

CONDITIONING COTTON FOR DEFOLIATION

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During 1972, a growth regulator chemical, Pennwalt TD-1123 (3,4-dichloroisothiazole-5-carboxylic acid) was included in crop termination tests on cotton. It was also included in the following years where we noted that the efficiency of chemical defoliation was greatly improved on plots previously treated with TD-1123. In a termination experiment during 1974 rates of TD-1123 varying by .5 lb/A were applied during late August in combination with chlorflurenol at .5 lb/A. Rates of TD-1123 ranged from .5 to 2.0 lb/A. At the higher rates much defoliation occurred even before the application of a commercial defoliant. After the defoliant was applied a high leaf-drop was obtained even on plots treated with the lowest rate of TD-1123 (.5 lb/A).

During 1975 an experiment was conducted at the Cotton Research Center, Phoenix, Arizona to evaluate the potential of TD-1123 as a conditioner for defoliation. TD-1123 was applied at rates of .2, .35 and .5 pounds in 12 gallons water per acre. Applications were made on five dates (approximate weekly intervals) varying from one month to one day before application of a commercial defoliant (DEF-6) at 1.5 pts/A. An unseasonably early frost on October 24 and 25 in addition to excessively rank cotton growth (up to seven feet) served to detract from anticipated results.

At each rate of TD-1123 application, cotton foliage became decidedly reddened five-seven days following application, indicating an accumulation of anthocyanin. When applied at .5 lb/A there was an evident decrease in boll formation. Flowers usually shed three-four days after opening. A decrease (not significant) in seed cotton production was noted on the two earliest application dates. Foliage harvested one week after the applications of September 19 indicated no change in the content of fructose, glucose or sucrose. Starch content was somewhat variable but tended to be higher in treated foliage. Analysis of petioles indicated that treatment decreased sugar content, all three rates being about equally effective.

Efficiency of the defoliant was improved as compared to plots not treated with TD-1123 but was better as rates were increased. Best response to the defoliant application occurred when TD-1123 was applied at least one week ahead of the defoliant. Results of defoliant application have been variable and frequently unpredictable. The potential of TD-1123 to condition cotton plants for consistent leaf-drop appears encouraging. With proper timing there should be no adverse effect on the yield of seed cotton.

COTTON DEFOLIATION

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A field of cotton at the Cotton Research Center, Phoenix, was divided into two equal areas to study the effect of date of application of harvest-aid chemicals and leaf-drop. The cotton was green, rank, and four to six feet tall. These conditions result in cotton that is typically difficult to defoliate.

In general, one application of harvest-aid chemicals did not provide adequate defoliation at either application date. Harvest-aid chemicals applied at the later date when the cotton was approaching maturity provided better defoliation than the early date.

Defoliants were applied to four row plots with a high-boy applicator equipped with five nozzles per row. Total volume of solution was 24 gallons per acre and spray pressure 40 psi.