



Result Demonstration/Applied Research Report

**2003 Howard County
Cotton Harvest Aid Demonstration
Cooperator: USDA Farm in Big Spring**

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Summary

Thirteen treatments were applied over the top cotton on September 18 to prepare cotton for harvest. The plot was established on the USDA Farm located on the North side of Big Spring, Texas. The chemicals were applied to Paymaster 2200 Roundup Ready cotton that had 63 percent of its bolls open. Leaf shed was less than two percent. When these plots were evaluated on October 2, 2003 (14 days after the treatments were applied) most of the treatments resulted in an increase in boll opening, leaf defoliation and leaf desiccation.

Objective

In the Trans-Pecos 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.

Materials and Methods

Cooperating County Producer: USDA Big Spring, Texas
Location: North side of Big Spring, Texas

Crop Production Information:

Variety Planted: Paymaster 2200 Roundup Ready
Planting Pattern: 40 inch rows planted Solid
Irrigation: Dryland Production
Number of Irrigations: None

Harvest Aid Application Information:

Date Applied: September 18, 2003
Wind Speed: 5.0 miles per hour
Wind Direction: South
Air Temperature: 72⁰ Fahrenheit
Relative Humidity: 89%
Carrier: 20.0 gallons of water per acre
Pressure: 30 pounds per square inch
Nozzle Size: 8002VS flat fan one over the top and one on each side on
40 inch centers
Boom Height: 30 inches
Cotton Height: 14 to 20 inches
Ground Speed: 4.0 miles per hour
Application Device: Self propelled rig with 13.33 foot boom
Plot Size: 13.33 feet X 600 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 25 to 35 inches. Plants showed some signs of stress and leaf defoliation was less than two percent.

Results and Discussion

The application of the harvest aids did not impact boll opening significantly. The primary reason for the minimal impact was due to 70 percent of the cotton being open at the time harvest aids were applied. Leaf defoliation was higher than the check in most of the treatments by the time of the evaluation conducted on October 2, 2003 (14 days after the treatments were applied). Leaf desiccation was high in most of the plots where Gramoxone Max rates above 10 ounces were used. The information collected on October 2 is reported in Table 1.

Table 1. Howard County Cotton Harvest Aid Test, 2003
 October 2, 2003 (14 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	Regrowth Rating Top, Bottom
ET™ + Induce	2.0 oz. + 3.52 oz.	\$5.62 + \$0.51	75	90	10	Top= 1 Bottom= 1
ET™ + Gramoxone® Max + Induce	1.0 oz. + 10.0 oz. + 3.52 oz.	\$2.81 + \$2.69 + \$0.51	80	5	95	Top= 0 Bottom= 1
Aim™ + C.O.C.	1.0 oz. + 16 oz.	\$5.63 + \$1.16	80	50	50	Top= 0 Bottom= 1
Aim™ + Gramoxone® Max + C.O.C.	0.5 oz. + 10 oz. + 16.0 oz.	\$2.82 + \$2.69 + \$1.16	75	10	90	Top= 0 Bottom=1
Check	--	\$0.00	70	5	0	Top= 1 Bottom=1
Aim™ + Gramoxone® Max + Induce	0.5 oz. + 10.0 oz. + 3.52 oz.	\$2.82 + \$2.69 + \$0.51	85	5	95	Top= 0 Bottom=1
Ginstar	4.0 oz.	\$5.88	85	80	20	Top= 0 Bottom= 0
Gramoxone® Max + C.O.C.	16.0 oz. + 16.0 oz.	\$4.30 + \$1.16	80	10	90	Top= 0 Bottom=1
Gramoxone® Max + Induce	16.0 oz. + 3.52 oz.	\$4.30 + \$0.51	85	10	90	Top= 0 Bottom=1
Gramoxone® Max + L.I.700	16.0 oz. + 6.4 oz.	\$4.30 + \$1.27	85	10	90	Top= 0 Bottom=1
Gramoxone® Max + Induce	10 oz. + 3.52 oz.	\$2.69 + \$0.51	80	15	85	Top= 1 Bottom=1
Gramoxone® Max + Induce	4.0 oz. + 3.52 oz.	\$1.08 + \$0.51	85	95	5	Top= 3 Bottom=3
Aim™ + C.O.C.	1.5 oz. + 16 oz.	\$8.45 + \$1.16	85	15	85	Top= 0 Bottom=1
Aim™ + Gramoxone® Max + Induce	1.0 oz. + 10.0 oz. + 3.52 oz.	\$5.63 + \$2.69 + \$0.51	85	20	80	Top= 0 Bottom=1
North Side Of Field						

Results and Discussion (continued)

When these plots were evaluated on October 2, 2003 (14 days after the treatments were applied) most of the treatments applied had a significant difference in leaf defoliation and leaf desiccation when compared to the check. The lack of regrowth in all of the treatments except Gramoxone Max at 4 ounces plus Induce at 3.52 ounces was impressive. This lack of regrowth made it possible to harvest the test plot after the first application of harvest aid. The reason for this success is due to the nozzle arrangement used and the increased volume of water applied. The increased level of coverage on the top and bottom portion of the leaf and the desiccation of axillary and terminal buds helped to prepare the crop for harvest.

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. Both the 10 and 16 ounce rates defoliated and desiccated the cotton plant to the point that it was ready for harvest. Gramoxone Max preformed well whether it was combined with the surfactant Induce, the crop oil concentrate Herbimax, or a buffering surfactant L.I.-700. The 4 ounce rate per acre of Gramoxone Max provided a high level of defoliation but the regrowth was almost equal to the original canopy by the time it was evaluated 14 days after the treatments were applied.

Aim when applied in combination with the required Crop Oil Concentrate provided additional defoliation. Aim combined with Gramoxone Max is usually a good tank mix, but in this test it resulted in more desiccated leaves being retained by the plant. Hopefully, most of these leaves will be removed in the harvest and gin process.

A new harvest aid ET was evaluated in this plot. When it was applied at 2.0 ounces per acre combined with 3.52 ounces of Induce prepared the crop for harvest better than most of the treatments in this test. When ET at 1.0 ounce was combined with Gramoxone Max at 10 ounces the plot was harvestable but 95 percent of the leaves still remained attached to the cotton plant. According to Nichino America, the company that sells ET, a crop oil concentrate should be used instead of a surfactant.

Ginstar at 4 ounces alone provided a high level of defoliation and a higher than expected amount of desiccation. In this test it was one of the better treatments and within the set price range. Out of the six tests established this season that included this treatment. This is the only test that an application of a desiccant was not needed before harvest could be conducted.

The rainfall received in September and October has increased the difficulty of terminating this cotton crop. Producers will have to examine their cotton closely and if regrowth is already occurring they need to change nozzle configuration, increase the amount of water being applied and increase the application pressure. One of the better nozzle arrangements is the one used in this test, one nozzle over the top of the row and drops in the furrows with one nozzle spraying each side of the plant. The increased volume of water and pressure should be high enough to get good coverage on the top and bottom portion of the leaf and penetrate the canopy enough to burn the axillary and terminal buds.

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 8 dollar range per acre 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.

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- Syngenta Crop Protection, Inc. who provided the Gramoxone Max
- Tri-State Chemical DBA United Agra Products (UAP) who provided the L.I. 700 and C. O.C. (Herbimax)
- Helena Chemical Company who provided the Induce

Trade names of commercial products used in this report are included only for better understanding and clarity. Reference to commercial products or trade names is made with the understanding that no discrimination is intended and no endorsement by the Texas A&M University System is implied. Readers should realize that results from one experiment do not represent conclusive evidence that the same response would occur where conditions vary.