

Evaluation of some Selected Clones in the Himalayan Piedmont Plain Soil

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ABSTRACT

A comparative study of promising clones of I 413-88, I 291-87, BS 96 against the standard Isd 26 and Isd 28 were conducted at three locations during 2001-2002 cropping season in Himalayan Piedmont Plain Soils. It was found that the tested clones I 413-88 and I 291-87 produced significantly higher cane yield compared to standard varieties except BS 96. Highest (96.99 t ha^{-1}) cane yield was produced by the clone I 291-87 followed by I 413-88 (82.68 t ha^{-1}) in all the locations, while the lowest (50.20 t ha^{-1}) cane yield in BS 96. Lowest recovery was obtained from the clones I 413-88 (7.17%) and I 291-87 (7.81%) than the standard varieties. These clones could not be cultivated because of low recovery. The clones I 413-88 and I 291-87 showed good performance in respect of number of tiller, number of millable cane and cane yield. For these reasons, these clones might be included as breeding materials for future hybridization programme.

Key words: Sugarcane clones.

INTRODUCTION

Most of the soils in Bangladesh are low in organic matter (OM), generally containing less than 1.5% while 2.5 to 3.0% organic matter (OM) are necessary for suitable crop production (Bhander *et al.*, 1998). Sugar and gur industries in Bangladesh are facing problem due to lack of high yielding durable varieties of sugarcane. Of course, it is a common observation that sugarcane varieties show a tendency to decline in yield and vigor after a considerable period of cultivation (Humbert, 1959). According to Poehlman and Barthakur (1969), to maintain high yield of cane it is necessary to replace varieties every few years with new clones. To run the sugar industries for a long period with continuous supply of cane it is needed to develop new varieties of sugarcane with different maturity behavior. Considering the facts, the promising clones I 413-88 and I 291-87 were included in this study to evaluate their performance in the Himalayan Piedmont Plain Soil.

MATERIALS AND METHODS

The experiment was conducted at three Sugar Mills experimental farms. The name of the farms are Gobindanagar farm under Thakurgaon Sugar Mills (TSM), Protab farm under Setabganj Sugar Mills (STSM) and experimental farm of Panchagar Sugar Mills (PSM) during the cropping seasons of 2001-2002. The soils were sandy loam textured with pH 5.5 and low in

organic matter (OM). The experiment was comprised of five sugarcane clones/varieties viz, I 413-88, I 291-87, BS 96 and standard Isd 26 and Isd 28 were included as experimental materials. The clones I 413-88, I 291-87 and BS 96 have been developed from Bangladesh Sugarcane Research Institute (BRSI). The experiment was laid out in RCB design with four replications and plot size was 10m x 8m, where row to row distance maintained 1 meter. From third week to fourth week of November 2001, the experiment was set up in all the locations through conventional method with three budded setts. Urea, Triple superphosphate (TSP), Muriate of potash (MOP) and Gypsum were used as the source of N, P, K and S respectively. The urea was applied in three equal splits, the first split at the planting time, the second split at tiller completion stage 90 DAP (Days after plantation) and the third at grand growth phase 180 DAP. Full amount of TSP, Gypsum and one third of MOP were applied in trenches and thoroughly mixed with soil prior to setts plantation. The rest amount of MOP was applied as first and second top dressing at 90 DAP and 180 DAP respectively. Intercultural operation was made when necessary. Data were taken in the month of February, March, May, September, December and January. Different data on germination, number of tiller per hectare, number of millable cane, sucrose percent and yield of cane were recorded. The canes at different locations were harvested last week of December 2002 to second week of January 2003. The data obtained were statistically analyzed by using analysis of variance and finally least significant difference (LSD) test at $P = 0.05$.

RESULTS AND DISCUSSION

Performance of the clones under different locations presented in Table 1. It was revealed from the table, data on tiller population showed that there were significant difference among the clone/varieties. The maximum number of ($149.3 \times 10^3 \text{ ha}^{-1}$) tillers were produced by the clones I 413-88 followed by I 291-87 ($145.4 \times 10^3 \text{ ha}^{-1}$) while the lowest tiller ($103.3 \times 10^3 \text{ ha}^{-1}$) was produced by the clone BS 96 (Table 1). Variation in tiller production among the different varieties were reported by Miah *et al.* (1994) and Rashid *et al.* (2001). Different clones and varieties also significantly affected the number of millable cane. Highest ($102.2 \times 10^3 \text{ ha}^{-1}$) number of millable canes were recorded from the clones I 291-87 and followed by I 413-88 ($89.65 \times 10^3 \text{ ha}^{-1}$). Lowest ($71.17 \times 10^3 \text{ ha}^{-1}$) number of millable canes were produced by the BS 96. The maximum number of millable cane production in the clone I 291-87 might be due to the higher number of tiller production compared to others clones/varieties. Matin *et al.* (1989) and Paul *et al.* (1994) also reported similar results on millable cane production. Highest (96.99 t ha^{-1}) cane yield was produced by the clone I 291-87 followed by I 413-88 (82.68 t ha^{-1}) in all the locations, while lowest (50.20 t ha^{-1}) cane yield was in BS 96. Lowest recovery was obtained from the clones I 413-88 (7.17%) and I 291-87 (7.81%) than the standard varieties. These clones could not be cultivated in the regions because of low recovery. The clones I 413-88 and I 291-87 showed good performance in respect of number of tiller, number of millable cane and cane yield. For this reason, these clones might be used as breeding materials.

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Table 1. Yield and yield attributes of the tested sugarcane varieties/clones under TSM, PSM and STSM Zones in 2001-2002.

Treatments	Germination (%)			No. of Tiller ($\times 10^3 \text{ ha}^{-1}$)			No. of Millable cane ($\times 10^3 \text{ ha}^{-1}$)			Yield (tha^{-1})			Recovery (%)		
	Gobindo nagar Farm (TSM)	Protap Farm (STSM)	Pancha gar Farm (PSM)	Gobindo nagar Farm (TSM)	Protap Farm (STSM)	Pancha gar Farm (PSM)	Gobindo nagar Farm (TSM)	Protap Farm (STSM)	Pancha gar Farm (PSM)	Gobindo nagar Farm (TSM)	Protap Farm (STSM)	Pancha gar Farm (PSM)	Gobindo nagar Farm (TSM)	Protap Farm (STSM)	Pancha gar Farm (PSM)
Isd 26 (Std)	34.20c	33.47c	35.53b	114.6c	116.3c	126.8c	79.18c	80.72c	90.60b	63.34d	64.57d	72.47c	9.10	9.04	9.26
Isd 28 (Std)	35.27b	34.60bc	36.04b	133.2b	133.3b	136.2b	87.32b	87.87b	89.98b	78.59c	79.07c	81.02b	8.26	8.32	8.58
BS 96	33.58c	32.92c	35.47b	99.48d	99.04d	103.3d	63.14d	63.13d	71.71c	44.19e	44.19e	50.20d	7.72	8.14	7.08
I 291-87	35.83b	36.74ab	44.53a	135.2b	136.1b	145.4a	94.87a	96.68a	102.2a	85.38a	91.99a	91.99a	7.61	7.81	7.04
I 413-88	36.12a	37.90a	41.13a	138.6a	141.2a	149.3a	86.55b	87.03b	89.65b	82.22b	82.68b	89.65a	7.56	7.17	6.99
LSD (5%)	ns	2.741	4.281	3.042	3.843	4.359	3.014	3.399	6.181	2.707	2.881	6.181			

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