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SHORT COMMUNICATION

Sugarcane Yield as Influenced by Different Harvesting Times

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Sugarcane (*Saccharum officinarum* L.) is the major source of white sugar and gur, and the second most important cash crop in Bangladesh. Worldwide sugarcane occupies an area of 20.42 million ha. with a total production of 1333 million metric tons (FAO, 2003). The soil and climate of Bangladesh are very much conducive to obtained maximum yield of sugarcane. Despite a favorable land and soil type and agro-climatic condition, the yield of sugarcane in Bangladesh is very low (average 38.5 t ha^{-1} ; 46 t ha^{-1} in sugar mill areas and 36 t ha^{-1} in gur areas) with 7.16 % recoverable sucrose (BBS, 2008) as against 62.8 t ha^{-1} in India (FAO, 2003).

The timing of planting and harvesting influences the productivity of a sugarcane crop cycle. It is necessary to quantify these effects, both within and outside the current harvest season, to optimise crop cycle productivity and to optimise harvest season length. Most of the sugar factories nowadays are encountering the difficulty in arranging queue for sugar cane farmers who deliver sugar cane to the factory. There are several factors lead to this problem. At the time of harvest to deliver their products to the factory, the counter party farmers can usually not achieve the specified amount. Some farmers have to harvest their crops before their queue due to problems of economic. However, harvesting either under-aged or over-aged cane leads to loss in cane yield, sugar recovery, poor juice quality and problems in milling due to extraneous matter. Australian studies have found different harvesting times within the harvest season had significant effects on cane and sugar yield (Chapman and Leverington, 1976). Thus, this study was initiated to determine the most suitable date of harvest of sugarcane to realize maximum productivity.

The experiment has been conducted at Bangladesh Sugarcane Research Institute (BSRI) farm, Ishurdi, Pabna during 2007-2008 cropping season under irrigated condition. The site represents High Ganges River Floodplain under Agro-ecological Zone-11 with medium high land of typical sandy loam soil having pH 7.6. In this experiment five harvesting times of sugarcane viz. mid-November, mid-December, mid-January, Mid-February and mid-March and sugarcane variety Isd 34 were the treatment variable. The experiment was laid out in Randomized Complete Block (RCB) design with three replications. The unit plot size was 8 m x 7 m.

Two budded setts were planted end to end on 1 November, 2007 with row to row spacing 100 cm. Fertilizers were applied @ 347, 244, 184 and 222 kg ha^{-1} as Urea, TSP, MP and Gypsum respectively (BARC, 1997). All TSP, Gypsum and one third of MP were applied in trench and thoroughly mixed with soil prior to transplanting of settlings. The basal dose of Urea ($1/3^{rd}$) was applied as side dressing at 21 days after transplanting (DAT) of settlings. The second dose of $1/3^{rd}$ Urea and $1/3^{rd}$ MP were applied as first top dressing at 90 DAT. Final top dressing of the rest Urea and MP were applied at 150 DAT. Other intercultural operations like irrigation, gap filling, weeding, mulching, earthing-up and tying, etc. were done in time. The experimental plots were divided into 5 parts for harvesting. First was harvested at 12 months after planting and the other parts at 13,14,15 and 16 months. Each component was weighed and sampled for chemical analysis.

The results of the experiment are presented in the Table 1. It is found that the highest number of millable cane production (115.22×10^3 ha^{-1}) was recorded in mid-November followed by (115.12×10^3ha^{-1}) mid-December harvesting and the lowest was from the mid-March during late harvesting. Similar trend was observed for millable cane production in late harvesting. These results indicated that millable cane production were declined due to late harvesting.

Table 1: Millable cane, cane yield and total sugar content of sugarcane as affected by different harvesting times

Harvesting time	Millable cane ($\times 10^3$ ha^{-1})	Cane yield (t ha^{-1})	Pol % cane	Total Sugar content (t ha^{-1})
T_1: Mid-November, 08	115.22	82.16	11.32	9.30
T_2 : Mid-December, 08	115.12	77.14	13.20	10.18
T_3 : Mid-January, 09	112.10	73.15	13.80	10.09
T_4 : Mid-February 09	112.45	66.56	14.39	9.57
T_5 : Mid-March, 09	111.07	64.16	14.18	9.09
LSD (5%)	16.27	5.682	1.274	-

The cane yield was significantly influenced by the harvesting time. In case of cane yield November harvesting significantly better than that of March harvesting. The November harvesting yield of cane was supported by all yield contributing characters. In table 1 the maximum cane yield (82.16 t ha^{-1}) was obtained from mid-November harvesting followed by mid-December (77.14 t ha^{-1}) and the lowest was from mid-March (64.16 t ha^{-1}).

The data on pol % cane was found statistically identical among different harvesting time (Fig. 1). A narrow range indicates ripeness of the cane, while a wide difference indicates that the cane is yet too ripe. The highest pol % cane (14.39) was obtained from mid February followed by mid march and the lowest (11.32) was recorded from mid November that means early harvesting.

Total sugar content is the amount of total sugar that is contained with the total produced cane. Thus, proper harvesting time is an important in determining cane yield. Considering the harvesting treatments the highest amount of total sugar was (10.18 t ha^{-1}) obtained from T_2 (Mid-December) treatments. These results show that it is possible to achieve comparable or higher levels of productivity by harvesting of sugarcane in mid-December.

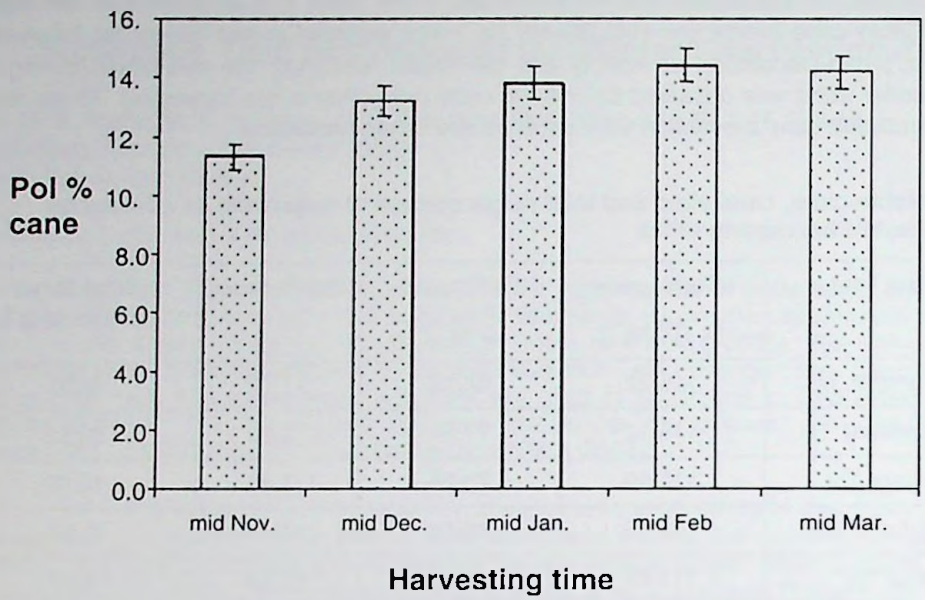

Fig. 1. Pol % cane as affected by different harvesting time

The overall results indicated that the time of harvesting and crop age significantly affected cane and sugar yield and December harvesting was the best in terms of yield and yield contributing characters compared to that of late harvesting dates.

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