Pak. Jour. Agri. Sci.
22 (3), 164, 1985

EFFECT OF DIFFERENT INTERPLANT SPACINGS ON THE YIELD OF FOUR COTTON VARIETIES

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The effect of different plant spacings on the yield of seed-cotton of four varieties of upland cotton, i.e. B557, AU59, Express and Rachna was studied. Keeping interrow space (75 cm) constant it was observed that AU59 performed better at 60 cm plant to plant distance, whereas Express did so at 15 cm and 30 cm. Rachna gave good results when sown at 15 cm interplant spacings.

INTRODUCTION

Cotton, the most important cash crop of Pakistan, is continuously being studied for its improvement in yield and quality. Consequently, many high yielding varieties have been evolved by the breeders which increased the production substantially. But comparing with other cotton growing countries, Pakistan still lags behind as far as its per unit area production is concerned. Probably, for a long time the potential of our cotton varieties could not be fully exploited. Mere genetic improvement of a crop does not work unless its production technology including agronomic aspects are properly taken care of. One of the most important agronomic practices of cotton growing is to keep proper spacing among the plants. Ample evidence on this aspect of cotton cultivation is available in the literature. For example, Nayak (1954) observed that spacing of 88 cm gave higher yield of seedcotton than 45 and 60 cm. Stephen and Morrill (1976) reported significantly higher yield under 25 and 51 cm row spacing than 76 cm. El-Hattab *et al.* (1976) obtained increased seedcotton yield per unit area with increased hill spacing from 20 to 30 cm and one plant per hill instead of 2-3 plants in case of 'Ashmouni' cotton variety. Similarly, Rana and Shah (1981) and Khan *et al.* (1981) also studied the effect of interplant space on different varieties of cotton. But the newly developed cotton cultivars necessi-

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tated the conduct of the present study. Hence the main objective of the present investigation is to determine the proper interplant distance in the field for the newly evolved varieties where they can give the maximum seedcotton yield.

MATERIALS AND METHODS

The effect of different interplant spacings on the yield of seedcotton of four varieties, i.e. B557, AU59, Express and Rachna was studied at the Agronomy Research Area, University of Agriculture, Faisalabad. The experiment was laid out in a split plot design by randomizing the varieties in the main plots and the spacings in the sub-plots. There were four replications having sixteen plots each. The net experimental unit was of 0.0015 hectare. Row to row distance was kept constant at 75 cm while plant to plant distance varied from 15 cm to 60 cm for spacings 1 to 4 (S_1, S_2, S_3, and S_4,), respectively. Fifty kg P_2O_5 and 25 kg N per hectare in the form of single superphosphate and urea were applied at the time of sowing, while another dose of 25 kg N was administered at the flowering stage. The crop was sown by dibbling presoaked seed in the field during 3rd week of April. Four irrigations were given to the crop and a weeding was done during the crop growing season.

The data were collected and analysed for variance and Duncan's multiple range test at 5% probability was applied to compare the significance of the treatment means.

RESULTS AND DISCUSSION

The results have been presented in Tables 1 and 2. It was observed from the analysis of variance that the effect of varieties, spacings and variety x spacing on the yield of seedcotton was highly significant (Table 1). On overall basis, S_1 and S_2 proved to be the best interplant distance for all the varieties (Table2). Among the varieties, B557 topped the list by securing the highest array mean (2.30 kg) which was followed by AU59 (2.06 kg). As far as the individual varietal performance under different spacings is concerned, the results revealed that B557 gave good results under S_2 and S_3 and AU59 under S_4, whereas Express performed better under S_1 and S_2 and Rachna under S_1 conditions. From the foregoing results it could be concluded that AU59, a newly evolved candidate variety, proved the best for yield of seedcotton with 60 cm plant to plant space, but it was retarded as the space decreased. This indicates that AU59 has got

such a genetic make up which leads to a spreading type of plant producing better results under wider space. Similarly, B557 which is of course a tall growing variety (here used as a standard) seemed to be less spreading in behaviour as compared to AU 59 as it performed the best when provided 30 cm plant to plant distance.

Express and Rachna, also the newly evloved candidate varieties, performed the best under the least interplant space (15 cm) and decreased as the interplant space increased (Table 2). This situation reveals that these two varieties are genetically less spreading in behaviour, thus produced better under low plant to plant distance.

These results are not in agreement with those of Rana and Shah (1981) who observed no effect of spacing of varieties on different plant characters including the yield of seedcotton. The reason might be that the varieties (AC 134, C557, AU14 and AU 59) they studied were all tall growing. The present observations, however, verfy the findings of Stephen and Morrill (1976), who reported significant effect of variable interplant spacing on the yield of seedcotton. Under the conditions of this study, the following spacings are suggested for the varieties used :

Variety	Interrow space	Interplant space
AU 59	75 cm	60 cm
Express	75 cm	15 and 30 cm
Rachna	75 cm	15 cm

Table 1. *Analysis of variance of interplant spacings of four cotton varieties*

Source of variation	DF	SS	MS	FR
Replications	3	0.01	0.003	
Varieties	3	4.69	1.56	91.76**
Error I	9	0.15	0.02	
Spacings	3	0.74	0.25	12.50**
Spacings x varieties	9	5.03	0.56	28.00**
Error II	36	0.88	0.02	
Total	63	11.50		

** = Significant at 1% level of probability.

Table 2. *Performance of interplant spacings on the yield of seedcotton (kg per 3 x 6 m²) of four cotton varieties.*

Spaces	B557	AU59	Express	Rachna	Mean
15 cm (S_1)	2.32 b	1.74 c	2.46 a	1.83 a	2 09 a
30 cm (S_2)	2.56 a	1.78 c	2.31 a	1.57 b	2.06 a
45 cm (S_3)	2.36 b	2 20 b	1.69 b	1.49 bc	1.93 b
60 cm (S_4)	1.96 c	2.53 a	1.45 c	1.33 c	1.82 c
Mean	2.30 a	2.06 b	1.98 b	1.55 c	

Mean values sharing the same letters did not differ significantly at 5% level of probability.

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