EVALUATION OF SUGARCANE GERMPLASM FOR DEVELOPMENT OF CORE-COLLECTIONS IN DIRECTIONAL BREEDING OF SUGARCANE (*Saccharum* spp. hybrid)

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By
LOKU BOGAHAWATTAGE SADEERA SUPUNI

Faculty of Animal Science and Export Agriculture
Uva Wellassa University

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ABSTRACT

Evaluation of germplasm for parent selection in hybridization is a necessity in increasing the efficiency of any crop breeding programme. This study carried out at the Sugarcane Research Institute focused to assess parental worth of 217 sugarcane accessions to identify parents in crosses directed to high cane yield, high sugar content in juice and moderate fiber content. The specific objectives were to estimate breeding values of accessions for yield components, clustering of accessions for making core-collections and estimation of association between yield components of sugarcane. The accessions comprised local collections (131), imported varieties (75) and standard varieties (11) were tested for cane and sugar yield components in plant crop and in ratoon 1 crop. Analysis of variance, cluster analysis and breeding values of accessions were used to select the parents. Association between characteristics was found through phenotypic correlations. Significant differences among accessions indicated that there is a good potential for selection of parent clones for directional breeding of sugarcane. The correlation studies proved that stalk length and number of stalks are the major determinants of cane yield and hence the accessions with higher number of millable stalks with acceptable diameter have to be selected for directional breeding of cane yield. Cluster analysis and estimation of breeding values of parents were proved to be useful tools in selection of parents for directional breeding. Fourteen accessions were found as parents for crosses to improve both cane yield and sugar content, simultaneously. Nearly 10 percent of the accessions in the population were classified as the parents in crosses to be performed for directional breeding of respective characteristics using breeding values. The accessions CO 775 and PH 58260 were identified as parents for incorporation of moderate fiber content in high sugar progenies.

Key words: Breeding values, Directional breeding, Parent selection, Sugarcane.