

Studies on the Performance of Hybrid-4 Cotton to Dates of Sowing and Spacings

H. M. Mehta, D. P. Patel, J. J. Patel, K. V. Jadav and H. V. Patel

Department of Agronomy, Gujarat Agricultural University, Anand Campus, Anand.

ABSTRACT

A field experiment to evaluate the effect of six dates of planting combined with three spacings of 'Hybrid-4' cotton was conducted for three years from 1973-74 to 1975-76 on sandy loam soil of middle Gujarat. The results indicated that planting from May 15 to June 1 with a spacing of 120 cm $\times$ 30 cm was conducive for higher yield".

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INTRODUCTION

PROBABLY no single cultural factor is more important to cotton production in general than planting date and its interaction with spacing. Singh, Chokhey, Singh and Katti, (1969) reported that earlier sowing increased and delay in sowing reduced, while spacings did not cause any marked differences in yield. Hunisingi, Siddappa and Amarnath, (1971) observed no differences in yield due to sowing dates and spacings. Rao, Nageswara. Janardhana Rao., Kotti Reddy and Satynarayaner Murthy, (1971) reported that June sowing in red soils and August sowing in black soils favoured the cotton yield. Sinha, (1974) reported that the number of cotton bolls per plant increased with the subsequent increase in the area per plant while total number of bolls per hectare declined with the increased area per plant. Singh, Chokhey, Khan and Sowani, (1969) reported that

sowing one week before the onset of monsoon gave high yield of cotton. They further reported that yield decreased with increased spacing and by delaying the sowing after the onset of monsoon. As the variety 'Hybrid-4' cotton covered most of the area under irrigated cotton in middle Gujarat it was deemed essential to ascertain suitable date of sowing and spacing for this tract at the Agronomy farm of the Gujarat Agricultural University, Anand campus, Anand.

MATERIALS AND METHODS

The experiment was conducted on sandy loam soil popularly known as "goradu" soil having a pH of 7.2. It contained 0.47% organic matter, 0.030% total nitrogen, 50 kg/ha 5M NaHCO₃ soluble phosphorus and 350 kg/ha exchangeable potash. Split plot design was employed with main plots allotted to dates of sowing while the spacing

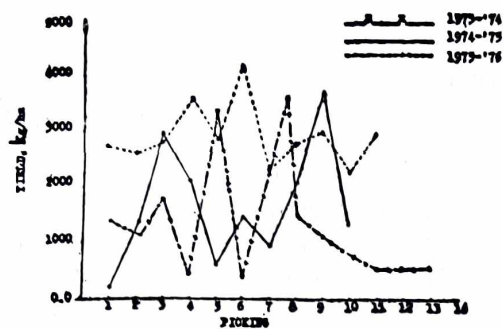


Fig. 1 Yield of cotton at each picking.

treatments were assigned to sub-plots. The crop was planted on May 15 (D_1), June 1 (D_2), June 15 (D_3), July 1 (D_4), July 15 (D_5) and August 1 (D_6) during the years under report. The spacings were 120 cm $\times$ 30 cm (S_1), 150 cm $\times$ 60 cm (S_2) and 180 cm $\times$ 60 cm (S_3). The first picking was carried out on October 18 for first, second and third date of sowing during 1973-74, on September 13, for the first date of sowing during 1974-75 and on October 8, for the first and second date of sowing during the year 1975-76. The last pickings were done on March 9, March 12 and April 26 during the years 1973-74, 1974-75 and 1975-76, respectively.

A pre-sowing irrigation was given to provide an ideal soil moisture condition for uniform germination for the early dates of sowing and when there was no rain for the late dates. Fertilizers were applied at the rate of 150 kg N, 75 kg P_2O_5 and 75 kg K_2O /ha to all the experimental plots. The entire quantities of phosphorus and potash and 50 kg nitrogen in the form of diammonium phosphate, muriate of potash and urea, respectively, were applied in plough furrow before sowing. The remaining

quantity of nitrogen i.e. 100 kg was top dressed in four equal splits just after 1½, 3½, 4½ and 5½ months after sowing every year.

The meteorological data recorded for the three crop seasons are given in Table 1. The data on the rainfall indicated that total rainfall was 1070.34 mm, 363.17 mm and 882.36 mm for the years 1973, 1974 and 1975, respectively, against average annual rainfall of about 862 mm, for the tract. Thus, it was comparatively high during the first year. Hence, it was observed that there was shedding of flowers in early sown plots. However, this reduction in yield was compensated by good flush obtained during the month of December. (Fig.-1 and 2). During the second year there was a drought with 363.17 mm of rainfall. In spite of giving adequate irrigation effect of the climate reflected on the average yield which could be seen from the Fig. 1 and 2. The last year was the moderate year and the average performance was good as compared with the previous years. During the last year the highest yield was obtained in the month of January followed by November.

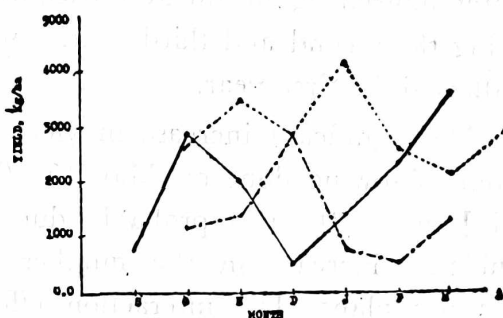


Fig. 2 Monthwise yield of cotton flush.

TABLE 1

Monthly record of meteorological data.

Month	1973-74			1974-75			1975-76		
	Maximum Temp. °C	Minimum Temp. °C	Rainfall mm	Maximum Temp. °C	Minimum Temp. °C	Rainfall mm	Maximum Temp. °C	Minimum Temp. °C	Rainfall mm
May	41.32	25.25	—	39.25	23.66	35.30	39.55	24.72	—
June	37.00	26.95	79.50	34.55	26.61	28.44	36.70	25.88	177.09
July	31.00	25.34	152.65	32.67	27.00	115.82	32.11	24.83	128.52
August	29.90	24.00	391.92	32.33	25.88	14.22	30.70	25.38	337.31
September	30.15	22.25	425.19	31.00	26.50	142.49	30.66	24.16	216.66
October	35.56	19.34	22.86	34.11	23.00	13.71	31.72	22.06	83.05
November	31.90	12.00	—	29.55	13.00	—	29.25	13.77	—
December	27.00	12.25	—	28.77	12.88	—	28.20	10.55	—
January	27.90	8.25	—	27.11	9.66	—	27.72	13.94	—
February	29.60	10.25	—	30.10	12.83	—	28.90	11.55	—
March	32.90	14.83	—	34.83	14.55	—	32.55	16.11	—
April	38.25	20.25	7.87	39.50	19.83	—	37.00	19.44	—

RESULTS AND DISCUSSION

The differences due to date of sowing were significant in all the three years under study. May 15 (D_1), was ideal giving increased yield of seed cotton in all the years under report while sowing on August 1 (D_6) produced the lowest yield. The sowing on June 1 (D_2) was statistically at par with the first date. As the sowing was delayed, there was linear decline in yield. The number of branches per plant did not show any effect due to sowing time. The number of bolls per plant and plant height differed significantly during the second and third year of study, while the dry matter showed significant difference only during the second and third year, it was unaffected in first year.

The significant increase in yield in favour of sowing done on May 15 (D_1) and June 1 (D_2) was probably due to significant increase in the number of bolls per plant. The interaction effect of date of sowing $\times$ spacing showed

significant difference in yield of cotton during the second year, while during the rest of the two years, it was not significant. The pooled analysis indicated significant effect on yield due to these two factors.

The data on the effect of spacing revealed that the differences in the yield of seed cotton due to spacing were not significant during individual year. However, the pooled analysis indicated that the spacing of 120 cm $\times$ 30 cm (S_1) was superior as compared to 150 cm $\times$ 60 cm (S_2) and 180 cm $\times$ 60 cm (S_3) while 150 cm $\times$ 60 cm (S_2) and 180 cm $\times$ 60 cm (S_3) were at par. The number of branches significantly differed due to spacing during the second year. Number of bolls per plant and plant height were not affected by the spacings during all the three years. However, the dry matter of the plant showed significant difference during the first year of the study and remained unaffected for the rest of the years. The pooled analysis showed in-

crease in seed cotton yield of the crop under (S_1) which might be due to the fact that under this spacing the plant density per hectare increased to a considerable extent as compared to (S_2) and (S_3). It was also indicated that although there is a significant increase in total yield per hectare the individual plant did not show any increase in total number of bolls. The results are given in Table 2.

From the above discussion it is suggested that planting of cotton 'Hybrid-4' from May 15 to June 1, keeping 120 cm distance between and 30 cm within lines is very ideal for securing the highest seed cotton yield.

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