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Short Communication

GENETIC DIVERGENCE IN SUGARCANE GERMPLASM

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Fifty three sugarcane clones were evaluated for sugar yield and its components under coastal conditions of Andhra Pradesh with a view to identify elite donors for future breeding programme for east coast zone. Data recorded on 12 characters in each clone were subjected to Mahalanobis' D^2 analysis. The clones were grouped in various clusters by Tocher's method (Rao, 1952). These 53 clones were grouped into 12 clusters (Table 1). Cluster I comprised the maximum number (24) of clones followed by seven in cluster II. Clones Co 8348, Co 8354, Co 8356, Co 8361 and Co 8365 formed separate clusters (VIII to XII). Inter-cluster distances varied from 7.05 between cluster II and III to 20.17 between clusters III and XII. Clusters II, III, IV and XI were quite close to each other. Intra-cluster distances ranged from 0.00 to 6.96. The highest value was observed for cluster VII followed by cluster I and VI.

Cluster means (Table 2) indicated that cluster III had the highest stalk yield and sugar yield and acceptable juice quality (18.84% sucrose at 12 months), whereas cluster IX had the lowest stalk yield and sugar yields. This deviation was mainly attributed to number of millable canes (NMC) per plot. Comparatively lower stalk yield in cluster X was compensated with the best CCS per cent resulting in almost similar sugar yields in cluster III and X. Cluster VI comprised clones with the maximum mean sucrose per cent in juice but poor mean stalk yield. In cluster XII (Co 8365) stalk diameter and single stalk weight were the highest but NMC was low whereas in cluster VII-stalk diameter and single stalk weight were the lowest having the highest NMC.

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Table 1. Distribution of 53 sugarcane clones in different clusters

Cluster	No. of clones	Clones
I	24	Co 6907, Co 7219, Co 7542, Co 7704, Co 7907, Co 8013, Co 8014, Co 8021, Co 8343, Co 8351, Co 8352, Co 8357, Co 8358, Co 8363, Co 8364, Co 8366, Co 8367, Co 8368, Co 85032, Co 85041, Co 85268, Co 86047, Co 87045, Co 87263.
II	7	Co 7643, Co 8025, Co 8342, Co 8344, Co 8346, Co 8347, Co 85035
III	3	Co 7805, Co 8345, Co 8362
IV	4	Co 671, Co 8353, Co 8359, Co 8369
V	3	Co 6304, Co 85033, Co 85044
VI	2	Co 8020, Co 85045
VII	2	Co 7901, Co 85036
VIII	1	Co 8348
IX	1	Co 8354
X	1	Co 8356
XI	1	Co 8361
XII	1	Co 8365

The use of genotypes from clusters III and XII, III and IX, and VII and IX with the maximum diversity among themselves may yield better recombinants. Clusters VII and XII were complementry to each other for cane yield components and crossing among the clones from these two clusters will be advantageous for improving stalk yield and hence sugar yield of the progenies when the sucrose percent is maintained at parental level. As also advocated by Singh and Singh (1981), Gill and Tripathi (1983) and Hooda *et al.* (1990). A hybridization programme among clones belonging to different clusters having maximum distances will be fruitful to generate variability particularly for stalk yield components which will increase the selection efficiency among the progenies.

Table 2. Cluster means for 12 characters (stalk yield and quality) in sugarcane

Cluster	Germination (%)	NMC	Stalk diameter (cm)	Stalk length (cm)	Single stalk weight (kg)	Stalk yield/plot (kg)	Brix (%)	Sucrose (%) 10 mon.	Sucrose (%) 12 mon.	Purity (%)	CCS (%)	Sugar yield/plot (kg)
I	53.1	111	2.46	274	0.95	103.2	22.03	18.13	19.54	88.68	13.52	13.94
II	65.5	151	2.41	267	0.88	130.6	21.10	17.91	18.87	89.10	13.13	17.13
III	69.2	156	2.65	286	1.10	170.6	20.85	17.87	18.84	89.63	13.30	22.67
IV	38.3	92	2.88	286	1.34	122.2	21.04	16.91	18.89	89.79	13.21	16.16
V	37.6	145	2.53	249	0.95	135.6	22.17	19.04	19.50	87.94	13.45	18.25
VI	43.5	73	2.30	230	0.76	54.7	23.00	20.16	20.33	88.40	14.04	7.71
VII	56.5	176	2.15	248	0.67	116.1	21.36	14.82	19.26	90.12	13.45	15.58
VIII	92.7	137	2.60	283	1.00	137.0	18.81	13.51	16.10	83.55	10.96	15.02
IX	58.3	56	2.80	108	0.90	51.6	21.36	17.33	18.80	88.00	12.98	6.68
X	39.7	106	2.65	304	1.50	158.8	22.45	18.89	20.17	89.86	14.06	22.32
XI	44.0	126	2.50	283	1.06	133.5	22.37	15.70	20.27	90.64	13.69	18.28
XII	28.0	63	3.05	324	1.50	92.8	23.07	15.78	20.24	87.73	13.84	12.84

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