pp.30.

Al-Mamun, M., Saha, C. K., Mostofa, M. G., Miah, A., and Hossain, M. Z., 2017. Identification of suitable varieties for seed production of jute in non-traditional areas of Bangladesh. Bangladesh Journal of Plant Breeding and Genetics, 30(1), Pp. 33-38.

Hasan, M. H., Rahman, M. R., Haque, A., and Hossain, T., 2019. Soil salinity hazard assessment in Bangladesh coastal zone. In International Conference on Disaster Risk Management.

Hossain, M. A., Mannan, S. A., Sultana, M. K., and Khandakar, A. L., 1994. Survey on the constraints of quality jute seed at farm level. Ministry of Agriculture, Agricultural Support Service Project. GOB/World Bank/ODA seed technological research team, Bangladesh Jute Research Institute. Dhaka. Pp. 25.

Cite the Article: Mohammad Saiful Alam Sarker, Ariful Islam, Md. Moniruzzaman, Muhammad Delwar Hossain Sarker and Md. Zablul Tareq (2023). Effect of Geographic Location on Yield and Quality of Seed of Bjri Tossa Pat-8. *Tropical Agrobiodiversity, 4(1): 27-29.*

Islam, M and Uddin, N., 2019. Research and Development Advances of Jute Seed in Bangladesh: A Review. Haya Saudi Journal of Life Science, 4 (2),Pp. 52-68.

Islam, M. M., 2009. Jute Seed Technology. 397, Middle Monipur, Mirpur, Dhaka. Pp. 01.

Islam, M. S and Alauddin, M., 2012. World Production of Jute: A Comparative Analysis of Bangladesh. International Journal of Management and Business Studies, 2 (1);Pp. 14-22.

Karim, Z., Hussain, S. G. and Ahmed, M., 1990. Salinity problems and crop intensification in the coastal regions of Bangladesh. Soil Publication 33. BARC. Pp. 63.

Khan, M. S., Rahman, M. M., Begum, R. A., Alam, M. K., Mondol, A. T. M. A. I., Islam, M. S., and Salahin, N., 2008. Research experiment with problem soils of Bangladesh. Soil Science Publication (8), Soil Science Division, Bangladesh Agricultural Research Institute. Pp.1-25.

Singh, S. K. and Ghosh, B. C., 1999. Integrated nutrient management in jute (Corchorus capsularis) –rice (Oryza sativa) cropping system under rainfed lowlands. Indian Journal of Agriculture Science. 69(4): Pp. 300-301.

Tareq, M. Z., Hossen, B., Biswas, S. K., Hoque, A. B. M. Z., and Hasan, M. M., 2018. Yield and quality of jute (Corchorus capsularis L.) vegetable seed as affected by salinity environment. Journal of Agroecology and Natural Resource Management, 5;Pp. 30-33.