



Result Demonstration/Applied Research Report

**2005 Runnels County
Cotton Harvest Aid Demonstration
Cooperators: Dennis Minzenmayer**

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Summary

Twelve treatments were applied over the top of cotton on September 21 to prepare for harvest. The plot was established on Dennis Minzenmayer's Farm located 5 miles south of Ballinger, Texas. The chemicals were applied to Deltapine 488 BG/RR cotton that had 70 percent of its bolls open. Leaf shed was less than one percent when the plot was established. When these plots were evaluated on September 29, 2005 (8 days after the treatments were applied) and October 5, 2005 (14 days after the treatments were applied), most of the treatments resulted in an increase in open bolls, 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.

Materials and Methods

Cooperating County Producer: Dennis Minzenmayer
Location: 5 miles south of Ballinger, Texas

Crop Production Information:

Variety Planted: Deltapine 488 BG/RR
Planting Pattern: Planted 2-in-1-out
Planting Date: May 24, 2005
Number of Irrigations: None - Dryland Production

Harvest Aid Application Information:

Date Applied: September 21, 2005
Wind Speed: 4.0 to 5.0 miles per hour
Wind Direction: Southwest
Air Temperature: 81 to 88⁰ Fahrenheit
Relative Humidity: 42 to 59%
Carrier: 15.0 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: 34 inches
Cotton Height: 26 inches
Ground Speed: 4.0 miles per hour
Application Device: Self propelled rig with 13.33 foot boom
Plot Size: 13.33 feet X 60 feet
Test Design: randomized block design replicated four times

Plant Information

At the time of application, the upper most cotton bolls were cross-sectioned, the seed coats were dark, and the cotyledons well developed. Cotton height ranged from 24 to 28 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 70 percent open with most of the remaining bolls being mature. The application of the harvest aids did impact boll opening, percent defoliation and percent desiccation. Several factors contributed to the success of the harvest aids applied, these include: 1) The cotton was mature; 2) Chemical coverage was excellent due to gallonage, pressure used, and wind; 3) Air temperatures for the 14 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 27 to 85 percent on September 29, 2005 (8 days after the treatments were applied). None of the regrowth was high enough to be a concern. The data collected on September 29 is reported in Table 1. The test plot was evaluated on October 5, 2005 (14 Day after the treatments were applied) and the data collected is reported in Table 2.

Table 1. Runnels County Cotton Harvest Aid Test, Dennis Minzenmayer,
September 29, 2005 (8 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
Blizzard + Gramoxone Max + Herbimax (C.O.C.)	0.5 oz. + 16 oz. + 1% v/v	\$3.50 + \$4.38 + \$1.38	87.50 abc	54.25 cde	38.75 cd
Gramoxone Inteon + Activator 90	24 oz. + 0.5% v/v	\$4.38 + \$1.68	88.75 ab	36.00 fg	60.00 a
Gramoxone Max + Activator 90	16 oz. + 0.5% v/v	\$4.38 + \$1.68	90.00 a	40.00 fg	55.00 ab
Gramoxone Max + LI 700	16 oz. + 0.5% v/v	\$4.38 + \$1.87	88.75 ab	40.75 fg	53.75 abc
Gramoxone Max + Activator 90	12 oz. + 0.5% v/v	\$3.29 + \$1.68	86.25 abcd	44.25 efg	50.00 abc
Gramoxone Max + Induce	16 oz. + 0.5% v/v	\$4.38 + \$1.50	90.00 a	32.25 g	61.75 a
Aim + Gramoxone Max + Herbimax (C.O.C.)	0.75 oz. + 16 oz. + 1% v/v	\$4.10 + 4.38 + 1.38	85.00 bcd	47.50 def	42.50 bcd
Ginstar + Prep	4 oz. + 16 oz.	\$5.92 + \$4.13	82.50 de	85.00 a	3.75 e
ET + Gramoxone Max + Herbimax (C.O.C.)	1.25 oz. + 8 oz. + 1% v/v	\$3.13 + \$2.19 + \$1.38	85.00 bcd	74.25 b	12.00 e
Gramoxone Max + Activator 90	8 oz. + 0.5% v/v	\$2.19 + \$1.68	83.75 cde	59.00 cd	28.75 d
ET + Prep + Herbimax (C.O.C.)	1.5 oz. + 21 oz. + 1% v/v	\$3.75 + \$5.42 + \$1.38	85.00 bcd	74.75 b	4.00 e
Aim + CottonQuik Herbimax (C.O.C.)	0.75 oz. + 32 oz. + 1% v/v	\$4.10 + \$6.02 + \$1.38	87.50 abc	64.00 bc	9.75 e
Check	-	-	80.00 e	5.00 h	0.00 e

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

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 axillary and terminal buds, as well as the bolls.

When these plots were evaluated on September 29, 2005 (8 days after the treatments were applied), most of the treatments applied had a significant difference in boll opening, leaf defoliation and leaf desiccation.

By October 5 the amount of boll opening was no longer statistically different. However, in most treatments there was an increase in the amount of leaf defoliation and a decrease in leaf desiccation when compared to the data collected on September 29.

No regrowth had developed enough to be a concern at harvest time. However, some of the materials applied are known to be better at desiccating or removing juvenile growth. These include Aim, Blizzard, ET and Ginstar.

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

On October 5 the boll opening ranged from 90 to 95.75 percent. The advantage shown on September 29 from the addition of ethephon which was applied, either as Prep or in CottonQuik was now masked by the maturing cotton bolls.

On October 5 the amount of leaf desiccation had dropped by 50 percent when compared to the data collected on September 29. The desiccated leaves in the range of 13 to 27 percent may still result in a higher amount of leaf in the ginned sample. Most years the gins in our area do a good job of removing the leaves with the ginned samples ranging between 2 and 4.

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. Several of the treatments were in the 6 to 10 dollar per acre range and the use 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.

Table 2. Runnels County Cotton Harvest Aid Test, Dennis Minzenmayer,
 October 5, 2005 (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
Gramoxone Max + LI 700	16 oz. + 0.5% v/v	\$4.38 + \$1.87	95.00	73.00 bc	23.25 ab
Gramoxone Max + Induce	16 oz. + 0.5% v/v	\$4.38 + \$1.50	93.75	69.75 c	26.25 a
Gramoxone Inteon + Activator 90	24 oz. + 0.5% v/v	\$4.38 + \$1.68	95.75	73.00 bc	20.25 abc
Gramoxone Max + Activator 90	16 oz. + 0.5% v/v	\$4.38 + \$1.68	94.50	68.75 c	25.00 a
Gramoxone Max + Activator 90	12 oz. + 0.5% v/v	\$3.29 + \$1.68	93.75	68.50 c	26.75 a
Aim + Gramoxone Max + Herbimax (C.O.C.)	0.75 oz. + 16 oz. + 1% v/v	\$4.10 + 4.38 + 1.38	93.75	75.50 bc	18.75 abc
Blizzard + Gramoxone Max + Herbimax (C.O.C.)	0.5 oz. + 16 oz. + 1% v/v	\$3.50 + \$4.38 + \$1.38	93.75	76.50 bc	16.25 bc
ET + Gramoxone Max + Herbimax (C.O.C.)	1.25 oz. + 8 oz. + 1% v/v	\$3.13 + \$2.19 + \$1.38	91.25	75.00 bc	13.75 c
Gramoxone Max + Activator 90	8 oz. + 0.5% v/v	\$2.19 + \$1.68	93.75	73.75 bc	15.00 bc
Ginstar + Prep	4 oz. + 16 oz.	\$5.92 + \$4.13	95.00	85.00 a	3.75 d
ET + Prep + Herbimax (C.O.C.)	1.5 oz. + 21 oz. + 1% v/v	\$3.75 + \$5.42 + \$1.38	92.50	79.25 ab	3.25 d
Aim + CottonQuik Herbimax (C.O.C.)	0.75 oz. + 32 oz. + 1% v/v	\$4.10 + \$6.02 + \$1.38	93.75	72.75 bc	6.00 d
Check	-	-	90.00	10.00 d	0.00 d

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

Acknowledgments

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I would also like to thank the companies that provided the chemicals for this harvest aid test. These include:

- Bayer CropScience who provided the Ginstar and Prep
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- FMC Corporation who provided the Aim
- Syngenta Crop Protection, Inc. who provided the Gramoxone Max and Gramoxone Inteon
- Nichino America who provided the ET
- Tri-State Chemical DBA United Agra Products (UAP) who provided the C.O.C. (Herbimax), Activator 90, and LI 700
- Helena Chemical Company who provided the Induce

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