



Result Demonstration/Applied Research Report

**2006 Tom Green County
Cotton Harvest Aid Demonstration
Cooperators: John and Doug Wilde**

Steve Sturtz, Tom Green County Extension Agent - Agriculture
Rick Minzenmayer - IPM for Runnels and Tom Green Counties
Dr. Billy Warrick, Extension Agronomist (San Angelo, Texas)

Summary

Fourteen treatments were applied over the top of cotton on September 11 to prepare for harvest. The plot was established on John and Doug Wilde's Farm located 3 miles southeast of San Angelo, Texas. The chemicals were applied to FiberMax 9063 BG2/RR cotton that had 60 percent of its bolls open. Leaf shed was less than one percent when the plot was established. When these plots were evaluated on September 22, 2006 (11 days after the treatments were applied), most of the treatments resulted in an increase in open bolls, leaf defoliation, and leaf desiccation. In this test several factors resulted in reduced performance of the harvest aids applied. These include poor coverage with the harvest aids applied and age differences in cotton plants.

Objective

In the Southern Rolling Plains, 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 Producers: John and Doug Wilde
Location: 3 miles southeast of San Angelo, Texas

Crop Production Information:

Variety Planted: FiberMax 9063 BG2/RR
Planting Pattern: Planted solid on 40 inch rows
Irrigation: Drip Irrigation
Number of Irrigations: Throughout the season

Harvest Aid Application Information:

Date Applied: September 11, 2006
Wind Speed: 4.0 to 5.0 miles per hour
Wind Direction: North
Air Temperature: 85 to 87⁰ Fahrenheit
Relative Humidity: 45 to 50%
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: 42 inches
Cotton Height: 28 to 34 inches
Ground Speed: 4.0 miles per hour
Application Device: Self propelled rig with 13.33 foot boom
Plot Size: 13.33 feet X 50 feet
Test Design: Randomized block design replicated three 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 averaged 30 inches but there were several tall plants that were more than 34 inches tall. The percent of open bolls averaged 60 percent but the range was from 10 to 80 percent because of emergence problems early in the growing season. Overall the plants were healthy and unstressed and leaf defoliation was less than one percent.

Results and Discussion

The cotton at the time of application was 60 percent open with a range from 10 to 80 percent. This difference in boll opening was due to age differences in the plants resulting from emergence delays of two to three weeks. This made the plot challenging and if I had it to do again the harvest aids would not be applied until the younger plants were 50 to 60 percent open. The plant height range on this plot was 28 to 34 inches and some taller plants were over 36 inches. The boom height on the sprayer was set to clear the tallest plants by nine inches. Even though drop nozzles were being used the penetration into the lower crop canopy was inadequate. The upper portion of the plant had a high level of defoliation and dessication, depending on the material applied. However, 40 to 50 percent of the leaves were still green at the bottom of the plant on September 22 (11 days after harvest aids were applied); these older leaves are the easiest to remove with defoliant. All harvest aids are contact

materials and coverage is critical the level of leaf defoliation was low because the lower leaves were not reached by the harvest aids applied.

The application of the harvest aids did impact boll opening, percent defoliation and percent desiccation. The range in cotton age and the spray coverage with the harvests applied were the primary reasons for lower boll opening and leaf defoliation than expected. Air temperatures for the 11 days after application were warm with a few cool night temperatures. Leaf defoliation was higher than the check in all but three of the treatments on September 22, 2006 (11 days after the treatments were applied). The data collected on September 22 is reported in Table 1.

In this test regrowth was a problem in plots where harvest aids were applied that do not impact juvenile leaves that were growing rapidly after the older leaves were removed. Some of the materials applied are known to be better at desiccating or removing juvenile growth; these include Aim, Blizzard, ET, Ginstar, and Resource. Please note that a crop oil concentrate was used in tank mixes that contained Aim, Blizzard, ET, and Resource. For maximum performance with these products C.O.C. is an important part of the tank mix.

Increased boll opening was noted in 10 of the treatments. In the Aim, Blizzard, ET, Ginstar, and Resource plots an abscission layer between the petiole and the main stem had formed but the leaves were still loosely attached.

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 11 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

I want to take this opportunity to thank John and Doug Wilde for their help in plot establishment and management.

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

- Bayer CropScience who provided the Def, Ginstar, and Prep
- Chemtura who provided the Blizzard and Firestorm
- FMC Corporation who provided the Aim
- Helena Chemical Company who provided the Induce
- Microflow Company who provided the MFX and Adios
- Nichino America who provided the ET
- Syngenta Crop Protection, Inc. who provided the Gramoxone Inteon
- Tri-State Chemical DBA United Agra Products (UAP) who provided the C.O.C. (Herbimax)
- Valent USA Corporation who provided the Resource

Table 1. Tom Green County Cotton Harvest Aid Test (John and Doug Wilde Farm, 2006)
September 22, 2006 (11 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 Inteon + Induce	6.0 oz. + 9.6 oz.	\$1.33 + \$1.50	70.0 e	36.7 bcd	16.7 cd
Gramoxone Inteon + Induce	12.0 oz. + 9.6 oz.	\$2.66 + \$1.50	76.7 bcd	37.7 bcd	20.7 c
Gramoxone Inteon + Induce	24.0 oz. + 9.6 oz.	\$5.32 + \$1.50	80.0 b	21.7 g	43.3 b
Aim + Prep + Herbimax (C.O.C.)	1.0 oz. + 16 oz. + 19.2 oz.	\$4.22 + \$4.75 + \$1.39	77.3 bc	25.7 fg	17.7 cd
ET + Prep + Herbimax (C.O.C.)	2.0 oz. + 16 oz. + 19.2 oz.	\$5.00 + \$4.75 + \$1.39	73.3 de	30.0 efg	10.0 ef
Ginstar	6.0 oz.	\$8.88	75.0 cd	48.7 a	3.0 g
Check	-	-	70.0 e	3.0 i	0.0 g
Def + Prep + Induce	16.0 oz. + 16.0 oz. + 9.6 oz.	\$6.25 + \$4.75 + \$1.50	70.0 e	44.0 ab	4.3 fg
Firestorm + Induce	16.0 oz. + 9.6 oz.	\$4.33 + \$1.50	85.0 a	13.3 h	56.7 a
MFX + Aim + Herbimax (C.O.C.)	32.0 oz. + 0.75 oz. + 19.2 oz.	\$7.63 + \$3.17 + \$1.39	78.3 bc	23.3 fg	11.7 de
MFX + Aim + Herbimax (C.O.C.)	24.0 oz. + 0.75 oz. + 19.2 oz.	\$5.72 + \$3.17 + \$1.39	75.0 cd	36.7 bcd	11.7 de
Audios + Induce	6.0 oz. + 9.6 oz.	\$8.44 + \$1.50	73.3 de	44.0 ab	6.0 efg
Gramoxone Inteon + Prep + Induce	5.0 oz. + 21 oz. + 9.6 oz.	\$1.10 + \$6.23 + \$1.50	80.0 b	40.7 bc	9.3 ef
Resource + Prep + Herbimax (C.O.C.)	8.0 oz. + 16 oz. + 19.2 oz.	\$9.50 + \$4.75 + \$1.39	75.0 cd	26.3 efg	18.7 c
Blizzard + Prep + Herbimax (C.O.C.)	0.6 oz. + 16 oz. + 19.2 oz.	\$6.00 + \$4.75 + \$1.39	76.7 bcd	33.3 cde	10.0 ef

NOTE: In Table 1 the individual or combination of letter a, b, c, d, e, f, g, h or 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). Also, to account for 100 percent of the leaves you would add the percent defoliation plus the percent dessication and subtract from 100. The difference represents the number of original green leaves still remaining on the plant.

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.