

Table 2. Pima Cotton Irrigation Test, Safford, 1967 (picked 11/21/67).

Irrigation treatment	Est. inches water used	Variety		2-Variety mean Lint Yield lb/A	
		S-3	S-4		
Wet, alt. row	30	554 a	596 a	575 a	
Med., alt. row	21	471 a	442 b	457 b	
Dry, alt. row	21	515 a	493 b	504 b	
Med., every row	25	521 a	489 b	505 b	
<u>Spacing</u>					
	<u>Planned</u>	<u>Actual</u>			
Unthinned	3"		535 ab	596 a	566 a
6"	9"		560 a	548 ab	554 a
12"	14"		518 ab	459 bc	488 b
18"	20"		449 b	418 c	433 c
Mean			515	505	510
C.V. = 11%					

Lint yields within a group of means are not significantly different if followed by the same letter.

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#### IRRIGATE TO SATISFY COTTON PLANT MOISTURE NEEDS

Leonard J. Erie and Orrin F. French<sup>1/</sup>

The maximum production from a cotton plant, assuming other factors are not limiting, is obtained by timing irrigations to satisfy the plant's water requirements. In contrast to many crops where scheduling of irrigations is relatively simple because moisture demands deviate little from year to year, water management on cotton is more difficult because of the plant's sensitive response to water and because requirements vary from one year to the next. This difference in plant-moisture-needs (consumptive use) is mainly due to the yearly differences in temperature, humidity, wind and length of cotton growing season.

It is well-known that over- or underirrigation is detrimental to production. Underirrigation decreases yield by reducing plant size, number of

<sup>1/</sup> Irrigation Engineer and Hydraulic Engineering Technician, respectively, USDA-ARS, U. S. Water Conservation Laboratory, Phoenix, Arizona.

blossoms, and weight per boll, and by retarding boll set. Overirrigation may cause excessive growth at the expense of fruiting, boll rot, late maturity, and excessive shedding. Because of the year-to-year differences in the consumptive use requirements for cotton, intelligent scheduling of irrigation must be made each year to prevent over- or underirrigating.

A study was conducted at the Cotton Research Center comparing the water use and yields of several new and old varieties of cotton. The consumptive use in 1966 was about 37 inches and in 1967 about 34 inches, necessitating one less irrigation. The lower and upper extremes in water use occurred in 1959, when plants used less than 30 inches of water and maximum production was attained with 3 irrigations, and in 1954, when 7 irrigations were needed and plants used nearly 50 inches of water for maximum production.

The mean consumptive use for cotton during an 8-year period -- 1954 through 1962 -- was 41.2 inches, which could be supplied with 6 irrigations following a preplanting irrigation. Though 6 irrigations properly timed usually will be adequate to prevent reductions in yield associated with moisture extremes, the irrigation date should be decided upon by close observations of plant stress symptoms such as dark bluish-green leaves, lack of new growth, redness near terminal bud, and afternoon wilt. Plants should not be stressed for water to the point where lower leaves are shed.

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COTTON PRODUCTION EFFICIENCY THROUGH  
TIMELY TERMINATION OF IRRIGATION

E. B. Jackson, Associate Agronomist  
F. M. Carasso, Research Assistant in Agronomy

This is a progress report on the second year of a study begun in 1966. Results of the first year's work were reported under the same title in Cotton, a University of Arizona, College of Agriculture Report, Series P-5, February 1967.

The objectives of these experiments are: (1) to determine the earliest date on which irrigation can be terminated and still leave just enough water in the soil to mature all the bolls set before "cut-out", and (2) to measure the efficiency of water use at different irrigation termination dates.

Procedure: The soil of the experimental area used in 1967 was a silt loam 20 inches deep, underlain with hard clay to 31 inches, very hard clay to 54 inches, loamy sand to 81 inches, and coarse sand to the water table at 102 inches.

Acala 4-42 and Deltapine Smooth Leaf were planted in moist soil on March 20, 1967. The experimental design was a split plot randomized block with eight replications. Whole plots were irrigation treatments and subplots were varieties. A subplot was four rows 35 feet long with the two center rows picked for yield. All plots were sidedressed with ammonium nitrate at the