

Performance of Chewing Varieties at Sreepur, Gazipur under Modhupur AEZ

M. A. Rashid, M. N. Alam, M.A.T. Sohel, M. S. Rahman and Kuasha Mahmud
Bangladesh Sugarcane Research Institute,
Ishurdi, Pabna, Bangladesh.

ABSTRACT

An experiment was conducted with twelve chewing varieties namely Amrita, Barong, Co 527, Chandpuri gandary, Gazipuri gandary, Zurain gandary, Isd 24, Khowai, Misrimala, Piashi, Tanai and Turag at sreepur, Gazipur, Bangladesh in a farmers plot during cropping season 1999-2000 and 2000-01 to find out the suitable variety for chewing purpose. In 1999-2000 on the basis of tiller, millable cane and yield of cane production. Co 527 showed the best performance and produced highest, but on the basis of benefit cost ratio (BCR) Amrita and Gazipuri gandary showed better performance which values 5.86:1 and 5.90:1. Similarly in 2000-01 Amrita produced highest BCR which values 4.61:1. The results indicated the Amrita was comparatively a better chewing variety.

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

INTRODUCTION

Sugarcane (*Saccharum officinarum* L.) is one of the most important commercial crops of tropical countries and it is the main source of sugar in Bangladesh. There is little scope for increasing area under sugarcane due to limitations of irrigation and land. In Bangladesh sugar producing varieties were cultivated in large scale but chewing varieties were cultivated in very limited area. 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. It has been used to cure jaundice and liver-related disorders in Indian systems of medicine. 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 *Escherichia coli* cultures (LuNai *et al.*, 2004). They also reported that sugarcane juice have the ability to scavenge free radicals, reduce iron complex and inhibit lipid peroxidation, may explain possible mechanisms by which sugarcane juice exhibits its beneficial effects in relation to its reported health benefits. Cultivation of chewing sugarcane uses a plastic shed to create a microclimate in favour of chewing sugarcane growth and encouraging early maturity. Using this method during 2002-03 in Zhejiang, China, resulted in marginal sugarcane areas in Northern China reaching early marketing, increases in stalk yields and economic benefits (LuNai *et al.*, 2004). In Bangladesh there are some genotypes that has chewing character are being cultivated in different side of the country are tested in the red soil environment of Modhupur Tract. The present study was undertaken to determine the suitable chewing sugarcane varieties that is soft, succulent, easily remove the bark, highly price and beneficial to human being.

MATERIALS AND METHODS

The experiment was conducted in farmer's field at Sreepur, Gazipur during the cropping season 1998-99 and 1999-2000. Twelve chewing varieties of sugarcane were transplanted in farmer's field following RCB design and replicated three times. 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 heaping and covered with straw for generating heat which helps in proper sprouting of eye buds. All the varieties were transplanted in 10m x 8m size plot. The cane harvested at February 1999 and February 2000. Data on settlings establishment%, number of tiller, millable cane, yield of cane and brix % were taken and analyzed. The variety Isd 24 was standard. The following treatments or chewing varieties were included in the experiment:-

T ₁ – Amrita	T ₂ – Barong
T ₃ – Co.527	T ₄ – Chandpuri gandary
T ₅ – Gazipuri gandary	T ₆ – Zurain gandary
T ₇ – Isd 24	T ₈ – Khowai
T ₉ – Misrimala	T ₁₀ – Piashi
T ₁₁ – Kishan	T ₁₂ – Turag

RESULTS AND DISCUSSION

Result (Table 1a) revealed that mortality settlings (%), number of tiller, number of millable cane production and cane yield showed significant effect. In case of mortality the clone Amrita expressed lower percentage and differed significantly with Co 527, Khowai, Misrimala, Barong and Gazipuri gandari. In tiller production the variety Co 527 produced significantly higher number of tiller ($270.53 \times 10^3 \text{ ha}^{-1}$) and differed with the remaining varieties. In millable cane production the variety Co 527 produced highest number ($103.87 \times 10^3 \text{ ha}^{-1}$) and significantly differed from all the varieties. Amrita, Zurain gandary and Misrimala produced second highest number of millable cane. In cane yield, the variety Co 527 produced highest (114.72 tha^{-1}) which did not differ significantly with Amrita and Misrimala but significantly differ with other varieties. Also Amrita produced second highest (112.55 tha^{-1}) cane yield instead of lower number of millable cane. Because the average per cane weight Amrita variety was higher than others. Beside the agronomic factors some parameters regarding chewing quality, stalk colour, market value and overall choice of neighboring farmers were recorded. According to colour and market price the varieties Amrita, Gazipuri gandary, Chandpuri gandary, Co 527, Misrimala stands as number one choice. Chewing varieties are usually sold in the urban markets and are costly. The price per unit cane varies from Tk. 5 to 20 or some times more than that. However, economics of chewing canes are analyzed and presented in Table 1b. Among the twelve chewing varieties Gazipuri gandary gave highest profit of Tk. 296.78 thousand per hectare. Highest BCR 5.9:1 was also obtained from Gazipuri gandary. Amrita also gave almost equal return, profit and BCR to Gazipuri gandary when sold as chewing cane. Brix percentages, the indicator of sucrose content were also recorded where there was no significant difference among the varieties.

During the cropping season 2000-2001 results of the experiment are presented in the Table 2a indicated that all the characters studied showed significant effect. In case of mortality Isd 24 showed lowest percentage and differed significantly with rest of the entries. The highest germination was found in Isd 24 (71.11%) following Barong (68.00%), Gazipuri gandary (67.76%) respectively while the lowest was in Turag (60.09). Isd 24 produced highest number of tillers population followed by Misrimala, Chandpuri gandary, Turag, Piashi and differed significantly with rest entries. In millable cane production the variety Co 527 produced the highest number ($94.44 \times 10^3 \text{ ha}^{-1}$) and differed significantly with rest entries. However, Isd 24 and Khowai produced higher number compared to other entries. The highest cane yield obtained (107.55 t ha^{-1}) from Gazipuri gandary and differed significantly with other entries but not with Misrimala and Tanai. The varieties Isd 24 indicated higher percent brix (21.12 %) and differ significantly with other entries. Besides the agronomic factors some parameters regarding chewing quality, stalk colour, market value and overall choice of neighboring farmers were recorded. According to colour and market price of the varieties Co 527, Amrita, Misrimala, Barong, Gazipuri gandary and Tanai stands in number one choice.

The economics of chewing canes are analyzed and presented in the Table 2b. Among the twelve chewing varieties Gazipuri gandary gave the highest profit of Tk. 296.78 thousand per hectare. The highest BCR 4.61:1 was obtained from Amrita following Gazipuri gandary (3.92:1), Chandpuri gandary (3.74:1), Zurain gandary (3.68:1) respectively. Also these are good variety for profits when sold as chewing canes. Therefore, the overall results suggested that Isd 24, Co 527, Amrita, Misrimala, Barong, Gazipuri gandary, Chandpuri gandary and Tanai are the suitable chewing varieties suitable for commercial cultivation as plant cane in the tested environment. Therefore in conclusion, we can recommend Co 527, Amrita, Misrimala, Chandpuri gandary and Kishan are recommended as best sugarcane varieties that might be suitable for commercial cultivation in the tested environment.

Table 1a. Performance of Chewing varieties on different growth and yield parameters in during cropping season 1999-2000

Varieties	Mortality of settlings (%)	Tiller ($\times 10^3 \text{ ha}^{-1}$)	Millable cane ($\times 10^3 \text{ ha}^{-1}$)	Yield of cane (t ha^{-1})	Brix (%)
Amrita	1.38	233.39	70.95	112.55	19.50
Barong	8.60	203.63	71.84	70.20	18.00
Co 527	5.55	270.53	103.87	114.72	19.30
Chandpuri gandary	3.47	220.59	56.37	75.53c	18.72
Gazipuri gandary	8.51	194.34	73.51	100.46	19.66
Zurain gandary	2.08	236.96	64.82	87.08	20.08
Isd 24	2.62	214.34	87.26	83.57	19.61
Khowai	7.04	217.85	87.02	98.49	19.14
Misrimala	7.62	237.20	74.40	106.15	19.20
Piashi	4.80	222.44	79.94	86.63	19.42
Tanai	4.71	215.53	67.68	96.38	18.94
Turag	3.47	230.06	73.98	101.05	20.61
5%LSD	4.08	27.03	10.68	13.02	NS
CV (%)	-	8.4	9.8	9.6	6.3

Table 1b. Economics of chewing varieties of sugarcane during 1999-2000 planting season

Varieties	Millable cane (mc) ($\times 10^3 \text{ ha}^{-1}$)	Price/mc (Tk)	Income $\times 10^3 \text{ ha}^{-1}$ (Tk)	Cost of cultivation ($\times 10^3 \text{ ha}^{-1}$) (Tk)	Profit $\times 10^3 \text{ ha}^{-1}$ (Tk)	BCR
Amrita	70.95	5.00	354.75	60.50	294.25	5.86:1
Barong	71.84	3.00	215.52	60.50	155.02	3.56:1
Co 527	103.87	2.00	207.74	60.50	147.24	3.43:1
Chandpuri gandary	56.37	4.00	225.40	60.50	164.90	3.72:1
Gazipuri gandary	73.51	3.50	357.28	60.50	296.78	5.90:1
Zurain gandary	64.82	3.50	226.87	60.50	166.37	3.74:1
Isd 24	87.26	1.50	130.89	60.50	70.39	2.16:1
Khowai	87.02	1.50	130.53	60.50	70.03	2.15:1
Misrimala	74.40	3.00	223.20	60.50	162.70	3.68:1
Piashi	79.94	2.00	159.88	60.50	99.38	2.64:1
Tanai	67.68	2.25	152.28	60.50	91.78	2.51:1
Turag	73.98	2.00	147.96	60.50	87.46	2.44:1

Table 2a. Performance of chewing varieties on different growth and yield parameters during 2000-2001 cropping season

Varieties	Mortality of settlings (%)	Tiller ($\times 10^3 \text{ ha}^{-1}$)	Millable cane ($\times 10^3 \text{ ha}^{-1}$)	Yield of cane (t ha^{-1})	Brix (%)
Amrita	5.94	206.90	70.87	104.36	19.91
Barong	6.73	195.63	66.27	91.16	18.35
Co 527	8.93	254.69	94.44	103.74	17.70
Chandpuri gandary	7.93	223.17	56.66	89.71	17.90
Gazipuri gandary	6.74	194.68	67.93d	107.55	19.45
Zurain gandary	7.14	217.38	63.73	95.56	18.82
Isd 24	5.15	211.27	86.49	83.35	21.12
Khowai	6.34	213.97	84.52	101.88	18.26
Misrimala	6.74	245.55	69.44	104.83	18.04
Piashi	7.14	221.43	76.66	89.36	19.15
Tanai	7.93	219.92	69.36	104.71	18.93
Turag	7.14	221.66	72.06	101.83	19.70
5%LSD	3.08	30.87	4.65	3.14	0.67
CV (%)	26.1	8.3	3.8	1.9	2.1

Table 2b. Economics of chewing sugarcane varieties during 2000-01 cropping season

Varieties	Millable cane (mc) ($\times 10^3 \text{ ha}^{-1}$)	Price/mc (Tk)	Income $\times 10^3 \text{ ha}^{-1}$ (Tk)	Cost of cultivation ($\times 10^3 \text{ ha}^{-1}$) (Tk)	Profit $\times 10^3 \text{ ha}^{-1}$ (Tk)	BCR
Amrita	70.87	4.00	283.48	60.50	222.98	4.61:1
Barong	66.27	3.00	198.81	60.50	138.31	3.28:1
Co.527	94.44	2.00	188.88	60.50	128.38	3.12:1
Chandpuri gandary	56.66	4.00	226.64	60.50	166.14	3.74:1
Gazipuri gandary	67.93	3.50	237.75	60.50	296.78	3.92:1
Zurain gandary	63.73	3.50	223.05	60.50	162.55	3.68:1
Isd 24	86.49	1.50	129.73	60.50	69.23	2.14:1
Khowai	84.52	1.50	126.78	60.50	66.28	2.09:1
Misrimala	69.44	2.50	173.60	60.50	113.10	2.86:1
Piashi	76.66	2.00	153.32	60.50	92.82	2.53:1
Tanai	69.36	3.00	208.08	60.50	147.58	3.43:1
Turag	72.06	2.00	144.12	60.50	83.62	2.38:1

REFERENCES

- BSRI Annual report, 1999-2000. Bangladesh Sugarcane Research Institute, Ishurdi, Pabna, pp. 128-129.
- BSRI Annual report, 2000-2001. Bangladesh Sugarcane Research Institute, Ishurdi, Pabna, pp. 125-126.
- LuNai C.; WeiMin Z.; JianZhong, C.; WenFeng, W. and JianHong J. 2004. Mechanical cultivation technique for chewing sugarcane. Sugarcane, Vol. 11 (2): 22-24.