



Result Demonstration/Applied Research Report

**2003 Scurry County
Cotton Harvest Aid Demonstration
Cooperator: Morris Light**

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Summary

Fifteen treatments were applied over the top cotton on September 24 to prepare cotton for harvest. The plot was established on Morris Light's Farm located 7 miles north and 8 miles west of Roscoe. The chemicals were applied to cotton that had 70 percent of its bolls open. Leaf shed was less than two percent. When these plots were evaluated on September 30 and October 8, most of the treatments resulted in an increase in leaf defoliation and leaf desiccation.

Objective

In the Southern Rolling Plains 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: Morris Light
Location: One mile North of Inadale in Scurry County

Crop Production Information:

Planting Pattern: Four-in-1-out on 40 inch rows
Number of Irrigations: None – Dryland Production

Harvest Aid Application Information:

Date Applied: September 24, 2003
Wind Speed: 4.0 to 8.0 miles per hour
Wind Direction: South by Southeast
Air Temperature: 88 to 92⁰ Fahrenheit
Relative Humidity: 50 to 65%
Carrier: 16.0 gallons of water per acre
Pressure: 37 pounds per square inch
Nozzle Size: 110025 air induction fan over the top; 20 inch centers
Boom Height: 36 inches
Cotton Height: 28 to 30 inches
Ground Speed: 4.0 miles per hour
Application Device: Self propelled rig
Plot Size: four 40 inch rows 50 feet long
Test Design: randomized complete block design with three replications

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 28 to 30 inches. Plants showed some signs of stress and leaf defoliation was less than two percent.

Results and Discussion

When these plots were evaluated on September 30 and October 8, 2003 (7 and 14 days after the plot was established) most of the treatments applied had significantly more desiccation and defoliation than the check plot. The amount of defoliation ranged from 23 to 92 percent seven days after the treatments were applied. The amount of defoliation ranged from 46 to 93 percent 14 days after the treatments were applied. At the September 30 evaluation the desiccation ranged from 2 to 36 percent and at the October 8 evaluation desiccation ranged from 2 to 17 percent. The amount of regrowth in the top and bottom portion of the plants was high enough to be a concern in several of the treatments. Data collected on September 30 is reported in Table 1 and data collect October 8 is reported in Table 2..

Table 1. Scurry County Cotton Harvest Aid Test, 2003
September 30, 2003 (7 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
Check	--	\$0.00	70	0.0 h	0.0 g	1.0 c
Gramoxone® Max + Induce	4.0 oz. + 3.52 oz.	\$1.08 + \$0.51	75	23.3 g	36.7 a	1.0 c
Gramoxone® Max + Induce	10 oz. + 3.52 oz.	\$2.69 + \$0.51	75	75.0 bcd	16.7 bcde	2.0 ab
Gramoxone® Max + L.I.700	10.0 oz. + 3.52 oz.	\$2.69 + \$0.70	75	70.0 cde	20.0 bcd	2.0 ab
Gramoxone® Max + C.O.C.	10.0 oz. + 16.0 oz.	\$2.69 + \$1.16	75	63.3 def	26.7 abc	2.3 a
Gramoxone® Max + Induce	16.0 oz. + 3.52 oz.	\$4.30 + \$0.51	75	88.3 a	8.3 defg	2.0 ab
Gramoxone® Max + L.I.700	16.0 oz. + 3.52 oz.	\$4.30 + \$0.70	75	92.3 a	7.5 efg	1.5 bc
Gramoxone® Max + C.O.C.	16.0 oz. + 16.0 oz.	\$4.30 + \$1.16	75	81.7 abc	13.3 def	1.7 b
Ginstar	4.0 oz.	\$5.88	75	50.2 f	1.7 fg	1.0 c
Ginstar	6.0 oz.	\$8.82	75	60.0 def	6.7 efg	1.0 c
Aim™ + Gramoxone® Max + Induce	0.5 oz. + 10.0 oz. + 3.52 oz.	\$2.82 + \$2.69 + \$0.51	75	76.7 abcd	17.7 bcde	1.0 c
Aim™ + Gramoxone® Max + C.O.C.	0.5 oz. + 10 oz. + 16.0 oz.	\$2.82 + \$2.69 + \$1.16	75	76.7 abcd	20.0 bcd	1.0 c
Aim™ + C.O.C.	1.0 oz. + 16.0 oz.	\$5.63 + \$1.16	75	56.7 ef	33.3 a	1.0 c
ET™ + Gramoxone® Max + Induce	1.0 oz. + 10.0 oz. + 3.52 oz.	\$2.81 + \$2.69 + \$0.51	75	85.0 abc	15.0 cde	1.0 c
ET™ + C.O.C.	2.0 oz. + 16.0 oz.	\$5.62 + \$1.16	75	60.0 def	28.3 ab	1.0 ce
Gramoxone® Max + Prep + Induce	3.5 oz. + 16.0 oz. + 3.52 oz.	\$0.94 + \$6.52 + \$0.51	75	60.0 def	16.7 bcde	1.7 b

NOTE: In Table 1 the individual or combination of letter a, b, c, d, e, f, g, or h beside the number are to indicate statistical significance. There is no statistical difference between numbers that have the same letter to the side (even when there appears to be a large difference in results between the materials applied).

Table 2. Scurry County Cotton Harvest Aid Test, 2003
October 8, 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
Check	--	\$0.00	75	1.7 d	0.0 d	1.3 cde
Gramoxone® Max + Induce	4.0 oz. + 3.52 oz.	\$1.08 + \$0.51	85	53.3 bc	13.3 ab	1.7 bcd
Gramoxone® Max + Induce	10 oz. + 3.52 oz.	\$2.69 + \$0.51	85	84.7 a	2.7 cd	2.7 a
Gramoxone® Max + L.I.700	10.0 oz. + 3.52 oz.	\$2.69 + \$0.70	85	81.7 a	5.0 cd	2.3 ab
Gramoxone® Max + C.O.C.	10.0 oz. + 16.0 oz.	\$2.69 + \$1.16	85	83.3 a	6.7 bcd	2.3 ab
Gramoxone® Max + Induce	16.0 oz. + 3.52 oz.	\$4.30 + \$0.51	85	88.3 a	4.0 cd	2.3 ab
Gramoxone® Max + L.I.700	16.0 oz. + 3.52 oz.	\$4.30 + \$0.70	85	93.3 a	1.9 cd	2.0 abc
Gramoxone® Max + C.O.C.	16.0 oz. + 16.0 oz.	\$4.30 + \$1.16	85	92.7 a	3.3 cd	2.3 ab
Ginstar	4.0 oz.	\$5.88	85	58.3 bc	6.2 bcd	0.8 de
Ginstar	6.0 oz.	\$8.82	85	71.7 ab	5.0 cd	0.7 e
Aim™ + Gramoxone® Max + Induce	0.5 oz. + 10.0 oz. + 3.52 oz.	\$2.82 + \$2.69 + \$0.51	85	88.3 a	4.7 cd	1.7 bcd
Aim™ + Gramoxone® Max + C.O.C.	0.5 oz. + 10 oz. + 16.0 oz.	\$2.82 + \$2.69 + \$1.16	85	88.7 a	3.0 cd	1.7 bcd
Aim™ + C.O.C.	1.0 oz. + 16.0 oz.	\$5.63 + \$1.16	85	58.3 bc	16.7 a	1.7 bcd
ET™ + Gramoxone® Max + Induce	1.0 oz. + 10.0 oz. + 3.52 oz.	\$2.81 + \$2.69 + \$0.51	85	89.7 a	3.7 cd	1.7 bcd
ET™ + C.O.C.	2.0 oz. + 16.0 oz.	\$5.62 + \$1.16	85	70.0 ab	10.0 abc	1.3 cde
Gramoxone® Max + Prep + Induce	3.5 oz. + 16.0 oz. + 3.52 oz.	\$0.94 + \$6.52 + \$0.51	85	46.7 c	8.3 bc	2.0 abc

NOTE: In Table 2 the individual or combination of letter a, b, c, d, or e beside the number are to indicate statistical significance. There is no statistical difference between numbers that have the same letter to the side (even when there appears to be a large difference in results between the materials applied).

Results and Discussion (continued)

When the plots were evaluated on October 8, 2003 (14 days after the plot was established) the amount of defoliation had increased in most plots. The amount of desiccation had decreased in most plots when compared to data collected September 30. None of the plots had enough desiccation to be a concern. The amount of regrowth in the top and bottom portion of the plants was high enough to be a concern in many of the treatments. The data shown in Table 1 indicates how quickly the cotton responded to the treatments applied. The remaining discussion will focus on the data reported in Table 2.

If 10 ounces or more of Gramoxone Max was applied alone or in a tank mix the level of defoliation was over 81 percent. When 4 ounces or less of Gramoxone Max was applied per acre the range of defoliation was 46 to 53 percent. Gramoxone Max performed well whether it was combined with the surfactant Induce, the crop oil concentrate Herbimax, or a buffering surfactant L.I.-700. The amount of regrowth in the top and bottom portion of the plants was high enough to be a concern in these treatments.

In the treatment where Aim was applied at the 0.5 ounce rate some suppression occurred but it was short lived. Aim combined with Gramoxone Max was a good tank mix partner and will probably be used by producers as they terminate this cotton crop. The amount of Aim in the tank mix needed to be increased to at least 1 ounce per acre to provide additional suppression of regrowth.

A new harvest aid ET was evaluated in this plot. When it was applied at 2.0 ounces per acre combined with 16.0 ounces of C.O.C. provided the same level of defoliation and desiccation as ET at 1.0 ounce combined with Gramoxone Max at 10 ounces plus Induce at 3.52 ounces. In both plots green leaves remained on the plant, regrowth was becoming a problem, and another application of a harvest aid would be needed before this crop could be harvested. According to Nichino America, the company that sells ET, a crop oil concentrate should be used instead of a surfactant.

Ginstar defoliated better at 6 ounces than at 4, however, at that rate the cost of this harvest aid is high enough that most dryland producers will select a different harvest aid. Ginstar used at 4 and 6 ounces provided some of the best regrowth suppression of the treatments applied in this test.

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 one nozzle over the top of the row and drops in the furrows with one nozzle spraying each side of the plant. Coverage is critical! The 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.

Acknowledgments

I want to take this opportunity to thank Morris Light for his help in plot establishment and management.

I would also like to thank the companies that provided the chemicals for this harvest aid test, these included:

- Bayer Corporation provided the Ginstar and Prep
- FMC Corporation who provided the Aim
- Nichino America who provided the ET
- 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.