

IV - COTTON PRODUCTION

A. IRRIGATION

Alternate Versus Every Furrow Irrigation of Cotton

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Alternate-furrow irrigation of cotton is a common practice in Arizona, particularly in those areas with the most critical water shortages. Plots were established at the Marana Experiment Station in 1965 to study yields and water requirements for every-furrow and alternate-furrow irrigation.

The cotton (Acala 4-42) was solid planted. Timing of irrigation for each treatment was based on plant symptoms and soil moisture observations. Tensiometers were set at 18-inch and 36-inch depths for each treatment. However, tensiometers at both depths went off scale before plant symptoms and soil moisture indicated an irrigation was needed. Water delivery was measured with a propeller meter mounted on a culvert head wall.

Treatments studied were:

1. Irrigate every furrow
2. Irrigate alternate furrows, using the same furrows throughout the season
3. Irrigate alternate furrows, alternating furrows throughout the season
4. Irrigate alternate furrows for first irrigation and every furrow for remainder of the season.

All plots had been brought to field capacity with a pre-planting irrigation. After planting alternate-furrow plots were irrigated four times; the every-furrow irrigation treatments received only three irrigations. Approximately 14.5 inches of water were applied after planting by the alternate furrow method; about 17.0 for treatments 1 and 4.

The middle eight rows of each plot were picked by hand. Yields of seed cotton for each plot were recorded. Samples were taken from each plot for laboratory determination of boll size, seed weight, gin turnout, etc.

Average yield for the entire experiment was 3,017 lbs. of seed cotton per acre. Statistical analysis of the yield data indicates a significant difference between every-furrow treatments 1 and 4 and alternate furrow treatments 2 and 3 (3,127 vs 2,911 lbs/acre). However, this difference reflects the difference in quantity of water applied as well as the irrigation treatments. No significant differences were found between the every furrow treatments or between the alternate furrow treatments.

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Sprinkler Irrigation of Cotton With
High Salt Content Water

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Much work has been done on the tolerance of plants to soil salinity. However little is known of the tolerance of plants to Saline Water applied to the foliage with sprinklers. To determine if cotton can be successfully sprinkler irrigated with highly saline water, experiments were conducted at Safford Experiment Station.

Cotton plots are furrow-irrigated, day-sprinkled and night-sprinkled with water in the range of 3000 parts per million total soluble salts. Salt accumulation on foliage and in the surface soil and its effect on plant performance are measured.

The project has been in operation for two years. The results, as indicated in Tables I and II, show consistent differences favoring night over day sprinkling. Night sprinkling yields are similar to furrow irrigation yields. Yields are well correlated with the salt content of the leaves shown in Table II.

Table I. Plot Yields (lbs of seed cotton per 50 ft. of row)

Year	Day Sprinkled		Night Sprinkled		Furrow	
	Short Staple	Long Staple	Short Staple	Long Staple	Short Staple	Long Staple
1964	8.6	1.5	12.5	3.7	13.0	4.0
1965	6.7	---	8.2	---	5.9	---