

## GENETIC DIVERGENCE ANALYSIS IN PLANT AND RATOON OF SUGARCANE (*SACCHARUM OFFICINARUM* L.) TO ASSESS THE POTENTIAL OF GENOTYPES UNDER DIFFERENT TIME OF SOWING AND HARVESTING SCHEDULE

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**Abstract:** The twenty genotypes of sugarcane (*Saccharum officinarum*) were sown on two different dates and harvested at two stages thus comprising four environment for each plant cane and its ratoon crop. The objective of the study was to assess the genetic divergence among these clones based on five quantitative and five qualitative traits under different environments. The cane height, Stalk girth, numbers of millable cane, stalk weight and cane yield were major contributors ranging from 15.29 % to 10.98 % towards the total divergence where as the quality traits brix, CCS percent, sugar recovery, sucrose percent and CCS-yield in t/ha were minor contributors varying from 8.21 % to 5.29 % in both crops. The genotypes were grouped into five clusters in all environments with varying numbers of genotypes. The low intra-cluster distance is recorded from 0 to 1.76 in the cluster of all environments indicated the closeness of the clones that cannot be used as parents in the breeding program of hybridization. The genotypes environment interaction leads to different composition of cluster and consequently the genotypes which exhibit divergence in one environment may exhibit lack of divergence in the other. Therefore, the E<sub>2</sub> environment of plant cane sown in March and harvested at 12 months and E<sub>1</sub> ratoon of March sown plant cane and harvested at 10 month work considered suitable to work out the genetic divergence due to maximum expression of genotypes for cane yield and sugar recovery. In E<sub>2</sub> environment of plant cane the cluster I was largest comprised of seven genotype and cluster III was smallest comprising of two genotypes whereas in E<sub>1</sub> ratoon the cluster III was largest comprising of eight genotypes and cluster IV comprising solidary genotypes. In E<sub>2</sub> plant cane the cluster III and IV were found desirable for cane yield and cluster V for high sugar. Hence the genotypes should be selected for breeding purpose either from cluster II and IV from cluster III and V due to their higher intra-cluster distances. In E<sub>1</sub> ratoon the cluster II, IV and V were found desirable for cane yield and accordingly the selection of genotypes should be done either from cluster III and IV or from cluster I and II or from cluster II and V for involving them in the breeding program due to their more inter cluster distances. The critical analysis of clustering pattern and the characteristics of clusters in different environment of both crop the genotypes CoS-8436, CoS-91269, Co-1148, CoS-8432, CoLK-8102, CoJ-83, CoS-767, CoS-88216, CoS-86218 and CoS-88230 have been identified desirable for high cane yield or sugar or for both and found consistently exhibiting divergence with their corresponding genotypes.

**Keywords:** Cane yield, Genetic divergence, Genotype, Ratoon, *Saccharum officinarum*

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