

SHORT COMMUNICATION

Suitability of Cane Sampling Method for Juice Quality

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In varietal development programme, analysis for cane quality on monthly basis during sugarcane crushing period and its maturity is a great factor for quality determination. Accumulation of sugar in a particular variety at a particular period needs to be determined for appropriate harvesting schedule in order to maximize sugar yield in sugar factory. In case of juice quality analysis, two cane sampling methods are adopted. One is whole cane clump, and another is randomly selected cane from the field.

The crushing of quality cane is prerequisite for higher sugar recovery in sugar mills, and quality of cane is greatly depends on cane maturity which have great impact on pol % cane. Therefore, it is important to determine maturity status of cane before going for harvesting schedule to maximize pol % cane resulting ultimate higher sugar yield in sugar factory. In case of maturity determination chemical analysis of cane in the laboratory is necessary and needs to find out appropriate cane sampling method to get good chemical analysis results (Arefin, 2007).

Juice quality of particular cane variety at a particular age, and time is very important for breeders and millers, and they used to be both types of sampling for juice quality. In order to know magnitude of differences in quality between two different sampling methods. The breeders generally use former method in estimating cane quality of a huge number of genotypes as they have limited clumps of newly developed clones for selection. The factory people followed whole clump method on the ground that they crush huge canes at a time in sugar manufacturing. The information of such a study will be useful for both the research people and millers.

The experiment was conducted in Physiology and Sugar chemistry Division laboratory, Bangladesh Sugarcane Research Institute, Ishurdi, Pabna during 2005-07 analysis seasons. Two sampling methods were used for collecting cane samples from same field for cane quality determination. The two methods used were i) randomly selected single stalk cane samples, and ii) randomly selected whole clump samples from same field. In case of single stalk sampling method 10 stalks were selected randomly, while 5 clumps were randomly selected for whole clump sampling method (Ghafur, 1985). Mean stalk weight in each sample was recorded. Extraction per cent of juice in each sample was worked out by crushing cane in power driven cane crusher. The juice analysis was carried out in laboratory of Physiology and Sugar Chemistry Division by using Chen (1985) procedures. Data on Brix, pol % juice, purity %, pol % cane,

recoverable sucrose per cent and reducing sugars content were determined and recorded.

Data on sampling, single cane weight, juice extraction per centage, Brix, pol per cent juice, pol % cane, recoverable sugar per cent and reducing sugars per cent have been shown in the Table-1. It has been seen from the table that average results obtained in all parameters recorded under selected single stalk cane sampling are higher than that of whole clump sampling method except reducing sugars per cent.

Table 1: Juice quality of sugarcane varieties of two methods of cane sampling used

Sl. No.	Variety	Single Stalk Wt (Kg)	Extraction %	Brix	Pol % Juice	Purity	Pol % Cane	Recovery %	R.S %
UNDER WHOLE CLUMP SAMPLING METHOD									
1	Isd 2/54	0.70	46.4	18.2	15.8	86.6	12.4	9.6	0.20
2	Isd 16	1.15	48.9	20.5	18.3	89.3	14.3	11.2	0.39
3	Isd 35	0.78	46.2	20.0	17.8	88.8	14.0	10.8	0.25
4	Isd 36	0.61	40.8	20.2	18.2	90.2	14.3	11.2	0.36
5	Isd 37	1.13	45.1	18.9	16.9	89.2	13.3	10.3	0.29
	Mean	0.87	45.5	19.6	17.4	88.8	13.6	10.6	0.30
UNDER SELECTED CANE SAMPLING METHOD									
1	Isd 2/54	0.86	46.5	19.2	17.2	89.3	13.5	10.8	0.13
2	Isd 16	1.22	50.8	20.8	18.8	90.2	14.7	11.5	0.33
3	Isd 35	0.86	46.5	20.2	17.9	88.7	14.1	10.9	0.18
4	Isd 36	0.74	43.2	21.5	19.3	89.9	15.2	11.9	0.27
5	Isd 37	1.68	48.8	19.8	17.8	89.8	14.0	10.9	0.15
	Mean	1.07	47.2	20.3	18.2	89.6	14.3	11.2	0.21
Differences (on mean basis)		0.20	1.7	0.7	0.8	0.8	0.6	0.6	0.09
Superiority of selected cane method over whole clump method by (on mean basis)		22.98 %	3.76 %	3.78 %	4.66 %	0.80 %	4.69 %	5.76 %	30.0 %

The highest extraction per cent was found in the variety Isd 16 (48.9 %) in whole clump cane sampling method though average extraction per cent is higher (1.7 unit) in selected single stalk cane sampling method. In case of Brix, Isd-36 gave higher Brix percent under selected single stalk cane sampling method and average Brix per cent is also higher (0.7 unit) in selected single stalk cane sampling method. Similarly superiority was also found in pol % juice (19.3 %), pol % cane (15.2 %) and recoverable sugars (11.9 %) in the variety Isd-36 and found higher in selected single stalk cane sampling method. The results of the present findings are in conformity with the findings of Patil *et. al.* (1980). On the contrary, reducing sugars per cent was lowered by 0.1 units in whole clump sampling method.

In whole clump sampling method lower juice quality may be attributed to the crops comprises in different stages of cane quality. Samples taken from whole clump method gave lower juice quality than that obtained in the samples for selected cane sampling. Concerning the sampling method used for quality cane analysis of sugarcane varieties selected cane samples is superior in all respects. It may be concluded that whole clump sampling method is much more representative to whole field compare to single stalk method of cane sampling, recommended whole clump method of cane sampling for chemical analysis.

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