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SHORT COMMUNICATION

Varietal Performances of Budchip as Planting Materials for Sugarcane at Chuadanga Area

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Usually three budded setts are used as seed in conventional method for sugarcane cultivation, where seed rate is 6.0 to 6.5 t ha^{-1}. To reduce seed rate spaced transplanting methods is a popular and profitable technology packages for the sugarcane growers where it requires 1.5 to 2.0 ton cane per hectare as seed materials (Anon,1989). In this method one or two budded pregerminated soil bed or poly bag settlings are transplanted in the main field. It is possible to increase the yield of sugarcane from 1.5 to 2.0 times in the space transplanting methods over conventional method (Paul *et al.*, 2005).

Further seed reduction may be done using budchip as it requires only 116 to 150 kg sugarcane per hectare as seed materials (Eusufzai *et al.*, 1993). In this method sugarcane bud is just cut in the form of chip keeping the stalk intact. After removal of budchip from the cane stalk, the remaining parts can be used for sugar or gur production. The amount of bud chip required for raising settlings for one hectare is about 150 kg which costs about Tk. 200.00. Thus, it can save an amount of more than Tk.7,900.00 per hectare for seed material. Total area for sugarcane production is about 0.084 million hectare in the non mill zone of Bangladesh (Paul *et al.*, 2005). Bud chip may be used successfully specially in the non mill zone where sugarcane is used for gur production. Thus it can save more than Tk. 66 crore per year. Besides it was estimated that market value of the gur that might be produced from the remaining parts of the sugarcane stalks could be as high as Tk.12000.00 per hectare (Hossain, 2005). This money can be used by the farmers for purchasing irrigation water, fertilizer, pesticide or other services required for increasing sugarcane yield.

Therefore, a study was conducted to examine the varietals performances of budchip for the selected varieties to investigate: (i) germination potential of budchip in soil bed; (ii) establishment and (iii) yield potential of budchip settlings in field under irrigated condition. The study was carried out in a farmer's field under Chuadanga Sub-Station, Bangladesh Sugarcane Research Institute at Locknathpur in Darshona with five sugarcane varieties viz. Isd 16, Isd 21, Isd 32, Isd 34 and Isd 35 during 2005-2006 cropping season. Budchips of these varieties were collected from sugarcane stalks using BSRI developed Bud chip cutting machine that can cut about 8,000 bud chips per day-labour (Eusufzai *et al.*,1993). Settlings were raised from these collected bud chips in soil bed. At the age of 42 to 49 days the settlings were transplanted in the main field. The experiment was laid up in RCBD with five treatments (varieties) and three replications in irrigated conditions. The selected varieties used as treatment were as follows:

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V_1 = Variety Isd 16; V_2 = Variety Isd 21; V_3 = Variety Isd 32; V_4 = Variety Isd 34; V_5 = Variety Isd 35. The budchip settlings were transplanted in the main field at a rate of 25,000 settlings per hectare. The soil of the experimental field was sandy loam with p^H value ranged from 6.1 to 7.5. Chemical fertilizers were applied as per recommendation. (Rahman *et al.* 1998) and intercultural operations were done as per BSRI recommendation. Number of tillers produced by different varieties was counted after six (6) months of transplantation. Number of millable canes was counted just one week before harvesting. Chemical analyses of canes were done during the mature stage in the month of December to find the pol percent of the cane (pol % cane). Two live irrigations were applied in the field at 0 and 14 days after transplantation. Later irrigation was applied at depth of 10 cm water at 28 days intervals. Because irrigation required at field condition for the sandy loam soil is 10 cm (Michael, 1991).

The results obtained from the experiment in respect of raising budchip settlings of five sugarcane varieties and their performance in the main field are discussed below. Germination of bud chips obtained from different varieties of sugarcane are given in Table 1. Highest germination of bud chip was found for variety Isd 35 (94%) followed by variety Isd 21 (80.52 %), Isd 34 (74.16 %) and the lowest germination was found for variety Isd 32 (72.00 %). On the basis of the average germination of budchip, the selected varieties can be ranked as: Isd 35 > Isd 21 > Isd 34 > Isd 16 > Isd 32. Establishment of bud chip settlings of different varieties are given in Table 2. The establishments were found statistically non significant for the selected varieties (Table 2). Statistically similar establishment was also found for varieties V_1, V_2 and V_3. Highest establishment was found for variety V_3 (23.159×10^3 ha^{-1}) and the lowest establishment was found for variety V_4 (22.951×10^3 ha^{-1}). Therefore, on the basis of the establishment potential, the selected varieties can be ranked as: Isd 32 > Isd 21 > Isd 16 > Isd 35 > Isd 34. The number of tiller usually depends on the varietal characteristics of a variety. At the same level of input and environmental condition all varieties do not produce same number of tiller. From Table 2 it is evident that variety V_5 (185.17×10^3 ha^{-1}) and V_4 (163.73×10^3 ha^{-1}) produced significantly higher number of tiller over variety V_1 (121.43×10^3 ha^{-1}), V_2 (133.30×10^3 ha^{-1}) and V_3 (138.87×10^3 ha^{-1}). On the basis of the tiller production potential the selected varieties can be ranked as: Isd 35 > Isd 34> Isd 32 > Isd 21 > Isd 16. From Table 2, it is evident that variety V_5 (127.91×10^3 ha^{-1}) and V_4 (127.64×10^3 ha^{-1}) produced significantly higher number of millable cane over variety V_1 (109.02×10^3 ha^{-1}), V_2 (100.48×10^3 ha^{-1}) and V_3 (105.62×10^3 ha^{-1}). On the basis of the millable cane production potential, the selected varieties can be ranked as: Isd 35 > Isd 34 > Isd 16 > Isd 32 > Isd 21. The average cane yield of the selected varieties Isd 16, Isd 30, Isd 31, Isd 32, Isd 33 and Isd 34 when planted in conventional method were found to be 92.0, 78.0, 90.0, 104.0, 99.0, and 93.0 t ha^{-1} respectively (Rahman and Pal, 2003). In this experiment, all other varieties except Isd 16 produced significantly higher or similar yield to the conventional method. It is evident from Table 2 that the highest yield of sugarcane (111.59 t ha^{-1}) was produced by variety V_3 which is higher than variety V_1 (91.73 t ha^{-1}), V_2 (84.58 t ha^{-1}), V_4 (96.49 t ha^{-1}) and V_5 (98.68 t ha^{-1}). Lowest yield was produced by the variety V_2 (84.58 t ha^{-1}). On the basis of the yield performance, the selected varieties can be ranked as: Isd 32 > Isd 35 > Isd 34 > Isd 16 > Isd 21. Pol percent cane is the inherent characteristics of variety and is varied from one variety to others. The variation in pol percent cane produced by different varieties was not statistically significant. Highest pol percent cane was found for variety V_5 (15.91). The lowest pol percent cane was found for variety V_2 (12.88). On the basis of pol percent cane the selected varieties can be ranked as: Isd 35 > Isd 16 > Isd 32 > Isd 34 > Isd 21.

Table 1. Germination (%) of budchip on soil bed.

Variety	Total bud chip settlings	Total germination	Germination (%)	Rank
Isd 16 (V_1)	2500	1832	73.28	4
Isd 21 (V_2)	2500	2013	80.52	2
Isd 32 (V_3)	2500	1800	72.00	5
Isd 34 (V_4)	2500	1854	74.16	3
Isd 35 (V_5)	2500	2350	94.00	1

Table 2. Performance of budchip of five varieties on their establishment of settlings, tiller, millable cane and yield.

Treatments	Establishment of settlings ($x10^3$ ha^{-1})*	Tiller ($x10^3$ ha^{-1})	Millable cane ($x10^3$ ha^{-1})	Yield (t ha^{-1})	Brix (%)	Pole % Cane
Isd 16 (V_1)	23.14 (92.57)	121.43 d	109.02 b	91.73 b	17.23	14.82
Isd 21 (V_2)	23.15 (92.63)	133.30 c	100.48 b	84.58 b	15.59	12.88
Isd 32 (V_3)	23.16 (92.64)	138.87 c	105.63 b	111.56 a	17.12	14.37
Isd 34 (V_4)	22.95 (91.80)	163.73 b	127.64 a	96.49 a	16.87	14.11
Isd 35 (V_5)	22.98 (91.94)	185.17 a	127.91 a	98.68 a	19.03	15.91
LSD at 5%	ns	11.36	7.77	5.83	ns	ns

* Value within the parenthesis indicates the percentage

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