Result Demonstration/Applied Research Report

2004 Runnels County
Cotton Harvest Aid Demonstration
Cooperator: Mark Jacob

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Summary

Twelve treatments were applied over the top of cotton on September 14 to prepare for harvest. The plot was established on Mark Jacob's Farm located 5 mile south of Winters, Texas. The chemicals were applied to Associated Farmers Delinting AFD 3511 cotton that had 50 to 60 percent of its bolls open. Leaf shed was less than one percent when the plot was established. When these plots were evaluated on September 23, 2004 (9 days after the treatments were applied), most of the treatments resulted in an increase in leaf defoliation and leaf desiccation.

Objective

In the Concho Valley Area of Texas, cotton is usually planted starting in mid-May. Because of this planting date, many producers do not use harvest aids to terminate the cotton. When growing conditions are favorable, most of the cotton in this area is ready for harvest thirty days before the first killing freeze. The delay in harvest reduces the income of farmers due to the loss of lint yield and fiber quality. Even though the cost of several of the harvest aid treatments are expensive, there is usually a product that is economically justified that can be used effectively for crop termination. The intent of this field test is to: 1) determine the effectiveness of harvest aids at defoliating, desiccating, and opening bolls on cotton 2) provide producers the opportunity of observing how effectively the harvest aid materials work, and 3) determine the economic feasibility of using the harvest aid material.

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Materials and Methods

Cooperating County Producer: Mark Jacob
Location: 5 miles south of Winters, Texas

Crop Production Information:

- Variety Planted: Associated Farmers Delinting AFD 3511
- Planting Pattern: 2-in-1-out on 40 inch rows
- Irrigation: Dryland Production
- Number of Irrigations: None

Harvest Aid Application Information:

- Date Applied: September 14, 2004
- Wind Speed: 5.0 to 7.0 miles per hour
- Wind Direction: South
- Air Temperature: 80 to 86^0 Fahrenheit
- Relative Humidity: 50 to 65%
- Carrier: 16.5 gallons of water per acre
- Pressure: 32 pounds per square inch
- Nozzle Size: 11002 extended range flat fan over the top of each row and one 8002 Extended Range nozzle on each side of the row.
- Boom Height: 40 inches
- Cotton Height: 26 to 34 inches tall
- Ground Speed: 4.0 miles per hour
- Application Device: Self propelled rig with 13.33 foot boom
- Plot Size: 6.67 feet X 60 feet
- Test Design: randomized strip design

Plant Information

At the time of application, the upper most cotton bolls were cross-sectioned and the seed coats were dark and the cotyledons well developed. Cotton height ranged from 26 to 34 inches. Plants showed no sign of stress and leaf defoliation was less than one percent.

Results and Discussion

The cotton at the time of application was 50 to 60 percent open with most of the remaining bolls being mature. The application of the harvest aids did impact percent defoliation and percent desiccation. Factors that contributed to the success of the harvest aids applied were: 1) Chemical coverage was excellent due to gallonage, pressure used, and wind; 2) Air temperatures for the 10 days after application were warm enough to allow for good cotton plant response. Leaf defoliation was higher than the check in all treatments and the increase ranged from 11 to 81 percent on September 23, 2004 (9 days after the treatments were applied). Leaf desiccation was high in several plots where the Gramoxone Max rates were above 10 ounces. However, none of the desiccation was high enough to be a concern. The data collected on September 23 is reported in Table 1.

Table 1. Runnels County Cotton Harvest Aid Test, Mark Jacob, 2004
September 23, 2004 (9 days after treatments were applied)

Harvest Aid Chemicals Applied (4 rows of each)	Rate Applied Per Acre	Cost of Harvest Aid Per Acre	% Open Bolls	% Defoliation	% Desiccation
Ginstar	6 oz.	$8.88	70	85	0
Ginstar	4 oz.	$5.92	70	75	0
ET + Gramoxone Max + Herbimax (C.O.C.)	1 oz. + 16 oz. + 32 oz.	$2.50 + $4.32 + $2.31	80	40	30
Def + Prep + Herbimax (C.O.C.)	16 oz. + 16 oz. + 32 oz.	$6.00 + $5.00 + $2.31	75	65	1
Gramoxone Max + Activator 90	16 oz. + 5.2 oz.	$4.32 + $0.90	80	35	25
Gramoxone Max + Activator 90	8 oz. + 5.2 oz.	$2.16 + $0.90	75	50	10
ET + Gramoxone Max + Herbimax (C.O.C.)	1 oz. + 4 oz. + 32 oz.	$2.50 + $1.08 + $2.31	70	50	4
Aim + Prep + Herbimax (C.O.C.)	1 oz. + 16 oz. + 32 oz.	$5.62 + $5.00 + $2.31	75	50	3
ET + Gramoxone Max + Herbimax (C.O.C.)	1 oz. + 8 oz. + 32 oz.	$2.50 + $2.16 + $2.31	75	45	5
ET + Prep + Herbimax (C.O.C.)	1.5 oz. + 16 oz. + 32 oz.	$3.75 + $5.00 + $2.31	80	40	3
Gramoxone Max + Activator 90	6 oz. + 5.2 oz.	$1.62 + $0.90	75	20	3
Gramoxone Max + Activator 90	4 oz. + 5.2 oz.	$1.08 + $0.90	80	15	0
Check	--	$0.00	70	4	0

Results and Discussion (continued)

Prior to making any application the cotton plant was examined closely to determine if regrowth was occurring. Since most harvest aids are contact materials, nozzle type, nozzle configuration, volume of water applied and pressure are important considerations. One of the better nozzle arrangements was used in this plot. It consisted of one nozzle over the top of the row and drops in the furrows with one nozzle spraying each side of the plant. The volume of water and application pressure should be high enough to get good coverage on the top and bottom portion of the leaf and penetrate the canopy enough to properly cover the axilary and terminal buds, as well as the bolls.

No regrowth was noted in the plot. However, some of the materials applied are known to be better at desiccating or removing juvenile growth. These include Ginstar, ET and Aim.

Gramoxone Max is a harvest aid used by most dryland producers to terminate their crop. The effect of rate and type of tank additive were the focus of most of the treatments in the test. How these combinations compared to other harvest aids were also studied in this test. To get a moderate level of leaf defoliation, a minimum of six ounces of material had to be applied. The 16 ounce rate of Gramoxone Max preformed well, whether it was combined with a surfactant (Activator 90) or the crop oil concentrate (Herbimax). Increased boll opening was noted in the plots where ethephon and Gramoxone Max were applied.

Please note that a crop oil concentrate was used in tank mixes that contained ET or Aim. For maximum performance with these products that is an import part of the tank mix.

Economic Analysis

This test can be used to document the results obtained from the use of harvest aids. If the same treatments are consistently at the top of the list for several years, then producers may want to incorporate those treatments into their cotton production program. Most of the treatments were in the 6 to 10 dollar per acre range and the use of several of these treatments should result in increased profits for producers. It is important to remember that a higher lint yield is not the only way of increasing profit from the use of a harvest aid. Other factors include: timely harvest, improved fiber quality, improved harvesting efficiency, and higher percent lint turnout at the gin.

Acknowledgments

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- Syngenta Crop Protection, Inc. who provided the Gramoxone Max
- Nichino America who provided the ET
- Tri-State Chemical DBA United Agra Products (UAP) who provided the Activator 90 and Herbimax (C.O.C.)