Environment & Ecology 25 (3) : 484—486, 2007
 ISSN 0970-420

Effect of Potassium and Sulfur on Seed Production of Olitorius Jute Raised from Top Cutting

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Abstract

A field experiment was conducted for 2 years during August-December of 2002 and 2003 to evaluate the effect of potassium (K) and sulfur (S) on the seed production of olitorius jute (cv JRO-524) raised from top cutting. Application of K and S significantly influenced the seed production of jute. The higher seed yield due to different treatments was obtained through the increase in number of branches/plant, number of pods/plant and number of seeds/pod. The highest seed yield of 496 kg/ha was obtained with 20 kg K_2O along with 20 kg S/ha in olitorius jute (JRO-524) grown from top cutting.
Key words : Potassium, Sulfur, Top cutting, Jute, Seed production.

Annually, about 5,000 tonnes of quality seed is required for sowing about 8 lakh hectare of jute area now under cultivation in India. In jute cultivation, the conventional seed producing area (Maharashtra and Andhra Pradesh) and the fiber producing area (West Bengal, Assam, Bihar and Orissa) are located at distant places in India. Such isolation creates difficulties for timely availability of jute seeds in the market of the fiber producing areas and it leads to rise in the cost of the seed material due to long-distance transportation. Moreover, the fiber producing farmers of eastern Indian states are at the mercy of the jute seed traders who may play some tricks affecting jute farmers in particular and the economy of eastern India in general with regard to jute fiber production. Now it is established that jute seeds can be produced in the edapho-climatic condition of West Bengal (1, 2). But the farmers of this intensive cropping region are not willing to spare their land for normal mode of jute seed production as it will occupy the land for more than 6 months. However, the farmers of West Bengal may be interested in jute seed production, if the duration of land occupation is shortened considerably. With the said intention, to produce jute seeds in the southern plains of West Bengal by occupying the land only for 4–4$^1/_2$ months, the present investigation was undertaken to study the effect of potassium (K) and sulfur (S) on the jute seed crop raised from top cutting collected at harvest from the regular fiber crop. Earlier seed crop of jute was raised successfully by top cutting method under West Bengal condition (3, 4).

Methods

A field experiment was conducted for 2 years during August-December of 2002 and 2003 at the Instructional Farm, (22.95° N, 88.54° E, 9.75 m amsl), Jaguli, Bidhan Chandra Krishi Viswavidyalaya, Mohanpur, Nadia, West Bengal to study the effect of K and S on seed production of olitorius jute (cv JRO-524) raised from top cutting as described by Roy (4) and Majumdar (5). Top cuttings of 20 cm length collected from the 110 days fiber crop of jute were planted in the moist soil during the first week of August. About 70–80% survival of the cuttings was recorded. During the later part of the dry spell, two irrigations were given. The seed crop was harvested at 124 days age when the average plant height was 110—130 cm. The experimental soil was sandy-loam having pH 7.1, organic carbon 0.42%, total N 0.39%, available P 26 kg/ha, available K 163 kg/ha and available S 8 ppm. The experiment was laid out in a split plot design with nine treatments replicated thrice. The treatments were, three levels of K at 0, 10 and 20 kg K_2O/ha (in the main plots), three levels of S at 0, 10 and 20 kg S/ha (in the sub plots). K in the form of muriate of potash (KCl) and S in the form of elemental S (80% WP) were ap-

Table 1. Effect of K and S on number of branches/plant, pods/plant, seeds/pod, test weight of olitorius jute (pooled data of 2 years).

Treatments	No. of branches per plant	No. of pods per plant	No of seeds per pod	1000 seed weight (g)
Level of K (kg/ha)				
K_0	5.23	21.67	180.0	1.78
K_{10}	5.72	22.53	186.6	1.84
K_{20}	6.49	24.32	186.4	1.86
CD at 5%	1.05	1.62	NS	NS
Level of S (kg/ha)				
S_0	5.31	21.60	179.6	1.80
S_{10}	5.91	22.98	184.9	1.83
S_{20}	6.22	23.94	188.6	1.84
CD at 5%	0.88	1.41	5.84	NS

plied based on the treatment details. Biometrical observations were recorded at harvest.

Results and Discussion

Number of Branches/Plant

Application of K increased the number of branches significantly and the maximum number of branches (6.49/plant) was recorded with the application of 20 kg K_2O/ha (Table 1). Similarly, S application also significantly improved the number of branches and the highest number of branches (6.22/plant) was observed with 20 kg S/ha. There was no interaction effect of K and S on the number of branches per plant. Earlier similar effect of K and S on the number of branches in seed crop of olitorius jute was also reported (2).

Number of Pods/Plant

Number of pods differed significantly with different levels of K and S (Table 1). The maximum number of pods (24.32/plant) was recorded with 20 kg K_2O/ha. The highest number of pods (23.94/plant) was recorded with 20 kg S/ha which was at par with the pod numbers (22.98/plant) recorded with 10 kg S/ha. Interaction effect of K and S could not influence the number of pods per plant. The observation is consistent with earlier reports (2).

Table 2. Effect of K and S on seed yield of olitorius jute (pooled data of 2 years).

Treatments	Jute seed yield (kg/ha) K_0	K_{10}	K_{20}
S_0	112.5	193.2	354.1
S_{10}	142.3	251.4	473.6
S_{20}	171.4	323.2	496.2
CD at 5% for same level of S		6.1	
CD at 5% for same level of K		5.2	

Number of Seeds/Pod

Application of S significantly improved the number of seeds per pod (Table 1). The maximum number of seeds (188.59) per pod was recorded with 20 kg S/ha which was at par with the number of seeds (184.89) per pod observed with 10 kg S/ha ; whereas, treatment without S recorded significantly lower number of seeds (179.57) per pod. Application of K up to 20 kg K_2O/ha did not influence the number of seeds per pod which is unlike to some earlier results (2). No interaction effect of K and S was observed on number of seeds per pod.

Test Weight (1000 Seed Weight)

The test weight of olitorius jute seeds did not vary significantly with different levels of K and S.

Seed Yield

Application of K significantly influenced the olitorius jute seed yield (Table 2). The highest seed yield (441.30 kg/ha) was obtained with 20 kg K_2O/ha. Similarly, application of S also improved the seed yield of jute significantly. The highest jute seed yield (330.13 kg/ha) was recorded with the application of 20 kg S/ha. Earlier it was also reported that gradual increase in the levels of K and other nutrients (including S) increased the jute seed yield (1, 2). The present observations corroborate the earlier findings (3, 4) that jute seed crop raised from top cutting produced good seed yield (550 kg/ha) within 100—110 days. Interaction effect of K and S on the seed yield was also observed. The highest seed yield (496.2 kg/ha) was recorded with 20 kg K_2O/ha along with 20 kg S/ha, which was closely followed by 20 kg K_2O along with 10 kg S/ha producing seed yield of 473.6 kg/ha.

Similar interaction effect of K and S on the seed yield of olitorius jute was reported earlier (2).

It may be concluded that olitorius jute seed can be produced successfully in the edapho-climatic condition of West Bengal by applying 20 kg K_2O and 10–20 kg S/ha to the jute seed crop raised from top cutting.

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