

Determination of Genotypic Relationship among 12 Sugarcane (*Saccharum officinarum*) Varieties

Authors : Faith Eweluegim Enahoro-Ofagbe, Alike Eke Joseph

Abstract : Information on genetic variation within a population is crucial for utilizing heterozygosity for breeding programs that aim to improve crop species. The study was conducted to ascertain the genotypic similarities among twelve sugarcane (*Saccharum officinarum*) varieties to group them for purposes of hybridizations for cane yield improvement. The experiment was conducted at the University of Benin, Faculty of Agriculture Teaching and Research Farm, Benin City. Twelve sugarcane varieties obtained from National Cereals Research Institute, Badeggi, Niger State, Nigeria, were planted in three replications in a randomized complete block design. Each variety was planted on a five-row plot of 5.0 m in length. Data were collected on 12 agronomic traits, including; the number of millable cane, cane girth, internode length, number of male and female flowers (fuss), days to flag leaf, days to flowering, brix%, cane yield, and others. There were significant differences, according to the findings among the twelve genotypes for the number of days to flag leaf, number of male and female flowers (fuss), and cane yield. The relationship between the twelve sugarcane varieties was expressed using hierarchical cluster analysis. The twelve genotypes were grouped into three major clusters based on hierarchical classification. Cluster I had five genotypes, cluster II had four, and cluster III had three. Cluster III was dominated by varieties characterized by higher cane yield, number of leaves, internode length, brix%, number of millable stalks, stalk/stool, cane girth, and cane length. Cluster II contained genotypes with early maturity characteristics, such as early flowering, early flag leaf development, growth rate, and the number of female and male flowers (fuss). The maximum inter-cluster distance between clusters III and I indicated higher genetic diversity between the two groups. Hybridization between the two groups could result in transgressive recombinants for agronomically important traits.

Keywords : sugarcane, *Saccharum officinarum*, genotype, cluster analysis, principal components analysis

Conference Title : ICAPSB 2023 : International Conference on Agronomy, Plant Science and Breeding

Conference Location : New York, United States

Conference Dates : January 30-31, 2023