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COMPARATIVE GROWTH AND YIELD PERFORMANCE OF SOME NEW AND OLD CULTIVARS OF AUTUMN SUGARCANE (*SACCHARUM OFFICINARUM* L.)

Khalid Jamil, M. Shafi Nazir, Mahmood A. Randhawa & Riaz Ahmad
Department of Agronomy,
University of Agriculture, Faisalabad

Comparative yield performance of some new and old cultivars of autumn sugarcane was seen at the Postgraduate Agriculture Research Station (PARS), University of Agriculture, Faisalabad. The cultivars consisted of BF-162, BL-4, BF-166, COJ-64, CO-975, CO-1148, CO-1321, CP-43/33, CP-57/614, CP-75/300, HF-147, HF-150, HF-152 and PR-1000. The results revealed that all the varieties differed from one another in their growth as well as yield characteristics. The variety BF-162 was significantly the highest yielder (177.79 t ha^{-1}) of all the varieties under test while the minimum yield (67.20 t ha^{-1}) was recorded in CO-1321. The sucrose percentage determined in HF-152 was 17.35 followed by that of CO-1321 and CP-57/614 which yielded 17.21 and 16.4% sucrose, respectively. Harvest index percentage was the highest (80.14) in variety PR-1000 and the lowest (71.05) in HF-152.

INTRODUCTION

Sugarcane (*Saccharum officinarum* L.) supplies over 60% of the world sugar and is also a major sugar crop of Pakistan. It is grown on an area of 854.3 thousand hectares and its average yield ha^{-1} is 41.5 t ha^{-1} (Anonymous, 1990-91) which is far below the potential yield of our existing varieties. Although, there are many reasons for low productivity of sugarcane but lack of balanced nutrition and use of high yielding cultivars are considered to be of prime importance (Qureshi, 1988; Kannapan *et al.*, 1989). Since, with the passage of time, the present cultivars of sugarcane are rapidly deteriorating in yield potential (Balagtas and Lapitan, 1985), there is a need to select such varieties which have high yielding potential and wide range of adaptability in order to replace the old ones. Keeping this in view, it was contemplated in this study to compare yield performance of some new and old cultivars of sugarcane planted in September under irrigated conditions at Faisalabad.

MATERIALS AND METHODS

The experiment was conducted at the Postgraduate Agricultural Research Station (PARS), University of Agriculture, Faisalabad during the year 1989-90. The experiment was laid out in a randomised complete block design with four replications and a net plot measuring 6 x 7 m. Sugarcane cultivars included in the experiment were: BF-162, BL-4, BF-166, COJ-64, CO-975, CO-1148, CO-1321, CP-43/33, CP-57/614, CP-75/300, HF-147, HF-150, HF-152 and PR-1000. All the cultivars were planted on September 15, 1989 in 90 cm apart double row strips with 30 cm space between the rows of each strip on a well prepared seed bed. A recommended dose of 150 + 100 + 100 kg NPK ha^{-1} was applied to the crop in the form of urea, SSP and SOP, respectively.

Whole phosphorus and potash along with half of nitrogen were applied at sowing, while the remaining nitrogen was applied before earthing up towards the end of March. All other agronomic practices were normal and uniform for all the varieties under test. The crop received 21 irrigations. Data on crop growth and yield characteristics were collected following the standard procedures. Sucrose percentage was determined by Horn's dry lead acetate method of sugar analysis. The crop was harvested manually and wieght of stripped canes plot^{-1} was recorded. Data collected were analysed statistically using Fisher's analysis of variance technique and treatment means were compared by using Least Significant Difference (LSD) test at 5% probability level.

RESULTS AND DISCUSSION

The data on crop growth and yield characteristics of different varieties are presented in Table 1. The varieties significantly differed from one another in the number of millable canes produced unit^{-1} area (m^2). BF-162 produced the maximum number of millable canes m^{-2} (15.89), followed by that of CP-43/33 where the number of millable canes recorded unit^{-1} area was 13.00. The minimum number of millable canes (7.15 m^{-2}) was recorded for cultivar HF-150 which did not attribute to the variable inherent tillering potential of the cultivars under study. Similar results were reported by Behl *et al.* (1979), Qureshi (1988) and Ahmad (1988). Significant differences in cultivars indicated that cultivars CO-1148 and BF-162 being at par with each other, produced significantly longer canes as compared to rest of the cultivars. The lowest cane length was observed in case of CO-1321. Although, cultivars BF-166, PR-1000, BL-4 and CP-75/300 were similar to one another but produced significantly longer canes than HF-147, COJ-64, CP-43/33, HF-1509, CP-57/614, HF-152, CO-1321 except CO-975. These findings are similar to those of Bathla (1981) and Reddy and Khan (1984). It is also clear from Table 1 that maximum cane weight of 2.02 kg was recorded in case of PR-1000 which was at par with that of CO-1148 (1.95 kg) but was significantly higher than that of the rest of cultivars. Weight cane^{-1} recorded for BF-166 (1.77 kg) was though significantly lower than that of PR-1000 and CO-1148 but was significantly higher than rest of the cultivars. The lowest weight cane^{-1} was recorded for CO-1148 (0.60 kg). Results reported by Punia *et al.* (1983) and Ahmad (1984) are in line with these findings.

Significant differences among most of the cultivars under study with regard to stripped cane yield (BF-162) ha^{-1} gave the highest cane yield of 177.79 t which was significantly superior to rest of the 13 cultivars. The next high yielding cultivars appeared to be CO-1148 and PR-1000 with an average yield of 148.74 and 145.59 t ha^{-1}, respectively. Minimum cane yield of 67.20 t ha^{-1} was obtained from CO-1321. Rest of the cultivars showed intermediate yield with a considerable variation ha^{-1}. The results further indicated that although weight cane^{-1} in case of BF-162 was lower, yet the number of millable canes m^{-2} was considerably higher. These results are supported by those of Singh *et al.* (1983) and Reddy and Khan (1984).

The sucrose percentage recorded in variety HF-152 was the maximum (17.35) but it did not differ significantly from that of either CO-1321 or CP-57/614. The lowest sucrose percentage of 14.22 was recorded for CO-975. Differences in varieties owing to sucrose contents were also reported by Sharma *et al.* (1979). The harvest index values in varieties PR-1000 and BF-162 were

Table 1. Growth and yield characteristics of some new and old autumn planted cultivars of sugarcane

		Number of canes (m^{-2})	Cane length (m)	Weight $cane^{-1}$ (kg)	Stripped cane yield (t ha^{-1})	Sucrose content (%)	Harvest index
C1	BL-4	11.27 c	2.87 b	1.52 c	115.23 a	15.63 cde	75.57 b
C2	BF-162	15.89 a	3.20 a	1.32 de	177.79 a	14.76 ef	79.85 a
C3	BF-166	9.43 ef	2.94 b	1.77 b	133.03 c	14.75 ef	74.64 bc
C4	COJ-64	8.86 fg	2.60 d	1.17 f	94.69 ef	15.65 cde	71.82 de
C5	CO-975	9.48 ef	2.84 bc	1.20 ef	96.84 ef	14.22 f	71.10 de
C6	CO-1148	10.96 cd	3.22 a	1.95 a	148.74 b	15.78 cde	74.74 bc
C7	CO-1321	11.45 c	1.68 h	0.60 h	67.20 h	17.21 ab	73.01 bcde
C8	CP-43/33	13.00 b	2.45 de	0.92 g	122.08 d	15.66 cde	74.90 bc
C9	CP-57/614	9.17 fg	2.18 fg	0.95 g	89.94 f	16.41 abc	72.35 cde
C10	CP-75/300	10.16 de	2.85 b	1.37 d	101.54 e	15.46 cde	73.87 bcd
C11	HF-147	8.24 gh	2.62 cd	1.32 de	97.01 ef	15.84 cde	72.36 cde
C12	HF-150	7.15 i	2.34 ef	1.12 f	79.64 g	16.13 bcd	71.67 de
C13	HF-152	9.94 hi	2.11 g	1.37 d	91.30 f	17.35 a	71.05 e
C14	PR-1000	9.24 f	2.92 b	2.02 a	145.59 b	15.27 def	80.14 a

statistically the same and were followed by that of BF-164 which in turn did not differ significantly from that of either BF-166, CO-1148, CO-1321, CP-43/33 or CP-75/300. The highest (80.14%) and the lowest (71.05%) harvest index values were recorded in varieties PR-1000 and HF-152, respectively. High harvest index value is attributed to high weight of stripped cane yield in variety PR-1000.

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