

Ratooning potentiality of Chewing Sugarcane Clones at Sreepur, Gazipur under Modhupur AEZ

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

ABSTRACT

An experiment was conducted with twelve chewing clones namely Amrita, Barong, Co 527, Chandpuri gandary, Gazipuri gandary, Zurain gandary, Isd 24, Khowai, Misrimala, Piashi, Kishan and Turag to find out their ratooning potentiality after the plant cane at sreepur, Gazipur, Bangladesh in a farmers field during cropping season 1999-2000 and 2000-01. During 1999-2000 cropping season yield performance of Co 527 (71.64 MTha^{-1}), Gazipuri gandari (53.14 MTha^{-1}), Amrita (69.62 MTha^{-1}) and Barong (58.07 MTha^{-1}) showed better performance among the twelve varieties. But during 2000-01 cropping season Co 527 (74.01 MTha^{-1}), Misrimala (93.36 MTha^{-1}), Isd 24 (77.47 MTha^{-1}), Gazipuri gandary (75.49 MTha^{-1}), Amrita (98.91 MTha^{-1}) and Barong (82.06 MTha^{-1}) produced coparatively better yield of cane. Results from both cropping season indicated that Co 527, Gazipuri gandary, Amrita and Barong have good ratooning potentiality. Considering the benefit cost ratio (BCR) Gazipuri gandary was the best clone for ratooning with BCR was highest 4.82:1 and 5.06:1 during cropping season 1999-2000 and 2000-01 respectively. Ratooning of chewing cane may found as a profitable practice in the experimental area.

Keywords: Ratooning, sugarcane, chewing, potentiality

INTRODUCTION

Ratooning of sugarcane is common in cane growing countries. India about 50% of total cane area is under ratoons. It saves about 30-35% money spent on the cost of cultivation (Singh *et al.* 2003). They also assessed the ratooning ability of eight mid late maturing genotypes with respect to cane yield, growth parameter and quality attributes against two standard varieties under Bhat soil condition. The result showed that CoP 92186 was excellent in cane yield (77.16 MTha^{-1}) and stalk length (201.00 cm) followed by CoSe 92423 (69.54 MTha^{-1}) for yield. Variety CoSe 92429 was found to be the most promising genotype for quality character like sucrose. Singh *et al.* (2005) reported that RAJBHOG (CoSe 92423) is one of the high yielding mid late maturing variety of sugarcane India and it is an excellent ratooner. Kumar *et al.* reported in their study that cane height, cane weight, cane girth, cane internodes and internodes length had significant positive relation among the varieties. The ratooning behaviour of variety is the function of genotypeXenvironment interaction (Mishra and Mathur, 1991; Milligan *et al.* 1992). 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). BSRI Annual Report (2001-2002) reported that some locally collected clones have good ratooning character but

the cultivators of these clones did not practiced as ratoon none of these tested twelve varieties. Sugarcane is one of the most important commercial crops in tropical countries and is main source of sugar in Bangladesh. Besides, if there is a scope for ratooning in chewing cane the farmers will be benefited by avoiding replanting chewing cane in the same land after harvesting plant cane. There is little scope for increasing area under sugarcane due to limitations of irrigation and land. The present study was undertaken to determine the ratooning potentiality of yield contributing characters of chewing sugarcane.

MATERIALS AND METHODS

The experiment was conducted in a farmer's field at Sreepur, Gazipur, Bangladesh during 1999-2000 and 2000-01 cropping season following RCBD and replicated four times. Twelve chewing clones were transplanted in farmer's field during 1998-99 and 1999-2000 cropping season. It was conducted to study the performance of chewing clones in ratoon cane in farmer's field with both the cropping season. Plot size for each treatment was 10m x 8m. The clones were harvested in February '1999 and February '2000 and maintained for ratoon crop in 1999-2000 and 2000-01 cropping season. Immediately after harvesting the field was properly managed for ratoon crop as per schedule program. Intercultural operation like weeding, earthing up, mulching, and irrigation were done as usual. Data on germination was recorded after 120 date after harvesting plant cane. Growth and yield parameter i.e. tillers, millable cane, cane yield and brix (%) of sugarcane were recorded. The following chewing clones 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

During 1999-2000 planting season

Results found this study that germination, tiller, millable cane production and cane yield showed significant differences (Table-1a). Results revealed that the clones Co 527, Piashi, Kishan, Khowai, Isd 24 and Amrita performed better in germination; Co 527, Isd 24, Khowai and Kishan in tiller production. The clone Co 527 produced significantly higher millable cane while Isd 24, Piashi, Khowai and Kishan produced medium millable cane. In cane yield the clones Co 527, Amrita and Isd 24 performed better than from the reminder. Percent brix significantly difference from each other where Kishan, Isd 24, Turag, Co 527, Gazipuri gandari indicated higher percent compared to the rest. Economic analysis of the chewing clones when cultivated as ratoon were done and presented in Table-1b indicated that Gazipuri gandari, Amrita, Barong, Co 527 earned more profit than from others. Higher BCR was found in Gazipuri gandari, Amrita, Barong and Co 527 that were 4.92:1, 4.29:1, 4.16:1 and 4.15:1. The clones Co 527, Gazipuri gandari, Amrita and Barong may be profitable rationed in the experimental area.

Table 1a: Performance of Chewing varieties on different growth and yield parameters in ratoon cane during 1999-2000 planting season

Varieties	Germin. (%)	Tiller ($\times 10^3 \text{ ha}^{-1}$)	Millable cane ($\times 10^3 \text{ ha}^{-1}$)	Yield of cane (TCH)	Brix (%)
Amrita	76.91	127.09	59.99	69.62	18.73
Barong	70.50	178.46	58.20	58.07	18.35
Co 527	83.32	224.61	87.08	71.64	19.65
Chandpuri gandary	56.83	134.18	47.68	51.55	18.65
Gazipuri gandary	54.27	160.67	58.11	53.87	19.18
Zurain gandary	47.85	126.66	49.90	51.04	17.88
Isd 24	78.62	223.67	80.42	64.71	19.73
Khowai	79.48	211.53	76.83	62.20	17.33
Misrimala	52.13	145.38	51.62	53.01	18.74
Piashi	82.90	168.28	75.89	62.16	18.72
Kishan	78.20	216.24	76.83	62.50	19.94
Turag	56.40	128.20	58.62	58.72	19.40
5%LSD	6.63	43.30	5.90	6.61	1.17
CV%	5.80	15.00	5.40	6.50	3.70

Table 1b: Economics of chewing sugarcane varieties in ratoon during 1999-2000 cropping season

Varieties	Millable cane (mc) ($\times 10^3 \text{ ha}^{-1}$)	Price/Cane (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	59.99	3.00	179.97	41.92	137.87	4.29:1
Barong	58.20	3.00	174.60	41.92	132.68	4.16:1
Co 527	87.08	2.00	174.16	41.92	132.24	4.15:1
Chandpuri gandary	47.68	3.50	166.88	41.92	124.96	3.98:1
Gazipuri gandary	58.11	3.50	202.38	41.92	160.46	4.82:1
Zurain gandary	49.90	3.00	149.70	41.92	107.78	3.57:1
Isd 24	80.42	1.50	120.63	41.92	78.71	2.87:1
Khowai	76.83	1.50	115.24	41.92	73.32	2.74:1
Misrimala	51.62	2.50	129.05	41.92	87.13	3.07:1
Piashi	75.89	2.00	151.78	41.92	109.86	3.62:1
Kishan	76.83	2.00	153.76	41.92	111.84	3.66:1
Turag	58.62	2.00	117.24	41.92	75.32	2.79:1

During 2000-2001 planting season

Results presented in Table 2a revealed that there was no significant difference on germination among the varieties except Kishan (87.63%) and Zurain gandary (89.25%). Number of tillers production was highest ($228.26 \times 10^3 \text{ ha}^{-1}$) in Isd 24 and significantly differed with rest entries. Significant effect was found in millable cane production, yield of cane and percent brix. In millable cane production the variety Co 527 produced the highest ($90.83 \times 10^3 \text{ ha}^{-1}$) number and differed significantly with Kishan, Barong and Chandpuri gandary. Other entries produced almost similar as Co 527. In cane yield, the variety Amrita produced the highest (98.91 TCH) and differed significantly with Chandpuri gandary, Kishan and Zurain gandary but did not differ significantly with Misrimala, Piashi and Turag. The variety Isd 24 indicated higher percent brix and differ significantly with Barong but did not differ significantly with Co 527, Kishan and Gazipuri gandary. Besides the agronomic factors some parameters regarding chewing quality, stalk colour, market value and overall choice of neighboring farmers were recorded. According to colour, quality and market price of the varieties Amrita, Chandpuri gandary, Co 527 and Misrimala stand in number first choice.

Table 2a: Performance of chewing varieties on different growth and yield parameters in ratoon cane during 2000-01 planting season

Varieties	Germin. (%)	Tiller ($\times 10^3 \text{ ha}^{-1}$)	Millable cane ($\times 10^3 \text{ ha}^{-1}$)	Yield of cane (TCH)	Brix (%)
Amrita	97.37	126.25	75.97	98.91	16.86
Barong	95.22	117.77	58.68	82.06	14.11
Co 527	99.67	170.83	90.83	74.01	17.22
Chandpuri	91.39	131.04	61.94	62.89	15.77
Gazipuri gandary	97.71	173.40	70.83	75.49	16.91
Zurain gandary	89.25	118.68	67.01	64.19	15.47
Isd 24	99.67	228.26	79.23	77.47	18.05
Khowai	98.36	158.75	88.12	77.76	16.44
Misrimala	97.38	161.18	67.22	93.36	16.60
Piashi	94.07	164.93	72.71	93.05	16.50
Kishan	87.63	118.88	49.31	50.43	17.03
Turag	99.34	147.56	72.36	85.28	16.69
5%LSD	8.28	34.44	25.18	30.48	1.19
CV%	5.1	13.4	20.9	23.1	4.3

Economics of chewing canes were analyzed and presented in the Table 2b. Among the twelve chewing clones Gazipuri gandary gave the highest profit of TK. 1,70,570.00 ha^{-1} . The highest BCR 5.06:1 was also obtained from Gazipuri gandary. Chandpuri gandary, Barong and Amrita also returned good profits when sold as chewing cane. Gazipuri gandary, Amrita, Barong, Chandpuri gandary, Co 527 produced more profit than from others. The clones Co 527, Gazipuri Gandary, Amrita and Barong showed good performance as best suitable for ratooning chewing clones.

Table 2b: Economics of chewing sugarcane varieties in ratoon during 2000-01 cropping

Varieties	Millable cane (mc) ($\times 10^3 \text{ ha}^{-1}$)	Price/Cane (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	75.97	2.25	170.93	41.92	129.01	4.07:1
Barong	58.68	3.00	176.04	41.92	134.12	4.19:1
Co 527	90.83	1.50	136.24	41.92	94.32	3.25:1
Chandpuri gandary	61.94	3.00	185.82	41.92	143.90	4.43:1
Gazipuri gandary	70.83	3.00	212.49	41.92	170.57	5.06:1
Zurain gandary	67.01	2.5	167.52	41.92	125.60	3.99:1
Isd 24	79.23	1.50	119.74	41.92	77.82	2.85:1
Khowai	88.12	1.25	110.15	41.92	68.23	2.62:1
Misrimala	67.22	1.75	117.63	41.92	75.71	2.80:1
Piashi	72.71	1.50	109.06	41.92	67.14	2.60:1
Kishan	49.31	1.50	73.96	41.92	32.04	1.76:1
Turag	72.36	1.25	90.43	41.92	48.53	2.15:1

Chewing clones like Co 527, Amrita, Barong, Gazipuri gandary and Misrimala has a good ratooning potentiality and may be cultivated as chewing cane in the tested environment.

REFERENCES

- BSRI Annual report, 2001-2002. Bangladesh Sugarcane Research Institute, Ishurdi, Pabna, pp. 127-131 .
- Kumar, S.; Khan, A.Q. and Batnagar, P.K.1986. Association of characters in plant and ratoon crops of first clonal generation in sugarcane. *Ind. J. Sugarcane Technol.* 3 (2):96-100.
- LuNai C.; WeiMin Z.; JianZhong, C.; WenFeng, W. and JianHong J. 2004. Mechanical cultivation technique for chewing sugarcane. *Sugarcane*, 11 (2): 22-24.
- Milligan, S.B.; Gravois, K.A. and martin, F.A.1992. Inheritance of sugarcane ratooning ability and relationship of younger crop traits to older crop traits. 21st ISSCT Congress. 2: 404-416.
- Mishra, A. and Mathur, P.S. 1991. Ratooning of sugarcane varieties as influenced by time harvest and fertility levels. *Indian J. Sugarcane Technol.* 6: 1-7.
- Singh, I.S.; Singh, R.; Yadav, M.P.; Singh, R.R. and Singh S.B.2003. rationing behaviour of new promising varieties of sugarcane under Bhat soil condition. *Indian Sugar*, LII (5). August 2003. pp.333-336.
- Singh, S.B.; Singh, R. S.; Singh, I. S. and Chauhan, R.V.S.2005. RAJBHOG-a mid-late maturing high yielding sugarcane variety for nrth central zone of India. *Indian Sugar*. LIV : II(Feb 2005). pp.941-948.