

Quality Assessment of Standing Cane after Bud chip Collection

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ABSTRACT

The investigation was conducted at Bangladesh Sugarcane Research Institute Farm during the cropping season 2003-2004. Bud chips were collected from the standing cane of the field following the treatments of alternate every 2nd, every 3rd and every 4th buds chipped along with a control having all intact buds. After bud chip collection, Bavistin (0.1%) or Lime were used over wounded area. The canes of bud chip collected treatments along with control treatment were analyzed for brix, pol, purity, recovery and reducing sugars at 15, 30, 45, 60 and 75 days after bud chip collection. The results of chemical analysis showed that there was no remarkable difference between controls and treated canes having bud chip collection from the standing canes. The treatment of every 3rd bud chipped collected followed by use of Bavistin showed the better performances compared to other treatments. There was no lodging of canes occurred upto 75 days after bud chip collection. There was also no difference in pest and diseases attack from the other field near by the side of experimental field. Results of this investigation indicates the possibilities of bud chip collection from standing canes without remarkable loss due to deterioration of canes for gur and sugar production and successful use of bud chip as planting materials for cane production.

Key words: Bud chip, Brix, pol, recovery, reducing sugars

INTRODUCTION

In Bangladesh about 15-20 % of total cane production is used as seed every year. This huge amount of seeds increases the production cost and reduces the substantial amount of cane supply for sugar and gur production. In conventional method, where cane stalks are directly planted in the main field, it needs about 6.0 to 6.5 t/ha of seed cane. But in spaced transplanting (STP) method, where pregerminated one eyed or two eyed soil bed settlings of 45-60 days old are transplanted in the field, it needs about 1.5 to 2.0 t/ha of seed cane (Anon., 1989). The amount of seed material was further reduced to 116 Kg/ha when settlings were raised using bud chip of sugarcane (Eusufzai, *et al.*, 1993). The potential of bud chips as planting materials in poly bag and soil bed method was evaluated and reported elsewhere (Imam *et al.*, 1988; Anon, 1989; Hossain, *et al.*, 2005). Collected bud chips from the cane stored for 13 days could give better survival rates when raised in poly bags (Prasad and Sreenivasan, 1996). However, there is no report on the effect of bud chip collected stale cane and standing cane from which bud chips were collected. For optimum germination of sugarcane bud for raising settlings required temperature above

20°C which prevailed before the month of November. To get good germination from bud chips for raising polybag settlings, it is important to collect bud chips from the cane before crushing for gur making as well as for sending sugar mills. Therefore, the investigation was undertaken to evaluate the quality of cane retained after bud chip collection from the standing cane of the field.

MATERIALS AND METHODS

The investigation was carried out at Bangladesh Sugarcane Research Institute (BSRI) farm during the cropping season of 2003-2004 with sugarcane variety Isd 32. The bud chips were collected from the standing sugarcane (11 month old) using BSRI developed Bud chip Cutting Machine. Untied standing canes were used for bud chip collection. The bud chips were collected on October 11, 2004 and the following treatments were applied:

T_0 = Control

T_1 = Every alternate bud was chipped starting from the first visible one at base.

T_2 = After the first one, every 3rd bud was chipped leaving 2 intact buds in between 2 chipped ones.

T_3 = After the first one, every 4th bud was chipped leaving 3 intact buds in between 2 chipped ones.

T_4 = T_1 followed by Bavistin application.

T_5 = T_2 followed by Bavistin application.

T_6 = T_3 followed by Bavistin application.

T_7 = T_1 followed by Lime application.

T_8 = T_2 followed by Lime application.

T_9 = T_3 followed by Lime application.

Following collection of bud chips, Bavistin 0.1% solution and lime collected from local market was applied over wounded area using cloth pieces. After collection of bud chips and treatment with Bavistin and Lime the canes were allowed to grow in the field as usual. Chemical analysis was done for quality assessment of the bud chip collected canes evaluated for brix, purity, pol % cane, recovery and reducing sugar at 15, 30, 45, 60 and 75 d after collection of bud chips for each treatment. For analysis 5 canes per treatment were randomly selected from each treatment. The cane analysis was carried out at Physiology and Sugar Chemistry laboratory by using Chen and Chung (1993) procedures.

RESULTS AND DISCUSSION

The experiment was set up to study the possibilities of bud chip collection from standing canes for raising sugarcane settlings and utilization of the canes for sugar and gur making during crushing period. The results of the investigation are presented in the Fig. 1-5 and discussed below. In the month of September and October when good

germination conditions prevailed normally crushing of sugarcane does not start. Bud chips were collected during the month of October to get good germination to raising seedlings. Ninety two percentage of germination was reported by Hossain and co-workers (2005) from bud chip of variety Isd 32 in the month of September. However, during this period most of the sugar mills do not start crushing of cane. Gur making using the canes also gives lower recovery. For the proper use of canes after bud chip collection it is required to preserve the canes for subsequent uses. It was observed that harvested canes might be stored without any significant loss of deterioration for 3 days (Jabber *et. al.*, 1999). In this investigation the canes were allowed to grow in the field up to the month of December, 75 days after bud chip collection. No lodging and any remarkable visual deterioration of cane was observed following bud chips collection. In none of the treatments continuous bud chip collection without leaving alternate bud was done. This was the reason perhaps the bud chip collected canes were not prone to lodging. There were no differences in pest and disease infestation in the field where bud chips were collected and the other intact part of the field.

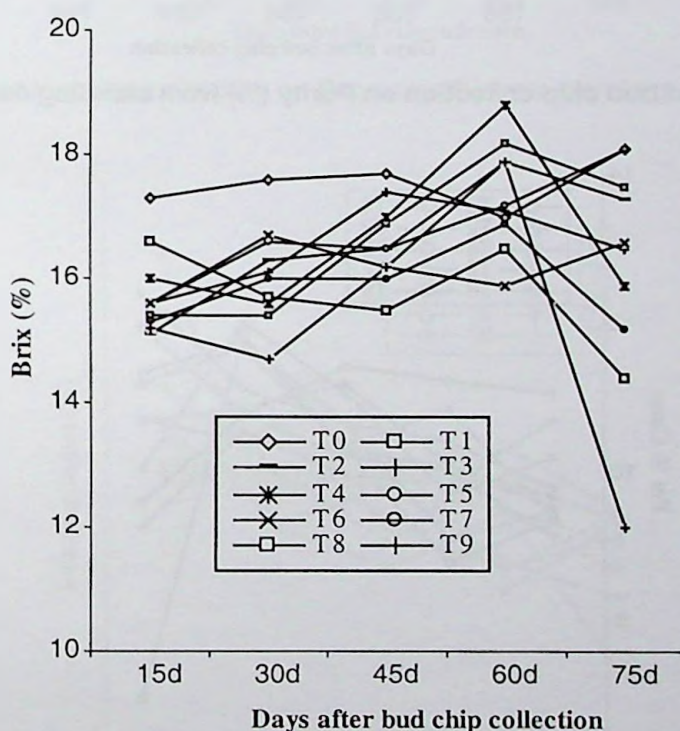


Figure 1 : Effects of bud chip collection on Brix (%) from standing cane in variety Isd 32

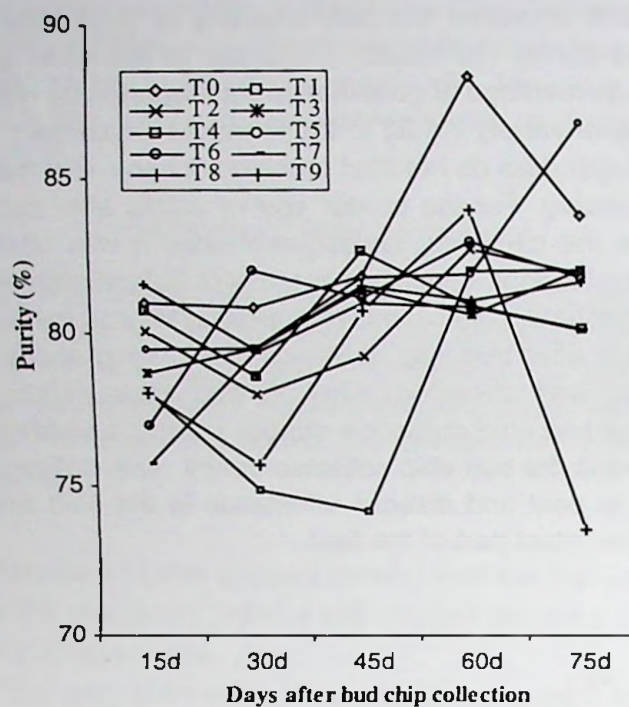


Figure 2 : Effects of bud chip collection on Purity (%) from standing cane in variety Isd 32

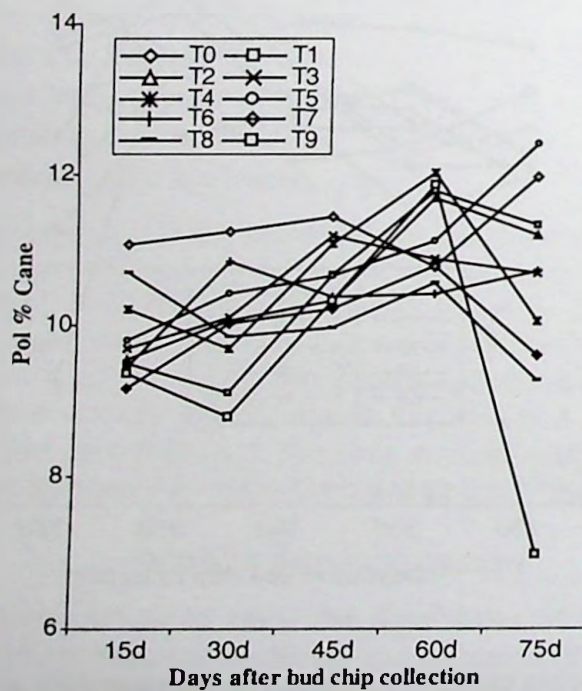


Figure 3 : Effects of bud chip collection on Pol % Cane from standing cane in variety Isd 32

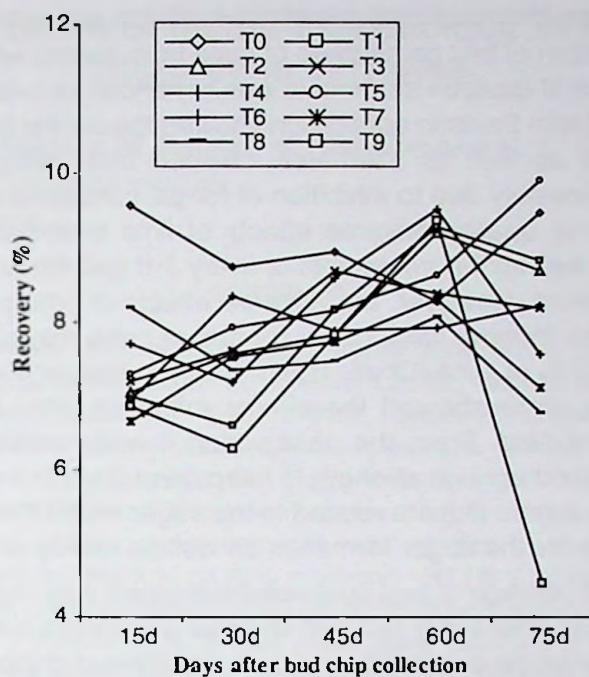


Figure 4 : Effects of bud chip collection on Recovery (%) from standing cane in variety Isd 32

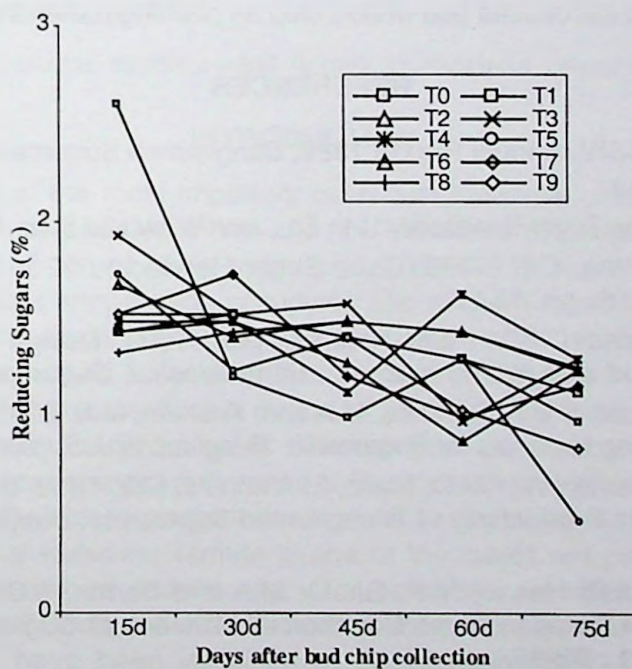


Figure 5 : Effects of bud chip collection on Reducing sugars from standing cane in variety Isd 32

It was revealed from chemical analysis of the bud chip collected canes that there was no significant deterioration of brix percentage of cane from control where no bud chips were collected. The influence of Bavistin treatments was beneficial for brix percentage. Every 3rd bud chipped treatment with Bavistin application showed the similar brix compared to control followed by the same as well as alternately chipped buds without Bavistin and Lime treatments. This was possibly due to inhibition of fungal contamination into wounded sites for deterioration of cane quality. Adverse effects of lime treatment were recorded from alternately chipped as well as the treatments of every 3rd and 4th buds chipped treatments during the analysis period. However, the adverse effects of lime application at the injury portion of standing cane forming calcium saccharate of cane may reduce pol of cane juice and thus falling of purity % of juice (Chen, 1985). Purity percentage of juice, pol percentage of cane and recovery were showed the similar influence after bud chip collection of standing cane from the field. From the observation it was revealed that every 3rd bud chipped treatment showed enough strength to keep cane erect in the field. Brix, pol, purity, recovery and reducing sugars (%) are related to the sugar production from the cane. These factors play similar role for the sugar formation as well as quality of cane.

Reducing sugar percentage of bud chip collected canes was higher than that of control plants. Among the treatments every 3rd bud chipped treatments with Bavistin showed the lowest percentage of reducing sugar followed by every 4th bud chipped with lime treatment. Higher reducing sugar percentage is the cause of deterioration of canes for sugar and gur production. Results of this investigation indicates the possibilities of bud chip collection from standing canes without remarkable loss due to deterioration of canes for gur and sugar production and successful use of bud chip as planting materials for cane production.

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