

Effect of flowering on the quality of sugarcane

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ABSTRACT

Comparative study between flowered and nonflowered cane of Co.1158 was conducted upto 90 days of flowering at 4 different stages in respect of fresh cane weight, recovery % cane, purity % cane and fibre % cane. Flowered cane was found to be superior in quality upto 60 days of flowering and beyond that deterioration was observed. Differences were found greater upto 30 days of flowering which decreased with the increase of flower age.

INTRODUCTION

In Bangladesh, most of the sugarcane varieties flower freely under natural conditions. Alexander (1973) reported that virtually all sugarcane varieties produce flower, some profusely and other reluctantly. According to Hernandez (1965) several important factors cause flowering in sugarcane. Among them, the most important factors are optimum temperature and light condition at appropriate time in the cane growing cycle.

Several workers reported beneficial effect of flowering, particularly early in the season and no adverse effect even late in the season (Anon, 1978; Arvier, 1968; Hernandez, 1965). No adverse effect of flowering was observed upto 60 days of flowering (Sarkar and Miah, 1980). Alexander (1973), however, reported that the growers believe heavy flowering represent production losses. Therefore, a comparative study between flowered and nonflowered cane was undertaken to investigate the effect of flowering on the quality of sugarcane beyond 60 days of flowering.

MATERIALS AND METHODS

A trial was conducted at Sugarcane Research Institute during crop year 1979-80. The widely cultivated commercial variety Co. 1158 was used for the present investigation. Plant samples were collected from the commercially cultivated plot of Sugarcane Research Institute farm where about 50% plants flowered and the rest remained vegetative till harvesting. Plants were raised following standard field practices and recommended doses of manures and fertilizers were applied. A good number of plants of approximately same aged from the same field were tagged before flowering. In this study, the flowered canes were compared to nonflowered ones at 4 different stages of flower development. The stages were (i) at the time of inflorescence emergence (ii) 30 days after emergence of inflorescence (iii) 60 days after emergence of inflorescence and (iv) 90 days after emergence of inflorescence.

At each stage, 30 stalks of flowered cane were randomly selected from tagged plants and made 3 bundles for 3 replications. Similarly, 30 stalks of nonflowered cane were also taken and made 3 bundles. All the 6 bundles of both flowered and nonflowered cane were weighed and crushed separately. Then chemical analysis was done following Horne's Dry Lead Method (Horne, 1903). Mean value of 3 samples of both flowered and nonflowered cane is presented in the table 1. For fibre analysis 15 stalks from flowered cane and another 15 stalks from nonflowered cane were randomly selected from tagged plants and made a total of 6 samples. The samples were disintegrated by Hammer-Mill. The fibres were washed into a running water for 8 hours and then sun dried and finally dried in an oven at 105°C. To explore the effect of flowering, fibre % cane, purity % cane, recovery % cane, weight of stalks etc. were determined.

RESULTS AND DISCUSSION

Differences were found between flowered and nonflowered cane in respect of all the factors investigated at 4 different stages. Results of the experiment are shown in the table 1. The fibre percent in the flowered cane was observed 3.04 to 4.44% higher over nonflowered cane at different stages. There was found a positive correlation between flower age and fibre percent. Increased fibre percent was obtained with the increase of flower age. Similar result was reported by Sarkar and Miah (1980). They observed increase in fibre content with the increase of flower age. The present finding, however, differed with the report of Hernandez (1965) who reported that there was no difference in the total fibre content at the time of inflorescence emergence.

Sugar recovery in flowered cane was found to be higher than in the nonflowered cane upto 60 days of flowering, while it was observed lower after 90 days of flowering. Hernandez (1965) found 2.89% higher sucrose in the flowered cane than in the nonflowered cane. Higher sugar recovery was obtained upto 60 days of flowering (Sarkar and Miah, 1980). Higher sucrose yield was found in flowered cane than in the nonflowered cane (Anon, 1973). The fall off in sugar content was, however, observed when harvesting was delayed due to side-shooting (Arvier, 1968). Purity % cane was higher in flowered cane upto 30 days of flowering which gradually decreased with the increase of flower age. In flowered cane purity was found to be 0.02% and 2.05% lower than nonflowered cane after 60 days and 90 days of flowering respectively. The present finding agrees with the report of Sarkar and Miah (1980), where they found decrease in purity with the increase of flower age. Hernandez (1965) also observed decrease in purity percent in flowered cane. The fresh weight of flowered cane was obtained 1.02% to 10.63% higher at all the stages investigated. This increase in weight mainly due to 9.09% to 10.55% additional internodes obtained as a result of flowering. Similar result was reported by Sarkar and Miah (1980). Here they found increased weight in flowered cane due to the 2-4 additional internodes in the flowered cane.

Fresh weight of stalks and recovery % cane in flowered cane were found to be higher than nonflowered cane upto 60 days of flowering. Purity 0.02% lower in the flowered cane and fibre percent higher which virtually reduce the juice extraction. After 90 days of flowering, recovery and purity were found to be 4.45% and 2.05% lower respectively in the flowered cane and fibre was also found to be 4.44% higher over nonflowered cane.

Table 1. Comparative analysis of flowered and nonflowered cane in respect of wt. of stalks (kg), purity % cane, recovery % cane, fibre % cane etc.

Variable		No. of inter-nodes/ stalk	Wt. of ten stalks (kg)	Purity % cane.	Recovery % cane.	Fibre % cane.
Stage of analysis	Category of plants					
At the time of emergence of Inflorescence.	Flowered	27.9	10.80	86.64	9.65	14.91
	Non-flowered	25.5	10.06	86.09	9.28	14.47
	% increase/decrease over non-flowered cane.	+9.41	+7.36	+0.64	+3.99	+3.04
30 days after inflorescence emergence.	Flowered	27.6	11.66	88.26	10.01	15.53
	Non-flowered	25.30	10.54	85.08	9.54	14.95
	% increase/decrease over non-flowered cane.	+9.09	+10.63	+3.74	+4.93	+3.88
60 days after inflorescence emergence.	Flowered	28.7	11.94	88.33	10.73	15.74
	Non-flowered	26.0	11.80	88.35	10.24	15.10
	% increase/decrease over non-flowered cane.	+10.38	+1.19	-0.02	+6.79	+4.24
90 days after inflorescence emergence.	Flowered	28.3	11.86	89.88	10.79	15.98
	Non-flowered	25.6	11.74	91.72	11.27	15.30
	% increase/decrease over non-flowered cane.	+10.55	+1.02	-2.05	-4.45	+4.44

From the above results, it was found that differences appeared between flowered and non-flowered cane in the quality of cane where flowered cane showed superiority upto 60 days of flowering and quality deterioration was observed beyond 60 days of flowering. It was also found that the difference was greater upto 30 days of flowering. The result was confirmed with the report of Sarkar and Miah (1980). They found superior cane juice quality in flowered cane upto 60 days of flowering. In conclusion, there was no adverse effect of flowering in cane quality upto 60 days of flowering, better cane quality upto 30 days of flowering and quality deterioration beyond 60 days of flowering. It is, thus suggested that it is better to harvest cane within 30 days of flowering and should not be left in the field beyond 60 days of flowering.

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