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PERFORMANCE OF SEED YIELD OF TOSSA JUTE O-9897

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Abstract

Jute seed production capacity varied significantly in relation to variety. An experiment was conducted at Jute Research Regional Station, Faridpur at September, 2016 to January, 2017 with five varieties, *viz* O-9897, BJRI Tossa Pat 4 (O-72), BJRI Tossa Pat 5 (O-795), BJRI Tossa Pat 6 (O-3820) and JRO-524 to find out the seed production capacity and quality. The result revealed that the highest seed yield was obtained from O-9897 (557.56kg/ha) which were statistically identical with the seed yield of O-795, O-3820 and JRO-524 where as O-72 gave the lowest seed yield. Seed quality was highest at O-3820 with maximum normal seedlings percentage (79.67%) and minimum abnormal seedlings percentage (10.33%). Jute seed yield was significantly positively correlated with plant population. For highest amount of seed production O-9897 cultivation should be recommended and for best quality seed BJRI Tossa Pat 6 may be recommended to cultivate at Faridpur region.

Key Words: Tossa, seed, yield, germination, plant population.

Introduction

Jute is the eco-friendly and important fiber crop among the world. Entire life cycle of jute from cultivation to usage, disposal it is friendly to the environment and produces no toxic materials (Sarkar 2008). On average, Jute of about 1 hector land, absorbs 15 ton CO_2 and 11 ton O_2 from the atmosphere during 100 days of its life (Anonymous, n.d.) . It plays an important role in increasing soil fertility, nutrient availability and soil conservation. It is the main cash crop of Bangladesh. About 40-45 lakh farmers are directly related to jute production. Faridpur region grows the most of the jute of the entire jute production. To grow quality jute, the seed quality should be ensure. If self dependence on jute seed is achieved, it will be helpful for quality fibre production and ultimately for increasing foreign currency. Every year 6500 MT jute seed is used in Bangladesh. In our country about 6200 MT of exotic jute seed is used for fibre production. But farmers show reluctance of producing jute seeds. Sometimes it is found that the exotic jute seeds are characterized with early flowering and higher branching in fibre plant also. Seed production capacity as well as seed quality is not same of different varieties of jute. So it is important to know the seed yield and seed quality of different jute varieties for identifying a suitable one for seed production at Faridpur region. Thats why this experiment is undertaken at Faridpur to identify the best one for jute seed production.

Methodology

The experiment was conducted at Jute Research Regional Station (JRRS), Faridpur (23.58^0 N latitude and 89.81^0 logitude) at September 2016 to January 2017 with five treatments as T_1 = O-9897, T_2 = BJRI Tossa Pat 5 (O-795), T_3 = BJRI Tossa Pat 4 (O-72), T_4 = BJRI Tossa Pat 6 (O-3820) and T_5 = JRO-524 at A_5 block to find out the seed production capacity and quality (BJRI 2016). Seeds of four BJRI jute varieties were collected from JRRS, Faridpur and the seed of exotic variety (JRO 524) from local market. The experiment was laid out in a Randomized Complete Block Design (RCBD) with three replication. Fertilizer was used as a rate of 220 kg/ha Urea, 100 kg/ha TSP, 60 kg/ha MoP

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and 100 kg/ha Gypsum (Hussain, 2014). Total cultivation was done at rainfed condition. Bangladesh Jute Research Institute recommended seed production techniques were followed. Seed were harvested at 116 days after sowing when about 80% pod reached at maturity stage. Harvested plant was dried in the sun for 2-3 days and then threshing was done and then the threshed seed was dried again for 4-6 days upto 10% moisture content (Islam 2009). During data collection at first 10 sample plants were randomly selected from the unit plot and then cut off. Branch/plant, number of pod/plant, number of seeds/pod was averaged from the data get from 10 sample plants. Then the whole plants of 3x2.1 m unit plot were cut and plant population was counted. After sun drying when the moisture content of the seed reached to 10% then 1000 seeds were counted and weighted to determine 1000 seed weight and then 100 seeds were placed to Petridis for germination test at seed germinator at optimum moisture and at optimum temperature. After five days the germinated normal and abnormal seedlings were counted according to AOSA, 1981. The statistical data analysis was done by SPSS.

Results and Discussion

he mean performance of the major seed yield contributing character of this experiment and co-efficient of variation at 5% level of significance are presented at table 1. The highest plant population was obtained at O-9897 variety which was 4.6 lakh per hectare and lowest at BJRI Tossa pat 4 (3.39 lakh/ha) but plant population of all the variety were not statistically significant. Number of branch per plant was highest at JRO-524 variety (2.10) and lowest (2.00) at O-9897 and O-72 variety but these were not statistically significant. Number of pod per plant was highest at O-795 (11.43) variety and lowest at O-9897 (8.76) but in case of all variety it was statistically identical. Number of seeds per pod was statistically identical for all variety but it was numerically highest in case of O-9897 (152.6) and lowest in case of JRO-524 (140.6). Thousand seed weight of all variety was statistically identical also but it was numerically highest in case of O-9897 (2.11 g) and lowest in case of O-72 (1.78 g). The seed yield of O-9897 variety was highest (557.56 kg/ha) which was statistically identical with O-795, O-3820 and JRO 524 and lowest seed yield was obtained in case of O -72 (306.34 kg/ha). This highest seed yield may be the result of highest plant population and highest number of seed per pod that occurred in case of O-9897 variety during 2016 for this experiment. As the plant population was highest as well as number of seeds per pod, O-9897 gave the highest seed yield.

Table1: Seed yield and quality of home and exotic varieties of tossa (*C. olitorious*) jute at Faridpur region during 2016

Treatments	PP (Lakh /ha)	No. of branch /plant	No. of pod /plant	No. of seeds/pod	1000 SW (g)	Seed yield (kg/ha)	% of germination (normal seedlings)	% Abnormal seedlings
T_1	4.60	2.00	8.76	1,526.00	2.11	557.56 a	77.00 a	13.33 b
T_2	4.41	2.50	11.43	1,492.67	1.83	521.52 a	74.67 a	12.67 b
T_3	3.39	2.00	9.16	1,466.00	1.78	306.34 b	52.33 b	31.00 a
T_4	4.17	2.06	9.3	1,524.67	1.93	480.18 a	79.67 a	10.33 b
T_5	4.14	2.10	8.9	1,406.00	1.96	474.88 a	79.00 a	15.33 b
F (5%)	NS	NS	NS	NS	NS	*	*	*
CV%	8.52	11.53	4.06	4.8	7.8	11.76	9.38	14.43

PP=Plant population, SW= Seed weight.*= significant at 5% level, NS= Not significant at 5% level

The highest germination percentage (normal seedlings) was observed in case of O-3820 (79.67%) which was statistically identical with the germination percentage of JRO 524, O-9897 and O-795. On the other hand, the lowest (52.33%) germination of normal seedlings was observed in case of O-72 variety. The highest percentage of abnormal seedlings (31.00%) was observed at O-72 variety and lowest at O-3820 variety (10.33%) which was statistically identical with the abnormal seedlings percentage of O-795, O-9897 and JRO 524 variety. The seed quality may be due to the competence of variety or may be the effect of environmental factors. Further experiment should be done to identify this.

Table 2. Correlation coefficient among seed yield and different seed yield parameters in tossa (*C. olitorious*) jute at Faridpur region during 2016

Characters	PP (Lakh/ha)	Branch/ plant (no.)	Pod /plant (no.)	Seeds /pod (no.)	TSW (g)	%Normal seedlings	%Abnormal seedlings	Seed yield (kg/ha)
PP (Lakh/ha)	1	-.049	-.064	.140	-.137	.477(*)	-.325	.487(*)
Branch/plant (no.)		1	.641(**)	.223	-.079	.296	-.495(*)	.093
Pod/plant (no.)			1	.617(**)	.206	.369	-.262	-.180
Seeds/pod (no.)				1	.235	.366	-.314	-.074
TSW (g)					1	.447(*)	-.253	.248
%Normal seedlings						1	-.817(**)	.495(*)
%Abnormal seedlings							1	-.483(*)
Seed yield (kg/ha.)								1

** Correlation is significant at the 0.01 level (1-tailed).

* Correlation is significant at the 0.05 level (1-tailed).

At the table 2, it was found that plant population exhibited significant positive correlation with seed yield and percentage of normal seedling. Branch/plant exhibited significant positive correlation with pod/plant and significant negative correlation with percentage of abnormal seedlings. Pods/plant exhibited significant positive correlation with seeds/plant. Thousand seed weight showed significant positive correlation with percentage of normal seedlings and plant population. Seed yield exhibited significant positive correlation with plant population, thousand seed weight, percentage of normal seedlings and exhibited significant negative correlation with percentage of abnormal seedlings. Sataynarayana *et al.* conducted a study in 2017 which showed that seed yield of Roselle (*Hibiscus sabdariffa* L.) positively correlated with pod/plant, seed/pod and test weight. In this experiment plant population played more significant role in case of increasing jute seed yield. As plant population were high then plant get lower space for their branching. High population indirectly disturbs fruit setting, seed formation and thousand seed weight. But as plant per area was high ultimately it increased total seed production and ultimately higher seed yield. In an experiment conducted by Rahman and Hossain during 2011 on soyabean argued that seed yield increased with increase of plant density up to a certain level depending on variety and season. The increase in plant density decreased yield components such as number of pods plant^{-1}, seeds pod^{-1} and 100-seed weight.

Conclusion

Seed production capacity of O-9897 was highest and quality of produced seed of O-3820 variety was best among the home and exotic jute variety (O-9897, O-795, O-72, O-3820, JRO 524 variety) during the experimental period at Faridpur Region.

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