



Result Demonstration/Applied Research Report

2003 Glasscock County Cotton Harvest Aid Demonstration Cooperator: Michael Fuchs

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Summary

Fourteen treatments were applied over the top cotton on August 27 to prepare cotton for harvest. The plot was established on Michael Fuchs's Farm located 1 mile south of the intersection of farm road 2401 and farm road 137 on the west side of the road. The chemicals were applied to cotton that had 15 percent of its bolls open. Leaf shed was less than two percent. When these plots were evaluated on September 3 and 9, 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: Michael Fuchs
Location: 1 mile south of the intersection of farm road 2401 and farm road 137 on the west side of the road

Crop Production Information:

Variety Planted: Deltapine 5415
Planting Pattern: Two-in-1-out on 40 inch rows
Number of Irrigations: Pre-Irrigation Only

Harvest Aid Application Information:

Date Applied: August 27, 2003
Wind Speed: 5.0 to 9.0 miles per hour
Wind Direction: South by Southeast
Air Temperature: 88 to 92⁰ Fahrenheit
Relative Humidity: 50 to 65%
Carrier: 10.0 gallons of water per acre
Pressure: 30 pounds per square inch
Nozzle Size: 11002 extended range flat 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: two 40 inch rows 100 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 3, 2003 (7 days after the plot was established) most of the treatments applied had visually more desiccation than the check plot. Some defoliation was occurring and it ranged from 1 to 8 percent except in the Gramoxone® Max @ 10 ounces plus Induce @ 3.52 ounces per acre that had 75 percent of its original leaves defoliated. The amount of regrowth in the top and bottom portion of the plants varied between treatments, however, no regrowth was high enough to impact harvesting or ginning. Data collected on September 3 is reported in Table 1.

Table 1. Glasscock County Cotton Harvest Aid Test, 2003
September 3, 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 Top, Bottom
Gramoxone® Max + Induce	4.0 oz. + 3.52 oz.	\$1.08 + \$0.51	65	5	70	Top= 0 Bottom= 0
Gramoxone® Max + Induce	10 oz. + 3.52 oz.	\$2.69 + \$0.51	65	75	8	Top= 1 Bottom= 1
Gramoxone® Max + L.I.700	16.0 oz. + 6.4 oz.	\$4.30 + \$1.27	70	8	90	Top= 0 Bottom= 0
Gramoxone® Max + Induce	16.0 oz. + 3.52 oz.	\$4.30 + \$0.51	75	6	90	Top= 0 Bottom= 0
Gramoxone® Max @ + Miller Plex	16 oz. + 2 oz.	\$4.30 + 1.10	75	5	95	Top= 0 Bottom= 0
Gramoxone® Max @ + Miller Plex + Induce	16 oz. + 2 oz. + 3.52 oz.	\$4.30 + \$1.10 + \$0.51	80	5	95	Top= 0 Bottom= 0
Gramoxone® Max + C.O.C.	16.0 oz. + 16.0 oz.	\$4.30 + \$1.16	75	6	90	Top= 0 Bottom= 1
Check	--	\$0.00	25	3	0	Top= 0 Bottom= 0
Aim™ + Gramoxone® Max + Induce	0.5 oz. + 10.0 oz. + 3.52 oz.	\$2.82 + \$2.69 + \$0.51	70	7	85	Top= 1 Bottom= 1
Resource + Gramoxone® Max + Induce	4.6 oz. + 10.0 oz. + 3.52 oz.	\$5.46 + \$2.69 + \$0.51	70	5	75	Top= 0 Bottom= 0
Aim™ + Gramoxone® Max + C.O.C.	0.5 oz. + 10 oz. + 16.0 oz.	\$2.82 + \$2.69 + \$1.16	65	5	70	Top= 1 Bottom= 1
Ginstar	4.0 oz.	\$5.88	30	1	25	Top= 0 Bottom= 0
Finish Pro 6	21 oz.	\$14.07	25	2	5	Top= 0 Bottom= 0
Gramoxone® Max + Prep + Induce	3.5 oz. + 16.0 oz. + 3.52 oz.	\$0.94 + \$6.52 + \$0.51	45	4	35	Top= 0 Bottom= 0
ET™ + Gramoxone® Max + Induce	1.0 oz. + 10.0 oz. + 3.52 oz.	\$2.81 + \$2.69 + \$0.51	80	6	87	Top= 1 Bottom= 0

Table 1. Glasscock County Cotton Harvest Aid Test, 2003
September 9, 2003 (13 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
Gramoxone® Max + Induce	4.0 oz. + 3.52 oz.	\$1.08 + \$0.51	88.33 ab	50 abcdef	7 efg	Top= 1 Bottom= 1
Gramoxone® Max + Induce	10 oz. + 3.52 oz.	\$2.69 + \$0.51	93.33 a	80 a	7.33 efg	Top= 1 Bottom= 1
Gramoxone® Max + L.I.700	16.0 oz. + 6.4 oz.	\$4.30 + \$1.27	95 a	35 defgh	60 abc	Top= 1 Bottom= 1
Gramoxone® Max + Induce	16.0 oz. + 3.52 oz.	\$4.30 + \$0.51	91.66 ab	25 efgh	70 ab	Top= 1 Bottom= 1
Gramoxone® Max @ + Miller Plex	16 oz. + 2 oz.	\$4.30 + 1.10	93.33 a	16 gh	83.33 a	Top= 1 Bottom= 1
Gramoxone® Max @ + Miller Plex + Induce	16 oz. + 2 oz. + 3.52 oz.	\$4.30 + \$1.10 + \$0.51	93.33 a	28.33 efgh	70 ab	Top= 1 Bottom= 1
Gramoxone® Max + C.O.C.	16.0 oz. + 16.0 oz.	\$4.30 + \$1.16	93.33 a	46.66 bcdefg	48.33 bcd	Top= 1 Bottom= 1
Check	--	\$0.00	75 c	6 h	0 g	Top= 0 Bottom= 0
Aim™ + Gramoxone® Max + Induce	0.5 oz. + 10.0 oz. + 3.52 oz.	\$2.82 + \$2.69 + \$0.51	93.33 a	55 abcde	36.66 cde	Top= 1 Bottom=1
Resource + Gramoxone® Max + Induce	4.6 oz. + 10.0 oz. + 3.52 oz.	\$5.46 + \$2.69 + \$0.51	93.33 a	63.33 abcd	31.66 cdef	Top= 1 Bottom= 1
Aim™ + Gramoxone® Max + C.O.C.	0.5 oz. + 10 oz. + 16.0 oz.	\$2.82 + \$2.69 + \$1.16	93.33 a	68.33 abc	25 defg	Top= 1 Bottom= 1
Ginstar	4.0 oz.	\$5.88	83.33 b	76.66 ab	2 fg	Top= 1 Bottom= 0
Finish Pro 6	21 oz.	\$14.07	91.66 ab	20 fgh	0 g	Top= 0 Bottom= 0
Gramoxone® Max + Prep + Induce	3.5 oz. + 16.0 oz. + 3.52 oz.	\$0.94 + \$6.52 + \$0.51	86.66 ab	36.66 cdefgh	5.66 fg	Top= 1 Bottom= 1
ET™ + Gramoxone® Max + Induce	1.0 oz. + 10.0 oz. + 3.52 oz.	\$2.81 + \$2.69 + \$0.51	88.33 ab	45.33 bcdefg	45.66 bcd	Top= 1 Bottom= 1

Results and Discussion (continued)

When the plots were evaluated on September 9, 2003 (13 days after the plot was established) the amount of defoliation had increased significantly. The amount of desiccation in most treatments were lower than when evaluated September 3. In some treatments the amount of desiccated leaf remaining on the cotton plant was a concern. The amount of regrowth in the top and bottom portion of the plants varied between treatments, however, no regrowth was high enough to impact harvesting or ginning. Data collected on September 9 is reported in Table 2.

Gramoxone Max applied at the 10 ounce rate had the highest level of defoliation. Although the amount of defoliation was 30 percent better than the plot where Gramoxone Max was applied at 4 ounces per acre there was enough variability between the test plots that it was not significantly better. The same is true about the percent of desiccated leaves between the 10 ounce and 4 ounce treatments. When 16 ounces of Gramoxone Max was applied it worked as a desiccant and a significantly high percentage of the leaves remained on the plant. At all treatment levels the amount of boll opening was significantly higher than the check plot. Gramoxone Max performed well whether it was combined with the surfactant Induce, the crop oil concentrate Herbimax, or a buffering surfactant L.I.-700. When Miller Plex was combined with Gramoxone Max it did increase the level of desiccation when compared to most of the treatments it was significantly higher.

In the treatment where Aim was applied at the 0.5 ounce rate the material did not provide suppress or control regrowth. 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 suppress or control regrowth.

A couple of new products were applied this year that work similar to Aim. Resource and ET were tank mixed with Gramoxone Max and they provided similar control. The cost of these harvest aids will impact there adoption by producers. ET is priced competitively and the price of Resource is high enough that producers will select between the other two products.

Finish Pro 6 did not perform well in this test and that was due to a mistake on my part. It should have been combined with Ginstar or Def to increase the performance. However, the price is high enough that dryland producers will use a cheaper harvest aid unless they have a yield potential of more than 500 pounds of lint per acre.

Ginstar performed well for the amount of material applied. To provide more regrowth suppression in the top of the cotton plant a higher rate of Ginstar needs to be applied. The cost of this harvest aid is high enough to keep most dryland producers from using it to defoliate their cotton.

Several of the treatments in this test provided enough defoliation and desiccation to allow for harvest of the crop. The amount of leaf trash is high enough to be a concern. Hopefully, most of these leaves will be removed before the cotton is pressed into a bale.

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

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

- Bayer Corporation provided the Def, Finish, Ginstar, and Prep
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- Syngenta Crop Protection, Inc. who provided the Gramoxone Max
- Valent U.S.A. Corporation who provided the Resource
- 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

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