MICRONUTRIENTS ON COTTON - MAYBE!

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A demonstration was set up on the Buster Brown farm located at 11-Mile Corner. The demonstration involved the use of micronutrient, iron chelate.

Situation

Many of the cotton producing acres are showing a response to micronutrients. Increased plant size, with color variation as well as increased yields in some areas.

Method

The demonstration was set up with approximately four acres in the test. Iron chelate was metered into the irrigation water. The variety of cotton was Hopicala.

Results

Because of the unevenness of the field as far as irrigation, it was very difficult to see at any time any difference in plant size or yield. A different means of applying the chelate is needed to get a readable result. Future plans will call for the use of iron and zinc chelate applied by ground injection equipment.

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THE INFLUENCE OF A WETTING AGENT AND A WETTING AGENT-CALCIUM POLYSULFIDE COMBINATION[1] ON COTTON YIELDS

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A test was established on the Colvin Farm in Eden, Arizona, to evaluate the effect of two soil conditioners on cotton yields. The area in which the test was established was selected because of the difficulty in obtaining adequate irrigation. The problem was felt to be a result of two factors, heavy soil texture (clay loam) and a high exchangeable sodium percentage, which combined to cause a rather impermeable soil. The result was inadequate irrigation which caused low yields.

The treatments consisted of a control, the wetting agent at 1.6 gallons per acre, and the wetting agent-calcium polysulfide combination at 15 gallons per acre. The treatments were applied at random to replicated plots which varied in width

from 10 to 12 rows. The row width was 38 inches. The soil conditioners were metered into the irrigation water with all of the material being applied during the preplanting irrigation. Composite soil samples consisting of six cores from the 0-12-inch depth were taken from each plot for analysis.

The soil samples were analyzed for electrical conductivity of the soil paste extract, pH, nitrate, phosphate, and exchangeable sodium percentage. The average values obtained for each of the parameters were 4.5 mmhos, 7.8, 84 ppm, 5 ppm and 16%, respectively. The high exchangeable sodium percentage suspected initially was confirmed by the soil analysis.

An evaluation of treatments was made by machine harvesting the middle two rows of each plot. The first picking was on October 29th and the second picking on November 11th. Approximately 90% of the total harvested crop was picked on the first date. The yields obtained for each of the treatments are shown in Table 1.

Table 1
Yield of Seed Cotton as Influenced by Treatment

Treatment	Mean Weight of Seed Cotton Per Plot
	-----Pounds--------
1. Control	362
2. Wetting Agent	358
3. Wetting Agent + Calcium Polysulfide	351

Standard error of the mean = 50.2 lbs./plot
Coefficient of variation = 14 percent

The data were analyzed statistically as a randomized complete block. No significant difference was found between treatments. To convert yield per plot to an approximate per acre basis, multiply by six.

It should be pointed out that the soil tests indicate the soil included in the experiment was saline-alkaline. In addition, the irrigation water used was saline. Under these conditions the saline irrigation water could have caused flocculation of the soil particles thereby mitigating the dispersion of the soil particles caused by the high exchangeable sodium percentage of the soil.

Under the current irrigation management program, the grower is achieving adequate irrigation without the aid of soil conditioners since no differences could be detected in the yields of seed cotton which could be attributed to the influence of the soil conditioners.

Previous tests by others have also shown that wetting agents do not increase yield by affecting the amount of irrigation water applied on wettable soils. However, on non-wettable, hydrophobic soils, increased infiltration has occurred when the soil was treated with a wetting agent.

An interesting corollary of the experiment were the differences observed in the fiber quality factors between the first and second picking which may be seen in Table 2.

Table 2
Relationship of Fiber Quality Factors
Between First and Second Picking

Fiber Quality Factor	First Picking*	Second Picking*	Calculated** t Value
Length (UHM)	1.16	1.08	7.62**
Strength	3.59	3.44	0.86 N.S.
Micronaire	3.40	2.58	4.26**

* Values are means of nine observations.

** t (0.01) with eight degrees of freedom = 3.36.

Significant differences in length and micronaire at the 99 percent confidence level were found between the first and second picking.

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EFFECTS OF MANAGEMENT PROGRAMS AND FERTILIZATION UPON UPLAND COTTON YIELDS

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Management and nitrogen fertilization effects were studied in two field experiments concluded at the Cotton Research Farm in 1968. Results are summarized here in terms of averages for seasons in which the data are valid for these comparisons.

Figure 1 shows averages for four years for five management systems involving manure usage, at three nitrogen levels on each management treatment: (1) only commercial N; (2) annual application of manure at 10 tons per acre; (3) ten tons of manure per acre the first and alternate years; (4) ten tons of manure per acre the first year only; and (5) ten tons of manure per acre the first year and five tons annually thereafter.

Without manure, nitrogen at 75 lb./A. increased cotton yield by 23%. Annual applications of ten tons of manure per acre supplied adequate nutrition for a 65% yield increase over the control; there was no response to additional nitrogen. Yields equal to the annual manure application were produced in the