

Upland Cotton Defoliation Test

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ABSTRACT

A field study was carried out to test the effectiveness of several defoliation treatments on Upland cotton in Pinal County. Three defoliation treatments were utilized. Results showed no significant differences among treatments in terms of percent leaf drop estimates taken seven and 14 days after initial application. Subsequent applications of defoliant materials were made to accomplish satisfactory levels of defoliation prior to harvest.

INTRODUCTION

A considerable amount of work has been done to develop guidelines useful in defoliating Upland cotton (*Gossypium hirsutum* L.) in Arizona. However, due to seasonal and location variability, questions are still asked concerning advantages of one defoliation treatment versus another. In response to continued interest in this area, a small field experiment was conducted on a cooperators field (D. Prechel) in Pinal County. The objective was to compare relative differences in the effectiveness of three defoliation treatments in a single application approach.

MATERIALS AND METHODS

The materials and rates of defoliation treatments used in this study are shown in Table 1. These treatments were selected based upon the experience of local growers in recent years and commonly utilized practices. A field of DPL 90 was selected to conduct the test. The field had been planted on April 18, 1987. The last irrigation was completed on September 3. At the time of initial treatment with defoliants, the plants were still green and actively growing. Approximately 75% or greater of the bolls on the plants had begun to open at this time. Soil moisture had been depleted to the low - moderate range of available soil moisture since the last irrigation.

All treatments were applied by use of a ground-rig applicator with 10 gallons H₂O per acre as carrier to plots which were 20 rows wide (40 inch rows) and 660 feet long. The field layout of treatments was in a randomized complete block design with four replications. There was a slight gradient of overall crop vigor, yield potential and soil type in the same direction that replications were placed in the field. All treatments were applied between 0800 and 1000 hours on September 18, 1987.

All plots were evaluated on September 25, 1987 by obtaining percent leaf drop estimates. Due to unsatisfactory levels of defoliation, an additional application of sodium chlorate (2 gallons per acre of 18.5% a.i. material) plus paraquat (0.5 lb. a.i. per acre) was made on all plots on September 29. Subsequently, all plots were once again evaluated by use of percent leaf drop estimates on October 2.

RESULTS AND DISCUSSION

Percent leaf drop estimates for both the September 25 and October 2 measurement dates are shown in Table 2. As indicated by the data, plots receiving the sodium chlorate treatment had experienced the greatest degree of defoliation seven days after application of treatments. It is worthy of noting, however, that the weather was cool and cloudy, and a light rain had occurred on September 21 and persisted for several days prior to obtaining the field measurements. This type of weather would not have been conducive to a favorable response from the Folex or Dropp treatments.

The percent leaf drop estimates taken on October 2 (Table 2) indicate that any treatment differences had been completely overcome by the sodium chlorate plus paraquat application of September 29. Obviously, the overall field condition was satisfactory for mechanical picking operations to begin, which began on October 2.

From this small study, only general conclusions can be made about the effectiveness of single applications of any of the treatments utilized as shown in Table 1. Further statements regarding merits of any of the single application treatments in providing satisfactory defoliation, would be highly speculative. However, if a double application approach is under consideration, the sodium chlorate treatments may have some advantage from a cost effective standpoint. Needless to say, further evaluations of defoliation practices are in order and results from this study are helpful but less than conclusive in developing desired guidelines.

Table 1. Defoliation treatments used in the study.

Material	Rate (per acre)
Folex	2 pt (1.5 lb a.i.)
Sodium Chlorate	2 gal. (18.5% Na-chlorate)
Dropp	0.2 lb a.i.

Table 2. Percent defoliation estimates.

Treatment	Leaf Drop	
	Sept. 25	Oct. 2
	-----%	
Na-chlorate	40 a*	85 a
Folex	20 b	85 a
Dropp	15 C	90 a

*Values followed by the same letter are not significantly different at the 0.05 probability level according to pairwise comparisons using Fishers LSD.