

Fertilizer - Population Study

The 60,000 plants/acre population produced significantly higher yield, taller plants and more seed per boll than the 90,000 plants/acre. The 60,000 plants/acre population treatment resulted in satisfactory operation of the stripper harvester and this population is well suited to the high-density, short-season cotton production system.

High nitrogen produced significantly taller plants that made stripper harvesting more difficult.

High nitrogen showed a trend for decreased lint percent. Phosphorus, potassium, and application of foliar micronutrients seemed to have no effect on lint percent.

Seed per boll were increased by high nitrogen, but were unaffected by application of phosphorus, potassium, and foliar micronutrients when nitrogen was not applied. When 75 pounds/acre nitrogen were applied alone, there was a trend for reducing Micronaire and lint index values.

PIMA COTTON IRRIGATION TESTS

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In previous tests on Pima cotton, the wet irrigation treatment produced the highest yields in the Phoenix area. There were indications that different responses might be expected on soils of different productivity. There were also indications that irrigation during August could be reduced.

Therefore, three irrigation tests were established with Pima S-4 cotton on sites designed to give three soil productivity levels. The high soil productivity test was on the Arizona State University farm. The low soil productivity test was on the University of Arizona Cotton Research Center. The medium soil productivity site was adjacent to the low productivity site, but received 250 pounds of N/A in 1973 as compared to 125 pounds of N/A on the low productivity test.

All treatments were given a uniform irrigation on the last of May. The wet treatment was irrigated again after 14 days and then every 7 days until the last of August. The medium treatment was irrigated every 14 days with 21 days between first and second irrigations. Dry was irrigated every 21 days with 28 days between first and second irrigations. Wet-medium had the wet treatment to mid-July and then the medium treatment thereafter. Medium-1 had the mid-August irrigation of the medium treatment left out. We tried to add enough water at each irrigation to refill the soil profile.

There were no appreciable differences in seed cotton yield among the three tests, nor were there differences in response among treatments in the three tests. It should be noted that an early infestation of pink bollworms reduced yield at ASU farm.

Wet irrigation produced the highest yield. Switching to medium irrigation in mid-season brought yield down to slightly below the medium treatment. Omission of the mid-August irrigation in the medium treatment did not greatly reduce yield. This is consistent with past results. Dry irrigation was lowest in yield. Differences between the wet, medium, and dry irrigations were greater than usual. This probably is due to the hotter and drier summer in 1973.

Table 1. Seed cotton yield and postplant water application for five irrigation treatments on Pima S-4 cotton. Average of three tests at Phoenix, Arizona in 1973.

Irrigation Treatment	No. Irrigations	Est. Inches Postplant Irrigation	Seed Cotton Lb./A
Wet	14	43	2531 a
Wet-medium	10	42	2068 b
Medium	8	39	2214 b
Medium-1	7	38	2077 b
Dry	5	34	1568 c
C.V.			13%

THE EFFECT OF IRRIGATION TERMINATION DATE ON
NARROW-ROW COTTON PRODUCTION

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Experiments were conducted at the Cotton Research Center in 1970, 1971, and 1972 to evaluate the effect of irrigation termination date on narrow-row cotton production. In these experiments Stoneville 213 was planted two rows, 12 to 14 inches apart, on 40-inch beds in late March or early April. The experiments were replicated four times. In May various plant populations were imposed by hand thinning. The cotton was managed for short-season production by limiting total nitrogen application to 100 pounds per acre and by applying moisture stresses as needed to hold mature plant height to between 30 and 40 inches.

Lint yields for these experiments is shown in Table 1. The data show that applying the final irrigation in mid-July reduced lint yields by more than 30% compared to yields obtained when an additional irrigation was applied two weeks later. In these experiments, little if any yield increase was obtained by applying an additional irrigation in mid-August over yields obtained when the final irrigation was applied in early August. An additional irrigation in late August increased yields about 10% in the 1972 experiment.

It is interesting to note that when the final irrigation was applied early, the higher plant populations tended to result in higher yields. However, when the growing season was extended, highest lint yields were obtained from the lower plant population. These results suggest that the optimum plant population for narrow-row cotton will depend upon length of growing season.