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Correlation studies in interspecific and intergenetic hybrids of sugarcane (*Saccharum officinarum* L.)

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Abstract

Correlation studies among six characters were studied in eighteen hybrids along with its nine parents (six lines and three testers). The study revealed that cane yield per plot showed significant positive correlation with cane thickness and single cane weight. Hence emphasis should be given while selection on cane thickness and single cane weight to increase cane yield in sugarcane.

Keywords: Correlation coefficient, *Saccharum officinarum*.

Introduction

Sugarcane belongs to the genus *Saccharum* and family Poaceae. It is an important source of sugar and other sweeteners. This crop accounts for about sixty percent of the world's requirement of sugar. Sugarcane is also a major source of by-products, which provide raw material for the distilleries, pulp and paper industries (Brian Purchase, 1995) [1]. Improvement in sugarcane production depends on the strategies and selection method of any breeding programme, which requires information on sugarcane yield and its contributing characters. The correlation studies are used to measure the intensity and direction of character association. Since selection is usually concerned with improving a group of characters simultaneously, an understanding of *inter se* correlations is of prime interest of the breeder. Hence, in the present investigation an attempt is made to understand the type of association existing between sugarcane yield and its component characters.

Materials and Methods

Six lines namely *Saccharum officinarum* L cv. Badila (L₁), COC 671 (L₂), COC 85061 (L₃), COC 92061 (L₄), CO86032 (L₅) and COG 93076 (L₆) and three testers namely *Saccharum spontaneum* (T₁), *Erianthus arundinaceus* (T₂) and *Miscanthus sacchariflorus* (T₃) were crossed in L × T fashion and obtained eighteen hybrid. All the parents and its hybrids (each) were raised in a randomized block design with two replications in a plot size of 5 rows × 5 M length and 0.8 M. The recommended agronomic practices were followed. They were evaluated for six characters including cane yield and its attributing characters *viz.*, cane length, internode length, number of millable cane, cane thickness, single cane weight, cane yield per plot. The genotypic correlations among the characters were estimated as per method suggested by Goulden (1952) [4].

Results and Discussion

Genotypic correlation coefficients between cane yield and its five components studies namely, cane length, internode length, cane thickness, cane weight and number of millable cane per plot are presented in Table 1. Cane yield significantly and positively correlated with cane thickness and cane weight, but negatively correlated with internode length. Similar observation have been reported by Bhide (1969) [2], Singh and Khan (1995) [9] and Hapase and Repale (1999) [5]. Cane length was significantly positively correlated with internode length, cane thickness and number of millable canes per plot. Earlier workers like Sahi and Patel (1975) [8], Reddy and Reddy (1987) and Choudhary and Singh (1994) [3] recorded similar findings. Internode length was significantly and positively correlated with number of millable canes per plot, but negatively with cane weight. Cane thickness was significantly and positively correlated with number of millable canes per plot. Similar reports were reported by Skinner (1982) [10], Reddy and Reddy (1986) [7], Venkateswaran (1986) [11] and Nair and Srinivasan (1989) [6]. It is clear from the above that cane yield per plot was highly correlated with cane weight followed by cane thickness. It revealed that more emphasis should be given while selection on cane thickness and single cane weight to increase cane yield in sugarcane.

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Table 1: Genotypic correlation coefficient among cane yield and its components

	Cane length	Internode length	Cane thickness	Cane weight	Number of millable canes per plot	Total
Cane length	–	0.65**	0.54**	0.11	0.41*	0.29
Internode length		–	-0.18	0.52**	0.59**	-0.41*
Cane thickness			–	0.80**	-0.24	0.88**
Cane weight				–	-0.50**	0.96**
Number of millable canes per plot					–	-0.32

*Significant at 5% level

**Significant at 1% level

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