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STUDIES ON COMPARATIVE YIELD PERFORMANCE OF FIVE SUGARCANE VARIETIES PLANTED IN AUTUMN SEASON

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To study the yield performance and sucrose contents of different varieties of sugarcane, an experiment was conducted in sandy clay loam field fertilized @ 150–100–100 kg NPK/ha. The cane varieties BF–162, CP–43/33, Triton, BL–4 and COJ–64 were planted in the pattern of 90 cm apart double row strips in the second week of September, 1986 and were harvested on 15th November, 1987. The highest cane yield of 161.58 tonnes per hectare was recorded in the case of Triton which was at par with BL–4 and BF–162 yielding 156.31 and 150.37 tonnes against 130.35 and 130.16 tonnes per hectare for CP–43/33 and COJ–64, respectively. The cane varieties COJ–64 and CP–43/33 produced significantly higher sucrose content of 19.59 and 19.29 per cent as against 17.63, 17.41 and 14.96 per cent for BL–4, BF–162 and Triton, respectively.

INTRODUCTION

Sugarcane is an important sugar crop of Pakistan, and is grown on an area of 779.8 thousand hectares giving an average cane yield of 35.72 tonnes of cane per hectare (Anonymous, 1986). Our yields are consistently low for the last two decades. Several reasons could be attributed to low yield, however non adoption of high yielding varieties could be one bottleneck in increasing yield of the province. So it is highly essential to select varieties with high yield potential and a wide range of adaptability. According to Fasihi and Ahmad (1967), the cane variety BL–4, gave the maximum cane yield and sucrose contents in cane juice. While Fraisee (1974) reported that out of four varieties (R–526, R–557, RP–261/63 and RP–633/63), the two varieties RP–261/63 and RP–633/63 produced a maximum yield of 134.00 and 151 tonnes per hectare stripped cane, respectively. The sugar yields of these two were also higher than the other varieties.

Eiland *et al.* (1978) compared nine varieties for 3 years and observed that harvesting losses and performance efficiency in the cane plant were dependent on stalk erectness and diameter. Small diameter stalks with high populations caused lower harvesting losses than thick stalks. Sharma and Kohi (1980) carried out investigations on various cane varieties and found that all the varieties gave similar cane yield but COJ–64 produced the highest amount of sugar per hectare and was closely followed by the varieties BO–70, CO–1148, CO–6239 and

COS–687. Verde *et al.* (1981) compared ten sugarcane varieties and results indicated that number of shoots per sq. metre, shoot weight and quality were directly related to yield of cane. Keeping this in view, the present study was designed to compare the yield potential of some new promising varieties of sugarcane with the commercial varieties BL–4 and Triton planted in autumn season under the irrigated conditions at Faisalabad.

MATERIALS AND METHODS

Studies were conducted in a sandy loam field at the Agronomic Research area, University of Agriculture, Faisalabad during the year 1986–87. The Experiment was laid out in a Randomized Complete Block Design with four replications using a net plot size of 7.25 x 7.20 m. The five cane varieties in the test comprised BF–162, CP–43/33, Triton, BL–4 and COJ–64. The crop varieties were planted in the second week of September in the pattern of 90 cm apart double row strips keeping row to row distance of 30 cm within a strip. A basal fertilizer dose of 150 kg N, 100 kg P_2O_5 and 100 kg K_2O per hectare in the form of urea, single superphosphate and sulphate of potash, respectively was applied.

Hoeing and earthing up was completed before the onset of monsoon. In all, 20 irrigations were applied through out the growing period. The crop was harvested on November 15, 1987 and observations were recorded on number of millable canes, cane length, cane girth, weight per cane, stripped cane yield, sucrose contents, cane to top ratio and harvest index using standard procedures. The harvest index was calculated by using the following formula:

$$\text{Harvest Index} = \frac{\text{millable cane yield}}{\text{cane biomass}} \times 100$$

The data collected were analysed statistically by using Fisher's analysis of variance technique and Duncan's New Multiple Range test was applied to compare the treatment means (Steel and Torrie, 1980).

RESULTS AND DISCUSSION

A perusal of the Table 1 indicated that sugarcane variety COJ–64 produced the highest number of millable canes (1, 85, 823 ha–1) and the means were significantly different from the means of BF–162, BL–4, Triton and CP–43/33. The higher number of millable canes per hectare in COJ–64 was attributed to its higher tillering potential which utilized input resources more efficiently. Similar results were reported by Fasihi and Ahmad (1967).

The results further indicated that the length of cane on an average varied from 1.98 to 3.23 metres. The sugarcane variety BF–162 produced significantly taller cane than rest of the varieties, while the lowest cane length was observed in case of COJ–64. The maximum cane girth of 2.73 was observed in case of Triton closely followed by

Table 1. Yield and yield parameters of autumn cane of different sugarcane varieties

Variety	No. of millable canes/ha.	Cane length(m)	Cane girth(cm)	Weight per cane (kg)	Stripped cane yield(t/ha)	Sucrose content (%)	Cane to top ratio	Harvest index
BF–162	136302 b	3.23 a	2.43 b	1.12 a	150.37 a	17.41 b	8.34 b	82.33 ab
CP–43/33	147748 b	2.78 b	2.06 c	0.88 b	130.35 b	19.29 a	6.91 b	78.90 ab
Triton	146551 b	2.50 c	2.73 a	1.10 a	161.58 a	14.96 c	9.86 ab	83.87 a
BL–4	144012 b	2.44 c	2.70 a	1.09 a	156.31 a	17.63 b	10.52 a	74.10 b
COJ–64	185823 a	1.98 d	2.04 c	0.70 c	130.16 b	19.59 a	8.02 b	76.25 b

Means sharing same letter differ non–significantly at P = 5%.

BL–4.While COJ–64 CP–43.33 produced thinner canes than rest of the varieties. These differences in cane length and cane girth were attributed to highly variable genetic make up and growth behaviour of the varieties under study. Similar results were reported by Eiland *et al.* (1978).

The variety BF–162 recorded the highest weight per cane (1.12 kg) closely followed by BL–4 and Triton weighing on an average 1.10 and 1.09 kg per cane, respectively. Significantly the lowest weight per cane was observed in the case of COJ–64 followed by CP–43/33. The higher weights per cane in case of Triton, BF–162 and BL–4 may be attributed to their higher cane length and/or thickness compared to rest of the varieties. These findings are in line with those of Verde *et al.* (1981).

The highest cane yield of 161.58 tonnes per hectare was recorded in case of Triton which was at par with BL–4 and BF–162 giving average cane yields of 156.31 and 150.37 tonnes per hectare, respectively. The higher yield of these varieties may be due to their higher cane weight, resulting from longer canes in BF–162 and thicker canes in Triton and BL–4. It may be concluded from the results that cane varieties Triton, BL–4 and BF–162 are equally good with regards to their yield potential and environmental response. The findings of Fasihi and Ahmad (1967), Fraisse (1974) and Sharma and Kohi (1980) are in conformity with these results.

The sugarcane variety BL–4 recorded significantly higher cane to top ratio of 10.52 against 8.02, 8.34 and 9.86 for COJ–64, BF–162 and Triton, respectively.

The Triton recorded significantly higher harvest index value (83.87) than rest of the varieties and was closely followed by BF–162 (82.33), whereas the lowest was recorded in the case of COJ–64 (76.25). The highest harvest index value for Triton, BF–162 and BL–4 indicated that these varieties are physiologically more strong and efficient in converting the reserve pool of photosynthates towards cane growth and development.

The data on sucrose content in cane juice reveal that COJ–64 and CP–43/33 with 19.59 and 19.29% sucrose were superior in cane juice quality than rest of the three varieties in the studies. Similar results were recorded by Fasihi and Ahmad (1967), Fraisse (1974) and Sharma and Kohi (1980).

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