



## **Result Demonstration/Applied Research Report**

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**2003 Mitchell County  
Cotton Harvest Aid Demonstration  
Cooperator: Todd Shaw**

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### **Summary**

Fifteen treatments were applied over the top cotton on September 23 to prepare cotton for harvest. The plot was established on Todd Shaw's Farm located 4 miles north and 2 miles east of Colorado City. The chemicals were applied to cotton that had 60 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: Todd Shaw  
Location: Three miles East of Buford in Mitchell County

### Crop Production Information:

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

### Harvest Aid Application Information:

Date Applied: September 23, 2003  
Wind Speed: 3.0 to 6.0 miles per hour  
Wind Direction: Southeast  
Air Temperature: 88 to 92<sup>0</sup> Fahrenheit  
Relative Humidity: 50 to 65%  
Carrier: 14.0 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: 20 to 25 inches  
Ground Speed: 4.0 miles per hour  
Application Device: Self propelled rig  
Plot Size: two 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 20 to 25 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 33 to 96 percent seven days after the treatments were applied. The amount of defoliation ranged from 60 to 99 percent 14 days after the treatments were applied. Desiccation was less than 12 percent for any treatment at both evaluations. 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. Mitchell 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	1.0 d	0.0 d	3.0 ab
Gramoxone® Max + Induce	4.0 oz. + 3.52 oz.	\$1.08 + \$0.51	75	33.3 bc	13.3 ab	3.3 a
Gramoxone® Max + Induce	10 oz. + 3.52 oz.	\$2.69 + \$0.51	75	93.3 a	4.0 cd	3.0 ab
Gramoxone® Max + L.I.700	10.0 oz. + 3.52 oz.	\$2.69 + \$0.70	75	91.7 a	5.0 cd	3.0 ab
Gramoxone® Max + C.O.C.	10.0 oz. + 16.0 oz.	\$2.69 + \$1.16	75	90.0 a	6.7 bcd	3.3 a
Gramoxone® Max + Induce	16.0 oz. + 3.52 oz.	\$4.30 + \$0.51	75	96.3 a	3.7 cd	2.7 ab
Gramoxone® Max + L.I.700	16.0 oz. + 3.52 oz.	\$4.30 + \$0.70	75	69.3 abc	4.0 cd	2.7 ab
Gramoxone® Max + C.O.C.	16.0 oz. + 16.0 oz.	\$4.30 + \$1.16	75	93.3 a	6.7 bcd	2.3 abc
Ginstar	4.0 oz.	\$5.88	75	75.0 ab	10.0 abc	2.0 bc
Ginstar	6.0 oz.	\$8.82	75	73.3 abc	16.7 a	1.3 cd
Aim™ + Gramoxone® Max + Induce	0.5 oz. + 10.0 oz. + 3.52 oz.	\$2.82 + \$2.69 + \$0.51	75	81.7 a	11.7 abc	2.3 abc
Aim™ + Gramoxone® Max + C.O.C.	0.5 oz. + 10 oz. + 16.0 oz.	\$2.82 + \$2.69 + \$1.16	75	87.7 a	7.3 bcd	1.0 d
Aim™ + C.O.C.	1.0 oz. + 16.0 oz.	\$5.63 + \$1.16	75	71.7 abc	8.3 bc	1.3 cd
ET™ + Gramoxone® Max + Induce	1.0 oz. + 10.0 oz. + 3.52 oz.	\$2.81 + \$2.69 + \$0.51	75	80.0 a	5.0 cd	2.3 abc
ET™ + C.O.C.	2.0 oz. + 16.0 oz.	\$5.62 + \$1.16	75	85.0 a	7.3 bcd	2.3 abc
Gramoxone® Max + Prep + Induce	3.5 oz. + 16.0 oz. + 3.52 oz.	\$0.94 + \$6.52 + \$0.51	75	55.0 abc	11.7 abc	2.7 ab

NOTE: In Table 2 the individual or combination of letter a, b, c, or d 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. Mitchell 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	1.0 d	3.3 abc	2.0 ab
Gramoxone® Max + Induce	4.0 oz. + 3.52 oz.	\$1.08 + \$0.51	85	60.0 c	8.3 ab	2.7 a
Gramoxone® Max + Induce	10 oz. + 3.52 oz.	\$2.69 + \$0.51	85	95.0 a	2.3 bc	2.3 ab
Gramoxone® Max + L.I.700	10.0 oz. + 3.52 oz.	\$2.69 + \$0.70	85	92.7 ab	2.7 bc	2.3 ab
Gramoxone® Max + C.O.C.	10.0 oz. + 16.0 oz.	\$2.69 + \$1.16	85	96.7 a	1.3 bc	2.7 a
Gramoxone® Max + Induce	16.0 oz. + 3.52 oz.	\$4.30 + \$0.51	85	98.0 a	0.7 c	2.0 ab
Gramoxone® Max + L.I.700	16.0 oz. + 3.52 oz.	\$4.30 + \$0.70	85	92.7 ab	1.7 bc	2.0 ab
Gramoxone® Max + C.O.C.	16.0 oz. + 16.0 oz.	\$4.30 + \$1.16	85	99.3 a	0.3 c	1.3 b
Ginstar	4.0 oz.	\$5.88	85	86.7 ab	3.7 abc	1.3 b
Ginstar	6.0 oz.	\$8.82	85	91.7 ab	3.0 abc	1.3 b
Aim™ + Gramoxone® Max + Induce	0.5 oz. + 10.0 oz. + 3.52 oz.	\$2.82 + \$2.69 + \$0.51	85	91.7 ab	3.7 abc	2.0 ab
Aim™ + Gramoxone® Max + C.O.C.	0.5 oz. + 10 oz. + 16.0 oz.	\$2.82 + \$2.69 + \$1.16	85	97.7 a	1.0 bc	1.3 b
Aim™ + C.O.C.	1.0 oz. + 16.0 oz.	\$5.63 + \$1.16	85	81.7 ab	6.7 abc	1.3 b
ET™ + Gramoxone® Max + Induce	1.0 oz. + 10.0 oz. + 3.52 oz.	\$2.81 + \$2.69 + \$0.51	85	96.0 a	1.0 bc	2.0 ab
ET™ + C.O.C.	2.0 oz. + 16.0 oz.	\$5.62 + \$1.16	85	94.3 a	2.7 bc	1.7 ab
Gramoxone® Max + Prep + Induce	3.5 oz. + 16.0 oz. + 3.52 oz.	\$0.94 + \$6.52 + \$0.51	85	73.3 bc	10.0 a	2.0 ab

NOTE: In Table 2 the individual or combination of letter a, b, or c shown 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 most 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 90 percent. When 4 ounces or less of Gramoxone Max was applied per acre the range of defoliation was 60 to 73 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 three percent of the 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 performed well at the 4 and 6 ounces per acre rate, however, the cost of this harvest aid is high enough that most dryland producers will select a different harvest aid. Ginstar did provide some regrowth suppression but it was short lived.

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 Todd Shaw 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.