

Performance of Some Promising Clones of Sugarcane as Plant and Ratoon Crops

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ABSTRACT

A comparative study on plant and ratoon cane of four promising clones I.59/74, I.41/75, I.24/76 and I.491/76 against the standards Isd. 2/54 and Isd. 16 was conducted at SRTI, RJSM and KCSM during the cropping season 1982-83 and 83-84 as plant cane and 1983-84 and 84-85 as ratoon cane. The experiments were laid out in randomized complete block design and data were taken on cane and sugar yield per hectare and recoverable sucrose content. It was observed that in all varieties/clones the cane and sugar yield per hectare of ratoon cane were significantly lower than the plant cane. In case of recoverable sucrose content, the ratoon cane of I.24/76 and I.491/76 produced significantly higher sucrose than the plant cane. However, the clones I.59/74 and I.24/76 were found most promising as they produced higher tonnage and sugar both in plant and ratoon cane in comparison with the standards.

INTRODUCTION

Ratooning ability is one of the most important characteristics of sugarcane which influence the decision to plant a particular variety (Chardon et. al., 1979). In Bangladesh, plant cane followed by ratoon cane is the usual practice of sugarcane cultivators especially in northern region. But often it is found that ratoon canes of the existing varieties are not always satisfactory as of the plant cane which disappoint the growers. Considering the fact, an experiment was undertaken to study the plant as well as ratoon cane of four promising clones against two standard varieties.

MATERIALS AND METHODS

Four promising clones I.59/74, I.41/75, I.24/76 and I.491/76 were used as experimental materials against the standard varieties Isd. 2/54 and Isd. 16. The experiment was set at SRTI, RJSM and KCSM during the cropping season 1982-83 and 83-84 as plant cane, and 1983-84 and 84-85 as ratoon cane, i.e., the trials for plant and ratoon cane were performed for two years in three different agro-climatic

zones. The experiments were laid out in randomized complete block design with four replications. The plot size was 6m x 10m where row to row distance maintained 1 metre. In all the experiments, the planting and shaving operations were done in the first week of December. Normal cultural practices were performed and fertilizer was applied at the rate of 112, 112 and 75kg per acre of urea, T.S.P. and M.P., respectively. Canes of the experiments were harvested in the following December (last week) and data were collected on cane and sugar yield per hectare and recoverable sucrose content. Sucrose content was determined through chemical analyses. However, the average data of all the three parameters were then statistically analysed and mean differences were evaluated by DNMR test.

RESULTS AND DISCUSSION

In respect of ton cane per hectare, it was observed that the yield of plant cane of all clones as well as varieties were significantly higher than ratoon cane (Table 1). It was also found that the clones I.59/74 and I.24/76 outyielded the both standards for plant and ratoon cane while I.41/75 produced higher yield than both standards in ratoon only and was almost close to the standard Isd. 16 in plant cane. But in comparison with Isd. 2/54 all the four clones outyielded the standard in plant cane. The higher and lower yield of clones than the standards in plant cane and the decreased yield in ratoon cane might be due to clonal differences and reduced values of different yield components, respectively. The results were partially supported by the work of Dunckelman and Henderson (1986) who found that among the 210 clones only 5% was acceptable for ratoon yield in comparison to the plant cane. They also reported that the lower yield in ratoon crop was due to reduced values for the yield components. Among the 15 varieties tested some in ratoon crop increased yield and some showed decreased trend (IISR Annual Report, 1972). The results of the present study were corroborated with the findings of Kadirvel and Devaraj (1979) who reported that the plant cane of variety Co. 671 produced better yield than the control Co. 658.

Regarding recoverable sucrose content, generally sucrose percentage in ratoon cane was comparatively higher than plant cane in all the clones and varieties except I.41/75 and Isd. 16 (Table 1). In all the four clones and two standards, the difference in sucrose content between the plant and ratoon cane was statistically insignificant except I.24/76 and I.491/76 where sucrose percent of ratoon cane was significantly higher than the plant cane. Only the clone I.41/75 appeared superior than both standards for sucrose recovery in plant cane but in ratoon cane the clone showed superiority to Isd. 2/54 and almost equal with Isd. 16. The results were in conformity with the findings of Dunckelman and Henderson (1986) who reported that among 210

Table 1. Mean values of cane and sugar yield per hectare and recoverable sucrose content.

Clones/ varieties	Type of cane	TCH	Recoverable sucrose content (%)	TSH
I.59/74	Plant	89.93a*	8.28a	7.43a
	Ratoon	57.05b	8.59a	4.88b
I.41/75	Plant	76.24a	9.08a	6.96a
	Ratoon	45.08b	8.81a	4.51b
I.24/76	Plant	89.09a	8.14b	7.25a
	Ratoon	54.73b	8.69a	4.36b
I.491/76	Plant	70.83a	8.31b	5.95a
	Ratoon	31.72b	8.72a	2.75b
Isd.2/54	Plant	68.67a	8.45a	5.81a
	Ratoon	38.17b	8.66a	3.35b
Isd.16	Plant	77.13a	8.83a	7.16a
	Ratoon	40.45b	8.82a	3.69b

* Figures with same letter do not differ significantly at 5% level as per DNMR test.

N.B. Comparisons have been made between plant and ratoon cane.

clones a number of progenies were acceptable in respect of their sucrose percent in ratoon crops comparing with the plant canes. The juice quality of the ratoon crop of 60 sugarcane varieties studied was superior to the plant crop which partially corroborate the present work (IISR Annual Report, 1971). Sexena et. al. (1983) reported that they found better juice quality in ratoon crop in a new variety than the control which also support the present study.

In case of ton sugar per hectare, the result showed that all the clones and varieties produced significantly higher yield of sugar in plant cane than ratoon (Table 1). The table revealed that the clones I.59/74 and I.24/76 produced

comparatively higher sugar than both standards whereas the yield of 1.41/75 was higher than the standard 1.2/54 in plant and ratoon cane. The sugar yield in plant cane of the clone 1.491/76 was also higher than 1.2/54 but was lower than both standards in ratoon cane. The result was in agreement with the findings of Gonzales-Monila (1978) who observed that among the 30 sugarcane varieties only two produced more sugar than the commercial variety in both the plant and ratoon cane. Fanguy *et. al.* (1984) found significantly higher sugar in a sugarcane variety than the control in both the plant and ratoon cane which also support the present results. The work was partially in conformity with the result of Glaz and Miller (1983) who found that sugar per ton of cane decreased from plant to ratoon crops in a new variety.

No clones and varieties produced the similar result for cane and sugar yield and recoverable sucrose content in plant and ratoon cane which indicates that the varieties and clones were influenced in different years by the environment at different locations.

From the results of the experiment it was found that the clones 1.59/74 and 1.24/76 were most promising as they produced higher tonnage and sugar both in plant and ratoon cane in comparison with the standards.

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