

Ratooning Potential of BSRI Released Latest Sugarcane Varieties in Old Himalayan Piedmont Plain Soils

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ABSTRACT

Experiment was conducted at the RSRS farm, Thakurgaon during the cropping season 2005-06 to study the ratooning potentialities of BSRI released latest sugarcane varieties namely Isd 31, Isd 32, Isd 33, Isd 34, Isd 35 and Isd 36 with two earlier released varieties Isd 16 and Isd 26 as standard. Results revealed that all the latest BSRI released varieties showed better performance over the standard varieties. Among them Isd 32 and Isd 36 were better suited ratooning varieties in Old Himalayan Piedmont Plain Soil and produced 73.25 and 70.85 TCH with benefit cost ratio (BCR) 2.59 and 2.51 respectively. Standard varieties Isd 16 and Isd 26 were found significantly inferior to the other tested varieties.

Key words: Sugarcane, Ratooning, Standard, Preceding, Stubble, Shaving

INTRODUCTION

Sugarcane like other perenial grass is able to regenerate shoots from the left-over stalk of preceding crops known as ratoon crop. Ratooning is an old age practice in almost all the major cane growing countries, following at least two even more ratoon from the same plantation. In Hawaii, Mauritius, Philippines and Cuba, 4 to 6 ratoons are quite common (Misra and Mathur, 1983). The main advantage of ratooning in sugarcane lies in its reduced crop life and cost of production as well as higher sugar recovery (Verma, 2002). Ratoon are profitable because nothing is spent on land preparation, planting operation, seed materials etc. (Yadav, 1986). Rather the yield of ratoon almost as good as those obtained with plant cane if the ratoon cane grown with recommended production and protection practices (Kapoor, 1966 and Mathur, 1986). The average yield of ratoon cane is poor in Bangladesh which is below 40 t ha⁻¹ while the potential yields is around 80 t ha⁻¹. Lack of suitable plant and ratooning varieties as well as improve production technologies are the major causes of poor yield. Different varieties do differ in their ratooning potential (Yadav, 1992). Ratoon crop have often failed to produce satisfactory germination, growth and yield in Bangladesh due to lack of suitable ratooning varieties and proper management practices (Majid and Alam, 1998). Therefore, this investigation was undertaken to study the ratooning potentiality of BSRI released latest sugarcane varieties at Thakurgaon in Old Himalayan Piedmont soils belt. Where sugarcane is a major crop in the cropping system.

MATERIALS AND METHODS

The experiment was conducted at the RSRS farm, Thakurgaon during the cropping season 2005-06 to see the ratooning potentialities of BSRI released latest sugarcane varieties. Experimental works were started through stubble shaving the left- over stalk of preceding planted

cane varieties by spade on the 1st week of December 2005 just immediate after harvest of plant cane. The plant cane was planted in STP method with pre-raised soil bed settlings of 60 days aged in RCB Design with 4 replications in the preceding year. The varieties undertaken in the experiment were as follows :

Cane varieties (Treatment)

V₁-Isd 16 (Std)

V₂-Isd 26 (Std)

V₃-Isd 31

V₄-Isd 32

V₅-Isd 33

V₆-Isd 34

V₇-Isd 35

V₈-Isd 38

The earlier released variety Isd 16 and Isd 26 were included as standard.

The inter row spacing between two cane rows were tilled well by country plough followed by laddering just immediate after stubble shaving. Recommended dose of Urea, TSP, MP and Zinc fertilizer per hectare were top dressed in furrows made by country plough by the side of cane rows in 3 equal splits along with recommended quantities of Carbofuran 5G in the last week of December '05, Mid March and 1st week of June 2006 followed by irrigation. In addition to that 100 kg urea and 100 kg, MP (Muriate of Potash) fertilizers per hectare were applied in two split with recommended fertilizers dose with 1st and 2nd top dressed fertilizers for proper ratoon management. The gap above 60 cm between cane stalks were filled with 50 days aged pre-raised poly bag cane settlings as soon as the gap were identified. During early growth period ratoon cane was irrigated 5 times followed by mulching. The other intercultural operations like weeding, earthing-up, tying and pest control measures were followed as and when necessary. Ratoon cane was harvested in the 1st week of January 2007. Necessary data on ratoon cane were taken, analysed and presented in Table 2.

RESULTS AND DISCUSSION

From Table 1 it revealed that the highest number of tiller in ratoon cane ($129.10 \times 10^3 \text{ ha}^{-1}$) was produced by the variety V₃ (Isd 31) which was identically followed by the variety V₇ (Isd 35) and V₆ (Isd 34) with tiller number 127.40×10^3 and $113.60 \times 10^3 \text{ ha}^{-1}$ respectively. Lowest number of tiller $71.56 \times 10^3 \text{ ha}^{-1}$ was associated with the variety V₂ (Isd 26).

Again in producing number of millable cane as well as cane yield per hectare variety V₃, V₄, V₆, V₇ and V₈ could not produce any significant difference in ratoon for both the characters and all were found statistically superior to the standard varieties. Among those, the variety V₇ (Isd 35) insignificantly produced the highest number of millable cane $90.31 \times 10^3 \text{ ha}^{-1}$. But it failed to produced the highest TCH where the highest yield 73.25 TCH was produced by the variety V₄ Isd 32 (Table 1) and the second highest yield of 70.85 TCH was obtained by the variety Isd 36. Highest yield of Isd 32 was supported by its tall & thick natured cane as well higher number of millable cane per hectare. Similar production behaviour of cane variety Isd 32 was also observed in the plant cane of preceding year where variety Isd 32 and Isd 36 produced higher TCH (Table 1) over others.

As regard brix at harvest of ratoon cane the tabulated data (Table 1) showed that none of the tested varieties could produce any significant difference for brix of cane. But insignificantly the highest brix (20.23%) was produced by the variety V_7 (Isd 35) followed by V_4 (Isd 32) which produced 19.81 % brix. The brix parameter data also indicate that all the latest BSRI released varieties (Isd 31, Isd 32, Isd 33, Isd 34, Isd 35 and Isd 36) produced higher brix in ratoon than that of plant cane (Table 1). Higher recoverable sucrose in ratoon cane has been reported by many authors (Yadav, 1992 and Kanwar, 1982).

Considering the cost benefit analysis Table 2 showed that irrespective of varieties ratoon cane resulted the higher BCR compare to plant cane. Among the tested varieties the highest net profit Tk. 57874.50 ha^{-1} and the highest BCR 2.59 were obtained by the variety V_4 (Isd 32) followed by V_8 , V_3 , V_6 and V_7 where the lowest BCR 1.61 recorded in the standard variety V_1 (Isd 16) followed by V_2 (Isd 26). In consideration of BCR of any BSRI latest released cane variety viz, Isd 32, Isd 36, Isd 31, Isd 34, Isd 35 and Isd 33 by fixing priority on Isd 32 and Isd 36 for growing ratoon profitably in Old Himalayan Piedmont Plain Soils of Northern belt.

Table 1. Comparative Performance of BSRI latest Released Sugarcane Varieties in Plant and Ratoon Cane in Old Himalayan Piedmont Plain Soils .

Cane varieties (Treatments)	Plant Cane						Ratoon Cane					
	No. of tiller (10^3 ha^{-1})	No. of millable cane (10^3 ha^{-1})	Cane yield (TCH)	Cane height (m)	Cane girth (cm)	Brix (%)	No. of tiller (10^3 ha^{-1})	No. of millable cane (10^3 ha^{-1})	Cane yield (TCH)	Cane height (m)	Cane girth (cm)	Brix (%)
V_1 Isd 16	130.02 BC	73.21 E	48.61 D	2.70 C	1.75	19.95 A	103.20 C	67.76 B	45.46 C	2.54 BC	2.07 BC	19.82
V_2 Isd 26	104.59 D	59.24 F	49.86 D	2.95 BC	2.10	20.27 A	71.56 D	52.00 C	45.89 C	2.23 C	2.01 BC	19.96
V_3 Isd 31	161.10 A	105.10 AB	76.56 B	3.53 A	1.99	19.15 B	129.10 A	83.43 A	67.09 AB	2.99 A	2.11 AB	19.10
V_4 Isd 32	112.40 C	86.20 DE	90.18 A	3.58 A	1.91	18.60 BC	102.20 C	79.21 AB	73.25 A	3.11 A	2.21 A	19.81
V_5 Isd 33	129.80 BC	105.90 A	75.72 B	3.34 A	1.86	18.33 CD	94.86 C	76.47 AB	56.21 BC	2.84 AB	2.04 BC	20.23
V_6 Isd 34	119.40 C	83.17 DE	64.18 C	2.85 BC	1.80	18.83 BC	113.60 ABC	87.52 A	65.83 AB	2.62 B	2.08 AB	19.13
V_7 Isd 35	157.10 AB	99.01 ABC	61.74 C	3.03 B	1.96	17.95 D	127.40 AB	90.31 A	61.00 AB	2.86 AB	1.94 C	18.74
V_8 Isd 36	120.0 C	91.82 BCD	93.40 A	3.55 A	2.05	18.38 CD	108.60 BC	85.93 A	70.85 A	3.11 A	2.08 AB	19.36

Similar letter in column do not differ significantly as per DMR test at 5% level.

Table 2. Economics of growing plant and ratoon cane in Old Himalayan Piedmont Plain Soil.

Cane varieties (Treatments)	Cane yield t ha ⁻¹	Plant Cane				Cane yield t ha ⁻¹	Ratoon Cane			
		Gross return (Tk ha ⁻¹)	Total variable cost (Tk ha ⁻¹)	Gross margin cost (Tk ha ⁻¹)	BCR		Gross return (Tk ha ⁻¹)	Total variable cost (Tk ha ⁻¹)	Gross margin cost (Tk ha ⁻¹)	BCR
V ₁ Isd 16	48.61	68054	62512	5541	1.09	45.46	63644	58461	5182	1.09
V ₂ Isd 26	49.86	69804	64119	5684	1.09	45.89	64246	59014	5231	1.09
V ₃ Isd 31	76.56	107184	98456	8727	1.09	67.09	93926	86277	7648	1.09
V ₄ Isd 32	90.18	126252	115978	10280	1.09	73.25	102550	94199	8350	1.09
V ₅ Isd 33	75.72	106008	97375	8632	1.09	56.21	78694	72286	6407	1.09
V ₆ Isd 34	64.18	89852	82535	7316	1.09	65.83	92162	84657	7504	1.09
V ₇ Isd 35	61.74	86436	79397	7038	1.09	61.00	85400	78446	6954	1.09
V ₈ Isd 36	93.40	130760	120112	10647	1.09	70.85	99190	91113	8076	1.09

★ Price of cane/ton = Tk. 1400

Table 3. Economic of growing plant and ratoon cane in Old Himalayan Piedmont Plain Soil.

Cane varieties (Treatments)	Plant Cane				Ratoon Cane			
	Variable cost (Tk ha ⁻¹)	Variable cost (Tk ha ⁻¹)	Variable cost (Tk ha ⁻¹)	BCR	Variable cost (Tk ha ⁻¹)	Variable cost (Tk ha ⁻¹)	Variable cost (Tk ha ⁻¹)	BCR
V ₁ Isd 16	51728.00	62512.46	10784.46	1:1.21	36325.00	58461.56	22136.56	1:1.61
V ₂ Isd 26	51728.00	64119.96	12391.96	1:1.24	36325.00	59014.54	22689.54	1:1.62
V ₃ Isd 31	51728.00	98456.16	46728.16	1:1.90	36325.00	86277.74	49952.74	1:2.38
V ₄ Isd 32	51728.00	115971.48	64243.48	1:2.24	36325.00	94199.50	57874.5	1:2.59
V ₅ Isd 33	51728.00	97375.92	45647.92	1:1.88	34325.00	72286.06	35961.06	1:1.99
V ₆ Isd 34	51728.00	82535.48	30807.48	1:1.60	36325.00	84657.38	48332.38	1:2.33
V ₇ Isd 35	51728.00	79397.64	27669.64	1:1.53	36325.00	78446.00	42121.00	1:2.16
V ₈ Isd 36	51728.00	120112.40	68384.40	1:2.32	36325.00	91113.10	54788.10	1:2.51

★ Price of cane/ton = Tk. 1400

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