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Performance of Chewing type Sugarcane Genotypes Under AEZ 28

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ABSTRACT

An experiment was conducted with five chewing clones namely Amrita, Co 208, Misridana, Co 527 and Isd 24 at RSRS (Regional Sugarcane Research Station) farm and Kaligonj farmer's field, Gazipur, Bangladesh during cropping season 2006-07 to find out the suitable clones for chewing purpose. Both of RSRS farm and farmers field at Kaligonj the highest cane yield was obtained from Amrita with 130.23 tha^{-1} and 158.24 tha^{-1}, but in the context of benefit cost ratio (BCR) Amrita and Co 208 gave the highest values of 2.57 and 3.62 respectively in RSRS farm and 2.25 and 2.34 in farmers field at Kaligonj.

Key words: Chewing variety, *Saccharum officinarum*, benefit cost ratio

INTRODUCTION

Sugarcane *(Saccharum officinarum* L.) is an important food crop of the tropics and subtropics and main source of white sugar in Bangladesh. It has been known for at least 2200 years. Alexander's army saw sugar cane during their conquest of India in 326 BC (Purseglove 1979). Sugar cane was originally grown for the sole purpose of chewing in southeastern Asia and the Pacific. The rind was removed and the internal tissues were sucked or chewed. Noble canes were the best for chewing due to softness, high sugar and juice contents. Naidu (1987) reported that sugarcane was primarily grown for chewing and livestock feed. Four sugar estates (Bacita, Numan, Sunti and Lafiagi) in Nigeria grow sugarcane on a relatively large scale, while the majority of smallholder farmers grow soft sugarcane (chewing cane) on land holdings of 0.2-0.5 ha (Anon.1997). Cane juice gives energy directly and it has medicinal value for treating jaundice affecting people. Sugarcane juice is widely consumed by people of the tropics and subtropics. LuNai *et al.* (2004) reported that the aqueous extracts of three varieties of sugarcane showed good antioxidant properties and were also able to protect against radiation induced DNA damage in pBR322 plasmid DNA and *Escherishia coli* cultures. They also observed that sugarcane juice have the ability to scavenge free radicals, reduce iron complex and inhibit lipid peroxidation and this exhibits its beneficial effects on human health. In our country sugar and gur producing varieties are cultivated in large scale but chewing varieties are cultivated in very limited area due to limitations of irrigation and scarcity of high land. The demand of chewing cane is increasing day by day and there is a scope to expand the area under chewing cane cultivation particularly in the non mill zone areas. Some promising clones having chewing characters are being cultivated in different side of the country. Therefore, the present work was considered for selection of suitable chewing sugarcane clone for red soil environment of Madhupur Tract.

MATERIALS AND METHODS

The experiment was set up at Regional Station, Bangladesh Sugarcane Research Institute, Joydebpur, Gazipur and Kaligonj farmer's field at Gazipur district during the cropping season of 2006-07. Chewing sugarcane clones viz; Amrita, Co 208, Misridana, Co 527 and Isd 24 were used as treatments which transplanted in both locations following RCB design with three replications. Two eyed pre germinated settlings were transplanted and recommended fertilizers, chemical insecticides were applied and appropriate intercultural operations were done. After cutting the setts, these were dipped in 1% Bavistin 50 WP solution for 30 minutes. Then the setts were placed in soil bed and covered with straw for germination. All the varieties were transplanted in 8m x 6m size plot. The cane was harvested at December 2007. Data on mortality, number of tiller per hectare, millable cane per hectare, yield of cane per hectare and Brix % were taken and analyzed with DNMRT (Duncan's New Multiple Range Test).

RESULTS AND DISCUSSION

At RSRS farm, Gazipur

The performance of the tested clones regarding tillering, millable cane and yield of cane are presented in Table 1a. In case of tiller production, there was significant differences among the clones where Co 208 produced the highest number of tillers ($130.84x10^3ha^{-1}$) followed by Co 527 ($130.21x10^3ha^{-1}$). On the contrary, Co 527 produced the highest ($102.50x10^3ha^{-1}$) number of millable cane per hectare and there were no significant differences among the clones. This result copes with BSRI Annual Report 1999-2000 and 2000-2001 where Co 527 gave the highest number of millable cane per hectare compared with other local varieties. On the other hand, in case of cane yield, the clones produced statistically similar result except Co 208. The highest yield was obtained from Amrita (130.23 tha^{-1}) due to higher individual cane weight of Amrita than others. Considering of Brix percent the clone Co 208 had the significantly the highest (20.89) estimates but statistically similar with Amrita (19.67). The economic analysis of the chewing clones are presented in Table 2b. Among the five clones, Co 208 gave the highest profit of Tk. 296.79 thousand per hectare and thus we found the highest BCR of 3.62. Meanwhile, Amrita also gave almost equal return, profit and BCR of 2.57. Though the clone Amrita is the best in respect of cane yield particularly in red soil of Madhupur tract, but it has some disadvantages like comparatively lower number of tillers, lower number of millable cane and hard rind than Co 208. From the economic point of view, Co 208 is more acceptable than Amrita. But considering juice and gur production, Amrita is better. Therefore, these two clones may be recommended for commercial cultivation as chewing varieties in Madhupur tract under non mill zone of Bangladesh.

Farmers' field, Kaligonj, Gazipur

Results presented in the Table 2a indicated that all the characters except tillering showed significant effect. In case of tillering Co 527 produced highest number ($152.08x10^3ha^{-1}$) of tillers population. In the context of millable cane production the clone Misridana produced the highest number ($105.42x10^3ha^{-1}$) of millable cane which was statistically similar with Co 527, Amrita and Isd 24 but differed significantly with Co 208. The highest cane yield was obtained from Amrita (158.24 tha^{-1}) and differed significantly

with other clones but not with Misridana (137.89 tha^{-1}). The clone Isd 24 had the highest Brix percentage (19.11) and differed significantly with Co 527 and Misridana but statistically similar with Amrita and Co 208. The economic analysis of chewing clones are presented in the Table 2b. The clone Co 208 gave the highest profit of Tk. 192.19 thousand per hectare. The highest BCR was obtained from Co 208 (2.34) following Amrita (2.25). The overall results suggested that Co 208 and Amrita are the suitable chewing clones for commercial cultivation as plant cane in the tested environment. Agronomic factors like chewing quality, stalk colour, market value and overall choice of neighbouring farmers were recorded in both the locations. On the basis of colour and market price the clones Co 208 and Amrita were found better.

Based on the performance of cane yield, quality and farmer's acceptance the clone Co 208 and Amrita might be recommended as commercial chewing cane for Gazipur Zone.

Table1a. Performance of Chewing clones on yield and yield parameters at RSRS farm, Gazipur

Varieties	Tiller ($x10^3$ ha^{-1})	Millable cane ($x10^3$ ha^{-1})	Yield of cane (tha^{-1})	Brix (%)
Amrita	112.50 b	85.42	130.23 a	19.67 ab
Co 208	130.84 a	84.17	44.36 b	20.89 a
Misridana	96.46 c	77.35	98.81 a	17.44 c
Co 527	130.21 a	102.50	113.52 a	19.56 ab
Isd 24	111.46 b	77.50	96.42 a	19.12 b
5%LSD	13.08	NS	41.49	1.52
CV (%)	5.97	33.03	22.80	4.17

Table1b. Economic analysis of chewing sugarcane clones at RSRS farm Gazipur

Varieties	Millable cane (mc) ($x10^3$ ha^{-1})	Price/ mc (Tk)	Income $x10^3ha^{-1}$ (Tk)	Cost of cultivation ($x10^3ha^{-1}$) (Tk)	Profit $x10^3ha^{-1}$ (Tk)	BCR
Amrita	85.42	3.50	298.97	83.54	215.43	2.57
Co.208	102.50	4.50	378.76	81.97	296.79	3.62
Misridana	77.35	3.00	154.70	78.16	78.45	1.02
Co.527	84.17	2.00	205.00	76.44	128.56	1.68
Isd 24	77.50	1.60	124.00	75.88	48.12	0.63

Table 2a. Performance of chewing clones on yield and yield parameters Kaligonj farmers field, Gazipur

Varieties	Tiller ($x10^3$ ha^{-1})	Millable cane ($x10^3$ ha^{-1})	Yield of cane (tha^{-1})	Brix (%)
Amrita	145.00	90.63 ab	158.24 a	16.77 ab
Co 208	151.04	68.54 b	43.63 d	16.44 ab
Misridana	147.08	105.42 a	137.89 ab	13.11 b
Co 527	152.08	98.96 a	102.75 c	15.22 b
Isd 24	148.96	85.42 ab	111.30 bc	19.11 a
5%LSD	NS	24.53	31.27	3.87
CV (%)	4.99	14.51	15.00	12.75

Table 2b. Economic analysis of chewing sugarcane clones at farmers field, Gazipur

Varieties	MC ($x10^3$ $ha^{-1)}$	Price/mc (Tk)	Income $x10^3ha^{-1}$ (Tk)	Cost of cultivation ($x10^3ha^{-1)}$ (Tk)	Profit $x10^3ha^{-1}$ (Tk)	BCR
Amrita	90.63	3.00	271.89	83.54	188.35	2.25
Co.208	68.54	4.00	274.16	81.97	192.19	2.34
Misridana	105.42	2.00	210.84	76.25	134.59	1.76
Co.527	98.96	2.00	197.92	76.44	121.48	1.60
Isd 24	85.42	1.60	136.67	75.88	60.79	0.80

MC = Millable cane BCR = Benefit Cost Ratio Price: Amrita- 2500 Tk./Ton, Co 208 - 3000 Tk./Ton, Misridana- 1500 Tk./Ton Co 527- 1700 Tk./Ton Amrita- 1400 Tk./Ton

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