

Agronomic Performance of Some Promising Clones of Sugarcane Influenced by Different Planting Time

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ABSTRACT

An experiment was conducted at Bangladesh Sugarcane Research Institute (BSRI) farm, under irrigated condition during 2004-2005 cropping season to study the agronomic performances and effect of time of transplanting on yield and quality of some promising sugarcane clones developed by Breeding division of BSRI. There were two transplanting times November, 2004 as early and February, 2005 as late. Five promising clones namely I 98-98, I 110-98, I 131-97, I 142-98 and I 202-97 along with variety Isd 34 as standard were tested in this experiment. Number of tiller, millable cane and better cane yield and pol % cane were found both in early and late planting from the clone I 131-97 and I 202-97. Yield level and production of yield contributing factors were found to decline in late transplanting. Pol % cane in early planting was found statistically identical among different clones/variety but significantly varied in late planting. Hence, clones I 131-97 and I 202-97 proved their superiority in respect of all yield and yield contributing characters over the other tested clones both in early and late planting and may be recommended for commercial cultivation.

Key words: Sugarcane, planting time, promising clones, agronomic performance

INTRODUCTION

Sugarcane is an important cash crop of Bangladesh with an average yield of 45 TCH as against its theoretical approximation of 75 TCH. The main reason of poor yield of sugarcane have been identified as insufficient number of millable stalks and lower unit stalks weight. Sugar industries in Bangladesh continuously need high yielding and high sugar varieties. After a considerable period of cultivation sugarcane varieties show a tendency to decline in yield and vigour (Barnes, 1954 and Humbert, 1959). It is an obscure and puzzling problem to scientists, growers and processors. To maintain high yielding, it is necessary to replace varieties every few years with new clones (Poehlman and Barthakur, 1969). Planting time is one of the main determinant of growth rate and yields of sugarcane. The earlier the planting time the higher is the yield (Pai, 1958). Late planting reduces the cane yield by about 20 to 35 percent probably due to shortening of growing period of cane (Imam *et al.*, 1982). A very low level of yield with the major commercial cultivar may be obtained under summer transplanted conditions (Rahman *et al.*, 1987). The yield of transplanted settling is much higher even if it is transplanted 72 days after conventionally planted sett (Rahman and Rahman, 1979). Transplanting sugarcane is becoming an important practice when one considers that, by using nursery raised seedlings the field growth period can be shortened without reduction of yield (Tang, 1974). Spaced transplanting (STP) of sugarcane settling received considerable research attention for increasing number of millable cane stalks (Rahman and Rahman, 1979; Srivastava *et al.*, 1985). Before recommendation as variety the promising clones of sugarcane are required to be studied in respect of their ability to yield production and quality both in plant and ratoon crop. From this view, five promising clones developed by Breeding division of BSRI along with a standard variety were studied for agronomic performances.

MATERIALS AND METHODS

An experiment was conducted at Bangladesh Sugarcane Research Institute (BSRI) farm, Ishurdi, Pabna during 2004-2005 cropping season under irrigated condition. The site represents High Ganges River Floodplain under Agro-ecological Zone-11 with medium high land of typical sandy loam soil having pH 7.6. In this experiment five promising clones of sugarcane along with a standard variety were transplanted to study their agronomic performances. The experiment was laid out in Randomized Complete Block (RCB) design with three replications. The unit plot size was 8 m x 7 m and the treatments (clones/varieties) were as follows.

Promising Clones/ Variety

T₁: I 98-98

T₂: I 110-98

T₃: I 131-97

T₄: I 142-98

T₅: I 202-97

T₆: I sd 34 (standard)

Transplanting time :

1. Early Planting : November, 2004
2. Late Planting : February, 2005

Single budded soil bed settlings of 45 days old were transplanted in November, 2004 and February, 2005 with row to row spacing 100 cm and plant to plant spacing 30 cm. Fertilizers were applied @ 347, 244, 184 and 222 kg ha⁻¹ as Urea, TSP, MP and Gypsum respectively (BARC, 1997). All TSP, Gypsum and one third of MP were applied in trench and thoroughly mixed with soil prior to transplanting of settlings. The basal dose of Urea (1/3rd) was applied as side dressing at 21 days after transplanting (DAT) of settlings. The second dose of 1/3rd Urea and 1/3rd MP were applied as first top dressing at 90 DAT. Final top dressing of rest Urea and MP were applied at 150 DAT. Other intercultural operations like irrigation, gap filling, weeding, mulching, earthing-up and tying, etc. were done in time. Data on yield and various yield contributing parameters of cane were recorded.

RESULTS AND DISCUSSION

Tiller and millable cane production

The results of the experiment have been presented in the Table 1. It is seen from the table that higher number of tillers and millable canes were produced in early transplanting i.e. November transplanting. In early transplanting the highest number of tillers ($200.60 \times 10^3 \text{ ha}^{-1}$) was obtained in the clone I 131-97 followed by clone I 202-97 ($171.70 \times 10^3 \text{ ha}^{-1}$) and the lowest was from clone I 142-98 ($121.10 \times 10^3 \text{ ha}^{-1}$). In late transplanting the maximum number of tillers also was obtained in the clone I 131-97 followed by clone I 202-97 and the lowest in I 142-98. In case of millable cane production maximum number of millable canes of $120.90 \times 10^3 \text{ ha}^{-1}$ was recorded in clone I 131-97 followed by $100.02 \times 10^3 \text{ ha}^{-1}$ from clone I 202-97 and the lowest was from the clone I 142-98 during early transplanting. Same trend was observed for millable cane production in late transplanting. These results indicated that tiller and millable cane production were declined in late transplanted cane.

Table 1. Tiller, millable cane and cane yield of different sugarcane clones/variety transplanted in different times. BSRI, 2004-2005.

Planting time Treatments	Tiller ($\times 10^3 \text{ ha}^{-1}$)		Millable cane ($\times 10^3 \text{ ha}^{-1}$)		Cane yield (t ha^{-1})	
	Early	Late	Early	Late	Early	Late
T ₁ : I 98-98	150.60	141.33	90.15	80.20	70.11	67.50
T ₂ : I 110-98	146.21	139.41	89.11	86.51	68.30	65.87
T ₃ : I 131-97	200.60	194.50	120.90	112.20	82.32	78.90
T ₄ : I 142-98	121.10	106.30	80.29	71.30	66.80	64.10
T ₅ : I 202-97	171.70	166.40	100.20	95.75	79.35	75.11
T ₆ : I sd 34	154.00	144.10	95.12	84.82	72.15	66.70
Mean value	157.37	148.67	95.96	88.46	73.17	69.70
LSD (5%)	35.09	32.92	14.24	11.10	17.06	11.96

Cane yield

Yield was significantly influenced by the transplanting time. November planting significantly out yielded February planting. The yield of cane in early planting was supported by all yield contributing characters and was superior to late planting. This finding agrees with Hoque *et al.*, 1994. In early planting the maximum cane yield (82.32 t ha^{-1}) was obtained from with clone I 131-97 followed by clone I 202-97 and the lowest cane yield (66.80 t ha^{-1}) was recorded from clone I 142-98. In late planting the highest cane yield 78.90 t ha^{-1} was also obtained from the clone I 131-97 followed by clone I 202-97 and the lowest was recorded in clone I 142-98 (64.10 t ha^{-1}).

Pol % cane

The data on pol % cane in early planting was found statistically identical among different clones/varieties but it was varied significantly in late planting (Fig. 1). In early planting the highest pol % cane (15.69) was obtained from clone I 131-97 followed by clone I 202-97 and the lowest (14.05) was recorded from standard variety I sd 34. In late planting the highest pol % cane (15.52) was also obtained from clone I 131-97 followed by clone I 202-97 and the lowest from variety I sd 34. However, clone I 131-97 gave maximum pol % cane in both early and late planting while the minimum was with the standard variety I sd 34.

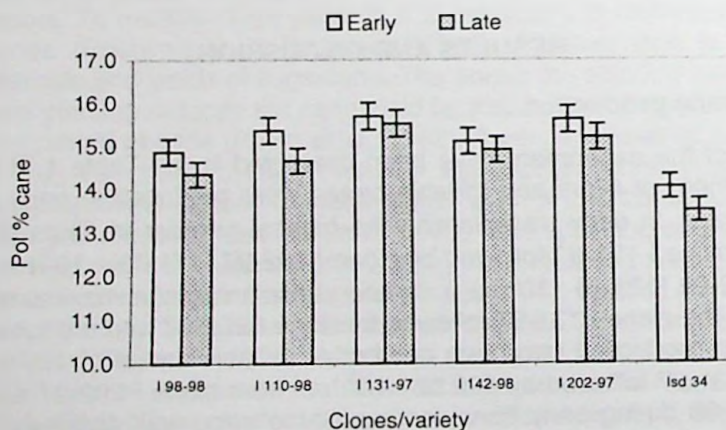


Figure. 1. Pol % cane as affected by different planting time.

The overall results indicated that all the clones and variety performed better in early planting compared to late planting. Clones I 131-97 and I 202-97 proved their superiority in respect of yield contributing characters over the other tested clones both in early and late planting even to standard variety used in the experiment.

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