

HVI Lint Quality as Affected by Defoliation Treatments, Marana, 1991

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Abstract

This study was conducted to determine the effect of various defoliation treatments on the HVI quality of short staple cotton. We compared two applications of sodium chlorate and Accelerate to single applications of Dropp plus crop oil with and without Accelerate. We measured significant differences in percent defoliation and desiccation. We also measured significant differences in the HVI parameters of staple, micronaire, and length.

Introduction

Virtually all Arizona cotton is now graded by high volume instruments (HVI). While the genetic potential of the cotton variety sets the limits of the parameters measured by HVI, weather and management also affect the quality of the cotton bale. We conducted this study to measure the effect of alternative defoliation treatments on HVI quality.

Materials and Methods

The test site was in an 80-acre field of Stoneville 506 cotton in Marana, Arizona. The plot design was four replications of complete randomized blocks. Each plot was 22 rows wide by about 1200 feet long. The defoliation treatments were:

- Dropp 0.25 lb/acre + crop oil 1.0 pint/acre
- Dropp 0.25 lb/acre + Accelerate 1.0 pint/acre + crop oil 1.0 pint/acre
- Sodium chlorate 2.0 gallons/acre + Accelerate 1.0 pint/acre (the cooperator's standard treatment)

We applied the treatments with a ground rig using 20 GPA of water on September 23, 1991. On October 1 the cooperator made a second application of the sodium chlorate + Accelerate treatment.

The plots were visually rated for percent defoliation and desiccation on October 7, 1991. On October 16th we harvested the center sixteen rows of each plot and dumped cotton from each treatment into separate modules.

The three modules were ginned on October 22nd. We selected the first ten bales from each module for a statistical analysis of HVI grades.

Results and Discussion

The Dropp + oil treatment resulted in a significantly lower defoliation percentage than the other treatments (Table 1). The defoliation percentage of the Dropp + Accelerate + oil treatment was not significantly lower than with the two applications of sodium chlorate + Accelerate.

The percentage of desiccated leaves remaining on the plants was significantly highest with the two applications of sodium chlorate + Accelerate, significantly less with the Dropp + Accelerate + oil treatment, and significantly the least of all treatments with Dropp + oil (Table 1).

We found significant differences in the HVI grades (Table 1). Staple was significantly lower with the two applications of sodium chlorate + Accelerate. Micronaire was significantly highest with the Dropp + oil treatment. The length of the Dropp + oil treatment was significantly higher than with the two applications of sodium chlorate + Accelerate. The length of the Dropp + Accelerate + oil treatment was not significantly different from either of the other treatments. We found no significant differences in grade, strength, or uniformity.

Acknowledgments

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Table 1. Percent defoliation, percent desiccation, and HVI grades as affected by three defoliation treatments.

Treatments and Rates	Defoliation percent	Desiccation percent	Grade	Staple	Micronaire	Strength	Length	Uniformity
Dropp + crop oil 0.25 lb/ac + 1.0 pt/ac	30 b*	3 c*	21 a*	37.6 a*	36.6 a*	26.35 a*	1.174 a*	81.8 a*
Dropp + Accelerate + crop oil 0.25 lb/ac + 1.0 pt/ac + 1.0 pt/ac	50 a	20 b	19 a	37.6 a	33.9 b	25.67 a	1.170 ab	81.6 a
Sodium chlorate + Accelerate 2.0 gal/ac + 1.0 pt/ac TWICE	55 a	38 a	20 a	37.1 b	33.6 b	25.95 a	1.162 b	81.5 a
Coefficient of Variation %	12.8	18.6	15.8	1.1	7.0	5.3	1.1	1.1

* Means within a column followed by the same letter are not significantly different at the 95% confidence level.