2005 ANNUAL REPORT

JONES - MITCHELL - NOLAN - SCURRY COUNTIES

INTEGRATED PEST MANAGEMENT PROGRAM

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in cooperation with

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Integrated Pest Management Steering Committee from Jones - Mitchell - Nolan - Scurry Counties

and

Texas Pest Management Association

Preface

Integrated Pest Management, or IPM, refers to a system's approach to insect, weed, and plant disease control using a variety of methods that are effective, economical, and environmentally sound. IPM practices include cultural control, biological control, field scouting and use of economic thresholds in the timing and use of chemical insecticides.

This was the seventh year for the Jones-Mitchell-Nolan-Scurry counties IPM program, one of twenty-six similar programs located in Texas. The IPM program operates in cooperation with the Texas Pest Management Association (TPMA), a producer organization for the development and implementation of IPM in Texas.

This IPM program was created with the goals of:

1. keeping producers informed of present and expected insect and crop development situations in their fields, and

2. demonstrating crop production practices and technologies of interest to area producers.

Acknowledgments

Great appreciation is extended for the support of the IPM Steering Committee and all participating producers. The program is also very thankful to the members of the Texas Cooperative Extension for their guidance and support of this IPM Program.

Dr. Tom Fuchs . . . . . Extension Entomologist and IPM Coordinator, San Angelo
Dr. Chris Sansone . . . . . Extension Entomologist, San Angelo
Dr. Billy Warrick . . . . . Extension Agronomist, San Angelo
Scott Durham . . . . . District Extension Administrator, District 7, San Angelo
Jett Major . . . . . District Extension Administrator, District 2, Lubbock
Rick Minzenmayer . . . . . Extension Agent - IPM, Runnels and Tom Green Counties
Todd Vineyard . . . . . County Extension Agent - AG, Jones County
John Senter . . . . . County Extension Agent - AG, Mitchell County
Zach Wilcox . . . . . County Extension Agent - AG, Nolan County
Greg Gruben . . . . . County Extension Agent - AG, Scurry County
Treet Broadwell . . . . . Secretary to the Extension Agent - IPM, Sweetwater

The support and assistance of David Oefinger and staff of the Texas Pest Management Association is greatly appreciated.

Table of Contents

Lower Rolling Plains Pest Management Program - 2005

Introduction

An integrated pest management program was operated in 2005 with the goal of assisting growers in making pest management decisions and to inform them about recent innovations in crop production. The two main missions of the IPM program were: 1) to keep producers informed of insect and crop development situations in their fields, and 2) to demonstrate crop production practices and technologies of interest to area producers. Insect pressures and crop development were determined by scouting 58 cotton fields for 39 producers in Jones, Mitchell, Nolan, and Scurry counties.

To demonstrate new crop technologies and other production interests, result-demonstration trials were conducted in the areas of insect pest management, weed control, and harvest-aid defoliants and dessicants. Information from the scouting program and demonstration trials were made available to producers and ag-businesses through weekly newsletters and meetings during the growing season.

The IPM program focuses primarily on cotton due to the complexity of insects, weeds, and diseases that affect the crop and the limited production of other crops. However, as the need arises, educational programs and information are provided for other crops and pests. Reports on the seasonal occurrence and management practices were provided during the growing season for sorghum headworm and sorghum midge. Pecan growers in Nolan, and Mitchell counties participated in a statewide Master Pecan Scout Program to monitor Pecan Nut Casebearer population development and damage potential.

Program Steering Committee Activities

The Lower Rolling Plains Integrated Pest Management Program Steering Committee is comprised of eight producers, two from each of the four counties. The committee members are elected from their Ag Committees and have worked diligently during the past year to ensure the Lower Rolling Plains IPM Program is a success, and the major decisions were made by the Steering Committee.

The IPM Steering Committee consists of the following members.

Jon Derouen (Scurry County) . . . . . Director/Chairman
Carl Guelker (Mitchell County) . . . . . Secretary
Mike Alexander (Nolan County) . . . . . Committee Member
Jim Boston (Nolan County) . . . . . Committee Member
Steve Moore (Scurry County) . . . . . Committee Member
Larry Lytle (Jones County) . . . . . Committee Member
Erick Richards (Jones County) . . . . . Committee Member
Brooks Wallis (Mitchell County) . . . . . Committee Member

Lower Rolling Plains IPM Unit Supporters

The Lower Rolling Plains IPM Unit would not be able to function without the economic support of the four counties. Each county funds the scouting program through contributions provided by various agriculturally related businesses, organizations, and boards. These funds are returned to the originating counties through the employment of a cotton scout, applied research conducted at the request of local producers, and increased profits as a result of program activities.

The following businesses, organizations, and boards have supported the IPM program in 2005 through their generous financial contributions, and should be commended for their generosity.

Jones County

Farmers Co-Op Gin - Anson
Farmers Co-Op Society - Stamford
Ericksdahl Gin Co.
Radium Gin

Mitchell County

Mitchell County Economic Development Board
Producers Co-Op Gin - Colorado City
Co-Op Gin Association - Loraine
City National Bank - Colorado City

Nolan County

Roscoe Co-Op Gin
U.A.P.- Roscoe
Gary Pieper Crop Insurance Co.

Scurry County

Scurry County Cotton Producers Association

Lower Rolling Plains IPM Unit Financial Report

Texas Pest Management Association
Unit Financial Report
Lower Rolling Plains
as of December 31, 2005

Funds on hand, January 1, 2005	$10,548.75
Budget Receipts	
Unit Scouting Contributions	$24,550.00
Interest Income	$345.42
Misc. Income	$90.25
Total Budget Receipts	$35,534.42
Scouting Expense	
Administrative Fee	$3,682.50
Miscellaneous	$851.00
Salaries	$8,623.29
Payroll taxes	$829.56
Mileage	$3,958.80
Supplies	$0.00
Telephone	$745.74
Total Scouting Expense	$18,690.89
Other Disbursements	
Memberships Fee	$0.00
Total Other Disbursements	$0.00
Operating Balance as of December 31, 2005	
Cash in Bank	$1,441.24
Cash in Paine-Webber	$15,402.29
Balance as of Dec. 31, 2005	$16,843.53

Educational Activities

Educational activities are very important to the overall IPM program in Jones, Mitchell, Nolan and Scurry counties. Educational activities conducted in the four-county area during 2005 were:

Newsletters:	
No. Issues Written	17
No. Clientele on Mailing List	225
No. Clientele on E-mail List	118
Newspaper Articles:	
No. Prepared	7
No. Newspapers Carrying	4
Farm Visits	99
Scouts Trained	4
CEU Credits	148
Pest Management Steering Committee Meetings	3
Educational Meetings:	
County Governments/Ag Committees	8
Turn-Row/Gin Meetings	36
Field Days/Tours	2
Multi-County/Regional Meetings	1
Schools	1
Civic Clubs	2
FCS/BLT Meetings	1
4-H Clubs	0
Professional Meetings	1
No. Applied Research/Demonstration Projects	14
No. Involving Cotton	13
No. Direct Ag Contacts	7,483
No. Other Contacts	174
Grants and Contracts:	
IPM. County Support	$24,550.00
No. Grants Received as Principal Investigator	2
Other Support Dollars Generated	$3,040.00
Retail Value of “In-Kind” Contributions	$3,900.00
Total Dollars Generated for Program	$31,490.00

Scouting Program Activities

Four scouts were hired in 2005 at a wage of $6.50 per hour, and were paid $0.30 per mile for mileage driven. A bonus of $360.00 ($0.75 / hr X 480 hrs) was budgeted for each scout if they performed their duties and worked until their services were no longer needed.

The 2005 scouts were:

Coy Sanchez . . . . . Field Scout, Jones County
Jared Rivera . . . . . Field Scout, Mitchell County
Amber Purcell . . . . . Field Scout, Nolan County
Valerie West . . . . . Field Scout, Scurry County

All scouts attended Scout School in San Angelo and became proficient at scouting cotton. These scouts checked fields weekly or twice weekly and reported on information such as number of fleahoppers, thrips, bollworm eggs and larvae, percent square set and other information to assist the producer in management decisions. The participating producer and the Extension Agent - IPM received copies of these reports.

2005 IPM Program Evaluation
FOUR COUNTY SUMMARY

1) In which county is your primary occupation or farm?

__**7**__ Jones __**8**__ Mitchell __**7**__ Nolan __**5**__ Scurry _____ Other (Haskell)

2) How did you find out about insect information in your area? Check ***ALL*** that apply.

16 Scouting Program **25** Newsletter **16** Farmers

__**10**__ Turn-row / Gin Meetings __**13**__ Chemical Salesman __**1**__ Other

3) Which of the following IPM tactics do you use in managing pests of your major crop? Check ***ALL*** that apply.

__**18**__ Select varieties that reduce or avoid insects and diseases.
__**22**__ Use recommended planting dates.
__**24**__ Use field scouting for insects, disease or weed pests.
__**05**__ Use pheromone traps to monitor pests.
__**10**__ Rotate crops for insect, disease or weed management.
__**19**__ Conserve or protect beneficial insects.
__**02**__ Purchase and release beneficial insects.
__**00**__ Use computerized forecasting models.
__**13**__ Use economic thresholds for pests.
__**22**__ Cultivate for weed control.
__**13**__ Use hand hoeing for weed control.
__**10**__ Band pesticides to reduce amount applied.
__**09**__ Soil tests to determine fertilizer rates.
__**17**__ Destroy or plow down stalks after harvest to reduce pests.

4) How do you decide when a pesticide application is needed on your farm? Check ***ALL*** that apply.

__**08**__ Neighboring farms being treated.
__**09**__ Pesticide dealer or aerial applicator recommendation.
__**13**__ Consultant recommendation.
__**19**__ Scout my own fields.
__**01**__ Family member or field hand scouting field.
__**14**__ Extension IPM agent scouting report or recommendation.
__**02**__ Crop stage or calendar date.

For the following two questions, your answers should be based on how the overall IPM program has impacted your farming operation. The IPM program includes scouting/monitoring, applied research and result demonstrations which include variety testing, newsletters, and educational programs.

5) How has IPM affected your pest management costs in cotton?

11 Reduced **4** Increased **7** Remained the same

If IPM has affected your pest management costs, please indicate:

11 $1 to $10/acre **3** $10 to $20/acre **1** $20 to $30/acre _____ Other

6) How has IPM affected your net profit?

_____ Reduced **17** Increased **4** Remained the same

If IPM has affected your net profit, please indicate:

4 $1 to 10/acre **6** $10 to $20/acre **3** $20 to $30/acre **1** Other

7) How often do you use the following sources to acquire information on pesticide use?

SOURCE	FREQUENTLY	SOMETIMES	NEVER
Neighboring Producer	**05**	**11**	**01**
Ag Chemical Magazine	**03**	**09**	**06**
Computer Programs			**14**
Extension IPM Entomologist	**10**	**09**	
Ag Chemical Salesmen	**08**	**12**	
Extension IPM Newsletter	**15**	**07**	

8) Please evaluate the IPM newsletter for Jones, Mitchell, Nolan, and Scurry Counties.

USEFULNESS
19 Highly Useful
06 Somewhat Useful
_____ Not Useful

LENGTH
_____ Too Long
02 Too Short
20 About Right

9) If you had a field in the scouting program did you look at the scouting reports?

13 Yes _____ No

10) Was the information collected from the cotton scouting program useful to your farming operation?

14 Yes _____ No

11) Please feel free to make any comments or suggestions regarding the IPM program, demonstration work, or newsletter.

"For several years I have signed up to have at least one of my farms scouted. A couple of years in the past I guess the scout quit in mid-season, or earlier. This past season (2005), I did not plant my cotton until June 19-June 28; so about the time I needed more scouting reports for worms, etc., the scout had finished for the season. I think I received my last scouting report as of 8 August this year. I do appreciate your efforts. Sincerely, Warren R. Olson."

"Your program, I feel, was most helpful to us this past year when worm infestation in our area was very high. Would like to see some field training on insect recognition for farms so that we can better scout our own fields. We would like to have a field in the 2006 IPM Program. Thanks - Shirley Jackson."

"Did not have a field in the scouting program."

"We need all the help we can get. This program is a big help to all farmers. Thank you Derrell Sloan."

"I liked having my fields scouted & would like to have some scouted another year."

"I would like for my scout to stay for longer in the season esp. in a year where the crop was late planted. Also, more experience would help."

"I feel the scouting program is very beneficial to us here in Mitchell Co. Ed is very good at what he does. I enjoy his turnrow meetings and they help us find insects early. I hope the IPM can acquire some good scouts that are dependable to help Ed in 06. The newsletter is very informative and I read everyone in its entirety. Keep up the good work."

"We only raise a few cows and have only 5.6 acres of our 159.4 acres cultivated in sudan *haygrazer) or wheat. No cotton or other field crops. I do read the IPM Newsletter every time we receive one, as I like to keep abreast of what is happening in the county and especially if something that is occurring will affect me, or us. (My wife and I). Your newsletter is greately

aprpeciated. Thank you. Arthur Bixler."

"I am a landowner landlord. My son works my land. He makes all the decisions on insect & spraying. I enjoy getting the news reports. Thanks, Raymond Watlington."

"Not in scouting program in '05. Have been in past and always read scouting reports. Info was useful."

Comment for question number 3: "look at Boll Weevil Traps"
Comment regarding question number 7: the length of the Newsletter wherein person stated it was "too short" - "More Info."
Comment made regarding question number 9: "Didn't have one!"

"Very good program and I will use the program in the future. The program employees and products are very useful to my farming operation and they are the most reliable source of information. Ricky Bowman."

Environmental and Crop Conditions

Rains in October and November of 2004 (4.15 in. and 4.73 in., respectively) provided excellent subsoil moisture for the 2005 growing season.

In comparison to previous years and yearly averages, conditions for the 2005 growing season (May to October) were overall more moderate for temperatures with heavier precipitation (Table 1 and Figure 1). The minimum daily temperatures were mostly higher than the average minimum temperatures (1999 to 2004). There was an exceptionally hot and dry period during September, which enabled much of the late blooming cotton to develop to mature crop.

Prior to planting, rainfall in March added moisture to the soil profile, but dry and windy conditions in April depleted moisture in the top 1 to 6 inches of soil. Rainfall during May (3.99 in.) brought badly needed moisture, but wet conditions after May 15th delayed planting in some areas across the four county area (Table 1). The severe thunderstorms associated with rainfall in May caused considerable damage to wheat fields, primarily in Jones county.

The average soil temperature in May was 67^{o} F. Temperatures at the beginning of the month was 64^{o} F and steadily increased to 72^{o} F by the end of the month. These were good soil temperatures for planting.

Some producers were able to plant some of their cotton acreage during the last two weeks of May. Rainfall (1 to 4+ in.) during the first two weeks of June further delayed cotton planting again in the four county area. By June soil temperatures averaged 74^{o} F with a range from 69^{o} F to 80^{o} F; most producers were able to finish planting by the end of June. Conditions were perfect for exceptional germination and good seedling growth across most of the area.

During June, the maximum daily temperatures (^{o} F) were generally in the low to upper 90's and July's temperatures remained in the upper 90's. Scattered rains (0.4 to 1.5 in.) occurred during the first 10 days of July. Additional rains (1.0 to 3.5+ in.) fell during the last week of July. These conditions provided good growing conditions for our dryland cotton and grain sorghum. A rainy period continued through August 16 which resulted in significant accumulation of moisture (4 to 10+ in.) and caused flooding in Jones and Scurry Counties. Thunderstorms produced damaging hail across the area. Cloudy conditions prevailed from August 13 to August 16 during a period of heavy rainfall. This period had seasonably cooler daytime high temperatures (avg. 75^{o} F). Following this period of cool, wet, and conditions, cotton shed much of the squares and small bolls.

Following this rainy period we had no measurable rainfall from August 17 through September and temperatures became seasonably hot (92^{o} F avg. daily maximum temperature) September. A good portion of the cotton was cutting out during the first part of September. During this period of hot and dry conditions root rot symptoms became pronounced and extensive across the area. Late maturing cotton during the last part of September were showing signs of moisture stress. Rains from October 5 to October 10 provided from 1 to 3 in. of badly needed moisture.

Dry and mild conditions during October and November was good for harvest-aid applications.

Table 1. Monthly rainfall totals for the 1999 - 2005 growing seasons as recorded by weather station 7.5 miles northwest of Roscoe.

	Total Rainfall (inches)							
	1999	2000	2001	2002	2003	2004	2005	Average
May	0.90	0.66	2.44	3.94	1.80	1.03	3.99	2.11
June	3.40	8.00	0.60	1.37	4.60	4.32	1.66	3.42
July	1.00	0.69	0.12	1.54	0.03	4.59	4.76	1.82
August	0.50	0.00	1.67	1.29	2.62	3.53	7.80	2.49
September	0.80	0.50	1.44	5.38	0.86	1.65	0.00	1.52
October	1.40	4.81	0.99	3.51	0.95	4.15	2.72	2.65
Total	8.00	14.66	7.26	17.03	10.86	19.27	20.93	14.00

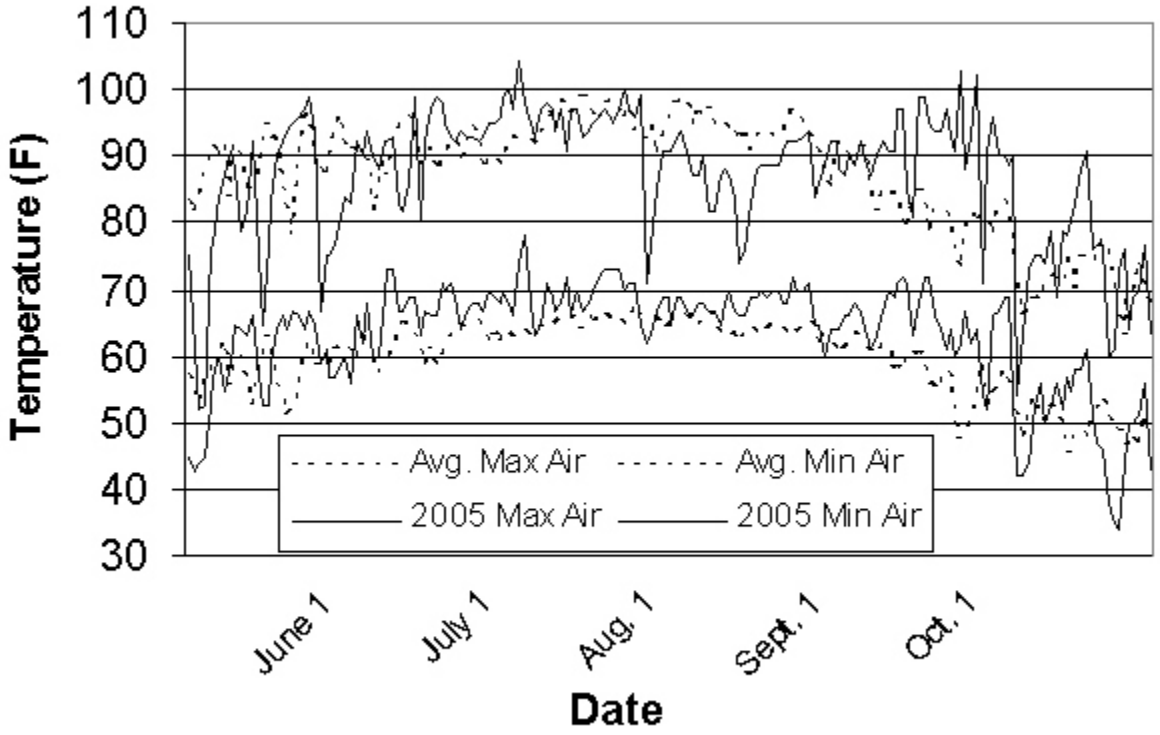

Figure 1. Maximum and minimum temperatures for 2005.

The subsequent heat units which were accumulated from June to October for 2005 was slightly lower (2547) than the yearly average (2571), but was considerably higher than the total for 2004 (Table 2 and Figure 2). Heat units accumulated during September (551) made up for low numbers during August (552) and helped late planted cotton to mature blooms and bolls formed in late August and early September. Heat units required from planting to when 95% of the cotton bolls are mature on a plant is 2271. For 2005, cotton planted prior to May 20 would have accumulated sufficient heat units to mature 95% of the cotton bolls by September 15 (Table 3). For cotton planted by June 1 there would have been an adequate number of heat units by September 30. Cotton planted around June 10 would have needed heat units to October 15 for 95% boll maturity. Cotton planted at June 20 or after would not have had sufficient heat units to mature 95% of the cotton bolls.

Table 2. Cumulative heat units by month for years 1999 to 2005.

	Years							
Month	1999	2000	2001	2002	2003	2004	2005	Avg.
June	557	519	662	581	504	542	**587**	565
July	709	761	824	631	707	642	**673**	707
Aug	789	747	674	728	688	535	**552**	673
Sept	452	520	418	429	381	406	**551**	451
Oct	180	231	153	110	196	174	**184**	175
Total	2687	2778	2731	2479	2476	2299	**2547**	2571

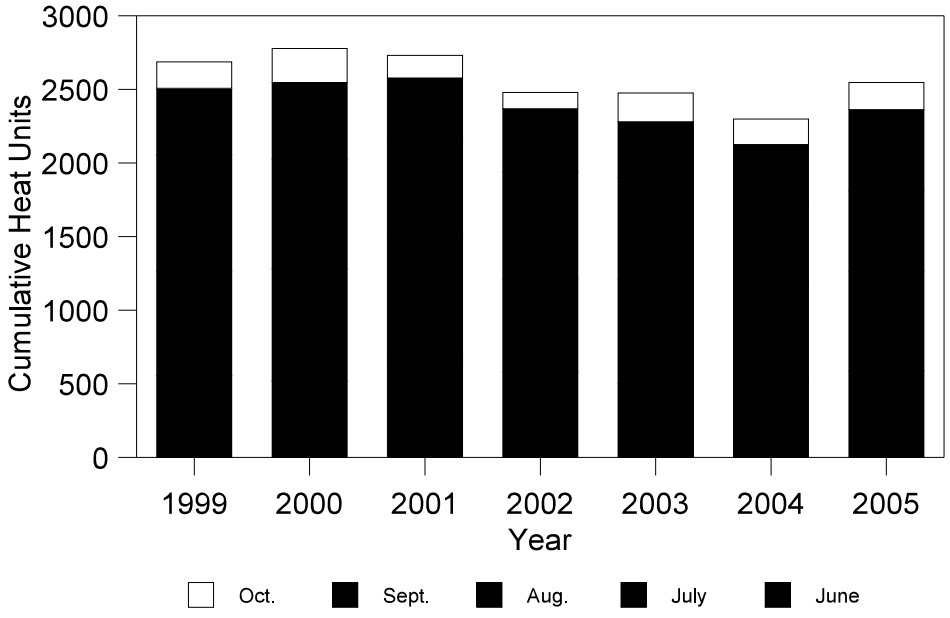

Figure 2. Cumulative heat units by month for years 1999 to 2005.

Table 3. Cumulative heat units at calendar dates for specific planting dates. 2005.

Planting Date	Calendar Date			
	9/15	9/30	10/15	10/30
5/01	2400	2671	2773	2794
5/10	2382	2652	2755	2776
5/20	2261	2532	2634	2655
6/1	2091	2362	2464	2485
6/10	1930	2201	2303	2324
6/20	1737	2008	2110	2131
6/30	1529	1800	1902	1923

Heat units required to mature 95% of bolls is 2271.

Pest Situation

While the environmental conditions were beneficial for cotton and resulted in another year of exceptional yields, conditions were also favorable for a number of insect pests, weeds, and diseases.

Cotton Pests

The delays in planting across the area, due to rains in late May and June, caused staggered plant growth stages throughout the growing season. The lack of uniformity in crop development across the area resulted in conditions where fields were vulnerable to different insect pests at all times.

The delay in planting across the area may have resulted in low infestation levels of thrips on seedling cotton. Damage from thrips was minimal, but blowing sand did cause some damage.

Areawide, Cotton fleahopper infestations were generally below economic threshold levels, but some fields did require an insecticide application. The chemical of choice for most producers was Intruder 70WP followed by Centric 40WG.

The lepidopteran "worm" complex was a major concern from July to September. Moth traps for the cotton bollworm and tobacco budworm were set out the first week of July on Mr. Ferdie Walker's farm near Stamford in Jones Co., Mr. Tony Turner's farm southeast of Colorado City in Mitchell Co., Mr. Jimmy Joy's farm southwest of Roscoe in Nolan Co., and Mr. Larry West's farm south of Hermleigh in Scurry Co. Traps were checked every two to three days from July 5 to September 16 in all counties, except Nolan County, which was checked from July 5 to August 19. The total number of tobacco budworm moths caught during the season was very low in comparison to cotton bollworm moths trapped (Figure 3 and Figure 4). In all, there were only 44, 132, 67, and 87 tobacco budworm moths trapped in Jones, Mitchell, Nolan, and Scurry counties, respectively. This moth activity never materialized into damaging infestations.

However, cotton bollworm moth activity was relatively high from the beginning of the sample period to the end of the sample period in all counties (Figure 3). The total number of bollworm moths caught in pheromone traps were 2707, 2677, 1098, and 1170 for Jones, Mitchell, Nolan, and Scurry Counties, respectively. Jones and Mitchell Counties had very high peak activity of moth flights. In Jones County, there were two distinct dates of peak activity which occurred around July 15 (399 moths) and August 22 (306 moths). For Mitchell County there were several dates when moth trap catches were high; these were on August 5 (382 moths), August 8 (272 moths), August 17 (303 moths), August 22 (175 moths), and September 6 (195 moths).

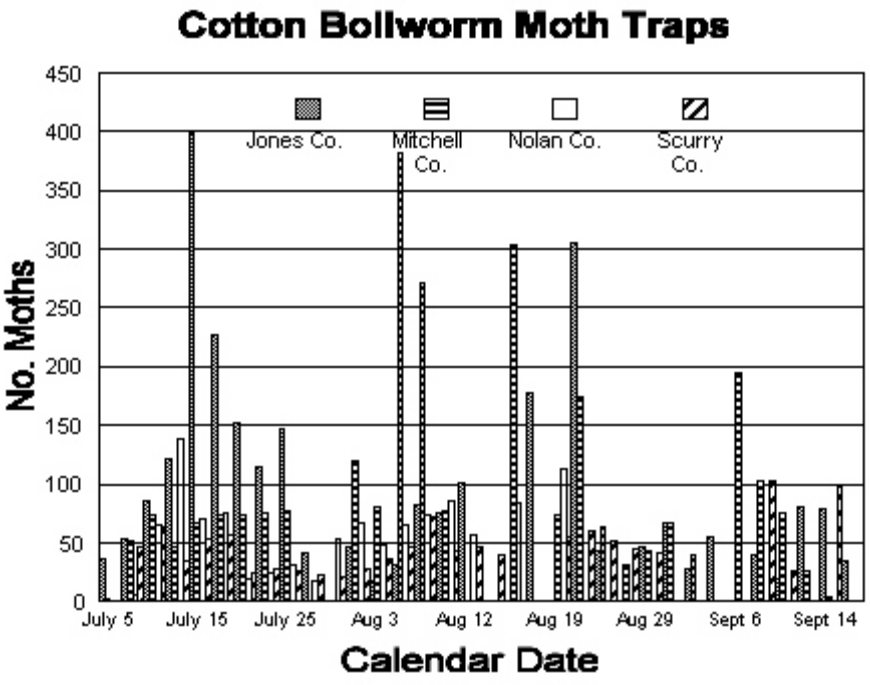

Figure 3. Cotton bollworm moth captures during the growing season.

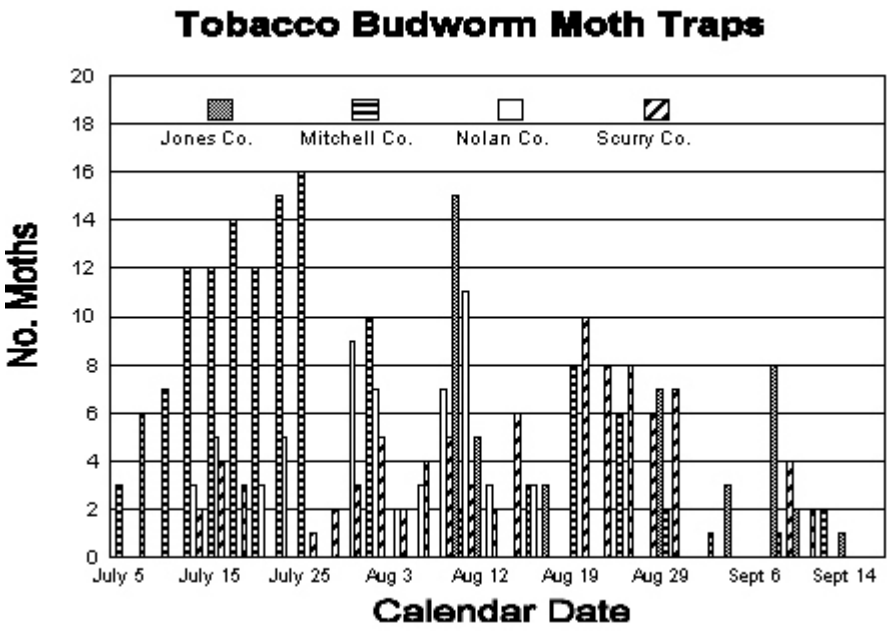

Figure 4. Tobacco budworm moth captures during the growing season.

Heaviest egg-laying generally followed peak moth flights, but moth activity was sufficient to cause chronic egg and caterpillar infestations throughout the growing season in all counties. Natural predation was important in keeping infestations below economic damaging levels in many fields, but cotton bollworm infestations damaged a substantial number of fields. Fields planted to conventional cotton varieties were sprayed from 1 to 4 times during the season. Infestations were severe enough in some places that fields planted to Bollgard varieties had to be treated to prevent boll damage. Bollgard II type varieties provided good protection against the bollworm infestations and damage was minimal. In fields where infestations exceeded the economic threshold level, applications of a pyrethroid (mostly Karate) provided good control.

During the first week of September, I worked with Mr. Tomie Runyan from Syngenta Co., to test bollworm moths for insecticide resistance in Fisher and Mitchell counties. Dr. Patricia Pietrantonio, insect toxicologist, with Texas A&M University provided test vials for the pyrethroid resistance bioassay. The assays conducted in Fisher and Mitchell counties were a part of a statewide study to determine cotton bollworm resistance levels across the state. The bioassays for Fisher and Mitchell counties showed no resistance to pyrethroids (Table 4). Moths from these counties were among the most susceptible when compared to moths across the state, and there were not any differences in susceptibility between our bollworms and a susceptible laboratory colony at Texas A&M University.

Table 4. Fisher/Mitchell Co. Cypermethrin Bioassay for bollworm, *Helicoverpa zea*, 2005

Date	n	Slope ± SE	LC_{50} µg/vial	LC_{90} µg/vial	RR LC_{50} µg/vial	RR LC_{90} µg/vial	χ^2
Susceptible Colony	432	4.13 ± 0.52	0.79 (0.70-0.91)	1.62 (1.35-2.14)	--	--	1.47
09/03/05 & 09/07/05	180	1.83 ± 0.52	0.51 (0.20-0.86)	2.60 (1.44-13.56)	0.65 (0.36-1.18)	1.59 (0.67-3.79)	0.72

n = number of insects tested. ( ) = 95% confidence intervals. LC = lethal concentrations. RR = Resistance ratio based on susceptible colony.

Problems with insecticide applications were probably related to either poor application coverage or to infestations being Beet Armyworms or Fall Armyworms. During the first week of August Beet Armyworm infestations were found feeding on squares and bolls from Colorado City to Hermleigh. In September, we had additional infestations which were more widespread across the area.

Fall Armyworms were a major concern in all counties during the end of August and through September. These late infestations caused boll damage to fields planted with both conventional and Bollgard cotton varieties. Larvae could be found feeding in white and pink blooms, bloom tags, and bolls. Worms of all sizes were found in Bollgard and Bollgard II cotton varieties. For the size and age of larvae in the heaviest infested fields, damage to bolls and squares of Bollgard and Bollgard II type cotton was minimal, but insecticide applications were warranted in some Bollgard cotton. The expense ($18 to $22 per acre) of insecticides registered for Beet Armyworm and Fall Armyworm control made for difficult decisions to protect small bolls and red blooms this late in the season. When applications were warranted, good control was achieved with Intrepid or Steward insecticides. However, applications of Karate or a mixture of Karate with Lorsban did not provide adequate control.

Early infestations of cotton aphids on seedling cotton were a concern and a few fields required treatment. The chemical of choice was Intruder followed by Centric. Infestations later in the season were sporadic across all counties. Few, if any fields were treated specifically for the late season aphid infestations. When fields were treated for caterpillars and aphids were present, some producers added an aphicide to prevent any chance of a secondary outbreak of aphids.

During the hot and dry conditions in September, sporadic infestations of spidermites occurred across the area. These infestations were not a primary concern and did not cause any significant damage to the cotton crop.

Grain Sorghum Pests

Both, sorghum midge and head worms were active during the first two weeks of August and economic damaging infestations were present in flowering sorghum heads. Greenbug infestations were light across the area.

Pecan Pests

Two pecan producers, one each in Mitchell and Nolan counties, participated in a statewide Master Pecan Scout Program to monitor Pecan nut casebearer moth flights with pheromone traps. Traps were placed in each orchard on April 21 and monitored at 2 day intervals for six weeks. Data

showed moth activity was relatively light in both counties. The first date Pecan nut casebearer moths (PNC) were trapped in Mitchell county was on May 6, and the peak moth activity was between May 11 to May 14 with 4 moths per trap on average. Two weeks after peak moth activity 17% of the nut clusters were infested with PNC eggs; this infestation did warrant an insecticide application of Intrepid at 8 oz/ac. In Nolan county, PNC moths were initially caught in pheromone traps on May 9, but no other moths were trapped after this date.

Weeds

Weed pressures in 2005 were heavy throughout the growing season in all counties because of the above normal rainfall. Roundup Ready cotton varieties provided some producers with a means to manage weeds after planting. The key to effective control was proper application timing of recommended rates of glyphosate.

Diseases

Root rot was a major problem late in the season. Some fields had large acreages of infected plants. Unfortunately, there are no control options available which will eliminate infected areas. Crop rotation may help alleviate some problems.

Applied Research and Result Demonstration Reports

Result Demonstration/Applied Research Report

2005 Purple Nutsedge Weed Control

Scurry County

Cooperator: Mr. Jon Derouen

Dr. Ed Bynum, Extension Agent - IPM for Jones, Mitchell, Nolan and Scurry Counties
Mr. Greg Gruben, Scurry County Extension Agent - Agriculture
Dr. Billy Warrick, Extension Agronomist (San Angelo, Texas)

Summary

Envoke™ herbicide treatments with and without other herbicides, Zorial Rapid 80™, and Roundup Weathermax™ were applied to purple nutsedge, *Cyperus rotundus*, on July 12, 2005. The application of Roundup Weathermax™ with ammonium sulphate provided the highest level of control for the longest period of time and was the most cost effective at $12.24 per acre. The addition of either Sequence™ or Touchdown HiTech™ did not enhance the performance of Envoke™. The addition of both Sequence™ and Touchdown HiTech™ to Envoke™ did improve control, but the cost for this mixture would be cost prohibitive at $34.41 per acre.

Problem

Purple nutsedge, *Cyperus rotundus*, is a common perennial weed in fields throughout the Southern Rolling Plains of Texas. Plants have triangular stems with prominent mid-ribbed leaves produced in groups of 3 at the base of the plant. The flower head of the purple nutsedge has a reddish tinge with dark brown or black seeds. Plants form several tubers, "nutlets", on rhizomes that are 8 to 14 inches below the soil surface. Mature tubers can resprout as many as 10 to 12 times and may survive for 1 to 3 years. New buds from the tubers form large patches that spread profusely. Cultivation and tillage practices worsens the weed infestation by moving tubers around in the soil that can resprout.

Control is difficult with systemic herbicides because very little of the herbicide will translocate from leaves to mature tubers. Thus, postemergent herbicides must be applied before the 5th-leaf stage while energy reserves are being translocated from leaves to newly forming tubers. Also, applications must be repeated and may only result in limited suppression of this weed. Herbicide activity is further hindered in the Southern Rolling Plains of Texas by semi-arid conditions that limit soil moisture and cause plant stress conditions. Syngenta Chemical Company markets a herbicide, Envoke™, for sedge control in picker-type cotton varieties, but its registered use is limited to portions of Texas east of I-35. The use of Envoke™ was evaluated to determine the feasibility of purple nutsedge control for producers in the Southern Rolling Plains of Texas.

Objective

This field test is designed to 1) determine the effectiveness of Envoke™ alone and in combination with other herbicides for purple nutsedge control 2) determine injury levels to cotton, and 3) determine the economic feasibility of using Envoke™ applications.

Materials and Methods

Cooperating County Producer:	Mr. Jon Derouen
Location:	4 miles East of Dunn, TX

Application Information:

Date Applied:	July 12, 2005
Time:	9:00 a.m. to 10:00 a.m.
Wind Speed:	5 to 8 mph
Wind Direction:	North
Air Temperature:	78 degrees F
Relative Humidity:	70 percent
Pressure:	32 p.s.i.
Boom Height:	19 inches
Water Applied:	18 gallons per acre
Nozzle:	Air Induction 11002 on 20 inch centers
Ground Speed:	3 miles per hour
Application Device:	Self propelled rig
Plot Size:	13.33 feet wide by 60 feet long
Test Design:	Randomized complete block design with three replications
Weed Stage:	Purple Nutsedge - 2 to 4 inches
Crop Stage:	Cotton - 4 leaf stage and stressed for moisture

Plant Information

Purple nutsedge plants were 2 to 4 inches tall with 10 plants per square foot at the time of application. The field was planted on May 18. Cotton plants were at the 4 leaf growth stage at the time of application. Cotton and purple nutsedge plants were stressed for moisture. Prior to spraying the herbicide trial, the producer sprayed Roundup UltraMax™ (22 oz/ac) on June 7 to suppress purple nutsedge growth. Soil moisture conditions were extremely dry on July 12 and for 14 days following herbicide treatments.

Results and Discussion

Conditions were hot and dry prior to and after the application of the tested herbicides. These conditions coupled with the producers application of Roundup UltraMax™ on June 7 resulted in plant and leaf necrosis which were indicated by percentage of control (33) in the untreated plots 8

days after treatment (Table 1). None of the tested herbicides provided any significant mortality of purple nutsedge during these dry conditions.

A 3.5 inch rain the week before the 22 day evaluation improved conditions for purple nutsedge growth and herbicide activity. At the 22 day evaluation, Roundup Weathermax™ with ammonium sulphate and the mixture of Envoke™ + Touchdown HiTech™ + Sequence™ + NIS were beginning to kill purple nutsedge plants and were the only treatments to result in significant purple nutsedge control over the untreated and Zorial Rapid 80™. At this date, each of the Envoke treatments did not differ in the level of purple nutsedge control.

Additional rains 10 days prior to the 35 day evaluation date, continued to provide good growing conditions. Purple nutsedge response to the applied herbicides increased in all treatments which provided statistically significant control of the weed over the untreated. Injury symptoms, white leaf streaking, from the pigment inhibitor herbicide, Zorial Rapid 80, were evident at this sample date and the level of control had increased from the 22 day sample date. The treatment using Roundup Weathermax™ with ammonium sulphate and the mixture of Envoke™ + Touchdown HiTech™ + Sequence™ + NIS provided significantly better control (82% and 83%, respectively) than any of the other treatments.

By October 13 (93 days after application), Roundup Weathermax™ with ammonium sulphate and the mixture of Envoke™ + Touchdown HiTech™ + Sequence™ + NIS maintained a significant level of control over the other Envoke™ and Zorial™ treatments and the untreated. Purple nutsedge growth had recovered in the other herbicide treatments.

The heavy infestation of purple nutsedge in the test plots prevented normal growth and establishment of cotton. Therefore, herbicide crop injury assessment could not be made on the cotton.

The poor performance of Envoke™ + NIS, Envoke™ + NIS + Sequence™, Envoke™ + NIS + Touchdown HiTech™, Zorial Rapid 80™ would not justify the expense of these herbicides for purple nutsedge control. Although the mixture of Envoke™ + Touchdown HiTech™ + Sequence™ + NIS provided acceptable levels of control, the $34.41 per acre cost of the mixture would be prohibitive to use. The most cost effective herbicide application for purple nutsedge control was Roundup Weathermax™ with ammonium sulphate.

Acknowledgments

We want to take this opportunity to thank Mr. Jon Derouen for his help in plot establishment and management.

We would also like to thank Syngenta and Monsanto for providing herbicides for this test.

Table 1. Purple nutsedge control following applications of herbicide mixtures with and without Envoke™. Dunn, TX 2005.

		% Control				
Treatment	Rate	8 Day 7/20/05	22 Day 8/3/05	35 Day 8/17/05	93 Day 10/13/05	Cost/ac
Envoke + NIS	0.15 oz/ac + 0.25%	26.7 a	20.0 abc	56.7 b	13.3 b	$10.50 + $ 0.91 $11.41
Envoke + NIS + Sequence	0.15 oz/ac + 0.25% + 2.5 pt/ac	53.3 a	20.0 abc	51.7 b	6.7 b	$10.50 + $ 0.91 + $16.25 $27.66
Envoke + NIS + Touchdown HiTech	0.15 oz/ac + 0.25% + 19.2 oz/ac	28.3 a	16.7 bc	56.7 b	23.3 b	$10.50 + $ 0.91 + $ 6.75 $18.16
Envoke + NIS + Sequence + Touchdown HiTech	0.15 oz/ac + 0.25% + 2.5 pt/ac + 19.2 oz/ac	43.3 a	30.0 ab	83.3 a	66.7 a	$10.50 + $ 0.91 + $16.25 + $ 6.75 $34.41
Roundup Weathermax + Ammonium Sulphate	22 oz/ac + 0.17 lbs/gal	33.3 a	33.3 a	81.7 a	80.0 a	$ 7.95 + $ 4.29 $12.24
Zorial Rapid 80	0.6 lbs/ac	13.3 a	0.0 d	41.7 b	13.3 b	$ 9.00
Untreated		33.3 a	6.7 cd	10.0 c	10.0 b	
Anova F values		0.3410	0.0011	0.0003	0.0009	

Means in each column followed by the same lowercase letter are not significantly different according to Duncan's multiple range test (P=0.05[Agriculture Research Manager Statistical Program]).

Result Demonstration/Applied Research Report

2004 - 2005 Hog Potato Weed Control Demonstration
Nolan County
Cooperator: Bill Hunter

Zachary Wilcox, Nolan County Extension Agent--Agriculture
Dr. Ed Bynum, Extension Agent - IPM for Jones, Mitchell, Nolan and Scurry Counties
Dr. Billy Warrick, Extension Agronomist (San Angelo, Texas)

Summary

Six treatments were applied to Hog Potato on December 9, 2004. A wide range of control was achieved with the herbicides applied. Tordon 22K, Surmount, and a combination of Remedy and Reclaim provided the highest level of Hog Potato control six months and 11 months after the test was established. The treatments that included Tordon 22K or Surmount had enough soil activity the broadleaf weeds were still being controlled when plots were evaluated on June 16, 2005. In a non-crop situation, these herbicides would be useful.

Problem

In the Rolling Plains of Texas, Hog Potato (*Hoffmanseggia densiflora*) is a problem in crop production and non-crop areas. This weed is a low growing, slender stemmed perennial, that is 6 to 10 inches tall. It reproduces from seeds, from creeping underground horizontal roots, and from deep seated nutlike tuberous enlargements of the roots. The twice divided leaves are alternate, 2 to 5 inches long including the stalks, and are covered with glandular dots and fine incurved hairs. They are divided into 3 to 5 pairs of primary leaflets (or divisions), each of which is further divided into 5 to 10 pairs of oblong secondary leaflets only 1/8 to 1/4 inch long. The flowers have 5 yellow or orange red petals about l/2 inch long, each narrowed into a stalk covered with small glands. The flowers occur along the upper part of the stems, the flowering part only about 2 to 6 inches long and covered with small sticky tackshaped reddish glands. The flattened, slightly curved pods, 2/3 to 1 2/3 inches long, are dark reddish brown, and have few to several seeds. The grayish seeds are smooth, flattened eggshaped, and slightly more than 1/8 inch long. A common native weed, often forming large colonies in heavy alkaline soil along roadsides, ditch banks, and waste places, becoming a troublesome pest when it spreads to adjacent cultivated lands and pastures.

Objective

Through the use of a field test: 1) determine the effectiveness of herbicides at controlling the weed, 2) provide producers the opportunity of observing how effectively the herbicides control the weed, and 3) determine the economic feasibility of applying the herbicides for weed control.

Materials and Methods

Cooperating County Producer: Bill Hunter
Location: Three miles west of Trent, Texas

Application Information:

Date Applied:	December 9, 2004	Time:	9:30 to 11:00 a.m.
Wind Speed:	10 miles per hour	Wind Direction:	West
Air Temperature:	54 to 59^0 Fahrenheit	Relative Humidity:	40 to 50%
Ground Speed:	3.0 miles per hour		
Application Device:	Self propelled rig		
Pressure:	32 pounds per square inch		
Boom Height:	10 inches above the top of the weed		
Water Applied:	18 gallons per acre		
Nozzle:	Air Induction 11002 on 20 inch centers		
Plot Size:	13.33 feet wide by 60 feet long		
Test Design:	randomized complete block design with three replications		

Plant Information
December 9, Hog Potato plants were four to six inches tall, still green, and growing when herbicides were applied. High gallonage was needed to get adequate spray coverage to the plant. The Hog Potato plant population averaged 3 per square foot.

Results and Discussion

These plots were evaluated on June 16, 2005 (six months after plot establishment), and on November 7, 2005; the information collected is reported in Table 1. Several of the herbicide treatments controlled 100 percent of the Hog Potato. Some of the products applied still had soil activity at the time the plot was rated June 16.

To simplify the explanations in this section, I will discuss each chemical and the level of weed control observed.

Tordon 22K did an impressive job in controlling the Hog potato. The 32 ounce rate still had some soil activity six months after the plot was established. The addition of 32 ounces of 2,4-D in a tank mix did not increase the level of weed control in this test. The soil activity resulted in injury to cotton planted for 2005.

Reclaim and Remedy was used at two different rates in this test and both provided excellent control of the Hog potato plants. At the time plots were rated for weed control, there was no evidence of injury to cotton.

Surmount used at 32 ounces per acre was effective in controlling the Hog potato, but there was soil activity resulting in injury to the cotton.

PastureGard (triclopyr + fluroxypyr), at a 64 ounce rate, provided minimal control of the Hog potato initially but had an improved rating on November 7. This product has a limited use on ditch banks and CRP acreage.

Table 1. Data collected from Bill Hunter's Hog Potato Control Test (Nolan County, 2005)

Treatment	Cost of Herbicide Per Acre	Percent Hog Potato Control (June 6, 2005)	Percent Hog Potato Control (Nov. 7, 2005)
Tordon 22K @ 32 ounces per acre + C.O.C. @ 1% v/v	$20.48	100 a	91 a
Tordon 22K @ 32 ounces per acre + 2,4-D @ 32 ounces per acre + C.O.C. @ 1% v/v	$25.38	100 a	90 a
Surmount @ 32 ounces per acre + C.O.C. @ 1% v/v	$12.22	100 a	90 a
Remedy @ 1.0% v/v + Reclaim @ 1.0% v/v	$37.10	100 a	90 a
Remedy @ 0.5% v/v + Reclaim @ 0.5% v/v	$18.55	100 a	93 a
PastureGard @ 64 ounces + C.O.C. @ 1% v/v	$21.93	0 b	68 a
Check	$0.00	0 b	0 b

NOTE: In Table 1, the individual or combination of letter a or b beside the number is to indicate statistical significance. There is no statistical difference between numbers which have the same letter to the side.

Acknowledgments

We want to take this opportunity to thank Bill Hunter for his help in plot establishment and management.

We would also like to thank Dow AgroSciences LLC for providing PastureGard, Reclaim, Remedy, Surmount and Tordon 22K and UAP for providing the 2,4-D and C.O.C. for this test.

Result Demonstration/Applied Research Report

2004 - 2005 Jones County
Silverleaf Nightshade Control Demonstration
Cooperator: Gary and Susie Lovvorn

Todd Vineyard, Jones County Extension Agent --Agriculture
Dr. Ed Bynum, Extension Agent - IPM for Jones, Mitchell, Nolan and Scurry Counties
Dr. Billy Warrick, Extension Agronomist (San Angelo, Texas)

Summary

Five treatments were applied to Silverleaf nightshade on October 18, 2004. A wide range of control was achieved with the herbicides applied. Tordon 22K plus 2,4-D provided the highest level of Silverleaf nightshade control seven months after the test was established. The higher rates of Clarity and Tordon 22K had enough soil activity the broadleaf weeds were still being controlled when plots were evaluated on June 16, 2005.

Problem

In the Rolling Plains of Texas, Silverleaf nightshade (*Solanum elaegnifolium*) is a problem in crop production and non-crop areas. Silverleaf nightshade is a perennial which grows up to 3 feet tall. Leaves are an inch or less in width, lance shaped, somewhat wavy along the edges, and up to 5 inches long. Stems are armed with a few yellowish thorns. Both stems and leaves are covered with downy hairs, giving the plant a silvery appearance. Flowers are about 1 inch wide with 5 bluish to lavender petals, surrounding 5 bright yellow anthers clustered in the center. Flowers can be seen from midsummer until frost. Fruits are smooth, orange-yellow to dark colored, many-seeded berries. The plant has extensive horizontal rhizomes from the crown.

Objective

Through the use of a field test: 1) determine the effectiveness of herbicides at controlling the weed, 2) provide producers the opportunity of observing how effectively the herbicides control the weed, and 3) determine the economic feasibility of applying the herbicides for weed control.

Materials and Methods

Cooperating County Producer: Gary and Susie Lovvorn
Location: 0.5 miles south of Corinth on east side of Highway 277

Application Information:
Date Applied: October 18, 2004
Time: 11:00 a.m. to 12:30 p.m.

Wind Speed:	6 to 9 miles per hour
Wind Direction:	West
Air Temperature:	80 to 82^0 Fahrenheit
Relative Humidity:	31 to 38%
Pressure:	32 pounds per square inch
Boom Height:	19 inches
Water Applied:	17 gallons per acre
Nozzle:	Air Induction 11002 on 20 inch centers
Ground Speed:	3.0 miles per hour
Application Device:	Self propelled rig
Plot Size:	13.33 feet wide by 25 feet long
Test Design:	Randomized complete block design with three replications

Plant Information

The Silverleaf nightshade plants were actively growing at the time the herbicides were applied. The plants were 6 to 10 inches tall growing in an unstressed condition with no blooms.

Results and Discussion

These plots were evaluated on June 16, 2005 (seven months after plot establishment) and only one of the treatments provided a significantly higher level of weed control than the check. The variability between plots was the primary reason most treatments were shown not to provide any higher level of weed control than the check. The information collected on June 16 is summarized in Table 1.

To simplify the explanations in this section, I will discussion each chemical and the level of weed control observed.

Clarity provided only 28 percent control of the Silverleaf nightshade in this test. It has the potential to be used in the fall and then planted back to cotton the next spring. At 32 ounces per acre the soil residual should be at a minimum seven months after application. At 64 ounce per acre the impact to emerging cotton the next spring should be easily seen.

Remedy and Reclaim provided 60 percent control of the Silverleaf nightshade. There is no method to legally use this herbicide combination on cropland. In rangeland, it does have potential to be used for Silverleaf nightshade control.

Roundup WeatherMAX at 56 ounces took out 67 percent of the Silverleaf nightshade. Since this herbicide has no soil activity, the plots were infested with weeds at the seventh month rating.

Tordon 22K when combined with 2,4-D did an impressive job in controlling Silverleaf nightshade in this test. This was the only treatment providing significantly better control than the check. The 32 ounce rate of Tordon 22K still had a lot of soil activity at the seventh month rating.

Factors improving the performance of herbicides in this test were: actively growing Silverleaf nightshade, increased gallonage of water, and applying the material under favorable environmental conditions.

Table 1. Data collected from Gary and Susie Lovvorn's Silverleaf Nightshade Control Test (Jones County, 2005)

Treatment	Cost of Herbicide Per Acre	Percent Silverleaf Nightshade Control (June 16, 2005)
Tordon 22K @ 32 ounces per acre + 2,4-D @ 32 ounces per acre + C.O.C. @ 1% v/v	$25.38	94.7 a
Roundup WeatherMAX @ 56 oz. per acre + Ammonium Sulphate @ 0.17 pound per gallon	$24.50	66.7 ab
Remedy @ 1.0% v/v + Reclaim @ 1.0% v/v	$37.10	59.7 ab
Tordon 22K @ 32 ounces per acre + C.O.C. @ 1% v/v	$20.48	30.0 ab
Clarity @ 32 ounces per + C.O.C. @ 1% v/v	$22.00	28.0 ab
Check	$0.00	0.0 b

NOTE: In Table 1, the individual or combination of letter a or b beside the number is to indicate statistical significance. There is no statistical difference between numbers which have the same letter to the side (even when there appears to be a large difference in results between materials applied).

Acknowledgments

We want to take this opportunity to thank Gary and Susie Lovvorn for their help in plot establishment and management.

Also, we would like to thank the following companies for providing herbicide for this test.

Monsanto provided Roundup WeatherMAX
BASF provided Clarity
Dow AgroSciences LLC provided Remedy, Reclaim and Tordon 22K
UAP provided 2,4-D and C.O.C.

Result Demonstration/Applied Research Report

2004 - 2005 Jones County
Field Bindweed Control Demonstration
Cooperator: Jesse Morton

Todd Vineyard, Jones County Extension Agent --Agriculture
Dr. Ed Bynum, Extension Agent - IPM for Jones, Mitchell, Nolan and Scurry Counties
Dr. Billy Warrick, Extension Agronomist (San Angelo, Texas)

Summary

Twelve treatments were applied to Field Bindweed on October 18, 2004. A wide range of control was achieved with the herbicides applied. Arsenal and Tordon 22K were still providing the highest level of Field Bindweed control seven months after the test was established. The higher rates of Arsenal and Tordon 22K had enough soil activity that the broadleaf weeds were still being controlled when plots were evaluated on June 16, 2005. In a non-crop situation, these herbicides would be useful.

Problem

In the Rolling Plains of Texas, Field Bindweed (*Convolvulus arvensis*) is a problem in crop production and non-crop areas. Field Bindweed can be recognized by its arrowhead-shaped leaves, white or pink funnel-shaped flowers, and the presence of two finger-like bracts below the flowers. The plant has smooth stems that twine and spread to form a mat on the ground surface. The arrowhead leaves are located alternately along the plant's vine. The leaves usually have a rounded tip and smooth margins. The 1-inch pink to white funnel-shaped flowers are the plant's most distinctive characteristic. Flowering occurs from mid-May until frost in the fall. The two small bracts located 1 inch below the flower distinguish this species from other vine weeds. The irregular-shaped seed pod usually contains four seeds. Seeds are dull brown, rough, 1/8 to 1/6 inch long and have an orange slice appearance. Seedlings emerge from the seeds with two leaves similar to alfalfa or radishes. In agricultural areas, Field Bindweed depletes soil moisture resulting in reduced yield. The seed of Field Bindweed are hard and can remain viable in the soil for more than 20 years. The presence of seed in grain crops reduces the value of production sold.

Objective

Through the use of a field test: 1) determine the effectiveness of herbicides at controlling the weed, 2) provide producers the opportunity of observing how effectively the herbicides control the weed, and 3) determine the economic feasibility of applying the herbicides for weed control.

Materials and Methods

Cooperating County Producer:	Jesse Morton
Location:	3 miles west of Farm Road 1661 on north side of Farm Road 2834

Application Information:

Date Applied:	October 18, 2004
Time:	2:30 p.m. to 4:30 p.m.
Wind Speed:	9 to 10 miles per hour
Wind Direction:	West
Air Temperature:	84^0 to 86^0 Fahrenheit
Relative Humidity:	21 to 23%
Pressure:	32 pounds per square inch
Boom Height:	19 inches
Water Applied:	17 gallons per acre
Nozzle:	Air Induction 11002 on 20 inch centers
Ground Speed:	3.0 miles per hour
Application Device:	Self propelled rig
Plot Size:	13.33 feet wide by 50 feet long
Plot Locations:	East side of plot 109 lines up with telephone pole across the road. The telephone pole is the second one west of the fence.
Test Design:	randomized complete block design with three replications

Plant Information

The Field Bindweed plants were actively growing at the time of application made and the runners were 3 to 5 inches long. The plants were young and in a growth stage which should allow for a high level of control. The average number of Field Bindweed was eight plants per square foot.

Results and Discussion

These plots were evaluated on June 16, 2005 (seven months after plot establishment) and several of the herbicides controlled more than 90 percent of the field bindweed. Some of the products applied still had soil activity that was controlling any weeds which were trying to emerge. The information collected on June 16 is summarized in Table 1.

To simplify the explanations in this section, I will discussion each chemical and the level of weed control observed.

Arsenal controlled the Field Bindweed at all rates used. The three ounce rate was sufficient to control Field Bindweed but soil residual activity was minimal. This was evident at the June 16 rating where plots were heavily infested with broadleaf weeds and grasses but no Field Bindweed. Higher rates of Arsenal increased the soil residual level and weed control. At the 16 ounce rate the plot had over 95 percent of all weeds controlled. For non-crop purposes this herbicide has strong potential in controlling Field Bindweed.

Clarity provided moderate control in this Field Bindweed test. It does have the potential to be used in the fall and then planted back to cotton the next spring. At 32 ounces per acre the soil residual should be at a minimum seven months after application. At 64 ounce per acre the impact to emerging cotton the next spring should be easily seen.

Paramount herbicide's strength is in the ability to use this herbicide to control Field Bindweed in a grain sorghum crop. In this test 64 percent of the targeted weeds were controlled using 16 ounces of Paramount per acre. It will need help from other herbicides to control most of the other weeds.

Remedy and Reclaim provided no control of the Field Bindweed in this test.

Roundup WeatherMAX, at 28 ounces, took out 62 percent of the Field Bindweed. Since this herbicide has no soil activity, the plot was infested with weeds at the seventh month rating.

Tordon 22K did an impressive job in controlling the Field Bindweed. The 32 ounce rate still had a lot of soil activity at the seventh month rating. The addition of 2,4-D to the mix did not increase the level of Field Bindweed control in this test.

Weedmaster, at 80 ounces per acre, only controlled 27 percent of the Field Bindweed in this test. By June 16 it had basically broken down and most of the broadleaf and annual weeds were actively growing in the plots.

Several factors which improved the performance of herbicides in this test were: actively growing Field Bindweed, increased gallonage of water, and applying the material under favorable environmental conditions.

Acknowledgments

We want to take this opportunity to thank Jesse Morton for his help in plot establishment and management. Also, we would like to thank the following companies for providing herbicide for this test.

Monsanto provided Roundup WeatherMAX
BASF provided Arsenal, Clarity, Paramount and Weedmaster,
Dow AgroSciences LLC provided Remedy, Reclaim and Tordon 22K
UAP provided 2,4-D and C.O.C.

Table 1. Data collected from Jesse Morton's Field Bindweed Control Test (Jones County, 2005)

Treatment	Cost of Herbicide Per Acre	Percent Field Bindweed Control (June 16, 2005)
Arsenal @ 9 ounces per acre + C.O.C. @ 1% v/v	$20.43	99.0 a
Tordon 22K @ 32 ounces per acre + C.O.C. @ 1% v/v	$20.48	98.0 a
Arsenal @ 6 ounces per acre + C.O.C. @ 1% v/v	$13.62	95.0 a
Arsenal @ 3 ounces per acre + C.O.C. @ 1% v/v	$6.81	87.7 a
Arsenal @ 12 ounces per acre + C.O.C. @ 1% v/v	$27.24	85.7 a
Tordon 22K @ 32 ounces per acre + 2,4-D @ 32 ounces per acre + C.O.C. @ 1% v/v	$25.38	84.3 a
Paramount @ 16 ounces per acre + C.O.C. @ 1% v/v	$45.00	64.3 ab
Roundup WeatherMAX @ 28 oz. per acre + Ammonium Sulphate @ 0.17 pound per gallon	$12.25	61.7 ab
Clarity @ 32 ounces per + C.O.C. @ 1% v/v	$22.00	31.7 bc
Roundup WeatherMAX @ 56 oz. per acre + Ammonium Sulphate @ 0.17 pound per gallon	$24.50	31.7 bc
Weedmaster @ 80 ounces per acre + C.O.C. @ 1% v/v	$16.88	26.7 bc
Remedy @ 1.0% v/v + Reclaim @ 1.0% v/v	$37.10	0.0 c
Check	$0.00	0.0 c

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

Result Demonstration/Applied Research Report

2005 Nolan County Liberty Link Test

Cooperator: Randall Smith

Zach Wilcox, Nolan County Extension Agent--Agriculture
Dr. Ed Bynum, Extension Agent - IPM for Jones, Mitchell, Nolan and Scurry Counties
Dr. Billy Warrick, Extension Agronomist (San Angelo, Texas)

Summary

Initially this test was established to determine the effectiveness of Ignite 280 herbicide in controlling annual weeds. An application of Roundup WeatherMAX (glyphosate) prior to planting the Liberty Link cotton controlled most of the weeds for the season. The only weed which remained in the test plots was Field Bindweed, which emerged in late-May. Ignite is a contact herbicide which would be able to kill the seedling Field Bindweed but not the perennial weeds regrowing from the root system. The focus of the test was changed to evaluate if Field Bindweed could be suppressed and/or controlled using Ignite 280. Applications of Ignite were made on July 6, August 1, and August 31, to actively growing and unstressed Field Bindweed which had vines ranging from six to eight inches long. Each application of herbicide eliminated most of the Field Bindweed vegetation that existed and provided a window of opportunity for the cotton to develop with no weed competition. Each rainfall event resulted in additional Field Bindweed development. The herbicides applied did control the plants which were growing at the time the application(s) were made. However, reinfestation continued throughout the growing season.

Problem

In the Rolling Plains of Texas, Field Bindweed (*Convolvulus arvensis*) is a problem in crop production and non-crop areas. Field Bindweed can be recognized by its arrowhead-shaped leaves, white or pink funnel-shaped flowers, and the presence of two finger-like bracts below the flowers. The plant has smooth stems that twine and spread to form a mat on the ground surface and through the crop canopy. The arrowhead leaves are located alternately along the plant's vine. The leaves usually have a rounded tip and smooth margins. The 1-inch pink to white funnel-shaped flowers are the plant's most distinctive characteristics. Flowering occurs from mid-May until frost in the fall. The two small bracts located 1 inch below the flower distinguish this species from other vine weeds. The irregular-shaped seed pod usually contains four seeds. Seeds are dull brown, rough, 1/8 to 1/6 inch long and have an orange slice appearance. Seedlings emerge from the seeds with two leaves similar to alfalfa or radishes. In agricultural areas, Field Bindweed depletes soil moisture resulting in reduced yield and the vine growth in the cotton canopy can interfere with harvesting. The seed of Field Bindweed is hard and can remain viable in the soil for more than 20 years.

Objective

Through the use of a field test: 1) determine the effectiveness of herbicides at controlling the weed, 2) provide producers the opportunity of observing how effectively herbicides control the weed, and 3) determine economic feasibility of applying herbicides for weed control.

Materials and Methods

Cooperating County Producer: Randall Smith
Location: West side of Roscoe, Texas

Application Information:

Date Applied:	July 6, 2005	August 1, 2005	August 31, 2005
Time of Application:	9:30 a.m. - 10:15 a.m.	9:00 a.m. - 10:15 a.m.	9:00 a.m. - 10:00 a.m.
Wind Speed:	5 miles per hour	3 to 4 miles per hour	6 to 8 miles per hour
Wind Direction:	South by Southwest	South	South
Air Temperature:	76 to 78^0 Fahrenheit	75 to 80^0 Fahrenheit	76 to 82^0 Fahrenheit
Relative Humidity:	60 %	45 to 50%	58 to 67%
Spray Volume	18.0 gallons per acre	15.3 gallons per acre	19.0 gallons per acre
Pressure:	32 p.s.i.	32 p.s.i.	32 p.s.i.
Application Device:	Hand boom	Hand boom	Hand boom
Ground Speed:	3.0 miles per hour	3.0 miles per hour	3.0 miles per hour
Nozzle:	11002 Air Induction Flat Fan on 20 inch center.	11002 Air Induction Flat Fan on 20 inch center.	11002 Air Induction Flat Fan over the top of the row and 8002 flat fan nozzels on each side of the row.
Boom Height:	16 inches	16 inches	32 inches
Field Bindweed:	6 to 8 inch runners	6 to 8 inch runners	2 to 8 inch runners
All plots: Plot Size: 6.7 feet wide by 45 feet long Test Design: randomized complete block design with three replications			

Results and Discussion

The purpose of this test was to determine how well Ignite 280 controlled annual weeds in Liberty Link cotton. An application of glyphosate (Roundup WeatherMAX), prior to the planting of cotton, controlled most of the weeds for the growing season. By late-May, Field Bindweed emerged in the test plots and it became the target weed of this study. Ignite 280 is a contact herbicide which can kill the seedling Field Bindweed, but not regrowth of perennial weeds from the root system. Applications of Ignite 280 were made on July 6, August 1, and August 31 to actively growing and unstressed Field Bindweed which had vines ranging from six to eight inches long. Each application of herbicide eliminated most of the Field Bindweed vegetation and provided a window of opportunity for the cotton to develop with no weed competition.

On August 1, prior to any Field Bindweed blooming, the check plots were oversprayed with Roundup WeatherMAX to prevent any seed from being produced. The number of Field Bindweed plants in the check plots averaged one plant per square foot (300 plants per plot). The level of weed control in the Ignite 280 plots established on July 6, ranged from 29 to 75 percent. Due to the variability between plots, there was no statistical difference between treatments. With each rainfall event during the growing season, additional Field Bindweed would develop either from the perennial root system or from seed. Also, the application of glyphosate provided the opportunity to evaluate and take pictures of the impact of the herbicide on Liberty Link cotton.

Different followup treatments were applied on August 1, and when it was evaluated on August 31 the level of weed control ranged from 29 percent to 90 percent. All treatments were better than the check, which was set at 300 plants per plot. The variability between treatments resulted in no statistical difference between treatments. Also, the application of glyphosate to the Liberty Link cotton resulted in a plant height reduction of 12 inches and no boll retention. The leaves appeared strapped, very similar to hormone herbicide damage. The data collected on August 31 is reported in Table 1.

On August 31, all plots were oversprayed with either 23 ounces of Ignite 280 or 28 ounces of glyphosate (Roundup WeatherMax). Due to the plant size, a three nozzle per row arrangement was used with increased gallonage. The cotton plant was nearing cut out with five nodes above white flower. A large portion of the early boll set had been lost to bollworms and budworms. Some of the first replacement bolls were now almost full size. The plot was evaluated on September 26 and the data collected is reported in Table 1.

As the plots were evaluated on September 26, it was noted the glyphosate applied on August 31 for the first time had caused some minor plant injury and most of the young bolls had been aborted. The plot where glyphosate had been applied for a second time was stunted but not dead. The level of Field Bindweed control was over 90 percent in all plots, except the treatment where Roundup was applied only once on August 1. There were very few Field Bindweed in the test plots which had not been injured by the herbicides applied. No plants had produced seed during the season. Overall, the level of weed control achieved was higher than expected. The number of applications needed was also more than expected.

Several factors improved the performance of the herbicides in this test. They included actively growing Field Bindweed, increased gallonage of water, and applying the material under favorable environmental conditions.

The impact of glyphosate on Liberty Link Cotton was a reminder producers will need to properly mark fields where different technologies are used. The impact of using the wrong herbicide for the technology in this test, was reduced plant height, reduced plant performance, and dramatic yield reductions of lint and seed.

Since perennial Field Bindweed is an aggressive grower it will take multiple applications of Ignite to keep the weed suppressed. Since it does not have the systemic characteristic glyphosate does, only a minor impact was made to the perennial root system.

Ignite is a contact herbicide, so coverage is very important. Producers needed to make sure a minimum of 15 gallons of water per acre and nozzles provide through coverage are used.

Economics

Weed control from the herbicides applied was impressive for most treatments. The cost per acre was high enough that producers may have to mark only the areas of the field which need treating and use an aggressive spot treatment program. The Liberty Link program gives the producer the opportunity of raising a crop and controlling weeds throughout the season. Roundup tolerant cotton varieties which are to be released in 2006 will offer the same opportunity using a specially formulated glyphosate. Either herbicide program will allow a producer to have income from lint and seed production to help offset the cost of herbicides applied.

Acknowledgments

We want to take this opportunity to thank Randall Smith for his help in plot establishment and management.

We would also like to thank: Bayer CropScience for providing Ignite 280; DuPont Company for providing Staple; FMC Corporation for providing Aim; Monsanto for providing Roundup WeatherMAX; Syngenta Corporation for providing Envoke; and Valent Corporation for providing Valor.

Table 1. Data collected from Randall Smith's Field Bindweed Control Test (Nolan County, 2005)

Treatment	Cost of Herbicide Per Acre	Percent Field Bindweed Control	
		August 31 a/	September 26 b/
Check -------->followed by Roundup WeatherMAX @ 28 oz. per acre (August 1, 2005) -------->followed by Roundup WeatherMAX @ 28 oz. per acre (August 31, 2005)	$9.41 $9.41	91.11	97.22 ab
Ignite 280 @ 23 oz. per acre ------->followed by Roundup WeatherMAX @ 28 oz. per acre (August 1, 2005)	$9.00 $9.41	83.44	72.56 b
Ignite 280 @ 23 oz. per acre ------->followed by Ignite 280 @ 23 oz. per acre (August 1, 2005) ------->followed by Ignite 280 @ 23 oz. per acre (August 31, 2005)	$9.00 $9.00 $9.00	29.00	95.89 ab
Ignite 280 @ 23 oz. per acre ------->followed by Ignite 280 @ 23 oz. + Valor @ 1.5 oz. per acre (August 1, 2005) ------->followed by Roundup WeatherMAX @ 28 oz. per acre (August 31, 2005)	$9.00 $7.59 $9.41	76.00	99.78 a
Ignite 280 @ 23 oz. per acre ------->followed by Ignite 280 @ 23 oz. + Envoke@ 0.25 oz. per acre (August 1, 2005) ------->followed by Roundup WeatherMAX @ 28 oz. per acre (August 31, 2005)	$9.00 $12.25 $9.41	47.33	93.00 ab
Ignite 280 @ 23 oz. per acre ------->followed by Ignite 280 @ 23 oz. + Staple@ 1.5 oz. per acre (August 1, 2005) ------->followed by Ignite 280 @ 23 oz. per acre (August 31, 2005)	$9.00 $27.00 $9.00	90.00	95.44 ab
Ignite 280 @ 23 oz. per acre ------->followed by Ignite 280 @ 23 oz. + Staple@ 0.6 oz. per acre (August 1, 2005) ------->followed by Ignite 280 @ 23 oz. per acre (August 31, 2005)	$9.00 $10.80 $9.00	86.44	94.78 ab
Ignite 280 @ 23 oz. per acre ------->followed by Ignite 280 @ 23 oz. + Aim@ 1.0 oz. per acre (August 1, 2005) ------->followed by Roundup WeatherMAX @ 28 oz. per acre (August 31, 2005)	$9.00 $5.47 $9.41	40.44	98.22 ab

a/Nolan County – August 31 column is the rating of the application made August 1, 2005
b/Nolan County – September 26 column is the rating of the application made August 31, 2005

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

Result Demonstration/Applied Research Report

2005 Jones County Roundup Flex Test

Cooperator: Steve Blankenship

Todd Vineyard, Jones County Extension Agent --Agriculture
Dr. Ed Bynum, Extension Agent - IPM for Jones, Mitchell, Nolan and Scurry Counties
Dr. Billy Warrick, Extension Agronomist (San Angelo, Texas)

Summary

Two applications of RoundupWeatherMax (glyphosate) were applied to cotton that was planted on June 28. The spectrum of weeds in the plot included annual and perennial weeds. Applications of glyphosate were made on July 18 and August 22 to actively growing, unstressed, weeds which ranged in size from two inches to eight inches. Each application of glyphosate eliminated over 98 percent of the existing weeds and provided a window of opportunity for the cotton to develop with no weed competition. Each rainfall event resulted in more weed seed germination and reinfestation of the plots. The glyphosate did control all the weeds in the plots except for Ground cherry. All weeds were actively growing in an unstressed condition at the time the applications were made. The Roundup Flex program provided over 98 percent weed control for the season.

Problem

In the Rolling Plains of Texas, the control of weeds is critical to reach the yield potential of the cotton crop. One herbicide program gaining popularity by producers is using glyphosate on Roundup Ready cotton to control both annual and perennial weeds. The main weakness of the program is multiple flushes of weeds which require the use of hooded sprayers to make herbicide applications after the cotton plant has past the fifth true leaf stage. With the introduction of Roundup Flex cotton, a producer can spray over the top of cotton until the 12^{th} node stage without injuring the yield potential of the cotton. Since this is a new technology, producers will need several growing seasons to verify the full value of the improved varieties. If it meets expectations this will be a useful tool in controlling several weed problems in cotton.

Objective

Through the use of a field test: 1) determine the effectiveness of herbicides at controlling the weed, 2) provide producers the opportunity of observing how effectively the new Roundup Flex program worked in controlling weeds, and 3) determine the economic feasibility of applying the herbicides for weed control.

Materials and Methods

Cooperating County Producer: Steve Blankenship
Location: 3 miles west of Fm Rd 707 on Farm Road 2746. Then 2.0 miles south on Fm Rd 3116 then 0.6 mile east on field road

Application Information:

Date Applied:	July 18, 2005	August 22, 2005
Time of Application:	10:00 - 11:30 a.m.	9:30 a.m. - 11:30 a.m.
Wind Speed:	9 to 10 miles per hour	4 to 5 miles per hour
Wind Direction:	South	Southwest
Air Temperature:	80 to 85^0 Fahrenheit	84 to 89^0 Fahrenheit
Relative Humidity:	45 to 60%	50 to 63%
Spray Volume	10.0 gallons per acre	10.0 gallons per acre
Pressure:	32 p.s.i.	32 psi
Application Device:	Self Propelled	Self Propelled
Ground Speed:	4.0 m.p.h.	4.0 miles per hour
Nozzle:	11002 Flat Fan on 20 inch centers	11002 Flat Fan on 20 inch centers
Boom Height:	12 inches	28 inches
Cotton:	3rd True Leaf Stage	½ grown square stage
All plots: Plot Size: 13.33 feet wide by 50 feet long Test Design: randomized complete block design with four replications Note: All treatments applied July 18 included an insecticide (Centric® 40WG) @ 2 ounces per acre		

Results and Discussion

The purpose of this test was to determine if multiple applications of glyphosate in a Roundup Ready cotton production system was a better approach than fall applied herbicides. Most of the fall applied herbicides have enough soil residual activity to impact or prevent the cottonseed from germinating and developing a plant the following spring. By using glyphosate, with glyphosate resistant cotton, the weeds could be controlled while producing a cotton crop.

On July 18 the first application of Roundup WeatherMax was applied and a high level of weed control was achieved which allowed the cotton to develop with no weed competition. Weed height at the time of the application ranged from two to eight inches and plants were rapidly growing. The information collected on August 22 is summarized in Table 1.

Prior to making the second application, an inventory of the weeds in each of the plots was conducted. The purpose of the inventory was to document weeds that might be more difficult to control because of size. Weeds found in the plots included Cocklebur, Devil's Claw, Redroot Pigweed, Johnsongrass, Silverleaf Nightshade, Ground Spurge, Turnip Weed, Russian Thistle, and Ground Cherry.

On August 22 the second application of Roundup was applied to control the weeds that had emerged due to favorable soil moisture conditions. If this had been Roundup Ready cotton then the herbicide would have been applied using a hooded sprayer because of the advanced cotton growth stage. Since this was Roundup Flex cotton then an application of Roundup was made over the top of the cotton. Weed size for most of the plants in the plot was less than two inches at the time of application and the plants were unstressed and rapidly growing. The information collected on September 22 and October 22 is summarized in Table 1.

The plot rating on October 22 was to provide information concerning season long control of the weeds. More than 98 percent of the weeds were controlled in all plots. The only exception was the Ground Cherry which was not impacted by any of the herbicides applied. Weed seed production was greatly reduced on this acreage.

The higher rate of Roundup WeatherMAX or the addition of Staple did not provide additional levels of weed control in this test. Often the residual activity of Staple extends the time period before additional applications of herbicides are needed. That was not the case in this test, primarily due to the hot dry September and October which did not result in additional weed emergence.

Several factors improved the performance of the herbicides in this test. They included: 1) actively growing unstressed weeds, 2) good coverage of the weeds with the herbicide(s) applied, and 3) applying the material under favorable environmental conditions.

Economics

Weed control from the fall applied herbicides provided a high level of weed control but most of the herbicides applied injured the cotton as it emerged in the spring. With the drop in price on glyphosate and the availability of high quality Roundup tolerant cotton varieties the spring and in-season summer herbicide program for controlling many of the weed problems in cotton makes the most economic sense. If the least expensive glyphosate was used, the three applications of herbicide would cost less than $25 and provide excellent weed control (if applied correctly).

Table 1. Data collected from Steve Blankenship's Roundup Flex Test (Jones County, 2005)

Treatment	Cost of Herbicide Per Acre	Weed Control Rating		
		August 22	September 22	October 22
Roundup WeatherMAX @ 22 oz. per acre + Ammonium Sulphate @ 0.17 pound per gallon followed by Roundup WeatherMAX @ 22 oz. per acre + Ammonium Sulphate @ 0.17 pound per gallon	$4.90+ $0.34 $4.90+ $0.34	95	99	99
Roundup WeatherMAX @ 22 oz. per acre + Ammonium Sulphate @ 0.17 pound per gallon followed by Roundup WeatherMAX @ 32 oz. per acre + Ammonium Sulphate @ 0.17 pound per gallon	$4.90+ $0.34 $7.13+ $0.34	95	99	99
Roundup WeatherMAX @ 22 oz. per acre + Ammonium Sulphate @ 0.17 pound per gallon followed by Roundup WeatherMAX @ 22 oz. per acre + Staple @ 1.5 ounces per acre + Ammonium Sulphate @ 0.17 pound per gallon	$4.90 + $0.34 $4.90 + $27.00 + $0.34	95	99	99
Roundup WeatherMAX @ 22 oz. per acre + Ammonium Sulphate @ 0.17 pound per gallon followed by Roundup WeatherMAX @ 32 oz. per acre + Staple @ 1.5 ounces per acre + Ammonium Sulphate @ 0.17 pound per gallon	$4.90 + $0.34 $7.13+ $27.00 + $0.34	95	99	99
Check	-	0	0	0
Roundup WeatherMAX @ 22 oz. per acre + Ammonium Sulphate @ 0.17 pound per gallon followed by Roundup WeatherMAX @ 22 oz. per acre + Ammonium Sulphate @ 0.17 pound per gallon	$4.90+ $0.34 $4.90+ $0.34	95	99	99
Roundup WeatherMAX @ 22 oz. per acre + Ammonium Sulphate @ 0.17 pound per gallon followed by Roundup WeatherMAX @ 22 oz. per acre + Staple @ 1.5 ounces per acre + Ammonium Sulphate @ 0.17 pound per gallon	$4.90 + $0.34 $4.90 + $27.00 + $0.34	95	99	99

Acknowledgments

We want to take this opportunity to thank Steve Blankenship for his help in plot establishment and management.

We would also like to thank Monsanto for providing Roundup WeatherMAX for this test.

Also, we would like to thank DuPont for providing Staple for this test.

Result Demonstration/Applied Research Report

2005 Jones County Cotton Harvest Aid Demonstration

Cooperator: Brent Hargrove

Todd Vineyard, Jones County Extension Agent--Agriculture
Dr. Ed Bynum, Extension Agent - IPM for Jones, Mitchell, Nolan and Scurry Counties
Dr. Billy Warrick, Extension Agronomist (San Angelo, Texas)

Summary

Twelve treatments were applied over the top of cotton on October 5 to prepare for harvest. The plot was established on Brent Hargrove's Farm located 2 miles north and 2.5 miles west of Anson, Texas. The chemicals were applied to Paymaster 2379 RR that had 20 percent of its bolls open. Leaf shed was less than one percent when the plot was established. When these plots were evaluated on October 19, 2005 (14 days after treatments were applied) most of the treatments had increased boll opening, leaf defoliation and leaf desiccation. Initiating the test before the cotton was mature reduced the performance of the plant to the harvest aids applied.

Objective

In the Southern Rolling Plains 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 which 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:	Brent Hargrove
Location:	2 miles north and 2.5 miles west of Anson, Texas

Crop Production Information:

Variety Planted:	Paymaster 2379 RR
Planting Pattern:	2 X 1
Irrigation:	Dryland Production
Number of Irrigations:	None

Harvest Aid Application Information:

Date Applied:	October 5, 2005
Wind Speed:	7.0 to 9.0 miles per hour
Wind Direction:	Southeast
Air Temperature:	88 to 89^0 Fahrenheit
Relative Humidity:	37 to 40%
Carrier:	15.0 gallons of water per acre
Pressure:	34 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:	40 inches
Cotton Height:	32 inches
Ground Speed:	4.0 miles per hour
Application Device:	Self propelled rig with 13.33 foot boom
Plot Size:	6.7 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 over half of the bolls were not mature. Cotton height ranged from 30 to 34 inches. Plants showed no sign of stress and leaf defoliation was less than one percent.

Results and Discussion

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 axilary and terminal buds, as well as the bolls.

Before the plot was evaluated on October 19, it looked as if the plot had been oversprayed. The producer was not aware of this but the check plots were almost defoliated and the top regrowth in most plots had been desiccated. Since we are not sure what was sprayed then it can not be documented. Most of the plot was ready to be harvested on October 13.

At the time the harvest aids were applied, 20 percent of the bolls were open and over half of the bolls on the plant were immature. The application of the harvest aids did impact boll opening, percent defoliation and percent desiccation. Several factors contributed to the poor response of the cotton

to the harvest aids applied, these include: 1) The cotton was immature; 2) Rainfall occurred 7 hours after the plot was established on October 5; and 3) Daytime air temperature was low for four days after the plot was established.

Boll opening, leaf defoliation and leaf desiccation was different than expected due to the plot being initiated before the cotton was mature. However, there still was some differences in boll opening, leaf defoliation and leaf desiccation between the check and the treatments. In this plot, no regrowth existed in the top or bottom portion of the cotton plant. The data collected on October 19 is reported in Table 1.

If regrowth becomes a concern by harvest time, some of the materials used in the test are known to be better at desiccating or removing juvenile growth. These include Aim, Blizzard, ET, Ginstar, and Resource. Please note a crop oil concentrate was used in tank mixes which contained Aim, Blizzard, ET, and Resource. For maximum performance with these products, that is an important part of the tank mix.

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 eight ounces or more of Gramoxone Max was applied.

On October 19 most of this plot was not ready for harvest. The percent green and desiccated leaves remaining on the plant was too high. In the plots where Gramoxone was applied, 75 percent of the leaves were desiccated and would have resulted in a high leaf discount. 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.

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. It is important to remember 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

We want to take this opportunity to thank Brent Hargrove for his help in plot establishment and management.

We would also like to thank the companies who provided chemicals for this harvest aid test.

- Bayer CropScience provided Ginstar and Prep
- Chemtra provided Blizzard
- DuPont provided CottonQuik
- FMC Corporation provided Aim

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

Table 1. Brent Hargrove's Cotton Harvest Aid Test (Jones County, 2005)
October 19, 2005 (14 days after treatments were applied)

Harvest Aid Chemicals Applied (2 rows of each)	Rate Applied Per Acre	Cost of Harvest Aid Per Acre	% Open Bolls	% Defoliation	% Desiccation
ET + CottonQuik + Herbimax (C.O.C.)	1.5 oz. + 48 oz. + 1% v/v	$3.75 + $9.02 + $1.38	65.00 a	62.50 a	17.50 cd
Blizzard + CottonQuik + Herbimax (C.O.C.)	0.5 oz. + 48 oz. + 1% v/v	$3.50 + $9.02 + $1.38	65.00 a	51.25 ab	15.00 cde
Blizzard + Prep + Herbimax (C.O.C.)	0.5 oz. + 21 oz. + 1% v/v	$3.50 + $5.42 + $1.38	58.75 ab	65.00 a	16.25 cd
Aim + Prep + Herbimax (C.O.C.)	0.75 oz. + 21 oz. + 1% v/v	$4.10 + $5.42 + $1.38	65.00 a	58.75 ab	8.75 defg
ET + Prep + Herbimax (C.O.C.)	1.5 oz. + 21 oz. + 1% v/v	$3.75 + $5.42 + $1.38	65.00 a	52.50 ab	15.00 cde
Resource + Prep + Herbimax (C.O.C.)	8.0 oz. + 21 oz. + 1% v/v	$6.00 + $5.42 + $1.38	62.50 a	46.25 b	12.50 cdef
Ginstar + Prep	5 oz. + 16 oz. +	$7.40 + $4.13	57.50 ab	51.25 ab	5.25 efg
ET + Gramoxone Max + Herbimax (C.O.C.)	1.5 oz. + 8 oz. + 1% v/v	$3.75 + $2.19 + $1.38	55.00 abc	51.25 ab	31.25 b
ET + Herbimax (C.O.C.)	2.75 oz. + 1% v/v	$6.88 + $1.38	50.00 bcd	56.25 ab	21.50 c
Ginstar	7 oz.	$10.36	38.75 d	65.00 a	3.75 fg
Check	-	$0.00	43.75 cd	15.00 c	0.00 g
Gramoxone Max + Activator 90	16 oz. + 0.5% v/v	$4.38 + $1.68	55.00 abc	25.00 c	75.00 a
Gramoxone Inteon + Activator 90	24 oz. + 0.5% v/v	$4.38 + $1.68	50.00 bcd	25.00 c	75.00 a

NOTE: In Table 1, the individual or combination of letter a, b, c, d, e, f, or g shown beside the number is 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).

Result Demonstration/Applied Research Report

2005 Nolan County Cotton Harvest Aid Demonstration

Cooperator: Kim Alexander

Zach Wilcox, Nolan County Extension Agent--Agriculture
Dr. Ed Bynum, Extension Agent - IPM for Jones, Mitchell, Nolan and Scurry Counties
Dr. Billy Warrick, Extension Agronomist (San Angelo, Texas)

Summary

Twelve treatments were applied over the top of cotton on September 26 to prepare for harvest. The plot was established on Kim Alexander's Farm located 0.5 mile south of Roscoe, Texas. The chemicals were applied to FiberMax 991 BG2/RR cotton that had 50 percent of its bolls open. Leaf shed was less than one percent when the plot was established. When these plots were evaluated on October 13, 2005 (17 days after the treatments were applied) some of the treatments had increased boll opening, 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:	Kim Alexander
Location:	0.5 mile south of Roscoe, Texas

Crop Production Information:

Variety Planted:	FiberMax 991 BG2/RR
Planting Pattern:	Planted solid
Irrigation:	Dryland Production

Number of Irrigations: None

Harvest Aid Application Information:

Date Applied:	September 26, 2005
Wind Speed:	7.0 to 9.0 miles per hour
Wind Direction:	Southwest
Air Temperature:	80 to 90^0 Fahrenheit
Relative Humidity:	24 to 36%
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:	36 inches
Cotton Height:	28 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 26 to 30 inches. Plants showed no sign of stress and leaf defoliation was less than one percent.

Results and Discussion

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.

Before the plot was evaluated on October 13, it looked as if the plot had been oversprayed. The producer was not aware of this but the check plots were almost defoliated and the top regrowth in most plots had been desiccated. Since we are not sure what was sprayed, then it can not be documented. Most of the plot was ready to be harvested on October 13.

Fifty percent of the bolls were open at the time harvest aids were applied, most of the remaining 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) The cotton was mature; 2) Chemical coverage was excellent due to gallonage, pressure used, and wind; 3) Air temperatures for the first 9 days after application were warm enough to allow for good cotton plant response.

Leaf defoliation and desiccation was different than expected due to the plot being oversprayed. However, there still was some differences in boll opening, leaf defoliation and leaf desiccation. In this plot, regrowth only existed in the bottom portion of the plant and none of it was developed enough to be a harvest concern. The data collected on October 13 is reported in Table 1.

If regrowth becomes a concern by harvest time, some of the materials used in the test are known to be better at desiccating or removing juvenile growth. These include Aim, Blizzard, ET and Ginstar. Please note a crop oil concentrate was used in tank mixes which contained Aim, Blizzard, or ET. For maximum performance with these products, that is an important part of the tank mix.

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 eight ounces or more of Gramoxone Max was applied.

On October 13, the amount of leaf defoliation, combined with leaf desiccation resulted in over half of these plots being ready to harvest. The biggest concern in the test plot was the amount of leaves remaining on the plant. 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.

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 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

We want to take this opportunity to thank Kim Alexander for his help in plot establishment and management.

We would also like to thank the companies who provided the chemicals for this harvest aid test.

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

Table 1. Kim Alexander's Cotton Harvest Aid Test (Nolan County, 2005)
October 13, 2005 (17 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. + 8 oz. + 1% v/v	$3.50 + $2.19 + $1.38	88.75 ab	86.50 bc	12.75 ef
Gramoxone Max + Activator 90	12 oz. + 0.5% v/v	$3.29 + $1.68	86.75 abc	84.75 bcd	15.00 cdef
Gramoxone Inteon + Activator 90	24 oz. + 0.5% v/v	$4.38 + $1.68	86.25 abc	76.25 de	23.75 abcd
Gramoxone Max + Activator 90	16 oz. + 0.5% v/v	$4.38 + $1.68	85.00 bc	75.00 de	25.00 abc
Gramoxone Max + Induce	16 oz. + 0.5% v/v	$4.38 + $1.50	83.75 bc	73.75 e	26.25 ab
Gramoxone Max + LI 700	16 oz. + 0.5% v/v	$4.38 + $1.87	85.00 bc	71.25 e	28.75 a
Gramoxone Max + Activator 90	8 oz. + 0.5% v/v	$2.19 + $1.68	83.75 bc	77.00 cde	21.75 abcde
Aim + Gramoxone Max + Herbimax (C.O.C.)	0.75 oz. + 8 oz. + 1% v/v	$4.10 + 2.19 + 1.38	85.00 bc	76.25 de	21.50 abcde
ET + Gramoxone Max + Herbimax (C.O.C.)	1.25 oz. + 8 oz. + 1% v/v	$3.13 + $2.19 + $1.38	83.75 bc	80.75 cde	16.25 bcde
Aim + Prep + Herbimax (C.O.C.)	0.75 oz. + 16 oz. + 1% v/v	$4.10 + $4.13 + $1.38	93.25 a	91.50 ab	2.00 g
Ginstar	5 oz.	$7.40	80.00 c	97.25 a	0.25 g
Aim + CottonQuik + Herbimax (C.O.C.)	0.75 oz. + 32 oz. + 1% v/v	$4.10 + $6.02 + $1.38	83.75 bc	86.25 bc	5.25 fg
Check	-	-	80.00 c	75.00 de	13.75 def

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

Result Demonstration/Applied Research Report

2005 JONES COUNTY DRYLAND COTTON VARIETY TEST

Cooperators: Richard Newman and Terry White

Todd Vineyard, CEA-AG, Jones County, Anson, Texas
Dr. Billy E. Warrick, Professor and Extension Agonomist
Dr. Ed Bynum, Extension Agent - IPM for Jones, Mitchell, Nolan, and Scurry Counties

Summary

Twelve cotton varieties were planted to compare fiber yield and quality characteristic under similar dryland production conditions. Deltapine 432 R and Associated Farmers Delinting AFD 3511R were the highest yielding varieties in this test. FiberMax 800 R had the highest loan value at 57.95 cents per pound. This is only one years result and continued testing is recommended before making a significant switch to a new variety.

Problems

Several new varieties of cotton become available each year and when combined with the varieties already available makes planting seed selection increasingly difficult. Producers need local data to help in selecting adapted high yielding varieties with desirable fiber quality traits. The primary fiber quality characteristics of interest to producers are higher strength and longer staple.

Objective

With improved varieties being introduced each season, testing is a necessary part of any farming operation. This field test was established to compare new and traditional varieties. The main focus is to find those varieties that provide high lint yield with desirable fiber traits. Since some varieties have a limited success within a narrow range of production conditions, local testing is necessary and justified. This test will allow area producers to determine if new varieties being introduced are more productive than what they currently plant. Also, it will provide area producers with the opportunity to examine differences in plant development between the old and new varieties.

Materials and Methods

Cooperator: Richard Newman and Terry White
County Precinct: 1, N. W. of Anson, TX
Planting Date: May 21, 2005
Planting Rate: 3 3/4 in. spacing
Planting Pattern: Solid
Row Width: 40 inches
Previous Crop: Cotton
Irrigation: None
Fertilizer: 33 pounds of nitrogen, 33 pounds of phosphorus, 12 pounds of sulphur, and trace elements of copper, iron, manganese and zinc were applied per acre.
Herbicide: March 15, applied Treflan PPI at 1 qt/acre.
4th leaf stage, Roundup Original Max at 22 oz/acre
Insecticide: June 23, applied 0.6 ounce per acre of Intruder
August 10, applied 0.6 ounce of Intruder + 4 ounces of Mepichlor + 3.9 ounces Karate per acre
August 18, applied 4.3 ounces of Karate + 1 ounce of Trimax + 4 ounces of Pix.
Another 10 ounces of Pix was applied on August 27.
Soil Moisture at Planting: Very marginal

The test plots were stripper harvested to determine the yield per acre. The sample was large enough to gin at Farmers Cooperative Gin in Stamford, Texas. Then, samples for fiber quality were sent to the U.S.D.A. Cotton Classing Office. Yield and fiber quality information are summarized in Table 1.

Results, Discussion, and Economic Analysis

As seen in Table 1, the yields in this test ranged from 673 pounds per acre to 1584 pounds per acre. Deltapine 432 R and Associated Farmers Delinting AFD 3511R were the highest yielding varieties in this test. FiberMax 800 R had the highest loan value at 57.95 cents per pound.

At harvest on November 1, the following notes were taken for boll tightness and other observable traits. AFD 3602 R, Stoneville NG3969 R and FiberMax 960 R had tight bolls. Cotton varieties BG 24 R, DP 432 R, AFD 3511 R appeared to have moderately tight bolls. Cotton was beginning to string out of the boll (moderately loose) in cotton varieties Stoneville 4686 R, Stoneville 5599 BR, Deltapine 434 R, Deltapine 494 R, and FiberMax 800 R. Phytogen 310 R had very loose cotton stringing out of the bolls.

Deltapine 434 R had open bolls all the way to the top of the plant. While AFD 3511 had green unopened bolls at the top of the plant, FiberMax 800 had very few bolls at the top of the plant.

Table 1. Data from Richard Newman's 2005 Dryland Cotton Variety Test (Jones County)

Variety	Yield Per Acre In Pounds		Fiber Quality					CCC Loan Value	Lint Gross Return ($/acre)	Seed Gross Return ($/acre)	Total Gross Return ($/acre)
	Lint	Seed	Color-Leaf	Fiber Length (staple)	Mic	Strength (gram/tex)	Uniformity				
Deltapine 432 R	1584	2816	29.6	52.7	313	35	3.8	29.5	80.1	56.25	891.00
AFD 3511 R	1355	2463	34.5	62.8	312	35	4.3	28.3	79.5	56.10	760.16
FiberMax 800 R	1345	1993	36.4	54.0	212	36	3.7	28.8	81.0	57.95	779.43
Stoneville ST 5599 BR	1348	2107	33.8	52.9	312	34	3.7	25.8	78.2	54.30	731.96
Deltapine 494 R	1076	1586	31.0	45.7	312	36	3.8	29.1	80.6	57.15	614.93
Phytogen 310 R	1131	1458	31.8	41.0	312	34	3.9	26.9	80.4	54.30	614.13
FiberMax 960 R	1057	1550	29.6	43.4	312	35	3.5	29.1	81.0	56.10	592.98
AFD 3602 R	956	1626	29.3	49.9	211	35	3.9	28.4	79.7	56.95	544.44
Stoneville ST 4686 R	962	1434	27.5	41.0	312	35	3.8	27.6	79.9	56.35	542.09
Deltapine 434 R	858	1256	30.5	44.7	312	35	3.6	29.1	80.6	56.10	481.34
Stoneville NG 3969 R	658	1036	29.4	46.2	212	36	3.3	29.5	81.7	55.80	367.16
BGC 24 R	673	1137	32.0	54.0	313	33	3.7	26.4	79.0	51.90	349.29

NOTE: Seed income was calculated using a cottonseed price of $100 per ton

Acknowledgments:

A word of thanks to Richard Newman for his management of this dryland cotton variety test.

A word of thanks to Rex Ford at Farmers Cooperative Gin at Stamford, TX for ginning each cotton variety.

A word of appreciation is extended to the following seed companies for providing seed for this plot.

- Delta and Pineland Company provided Deltapine 432 R, Deltapine 494 R and Deltapine 434 R
- Associated Farmers Delinting, Inc. provided AFD 3511 R and AFD 3602 R, now owned by Bayer CropScience
- Bayer CropScience provided FiberMax 800 R and FiberMax 960 R
- Monsanto/Stoneville Pedigreed Seed provided Stoneville ST 5999 BR, Stoneville ST 4686 R and Stoneville NG 3969 R
- DowElanco/Phytogen Seed Company provided Phytogen 310 R
- Beltwide Cotton Genetics provided BCG 24

Result Demonstration/Applied Research Report

2005 JONES COUNTY DRYLAND COTTON VARIETY TEST

Cooperator: Eric Richards

Todd Vineyard, CEA-AG, Jones County, Anson, Texas
Dr. Billy E. Warrick, Professor and Extension Agonomist
Dr. Ed Bynum, Extension Agent - IPM for Jones, Mitchell, Nolan, and Scurry Counties

Summary

Ten cotton varieties were planted to compare fiber yield and quality characteristic under similar dryland production conditions. Stoneville ST 5599 BR and Deltapine 488 BR were the highest yielding varieties in this test. Stoneville ST 5599 BR had the highest loan value at 54.70 cents per pound. This is only one years result and continued testing is recommended before making a significant switch to a new variety.

Problems

Several new varieties of cotton become available each year and when combined with the varieties already available makes planting seed selection increasingly difficult. Producers need local data to help in selecting adapted high yielding varieties with desirable fiber quality traits. The primary fiber quality characteristics of interest to producers are higher strength and longer staple.

Objective

With improved varieties being introduced each season, testing is a necessary part of any farming operation. This field test was established to compare new and traditional varieties. The main focus is to find those varieties that provide high lint yield with desirable fiber traits. Since some varieties have a limited success within a narrow range of production conditions, local testing is necessary and justified. This test will allow area producers to determine if new varieties being introduced are more productive than what they currently plant. Also, it will provide area producers with the opportunity to examine differences in plant development between the old and new varieties.

Materials and Methods

Cooperator: Eric Richards
County Precinct: 2
Planting Date: June 10, 2005
Planting Rate: 1 seed every 4 inches
Plantin Pattern: 2-in-1-out
Row Width: 40 inches
Previous Crop: Cotton
Irrigation: None
Fertilizer: May 25, applied 125 pounds of nitrogen and 24 pounds of phosphorus per acre
Herbicide: May 15, pre-plant burn down with a generic brand of glyphosate applied at 1 qt./acre
June 27, post-emergence application of a generic brand of glyphosate at 1 qt./acre
Insecticide: July 18, applied 0.6 ounce of Intruder per acre
Soil Moisture at Planting: very good
Acres of Each Variety Planted:
Harvest Aid: October 27 applied 16 ounces of Ethephon plus 4 ounces of Def per acre followed by 16 ounces of Gramoxone Max applied on November 18.

The test plots were stripper harvested to determine the yield per acre. The sample was large enough to gin at Ericksdahl Coop Gin, 6 mi. E and 1 mi. S. of Stamford, Texas. Then, samples for fiber quality were sent to the U.S.D.A. Cotton Classing Office. Yield information and fiber quality information are summarized in Table 3.

Results, Discussion, and Economic Analysis

As seen in Table 3, the yields in this test ranged from 564 pounds per acre to 704 pounds per acre. Stoneville ST 5599 BR and Deltapine 488 BR were the highest yielding varieties in this test. Stoneville ST 5599 BR had the highest loan value at 54.70 cents per pound.

The data in Table 1 shows the cotton aphid infestation on July 28. Six locations within each variety were rated for cotton aphid densities. The rating was based on a 0 to 5 scale with 0 = no aphids, 1 = aphids in terminal and on 1st true leaf, 2 = aphids on top 4 node leaves and terminal, 3 = aphids on top 7 node leaves and terminal, 4 = aphids on top 10 node leaves and terminal, 5 = aphids throughout entire plant. This data indicates possible variety differences to aphid infestations. However, the information is only preliminary and further evaluations using replicated trials will need to be conducted to better understand varietal differences to aphid infestations.

Table 1. Mean rating for cotton aphid infestation on Bollgard cotton varieties. Jones Co. 2005.

Variety	Rating [a,b]	
DP 455 B/R	0.67	c
Stoneville 5599 B/R	0.67	c
DP 449 B/R	0.67	c
DP 444 B/R	1.00	bc
DP 445 B/R	1.17	bc
DP 488 B/R	1.33	abc
Stoneville 5242 B/R	1.33	abc
FM 960 B2/R	1.67	abc
FM 960 B/R	2.00	ab
Stoneville 4575 B/R	2.33	a

[a] Aphid infestations were rated based on a 0 to 5 scale; 0 = no aphids, 1 = aphids in terminal and on 1st true leaf, 2 = aphids on top 4 node leaves and terminal, 3 = aphids on top 7 node leaves and terminal, 4 = aphids on top 10 node leaves and terminal, 5 = aphids throughout entire plant.
[B] Mean is a column followed by the same lowercase letter are not significantly different according to Duncan's multiple range test (P=0.05).

The data in Table 2 shows the number of bolls per plant for each variety. This was determined from counting the number of bolls and plants on one-thousandth of an acre in four locations per variety on September 8. The highest plant population was 30,300 plants per acre and the target population should have been approximately 39,200 plants per acre which would average three plants per foot. To make up for the lower plant population you have to make more bolls per plant. The impressive part of this is the test was planted on June 10 and all the micronaire was in an acceptable range between 3.9 and 4.4 which indicated it had layered enough cellulose in the fiber that averaged between 1 inch and 1.06 inches in length.

Table 2. Mean number of bolls per row, plants per row, and bolls per plant for Bollgard cotton varieties. Jones Co. 2005.

	Mean Number [a]		
Variety	Bolls / 13.1 row ft.	Plants / 13.1 row ft.	Bolls / Plant
DP 455 B/R	315.7 ab	18.7 a	16.9 a
DP 488 B/R	342.7 a	27.3 a	14.6 ab
Stoneville 4575 B/R	250.0 bcd	22.3 a	13.1abc
DP 445 B/R	316.7 ab	25.0 a	12.9 abc
DP 444 B/R	308.3 abc	24.3 a	12.6 abc
DP 449 B/R	290.7 abc	23.7 a	12.2 abc
Stoneville 5242 B/R	244.0 bcd	22.3 a	10.9 bc
FM 960 B2/R	285.0 abc	27.3 a	10.6 bc
Stoneville 5599 B/R	209.3 d	23.3 a	8.9 bc
FM 960 B/R	240.0 dc	30.3 a	7.9 c

[a] Means in each column followed by the same lowercase letter are not significantly different according to Duncan's multiple range test (P=0.05).

Table 3. Data from Eric Richards' 2005 Dryland Cotton Variety Test (Jones County)

Variety	Yield Per Acre In Pounds		Fiber Quality					CCC Loan Value	Lint Gross Return ($/acre)	Seed Gross Return ($/acre)	Total Gross Return ($/acre)
	Lint	Seed	Color-Leaf	Fiber Length (staple)	Mic	Strength (gram/tex)	Uniformity				
Stoneville ST 5599 BR	704	892	35.9	45.5	112	34	4.3	27.2	79.9	54.70	385.09
Deltapine 488 BR	658	867	35.9	47.3	211	33	4.3	28.3	78.9	51.65	339.86
Deltapine 444 BR	645	850	35.5	46.8	211	33	4.1	26.6	79.7	52.30	337.34
Deltapine 455 BR	650	833	35.9	46.1	112	33	3.8	26.8	78.7	51.90	337.35
FiberMax 960 B2R	640	858	32.8	44.0	112	33	4.1	26.7	78.8	51.90	332.16
FiberMax 960 BR	648	842	35.5	46.1	112	32	4.2	28.3	78.6	49.95	323.68
Deltapine 445 BR	618	767	36.2	44.9	112	33	4.2	26.8	80.5	52.30	323.21
Stoneville ST 5242 BR	614	775	36.8	46.5	111	33	4.4	24.8	80.2	50.95	312.83
Stoneville ST 4575 BR	600	775	34.8	44.9	112	32	4.2	27.8	79.8	50.35	302.10
Deltapine 449 BR	564	767	33.3	45.3	111	32	3.9	26.6	79.5	50.35	283.97

NOTE: Seed income was calculated using a cottonseed price of $100 per ton

Acknowledgments:

A word of thanks to Eric Richards for his management of this dryland cotton variety test.

A word of thanks to Dennis Olsen at Ericksdahl Coop Gin for ginning each cotton variety.

A word of appreciation is extended to the following seed companies for providing seed for this plot.

- Monsanto/Stoneville Pedigreed Seed provided Stoneville ST 5999 BR, Stoneville ST 5242 BR, and Stoneville ST 4575 BR
- Delta and Pineland Company provided Deltapine 488 BR, Deltapine 444 BR, Deltapine 455 BR, Deltapine 445 BR, and Deltapine 449 BR
- Bayer CropScience provided FiberMax 960 B2R and FiberMax 960 BR

Result Demonstration/Applied Research Report

2005 Nolan County Dryland Cotton Variety Test

Cooperator: Jimmy Joy

Zach Wilcox, Nolan County Extension Agent
Dr. Billy E. Warrick, Extension Agronomist (San Angelo, Texas)
Dr. Ed Bynum, Extension Agent - IPM for Jones, Mitchell, Nolan and Scurry Counties

Summary

Seventeen varieties of cotton were planted between June 10 to 13, 2005 by Jimmy Joy on his farm, located approximately 6 miles west-southwest of Roscoe, TX. All varieties in the test were resistant to Roundup and some combined with Bollgard, Bollgard 2, or Widestrike technology. This test was established to monitor yield and quality traits on newer varieties of genetically modified cotton.

Objective

Due to the increased interest in genetically modified cotton, primarily for the control of problem weeds, field tests are needed to determine the production potential of the available varieties. A field test established in Nolan County would allow producers the opportunity of observing the growth and development patterns of the cotton through the growing season. Taking the plots to harvest would provide producers information on yield and fiber quality.

A field test was established in western Nolan County with yield being determined from hand harvesting. A two pound sample of seed cotton was ginned at the Texas Agricultural Experiment Station in Lubbock to determine the percent turnout of lint and seed. A sample of the ginned cotton was taken to the International Textile Center in Lubbock to have fiber properties determined using a HVI classing machine. This test provided additional information to see if the increased cost of genetically modified cotton could be offset by additional lint production.

Materials and Methods

Cooperators: Jimmy Joy
Plot Location: 6 miles west-southwest of Roscoe, TX

Crop Production Information:

Planting Date:	June 10 - Bollgard varieties June 13 - Non-Bt varieties
Planting Pattern:	Solid on 40 inch rows
Planting Rate:	3 seeds per ft., ca. 6 lb/acre
Herbicide Applied:	PPI, 1 ½ pt./acre of trifluralin at 10 gpa in April 5th leaf stage, 20 oz/acre of Glyphomax Plus at 10 gpa
Insecticides Applied:	August 11, 2.56 fl.oz/acre Karate +1 ½ fl. oz/acre Centric + 10 oz Penetrator (aerially applied at 3 gpa) September 8, 2.56 fl.oz/acre Ammo + 1 pt/acre Lorsban + 10 oz Penetrator (ground application at 7gpa)
Fertilizer Applied:	none
Soil Type:	clay
Previous Crop:	cotton
Harvest Aids:	October 28, 16 oz/acre DEF + 20 oz/acre ethephon (aerially applied at 3gpa)

Results and Discussion

The cotton variety test established by Jimmy Joy provided very useful information to producers. The desired cotton emergence was achieved in seven days after planting. Weed competition was kept to a minimum by the herbicide program used by the producer. The PPI application of trifluralin and the glyphosate application at the 5th leaf stage resulted in excellent weed control for the entire growing season. Insecticides were only applied to cotton varieties that did not have Bollgard, Bollgard 2, or Widestrike technology.

General observations made by the producer at harvest were that FM 800 R and B2R had very tight bolls, FM 960 R had tight bolls, and FM 989 B2R was moderately loose. The picker type Phytogen varieties were generally tall with loose bolls. Stoneville varieties looked good and ST6848 appeared to have tighter bolls than the Phytogen varieties. The Deltapine varieties seemed to be fairly storm proof. The producer believed all varieties yielded 2 bales per acre or better when he was harvesting. The hand samples for yield should have been collected from more than one location to better determine actual yield for each variety.

The lint yields in this test ranged from 538 to 1096 pounds per acre. Stoneville ST 6848 R had the highest gross return per acre numerically; however, several varieties were close in yield and fiber quality and probably are not statistically different. Stoneville ST 6848 R had the highest loan value at 58.80 cents per pound.

As you look at Table 1, several varieties performed well in most categories and would be worth testing on a five acre plot on the farm to see how it performs under your management. Remember this is only

one years result and continued testing is recommended before making a significant switch to a new variety.

Table 1. Agronomic Data from Jimmy Joy's Dryland Cotton Variety Test (Nolan County, 2005)

	Yield Per Acre				Fiber Quality								
	In Pounds		% Turnout								Lint	Seed	Total
Variety	Lint	Seed	Lint	Seed	Color-Leaf	Fiber Length (staple)	Mic	Strength (gram/tex)	Uniformity	CCC Loan Value	Gross Return ($/acre)	Gross Return ($/acre)	Gross Return ($/acre)
Stoneville ST 6848 R	1075	1710	27.2	43.2	211	37	3.6	34.3	85.3	58.80	632.07	85.52	717.59
FiberMax 800 R	1096	1532	29.3	41.0	212	35	3.7	32.3	82.5	57.65	631.98	76.60	708.58
Stoneville ST 4686 R	1045	1555	29.7	44.2	313	33	3.3	27.5	81.8	49.75	520.07	77.73	597.81
Phytogen 470 WR	879	1376	24.7	38.6	312	36	3.7	28.6	82.8	57.40	504.74	68.81	573.55
Deltapine 488 BR	882	1434	26.5	43.1	312	36	3.6	28.3	80.6	56.90	501.77	71.70	573.47
FiberMax 960 R	871	1348	27.2	42.1	312	35	3.3	29.4	80.7	54.20	471.99	67.38	539.38
Stoneville ST 5242 BR	771	1039	32.2	43.4	311	34	4.5	26.7	84.0	54.40	419.22	51.96	471.18
FiberMax 800 B2R	704	1100	27.7	43.2	312	36	3.6	30.7	81.1	57.35	403.59	54.98	458.57
ADF 3511 R	693	1247	24.2	43.6	312	35	3.6	29.5	82.5	56.60	392.00	62.33	454.34
FiberMax 989 B2R	728	1197	26.9	44.3	312	36	3.1	27.9	80.7	53.30	387.89	59.84	447.73
ADF 3602 R	679	1077	25.2	39.9	211	35	3.8	29.8	82.3	57.20	388.50	53.86	442.37
Stoneville ST 4575 BR	719	1030	29.0	41.5	312	33	4.2	27.3	83.0	52.30	376.00	51.49	427.48
BCG 24 R	703	1055	26.1	39.1	212	34	3.3	28.2	82.4	52.80	371.29	52.74	424.03
Phytogen 310 R	557	756	27.5	37.3	211	34	4.1	28.3	81.5	54.95	306.04	37.79	343.83
Phytogen 480 WR	533	823	25.5	39.4	411	35	4.2	27.3	82.6	54.40	289.79	41.14	330.93
FiberMax 960 B2R	510	777	25.2	38.3	312	36	4.1	28.7	82.3	57.15	291.55	38.83	330.37
Deltapine 555 BR	538	813	27.2	41.1	312	33	3.8	26.9	79.5	52.05	279.87	40.66	320.53

N0TE: 1) Yield was determined by hand harvesting
2) Gross return per acre for cottonseed was based on a sale price of $100 per ton

Economic Analysis

Let me stress looking at the total gross return can be deceiving in selecting varieties from one test. Year to year variation and differences in plots and production practices make a difference. The variability between the samples collected showed significant difference in yield only between the top and bottom variety. It is recommended producers look at tests conducted in the region for the last 2 to 3 years and from ten or more field tests and find a variety that is in the upper third. Those selected varieties can then be tested on your farm under your production practices to determined if increased acreage of that variety is justified. Most of the varieties in this test have a fiber quality that is desired by the buyers with high strength, length, and uniformity.

Acknowledgments

We want to take this opportunity to thank Jimmy Joy for establishing and managing this cotton variety test.

A word of appreciation is extended to the following seed companies for providing seed for this plot.

- Monsanto/Stoneville Pedigreed Seed provided Stoneville ST 6848 R, Stoneville ST 4686 R, Stoneville ST 5242 BR and Stoneville ST 4575 BR
- Bayer CropScience provided FiberMax 800 R, FiberMax 960 R, FiberMax 800 B2R, FiberMax 989 B2R, and FiberMax 960 B2R
- DowElanco/Phytogen Seed Company provided Phytogen 470 WR, Phytogen 310 R and Phytogen 480 WR
- Delta and Pineland Company provided Deltapine 488 BR and Deltapine 555 BR
- Associated Farmers Delinting, Inc. provided AFD 3511 R and AFD 3602 R, now owned by Bayer CropScience
- Beltwide Cotton Genetics provided BCG 24

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