



Result Demonstration/Applied Research Report

**2005 Howard County
Cotton Harvest Aid Demonstration
Cooperator: U.S.D.A. - A.R.S. at Big Spring, Texas**

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Summary

Eighteen treatments were applied over the top of cotton on September 19 to prepare for harvest. The plot was established on U.S.D.A. - A.R.S. farm located on the north side of Big Spring, Texas. The chemicals were applied to FiberMax 819 cotton that had 30 to 40 percent of its bolls open. Leaf shed was less than one percent when the plot was established. When these plots were evaluated on October 4, 2005 (15 days after the treatments were applied), most of the treatments resulted in an increase in open bolls, leaf defoliation and leaf desiccation.

Objective

On the east side of the Trans-Pecos Region 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: U.S.D.A. - A.R.S. at Big Spring
Location: North side of Big Spring, Texas

Crop Production Information:

Variety Planted: FiberMax 819
Planting Pattern: Solid
Irrigation: Dryland Production
Number of Irrigations: None

Harvest Aid Application Information:

Date Applied: September 19, 2005
Wind Speed: 8.0 to 10.0 miles per hour
Wind Direction: Southwest
Air Temperature: 78 to 88^o Fahrenheit
Relative Humidity: 46 to 65%
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: 32 inches
Cotton Height: 24 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 and several of the upper bolls were still immature. Cotton height ranged from 24 to 26 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 30 to 40 percent open, about 65 percent of the bolls were 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) Chemical coverage was excellent due to gallonage, pressure used, and wind; and 2) 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 October 4, 2005 (15 days after the treatments were applied). None of the regrowth was high enough to be a concern. The data collected on October 4 is reported in Table 1.

Table 1. Howard County Cotton Harvest Aid Test, USDA-ARS at Big Spring
October 4, 2005 (15 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 + Slingshot	16 oz. + 16 oz.	\$4.32 + \$1.00	73.75 abcd	67.75 d	28.75 b
Gramoxone Max + LI 700	16 oz. + 0.5% v/v	\$4.38 + \$1.87	71.25 abcde	70.00 d	26.25 bc
ET + Gramoxone Max + Herbimax (C.O.C.)	1.0 oz. + 16 oz. + 32 oz.	\$2.50 + \$4.38 + \$2.30	72.50 abcde	75.00 bcd	21.25 cd
Gramoxone Inteon + Activator 90	24 oz. + 0.5% v/v	\$4.38 + \$1.68	73.75 abcd	73.50 bcd	21.25 cd
Ginstar + Prep	5 oz. + 16 oz.	\$7.40 + \$4.13	78.75 a	84.75 a	6.75 fghi
ET + Gramoxone Max + Herbimax (C.O.C.)	1.0 oz. + 8 oz. + 1% v/v	\$2.50 + \$2.19 + \$1.38	71.25 abcde	81.25 ab	11.00 efg
Gramoxone Max + Induce	16 oz. + 0.5% v/v	\$4.38 + \$1.50	70.00 bcde	68.25 d	27.50 bc
Gramoxone Max + Activator 90	21 oz. + 0.5% v/v	\$5.75 + \$1.68	72.50 abcde	57.50 e	41.25 a
Gramoxone Max + Activator 90	16 oz. + 0.5% v/v	\$4.38 + \$1.68	67.50 de	70.25 d	26.25 bc
Gramoxone Max + Activator 90	12 oz. + 0.5% v/v	\$3.29 + \$1.68	68.75 cde	72.00 cd	17.50 de
ET + Prep + Herbimax (C.O.C.)	1.5 oz. + 16 oz. + 32 oz.	\$3.75 + \$4.13 + \$2.30	76.25 abc	84.50 a	4.25 ghi
ET + CottonQuik + Herbimax (C.O.C.)	2.0 oz. + 32 oz. + 1% v/v	\$5.00 + \$6.02 + \$1.38	71.25 abcde	80.00 abc	8.75 fgh
ET + Gramoxone Max + Herbimax (C.O.C.)	1.0 oz. + 4 oz. + 32 oz.	\$2.50 + \$1.10 + \$2.30	73.75 abcd	79.50 abc	8.00 fgh
Def + Prep	16 oz. + 16 oz.	\$5.50 + \$4.13	77.50 ab	81.50 ab	2.25 hi
Aim + Gramoxone Max + Herbimax (C.O.C.)	1.0 oz. + 5 oz. + 1% v/v	\$5.47 + 1.37 + 1.38	71.25 abcde	72.75 bcd	8.50 fgh
Aim + CottonQuik + Herbimax (C.O.C.)	1.0 oz. + 32 oz. + 1% v/v	\$5.47 + \$6.02 + \$1.38	72.50 abcde	76.00 abcd	2.75 hi
Resource + Prep + Herbimax (C.O.C.)	8.0 oz. + 21 oz. + 1% v/v	\$6.00 + \$5.42 + \$1.38	75.00 abcd	74.75 bcd	2.75 hi
Gramoxone Max + Activator 90	8 oz. + 0.5% v/v	\$2.19 + \$1.68	65.00 e	68.75 d	12.50 ef
Check	-	-	53.75 f	12.50 f	0.00 i

NOTE: In Table 1 the individual or combination of letter a through i 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 October 4, 2005 (15 days after the treatments were applied), most of the treatments applied had a significant difference in boll opening, leaf defoliation and leaf desiccation.

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, ET, Ginstar, and Resource. Please note that a crop oil concentrate was used in tank mixes that contained Aim, ET and Resource; for maximum performance with these products, that is an important part of the tank mix.

On October 4 the boll opening ranged from 53.75 to 78.75 percent. Increased boll opening was noted in the plots where ethephon was applied, either as Prep or in CottonQuik. Also, boll opening was increased in plots where five ounces or more of Gramoxone Max was applied. You would expect to have 90 percent of the bolls open by 14 days after treatments were applied, however, this cotton was not fully mature at the time the test was initiated and no additional boll opening was expected.

On October 4 the amount of leaf defoliation combined with leaf desiccation resulted in several of these plots being ready to harvest. The biggest concern in the test plot was the amount of leaves remaining on the plant in the Gramoxone Max treatment where 21 ounces was applied. Having more than 13 percent of the desiccated leaves remaining on the plant 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. In several treatments a followup application of a desiccant would have prepared the field for harvest with very few leaves remaining.

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.

Acknowledgments

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- Syngenta Crop Protection, Inc. who provided the Gramoxone Max and Gramoxone Inteon
- Tri-State Chemical DBA United Agra Products (UAP) who provided the C.O.C. (Herbimax), Activator 90, LI 700, and Slingshot
- Valent USA Corporation who provided the Resource

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.