

B-66: Determination of a suitable sampling technique to estimate sugar qualities of harvested sugarcane

S K Weerasinghe, B D S K Ariyawansa
(*Sugarcane Research Institute, Uda Walawe*)

Presently payment for sugarcane in Sri Lanka is based on bulk weight, but sugar recovery depends on quality (sucrose) parameters of sugarcane supplied to the factory. As there is no suitable sampling method to estimate cane quality in Sri Lanka, a survey was conducted to introduce a sampling method to estimate quality (brix and pol) of harvested sugarcane. In this survey the following 8 sampling techniques were tested. (1) A composite sample consisting of 15 sub-samples of each 2 stalks. (2) A composite sample consisting of 10 sub-samples of each 3 stalks. (3) A composite sample consisting of 7 sub-samples of each 4 stalks. (4) A composite sample consisting of 6 sub-samples of each 5 stalks. (5) A composite sample consisting of 5 sub-samples of each 6 stalks. (6) A composite sample consisting of 4 sub-samples of each 7 stalks. (7) A composite sample consisting of 4 sub-samples of each 8 stalks. (8) A composite sample consisting of 3

sub-samples of each 9 stalks. Samples were taken randomly from the tractor loads of cane and crushed using a laboratory mill (mini mill) to obtain juice. The juice was analysed for Brix (total soluble solids in juice) and pol (sucrose of juice). At the same time respective tractor load of cane was crushed by the factory mill and actual pol and Brix values of juice were recorded. Sample means of respective samples were statistically compared to determine the ideal sampling techniques. Estimates were also compared with the respective actual values to find how close the estimates were to the actual values. Samples were ranked, based on deviation from actual mean value of Brix and pol less than 10%. Out of ten, nine times sample technique six has fallen in the above range on brix while six out of ten has fallen on pol. The technique 8 has fallen ten out of ten on brix while five out of ten on pol in this range. The technique five has fallen seven out of ten on brix and seven out of ten, on pol in this range.

The following three sampling techniques (given according to the ranked order) have given better estimates which are close to the actual values. Composite sample of 4 sub-samples of 7 stalks each, has given the best estimate while a composite sample of 3 sub-samples of 9 stalks each, has given the second best estimate. A composite sample of 5 sub-samples of 6 stalks each, has given the third best estimate.

However, it is important to test whether the number of sub-samples could be further reduced to a small size without decreasing the accuracy of the estimates, as small sample will cost less money and time for analysis.