

TECHNICAL BULLETIN

No. 11, 2019

Validation and Up-Scaling of Off-Season Jute Seed Production Technologies in Different Jute Growing Areas of Bangladesh

Jute (*Corchorus spp.*), the most important natural fiber crop of Bangladesh, is the main cash crop and has a great influence on socio-economic conditions of the farmers of the country. In 2011-2012, 145.2 lakh bales of jute were produced from 7.6 lakh ha of land requiring about 5500-6000 t of jute seed, only 12% to 15% of which was produced and supplied by the Bangladesh Agricultural Development Corporation (BADC). Rest of the jute seeds was only partially produced domestically and a major portion had to be imported at the cost of valuable hard currency.

Jute seed production in Bangladesh is constrained by problems like scarcity of high land in the sowing season (August-September) and high rainfall which sometimes makes sowing impossible. Moreover, low seed yield per unit area, low availability of jute seeds in the sowing season, poor quality of the available seeds, high cost of production but poor return compared with competing cereal crops, etc. discourage farmers and they distance themselves from the seed production process.



Jute farmers mostly depend on poor quality indigenous or smuggled seeds purchased from local markets. These poor quality seeds produce plants with low fiber strength. Hence, enhancing local production of quality jute seeds is very much essential. BJRI has developed several modern jute varieties along with suitable production technologies, such as, direct seeding, seedling transplanting and top cutting, some of

which are very cost effective and produce good quality seeds. One promising technology is jute seed production with winter vegetables. However, jute farmers are not yet aware of these technologies.

Recent studies revealed that jute seeds produced in the southern areas of the country are better than those in the northern areas, especially in the late season. This project was designed to



KRISHI GOBESHONA FOUNDATION

A non-profit foundation for sustainable support to agricultural research and development

investigate the production potential of off-season jute seed cultivation using different varieties and different production methods integrating jute seed production with winter vegetables in farmers' fields of the southern region of Bangladesh. The specific objectives were to validate and up-scale advanced technologies for off-season jute seed production at farm levels and improve the farmers' knowledge and skills for quality jute seed and fiber production. The project activities included:

- i. Dissemination of information on modern jute varieties and production methods and techniques through adaptive research by BJRI scientists in collaboration with DAE officials
- ii. Adaptive trials on optimum planting time, proper tillage operation and fertilizer application, population stand, plant protection measures, proper time and method of harvest, drying and storing of seeds.
- iii. Technology validation and demonstrations in large blocks (50 farmers/location/year/crop) at four locations (2 upazilas each of Barishal and Patuakhali districts)
- iv. Field experiments on (a) performance evaluation of tossa jute varieties in off-season seed production, (b) study on production methods for off-season jute seed, (c) validation of techniques of off- season jute seed production by intercropping jute with winter vegetables, (d) performance evaluation of deshi and tossa jute varieties for fiber production, (e) evaluation of farmers' self produced jute seeds obtained from intercropping of jute with winter vegetables
- v. Evaluation of the tossa jute varieties (O-9897, BJRI Tossa Pat-4 and BJRI Tossa Pat-5) were for seed and fiber production at all project locations of Barishal and Patuakhali, and also of the deshi jute varieties (CVL-1, CVE-3 and BJC-2197) in the Patuakhali district

Results and Outputs

Jute seed yield was the highest (178.33, 160.66 and 191.50 kg/ha for O-9897, BJRI Tossa Pat-4 and BJRI Tossa Pat-5, respectively) in Sadar upazila of Patuakhali. Similar yield was obtained in Kalapara and Babuganj, but it was the lowest in Wazirpur (68.14 and 88.07 kg/ha). The crop was stunted and seed yield was very low due to heavy rains in Wazirpur. The variety BJRI Tossa Pat-5 performed better at all the locations in off season.



The variety BJRI Tossa Pat-5 may be less photosensitive and more tolerant of low temperatures which might have enabled this variety to produce well off season (winter). In terms of seed quality attributes, significant differences across variety and location were observed. The



variety O-9897 showed better quality attributes than any of the other variety. The criteria for good quality jute seeds were set as: germination $\geq 89.2\%$, 1000 seed weight ≥ 1.99 g, vigor ≥ 70.15 .

Production methods influenced jute plant growth and seed yield. The performance order of the methods was, line sowing method (175.70 kg /ha) > broadcast (140.80 kg/ha) > top cutting (98.67 kg/ha) > seedling transplanting (61.81 kg /ha).

Jute seed production with winter vegetables is a new technology of producing jute seeds in an economic way. In this technique, red amaranth (BARI Lalshak-1), turnip (Early White), tomato (BARI Tomato-14), brinjal (BARI Begun-10) and radish (Japani Torki) were grown.



The maximum earning equivalent ratio (EER, income advantage of intercrops over sole cropping of the main crop), gross benefits and BCR were achieved with the jute-tomato/red amaranth/radish combinations.

Fibre production by deshi and tossa jute varieties was satisfactory in the southern region (Patuakhali and Barisal) of Bangladesh across location, variety and production method. The tossa jute variety O-9897 was the best fiber producer.

The yield order was O-9897 (broadcast, 2.92 t/ha) > BJRI Tossa Pat-5 (broadcast, 2.91 t/ha) > BJRI Tossa Pat-4 (broadcast, 2.88 t/ha) > O-9897 (line sowing, 2.83 t/ha) > BJRI Tossa Pat-5 (line sowing, 2.77 t/ha) > BJRI Tossa Pat-4 (line sowing, 2.73 t/ha). It was concluded that all the varieties can be cultivated in Wazirpur, Babuganj and Patuakhali Sadar in any sowing method but in Kalapara, line sowing is preferable for production of tossa jute for fiber.

Benefits and Outcomes

Opportunities of expansion of jute cultivation in new, non-traditional areas of the country have been created. The new technology of off season jute intercropping with winter vegetables was validated with good farmer acceptance.

Jute seed production in the intercropping system was as much as 1.77 kg/decimal or 438kg/ha, came as a breakthrough compared with the traditional yield of 200kg to 300kg/ha. Growers' incomes increased by 2-3 times with jute-vegetables over single cropping of jute for seed production.

Recommendations

- In the southern region of Bangladesh, the tossa jute varieties, BJRI Tossa Pat-5 and O-9897, can be cultivated for successful jute seed production.
- The jute-winter vegetable (off season jute) intercropping technology can be very rewarding in terms of both quality jute seed production and cash incomes.
- Fertilizer management for off-season jute seed production with winter vegetables particularly in the southern region needs to be researched.
- Research should be done on dry land seedling transplanting method (like pepper seedling transplanting for pepper production) for jute seed production because farmers are not interested in the present seedling transplanting method under wetland conditions although this method has broadened the scope for seed production under very late sowing conditions.

Expected Impacts

Technologies of off season jute production along with winter vegetables tested in this project will be beneficial particularly for small scale farm households. In small scale production, jute with component winter crops production is easy for a small farmer to manage.

In Bangladesh, jute seed production should be practiced in small land so that a farmer can meet his demand of jute seeds through his self-production.

At the present national jute production level, 80% of the jute farmers require only 2-5 kg jute seeds/farmer in the jute crop season for fiber production. So, 2 to 5 decimal land is enough to meet a farmer's seed requirement.



Farmers' self-production, or "nijer beej nije kori" has a good prospect for increasing jute seed production contributing significantly to building up of a domestic jute seed stock.

The BJRI jute varieties, especially the deshi jute varieties, can be cultivated in the southern region even in highly saline conditions (soil salinity level up to ECe 9 dS/m). Almost 60% of the 0.83 million ha arable lands in the southern coastal zone remains fallow or is just single cropped.

Growing jute on the fallow lands can have a big impact on the cropping scenario of the southern coastal zone.

This bulletin has been prepared on the basis of technical information available from a completed CGP project of KGF, the details of which are given below:

Project code and title: TF-11C: Validation and up-scaling of off-season jute seed production technologies in different jute growing areas of Bangladesh; Principal Investigator: Dr. Md. Abdul Alim, Bangladesh Jute Research Institute; project duration: August 2013 to September 2016