

Performance of Some Newly Released Sugarcane Varieties in High Ganges River Floodplain Soils of Bangladesh.

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ABSTRACT

An experiment was conducted with eight varieties viz. Isd 2-54, Isd 16, Isd 31, Isd 32, Isd 33, Isd 34, Isd 35 and Isd 36 at farmer's field in High Ganges River Floodplain soils of Bangladesh during the cropping season 2006-2007. Significant difference was recorded among different varieties. The highest tiller production ($237.8 \times 10^3 \text{ ha}^{-1}$) and millable cane ($140.5 \times 10^3 \text{ ha}^{-1}$) were obtained in variety Isd 34 but higher yields, were obtained from varieties Isd 33 (126.7 tha^{-1}) and Isd 32 (125.1 tha^{-1}) at Chuadanga location. However, the highest tiller production ($238.6 \times 10^3 \text{ ha}^{-1}$), millable cane ($138.6 \times 10^3 \text{ ha}^{-1}$) and yield (125.9 tha^{-1}) was obtained from Isd 33 at Jhenaidha location.

Key words: Sugarcane, varieties, performance, High ganges river floodplain soil.

INTRODUCTION

Sugarcane is one of the most important cash-cum-industrial crop in Bangladesh. Success of a variety depends on several factors of which adaptation to agro-ecological conditions of an area is very important. In Bangladesh, sugarcane is grown under many diverse agro-ecological conditions on an area of about 0.16 million hectares. The yield of a particular variety depends upon the potential of the genotype and the environment where it is exposed during the course of life cycle (Yadava, 1993). It occupies about 0.16 million hectare of cultivable land with an average production of 42 ton ha^{-1} (Ali *et al.*, 1989). But in Hawaii and Australia, the yields of sugarcane were 222 ton ha^{-1} and 74 ton ha^{-1} , respectively (Hossain *et al.*, 1990). The low yield of sugarcane was mainly due to improper and poor management such as land preparation, planting date, weeding, disease and pest control and irrigation (Eusufzai *et al.*, 2002). Sugarcane varieties after a considerable period of cultivation showed a tendency to decline in yield and vigour (Barnes, 1954). It is an obscure and puzzling problem to scientists; growers and processors of sugar industries in Bangladesh continuously need high yielding sugarcane varieties. Bangladesh Sugarcane Research Institute (BSRI) released varieties which did not perform equally well in all locations (Miah *et al.*, 1994). It had been observed that some varieties doing well in one climatic condition that also gave good results in the other climatic condition, thus had high genetic buffering capacity (Fungugy and Fontenat, 1989). Considering the fact, a study with some newly released sugarcane varieties were undertaken at High Ganges River Floodplain soil to evaluate the comparative performances of these newly released varieties.

MATERIALS AND METHODS

The experiments were conducted at two locations viz. Chuadanga and Jhenaidah locations under High Ganges River Flood Plain Soils during the cropping season 2006-2007. The experiment was laid out in a randomized complete block design with three replications. The treatments were as T_1 - Isd 2-54, T_2 - Isd 16, T_3 - Isd 31, T_4 - Isd 32, T_5 - Isd 33, T_6 - Isd 34, T_7 - Isd 35 and T_8 - Isd 36. The unit plot size was 10m x 8m. About 45 days old two budded seedlings raised in soil bed were used in this experiment. Row to row and seedlings to seedlings distances were 1 meter and 0.45 meter, respectively. The experiment was set up on December 15, 2006 and harvested on January 15, 2007. Application of chemical fertilizers for sugarcane was done @ 326, 253, 180, 189 and 10 kg ha⁻¹ as Urea, triple super phosphate, muriate of potash, Gypsum and Zinc Sulphate, respectively. Full doses of TSP, Gypsum, Zinc Sulphate, were applied in trenches during the time of transplantation. one-third of MOP and one-third of Urea were applied after 25 days of transplantation in ring method as basal. The rest MOP and Urea were applied in two equal splits at early growth stage of tillers (120 days after transplanting) and late tillering phase (150 days after transplanting) of sugarcane. Intercultural operations were done as and when required. Data on different growth parameters were collected and analyzed statistically.

RESULTS AND DISCUSSION

In the present investigation significant differences in tiller, millable cane production and yield were obtained in different varieties at Chuadanga location (Table 1). It was further noted that significantly higher tiller was recorded in variety Isd 34 (237.8x10³ha⁻¹) followed by Isd 21 (202.1x10³ha⁻¹), while the lowest tiller production was obtained in variety Isd 2/54 (142.6x10³ha⁻¹). The highest number of millable cane was obtained in variety Isd 34 (140.5x10³ha⁻¹) followed by Isd 21 (118.8x10³ha⁻¹), while the lower number of millable cane was obtained in variety Isd 2/54 (97.23x10³ha⁻¹). The highest cane yield was obtained in variety Isd 33 (126.7 tha⁻¹) followed by Isd 32 (125.1 tha⁻¹), Isd 21 (108.9 tha⁻¹) and Isd 16 (101.8 tha⁻¹), while the lowest yield was obtained in variety Isd 2-54 (75.9 t.ha⁻¹).

Table 1. Performance of BSRI Sugarcane varieties in High Ganges Floodplain Soil (Chuadanga and Jhenaidha site)

Varieties	Chuadanga			Jhenaidha		
	Tiller x (10 ³ ha ⁻¹)	Millable cane (10 ³ ha ⁻¹)	Yield (t ha ⁻¹)	Tiller x (10 ³ ha ⁻¹)	Millable cane (10 ³ ha ⁻¹)	Yield (t ha ⁻¹)
T_1 =Isd 2/54	142.6 d	97.23 c	75.90 d	136.0 e	92.27 b	77.53 e
T_2 =Isd 16	177.9 bc	103.2 bc	101.8 b	201.0 b	104.5 b	102.0 b
T_3 =Isd 21	202.1 b	118.8 b	108.9 b	198.8 b	106.4 b	108.1 b
T_4 =Isd 32	185.2 bc	102.9 bc	125.1 a	197.3 b	107.6 b	124.4 a
T_5 =Isd 33	190.0 bc	111.2 bc	126.7 a	238.6 a	138.6 a	125.9 a
T_6 =Isd 34	237.8 a	140.5 a	90.77 c	181.3 bc	106.3 b	88.22 cd
T_7 =Isd 35	161.0 cd	102.9 bc	90.23 c	163.8 cd	104.3 b	91.53 c
T_8 =Isd 36	145.6 d	98.30 c	86.27 c	155.7 de	98.70 b	83.53 de
CV (%)	8.91	8.77	4.67	7.04	8.30	4.10

The results presented in Table (1) showed that at Jhenidha location the highest tiller population was found in variety Isd 33 ($238.6 \times 10^3 \text{ha}^{-1}$) but the lowest tiller population in Isd 2/54 ($136.0 \times 10^3 \text{ha}^{-1}$). The highest number of millable cane was obtained in variety Isd 33 ($138.6 \times 10^3 \text{ha}^{-1}$) and the lowest was obtained in variety Isd 2-54 ($92.27 \times 10^3 \text{ha}^{-1}$).

The highest cane yield was obtained in varieties Isd 33 (125.9tha^{-1}) and Isd 32 (124.4tha^{-1}), followed by variety Isd 21 (108.1tha^{-1}), variety Isd 16 (102tha^{-1}) of Isd 2-54 (77.53tha^{-1}) followed by lowest in variety Isd 36 (83.53tha^{-1}).

It may be concluded that Isd 33 and Isd 32 produced significantly higher sugarcane yields among all other tested varieties. However, it is being found that all the newly released sugarcane varieties showed superiority to standard popular varieties Isd 2-54 and Isd 16 in terms of yield. Thus it can be suggested to cultivate these sugarcane varieties for higher monetary income in High Ganges River Floodplain Soil.

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