

## BETWEEN- AND WITHIN-ROW SPACING OF COTTON

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In 1968 an experiment was conducted at the Cotton Research Center (CRC), Phoenix, to compare two cotton varieties with three between-row spacings, three within-row spacings and bed and flat plantings. The varieties used were Deltapine 16 and Hopicala. Between-row spacings included 20, 30 and 40-inch rows with 6, 12 and 18-inch within-row spacings. This test had five replications.

Deltapine 16 yielded significantly higher than Hopicala over-all between- and within-row spacings. There was an interaction of varieties with the planting method. Hopicala yielded better with the flat planting than on beds while the yields of Deltapine 16 were similar with beds and flat plantings.

Seed cotton yields of the 20 and 30 inch between-row spacings were not significantly different, but yields at these spacings were significantly higher than the conventional 40-inch row method. Yields with the 12-inch within-row spacing were significantly higher than the 6 or 18-inch spacings which were not significantly different.

The only significant interaction in this test was with variety and planting method which has been discussed. Results of this 1968 test were more comparable to between- and within-row studies prior to 1967. Our results indicate that higher yields can be obtained with narrower between-row spacings than the conventional 40-inch row in use today.

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## MANAGEMENT OF BROADCAST PLANTED COTTON

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An experiment was conducted in 1968 at the Cotton Research Center (CRC), Phoenix, to study the management of broadcast planted cotton using three irrigation levels, three plant populations and four varieties. Four replications were used.

The three irrigation levels used were as follows:  $I_1$ . Irrigate when 50% of the available water was used in the top three feet of soil;  $I_2$ . Irrigate when 65% of the available water was used in the top three feet of soil;  $I_3$ . Stress after the stand was established until after flowering began than irrigate when 65% of the available water was used in the top three feet of soil. Plant populations of 50, 150 and 250 thousand plants per acre were planned. However,

emergence was greater than expected and the final plant populations were much higher than intended and there were large differences between varieties. Because of the great range in the final stand in this test, the primary value of this study is as preliminary data for future tests. The four varieties included Deltapine 16, Hopicala, Stoneville 213 and CA-491, a Texas experimental variety.

There were significant differences in the seed cotton yields between all three irrigation treatments over-all varieties and plant populations. The highest yields were obtained from the wettest irrigation treatment and the lowest from the stressed treatment.

Seed cotton yields for the four varieties and three plant populations overall irrigation treatments are shown in the following table:

Calculated Seed Cotton Yields in Pounds Per Acre for Four Varieties and Three Plant Populations Averaged Over Three Irrigation Treatments at the CRC, 1968.

Variety	Lowest Population		Middle Population		Highest Population	
	Plants/A	Yield	Plants/A	Yield	Plants/A	Yield
Stoneville 213	60,000	3531	194,000	3313	308,000	2503
Deltapine 16	92,000	3391	279,000	2618	461,000	2078
CA-491	84,000	2662	394,000	2422	499,000	1975
Hopicala	92,000	2262	484,000	1479	655,000	1224

The highest yield was obtained with Stoneville 213 at the lowest plant population. As explained above, yields cannot be properly compared between varieties within a population because of the large variability of the plant population. However, it is of interest to note that for any variety, as the plant population increased, yields decreased. Thus, these results indicate that very high plant populations are undesirable with our present management practices for broadcast planted cotton.

In another study at the CRC in 1968, three large borders of Stoneville 213 were planted with a grain drill. The final population was approximately 120,000 plants per acre. The calculated average yield of these three borders was 1,015 pounds lint per acre. This yield is similar to the average lint yield per acre in Arizona. We hope that by solving some of the problems in producing broadcast planted cotton we can also increase the yield potential.