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Response of Cotton Genotypes to Time of Sowing

¹M. Akhtar, ¹M. S. Cheema, Moazzam Jamil, Shaukat Ali Shahid and M. Iqbal Shahid

¹Agronomic Research Station, Bahawalpur, Punjab, Pakistan
Soil and Water Testing Laboratory, Bahawalpur, Punjab, Pakistan

Abstract: Study was conducted to evaluate the appropriate sowing time of cotton varieties/cultivars under Bahawalpur conditions. The experiment included four sowing dates started from 1st May up to 16th June, with equal intervals of fifteen days and six varieties viz., V.SLS-1, V.FVH-53, V.BH-118, V.CIM-443, V.CIM-448 with NIAB-Karishma as standard one. Regardless of the varieties/cultivars, the best results were obtained when crop was sown on 16th May. However, cotton varieties NIAB Karishma and BH-118 gave significantly higher weights in a wide range of sowing period i.e., from 1st May to 1st June. The highest mean seed cotton yield of 2403 kg ha⁻¹ was obtained when crop was sown on (D₂)16th May. Sowing of cotton crop before or after this sowing date decreased yield of seed cotton significantly.

Key words: Sowing time, cotton varieties, seed cotton yield, bolls per plant

Introduction

Cotton (*Gossypium hirsutum* L.) is an important cash crop of Pakistan. It covers an area of 2927.5 thousand hectares with annual production of 10731.9 thousand bales during the year 2000 (Anonymous, 2002) Cotton is not only a source of foreign exchange but it is also a source of income to farmer's and laborer's because of local textile industry is based on the cotton production. Cotton seed is the major source of vegetable oil and oil seed cake for animal feed. Although Pakistan has been able to achieve breakthrough in production of cotton, yet there is vast gap between the potential and national average yield.

This yield of seed cotton is far below than the potential yield. Despite all out efforts made in this direction, yield of seed cotton is a result of many contributing factors, among these the time of sowing is important one and can only be achieved by sowing of wheat crop at its appropriate time. Late sowing beyond certain limit lowers the seed cotton yield significantly. Khan *et al.* (1980) concluded that sowing of cotton in early season from 15th April to 1st May gave an increased yield over that of late sowing. Pakistan Central Cotton Committee, 1985 has recommended an optimum sowing time for cotton at D.I.Khan as 3rd Week of April to end of May, in its cotton production plan for 1985-86 (Anonymous, 1985).

Ital *et al.* (1993) reported that seed cotton yield was decreased by delaying sowing after July. They further observed that higher seed cotton yield due to early sowing was mainly attributed to higher number of open bolls and seed cotton weight per plant. Hosny and Shahine (1995) concluded delayed sowing increased the period from sowing to seedling emergence, 1st square, 1st flower, 1st open boll and full harvest, while no of open bolls plant⁻¹ and plant survival decreased however, boll wt. was unaffected by sowing date.

Sivasankaran *et al.* (1995) concluded that the optimum sowing dates was 15 August to get maximum seed cotton yield. Sarma *et al.* (1997) reported that delaying sowing decreased seed cotton yield. Supriya, MCU 5-VT and laxmi produced mean seed cotton yield of 1.45, 1.25 and 1.05 kg ha⁻¹, respectively. Shekara *et al.* (1998) reported that mean seed cotton yield was 1871 kg ha⁻¹ from the earliest sowing date, 1655 kg when sown in the first fortnight of June, and < 600 kg ha⁻¹ with later sowing dates.

Keeping in view all these, study was conducted to find out the appropriate sowing time of cotton varieties under irrigated conditions of Bahawalpur. Bolonhezi *et al.* (1999) reported that sowing in January and February resulted in significant reductions in length, resistance and the micronaire index for the cotton varieties under studies, however elongation was not altered.

Materials and Methods

The study was carried out at Agronomic Research Station, Bahawalpur during the year kharif 1999 and 2000 to find out the

appropriate sowing time of cotton varieties/ cultivars for maximum seed cotton yield. The experiment was laid out in split plot design with three replications and a plot size of 4.5 X 8m² having varieties in main plots and sowing dates in sub-plots. Standard dose of NPK fertilizer (100-60-0 kg ha⁻¹) was applied as blank application. The experiment involved the following levels of the two factors.

Factor-I

Varieties:

V ₁ SLS-1	V ₂ NIAB-Karishma	V ₃ FVH-53
V ₄ BH-118	V ₅ CIM-443	V ₆ CIM-448

Factor-II

Sowing dates:

D₁ 1st May of year 1999 to 2000
D₂ 16th May of year 1999 to 2000
D₃ 1st June of year 1999 to 2000
D₄ 16th June of year 1999 to 2000

The Observations were recorded for yield and yield components. Data collected were analyzed statistically using least significant difference test at five percent level of probability (Steel and Torrie, 1984).

Results and Discussion

Seed cotton Yield (Kg ha⁻¹): The analysis of variance (Table 1) showed significant differences among wheat varieties/cultivars for all the characteristics at different sowing dates. The thorough scrutiny of the data revealed a superiority of V. NIAB-Karishma over others, and among sowing dates, sowing on 16th May were the best for all growth parameters and consequently the seed cotton yield. The data (Table 1) depicts a detailed scenario of yield performance of cotton varieties at different sowing dates. The highest mean seed cotton yield of 2403 kg ha⁻¹ was obtained when crop was sown on 16th May. Sowing before or after that date, seed cotton yield of all varieties included in the experiment decreased significantly. Therefore mid of May be considered the optimum time of cotton plantation.

Similar findings were reported by Anonymous (1985), shekara *et al.* (1998) and sarma *et al.* (1997). Results were some contradictory reported by Khan *et al.* (1980), Hosny and Shahine (1995) and Ital *et al.* (1993). As for as varieties are concerned NIAB-Karishma gave reasonably higher seed cotton yield in all the cases even from 1st May to 1st June. The interaction between cotton varieties and sowing dates was highly significant reflecting the optimum sowing time for different cotton varieties under study.

Bolls per plant: Maximum number of bolls per plant were attained on 16th May for all varieties (Table 2) included in the experiment, before or after this sowing date, growth parameter decreased

Akhtar *et al.*: Sowing time, cotton varieties, seed cotton yield, bolls per plant

Table 1: seed cotton yield (Kg ha⁻¹) of different varieties (V) at different sowing dates (D) of year 1999 to 2000

Varieties	1st May	16th May	1st June	16th June	Mean
SLS-1	2078f	2268cde	1978g	1551jk	1968C
NIAB-Karishma	2309bcd	2593a	2251de	1724j	2219A
FVH-53	1960g	2268cde	1986g	1514k	1932CD
BH-118	2265cde	2599a	2203e	1610j	2169B
CIM-443	2025fg	2364b	1888h	1421l	1925D
CIM-448	1988g	2324bc	1782j	1403l	1874E
Mean	2104B	2403A	2015C	1537D	

Cd₁ for sowing dates = 29.88 Cd₁ for varieties = 36.81 Cd₁ for sowing dates X varieties = 61.04

Table 2: Bolls per plant⁻¹ of different cotton varieties (V) at different sowing dates (D) of year 1999 to 2000

Varieties	1st May	16th May	1st June	16th June	Mean
SLS-1	40	44	35	24	35.75A
NIAB-Karishma	39	42	34	23	34.33B
FVH-53	33	36	30	22	30.35C
BH-118	38	40	33	23	33.50B
CIM-443	39	42	32	20	33.00B
CIM-448	35	38	30	18	30.25C
Mean	37.33B	40.11A	32.28C	21.72D	

Cd₁ for varieties = 1.327 Cd₁ for sowing dates = 1.40

Table 3: 100 boll weight (g) of different cotton varieties (V) at different sowing dates (D) of year 1999 to 2000

Varieties	1st May	16th May	1st June	16th June	Mean
SLS-1	305jk	320h	300k	250n	318.8C
NIAB-Karishma	330g	360c	310j	260m	315.0CD
FVH-53	360c	390a	350d	280l	345.3A
BH-118	334fg	350d	315hi	250n	312.60D
CIM-443	339ef	346de	301ij	241o	306.60F
CIM-448	360c	380b	330g	260m	332.70B
Mean	338.20B	357.70A	317.90C	273.4D	

Cd₁ for sowing dates = 4.055 Cd₁ for varieties = 4.77 Cd₁ for sowing dates X varieties = 7.65

Means not sharing a letter in common differ significantly at P ≤ 0.05

significantly, reflecting optimum time for cotton plantation. Similar findings were reported by Itnal *et al.* (1993) Hosny and Shahine (1995). As for as variety was concerned SLS-1 gave maximum bolls per plant.

100 bolls weight: Maximum 100 boll weight was attained on 16th may for all the varieties included in the experiment before or after this date this growth parameter decreased significantly (Table 3). As for as varieties were concerned FVH-53 gave maximum boll weight. The interaction between sowing dates and varieties was also significant reflecting the optimum time for plantation of different cotton varieties under study.

On the basis of two years results it was concluded that sowing of cotton crop on mid May (D₂) resulted in a significantly higher values as compared to rest of sowing dates. So mid of may is the appropriate sowing time of cotton plantation for all the cotton varieties under study moreover, sowing of cotton crop after mid June gave vary poor values.

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