EFFECT OF DIFFERENT PLANTING DATES ON THE YIELD AND QUALITY OF AUTUMN PLANTED SUGARCANE (*SACCHARUM OFFICINARUM* L.)

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The study pertaining to the yield and quality of autumn planted sugarcane as affected by different planting dates was conducted on a sandy clay loam soil. The planting dates were August 15, September 1, September 15, October 1, October 15 and November 1. Sugarcane planted on August 15, produced the highest cane yield of 155.11 t ha^{-1} followed by 137.74, 134.88, 126.93, 122.83 and 119.15 t ha^{-1} in the case of cane planted on September 1, September 15, October 1, October 15 and November 1, respectively. The maximum number of millable canes was recorded in plots planted on August 15 and the lowest in plots planted on November 1. A progressive decrease in sucrose contents of cane juice with each delay in planting after August 15 to November 1 was recorded.

INTRODUCTION

The main cause of low average yield of sugarcane in Pakistan is the shorter growing season of only 9-12 months compared with 15-22 months in the countries with higher cane yield. Planting time of spring sugarcane is sometimes extended to May, which further reduces the growth duration by 45-60 days. The temperature under spring sowing rises with the advancement of season which adversely effects the germination and seedling establishment. Consequently, cane and sugar yields decrease. According to Brieger (1964), the September/October planting was better than any other season. The higher yield of autumn planted cane compared to spring planting was also reported by Chang and Shine (1964), Fasihi *et al.* (1974).

Mahmood *et al.* (1988) reported that the highest germination (46.36%) was recorded in case of sugarcane planted on 15th of September as against the minimum (38.01%) for August 1 planting and the maximum stripped cane yield (177.04 t ha^{-1}) was recorded from cane planted on 15th of September. They further added that there was a progressive decrease in sucrose contents in juice with each delay in planting starting from August 1 to October 15 at fortnight interval. Keeping in view these varied opinions, the present study was designed to find out a suitable planting date for autumn sugarcane leading to higher cane yield of good quality under the irrigated conditions at Faisalabad.

MATERIALS AND METHODS

The proposed study was conducted at the Agronomic Research Area, University of Agriculture, Faisalabad on a sandy clay loam soil during the year 1987-88. The experiment was laid out in Randomized Complete Block Design with four replications keeping a net plot size of 7.20 x 9.0 m. The planting dates were August 15, September 1, September

15, October 1, October 15 and November 1. The meteorological data for growing period of the crop is given in Table 1.

Table 1. Meteorological data for the growing period (1987-88)

Month	Temperature (°C)		Humidity (%)	Rainfall (mm)
	Maximum	Minimum		
1987				
August	40.00	28.30	64.00	33.80
September	38.30	24.30	59.40	8.50
October	33.13	17.80	61.00	0.50
November	29.03	11.06	70.60	0.00
December	23.50	5.24	84.50	7.00
1988				
January	21.60	6.40	83.70	3.50
February	23.80	8.80	81.60	1.40
March	26.80	11.90	76.80	43.20
April	36.20	19.30	51.00	6.10
May	42.16	25.48	36.68	0.50
June	41.30	28.50	47.00	0.30
July	37.13	27.93	73.00	81.30
August	35.35	25.90	78.30	202.70
September	35.40	24.20	71.00	6.00
October	33.30	17.70	64.00	13.00
November	27.90	11.60	76.00	0.00
December	22.40	7.40	80.00	21.90

At each sowing date, the variety BL 4 was planted in double row strips 90 cm apart with 30 cm space between the rows of each strip placing two budded sets end to end in the furrows. A basal dose of 150-100-100 kg ha^{-1} NPK was applied in the form of urea, SSP and SOP. In all, 18 irrigations each of 10 ha-cm were given to the crop in addition to 429 mm rainfall received during the growing period. Crop was harvested on January 6, 1989.

Germination count, number of millable canes, cane length, cane girth, weight per cane, cane yield, tops weight, cane to top ratio and sucrose contents were recorded using standard procedures. The data obtained, were analyzed statistically by using Fisher's Analysis of Variance Technique and Duncan's New Multiple Range test at 5% level of probability was used to compare the differences among treatment means (Steel and Torrie, 1980).

RESULTS AND DISCUSSION

Germination of sugarcane was influenced significantly by different planting dates (Table 2). Sugarcane planted on September 1, gave significantly the highest germination count of 997.75 as against 971.00, 925.00, 841.50, 805.00 and 727.25 per plot (7.20 x 9.0 cm) for cane planted on August 15, September 15, October 15 and November 1, respectively. The differences in germination among the different planting treatments may be attributed to the use of cane buds of different age and maturity and favourable temperature prevailing at the time of planting in the respective treatments. These results are in agreement with those of Fasihi *et al.* (1974) and Mahmood *et al.* (1988).

The highest number of millable canes (10.60) per m^2 was recorded in plots planted on August 15 as against the lowest (8.85) in plots planted on November 1 (Table 2). Higher number of canes per m^2 in case of August 15 planted crop seems to be due to higher tillering. The highest cane length was noted in case of August 15 and lowest in case of November 1 planting. Successive decrease in the cane length with delay in planting was observed. However, the differences in cane length among September 1, September 15 and October 1 could not reach to the level of significance and November 1 sown crop was at par with October 1 and October 15.

The cane crop plated on August 15 and September 1 produced thicker cane (2.82 cm) whereas the lowest cane girth (2.73 cm) was observed in canes planted on November 1. Cane planted on August 15, recorded the highest weight per cane (2.02 kg) as against 1.74, 1.57, 1.50, 1.41 and 1.30 kg for that planted on September 1, September 15, October 1, October 15 and November 1,

Table 2. Yield and yield parameters of sugarcane as affected by different planting dates

Planting date	Germination count per plot	Number of millable canes/m^2	Cane length (m)	Cane girth (cm)	Weight per cane (kg)	Cane yield (t ha^{-1})	Tops weight (t ha^{-1})	Cane to top ratio	Sucrose content (%)
August 15	971.00 b	10.60 a	2.99 a	2.82^{NS}	2.02 a	155.11 a	14.27 a	10.66	18.41 a
September 1	997.75 a	10.41 a	2.63 b	2.82	1.74 b	137.74 b	11.30 c	12.23 a	17.53 b
September 15	925.00 c	10.03 a	2.61 bc	2.78	1.57 c	134.88 b	10.65 c	12.67 a	17.00 b
October 1	841.50 d	9.08 b	2.52 bcd	2.75	1.50 cd	126.93 c	11.87 b	10.70 b	15.94 c
October 15	805.00 e	8.85 b	2.31 cd	2.77	1.41 de	122.83 cd	11.26 bc	10.90 b	15.77 c
November 1	727.25 f	8.83 b	2.28 d	2.73	1.30 e	119.15 d	11.55 b	10.80 b	15.36 c

Any two means in a column not sharing a letter in common differ significantly at 5% level of probability.

respectively. Higher weight/cane in case of early planted sugarcane may be attributed to the longer growth period available compared to the late-planted cane.

Sugarcane planted on August 15 on account of greater number of millable canes and higher weight per cane gave significantly the highest cane yield of 155.12 t ha^{-1} than rest of the planting dates (Table 2). On the other hand, the minimum yield of 119.15 t ha^{-1} was obtained from plots planted on November 1 which seems to be due to less number of millable canes per unit area compared with rest of the planting dates. These results are in line with those of Brieger (1984), Chang and Shine (1964) and Mahmood *et al.* (1988).

There were also significant differences among all the treatments with regard to weight of tops. Cane planted on August 15 gave the maximum tops weight (14.27 t ha^{-1}) while minimum (10.65 t ha^{-1}) in case of sugarcane planted on September 15 was recorded. There was a significant decrease in sucrose content of cane with each delay in planting. This can be attributed to differential maturity. Early planted cane reached advanced stage of maturity than the late sown cane when both were harvested at the same time. These results are in line with those of Fasihi *et al.* (1974) and Mahmood *et al.* (1988).

Cane to top ratio determines the degree of physiological efficiency of sugarcane towards cane development. Highest cane to top ratio was observed for September 15 (12.67) and the lowest cane-top ratio (10.75) in case of October 1 plantation (Table 2). The results led to the conclusion that autumn sugarcane should preferably be planted in the month of August rather than planting in the month of September or late in the month of October for obtaining higher cane and sugar yields.

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