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# Performance of Newly Released Sugarcane Varieties using Budchip Settlings as a Planting Material

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## ABSTRACT

An experiment was conducted at the RSRS farm of Bangladesh Sugarcane Research Institute, Joydebpur, Gazipur with six sugarcane varieties viz; Isd 32, Isd 33, Isd 34, Isd 35, Isd 36 and Isd 37 during the cropping season 2007-2008 to find out suitable variety for budchips as a planting material. Satisfactory germination percentage was observed in all the varieties ranged from 76.6 to 90.8 percent in soil bed. All the varieties showed more than 99% establishment of budchip settlings in the main field. Variety Isd 34 (86.69 $tha^{-1}$) produced the highest cane yield followed by Isd 32 (82.52 $tha^{-1}$) and Isd 33 (82.24 $tha^{-1}$). The results indicated that newly released sugarcane varieties like Isd 34, Isd 32 and Isd 33 may be cultivated using budchip as planting material.

**Key words:** Budchip settlings, planting material, sugarcane varieties

## INTRODUCTION

Sugarcane (*Saccharum officinarum* L.) is a vegetatively propagated perennial crop. The sugarcane yield of a particular variety depends upon the heredity potential of the genotype and the environment where it is exposed during the course of its life cycle (Yadava, 1993). Variety of a crop plays an important role with regards to the yield and quality, sugarcane is no exception (Anon., 1989). Spaced transplanting method (STP) where settlings raised in different method transplant in the main field is a popular and profitable technology for the sugarcane growers. The technology requires 1.5 to 2.0 t $ha^{-1}$ as seed materials compared to 5.0 to 6.0 t $ha^{-1}$ in conventional method (Anon., 1989). Paul *et al.* (2005) reported that STP increased sugarcane yield 1.5 to 2.0 times over the conventional method. Among the settling raising material, budchips is a unique system where different varieties gave more than 92 percent establishment of settlings (Rahman *et al.*, 2009). Moreover, it requires only 116 to 150 kg per hectare budchips as seed materials (Eusufzai *et al.*, 1993). That is sugarcane bud is just cut in the form of chip keeping the stalk intact. After removal of budchip from the cane stalk, the rest parts can be used for sugar and gur production. Budchip can save an amount of TK. 7900.00 per hectare of seed material (Rahman, 2007). The system is very useful and promising for marginal and small growers for gur production especially in the non mill zone. In this area sugarcane is grown for gur production and chewing purpose which covered about 0.084 million hectare (Paul *et al.* 2005). Settlings raised from budchips are very profitable compared to other system. It can save more than TK. 66 crore per year by saving seed material needed for sugarcane cultivation in the country. Hossain *et al.* (2005) reported that remaining parts of the sugarcane stalks after taking budchips valued as high as TK. 12000.00 per hectare which used as gur production. This money can be used for other operations such as watering, fertilizing, pesticide application etc. for increasing sugarcane yield. Bangladesh Sugarcane Research Institute has developed about 40 modern varieties of sugarcane which are well adopted in sugar mills zone. These varieties are rarely cultivated in non mills zone. But these high yielding varieties should be disseminated among the sugarcane farmers of a particular area to replace the local variety under cultivation. This replacement would be played a vital role in increasing cane yield as well as gur production of the country. And STP through budchip settlings can play an important role for rapid multiplication and easy transportation of seed material

from one place to another in Bangladesh. In view of the above factors the experiment was conducted to observe the performance of newly released sugarcane varieties using budchip settlings as planting materials.

## MATERIALS AND METHODS

This experiment was conducted at RSRS farm, Joydebpur, Gazipur during 2007-2008 cropping season. The land under the study was medium high and typical loamy with pH 7.5. The experiment was laid out in a randomized complete block design (RCB) with three replications. Each variety was considered as a treatment. The unit plot size was 6.0 m × 8.0 m. The selected varieties were as follows:

$T_1$- Isd 32 $T_2$- Isd 33
$T_3$- Isd 34 $T_4$- Isd 35
$T_5$- Isd 36 $T_6$- Isd 37

Budchips of these varieties were collected from sugarcane stalks using BSRI developed budchip cutting machine that can cut about 8000 budchips per day per labour (Eusufzai *et al.*, 1993). Settlings were raised from these collected budchips in soil bed. At the age of 45 to 50 days the settlings were transplanted in the main field. Chemical fertilizers were applied @ 240, 200, 200, 165 and 9 kg $ha^{-1}$ as Urea, TSP, MP, Gypsum and Zinc Sulphate respectively. Full doses of TSP, Gypsum, Zinc Sulphate and 1/3rd MP were applied in trenches during the time of transplanting. One third of Urea was applied as side dressing at 21 days after transplanting. The rest of MP and Urea were applied in two equal splits at early tillering stage and late tillering phase of sugarcane. Recommended intercultural operations like weeding, mulching, irrigation and pest management were done as and when required. For the control of top shoot borer Furadan 5G @ 40 kg $ha^{-1}$ was applied. Germination and establishment of settlings (%), tiller, millable canes were recorded. The yield of sugarcane was also recorded at harvest. Brix (%) was determined by hand refractometer. Data on different parameters were analyzed following the standard statistical procedures.

## RESULTS AND DISCUSSION

### Germination of budchip in soil bed

Germination percentages of budchip from different varieties were furnished in Table 1. One thousand (1000) from each variety budchip cuttings were placed for raising settlings. The highest germination of budchip was found from variety Isd 35 (90.8%) followed by variety Isd 37 (90.0%). Isd 32 (87.6%), Isd 36 (85.8%) and the lowest germination was obtained from the variety Isd 34 (76.6%). Rahman *et al.* (2009) also reported a satisfactory germination percentage of budchips in soil bed condition.

**Table 1. Germination (%) of budchip of six varieties of sugarcane on soil bed**

| Variety | Total budchips | Total germination | Germination (%) | Rank |
|---|---|---|---|---|
| Isd 32 | 1000 | 876 | 87.6 | 3 |
| Isd 33 | 1000 | 780 | 78.0 | 5 |
| Isd 34 | 1000 | 766 | 76.6 | 6 |
| Isd 35 | 1000 | 908 | 90.8 | 1 |
| Isd 36 | 1000 | 858 | 85.8 | 4 |
| Isd 37 | 1000 | 900 | 90.0 | 2 |

**Establishment % of settlings**

The establishment percentage of settlings of the tested sugarcane varieties after transplanting in main field were found statistically insignificant. The highest establishment (%) of settlings was found in lsd 37 (99.66%) and lsd 35 (99.66%) where as the lowest establishment (%) of settlings was found in lsd 32 (99.01%), lsd 33 (99.01%) and lsd 36 (99.01%) (Fig. 1).

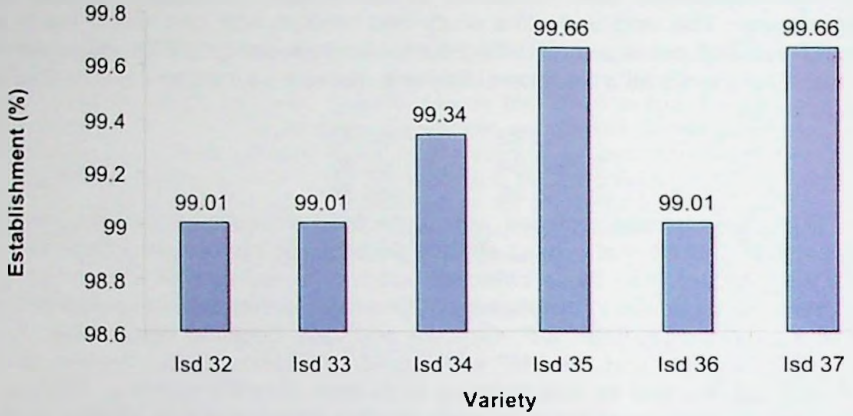


**Figure 1. Establishment percentages of budchip settlings of six varieties of sugarcane**

**Tiller population**

Data on tiller population showed that there was significant difference in tiller population among the varieties. The highest (175.27 x 103 $ha^{-1}$) tiller population was obtained from the variety lsd 34 while the lowest (125.34 x 103 $ha^{-1}$) tiller was in lsd 37 (Table 2). Variation in tiller production among the different varieties was reported earlier by Miah *et al.* (1994) and Rashid *et al.* (2001).

**Table 2. Yield and yield contributing characters of budchip settlings of different varieties of sugarcane**

| Budchips settlings of | Tiller (x $10^3$ $ha^{-1}$) | Millable cane (x $10^3$ $ha^{-1}$) | Cane yield (t $ha^{-1}$) | % Brix |
|---|---|---|---|---|
| lsd 32 | 130.88 c | 97.36 b | 82.30 ab | 17.22 b |
| lsd 33 | 138.29 bc | 104.09 b | 82.24 ab | 20.54 a |
| lsd 34 | 175.27 a | 131.87 a | 86.69 a | 18.33 b |
| lsd 35 | 150.41 b | 123.67 a | 61.15 c | 20.04 a |
| lsd 36 | 139.92 bc | 94.44 b | 58.19 c | 20.20 a |
| lsd 37 | 125.34 c | 94.16 b | 68.09 bc | 20.45 a |
| CV% | 7.01 | 6.68 | 11.87 | 3.64 |
| LSD | 18.29 | 13.07 | 15.79 | 1.28 |

Values having common letter(s) in a column do not differ significantly at 5% level

**Millable cane stalks**

The number of millable cane stalks was also significantly affected by different varieties. The highest (131.87 x $10^3$ $ha^{-1}$) number of millable cane stalks was recorded from the variety Isd 34 followed by the variety Isd 35 (123.67 x $10^3$ $ha^{-1}$) and the lowest (94.16 x $10^3$ $ha^{-1}$) number of millable canes was obtained from the variety Isd 37 which was followed by the variety Isd 33, Isd 32 and Isd 36. The maximum number of millable cane production in the variety Isd 34 might be due to the higher number of tiller production compared to other varieties. Matin *et al.* (1989) and Paul *et al.* (1994) also reported similar results on millable cane production due to different varieties.

**Cane yield**

Yield is the contribution of several attributes like number of millable stalk, stalk length, weight of cane. It is evident from the Table 2 that the maximum cane yield (86.69 t $ha^{-1}$) was obtained from the variety Isd 34 followed by Isd 32 (82.52 t $ha^{-1}$) and Isd 33 (82.24 t $ha^{-1}$) when it was harvested. The lowest cane yield (58.19 t $ha^{-1}$) was obtained in Isd 36. The findings of the present experiment were in agreement with that of Singh *et al.* (1999) and Arvind *et al.*(1997) where they found a variation in cane yield among different varieties. However, the yield obtained from any of the variety in the present experiment was much higher compared to national average yield of 46 t $ha^{-1}$.

**Brix (%)**

The highest brix 20.54% was recorded from variety Isd 33 followed by Isd 37 (20.45%), Isd 36 (20.20%) and Isd 35 (20.04%) while the lowest (17.22%) was obtained from variety Isd 32 which followed by the variety Isd 34 (18.33%). Higher brix % of any variety is an indication to produce higher gur and sugar.

Considering the overall findings of the present study the varieties Isd 34, Isd 33 and Isd 32 were found superior to other varieties and budchip settlings may be used as planting materials.

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