

# SPRINKLING COTTON WITH SALINE WATER

By C. D. Busch and Fred Turner, Jr.

## When the water quality is low, then sprinkler irrigation management can influence cotton yields.

A sprinkler irrigation system was installed on three acres of the Safford Experiment Station late in the spring of 1964 to determine if cotton can be successfully sprinkler-irrigated with high salt-content water. The well, serving the sprinkler system, has an average salt content of over 3,000 parts per million. At this concentration the water carries four or five tons of salt in each acre foot.

Three comparisons were chosen to evaluate differences in the irrigation timing, type of cotton and ground preparation, and the effect they might have on cotton tolerance to sprinkler-applied saline water. They were:

### Day vs. Night

#### 1. Day vs Night Sprinkling. The

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are consistent with these findings. These measurements indicate that the supplies of low grade beef (including imports) and of other meats (pork, poultry, lamb) have only minor effects on the price of high quality beef (represented by the price of Choice steers, Chicago).

### Works the Other Way

There is an influence in the other direction, however. It has been estimated that nearly one quarter of the meat from fed beef carcasses finds its way into hamburger and manufacturing uses. Hence, supplies of quality beef do have a substantial influence on prices of low grade beef.

Additional support for these conclusions can be found by examina-

tion of the effect of imports on the price of low grade beef (using the price of Utility grade cows at Chicago as a measure). As is shown in the table, imports per capita increased from 5.3 pounds in 1960 to 9.4 pounds in 1962, an increase of some 80 percent, while the average price per hundredweight of Utility cows decreased hardly at all.

2. Flat vs Bed Planting. A flat field surface will have more uniform evaporation and water distribution. The salts in the soil, therefore, can be expected to move up and down in the profile equally throughout the plot. On a furrow and bed surface more evaporation can be expected from the protruding beds especially when the plants are small. Consequently the bed surface may concentrate soil salinity.

3. Long Staple (S-2) vs Short Staple (1517D) Cotton. Plant varieties can show marked differences in salt tolerance at various stages of growth.

Since the sharply increased levels of imported beef have not had a significant downward influence on prices in the markets of low grade beef, it does not appear likely that any major influence would be felt from imports on the fed beef markets.

In the next issue of *Progressive Agriculture* we shall continue the analysis with an examination of the effect of increased domestic supplies of beef on fed cattle prices.

Irrigations for both the sprinkler plots and adjacent furrow irrigated areas were scheduled from soil moisture tension readings to insure that all plots received adequate, but not excessive, moisture.

### Compared With Other Method

Tensiometers were set at 12, 24, and 48 inch depths. The 12 inch depth, with a tensiometer scale reading of 50 or higher, was used to indicate the need for irrigation. Neutron moisture readings were taken immediately before and after each irrigation for an indication of moisture distribution.

### First Year Results Reported

Three irrigations, each applying about three inches of water, were required during this season. An application rate of  $\frac{1}{4}$  inch per hour was used throughout. Some salt burn, associated with spray drift, was noted when the plants were less than 12 inches tall. Water application including the 12 inch pre-irrigation totaled 22.8 and 21.0 inches for the night and day sprinkled plots respectively. An additional 6 inches of rainfall supplemented the irrigations.

An analysis of cotton leaves revealed noteworthy differences related to treatments this first year. The method of irrigation affected salt content in the cotton leaf. These differences are from within the leaf tissue, since the leaf samples were thoroughly washed in preparation for analysis. The differences appear to be only in the leaf, as a similar petiole analysis showed no pattern in salt concentration. Table 1 presents the leaf data averaged for two replications.

**Table 1. Sodium Content of Washed Cotton Leaf Samples (percent of oven dry weight)**

Variety	Irrigation Method	
	Sprinkler	Surface Furrow
Short Staple (1517D)	.67	.32
Long Staple (S-2)	.39	.13

Irrigation and equipment problems

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IN PHOTO BELOW, Dr. Fred Turner, Jr. examines the day-sprinkled cotton for leaf burn. Some salt burn, associated with spray drift, was noted when the plants were less than a foot tall.



delayed planting until May 26 and were responsible for spotty stands. Yield data are reported for portions of the plots where the stands were judged normal and comparable among the treatments.

The following table presents the data, averaged for two replications.

**Table 2. Plot Yields**

Lbs. of seed cotton for 50 ft. of row.

Surface Treatment and Cotton Variety	Irrigation Method		
	Sprinkler Day	Sprinkler Night	Surface (Furrow)
<b>BEDDED</b>			
Short Staple (1517D)	8.8	13.2	13.0
Long Staple (S-2)	1.7	4.9	4.0
<b>FLAT</b>			
Short Staple (1517D)	8.3	11.8	—
Long Staple (S-2)	1.2	2.5	—

Night sprinkled and furrow irrigated cotton produced comparable amounts. The day sprinkled, however, produced only 68 percent as much as the furrow irrigated short staple cotton and only 43 percent

## Sedona Woman Heads Homemakers Council

Mrs. Charles "Sylvia" Nemec of Sedona, Oak Creek Canyon area of Coconino County, is the new president of the Arizona State Homemakers Council.

She succeeds Mrs. Bert Wood of Camp Verde, Yavapai County, who served as first president of the organization.

Other new officers, elected during Town and Country Life Conference on The U of A campus in June, are:

Vice President — Mrs. Forrest "Jeanne" Smith, 8235 East Koralee Place, Tucson.

Secretary — Mrs. Lonnie "Mae Olden" Davison, 4234 East Lee Street, Tucson.

Treasurer — Mrs. Joe "Irene" Mahan of Morenci, Greenlee County.

as much as the furrow irrigated long staple cotton.

Clearly the pattern of plot yields relates to the method of applying the salt laden water. The smaller but consistent effects of surface treatments are not fully understood at this time. However, the coming years' data should add to the understanding of cotton's salt tolerance.

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