

Isd 28-A High Yielding and Mid Maturing Variety of Sugarcane

M.A. Mannan, Sk. A. Mannan, B.P. Podder and A. Awal
Bangladesh Sugarcane Research Institute,
Ishurdi, Pabna, Bangladesh.

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ABSTRACT

Isd 28, a mid maturing variety of sugarcane was developed in Bangladesh Sugarcane Research Institute from a cross between Co 1158 as female and Co 530 as male. The clone was first selected from original seedlings in 1985, tested in different test stages and evaluated finally in Advanced Yield Trial (AYT), Zonal Yield (ZYT) at different agro-ecological zones. It gives higher germination, tiller, millable cane, resulting higher yield of cane and sugar in plant and ratoon crops. It produces attractive erect greenish reddish cane stalks of uniform length, medium thickness with green top. It gives yield of cane 69-88 t.ha⁻¹ under normal growing conditions and matures in November-December at 11-12 month age with recoverable sucrose content of 7.4 to 11.3 percent. It is moderately resistant to red rot, wilt, sumt in artificial inoculation and tolerant to top shoot borer, stem borer and scale insect under field condition. It has the adaptability for growing in different agro-ecological zones.

INTRODUCTION

Sugarcane is an important cash crop of Bangladesh and plays a vital role in national economy. Sugarcane varieties after a considerable period of cultivation show a tendency to decline in yield and vigour (Barnes, 1954). It has been recognized that suitable variety is a major factor needed for creating an impact on production. Sugarcane varieties with different maturity behavior are urgently needed to ensure continuous supply of cane to the mills. In the mill-zones, lack of mid maturing variety, the sugar mills are closed down with limited crushing period resulting in reduced yield of sugar. To solve the problem a mid maturing variety with excellent quality, Isd 28 has been development at Bangladesh Sugarcane Research Institute, Ishurdi, Pabna.

MATERIALS AND METHODS

Isd 28 was developed from the cross Co 1158 x Co 530, which was made in the Breeding Crossingshed at Bangladesh Sugarcane Research Institute (BSRI), Ishurdi, Pabna during 1984-85. It was selected from the F₁ seedling at BSRI, during 1985-86 and was tested in different test stages. Finally, the clone was evaluated in Zonal Yield Trial (ZYT) at different agro-ecological zones-Ishurdi (BSRI), Darsana (Carew & Co), Rajshahi (RJSM), Jaipurhat (JSM), Thakurgaon (NRS) and Jamalpur (ZBSM). The experiment was laidout in randomized complete block design with four replications using Isd 16 as standard. Normal cultural practics were followed. Normally the experiment was laidout in November-December and harvested in December in different zones. The ratooning ability of clone including the standard was studied for consecutive two years. Data on different

parameters-germination, tillers, millable cane/clump, yield and quality characteristics, ratooning ability and disease and insect-pest resistance were determined in subsequent clonal generations.

RESULTS AND DISCUSSION

The germination recorded after 75 days planting showed that the germination percent of Isd 28 was higher than Isd 16 (Table 1). The number of tillers counted after 150 days of planting showed that the variety Isd 28 produced higher tillers in all locations. On average, Isd 28 produced tillers ($133.17 \times 10^3 \text{ha}^{-1}$), whereas the variety Isd 16 produced ($100.83 \times 10^3 \text{ha}^{-1}$). Higher number of tillers per clump (5.10) was found in Isd 28. The mean number of tillers per clump was found to vary from 5.16 to 3.47 in Co 1148 and Isd 2-54, respectively (Anon., 1979). The number of millable cane counted at harvest indicated that the variety Isd 28 produced higher number of millable cane ($73.17 \times 10^3 \text{ha}^{-1}$) than Isd 16 ($63.33 \times 10^3 \text{ha}^{-1}$) in all locations (Table 1).

Table 1. Germination, tiller per clump, tiller (10^3ha^{-1}) and cane yield (t. ha^{-1}) in zonal yield trial (ZYT).

Yield contributing characters	Variety/Clone	Location						
		BSRI	RJSM	JSM	NRS	CAREW & Co	ZBSM	Mean
Germination (%)	Isd 28	32.67	34.11	33.28	33.24	25.56	19.67	29.76
	Isd 16	24.46	24.21	30.84	26.66	14.24	28.21	24.77
Tiller (10^3ha^{-1})	Isd 28	145	146	144	126	119	119	133.17
	Isd 16	132	104	122	71	70	106	100.83
Tiller/clump	Isd 28	4.43	4.88	4.84	4.42	5.23	6.80	5.10
	Isd 16	6.07	4.78	4.43	2.96	4.00	3.81	4.34
Millable cane (10^3ha^{-1})	Isd 28	79	71	80	67	77	65	73.17
	Isd 16	62	67	62	61	71	57	63.33
Cane yield (t. ha^{-1})	Isd 28	69	74	78	88	72	78	76.5
	Isd 16	51	66	49	53	72	72	60.5

In case of cane yield, 28 percent higher yield was produced by Isd 28 than the standard variety Isd 16 in advanced yield trial (Table 2). At different agro-ecological zones in multilocation trials the higher yield was found to produce by the variety Isd 28 but at Carew & Co the yield was at par with the standard Isd 16 (Table 1). Khan *et al.* (1995) reported that the yield of a mid maturing variety can vary from 80-85 t. ha^{-1} . The higher cane yield of Isd 28 lead the variety to produce higher yield of sugar than the standard variety Isd 16 (Table 2). On average the variety Isd 28 produced sugar 6.20 t/ha^{-1} against 4.90 t. ha^{-1} in Isd 16 i.e. it produced 21 percent higher sugar compared to the standard. Similar result was reported by others (Mannan *et al.* 1981 and Mia *et al.* 1989). As regards ratooning ability on an average Isd 28 produced cane yield 48.33 t. ha^{-1} while 32 t. ha^{-1}

were produced by the standard variety Isd 16 (Table 2). Higher cane yield was produced at BSRI and NRS and at per with the standard variety Isd 16 at RJSM. Sing *et al.* (1982) reported that the ratooning ability along with plant cane performances are the principal criteria for popularity of any variety among the growers.

Table 2. Cane yield (t.ha⁻¹), ratoon cane yield (t. ha⁻¹) and sugar yield (t. ha⁻¹).

Characters	Variety/clone	Location			
		BSRI	NRS	RJSM	Mean
Cane yield	Isd 28	109	72	-	90.5
(t.ha ⁻¹) in	Isd 16	73	56	-	64.5
AYT					
Cane yield	Isd 28	57	30	58	48.33
(t. ha ⁻¹) in	Isd 16	73	30	30	32.00
Ratoon					
Sugar yield	Isd 28	6.30	6.60	6.30	6.20
(t.ha ⁻¹)	Isd 16	4.90	4.40	5.30	4.90

From the chemical analyses in different months it was observed that variety Isd 28 produced more than 8 percent recovery in November which indicates that the variety is a mid maturing in habit (Table 3). It is moderately resistant to red rot, wilt and smut under inoculation test. It is tolerant to top shoot borer, scale insect in field conditions. The most distinguishing features of this variety are as follows :

Distinguishing features :

Stalk shape	: Conoidal
Stalk colour (Unexposed)	: Greenish to yellowish
Stalk colour (exposed)	: Greenish but develop reddish
Growth split	: Present
Bud groove	: Present
Bud shape	: Medium, oval
Growth ring	: Mature buds touches growth ring
Ligule	: Deltoid
Dewlap	: Greenish to pinkish
Outer auricle	: Deltoid
Inner auricle	: Lanceolate
Leaf colour	: Light green
Flower	: Flowering

Table 3. Estimated sugar recovery (%) and maturity status.

Variety/ Clone	Month							Maturity
	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	March	
Isd 28	7.4	7.7	8.8	9.3	10.2	11.3	10.7	Mid maturing
Isd 16	7.9	8.7	9.0	10.0	10.7	11.7	11.5	Early maturing

From the results of experiment it was found that the newly developed and released variety Isd 28 was superior to Isd 16 in germination, tiller, millable cane and sugar yield. This variety also remain green for longer period in field condition, hence it can be used for crushing in late season for the sugar mills.

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