VARIABILITY AND CORRELATIONS IN SUGARCANE HYBRIDS FOR ECONOMIC ATTRIBUTES

Sugarcane being a high polyploid hybrid by itself, inheritance of characters becomes more complex. Since variation in certain characters like weight of stalk is genetically stable, these can be relied upon as criteria for selection. Sugarcane breeding involves the production and evaluation of several thousand seedlings from different crosses every year in order to enable selection of elite seedlings for further evaluation in clonal (settling) population. As a part of tha venture to evolve locally adapted high yielding cane varieties suitable to the varied agroclimatic conditions of Kerala, variability was studied in 450 hybrid seedlings of the intervarietal cross, Co 775 x Co 453 at the Sugarcane Research Station, Thiruvalla during 1980-81.

Four hundred and fifty hybrid seedlings of the cross Co 775 x Co 453 planted at a spacing of 1 m x 1 m were observed for 13 characters. When the crop was eight months old, data on nine important economic characters were recorded. They were: (1) Weight of cane/stool (2) Number of shoots (3) Number of millable canes/stool (4) Height of cane at harvest (5) Number of internodes at harvest (6) Girth of cane (7) H. R. Brix (8) Weight of cane per unit length (9) Length of internode.

Statistical analyses with respect to the coefficient of variation and correlations were made. The results of the statistical analysis on variability are present ed in Table 1.

The coefficient of variation, with respect to the characters under study displayed a wide range. The maximum variation was manifested by weight of cane/stool followed by number of shoots and the minimum in H. R. Brix reading. The high variability in economic attributes suggests that there is ample scope for selection of superior canes. The above results were in conformity with the findings of Craig (1944) who observed a higher coefficient of variation for weight of stool than refractometric brix. Mariotti (1971) also recorded similar observations. He could observe low coefficients of variation for pol and juice purity.

The interrelationships among nine metric traits estimated are presented in Table 2. The maximum degree of positive association was expressed between girth of cane and weight of cane per unit length. The maximum negative association was exhibited between height of cane and H. R. Brix.

Weight of cane per stool had positive and significant correlations with all the quantitative traits except H. R. Brix where the relationship was negative and non-significant. Cane yield had the closest association with number of millable canes. Number of shoots also displayed positive significant correlations with all the characters except girth of cane, H. R. Brix and weight of cane per unit length.

Number of millable canes had an inverse relationship with girth of cane. But the same attribute had positive correlation with height of cane, number of internodes and length of internode. Hence, the contribution of number of millable canes to cane yield was presumed to be through height of cane as opined by Khairwal and Babu (1276). Height of cane at harvest displayed positive and significant correlation with all the characters except H. R. Brix where the association was negative and non-significant. The number of internodes recorded negative and significant correlation with length of internode while it displayed positive and significant correlation with other characters. Length of internode exhibited positive and significant association with girth of cane and weight of cane per unit length.

The H. R. Brix manifested negative correlation, with length of internode, number of millable canes and weight of cane per stool. The negative and non-significant correlation of brix with cane yield had been established by Stevenson (1954). Ethirajan (1965) also reported negative relationship between yield and juice quality in crosses.

Table 1

Mean and coefficient of variation for important economic characters

SI. No.	Characters	Mean	Coefficient of variation
1	Weight of cane/stool (kg)	2.21	55.18
2	Number of shoots	9.02	51.29
3	Number of millable canes/stool	5.69	44.61
4	Height of cane (cm)	103.36	20.82
5	Number of internodes	12.63	18.61
6	Length of internode (cm)	9.53	14.06
7	Girth of cane (cm)	7.08	11.30
8	H. R. Brix (%)	17.27	10.36
9	Weight of cane/unit length (g)	3.67	24.23

The results of the present study revealed that the weight of cane per stool displayed the maximum coefficient of variation followed by number of shoots and number of millable canes per stool. It also revealed that cane yield had positive correlations with all the yield components except H. R. Brix. The closest association of number of millable canes with cane yield was also established.

Table 2

Correlations between yield and its components in sugarcane seedling population

Characters	No. of shoots	No. of millable canes per stool	Height of cane at harvest	No. of internodes	Length of inter-node	Girth of cane	H. R. Brix	Weight of cane per unit length
Weight of cane per stool	0.61129**	0.71982**	0.62248**	0.49017**	0.24602**	0.405**	—0.4119	0.41920**
No. of shoots		0 62178**	0.27092**	0.19637**	0.11816*	0.05484	0.06376	0.0709
No. of millable canes per stool			0.32551**	0.20095**	0.18205**	—0.05201	-0.06726	-0.05063
Height of cane at harvest				0.70437**	0.38162**	—0.30424**	-0.00364	0.29941**
No. of internodes					—0.21332**	0.25959**	0.14524**	0.27598**
Length of internode						0.13881**	-0.10101*	0.14078**
Girth of cane							—0.02006**	0.37602**
H. R. Brix								—0.01225**

** Significant at 1% level   * Significant at 5% level

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