

Yield Performance of Sugarcane Varieties in different Technology-based Demonstration Plots

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ABSTRACT

During 1997-98 cane cultivation season sugarcane yields of different varieties were recorded from 40 demonstration plots under 8 technology areas. Considering averages of all the demonstration plots, among the BSRI bred varieties Isd 16 gave highest yield (89.77 t ha^{-1}) followed closely by Isd 28 (87.50 t ha^{-1}) and Isd 22 (87.70 t ha^{-1}). Varieties Isd 20, Isd 18 and Isd 27 gave indential but lower yields compared to other BSRI bred varieties. Among the local varieties, Misrimala gave highest yield (120.05 t ha^{-1}) in the highland of red soil areas at Sreepur, Gazipur. Performance of Misrimala was found better compared to all the varieties demonstrated. The varieties tested in the present demonstration produced much higher yield compared to the national average of yield 41.94 t ha^{-1} . However the yield of the same or different varieties varied in different technology demonstration plots and also from one area to another under different environmental conditions.

Key words : Sugarcane, yield performance, technology demonstration.

INTRODUCTION

Demonstration is a very important and effective tool in the dissemination of any new technology. Setting demonstration plots in the farmer's fields is a prerequisite for demonstrating the superiority of mature technologies over the existing practice or technologies. As such every development organisation set up demonstration as a part of extension activities for the diffusion of technology and information. Bangladesh Sugarcane Research Institute (BSRI) is mandated to carry out first-line demonstration of its mature technologies among the sugarcane farmers as per guidelines of National Agricultural Technical Coordination Committee (NATCC). BSRI organises this first-line demonstration as part of its annual technology transfer programme. Accordingly as a part of its technology transfer programme 40 demonstration plots were set up to disseminate mature technologies among the sugarcane farmers and also to produce and distribute seed materials of the newly released BSRI bred varieties suitable for gur production in the non-mill zone.

MATERIALS AND METHODS

Training and Technology Transfer Division in cooperation with the scientists of different Sub-Stations of BSRI raised 40 different demonstration plots during 1994-95 cropping season in different parts of the country, mainly in the non-mill zone. In the mill zone, there is a well-organized extension department under each sugar mills called cane department. Through this cane department all extension education activities including setting demonstration plots are implemented. The size of each demonstration plot was 0.13 ha . In the present demonstration plots farmer's existing practices were considered as 'control'. This was done to minimize cost of the demonstration though it was desirable to have a 'control' sub-plot in each demonstration plot. In the demonstration plots, recommended sugarcane

production technologies were adopted. Mature technologies demonstrated to the sugarcane farmers of different areas having different environmental conditions (Table 1).

Concerned scientists of BSRI Sub-Stations organised study tours and field visits of the local sugarcane farmers to visualise before them the yield performance of different varieties and superiority of the technologies demonstrated. In some of the locations, field days were also organised where farmers, extension officers and workers as well as the senior scientists of BSRI participated. Technologies demonstrated, locations of different demonstrations and sugarcane varieties cultivated are mentioned in Table 1.

Table 1. List of technologies demonstrated with locations and varieties.

Sl. No.	Technology demonstrated	Location	Nos.	Varities
1	Varities tolerant to drought and waterlogging stresses	Ishurdi, Pabna	5	Isd 20, Isd 22, Isd 28, and Isd 16
		Godagari, Rajshahi	1	Isd 20
2	Varities suitable for gur production	Santhia, Pabna	1	Isd 16 and Isd 22
		Shibganj, Nawabganj	1	Isd 16 and Isd 28
		Rajoir, Madaripur	2	Isd 16 and Isd 28
		Savar, Dhaka	1	Isd 20 and Isd 28
3	Paired-row sugarcane with double intercrops	Shibganj, Nawabgang	1	Isd 16 Intercrops Potato and Tilt
		Sreepur, Gazipur	1	Misrimala and Potato
		Kaunia, Rangpur	2	Isd 16 Intercrops Potato and Dhaincha
		Joypurhat	4	Isd 16, Isd 18 and Isd 28, Potato
4	Spaced Transplanting Technology (STP)	Atgharia, Pabna	1	Isd 28
		Thakurgaon	4	Isd 28
		Joypurhat	2	Isd 16 and Isd 18
		Islampur, Jamalpur	1	Isd 16
5	Performance of BSRI varieties	Melandaha, Jamalpur	4	Isd 20 and Isd 21
		Ishurdi, Pabna	2	Isd 18, Isd 20, Isd 22, Isd 27 and Isd 28
		Shibganj, Nawabganj	1	Isd 18, Isd 25, Isd 26 and Isd 28
		Chunarughat, Habiganj	2	Isd 16, Isd 20, Isd 26 and Isd 28
6	Single Intercropping	Shibganj, Nawabganj	1	Isd 28 and Potato (Cardinal)
7	Early Planting	Sreepur, Gazipur	2	Misrimala
8	Chewing varieties	Shibalaya, Manikganj	1	Kajla, Co 527, Misrimala and Gandari

RESULTS AND DISCUSSION

Yield performance of sugarcane varieties under different categories of demonstration plots are presented in Table 2. It was revealed from the Table that under drought and waterlogging stress conditions Isd 28 and Isd 16 gave the highest yields (99.62 and 96.78 t ha⁻¹) followed by Isd 20 and Isd 22 (82.22 and 77.27 t ha⁻¹)

In the demonstration plots of BSRI varieties for gur production, Isd 22 resulted highest yield (98.15 t ha⁻¹) followed by Isd 16 (59.64 t ha⁻¹) and Isd 20 (58.50 t ha⁻¹) and then followed by Isd 28 (42.09 t ha⁻¹). Yield reduction of Isd 28 was caused due to flood damage. The variety Isd 22 showed similar yield (89.58 t ha⁻¹) in a separate individual experiment conducted by Chowdhury *et al.* (1999).

Table 2. Yields of sugarcane varieties under different categories of demonstration.

Sl. No.	Demonstration categories	Nos.	Varieties	Yield (t ha ⁻¹)
1	Flood, drought and waterlogging tolerant varieties	6	Isd 20	82.22
			Isd 22	77.27
			Isd 28	99.62
			Isd 16	96.78
			Mean	88.97
2	BSRI varieties suitable for gur production	5	Isd 16	59.64
			Isd 20	58.50
			Isd 22	98.15
			Isd 28	42.09
			Mean	64.60
3	Paired row sugarcane with double intercrops	8	Isd 16	95.49
			Isd 18	71.80
			Isd 28	71.78
			Misrimala	71.72
			Mean	94.29
4	Single intercropping	1	Isd 28	46.09
5	Spaced Transplanting Technology	12	Isd 16	107.18
			Isd 18	80.10
			Isd 21	160.96
			Isd 28	92.48
			Mean	110.18
6	Performance of BSRI varieties	5	Isd 18	67.91
			Isd 20	88.12
			Isd 27	72.63
			Isd 28	73.89
			Mean	80.81
7	Early planting	2	Misrimala	132.41
8	Chewing varieties	2	Kajla	105.30
			Co.527	36.97
			Misrimala	107.70
			Gandari	107.66
			Amrita	105.25
			Mean	97.49

In paired-row demonstration plots, Isd 16 gave highest yield (95.49 t ha⁻¹) followed by Isd 18, Isd 28 and Misrimala having almost equal yields ranging from 71.72 to 71.80 t ha⁻¹. In single intercropping demonstration plots the yield of the variety Isd 28 was only 46.09 t ha⁻¹ which was mainly due to flood damage. Ali *et al.* (1989) reported that Isd 16 yield 98.8 t ha⁻¹ in paired row cane at 60 cm apart in a separate experiment.

In the demonstration plots of Spaced Transplanting Technology (STP), Isd 21 gave highest yield (160.96 t ha⁻¹) followed by Isd 16 (107.18 t ha⁻¹), Isd 28 (92.48 t ha⁻¹) and Isd 18 (80.10 t ha⁻¹).

In the demonstration plots on performance of BSRI varieties, Isd 20 resulted the highest yield (88.97 t ha⁻¹) followed by Isd 22 (77.27 t ha⁻¹) and then followed almost equally by Isd 28 (99.62 t ha⁻¹), Isd 27 (72.63 t ha⁻¹) and Isd 18 (67.91 t ha⁻¹).

In early planting demonstration plots, the yield of Misrimala was found the highest (132.41 t ha⁻¹) in the highland and red soil areas at Sreepur, Gazipur. In chewing variety demonstration, Misrimala, Gandari, Amrita and Kajla gave indential yields (105.25-107.70 t ha⁻¹) but Co. 527 yielded poor (36.97 t ha⁻¹).

Considering averages of all demonstration plots, among the BSRI bred varieties, Isd 16 gave the highest yield (89.77 t ha^{-1}) followed closely by Isd 28 (87.50 t ha^{-1}) and Isd 22 (87.70 t ha^{-1}). Variety Isd 20, Isd 18 and Isd 27 gave identical but lower yields compared to other varieties (Figure 1). The varieties tested in the present demonstration produced much higher yield compared to the national average yield of 41.94 t ha^{-1} during 1997-1998 season (Anon., 1998).

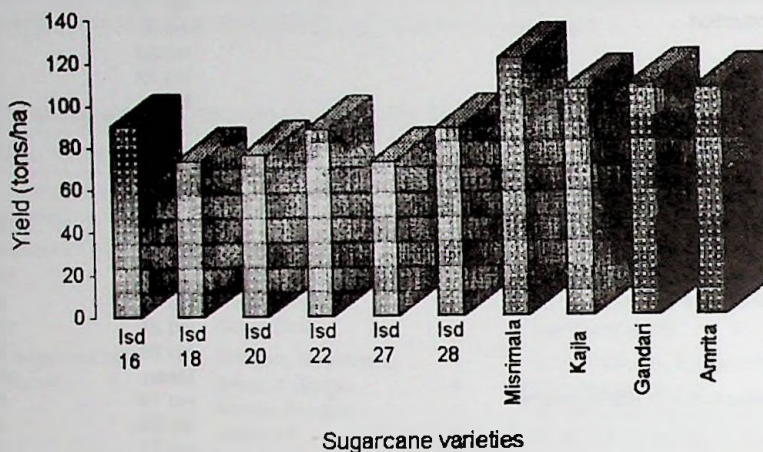


Figure 1. Comparative average yields of sugarcane varieties in different technology-based demonstration plots.

However, the yield of the same or different varieties varied in different technology demonstration plots and also from one area to another due to different environmental conditions. This is in agreement with the opinion that productivity of any crop variety is the net result of interaction of the variety in its growth phase with the environment (Potty *et al.* 1987).

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