

Studies on Cane Quality of some Promising Clones

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An experiment was conducted to study the cane quality of some selected promising sugarcane clones in respect of recoverable sucrose, reducing sugars and fibre percent cane. The cane quality is directly related to sucrose, invert sugars, fibre and other impurities, which were affect production process and sugar recovery in the factory. Yield loss affects cane growers while quality loss affects the sugar mills. It is universally recognized that the quality of sugarcane is good when the sucrose content is high and the fibre and other impurities are low.

The average sucrose and fibre content in sugarcane are about 10.50% and 16.50% respectively whereas in Australia, the sucrose and fibre content are about 15.00% and 13.50% respectively. The average sucrose content in India and Pakistan is about 12.30% and 11.75% and fibre content is 14.65% and 13.90% respectively (Islam, 1984).

The quality of sucrose is essentially a varietal character. The sucrose % cane is however affected by unfavourable soil and climatic conditions, pests and disease infestation, immaturity and over maturity of the crop. The quality also deteriorates fast after harvesting and recovery of sugar is adversely affected if sugarcane is not crushed within 24 hours of harvesting. Investigations on cane yield loss and other morphological parameters have been carried out but information on cane quality is lacking. Considering the importance of cane quality, the present study was undertaken on some promising sugarcane clones to assess the quality for higher sugar recovery.

The study was conducted with eight selected sugarcane clones I 60-91, I 344-91, BO 91, I 155-91, I 209-91, I 41-92, I 153-92, I 216-92 including Isd 16 as standard. The individual clone was planted in 20m long row with three replications. Application of recommended dose of fertilizers and normal cane management practices were done.

The chemical analyses for cane quality parameters viz. brix, pol, purity, percent reducing sugars and fibre percent cane were started from September'1999 and continued upto March' 2000. The cane samples were collected randomly from three replications for chemical analysis. The cane juice was clarified with basic lead sub-acetate. Brix and pol were determined with brix hydrometer and automatic polarimeter (Anon., 1970). The reducing sugars and fibre content were determined by standard Lane and Eynon and bag method (Spencer and Meade, 1952).

The periodic changes pertaining to recoverable sucrose content was found to increase progressively from the month of September and had been maximum in January (Figure 1). The increasing trend for all clones were nearly same (Quadratic) but the clone I 344-91 was somewhat steeper than others and exceeded the standard (Isd 16) after November. The

initial higher recoverable sucrose was observed in the clones I 344-91 and I 153-92. It was revealed that the peak maturity of the clones in the month of January. The reducing sugars in canes were decreased slowly in most cases (Figure 2). The initial reducing sugars content were found maximum in the clones I 41-92, I 153-92, I 155-91 and minimum in I 60-91 and I 344-91. Quick decrease in reducing sugars was found in the clones I 41-92, I 155-91, I 216-91 and I 153-92 in February although the standard variety (Isd 16) was very slow in comparison. However, the average trend was viewed quadratic and the peak minimum of reducing sugars was in February. For the clones I 344-91 and BO-91, it went down to standard (minimum) in that period. The clones I 344-91, BO-91 and I 209-91 were consistent in terms of fibre content (Figure 3). They were significantly lower than I 60-91 and I 216-92 clones followed by significantly higher clones I 155-91 and I 41-92. The clone I 153-92 showed the highest fibre content.

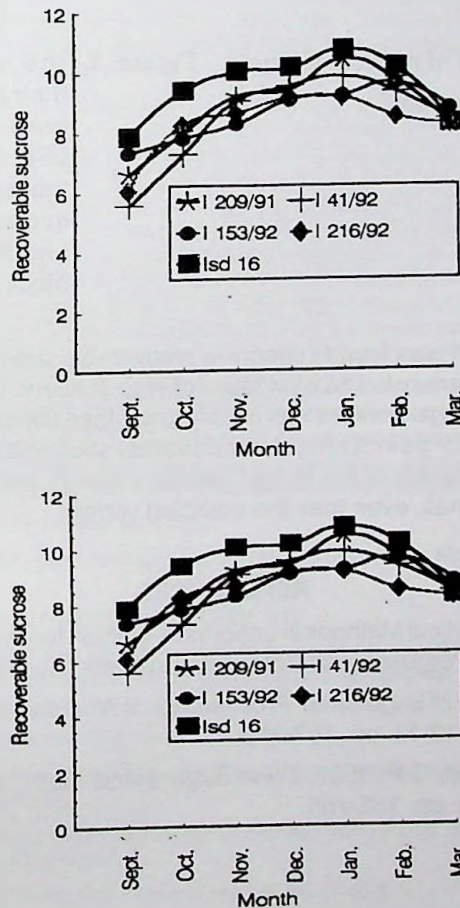


Figure 1. The changes of recoverable sucrose with time (month).

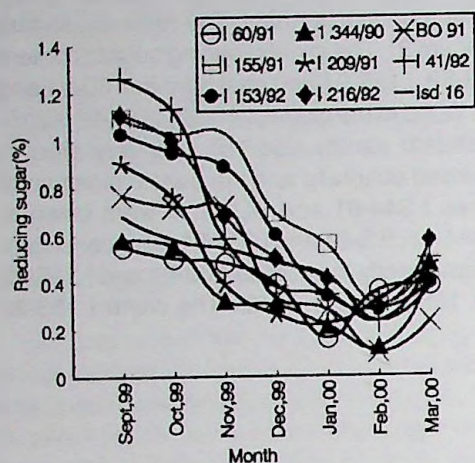


Figure 2. The changes of reducing sugars with time (month).

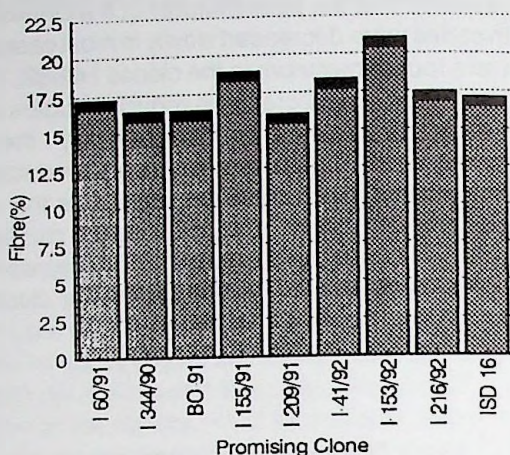


Figure 3. The solid black portions on their top show the average fibre % of the varieties and the LSD 5% value is indicated by the solid black portion. The average of the fibre % are not significantly for which the black portion do not overlap.

The clone I 344-91 was found superior in recoverable sucrose than the other clones, including the standard variety I 16 after November to January. The peak was observed in January. The reducing sugar content was initially lower than the other clones, even from the variety I 16 but all the clones including standard variety showed a minimum reducing sugars in February. The fibre content of the clone I 344-90, I 209-91 and BO 91 were significantly lower than the other clones, even than the standard variety.

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