Performance of Varieties of Gossypium arboreum at Rawalpindi

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The results of two varietal trials including 20 varieties of cotton made at Cotton Research Station, Rawalpindi for four years have indicated that cotton can be grown successfully in rainfed areas in Rawalpindi region. Fairly high yields of seed cotton were obtained when the cotton varieties were sown during March, with plants spaced six inches in rows one foot apart, and received a basic application of 10 tons farm yard manure and 30 lbs. nitrogen as ammonium sulphate.

INTRODUCTION

Improvement in the yield and quality of cotton in the former Punjab region of West Pakistan has already been reported by Afzal (1949), Khan (1960), and Khan and Khan (1965*a*, *b*). In general, more emphasis was placed on the evolution of high yielding varieties of cotton belonging to *Gossypium hirsutum* L., the medium and long staple cottons, which covered about 88 per cent of the area. However, short staple indigenous cottons were not given as much attention. Moreover, cotton cultivation in the rainfed areas of the Rawalpindi Division was almost ignored up to 1955, when a plan for the improvement of cotton for this area was prepared. Experiments on indigenous cottons (*Gossypium arboreum*) were laid out at Experimental Research Station, Rawalpindi from 1957 to 1960. The results of these experiments are presented in this paper.

MATERIAL AND METHODS

The varietal experiments with indigenous cotton (*G. arboreum*) reported in this paper were arranged during four years, 1957 to 1960 at the Cotton Research Station, Rawalpindi. Some changes in varieties were made especially during the year 1960, when a number of low yielding varieties were discarded to include new high yielding varieties.

Nine varieties were included in one of the trials during the first three years and 10 varieties during 1960. Similarly, 10 varieties were included in the second trial during the first three years and 8 varieties during 1960. The system of layout was randomised blocks. During the first three years of trials,

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cotton plants were spaced 12 inches apart in rows spaced 2 feet apart, but in 1960, the plants were spaced 6 inches apart in rows spaced 1 foot apart. The experimental plots received a basic application of 10 tons farmyard manure and 30 lbs. nitrogen as ammonium sulphate per acre during 1959 and 1960. The sowings were done in late May in 1957, in July in 1958, in March in 1959 and 1960 respectively.

EXPERIMENTAL RESULTS AND DISCUSSION

The results of two varietal trials during the years 1957 to 1960 are presented in Tables 1 and 2.

Table 1. *Yield of seed cotton of different varieties at Rawalpindi.*

Variety	Yield of seed cotton in maunds per acre during			
	1957	1958	1959	1960
39M	4.62	0.85	1.9	11.4
451R	3.08	1.02	2.6	11.0
450R	2.94	1.68	2.7	14.1
448R	2.58	1.23	2.3	9.7
447R	2.22	1.35	2.3	12.4
52M	1.82	0.42	1.26	..
Local	1.52	0.48	1.4	9.8
449R	1.27	1.62	2.2	12.6
119S	0.08	0.16	0.03	..
231R	..	..	..	9.7
465D	..	..	..	13.1
468D	..	..	..	7.1
L. S. D.	1.30	N.S.	0.63	2.84

The yield of seed cotton of the varieties under trial was very low during the first three years when the cotton plants were spaced one foot apart in rows spaced two feet apart. The yield of varieties under trial during 1957 ranged between 0.08 maunds per acre in case of 119S to 4.62 maunds per acre in case of 39M and the differences in yield were significant. Local variety yielded only 1.52 maunds per acre. During 1958, on account of extremely late planting in July, the yield of varieties ranged between 0.16 maunds in case of 119S to 1.68 maunds in case of 450R, while the yield of local variety gave only 0.48 maunds per acre. The differences in the yield of varieties were non-significant.

During 1959, there was no increase in yield even with the basic application of 10 tons farm yard manure and 30 lbs. nitrogen (as ammonium sulphate) per acre. The yield ranged between 0.03 maunds in case of 119S to 2.7 maunds in case of 450R, while the local variety yielded 1.4 maunds. Differences between yield of varieties were highly significant.

TABLE 2. *Yield of seed cotton of different varieties at Rawalpindi.*

Variety	Yield of seed cotton in maunds per acre during			
	1957	1958	1959	1960
39M	4.50	0.81	2.27	..
DC95	3.54	0.53	1.8	9.8
DC92	3.31	0.27	2.4	1.5
J. C.	3.02	0.66	1.9	9.6
DC116	2.85	0.49	2.0	7.9
DC110	2.60	0.66	1.8	8.9
Local	2.37	0.38	1.5	9.6
DC96	2.09	0.65	1.7	9.4
DC94	1.94	0.35	1.34	0.9
DC113	1.84	0.29	2.4	8.6
119S	0.35	..	..	..
231R	..	..	..	10.1
L. S. D.	1.15	N. S.	1.13	2.19

However, the results were different during 1960, when the same basic application of farmyard manure and nitrogen was made as during 1959-60, but the plant to plant distance was reduced to 6 inches and rows were spaced one foot apart. The yield of seed cotton of the varieties ranged between 7.1 maunds in case of 468D to 14.1 maunds in case of 450R, while the yield of local variety was 9.8 maunds. The differences in the yield of varieties were highly significant. No variety gave less than 7.1 maunds seed cotton per acre. 465D and 450R gave the highest yield of seed cotton per acre. Local variety was out yielded by 39M, 451R, 449R, 465D and 450R.

Results presented in Table 2 are more or less similar to those obtained from the varietal test I, given in Table I. This indicated that March plantings gave the highest yield with close spacings (plants spaced six inches apart in rows spaced 1 foot apart) and with 10 tons farmyard manure and 30 lbs. nitrogen.

The yield of seed cotton of the varieties ranged between 0.85 maunds to 4.50 in 1957, it was between 0.27 to 0.81 maunds per acre in 1958. Likewise, the yield of seed cotton was low during 1959. However, the yield of seed cotton of the varieties was considerably increased when close spacings were followed with the application of 10 tons farmyard manure and 30 lbs. nitrogen, during 1960. The yield of seed cotton ranged between 0.9 maunds from DC94 to 10.1 maunds in case of 231R. Local variety yielded 9.6 maunds per acre. The differences in the yield of varieties were highly significant in 1957, 1959 and 1960, whereas the results were non-significant in 1958.

The results of these cotton varieties have indicated that cotton can be grown successfully in rainfed areas of Rawalpindi and fairly high yield of seed cotton can be obtained by early sowings in March, close spacing of plants and application of farmyard manure and nitrogenous fertilizers, provided there is sufficient timely rainfall in February, March and April to permit early sowings.

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