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Performance of Some Promising Clones and Released Varieties of Sugarcane in Himalayan Piedmontplain Soils

M.A. Miah, A.Awal, S.M.N. Nahar, Sk.A. Mannan and M. Yasin Ali
Sugarcane Research and Training Institute, Ishurdi, Phban, Bangladesh.

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ABSTRACT

An experiment was conducted with four promising clones (I-150/82, Isd-16(M), I-197/83 and I-226/83) and four newly released varieties (Isd-18, Isd-19, Isd-20 and Isd-21) of sugarcane against standard Isd 16 and LJC at Panchagarh Sugar Mills farm to see their performance at Old Himalayan Piedmont plain soils. The clone I-150/82 and the variety Isd-19 were found to produce significantly higher percentage of germination over the standard varieties. Tillering, millable cane and yield in all varieties and clones, except I-226/83, did not show any significant difference compared to standard varieties. Significant variation was observed in cane height and diameter. However, the variety Isd-19 and the clone I-150/82 produced considerable higher tonnage than standard varieties. Hence, variety Isd-19 and the clone I-150/82 (now Isd 24) may be recommended for cultivation at Old Himalayan Piedmont plain soils.

INTRODUCTION

Sugarcane varieties after a considerable period of cultivation show a tendency to decline in yield and vigour (Branes, 1954). It is an obscure and puzzling problem to scientists, growers and processors. Sugar industries in Bangladesh continuously need high yielding high sugar durable sugarcane varieties. Sugarcane Research & Training Institute released varieties do not perform equally well in all locations. Himalayan piedmont plain soil is a problematic soil having lower level of organic content and higher rate of insect infestation. It is, therefore, important to screen sugarcane varieties suitable for this soil type for sustainable sugarcane production and ensured supply to sugar industries as well as gur makers. With this objectives an experiment was designed with four newly released varieties and four promising clones having higher percent of sucrose content to observe their performance at Old Himalayan Piedmontplain soils.

MATERIALS AND METHODS

An experiment was conducted at Panchagarh Sugar Mills farm with four newly released varieties (Isd-18, Isd-19, Isd-20 and Isd-21) and four promising clones (I-150/82. I-197/83, I-226/83 and Isd-16 (M) as experimental materials. Commercial varieties Isd 16 and LJC were used as standard. The experiment was laid out in a

randomized complete block design with three replications, and canes were planted on first week of December ,1991. Plot size was 6mx10m where row to row distance was maintained one meter. Sugarcane setts were planted following conventional method and recommended doses of fertilizers were applied. Normal cultural practices were done. The canes were harvested on following December, 1992 and data were recorded on germination, tillering, millable cane, height, diameter and cane yield. The average values of all parameters were statistically analysed to compare different clones/ varieties under observation.

RESULTS AND DISCUSSION

Analyses of variance showed significant difference for all characters (Table 1). Such significant differences of different characters among varieties/clones were also reported by Mian and Awal (1979). It might be due to differences of the genotypes.

Table 1. Analyses of variance with mean sum of square of different characters of Sugarcane.

Source of variation	df	Values of mean sum of square with level of significance					
		Germinatin (%)	No. of tillers/ha (000)	No. of millable cane/ha (000)	Height (m)	Diameter (cm)+	Yield (TCH)
Replication	2	11.4	373.2	116.3	0.114	0.0008	432.7
Variety	9	227.6**	788.3**	717.3**	0.125**	0.0857*	698.2**
Error	18	16.1	162.3	163.3	0.025	0.0242	112.7

*, **, Significant at 5 and 1 percent level, respectively.

+, ANOVA (after $\sqrt{x - 1.64}$ transformation)

In respect of germination, different genotypes showed differences in germination. The clone I-150/82 and the variety Isd 19 were found to produce significantly higher germination over other varieties and clones tested including standard varieties (Table 2). Significantly the lowest germination was observed in I-226/83 clone. Similar genotype variation was also obtained by Mannan *et al.* (1981) when they studied the germination percentage of sugarcane varieties and clones.

It is seen from the Table 2 that there was no significant difference in tiller production among the genotypes, except I-197/83 and I-226/83, both of which produced statistically lower number of tillers than the standard variety LJC. The findings partially supported the results of Anonymous (1979) who found variation in tiller production among different varieties/clones.

Table 2. Mean values for different characters of ten genotypes of sugarcane.

Varieties/ clones	Germination (%)	No. of tillers/ ha (000)	No. of millable cane/ha (000)	Height (m)	Diameter (cm)	Yield) (TCH)
I–150/82	57.0 a*	131.3ab	105.1ab	3.1a	2.09a	98.8a
I-197/83	45.5bcd	110.4b	87.6b	3.0abcd	1.88abc	69.6bcd
I–226/83	26.1f	77.1c	58.1c	2.6e	1.96ab	50.7d
Isd–16(M)	45.1cd	117.5ab	89.ob	2.8cde	2.20a	69.8bcd
Isd–18	37.9de	116.4ab	95.6ab	3.1abc	2.15a	80.6abc
Isd–19	53.1ab	125.0ab	86.4b	2.9bcd	2.08a	97.4a
Isd–20	36.8e	122.8ab	85.1b	3.1ab	1.75c	73.2bc
Isd–21	47.1bc	116.0ab	104.6ab	2.7de	1.79bc	62.2cd
LJC	43.7cde	137.6a	115.4a	2.8bcde	2.06a	88.5ab
Isd–16	40.3cde	117.8ab	93.1ab	3.2a	2.10a	82.0abc

*Figures with same letter do not differ significantly at 0.05 level as per DNMR test.

Regarding millable cane production all the clones and varieties, except I-226/83, showed no significant difference with the standard variety Isd-16. However, the clones I-197/83, I-226/83 and Isd- 16 (M), and varieties Isd-19 and Isd-20 produced significantly lower number of tillers compared to standard variety LJC (Table 2). The result corroborated with the findings of Miah *et al.* (1986) who found variation in number of millable cane production while studied the performance of some prominsig clones/varieties.

In case of cane height different genotypes behaved differently. The clones I-226/83 and Isd-16 (M), and varieties Isd-19 and Isd-21 showed statistically dwarf plant compared to Isd -16 while the clone I-150/82 showed significantly taller plant than the standard LJC (Table 2). The plant height of I-226/83 was significantly smaller compared to both standard varieties. All the clones and varieties, except Isd -20 and Isd -21, showed statistically no difference in diameter compared to standard varieties (Table 2). Genotypic variation in cane height and diameter in different clones and varieties were also reported by Miah *et al.* (1986).

Table 3. Percentage increase of cane yield of I–150/82 and Isd–19 over standard varieties.

Standard varieties	I–150/82 (Isd -24)	Isd -19
Isd 16	20.6	18.8
LJC	11.7	10.1

In case of cane yield, all the clones and varieties, except I-226/83 and Isd-21, exhibited no significant difference with standard varieties (Table 2). In the present trial, the clone I-150/82 and variety Isd-19 produced higher tonnage than the standard varieties showing 20.6 and 18.8 percent increase over the standard variety Isd-16, and 11.7 and 10.1 percent increase over the standard variety LJC, respectively (Table 3). The millable cane, height and diameter might have contributed to cane yield as reported by Singh and Sangwan (1980). In conclusion. the variety Isd-19 and clone I-150/82 (now Isd 24) may be recommended for cultivation in Old Himalayan Piedmontplain soils.

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