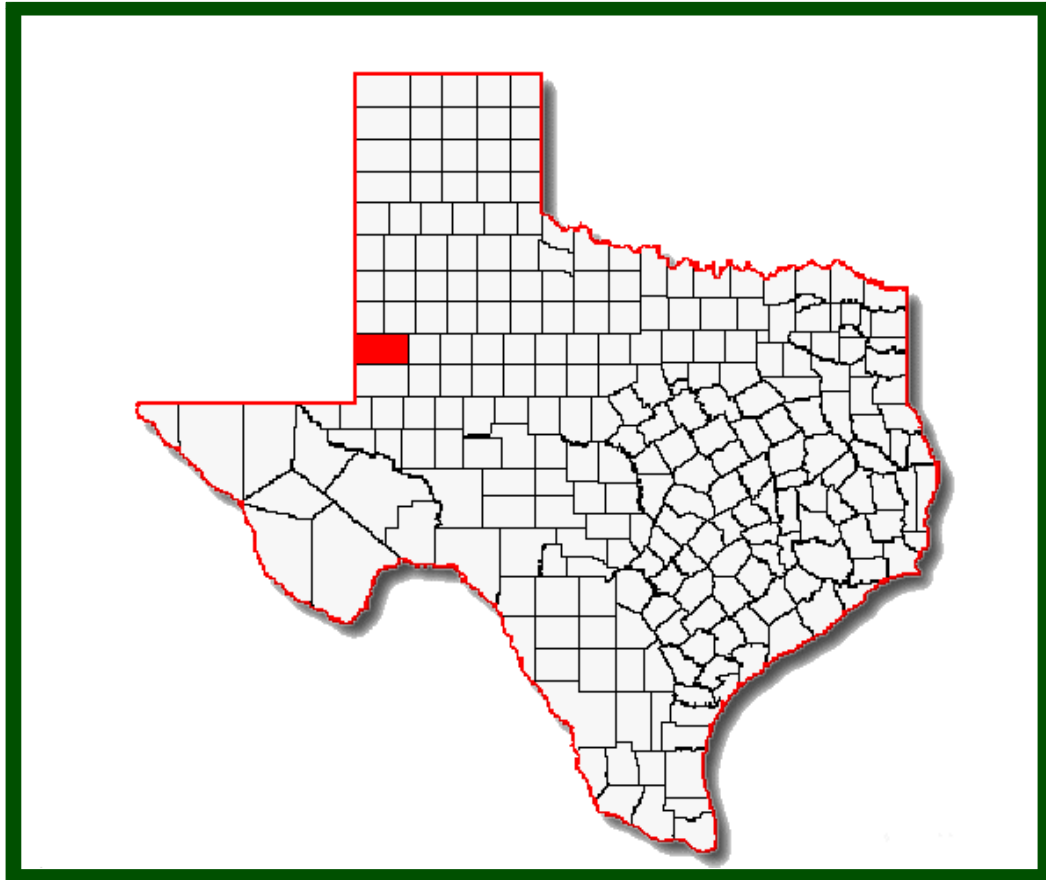


INTEGRATED PEST MANAGEMENT



Gaines County IPM Program 2010





**GAINES COUNTY
INTEGRATED PEST MANAGEMENT PROGRAM**

2010 ANNUAL REPORT

Prepared by

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**Extension Agent – Integrated Pest Management
Gaines County**

in cooperation with

Texas Pest Management Association

and

Gaines County IPM/TPMA Steering Committee



Partners with Nature

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Introduction

The Gaines County Integrated Pest Management (IPM) Program is part of the Texas IPM Program and serves as a multi-purpose education effort to provide the Gaines County agriculture industry with up-to-date information on all aspects of IPM. The Gaines County IPM Program is coordinated by Manda Anderson, Extension Agent – IPM, from the Texas AgriLife Extension Office in Seminole. Texas Pest Management Association (TPMA) provides the fiscal operations including paying salary, travel and liability insurance and workers compensation for the scouts as well as bookkeeping services. The local IPM/TPMA Steering Committee (made up of growers, consultants, and agriculture industry representatives) is the fundamental local support unit for the Gaines County IPM Program. This committee met on April 14 and December 16, 2010 to determine local priorities, develop educational programs, identify our target audiences, and develop applied research and result demonstrations to address the local needs. In the fall of 2010, an evaluation instrument (post survey approach) was utilized to measure programmatic impact of the Gaines County IPM Program. Additionally, as a committee, we utilize the results from the evaluation to modify the IPM Program and increase applicability to our target audience.

In 2010 the Gaines County IPM Program ran a survey scouting program which encompassed cotton, peanuts, and wheat. This survey scouting program was funded by twenty-seven business sponsors who brought in over \$10,800. Thirteen fields were scouted throughout the season for pest and beneficial populations, along with crop stage and development. The information gathered from these fields was used to write the Gaines County IPM Newsletter (See Appendix A) that was sent out to over 360 growers, ginners, crop consultants and agriculture industry representatives. The Gaines County IPM Program also was the lead or cooperator on twenty-one research trials to evaluate cotton variety performance, disease management, insect management, insecticide testing, cotton seeding rates, and peanut pod rot thresholds. Results from these trials will be provided to the growers in a book titled “2010 Gaines County, Texas Cotton, Peanut, and Wheat Research Reports.” Additionally, the Gaines County IPM Program had several educational events throughout the season such as presentations at field days and grower meetings, newspaper articles, and newsletters.

Acknowledgements and Recognition

2010 IPM/TPMA Steering Committee

Shelby Elam	Scott Nolen
Chuck Rowland	Jack Shanklin
Jody Anderson	Raymond McPherson
Jud Chevront	Michael Todd

2010 Gaines County Commissioners Court

Gaines County Judge	Tom Keyes
Commissioner, Precinct 1	Danny Yoakum
Commissioner, Precinct 2	Craig Belt
Commissioner, Precinct 3	Blair Tharp
Commissioner, Precinct 4	Charlie Lopez

2010 Gaines County IPM Program Sponsors and Contributors

Carter & Co. Irrigation Inc.
Oasis Gin Inc.
Ocho Gin Company
TriCounty Producers Gin
AG Aero
Doyle Fincher Farms
Five Points Gin
Golden Peanut Company
Nolen AG Services Inc.
Western Peanut Growers
Ag Texas Farm Credit Service
Anderson Welding Pump and Machine
Baucum Insurance Agency
Birdsong Peanuts
Brown's Ace Hardware
Crop Production Services, Inc.
First United Bank
Moore-Haralson Agency PC

Ocho Corp. Crop Plus Insurance
Pioneer Gin
Valley Irrigation & Pump Service Inc.
Ten High Gin Inc.
West Gaines Seed and Delinting Inc.
West Texas Agriplex, Inc.
Commercial State Bank
McKinzie Insurance
State Farm Insurance

Contributors:

Bayer CropScience (provided seed for research)
All-Tex Seed (provided seed for research)
Americot, Inc. (provided seed for research)
Monsanto (provided seed for research)
Dyna-Grow (provided seed for research)
Dow AgroSciences (provided seed for research)

Producers who planted, maintained, and harvested Research Trials

Jud Cheuvront
Marcus Crow
Shelby Elam
Froese Farms
Jimbo Grissom
Louis Grissom
Roy Johnson
Raymond McPherson

Ricky Mills
Tim Neufeld
Chuck Rowland
Glen Shook
Weldon Shook
Gregory Upton
Herman Wheeler

Producers who participated in the IPM Scouting Program

Marcus Crow
Shelby Elam
Doyle Fincher
Jimbo Grissom
Roy Johnson

Donny Kebecka
Chuck Rowland
Glen Shook
Michael Todd
Gregory Upton

Field Scout/Research Aides

Andrew Van Zielst, Landria Schmalzried, and Kamie Zamora

The field scout was responsible for the weekly monitoring and reporting of insect populations, disease status and crop development. They were also responsible with helping establish and collect data from research plots. Special appreciation is extended to the field scouts for their dedication.

**Special Thanks to the following Texas AgriLife Extension and Research Faculty
for their Programming Support, Assistance, and Collaboration Efforts**

Dr. David Ragsdale.....	Head of Entomology Department, College Station
Dr. Chris Sansone.....	Assoc. Head of Entomology Department, San Angelo
Dr. Charles Allen.....	IPM Coordinator, San Angelo
Miles Dabovich.....	District Extension Administrator, Lubbock
Dr. Galen Chandler.....	Regional Program Director, Lubbock
Dr. David Kerns.....	Extension Entomologist, Lubbock
Dr. Pat Porter.....	Extension Entomologist, Lubbock
Dr. Jason Woodward.....	Extension Plant Pathologist, Lubbock
Dr. Terry Wheeler.....	Research Plant Pathologist, Lubbock
Dr. Randy Boman.....	Extension Agronomist, Lubbock
Dr. Mark Kelley.....	Extension Program Specialist, Lubbock
Dr. Calvin Trostle.....	Extension Agronomist, Lubbock
Dr. Todd Baughman.....	Extension Agronomist, Vernon
Dr. Peter Dotray.....	Extension Weed and Herbicide Science, Lubbock
Dr. Jackie Smith.....	Extension Ag Economist, Lubbock
Jay Yates.....	Extension Risk Management Specialist, Lubbock
Jeff Pate.....	Extension Risk Management Specialist, Lubbock
Dr. Dana Porter.....	Extension Ag Engineering Specialist, Lubbock
Scott Russell.....	Extension Agent - IPM, Terry and Yoakum Counties
Brant Baugh.....	Extension Agent - IPM, Lubbock County
Dustin Patman.....	Extension Agent - IPM, Crosby and Floyd Counties
Warren Multer.....	Extension Agent - IPM, Glasscock, Reagan, & Upton Counties
Tommy Doederlien.....	Extension Agent - IPM, Lynn and Dawson Counties
Terry Millican.....	County Extension Agent – Ag, Seminole
Connie Lambert.....	EA-IPM Secretary, Gaines County, Seminole

Texas Pest Management Association

The support and assistance of David Oefinger, Executive Director of Texas Pest Management Association, is greatly appreciated.

Making a Difference 2010

2010 Gaines County Integrated Pest Management (IPM) Program

Manda Cattaneo, Extension Agent – IPM, Gaines County

Relevance

Gaines County is the number one cotton and peanut producer in the state of Texas, with approximately 280,974 and 41,710 planted acres of cotton and peanuts in 2010, respectively. These producers are being faced with increased crop production cost, increased scarcity of water, increased plant disease prevalence, and on-going insect management issues. Water and economic development are two of the top three critical issues identified by the Texas Community Futures Forum for Gaines County. The number one top agriculture issue is agriculture profitability.

The Texas AgriLife Extension Service Gaines County Integrated Pest Management (IPM) Program is part of the Texas IPM Program and serves as a multi-purpose education effort to provide Gaines County agriculture industry with up-to-date information on all aspects of IPM. The Gaines County IPM Steering Committee consists of five producers, two agriculture industry representatives, and one private agriculture consultant, and it serves as the fundamental local support unit for the Gaines County IPM Program.

The Gaines County IPM Program 2010 target audience is cotton and peanut producers, and agriculture industry representatives. By providing education on current crop and pest management tools and techniques, our goal is that the target audience will implement pest management strategies to maintain yields and net profit.

Response

Based on priorities identified by the Gaines County IPM Program steering committee, the following educational programs were developed and successfully implemented in 2010:

- ♦ **Alternative Crops and Profitability Workshop** held on January 26, 2010 in Gaines County. This workshop was attended by 20 people.
- ♦ **2009 Gaines County, Texas Cotton Peanut, and Wheat Research Reports** Book was compiled and dissemination to cotton gins and local business for distribution to their growers, ginners, and agriculture industry representatives. This book consists of the IPM Program research reports and the reports from research trials that were conducted in Gaines County by Texas AgriLife Extension and Research Specialists. The research reports were also posted on the Texas AgriLife Extension Service Gaines County website <http://gainesco.tamu.edu>.
- ♦ **Power point presentation entitled 2009 Gaines County IPM Research Trial Results** at the 2010 SandyLand Ag Conference held on February 2, 2010 in Seminole. This conference was attended by more than 190 people.
- ♦ **Posters presented at the 2010 Beltwide Cotton Conference** entitled *Evaluation of Variety Tolerance and Chemical Management of Southern Root-knot Nematodes* and *Developing an Action Threshold for Thrips in the Texas High Plain*.
- ♦ The **Gaines County IPM Survey Scouting Program** was utilized to gathered information on pest and beneficial insects, weeds, and cotton and peanut development. Fields were selected based on irrigation availability, farming practices, landscape, and location, which enabled us to gather information on all aspects of crop production throughout Gaines County. The information gathered from the survey scouting

Educational programs of the Texas AgriLife Extension Service are open to all people without regard to race, color, sex, disability, religion, age, or national origin. The Texas A&M University System, U.S. Department of Agriculture, and the County Commissioners Courts of Texas Cooperating

program was used to write the Gaines County IPM Newsletter, which is an effective way to distribute the information gathered from the survey scouting program to our target audience.

- ◆ The **Gaines County IPM Newsletter** was one of the main educational components. In 2010, 14 editions were distributed to more than 270 recipients and posted on the Texas AgriLife Extension Gaines County website, <http://gainesco.tamu.edu> and the Texas Pest Management Association website, <http://tpma.org>.
- ◆ Participated in the weekly **IPM Radio Program** on Fox Talk 950 from 12:30 p.m. - 1:00 p.m., which is broadcast out of Lubbock, TX. According to the local radio station listener data, there are 50,000 listeners of this program.
- ◆ The Gaines County IPM Program Steering Committee developed **on-farm applied research trials** that would effectively address our local priorities and provide applicable results to our target audience. In 2010, we worked cooperatively with Texas AgriLife Research and Extension Specialists out of Lubbock and thirteen producers to plant, maintain, and harvest thirteen large plot on-farm applied research trials and one small plot applied research trial. The trials evaluated irrigated and dryland cotton variety performance, cotton variety performance under verticillium wilt pressure, cotton variety performance under fusarium wilt pressure, cotton variety performance under nematode pressure, nematicides for the management of nematodes, cotton yield at varying seeding rates, peanut pod rot management, and a cotton bollworm & fall armyworm insecticide trial to determine the efficacy of the insecticides that were being applied by our producers. All of these trials were harvested and economic returns were determined.
- ◆ Growers had the opportunity to view our applied research trials during the **Gaines County Ag Tour**, which stopped at three of the IPM Program on-farm research trials. The Ag Tour was attended by over 50 people.

An **evaluation instrument** (post survey approach) was utilized to measure programmatic impact of the Gaines County IPM Program. Twelve individuals responded to the survey (50% response rate). Of those responding, 8 were producers (67%) and 4 were agriculture industry representatives (33%).

Results

(100%) 8 of 8 producers said they plan to take action or make changes based on information provided by the Gaines County IPM Newsletter.

(100%) 12 of 12 individuals said they selected varieties to plant on their farm based on the results from the Gaines County IPM Program research trials.

(100%) 8 of 8 producers said they anticipate benefiting economically as a direct result of what they learned from the IPM Program.

(63%) 5 of 8 producers indicated an economic benefit of \$16 or greater per acre

(13%) 1 of 8 producers indicated an economic benefit of \$13 to \$15 per acre

(25%) 2 of 8 producers indicated an economic benefit of \$10 to \$12 per acre

(100%) 11 of 11 individuals said the Gaines County IPM Newsletter information helped them make better decisions about their farming practices, pest management, and variety selection.

When asked what part of the Gaines County IPM Newsletter helped them the most:

50% of the respondents said disease identification

20% of the respondents said pest management

20% of the respondents said updates on what is going on in the fields

10% of the respondents said peanut and cotton pests

Table 1. The following percentages represent the number of individuals who said the following items were *mostly* or *very valuable* to their farms:

	# of Responses	Percent
Gaines County IPM Newsletter	12 of 12	100%
2009 Gaines County, Texas Cotton Peanut, and Wheat Research Reports Book	11 of 12	92%
Gaines County Ag Tour	9 of 11	75%

Table 2. The following percentages represent the number of individuals who said the Gaines County IPM Newsletter, the Gaines County Ag Tour, and the 2009 Gaines County Research Results Book *mostly* or *completely* increased their knowledge of the following items:

	# of Responses	Percent
Peanut Disease Identification	11 of 12	92%
Peanut Disease Management	12 of 12	100%
Cotton Disease Identification	11 of 12	92%
Use of Tolerant/Resistant Cotton Varieties to Manage Cotton Diseases	12 of 12	100%
Cotton Insect Identification and Management	10 of 12	83%
Description of Cropping Conditions in the Gaines County IPM Newsletter	12 of 12	100%

Table 3. The following percentages represent the number of individuals who said the following research trials were *mostly* or *very valuable* to their farms:

	# of Responses	Percent
Cotton Variety Trial Under Verticillium Wilt Pressure	12 of 12	100%
Cotton Variety Trial Under Nematode Pressure	12 of 12	100%
Nematicide Trial	12 of 12	100%
Irrigated Cotton Variety Trial	11 of 12	92%
Dryland Cotton Variety Trial	9 of 12	75%

Results indicate that Gaines County producers and agriculture industry representatives highly value the information provided by the Gaines County IPM Program.

The following is a testimonial from one of the producers:

"The test plots for nematodes and Verticillium wilt really opened my eyes as to what variety selection can do for us. Good Job."

The results of this survey are included in the 2010 Gaines County IPM Annual Report which is distributed to the Gaines County IPM Steering Committee, the Gaines County IPM Program Sponsors, and supporters. Future programming efforts will be based on these results and input provided by the Gaines County IPM Steering Committee. The Steering Committee assists in the interpretation and marketing of the Gaines County IPM Program to key stakeholders, agribusinesses, and the Commissioners Court.

Acknowledgements

Texas AgriLife Extension and Research faculty: Dr. Jason Woodward, Dr. Terry Wheeler, Dr. David Kerns, Dr. Randy Boman, Dr. Mark Kelley, Dr. Dana Porter, Dr. Todd Baughman, Dr. Jackie Smith, Jay Yates, Jeff Pate, Dr. Calvin Trostle, Dr. Peter Dotray, Scott Russell, Monti Vandiver, Brant Baugh, and Dustin Patman.

We would also like to thank the following producers for planting, maintaining and harvesting the Gaines County IPM Program on-farm applied research trials: Jud Cheuvront, Marcus Crow, Shelby Elam, Gerardo Froese, Jimbo Grissom, Roy Johnson, Raymond McPherson, Ricky Mills, Tim Neufeld, Glen Shook, Weldon Shook, Gregory Upton, and Herman Wheeler.

We also appreciate the support of the following businesses who sponsored and the 2010 Gaines County IPM Program: Carter & Co. Irrigation Inc., Oasis Gin Inc., Ocho Gin Company, TriCounty Producers Gin, AG Aero, Doyle Fincher Farms, Five Points Gin, Golden Peanut Company, Nolen AG Services Inc., Western Peanut Growers, Ag Texas Farm Credit Service, Anderson Welding Pump and Machine, Baucum Insurance Agency, Birdsong Peanuts, Brown's Ace Hardware, Crop Production Services, Inc., First United Bank, Moore-Haralson Agency PC, Ocho Corp. Crop Plus Insurance, Pioneer Gin, Valley Irrigation & Pump Service Inc., Ten High Gin Inc., West Gaines Seed and Delinting Inc., West Texas Agriplex, Inc., Commercial State Bank, McKinzie Insurance, State Farm Insurance.

Special thanks to the following individuals whose support and dedication made the Gaines County IPM Program a success: Connie Lambert-IPM Secretary; Andrew Van Zielst, Landria Schmalzried, and Kamie Zamora-Gaines County IPM Program summer scouts; Gaines County Judge-Tom Keyes; and the County Commissioners: Danny Yocum-Precinct 1; Craig Belt-Precinct 2; Blair Tharp-Precinct 3; Charlie Lopez-Precinct 4.

Educational Activities

Newsletters

No. Issues Written.....	14
No. Non-Extension Clientele on Mailing List.....	121
No. Non-Extension Clientele on E-mail List.....	239
Total Non-Extension Clientele.....	360

Radio Programs.....	23
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Published Abstracts or Proceedings.....	3
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Slide Sets.....	4
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Scientific Presentations/Posters.....	4
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Newspaper Articles

No. Prepared.....	5
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No. Newspaper Carrying.....	5
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Farm Visits.....	368
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Scouts Trained.....	2
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CEU Credits Offered.....	8
--------------------------	---

Pest Management Steering Committee Meetings.....	2
--	---

Presentations Made

County Meetings.....	2
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Field Days/Tours.....	2
-----------------------	---

Schools.....	2
--------------	---

No. Applied Research/Demonstration Projects.....	21
--	----

No. Involving Cotton.....	19
---------------------------	----

No. Involving Peanut.....	3
---------------------------	---

No. Direct Ag. Contacts.....	3,665
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Other Direct Contacts.....	306
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Funds Leveraged

Grants and Contracts

No. Grants as Cooperator/Collaborator.....	2
No. Dollars Received for Your Use.....	\$26,900
Support Dollars you Generated to Support other Educational Efforts.....	\$10,800
Retail Value of “In-Kind” Contributions.....	\$28,534
Total Dollars Generated for Your Program.....	\$66,234

**GAINES COUNTY IPM PROGRAM
FINANCIAL REPORT 2010**

Balance from 2009	22,059.38
2010 INCOME	
2010 Survey Scouting Program	10,800.00
2010 Peanut Pod Rot Research Dr. Terry Wheeler	4,500.00
2010 Irrigated Cotton Variety Trial	1,000.00
2010 Cotton Variety Trial Under Verticillium Wilt Pressure Trial	700.00
2010 Cotton Variety Trial Under Root-Knot Nematode Pressure Trial	700.00
2010 Cotton Variety Trial Under Two Levels Of Irrigation Trial	500.00
2010 Variety & Chemical Management of Root-Knot Nematoc	3,000.00
2009 Bayer CropScience CAP Trials	4,500.00
2010 Bayer CropScience CAP Trials	4,000.00
2010 Delta Pine FACT Trials	5,000.00
2010 Dow Agrosiences Phytogen Innovation Trial	3,000.00
Miscellaneous Income	18.00
Interest	3.10
Total Income	<u>37,721.10</u>
2010 EXPENSES	
Administrative Fees	5,655.00
Advertising for Scout	50.00
Dues & Subscriptions	101.00
Maint. & Repairs	179.98
Membership Paid	2,280.00
Postage	895.39
Scout Payroll	8,705.82
Travel-Connie	101.50
Travel-Directors	99.39
Travel-IPM E-A	4,138.68
Travel-Scout	2,455.50
Tax Expenses Payroll	613.26
Cell Phone Allowance for Scout	346.72
Equipment lease/ Purchases	433.32
Telephone	1,638.46
Conferences & Meetings	147.98
Auto Expenses	1,240.34
Research/Demo Project	1,864.25
Supplies/Research Demo Project	508.24
Office Supplies	128.83
Publications	20.00
Bank/UBS Service Fee	6.00
Total Expenses	<u>31,609.66</u>
Balance as of December 31, 2010	28,170.82



2010 Gaines County Crop Production Review

The wet fall and winter built up high expectations for this year's crop. However, expectations dwindled as we drew closer to planting time since we did not receive the much needed planting rains. In May several rain storms detoured around Gaines County. Cotton planted in late April and early May faced several weather fluctuations. We had several cold spells in which no heat units were accumulated during a 1 to 3 day period. As a result, emergence was slow in early planted cotton and peanut fields. We saw some seedlings that had reduced vigor due to "big shank". Several of these plants succumbed to fungal pathogens, which reduced plant stands in a few cotton fields. False wireworms were also observed in some cotton fields in the southwestern part of the county in May.

Far western Gaines County received some rain during the first week of June and a few fields also received some hail damage. However, a majority of the county remained dry. Additionally, root-knot nematodes were already starting to take their toll in some fields. We observed stunting associated with severe nematode populations in some fields. We also observed some beet armyworm damage in non-Bt cotton fields. However, beet armyworm larval survival was low, and therefore, insecticide applications were not justified in these fields. By June 10 we had reached treatable thrips levels in some fields and we were starting to see leaf and terminal damage. However, a majority of the fields had low thrips pressure or were growing fast enough to out run developing thrips populations.

In mid-June hail storms damaged some isolated cotton fields. Damage ranged from minor leaf damage to complete stand loss. For the most part, the cotton was benefiting from the warm temperatures and it was starting to stack on several new nodes. Thrips pressure had decreased and a majority of the cotton was past the point at which thrips could cause economic damage. Garden webworms were also being found in a non-Bt cotton field south of Seminole. Presence of southern root-knot nematodes was becoming more evident in some cotton fields. Stunting and uneven stands were some of the best indicators of nematodes being present. Peanuts were looking good and we were starting to see a few blooms in some fields. *Rhizobium* nodulation had increased in some peanut fields, but we were still seeing low nodulation levels in a couple of fields. Low populations of white grub worms were also being found in a couple of peanut fields. Additionally, weeds were quickly becoming a major pest in several fields. We were also seeing a lot of herbicide injury in both cotton and peanuts. In several cases there had been stand loss and stunting associated with the herbicide injury.

By late June most fields had received some rainfall and were benefiting from the warm temperatures. Some fields in the Loop area were struggling after being hit with severe hail storms on June 10 and heavy rainfall on June 20. Peanut fields were blooming and there were some pegs starting to form. Cotton stages were ranging from 5 leaves to 12 leaves. Square set was ranging from 79% to 100%, with a majority of the fields setting closer to 100%. Overall, insect pressure was low. The garden web worms had cycled out and they were no longer being found. However, we were still finding grubs in peanut fields east of Seagraves. Weed pressure was increasing in several fields. Nematode pressure was also increasing in several fields. Along with nematode pressure we were starting to see Fusarium wilt in some cotton fields. Fields that had received significant rainfall and were on the high end as far

as fertility and irrigation levels were in need of a plant growth regulator application. A crop consultant found a few peanut plants infected with Southern Blight. However, fungicide applications were not justified since the disease was confined to a few plants and it was not spreading down the rows.

Rain, Rain, and more Rain! The Fourth of July weekend brought us some slow drizzling rainfall. We recorded 4 1/2 to 6 inches of rainfall at our research plots scattered throughout the county and we received some reports of up to 11 inches. For the most part, the rainfall was able to soak into our sandy soils. However, there were wash outs in some fields. We were very thankful for the rainfall, but it added an extra challenge for our producers. Several producers needed to apply preventative fungicides in their peanuts, herbicides in their peanut & cotton fields, and plant growth regulators on their cotton. The cool wet weather was the perfect environment for disease development.

In mid-July cotton and peanut fields were looking good. Several cotton fields were blooming. Nodes Above White Flower (NAWF) was ranging from 8 to 10 NAWF in several fields. This indicated that there was potential for a good yield, as long as Mother Nature cooperated with us and the plants were able to maintain and mature out the high fruit load. Bollworm populations reached treatable levels in half of the non-Bt fields that we are scouting. We were finding 1 to 3 day old worms and damaged squares in the mid to upper canopy. Cotton aphid populations were also starting to build in some fields in eastern Gaines County. We were mainly seeing aphids in fields that had a skippy stand. Verticillium wilt was becoming very prevalent in fields that were known to have a history of Verticillium wilt. We were also picking up a little cotton rust and bacterial blight. Several cotton fields had plants that were hip high, however growers need to be cautious in making plant growth regulator applications. We were starting to see some signs of wilting during the heat of the day. Even though the plants were tall, their growth may have already started to slow down due to moisture stress and heat stress. Peanuts were pegging and forming pods. A majority of the peanut fields had several pegs and again this was indicating a good yield potential. We were starting to find some pegs/pods infected with Rhizoctonia and Phythium pod rot. A majority of the infected pegs/pods were identified in the lab as Rhizoctonia. A very small percentage was Phythium.

In late July cotton stages ranged from 5 to 10 NAWF, with a majority of the fields averaging 7 to 8 NAWF. We saw the NAWF drop rapidly in some fields. This was a good indication that the plants were stressed. Irrigation may not have been started back quick enough and the plants experienced some water stress. Cotton aphids were present in most fields; however, a majority of the populations were starting to dwindle due to the heat and beneficial insects. We were finding several ladybird beetles, green lacewings, and spiders. The impact of cotton root-knot nematodes was very evident in a lot of our cotton fields. Severe stunting was observed and damage would likely impact yields. Verticillium wilt incidence had increased in cotton fields and we were starting to see evidence of Verticillium wilt in peanuts. Peanuts were continuing to peg and form pods. We were starting to see a few large pods in some fields. Several fields were loaded with pegs and pods and it was going to be a challenge to keep up with the irrigation demands of the crop. Growers needed to make sure that they did not get behind on their irrigation. Anyone scouting peanuts did not have to look hard to find bollworms and yellow striped armyworms in the foliage. Both of these pests were feeding on the leaves and causing noticeable leaf loss. Worm counts ranged from 0 to 4 per foot of row, with several fields averaging around 1 bollworm per foot of row. We did not observe any fields that warranted an insecticide treatment. Most of the worms were 1 inch or larger and were fixing to cycle out. This meant that we may get another heavy egg lay within the next two weeks. Pod rot was starting to show up in more peanut fields. Most of the pod rot was caused by Rhizoctonia, but we were also picking up some pod rot caused by Pythium. Early leaf spot was increasing in some peanut fields.

By early August, we were very dry since we had not received any significant rainfall since early July. Cotton stages ranged from 3 to 8 NAWF, with a majority of the fields averaging 5.5 NAWF. Several fields had reached cutout, which is 5 NAWF. The crop was maturing quickly due to the hot conditions. Cotton aphids had increased in a majority of the cotton fields. Fields that were treated for bollworms had the greatest increase in aphid populations. Fields that were not treated for bollworms had a minor increase in aphid populations. Beneficial insect counts were also up in a majority of the fields. Beneficial insect counts ranged from 0.2 beneficials per plant to 0.73 beneficials per plant. Large peanut pods had formed. Maintaining irrigation was the key to successfully fulfilling the yield potential of this crop at this stage of the season. Pod rot caused by *Pythium* was starting to show up in more peanut fields. We were also seeing moderate levels of early leaf spot.

Around August 13, cotton stages ranged from 2 to 6 NAWF, with a majority of the fields at 4 to 5 NAWF. We were picking up cotton bollworms, cotton square borers, beet armyworms, and fall armyworms at various levels in some of our non-Bt (conventional) cotton fields. Beet armyworm stages ranged from just hatched to 1/4 inch. Bollworm moth trap catches increased significantly this week. Small bollworm counts ranged from 0 to 25 per 100 plants, with a majority of the fields at 0 to 5 small worms per 100 plants. We treated some non-Bt fields because of high bollworm populations. Additionally, we were finding fall armyworm egg masses and egg masses with hatching larvae. Low aphid populations were present in a majority of the fields.

By August 19, worm activity was the most important issue in non-Bt (conventional) cotton. The bollworms that we were finding in peanuts in late July/early August had developed into moths. Bollworm moth trap catches held steady the last two weeks and we were seeing several bollworm moths in the cotton fields. We were finding several small worms underneath the bloom tags that are stuck on the cotton bolls. The moths were laying their eggs in the blooms and when the worm hatched they immediately entered the tip of the boll and began feeding. At this point we were seeing chronic worm infestations. During the last two weeks we had a continuous egg lay, which resulted in worm sizes ranging from just emerged to 1 1/2 inches within the same field. In addition to the bollworms we were also finding fall armyworms and beet armyworms. We were also picking up a few lygus bug nymphs and stink bugs. Pod rot was present in several peanut fields. However, the preventative fungicides and the dry weather seem to be keeping the pod rot in check.

In late August, cotton and peanut fields were looking good for the most part. Peanut fields had formed pods that were maturing rapidly. We were starting to see cracked bolls in some cotton fields. At this point in the season, there was a very low likelihood that any blooms past this point would develop into mature bolls. Spider mites were being found in non-Bt (conventional) and Bt (transgenic) cotton fields at varying levels. We did not treat any fields for spider mites. For the most part, the thrips were helping to suppress the spider mite populations. Thrips are not considered a pest this late in the season; instead they were actually a beneficial because they feed on the spider mite eggs. One field in southwestern Gaines County had small worms (less than 1/2 inch). A majority of the bollworm, fall armyworm, and beet armyworm that were being found were 1 inch or longer, which indicated that the worms were fixing to cycle out; additionally, the bollworm moths were laying less eggs. Bollworm trap catches were also declining. Pod rot was still present in peanut fields at various levels. We were also picking up some early leaf spot. The hot dry weather was helping to suppress most of these diseases.

A majority of the crop was harvested in October and November.

Seasonal Heat Unit (H.U.) records for cotton (DD60s), National Climatic Data Center

						Avg. Monthly H.U.						Avg. Monthly Accumulated H.U.
Month	06	07	08	09	10		06	07	08	09	10	
May	437	194	319	310	308	314	437	194	319	310	308	314
June	598	427	626	549	645	569	1035	621	945	859	953	883
July	646	513	586	613	533	578	1681	1134	1531	1472	1486	1461
August	576	588	536	619	623	588	2257	1722	2067	2091	2109	2049
September	264	417	260	295	443	336	2521	2139	2327	2386	2552	2385
October	109	201	105	118	140	135	2630	2340	2432	2504	2692	2520
November	10	24	16	6	2	12	2640	2364	2448	2510	2694	2531

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2010 Research Reports



Developing a Sampling Protocol and Economic Threshold for Pod Rot of Peanut

Texas AgriLife Extension Service

Texas AgriLife Research Service

Gaines and Terry Counties

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Summary

Pod rot of peanut is significant disease in the Texas South Plains. Producers and crop consultants have listed it as a major problem. Pod rot is difficult and time consuming to scout for, due to its clumped occurrence in fields. Producers who have a history of pod rot will make chemical treatments based on the calendar. Two fields were investigated in 2010 for the effects of applying fungicides either by calendar schedules, or by basing the applications on pod rot thresholds. Three calendar scheduled treatments were evaluated. The fungicides applied were either Abound FL (24.6 oz/acre) or Ridomil EC + Provost (8 + 10.7 oz/acre) banded over 20 inches. Three threshold treatments were evaluated: low = 1-2% pod rot; moderate=3-4% pod rot; and high=5-6% pod rot. Plots were laid out in a randomized complete plot design with three replications. Fields were sampled weekly by rating a total of 101 points divided among the 21 plots. At each point, 1.5 ft. of row was dug and the pods examined for rot. Pod rot for all fields in 2010 were primarily caused by *Pythium* sp., though *Rhizoctonia solani* was also present as well in both fields. The low threshold treatment has done very well in terms of yield in both 2009 and 2010, in spite of having more pod rot fungicide treatment than the calendar applications. If threshold levels of pod rot are used to time applications, we recommend the low threshold (1-2%) for the first application. Once pod rot begins to climb again (by 1-2%) than another application is recommended, but not before at least 21-28 days. To get an accurate estimate of pod rot in a field, it is better to choose 20 random points, and only dig up a small area in each point.

Objective

This project is designed to determine if we can more successfully treat pod rot when fungicide application are made based on disease threshold rather than by calendar dates. To achieve this goal, we must identify what if any thresholds are better for timing of fungicides than calendar treatments. The second objective of this study is to determine how many samples a consultant must take to successfully estimate the average percent of pod rot.

Materials and Methods

Two fields were investigated in 2010 for the effects of adding fungicides either by calendar scheduling, or by basing the applications on thresholds of pod rot. The thresholds were: low = 1-2% pod rot; moderate=3-4% pod rot; and high=5-6% pod rot. The fields were intensively scouted on a weekly schedule, starting just before the first calendar application. Plots were 8-rows wide, on 36-inch (Gaines co.) or 40-inch (Terry co.) row spacing. There were three replications for each treatment, and treatments were arranged in a randomized complete block design. Pod rot for all fields in 2010 were primarily caused by *Pythium* sp., though *Rhizoctonia solani* were also present as well in both fields. Fungicide applications were made with a spider spray rig and were timed to be applied as the pivot was starting in the test area. The fungicides applied were either Abound FL (24.6 oz/acre) or Ridomil EC + Provost (8 + 10.7 oz/acre) banded over 20 inches. Application times and cost for each treatment are in Table 1. Plot size in the Gaines County site ranged from 0.5 to 1.2 acres and 0.4 to 1 acre in the Terry County site.

Table 1. Treatments, application timing, and cost for each treatment in Gaines and Terry counties in 2010 at pod rot tests.

Gaines Co. Trts	Application Dates for Gaines County			\$/acre Gaines Co.	Terry Co. Trts	Application Dates for Terry County		\$/acre Terry Co.
A ¹ /A/A	7 July	2 Aug.	5 Sept.	75.90	A/A	27 July	26 Aug.	45.52
A/R/A	7 July	2 Aug.	5 Sept.	101.14	A/R	27 July	26 Aug.	59.56
R ¹ /R/A	7 July	2 Aug.	5 Sept.	106.87	R/R	27 July	26 Aug.	73.60
Low		2 Aug.	22 Aug.	66.22	Low			0
Med.		9 Aug.	12 Sept.	66.22	Med.			0
High		16 Aug.		40.92	High			0
None	-	-	-	0	None			0

¹A=Abound FL applied at 24.6 oz/acre (20 inch bands) and R=Ridomil Gold EC + Provost applied at 8 and 10.7 oz/acre (20 inch bands).

Fields were sampled weekly by rating a total of 101 points divided among the 21 plots. At each point, 1.5 ft. of row was dug and the pods examined for rot. If there were any rotted pods, then the total number of pods and the number of rotted pods were counted. All rotted pods were placed in a bag and brought back to the laboratory. A number of pods were used to isolate the organisms associated with the rot. If pods were only marked superficially, then these were also counted and isolations were done. If *Rhizoctonia* or *Pythium* were isolated from a superficially marked pod, then these were also included in the "rot" category, otherwise, they were not counted towards the total percent rotted. All locations for sampling each week were determined ahead of time as random points within the field (without replacement) and their GPS locations were programmed into Garmin GPS receivers. People sampling went to their designated points each week to do the sampling. Each treatment had approximately the same number of samples taken, and more samples were taken from the longer rows than from the shorter rows.

A second objective of the study was to determine how many samples a scout should be taking in pod rot fields to adequately estimate the average pod rot. The total number of samples for each week was 101. The average from these samples, and a 95% confidence interval was calculated from both the two fields

in 2010 and two fields sampled in 2009 (also in Gaines and Terry counties). Of the 101 samples, a random number generator was used to sample (at random) 5, 10, 15, 20, 25, 30, and 35 of the 101 points for each week. This random number simulation was run 10 times for each sampling number. The average % pod rot generated from each of these sampling numbers was calculated. The percent of times that the average was wrong (i.e. outside of the 95% confidence interval for the 101 samples) was calculated.

Results and Discussion

Fungicide study:

Gaines County. The test area had a larger portion of pod rot located on the northwest side (Fig. 1). This affected the sampling estimates. Those plots that had a higher proportion of samples pulled from the more heavily diseased zones had higher pod rot averages each week. This caused the weekly sample averages to jump around more and it was harder to interpret as to whether the fungicide treatments were effective (Table 2). There was more pod rot overall in the low, medium, and high threshold treatments, and the untreated check than in the Abound FL (A/A/A) and Abound FL rotated with Ridomil + Provost treatments (A/R/A) (Table 2).

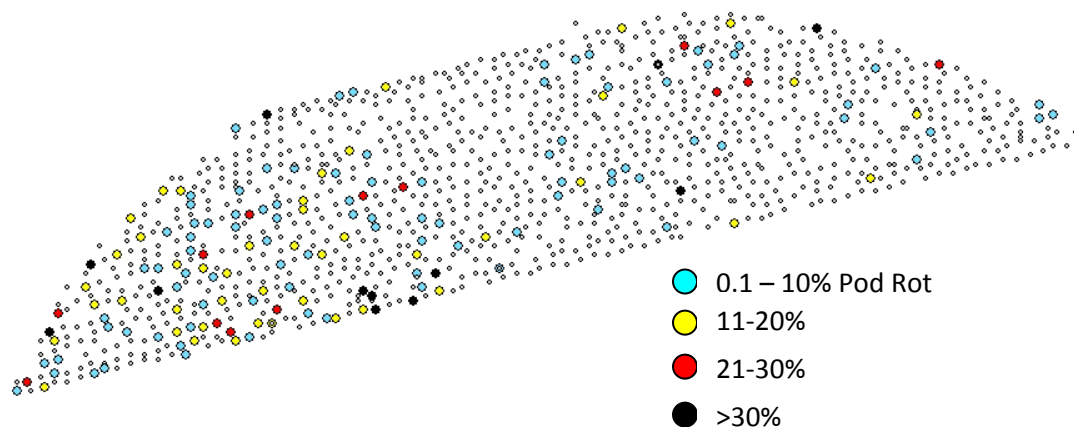


Figure 1. Location of areas with pod rot at the Gaines county field in 2010.

The Ridomil + Provost treatments (R/R/A) gave numerically higher pod rot than the calendar treatments that included Abound FL (Table 2). All three calendar treatments had less % diseased kernels at harvest than the threshold (low, mid, and high) and untreated check (Table 3). The grade was highest for the A/A/A treatment, and the value/ton (\$/ton) was higher for the A/A/A and A/R/A treatments than for the low and mid threshold treatments (Table 3). There were no significant differences between treatments with respect to yield, yield x kernel value, and this term minus chemical costs (Table 3).

Table 2. %Pod rot from week 4 – 11 of scouting and average pod rot across these weeks, by calendar and threshold treatments at a Gaines county site.

Trt ¹	Combined For 8 weeks		% Pod rot for each trt on each week							
			4 ²	5	6	7	8	9	10	11
A/A/A	0.6	b	0	0.2	0	2.8	0.6	1.0	0.2	0
A/R/A	0.3	b	0	0	0	2.4	0.1	0.2	0.2	0
R/R/A	2.1	ab	0	0.1	4.3	1.0	8.2	1.9	0.8	0.5
Low	2.9	a	0.5	1.1	3.6	5.2	2.1	0.6	3.2	4.9
Mid	4.0	a	0.2	3.2	3.6	3.0	8.3	0.9	2.9	1.2
High	2.6	ab	0.2	1.6	4.6	4.1	1.6	1.2	12.1	6.6
None	3.1	a	1.0	1.8	6.8	1.8	1.1	6.1	3.5	2.5

¹A=Abound FL; R=Ridomil Gold EC + Provost; Low=low threshold with applications at 1-2% pod rot; Mid=mid threshold with applications at 3-4% pod rot; High=high threshold with applications at 5-6% pod rot; None means no

²Week 4 was 27 July.

Table 3. Peanut yield, net return, and kernel characteristics for a fungicide test in Gaines County in 2010.

Trt ¹	Lbs/Acre	Value/ton (VT)		LA x VT	LA x VT-chemical costs	Grade	% DK ²
	(LA)	(\$)		(\$/acre)	(\$/a)		
A/A/A	5700	377	a	1076	1000	78.1 a	0.4 b
A/R/A	5233	374	a	978	870	76.6 b	0.3 b
R/R/A	5548	371	ab	1030	923	75.4 b	0.4 b
Low	6369	366	b	1167	1100	76.1 b	1.4 a
Mid	5302	366	b	971	905	75.4 b	1.3 a
High	4888	373	ab	910	869	76.7 b	1.1 a
None	5282	372	ab	983	983	76.4 b	1.1 a

¹A=Abound FL; R=Ridomil Gold EC + Provost; Low=low threshold with applications at 1-2% pod rot;

²DK =damaged kernels.

Pythium was isolated at an equal frequency among all the treatments, while *Rhizoctonia* was more frequently isolated in the untreated check than for all fungicide applied treatments, except the mid threshold treatment. *Pythium* was isolated about twice as frequently as *Rhizoctonia* from pods, inspite of it being more difficult to isolate, because pods are completely rotted with *Pythium* pod rot and have a lot of bacteria and secondary fungal contamination. In general, *Rhizoctonia* pod rot is easier to isolate, so the frequency of *Pythium* to *Rhizoctonia* in this field was probably considerably more than 2:1.

Terry County. Pod rot at this site was low all season, so none of the thresholds were triggered for applications. The test collapsed into four treatments, two calendar applications for Abound FL, Abound FL rotated with Ridomil Gold EC + Provost, and two applications of Ridomil Gold EC + Provost, compared against no fungicide treatment. There were no differences in pod rot at any individual week of the sampling or in the combined analysis for all weeks (Table 4). There were no differences between treatments in yield, yield x kernel value, grade, or % damaged kernels (Table 5).

The frequency of isolation for *Pythium* or *Rhizoctonia* was not affected by the fungicide treatments. *Pythium* was isolated about 2.5 times more frequently than was *Rhizoctonia* from pods with rot symptoms.

Table 4. %Pod rot from week 2 – 9 of scouting and average pod rot across these weeks, by calendar and threshold treatments at a Terry county site.

Trt ¹	Combined For 8 weeks	% Pod rot for each trt on each week							
		2 ²	3	4	5	6	7	8	9
A/A	0.3	0	0.6	0.4	0	0	0.4	0.7	0.2
A/R	0.1	0	0.3	0	0	0.4	0	0	0
R/R	0.1	0	0.2	0	0	0	0.2	0.5	0
None	0.6	0.9	0.1	0.2	0.5	0.7	0.7	0.9	0.6

¹A=Abound FL; R=Ridomil Gold EC + Provost; None means no fungicide
²Week 2 was 22 July.

Table 5. Peanut yield, net return, and kernel characteristics for a fungicide test in Terry county in 2010.

Trt ¹	Lbs/Acre (LA)	Value/ton (VT) (\$)	LA x VT (\$/acre)	LA x VT-chemical costs (\$/a)	Grade	% DK ²
A/A	5209	347	903	858	67.8	1.3
A/R	4930	345	850	790	67.2	1.2
R/R	5257	339	879	805	66.2	1.0
None	5055	334	857	857	65.3	1.0

¹A=Abound FL; R=Ridomil Gold EC + Provost; None means no fungicide applications.
²DK =damaged kernels.

Sampling intensity for pod rot: The four fields sampled in 2009 and 2010 had very different patterns of pod rot. The Terry County field in 2010 (Moore 2010) had very low levels of pod rot, the Gaines County field (Grissom) in 2010 had moderate levels of pod rot, and the two fields in 2009 (Grissom and Mason) had high levels of pod rot (Fig. 2).

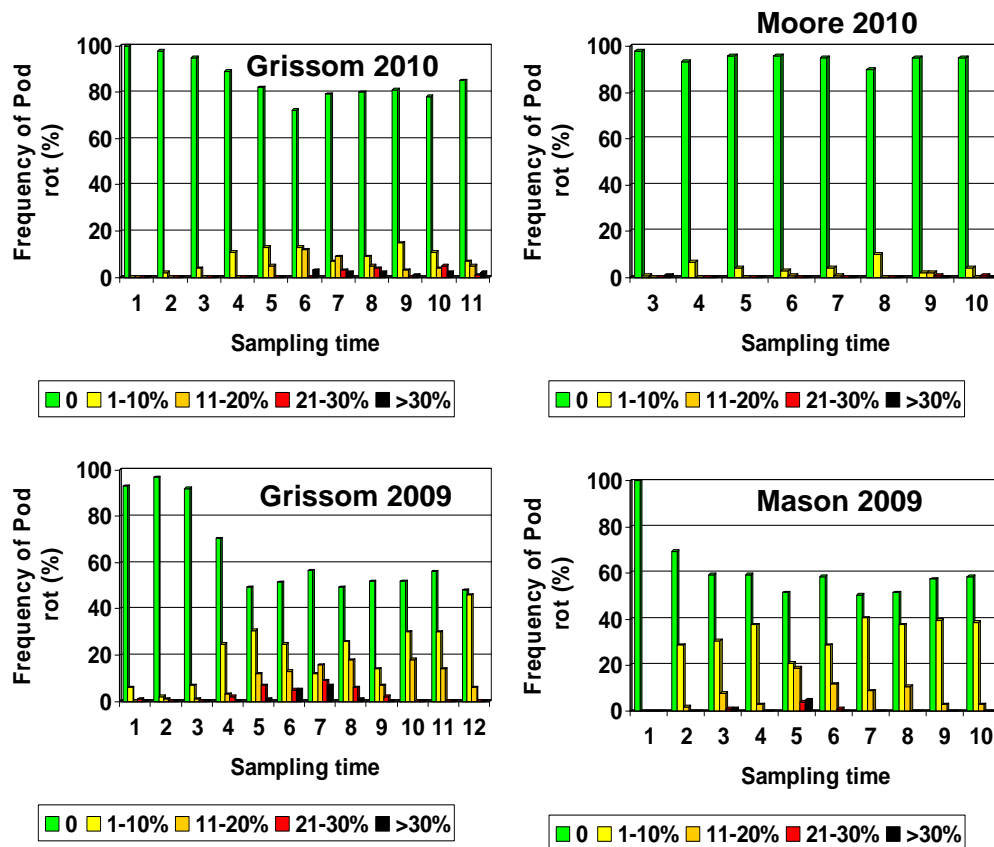


Figure 2. Frequency of pod rot samples taken in Gaines (Grissom 2009 and 2010) and Terry (Mason 2009 and Moore 2010) counties. Pod rot was grouped into 0, 1-10%, 11-20%, 21-30%, and >30% categories.

The Terry County field in 2010 had low levels of pod rot all season, and it didn't matter how many or few samples were taken to estimate the average of pod rot accurately. For the other sites, taking samples at 20 randomly selected locations meant that at least 67% of the time, the pod rot estimate was within a 95% confidence interval for the mean estimated by taking 101 samples. Taking only 15 samples meant that in at least one field, only 56% of the time was the average pod rot estimated in the field accurate, and sampling only 10 locations (probably closest to what consultants actually do) over 50% of the time, the pod rot estimate was incorrect. An example of what 5, 20, and 35 samples looks like for the T09 field is seen in *Figure 3*.

Table 6. Relationship between sampling intensity at four peanut fields and the percentage of times that the sample estimate of pod rot was incorrect.

N ¹	% of times the sample average for pod rot was incorrect ²			
	G09 ³	G10	T09	T10
5	43	64	79	26
10	30	49	53	18
15	28	30	44	18
20	20	24	33	23
25	12	24	28	18
30	8	15	19	24
35	3	15	14	6

¹N is the number of samples selected at random in the peanut field out of a total of 101 samples that were taken at each sampling time during the season.

²A sample average was incorrect if the mean fell outside of the 95% confidence intervals constructed around the mean when 101 samples were taken at each sampling time during

³G09 and G10 were fields in Gaines County and T09 and T10 were fields in Terry County.

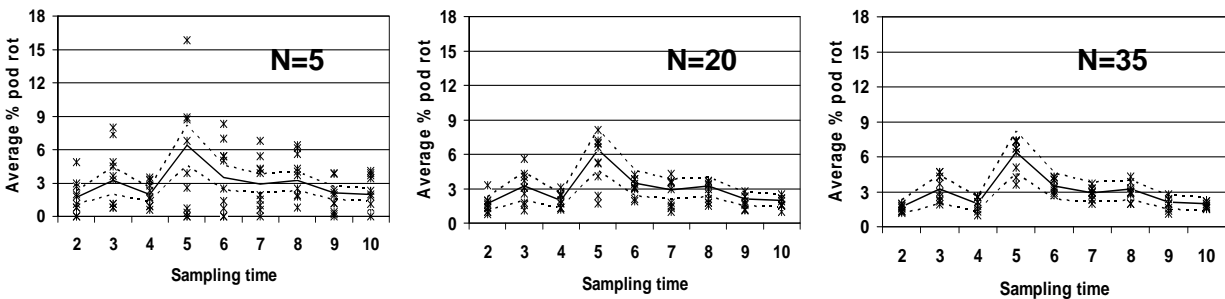


Figure 3. Average pod rot (solid line) based on 101 samples taken in the Terry County peanut field in 2009. The dotted lines are the 95% confidence intervals based around the mean and standard deviation from the 101 samples. The *'s are based on random samples taken at either 5, 20, or 35 locations in the field each time the field in sampled. The random sampling pattern was conducted 10 times (10 *'s per sampling week). If the * is located outside of the dotted line, then the average pod rot estimated from that sampling number (5, 20, or 35) was incorrect and a wrong management decision could be implemented if sampling estimates are poor. With 5, 20, and 35 samples, the wrong estimate was obtained 79, 33, and 14% of the time, when averaged over all sampling times.

Conclusions

In both years, there has been less pod rot in the plots treated with calendar applications of fungicides, rather than using thresholds. This is true even for the low threshold of 1-2% pod rot. The first calendar application goes out well before the first threshold application. However, this has not translated into significant gains in yield. The low threshold treatment has done very well in terms of yield in both 2009 and 2010, in spite of having more pod rot than the calendar application treatments. If threshold levels of pod rot are used to time applications, we recommend the low threshold (1-2%) for the first application. Once pod rot begins to climb again (by 1-2%) than another application is recommended, but not before at least 21-28 days.

The sampling number recommended for consultants was detailed above, and we are currently recommending taking 20 samples at random in a field. The Gaines co. field in 2010 had a higher frequency of pod rot in the NW edge than the rest of the field. If a consultant tried to “cheat” on the sample number by taking fewer samples, but digging up more row feet at a spot, that strategy would create problems in fields like the Gaines County 2010 field. If pod rot is distributed random around the field, then the strategy of visiting fewer spots, but digging up more plants would probably be fine. The Gaines County field in 2009 had a fairly random distribution of pod rot, and a scout was as likely to find pod rot in the next foot of row as the next random point. However, with the Gaines county field in 2010, if the scout was in the NW side, then the next foot of row had a higher chance of having pod rot than a random point somewhere else in the field. Also, in the rest of the field, the next foot of row was more likely to be healthy than a random point, which might fall in the NW part of the field. So, to get an accurate estimate of pod rot in a field, it is better to choose 20 random points, and only dig up a small area in each point.

Acknowledgements

Special thanks to Jimbo Grissom and Alan Bayer for cooperating with us on this project. This project was funded by the Texas Peanut Producers Board.

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**Boll Damage Survey of Bt and Non-Bt Cotton Varieties
in the South Plains Region of Texas 2007-10**

Cooperators: Texas AgriLife Extension Service

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South Plains

Summary:

Late-season boll damage surveys were conducted in 2007, 2008 and 2009 to evaluate the amount of Lepidoptera induced damage in Bt cotton varieties relative to non-Bt cotton varieties. Additional, data was collected on the number of insecticide applications required for these varieties to manage lepidopterous pests, and the number of bolls damaged by sucking pests in 2009. Boll damage was light in 2007; however, more damaged bolls were found in the non-Bt fields (3.11%) than in the Bollgard (0.52%) and Bollgard II (0.25%) fields, but did not differ from the Widestrike fields (1.29%). Very few insecticide applications were made targeting bollworm in any of the 2007 survey fields and there were no significant differences among variety types. None of the Bt cotton fields were treated for bollworms, whereas 9% on the non-Bt field received a single insecticide application. Late season bollworm damage in 2008 was similar to 2007. All of the Bt cotton variety types had significantly fewer damaged bolls than the non-Bt varieties and none of the Bt varieties required insecticide applications for lepidopterous pests, but unlike 2007, more non-Bt cotton was treated for bollworm and/or beet armyworms in 2008 (41% of the fields received a single insecticide application). In 2009, none of the surveyed fields were treated for lepidopterous pests. Worm damaged bolls were 2.83, 0.13 and 0.40% in non-Bt, Bollgard II and Widestrike varieties respectively. There were no differences among the variety types in sucking bug damaged which averaged 1.96% across all varieties. In 2010, 3.08% of bolls in the non-Bt fields were damaged, and 0.45 insecticide

applications were required per field on average. Damage did not exceed 0.27% in Bt cotton, and no Bt cotton field required treatment for lepidoterous pests. There were no differences among variety types regarding Lygus or stinkbug damaged bolls, which slight over 1% per field.

Objective:

The objective of this study was to compare the qualitative value of Bollgard II, Widestrike and Bollgard insect control traits in grower fields relative to each other and to non-Bt cotton varieties.

Materials and Methods:

In 2007, 2008, 2009 and 2010, boll damage surveys were conducted to quantify bollworm damage in late season Bt and non-Bt cotton varieties. Although the source of the damage is not certain, most of it is suspected to have come from cotton bollworms although beet armyworms were present in some fields in 2008, and fall armyworms were present in 2009 and 2010. Two of the non-Bt were treated for a mixed population of bollworms and beet armyworms in Bailey County in 2008, and non-Bt field in Gaines County in 2009 and 2010 contained about 20% fall armyworms and 80% bollworms. Fall armyworms were also present in Bailey County and Hale County experienced isolated beet armyworms problems. Additionally, cotton square borers were common throughout the southwestern and western areas of the South Plains in 2010. The survey was conducted late season because Bt levels in mature/senescent cotton tends to deteriorate relative to rapidly growing plants. Thus, late season would represent the time period when Bt levels would be less intensely expressed and damage would be more likely to occur.

Grower fields of non-Bt, Bollgard, Bollgard II and Widestrike cotton were sampled throughout the South Plains region of Texas (Table 1). Samples were taken after the last possible insecticide applications and before approximately 20% of the boll were open. Three distinct areas were sampled within each field, and 100 consecutive harvestable bolls were sampled from each location. Each field by variety type served as a replicate. Bolls were considered damaged if the carpal was breached through to the lint. The insecticide history in regard to insecticides targeting bollworms was recorded. In addition to bollworm damage, external Lygus and/or stinkbug damage to bolls was sampled for in most fields in 2009 and within 14 fields in 2010.

All data were analyzed using PROC MIXED and the means were separated using an F protected LSD ($P \leq 0.10$).

Results and Discussion:

In 2007, damage was very light across all of the field types. However, more damaged bolls were found in the non-Bt fields (3.11%) than in the Bollgard (0.52%) and Bollgard II (0.25%) fields, but did not differ from the Widestrike fields (1.29%) (Table 2). Damage in the Widestrike fields did not differ from the Bollgard and Bollgard II fields. The fact that Widestrike did not differ from the non-Bt fields does not appear to indicate a lack of efficacy, but probably indicates a lack of area wide bollworm pressure. Very few insecticide applications were made targeting bollworm

in any of the 2007 survey fields and there were no significant differences among variety types. None of the Bt cotton fields were treated for bollworms, whereas 9% on the non-Bt field received a single insecticide application.

Late season bollworm damage in 2008 was similar to 2007. All of the Bt cotton variety types had significantly fewer damaged bolls than the non-Bt varieties (Table 3). There were no differences in boll damage among the Bt types. Similar to 2007, none of the Bt varieties required insecticide applications for bollworms, but unlike 2007, more non-Bt cotton was treated for bollworms and/or beet armyworms in 2008 (41% of the fields received a single insecticide application).

Bollworm populations were exceptionally light during 2009 with the exception of Gaines County. Both Bollgard II and Widestrike varieties suffered very low damage to boll feeding lepidopterous pest in 2009 and had significantly fewer damaged bolls than the non-Bt varieties (no Bollgard fields were sampled in 2009) (Table 4). There were no differences in damaged bolls between the Bt types, and there were no differences among any of the varietal types in sucking bug damage. None of the fields sampled in the 2009 survey were treated for lepidopterous pests. Much of the South Plains had significant acreage of late-planted grain sorghum and corn, and these crops tended to act as trap crops, essentially preferentially attracting bollworms and fall armyworms away from the cotton.

In 2010, bollworm populations were moderate to high in portions of Gaines, Terry, Hockley, and Lubbock counties, and occurred late in the season in areas north of Lubbock. Dawson County reported no damage from bollworms or armyworms. Boll damage in 2010 was greatest in the non-Bt varieties, and the Bollgard II and Widestrike varieties did not differ from one another (Table 5). As in previous years, damage was numerically higher in the Widestrike varieties than the Bollgard II, suggesting a slight trend in lesser efficacy. However, no Bt cotton field, Widestrike or Bollgard II, ever required treatment for lepidopterous pests, indicating that both Bt technologies provide excellent control. The non-Bt varieties required 0.45 insecticide applications per field for lepidopterous pests.

Based on these data, Bt cotton appears to continue to be highly effective in preventing boll damage by lepidopterous pests in the South Plains region of Texas.

Acknowledgments:

Appreciation is expressed to the Monsanto Company and the Plains Cotton Improvement Program for financial support of this project.

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Table 1. Number of fields sampled by county and Bt trait in 2007-10.

County	Non-Bt	Bollgard	Bollgard II	Widestrike
Year 2007				
Bailey	0	3	1	0
Castro	4	0	3	0
Dawson	1	3	2	4
Floyd	3	0	4	0
Gaines	0	0	0	1
Hale	7	0	6	3
Hockley	3	2	2	2
Lubbock	1	5	2	1
Parmer	2	1	0	1
Terry	1	0	3	4
TOTAL	22	14	23	16
Year 2008				
Bailey	5	0	5	0
Castro	6	0	6	1
Dawson	0	0	0	2
Gaines	4	0	3	10
Hale	3	0	2	1
Hockley	5	5	5	3
Lubbock	6	0	5	0
TOTAL	29	5	26	17
Year 2009				
Bailey	1	0	1	0
Castro	1	0	2	1
Crosby	1	0	1	0
Dawson	0	0	1	1
Gaines	2	0	2	2
Hale	1	0	1	0
Hockley	1	0	1	0
Swisher	1	0	1	0
TOTAL	8	0	10	4
Year 2010				
Bailey	2	0	2	2
Crosby	1	0	2	0
Dawson	3	0	3	3
Floyd	1	0	0	0
Gaines	2	0	2	2
Hale	3	0	3	1
Hockley	3	0	3	4
Lubbock	3	0	3	2
Terry	2	0	2	2
TOTAL	20	0	20	16

Table 2. Percentage of damaged bolls and insecticide applications for non-Bt and various Bt technology varieties grown in the South Plains of Texas, 2007.

Variety type	n ^a	% damaged bolls ^b	Mean no. sprays per site ^c
Non-Bt	22	3.11 a	0.09 a
Bollgard	14	0.52 b	0.00 a
Bollgard II	23	0.25 b	0.00 a
WideStrike	14	1.29 ab	0.00 a

Means in a column followed by the same letter are not significantly different based on an F protected Mixed Procedure LSD ($P \leq 0.10$).

^aNumber of fields sampled.

^bPercentage of damaged bolls from three locations in each field, 100 bolls sampled per locations, 300 bolls per field.

^cMean number of insecticide applications targeting lepidopterous pests per site.

Table 3. Percentage of damaged bolls and insecticide applications for non-Bt and various Bt technology varieties grown in the South Plains of Texas, 2008.

Variety type	n ^a	% damaged bolls ^b	Mean no. sprays per site ^c
Non-Bt	29	3.16 a	0.41 a
Bollgard	5	0.53 b	0.00 b
Bollgard II	26	0.04 b	0.00 b
WideStrike	17	0.18 b	0.00 b

Means in a column followed by the same letter are not significantly different based on an F protected Mixed Procedure LSD ($P \leq 0.10$).

^aNumber of fields sampled.

^bPercentage of damaged bolls from three locations in each field, 100 bolls sampled per locations, 300 bolls per field.

^cMean number of insecticide applications targeting lepidopterous pests per site.

Table 4. Percentage of damaged bolls and insecticide applications for non-Bt and various Bt technology varieties grown on the South Plains of Texas, 2009.

Variety type	n ^a	% worm damaged bolls ^b	% sucking bug damaged bolls ^b	Mean no. sprays per site ^c
Non-Bt	8	2.83 a	3.83 a	0.00 a
Bollgard II	10	0.13 b	2.06 a	0.00 a
WideStrike	4	0.40 b	0.00 a	0.00 a

Means in a column followed by the same letter are not significantly different based on an F protected Mixed Procedure LSD ($P \leq 0.10$).

^aNumber of fields sampled.

^bPercentage of worm or sucking bug damaged bolls from three locations in each field, 100 bolls sampled per locations, 300 bolls per field.

^cMean number of insecticide applications targeting lepidopterous pests per site.

Table 5. Percentage of damaged bolls and insecticide applications for non-Bt and various Bt technology varieties grown on the South Plains of Texas, 2010.

Variety type	n ^a	% worm damaged bolls ^b	% sucking bug damaged bolls ^b	Mean no. sprays per site ^c
Non-Bt	20	3.08 a	1.87 a	0.45 a
Bollgard II	20	0.15 b	1.00 a	0.00 b
WideStrike	16	0.27 b	0.58 a	0.00 b

Means in a column followed by the same letter are not significantly different based on an F protected Mixed Procedure LSD ($P \leq 0.10$).

^aNumber of fields sampled.

^bPercentage of worm or sucking bug damaged bolls from three locations in each field, 100 bolls sampled per locations, 300 bolls per field; only 14 fields sampled for bug damage.

^cMean number of insecticide applications targeting lepidopterous pests per site.



Replicated LESA Irrigated Cotton Variety Demonstration
Texas AgriLife Extension Service
Gaines County
Cooperator: Jud Cheuvront
Manda Anderson, Extension Agent - IPM
Dr. Mark Kelley, Extension Program Specialists II - Cotton
Dr. Randy Boman, Extension Agronomist - Cotton

Summary

Significant differences were observed for all yield, economic, and HVI fiber quality parameters measured. Lint turnout ranged from a low of 34.7% and a high of 41.8% for Stoneville 4288B2F and PhytoGen 375WRF, respectively. Lint yield varied with a low of 1253 lb/acre (All-Tex ApexB2RF) and a high of 1708 (FiberMax 9170B2F). Lint loan values ranged from a low of \$0.5507/lb (All-Tex 65207B2RF) to a high of \$0.5738/lb (FiberMax 9170B2F). Net value/acre among varieties ranged from a high of \$973.05 (FiberMax 9170B2F) to a low of \$683.29 (All-Tex 65207B2RF), a difference of \$289.80. Micronaire values ranged from a low of 4.0 for Phytogen 367WRF to a high of 4.7 for Stoneville 4288B2F. Staple averaged 35.6 across all varieties with a low of 34.8 for Deltapine 0935B2RF and a high of 38.0 for FiberMax 9170B2F. Percent uniformity ranged from a high of 82.8% for NexGen 3348B2RF to a low of 80.2% for Deltapine 1032B2RF. Strength values averaged 28.6 g/tex with a high of 30.9 g/tex for FiberMax 9170B2F and a low of 26.2 g/tex for All-Tex ApexB2RF. These data indicate that substantial differences can be obtained in terms of net value/acre due to variety and technology selection.

Objective

The objective of this project was to compare agronomic characteristics, yields, gin turnout, fiber quality, and economic returns of transgenic cotton variety under irrigated production in Gaines County.

Materials and Methods

Varieties: All-Tex 65207B2RF, All-Tex ApexB2RF, Dyna-Gro 2570B2RF, Deltapine 0935B2RF, Deltapine 1032B2RF, FiberMax 1740B2F, FiberMax 9170B2F, NexGen 3348B2RF, PhytoGen 367WRF, PhytoGen 375WRF, Stoneville 4288B2F, Stoneville 5458B2RF

Experimental design: Randomized complete block with 3 replications

Seeding rate: 4.2 seeds/row-ft in 36-inch row spacing

Plot size: 6 rows by variable length of field (465ft to 722ft long)

Planting date: 6-May

Soil Texture: 90% sand, 3% silt, and 7% clay

Soil pH: 7.6

Fertilization: 2-April applied 39 gallons of 7-12-6-3. Applied 19 gal of 32-0-0 on 5-June, 17-June, and 23-June. 5 oz/acre of Zinc applied on 7-August.

Weed Management: A preplant application of Trifluralin (1pt/acre) on 12-April. 2.1 oz/acre Staple and 40 oz/acre of Makaze applied on 7-July.

Plant Growth Regulators: 2 oz/acre Potenza applied on 22-June, 7-July, and 21-July. 4 oz/acre of Pentza applied on 7-August.

Irrigation: This location was under a LESA center pivot. This trial received approximately 25.66 inches of irrigation and rainfall from 6-May to 22-October.

Date	Inches of Irrigation/Rainfall
6-May to 10-June	3.36
11-June to 15-July	11.35
16-July to 27-August	6.15
28-August to 22-October	4.8

Insecticides/
Nematicides: Temik 15G was applied infurrow at planting at a rate of 5 lb/acre. 8 oz of Vydate C-LV applied in a band on 9-June and 22-June.

Harvest Aides: Applied 1½ pt/acre of Bollbuster, 1 oz/acre Aim on 4-September. Applied 1 pt/acre of Gramoxone on 15-September.

Harvest: Plots were harvested on 22-October using a commercial picker harvester. Harvest material was transferred into a weigh wagon with integral electronic scales to determine individual plot weights. Plot yields were adjusted to lb/acre.

Gin Turnout: Grab samples were taken by plot and ginned at the Texas AgriLife Research and Extension Center at Lubbock to determine gin turnouts.

Fiber Analysis: Lint samples were submitted to the Fiber and Biopolymer Research Institute at Texas Tech University for HVI analysis, and USDA Commodity

Credit Corporation (CCC) Loan values were determined for each variety by plot.

Ginning cost and seed values:

Ginning costs were based on \$3.00 per cwt. of bur cotton and seed value/acre was based on \$175/ton. Ginning costs did not include checkoff.

Seed and technology fees:

Seed and technology costs were calculated using the appropriate seeding rate (4.2 seed/row-ft) for the 36 row spacing and entries using the online Plains Cotton Growers Seed Cost Comparison Worksheet available at: <http://www.plainscotton.org/Seed/PCGseed10.xls>

Results and Discussion

Significant differences were observed for all yield, economic, and HVI fiber quality parameters measured (Tables 1 and 2). Lint turnout ranged from a low of 34.7% and a high of 41.8% for Stoneville 4288B2F and PhytoGen 375WRF, respectively. Seed turnout ranged from a high of 56.0% for Stoneville 4288B2F to a low of 51.7% for Deltapine 1032B2RF. Bur cotton yields averaged 3792lb/acre with a high of 4594 lb/acre for FiberMax 9170B2F, and a low of 3401 lb/acre for Dyna-Gro 2570B2RF. Lint yield varied with a low of 1253 lb/acre (All-Tex ApexB2RF) and a high of 1708 (FiberMax 9170B2F). Lint loan values ranged from a low of \$0.5507/lb (All-Tex 65207B2RF) to a high of \$0.5738/lb (FiberMax 9170B2F). After adding lint and seed value, total value/acre for varieties ranged from a low of \$858.46 for All-Tex 65207B2RF to a high of \$1196.23 for FiberMax 9170B2F. When subtracting ginning, seed and technology fee costs, the net value/acre among varieties ranged from a high of \$973.05 (FiberMax 9170B2F) to a low of \$683.29 (All-Tex 65207B2RF), a difference of \$289.80.

Micronaire values ranged from a low of 4.0 for Phytogen 367WRF to a high of 4.7 for Stoneville 4288B2F. Staple averaged 35.6 across all varieties with a low of 34.8 for Deltapine 0935B2RF and a high of 38.0 for FiberMax 9170B2F. Percent uniformity ranged from a high of 82.8% for NexGen 3348B2RF to a low of 80.2% for Deltapine 1032B2RF. Strength values averaged 28.6 g/tex with a high of 30.9 g/tex for FiberMax 9170B2F and a low of 26.2 g/tex for All-Tex ApexB2RF. Elongation ranged from a high of 8.5% for Dyna-Gro 2570B2F to a low of 6.1% for FiberMax 9170B2F. Leaf grades ranged from 1 to 3, with a test average of 2.0. Values for reflectance (Rd) and yellowness (+b) averaged 82.1 and 7.8, respectively.

Conclusions

These data indicate that substantial differences can be obtained in terms of net value/acre due to variety and technology selection. It should be noted that no inclement weather was encountered at this location prior to harvest and therefore, no pre-harvest losses were observed. Additional multi-site and multi-year applied research is needed to evaluate varieties and technology across a series of environments.

Acknowledgements

Appreciation is expressed to Jud Cheuvront for the use of his land, equipment and labor for this demonstration. Further assistance with harvesting was provided by Jerardo Froese. Furthermore, we greatly appreciate the Texas Department of Agriculture - Food and Fiber Research for funding of HVI testing.

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Table 1. Harvest results from the cotton variety trial under center pivot irrigation, Jud Cheuvront Farm, Seminole, TX, 2010.

Entry	Lint turnout	Seed turnout	Bur cotton yield	Lint yield	Seed yield	Lint loan value	Lint value	Seed value	Total value	Ginning cost	Seed/technology cost	Net value
	----- % -----		----- lb/acre -----			\$/lb			----- \$/acre -----			
FiberMax 9170B2F	37.2	53.8	4594	1708	2471	0.5738	980.06	216.17	1196.23	137.83	85.35	973.05 a
PhytoGen 367WRF	37.5	52.8	4033	1512	2130	0.5655	855.14	186.41	1041.55	120.98	83.73	836.83 b
FiberMax 1740B2F	37.6	53.5	3964	1491	2121	0.5635	840.11	185.61	1025.72	118.91	85.35	821.46 bc
Stoneville 4288B2F	34.7	56.0	4162	1443	2328	0.5613	810.24	203.74	1013.98	124.85	85.35	803.78 bcd
PhytoGen 375WRF	41.8	52.4	3460	1448	1814	0.5615	812.88	158.73	971.60	103.81	83.73	784.06 bcd
Deltapine 0935B2RF	38.2	53.7	3765	1437	2020	0.5577	801.25	176.75	978.01	112.94	85.46	779.60 bcd
Deltapine 1032B2RF	39.6	51.7	3584	1418	1853	0.5658	802.23	162.14	964.37	107.53	86.68	770.16 bcde
NexGen 3348B2RF	35.3	55.9	3841	1356	2147	0.5577	756.24	187.83	944.07	115.22	76.31	752.54 cdef
Stoneville 5458B2RF	36.0	54.9	3721	1338	2042	0.5637	754.29	178.66	932.95	111.62	85.35	735.98 def
Dyna-Gro 2570B2RF	37.9	54.5	3401	1289	1855	0.5610	722.99	162.33	885.32	102.03	83.47	699.82 ef
All-Tex Apex B2RF	35.7	55.8	3505	1253	1954	0.5663	709.43	170.96	880.40	105.14	77.59	697.67 f
All-Tex 65207B2RF	36.2	54.8	3473	1257	1903	0.5507	691.93	166.53	858.46	104.19	70.99	683.29 f
Test average	37.3	54.1	3792	1412	2053	0.5624	794.73	179.65	974.39	113.75	82.45	778.19
CV, %	5.1	1.1	5.1	4.9	5.2	1.2	4.9	5.2	5.0	5.1	--	5.5
OSL	0.0089	<0.0001	<0.0001	<0.0001	<0.0001	0.0549†	<0.0001	<0.0001	<0.0001	<0.0001	--	<0.0001
LSD	3.2	1.0	326	118	180	0.0093	65.95	15.76	81.69	9.78	--	71.92

For net value/acre, means within a column with the same letter are not significantly different at the 0.05 probability level.

CV - coefficient of variation.

OSL - observed significance level, or probability of a greater F value.

LSD - least significant difference at the 0.05 level, †indicates significance at the 0.10 level.

Note: some columns may not add up due to rounding error.

Assumes:

\$3.00/cwt ginning cost.

\$175/ton for seed.

Value for lint based on CCC loan value from grab samples and FBRI HVI results.

Table 2. HVI fiber property results from the cotton variety trial under center pivot irrigation, Jud Cheuvront Farm, Seminole, TX, 2010.

Entry	Micronaire	Staple	Uniformity	Strength	Elongation	Leaf	Rd	+b	Color grade	
	units	32 ^{nds} inches	%	g/tex	%	grade	reflectance	yellowness	color 1	color 2
All-Tex 65207B2RF	4.3	35.0	82.0	27.9	7.3	3.0	81.3	8.0	2.0	1.0
All-Tex Apex B2RF	4.3	35.6	81.1	26.2	7.3	1.7	82.3	7.7	2.0	1.0
Dyna-Gro 2570B2RF	4.3	35.0	81.7	28.6	8.5	1.3	81.8	8.2	1.7	1.0
Deltapine 0935B2RF	4.2	34.8	80.4	28.7	7.1	1.3	83.1	7.9	1.7	1.0
Deltapine 1032B2RF	4.4	35.4	80.2	28.8	6.8	1.3	83.0	7.4	2.0	1.0
FiberMax 1740B2F	4.3	35.3	81.5	28.8	6.8	1.7	83.1	7.4	2.0	1.0
FiberMax 9170B2F	4.2	38.0	81.6	30.9	6.1	1.0	83.9	7.1	2.0	1.0
NexGen 3348B2RF	4.0	35.9	82.8	29.4	7.1	3.3	80.7	7.9	2.0	1.0
PhytoGen 367WRF	4.0	36.4	81.2	29.2	7.7	2.7	81.3	8.3	2.0	1.0
PhytoGen 375WRF	4.1	35.0	80.7	28.2	7.3	1.7	82.6	7.5	2.0	1.0
Stoneville 4288B2F	4.7	35.2	81.3	27.7	7.8	2.3	81.6	8.2	2.0	1.0
Stoneville 5458B2RF	4.4	35.7	80.5	28.7	7.1	2.7	80.8	8.2	2.0	1.0
Test average	4.3	35.6	81.2	28.6	7.2	2.0	82.1	7.8	1.9	1.0
CV, %	3.1	1.5	0.9	2.2	2.7	32.9	0.5	2.1	--	--
OSL	0.0002	<0.0001	0.0068	<0.0001	<0.0001	0.0025	<0.0001	<0.0001	--	--
LSD	0.2	0.9	1.2	1.0	0.3	1.1	0.7	0.3	--	--

CV - coefficient of variation.

OSL - observed significance level, or probability of a greater F value.

LSD - least significant difference at the 0.05 level.



**Replicated LESA Irrigated Cotton Variety Demonstration
Under Full and Limited (15% reduction) Irrigation
Texas AgriLife Extension Service
Gaines County
Cooperator: Shelby Elam
Manda Anderson, Extension Agent - IPM
Dr. Dana Porter, Extension Ag Engineering Specialist
Dr. Mark Kelley, Extension Program Specialists II - Cotton
Dr. Randy Boman, Extension Agronomist - Cotton**

Summary Significant differences were observed for all yield, economic, and most of the HVI fiber quality parameters measured. Net value/acre among varieties ranged from a high of \$914.77 (Deltapine 1032B2RF-Full Irrigation) to a low of \$619.30 (NexGen 3348B2RF-Limited Irrigation), a difference of \$295.48. There was a significant difference of \$209.74 between the Deltapine 1032B2RF-Full Irrigation and Deltapine 1032B2RF-Limited Irrigation. There was also a significant difference of \$97.72 between the NexGen 3348B2RF-Full Irrigation and NexGen 3348B2RF-Limited Irrigation. However, there was no significant difference between the Stoneville 4288B2RF-Full Irrigation and Stoneville 4288B2RF-Limited Irrigation. PhytoGen 367WRF showed a large numerical difference in net value of \$118.90 between the full and limited irrigation. Dyna-Gro 2570B2RF also showed a large numerical difference of \$62.90 between the full and limited irrigation. However, Stoneville 5458B2RF did not show a large numerical difference between full and limited irrigation. These data indicate that some varieties may have substantial differences in terms of varieties performance due to irrigation amounts. However, other varieties may not have as great of performance differences under varying levels of irrigation.

Objective The objective of this project was to compare agronomic characteristics, yields, gin turnout, fiber quality, and economic returns of transgenic cotton variety under full and limited irrigated production in Gaines County.

Materials and Methods

Varieties: Dyna-Gro 2570B2RF, Deltapine 1032B2RF, NexGen 3348B2RF, PhytoGen 367WRF, Stoneville 4288B2F, Stoneville 5458B2RF

Experimental design: Randomized complete block with 3 replications

Seeding rate: 3.5 seeds/row-ft in 40-inch row spacing

Plot size: 4 rows by variable length of field (175ft to 810ft long)

Planting date: 11-May

Soil Texture: 92% sand, 1% silt, and 7% clay

Soil pH: 8.0

Irrigation: This location was under a LESA center pivot. The full irrigation portion of the trial received approximately 15.87 inches of irrigation and rainfall from 11-May to 3-August. The limited irrigation portion of the trial received approximately 13.53 inches (15% reduction) of irrigation and rainfall from 11-May to 27-August 27. Irrigation and rainfall was not recorded after this time period.

Date	Inches of Irrigation/Rainfall Full Irrigation	Inches of Irrigation/Rainfall Limited Irrigation
11-May to 10-June	2.48	1.76
11-June to 15-July	8.29	7.07
16-July to 27-August	5.1	4.7

Insecticides: Temik 15G was applied infurrow at planting at a rate of 5 lb/acre

Harvest: Plots were harvested on 18-October using a commercial stripper harvester. Harvest material was transferred into a weigh wagon with integral electronic scales to determine individual plot weights. Plot yields were adjusted to lb/acre.

We were unable to harvest the 3rd replication of Dyna-Gro 2570B2RF, PhytoGen 367WRF, and Stoneville 5458B2RF. Therefore, these three varieties were excluded from the statistical analysis that is reported in Tables 1 and 2.

Averages of the 1st and 2nd replications for all varieties are reported in Table 3.

Gin Turnout: Grab samples were taken by plot and ginned at the Texas AgriLife Research and Extension Center at Lubbock to determine gin turnouts.

Fiber Analysis: Lint samples were submitted to the Fiber and Biopolymer Research Institute at Texas Tech University for HVI analysis, and USDA Commodity Credit Corporation (CCC) Loan values were determined for each variety by plot.

Ginning cost and
seed values:

Ginning costs were based on \$3.00 per cwt. of bur cotton and seed value/acre was based on \$175/ton. Ginning costs did not include checkoff.

Seed and
technology fees:

Seed and technology costs were calculated using the appropriate seeding rate (3.5 seed/row-ft) for the 40 row spacing and entries using the online Plains Cotton Growers Seed Cost Comparison Worksheet available at: <http://www.plainscotton.org/Seed/PCGseed10.xls>

Results and Discussion

Significant differences were observed for all yield, economic, and most of the HVI fiber quality parameters measured (Tables 1 and 2). Lint turnout ranged from a low of 29.8% and a high of 37.4% for NexGen 3348B2RF-Limited and Deltapine 1032B2RF-Full, respectively (Table 1). Seed turnout ranged from a high of 52.1% for NexGen 3348B2RF-Limited to a low of 47.1% for Deltapine 1032B2RF-Limited. Bur cotton yields averaged 4271lb/acre with a high of 4892 lb/acre for Stoneville 4288B2RF-Full, and a low of 3659 lb/acre for NexGen 3348B2RF-Limited. Lint yield varied with a low of 1092 lb/acre (NexGen 3348B2RF-Limited) and a high of 1616 (Deltapine 1032B2RF-Full). Lint loan values ranged from a low of \$0.5548/lb (Stoneville 4288B2RF-Limited) to a high of \$0.5742/lb (Deltapine 1032B2RF-Full). After adding lint and seed value, total value/acre for varieties ranged from a low of \$786.31 for NexGen 3348B2RF-Limited to a high of \$1109.58 for Deltapine 1032B2RF-Full.

When subtracting ginning, seed and technology fee costs, the net value/acre among varieties ranged from a high of \$914.77 (Deltapine 1032B2RF-Full Irrigation) to a low of \$619.30 (NexGen 3348B2RF-Limited Irrigation), a difference of \$295.48 (Table 1). There was a significant difference of \$209.74 between the Deltapine 1032B2RF-Full Irrigation and Deltapine 1032B2RF-Limited Irrigation. There was also a significant difference of \$97.72 between the NexGen 3348B2RF-Full Irrigation and NexGen 3348B2RF-Limited Irrigation. However, there was no significant difference between the Stoneville 4288B2RF-Full Irrigation and Stoneville 4288B2RF-Limited Irrigation.

Phytogen 367WRF showed a large numerical difference in net value of \$118.90 between the full and limited irrigation (Table 3). Dyna-Gro 2570B2RF also showed a large numerical difference of \$62.90 between the full and limited irrigation. However, Stoneville 5458B2RF did not show a large numerical difference between full and limited irrigation.

Micronaire values ranged from a low of 4.2 for NexGen 3348B2RF-Full to a high of 4.8 for Stoneville 4288B2F (Table 2). Staple averaged 36.6 across all varieties with a low of 35.9 for Stoneville 4288B2F-Limited and a high of 37.3 for Deltapine 1032B2RF. Percent uniformity ranged from a high of 83.3% for Deltapine 1032B2RF-Full to a low of 81.8% for NexGen 3348B2RF-Limited. Strength values averaged 30.0 g/tex with a high of 30.9 g/tex for Deltapine 1032B2RF and a low of 28.4 g/tex for Stoneville 4288B2F-Limited. Elongation ranged from a high of 7.8% for Stoneville 4288B2F-Limited to a low of 6.6% for Deltapine 1032B2RF-Full. Leaf grades ranged from 1 to 3, with a test average of 2.5. Values for reflectance (Rd) and yellowness (+b) averaged 80.8 and 8.4, respectively.

Conclusions

These data indicate that some varieties may have substantial differences in terms of varieties performance due to irrigation amounts. However, other varieties may not have as great of performance differences under varying levels of irrigation. Additional multi-site and multi-year applied research is needed to evaluate varieties and technology across a series of environments.

Acknowledgements

Appreciation is expressed to Shelby Elam for the use of his land, equipment and labor for this demonstration. Furthermore, we greatly appreciate the Texas Department of Agriculture - Food and Fiber Research for funding of HVI testing.

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Table 1. Harvest results from the cotton variety trial under full and limited center pivot irrigation (3 varieties), Shelby Elam Farm, Seminole, TX, 2010.

Entry	Lint turnout	Seed turnout	Bur cotton yield	Lint yield	Seed yield	Lint loan value	Lint value	Seed value	Total value	Ginning cost	Seed/technology cost	Net value
	----- % -----		----- lb/acre -----			\$/lb				----- \$/acre -----		
Deltapine 1032B2RF (Full Irrigation)	37.4	48.0	4327	1616	2075	0.5742	928.05	181.53	1109.58	129.80	65.01	914.77 a
Stoneville 4288B2F (Full Irrigation)	30.1	51.2	4892	1474	2505	0.5557	819.27	219.21	1038.47	146.76	64.01	827.70 a
Stoneville 4288B2F (Limited Irrigation)	30.8	51.1	4795	1475	2451	0.5548	818.51	214.49	1033.00	143.85	64.01	825.14 a
NexGen 3348B2RF (Full Irrigation)	30.5	51.8	4122	1256	2135	0.5662	711.12	186.79	897.92	123.66	57.23	717.02 b
Deltapine 1032B2RF (Limited Irrigation)	33.2	47.1	3828	1269	1805	0.5727	726.98	157.92	884.90	114.85	65.01	705.03 bc
NexGen 3348B2RF (Limited Irrigation)	29.8	52.1	3659	1092	1907	0.5672	619.44	166.87	786.31	109.78	57.23	619.30 c
Test average	32.0	50.2	4271	1364	2146	0.5651	770.56	187.80	958.36	128.12	62.09	768.16
CV, %	8.1	2.2	6.0	6.0	6.1	1.4	6.0	6.1	6.0	6.0	--	6.5
OSL	0.0345	0.0009	0.0007	0.0002	0.0003	0.0524 [†]	0.0002	0.0003	0.0004	0.0007	--	0.0003
LSD	4.7	2.0	470	150	239	0.0117	84.17	20.95	104.72	14.10	--	90.75

For net value/acre, means within a column with the same letter are not significantly different at the 0.05 probability level.

CV - coefficient of variation.

OSL - observed significance level, or probability of a greater F value.

LSD - least significant difference at the 0.05 level, [†]indicates significance at the 0.10 level.

Note: some columns may not add up due to rounding error.

Assumes:

\$3.00/cwt ginning cost.

\$175/ton for seed.

Value for lint based on CCC loan value from grab samples and FBRI HVI results.

Table 2. HVI fiber property results from the cotton variety trial under full and limited center pivot irrigation (3 varieties), Shelby Elam Farm, Seminole, TX, 2010.

Entry	Micronaire	Staple	Uniformity	Strength	Elongation	Leaf	Rd	+b	Color grade	
	units	32 ^{nds} inches	%	g/tex	%	grade	reflectance	yellowness	color 1	color 2
Deltapine 1032B2RF (Limited Irrigation)	4.7	37.3	82.4	30.9	6.9	1.0	82.5	8.1	1.3	1.0
Deltapine 1032B2RF (Full Irrigation)	4.4	37.3	83.3	30.9	6.6	1.7	81.9	8.1	1.7	1.0
NexGen 3348B2RF (Limited Irrigation)	4.3	36.4	81.8	30.1	6.9	2.7	79.9	8.6	2.0	1.0
NexGen 3348B2RF (Full Irrigation)	4.2	36.3	82.5	29.9	6.9	3.0	79.9	8.6	2.0	1.0
Stoneville 4288B2F (Limited Irrigation)	4.8	35.9	82.5	28.4	7.8	3.0	80.7	8.4	1.7	1.0
Stoneville 4288B2F (Full Irrigation)	4.8	36.6	82.1	29.6	7.5	3.7	79.6	8.6	2.0	1.0
Test average	4.5	36.6	82.4	30.0	7.1	2.5	80.8	8.4	1.8	1.0
CV, %	4.3	1.0	1.1	3.8	4.2	16.3	0.5	2.9	--	--
OSL	0.0172	0.0039	0.4628	0.1629	0.0045	0.0001	<0.0001	0.0556 [†]	--	--
LSD	0.4	0.7	NS	NS	0.5	0.7	0.7	0.4	--	--

CV - coefficient of variation.

OSL - observed significance level, or probability of a greater F value.

LSD - least significant difference at the 0.05 level, [†]indicates significance at the 0.10 level, NS - not significant

Table 3. Harvest results from the cotton variety trial under full and limited center pivot irrigation (all varieties), Shelby Elam Farm, Seminole, TX, 2010.

Entry	Lint turnout	Seed turnout	Bur cotton yield	Lint yield	Seed yield	Lint loan value	Lint value	Seed value	Total value	Ginning cost	Seed/technology cost	Net value
	----- % -----		----- lb/acre -----			\$/lb			----- \$/acre -----			
PHY 367WRF (Full Irrigation)	32.5	49.3	4942	1605	2440	0.5708	916.73	213.49	1130.22	148.27	62.80	919.15
DP 1032B2RF (Full Irrigation)	34.1	48.5	4524	1539	2192	0.5740	883.48	191.79	1075.27	135.73	65.01	874.53
ST 5458B2RF (Full Irrigation)	31.2	50.1	4982	1551	2496	0.5603	869.20	218.40	1087.60	149.46	64.01	874.13
ST 5458B2RF (Limited Irrigation)	32.6	50.8	4837	1571	2456	0.5458	857.45	214.90	1072.35	145.11	64.01	863.23
DG 2570B2RF (Full Irrigation)	33.7	51.8	4412	1485	2282	0.5735	851.43	199.71	1051.13	132.35	62.60	856.18
ST 4288B2F (Full Irrigation)	30.6	51.9	4946	1509	2555	0.5530	834.50	223.55	1058.05	148.37	64.01	845.67
ST 4288B2F (Limited Irrigation)	30.9	51.9	4770	1472	2475	0.5495	810.55	216.52	1027.07	143.09	64.01	819.97
PHY 367WRF (Limited Irrigation)	32.6	48.8	4364	1417	2130	0.5693	807.55	186.40	993.95	130.91	62.80	800.24
DG 2570B2RF (Limited Irrigation)	33.1	51.2	4188	1386	2145	0.5725	793.84	187.69	981.53	125.65	62.60	793.28
NG 3348B2RF (Full Irrigation)	30.5	51.3	4184	1275	2147	0.5658	721.53	187.84	909.38	125.53	57.23	726.62
DP 1032B2RF (Limited Irrigation)	33.8	47.8	3824	1293	1828	0.5735	741.73	159.99	901.72	114.72	65.01	721.99
NG 3348B2RF (Limited Irrigation)	29.9	52.3	3554	1060	1862	0.5673	601.23	162.91	764.15	106.63	57.23	600.29

We were not able to collect data from the third replication of PHY 367WRF, ST 5458B2RF, and DG 2570B2RF. Therefore, the data in this table represents the average of two replications. Statistical Analysis was not performed.



Replicated LESA Irrigated Cotton Variety Demonstration and the Use of Vydate C-LV Under Root-knot Nematode Pressure

Cooperator: Roy Johnson

Manda Anderson, Extension Agent - IPM

Dr. Terry Wheeler, Research Plant Pathologist

Dr. Jason Woodward, Extension Plant Pathologist

Dr. Mark Kelley, Extension Program Specialists II - Cotton

Dr. Randy Boman, Extension Agronomist - Cotton

Summary

Significant differences were observed for most of the yield, economic, and HVI fiber quality parameters measured. Net value/acre among varieties ranged from a high of \$619.38 (PhytoGen 375WRF-with Vydate) to a low of \$472.24 (NexGen 4010B2RF), a difference of \$147.14. There were no differences between varieties for root galling and root-knot nematode populations in the soil. Two of the varieties (Phytogen 375WRF and Stoneville 5458B2RF) were also tested with and without the nematicide Vydate CLV. Root-knot nematode population densities were higher for Phytogen 375WRF than for Stoneville 5458B2RF when Vydate CLV was absent, but densities were similar across both varieties when Vydate CLV was utilized. Root-knot nematode density was lower for Phytogen 375WRF when Vydate CLV was used, than when it was not used. However, root-knot population densities were similar for Stoneville 5458B2RF with or without Vydate. Net value did not differ between Vydate treatments (with and without) for either PhytoGen 375WRF and Stoneville 5458B2RF.

Objective

The objective of this project was to compare agronomic characteristics, yields, gin turnout, fiber quality, and economic returns of transgenic cotton variety under irrigated production in Gaines County.

Materials and Methods

Varieties: Deltapine 0935B2RF, Deltapine 1044B2RF, Deltapine 174RF, Dyna-Gro 2570B2RF, NexGen 3348B2RF, NexGen 4010B2RF, PhytoGen 367WRF, PhytoGen 375WRF, Stoneville 4288B2F, Stoneville 5458B2RF

Experimental design: Randomized complete block with 3 replications

Seeding rate: 3.5 seeds/row-ft in 36-inch row spacing

Plot size: Variable length of field (770ft to 2507ft long) by 8 rows for all varieties except for Stoneville 5458B2RF and Phytogen 375WRF which had 16 rows

Planting date: 13-May

Soil Texture: 90% sand, 3% silt, and 7% clay

Soil pH: 7.6

Irrigation: This location was under a LESA center pivot. This trial received approximately 13.45 inches of irrigation and rainfall from 13-May to 20-July. Irrigation and rainfall amounts were not recorded after this period.

Date	Inches of Irrigation/Rainfall
13-May to 10-June	3.49
11-June to 20-July	9.96

Insecticides: Temik 15G was applied in-furrow at planting at a rate of 5 lb/acre. Vydate C-LV was applied in a band at a rate of 17oz per acre on 18-June to all plots except for 8 rows of Stoneville 5458B2RF and Phytogen 375WRF in each replication

Harvest: Plots were harvested on 16 & 18-November using a commercial stripper harvester. Harvest material was transferred into a weigh wagon with integral electronic scales to determine individual plot weights. Plot yields were adjusted to lb/acre.

Gin Turnout: Grab samples were taken by plot and ginned at the Texas AgriLife Research and Extension Center at Lubbock to determine gin turnouts.

Fiber Analysis: Lint samples were submitted to the Fiber and Biopolymer Research Institute at Texas Tech University for HVI analysis, and USDA Commodity Credit Corporation (CCC) Loan values were determined for each variety by plot.

Ginning cost and seed values: Ginning cost were based on \$3.00 per cwt. of bur cotton and seed value/acre was based on \$175/ton. Ginning costs did not include checkoff.

Seed and technology fees: Seed and technology costs were calculated using the appropriate seeding rate (3.5 seed/row-ft) for the 36 row spacing and entries using the online Plains Cotton Growers Seed Cost Comparison Worksheet available at: <http://www.plainscotton.org/Seed/PCGseed10.xls>

Results and Discussion

Significant differences were observed for most of the yield, economic, and HVI fiber quality parameters measured (Tables 1 and 2). Lint turnout

ranged from a low of 29.7% and a high of 36.4% for NexGen 4010B2RF and PhytoGen 375WRF (with Vydate), respectively. Seed turnout ranged from a high of 51.8% for Stoneville 4288B2F to a low of 46.9% for Deltapine 174RF. Bur cotton yields averaged 3240lb/acre with a high of 3579 lb/acre for Stoneville 4288B2F, and a low of 2924 lb/acre for Deltapine 0935B2RF. Lint yield varied with a low of 879 lb/acre (NexGen 4010B2RF) and a high of 1175 (PhytoGen 375WRF-with Vydate). After adding lint and seed value, total value/acre for varieties ranged from a low of \$634.54 for NexGen 4010B2RF to a high of \$795.96 for PhytoGen 375WRF (with Vydate). When subtracting ginning, Vydate C-LV, seed and technology fee costs, the net value/acre among varieties ranged from a high of \$619.38 (PhytoGen 375WRF-with Vydate) to a low of \$472.24 (NexGen 4010B2RF), a difference of \$147.14. There was no significant difference between the PhytoGen 375WRF (no Vydate) and PhytoGen 375WRF (with Vydate). Also, there was no significant difference between the Stoneville 5458B2RF (no Vydate) and Stoneville 5458B2RF (with Vydate).

Micronaire values ranged from a low of 3.6 for NexGen 3348B2RF to a high of 4.7 for Deltapine 0935B2RF. Staple averaged 35.2 across all varieties with a low of 34.0 for Deltapine 0935B2RF and a high of 36.6 for NexGen 4010B2RF. Percent uniformity ranged from a high of 81.9% for NexGen 4010B2RF to a low of 79.1% for Stoneville 5458B2RF. Strength values averaged 28.3 g/tex with a high of 30.8 g/tex for NexGen 4010B2RF and a low of 26.5 g/tex for Stoneville 4288B2RF. Elongation ranged from a high of 8.4% for Deltapine 1044B2RF to a low of 6.6% for NexGen 3348B2RF. Leaf grades ranged from 1 to 3, with a test average of 2.5. Values for reflectance (Rd) and yellowness (+b) averaged 82.2 and 7.7, respectively.

All of the varieties were examined for differences in root galling and root-knot nematode populations in the soil. There were no differences between varieties for these parameters (Table 1).

Two of the varieties (Phytogen 375WRF and Stoneville 5458B2RF) were also tested with and without the nematicide Vydate CLV. The application of this chemical was made after the first generation of the nematode had already entered the roots and caused some galling, so the soil and root population density of root-knot was the only parameter of interest. Root-knot nematode population density was higher for Phytogen 375WRF than for Stoneville 5458B2RF when Vydate CLV was absent (Table 2), but root-knot nematode had similar densities across both varieties when Vydate CLV was present. Root-knot nematode density was lower in Phytogen 375WRF when Vydate CLV was present, than when it was

absent (Table 2). However, root-knot population density was similar both in the absence and presence of Vydate CLV for Stoneville 5458B2RF.

Conclusions

These data indicate that substantial differences can be obtained in terms of net value/acre due to variety and technology selection. However, no differences were obtained in terms of net value/acre due to the use of Vydate C-LV. It should be noted that no inclement weather was encountered at this location prior to harvest and therefore, no pre-harvest losses were observed. Additional multi-site and multi-year applied research is needed to evaluate varieties, technology, and use of Vydate C-LV across a series of environments.

Acknowledgements

Appreciation is expressed to Roy Johnson for the use of his land, equipment and labor for this demonstration. Furthermore, we greatly appreciate the Texas Department of Agriculture - Food and Fiber Research for funding of HVI testing.

Disclaimer Clause:

Trade names of commercial products used in this report are included only for better understanding and clarity. Reference to commercial products or trade names is made with the understanding that no discrimination is intended and no endorsement by the Texas A&M System is implied. Readers should realize that results from one experiment do not represent conclusive evidence that the same response would occur where conditions vary.

Table 1. Harvest results from the cotton variety trial under low root-knot nematode pressure, Roy Johnson Farm, Seminole, TX, 2010.

Entry	Lint turnout	Seed turnout	Bur cotton yield	Lint yield	Seed yield	Lint loan value	Lint value	Seed value	Total value	Ginning cost	Seed/technology cost	Vydate cost	Net value
	----- % -----		----- lb/acre -----			\$/lb					----- \$/acre -----		
PhytoGen 375WRF (Vydate)	36.4	48.0	3232	1175	1551	0.5617	660.23	135.73	795.96	96.97	69.78	9.83	619.38 a
PhytoGen 367WRF (Vydate)	32.7	48.2	3523	1152	1699	0.5567	641.27	148.70	789.97	105.69	69.78	9.83	604.68 ab
Stoneville 4288B2F (Vydate)	31.8	51.8	3579	1138	1854	0.5522	628.37	162.26	790.62	107.36	71.12	9.83	602.31 abc
Stoneville 5458B2RF (No Vydate)	32.6	49.8	3450	1124	1718	0.5455	613.01	150.33	763.34	103.51	71.12	0.00	588.70 abc
PhytoGen 375WRF (No Vydate)	34.5	47.9	3157	1090	1512	0.5612	611.59	132.33	743.92	94.72	69.78	0.00	579.43 abc
Stoneville 5458B2RF (Vydate)	33.4	49.5	3350	1117	1658	0.5442	608.04	145.06	753.10	100.50	71.12	9.83	571.65 abcd
Dyna-Gro 2570B2RF (Vydate)	33.7	51.2	3213	1082	1644	0.5577	603.30	143.87	747.17	96.38	69.56	9.83	571.40 abcd
NexGen 3348B2RF (Vydate)	31.3	51.6	3440	1077	1775	0.5450	586.81	155.31	742.12	103.19	63.59	9.83	565.50 bcd
Deltapine 174RF (Vydate)	35.6	46.9	2955	1051	1385	0.5610	589.49	121.23	710.72	88.66	61.60	9.83	550.63 cde
Deltapine 0935B2RF (Vydate)	35.4	49.5	2924	1036	1448	0.5408	560.41	126.67	687.09	87.73	71.22	9.83	518.31 def
Deltapine 1044B2RF (Vydate)	31.5	51.1	3099	976	1584	0.5515	538.50	138.56	677.06	92.98	70.00	9.83	504.26 ef
NexGen 4010B2RF (Vydate)	29.7	51.4	2962	879	1521	0.5705	501.41	133.13	634.54	88.87	63.59	9.83	472.24 f
Test average	33.2	49.7	3240	1075	1613	0.5540	595.20	141.10	736.30	97.21	68.52	8.19	562.37
CV, %	4.6	1.6	4.8	5.0	4.8	2.4	5.0	4.8	4.9	4.8	--	--	5.6
OSL	0.0005	<0.0001	0.0001	<0.0001	<0.0001	0.2492	<0.0001	<0.0001	0.0003	0.0001	--	--	0.0002
LSD	2.6	1.4	266	90	130	NS	50.24	11.38	61.56	7.97	--	--	53.61

For net value/acre, means within a column with the same letter are not significantly different at the 0.05 probability level.

CV - coefficient of variation.

OSL - observed significance level, or probability of a greater F value.

LSD - least significant difference at the 0.05 level, NS - not significant

Note: some columns may not add up due to rounding error.

Assumes:

\$3.00/cwt ginning cost.

\$175/ton for seed.

Value for lint based on CCC loan value from grab samples and FBRI HVI results.

Table 2. HVI fiber property results from the cotton variety trial under low root-knot nematode pressure, Roy Johnson Farm, Seminole, TX, 2010.

Entry	Micronaire	Staple	Uniformity	Strength	Elongation	Leaf	Rd	+b	Color grade	
	units	32 ^{nds} inches	%	g/tex	%	grade	reflectance	yellowness	color 1	color 2
Deltapine 0935B2RF (Vydate)	4.7	34.0	80.5	27.7	7.0	1.0	83.4	7.8	1.3	1.0
Deltapine 1044B2RF (Vydate)	4.5	34.6	81.1	28.6	8.4	2.0	83.1	7.5	1.7	1.0
Deltapine 174RF (Vydate)	4.5	35.7	80.8	26.8	7.0	2.7	81.3	7.8	2.0	1.0
Dyna-Gro 2570B2RF (Vydate)	4.1	35.3	80.4	28.1	8.1	2.0	82.7	7.8	2.0	1.0
NexGen 3348B2RF (Vydate)	3.6	35.7	81.4	29.8	6.6	3.7	81.4	7.5	2.0	1.0
NexGen 4010B2RF (Vydate)	4.1	36.6	81.9	30.8	6.8	2.0	82.2	7.9	2.0	1.0
PhytoGen 367WRF (Vydate)	4.0	35.7	80.7	29.0	7.5	3.3	82.0	7.9	2.0	1.0
PhytoGen 375WRF (Vydate)	4.2	35.6	80.5	27.6	6.7	2.7	82.6	7.3	2.0	1.0
PhytoGen 375WRF (No Vydate)	4.3	35.1	81.6	27.7	6.8	2.3	82.9	7.4	1.7	1.0
Stoneville 4288B2F (Vydate)	4.7	35.1	80.1	26.5	7.5	3.0	82.2	7.8	2.0	1.0
Stoneville 5458B2RF (Vydate)	4.7	34.6	80.1	28.7	6.7	2.7	81.4	8.0	2.0	1.0
Stoneville 5458B2RF (No Vydate)	4.4	34.5	79.1	27.9	7.1	2.7	80.9	8.1	2.0	1.0
Test average	4.3	35.2	80.7	28.3	7.2	2.5	82.2	7.7	1.9	1.0
CV, %	7.3	1.5	1.0	2.4	5.1	27.9	0.6	2.5	--	--
OSL	0.0087	0.0005	0.0241	<0.0001	<0.0001	0.0122	<0.0001	0.0005	--	--
LSD	0.5	0.9	1.4	1.2	0.6	1.2	0.8	0.3	--	--

CV - coefficient of variation.

OSL - observed significance level, or probability of a greater F value.

LSD - least significant difference at the 0.05 level.

Table 3. Root galling and population density of root-knot nematode for ten varieties when Vydate CLV was applied

Entry	Galls/ root	No. of root-knot nematode per 500 cm³ soil
Dyna-Gro 2570B2RF	19.3	267
Deltapine 1044B2RF	15	347
Deltapine 174RF	19	560
Deltapine 0935B2RF	11.3	2193
NexGen 3348B2RF	13.7	667
NexGen 4010B2RF	9	1245
PhytoGen 367WRF	11	525
PhytoGen 375WRF	16	284
Stoneville 4288B2F	12	0
Stoneville 5458B2RF	6	260

Table 4. Effect of Vydate CLV and variety on population density of root-knot nematode

Entry	Vydate CLV oz/acre	No. of root-knot nematode per 500 cm³ soil
PhytoGen 375WRF	0	1453 a
Stoneville 5458B2RF	0	640 b
PhytoGen 375WRF	17	347 b
Stoneville 5458B2RF	17	260 b



**Replicated LESA Irrigated Cotton Variety Demonstration
Under Low to Moderate Root-knot Nematode Pressure without Temik
Cooperator: Roy Johnson
Manda Anderson, Extension Agent - IPM
Dr. Jason Woodward, Extension Plant Pathologist**

Summary Significant differences were observed for most of the yield, economic, and HVI fiber quality parameters measured. Bur cotton yields averaged 2900lb/acre with a high of 3151 lb/acre for Stoneville 5458B2F and a low of 2467 lb/acre for FiberMax 9180B2RF. After multiplying lint yield and lint loan value, gross return value/acre for varieties ranged from a low of \$421.19 for FiberMax 9180B2RF to a high of \$557.85 for Stoneville 5458B2F. Net return ranged from a high of \$614.23 for Stoneville 5458B2F to a low of \$455.24 for FiberMax 9180B2RF. These data indicate that substantial differences can be obtained in terms of net value/acre due to variety and technology selection under root-knot nematode pressure when Temik 15G is not applied in-furrow at planting.

Objective The objective of this project was to compare agronomic characteristics, yields, gin turnout, fiber quality, and economic returns of transgenic cotton variety under root-knot nematode pressure when Temik 15G is not applied in-furrow at planting.

Materials and Methods

Varieties: Deltapine 174RF, Dyna-Gro 2570B2RF, FiberMax 9180B2RF, PhytoGen 367WRF, Stoneville 4288B2F, Stoneville 5458B2RF

Experimental design: Randomized complete block with 3 replications

Seeding rate: 3.5 seeds/row-ft in 36-inch row spacing

Plot size: Variable length of field (1866ft to 2400ft long) by 8 rows

Planting date: 21-May

Soil Texture: 78% sand, 7% silt, and 15% clay

Soil pH: 8.0

Harvest:	Plots were harvested on 18-November using a commercial stripper harvester. Harvest material was transferred into a weigh wagon with integral electronic scales to determine individual plot weights. Plot yields were adjusted to lb/acre.
Gin Turnout:	Grab samples were taken by plot and ginned at the Texas AgriLife Research and Extension Center at Lubbock to determine gin turnouts.
Fiber Analysis:	Lint samples were submitted to the Fiber and Biopolymer Research Institute at Texas Tech University for HVI analysis, and USDA Commodity Credit Corporation (CCC) Loan values were determined for each variety by plot.
Ginning cost and seed values:	Ginning cost were based on \$3.00 per cwt. of bur cotton and seed value/acre was based on \$175/ton. Ginning costs did not include checkoff.
Seed and technology fees:	Seed and technology costs were calculated using the appropriate seeding rate (3.5 seed/row-ft) for the 36 row spacing and entries using the online Plains Cotton Growers Seed Cost Comparison Worksheet available at: http://www.plainscotton.org/Seed/PCGseed10.xls

Results and Discussion

Significant differences were observed for most of the yield, economic, and HVI fiber quality parameters measured (Tables 1 and 2). Lint turnout ranged from a low of 30.0% to a high of 34.9% for FiberMax 9180B2RF and DynaGro 2570B2RF, respectively. Seed turnout ranged from a high of 48.8% for Stoneville 4288B2F to a low of 45.1% for Phytogen 367WRF. Bur cotton yields averaged 2900lb/acre with a high of 3151 lb/acre for Stoneville 5458B2F and a low of 2467 lb/acre for FiberMax 9180B2RF. Lint yield varied with a low of 740 lb/acre (FiberMax 9180B2RF) and a high of 1012 lb/acre (Stoneville 5458B2F). After multiplying lint yield and lint loan value, gross return value/acre for varieties ranged from a low of \$421.19 for FiberMax 9180B2RF to a high of \$557.85 for Stoneville 5458B2F. Seed value ranged from a high of \$130.26 for Stoneville 4288B2F to a low of \$105.17 for FiberMax 9180B2RF. Net returns ranged from a high of \$614.23 for Stoneville 5458B2F to a low of \$455.24 for FiberMax 9180B2RF.

Micronaire values ranged from a 4.27 to 4.77 for Phytogen 367WRF and Stoneville 4288B2RF, respectively. Length was lowest for Deltapine 174RF (1.07 in) and greatest for DynaGro 2570B2RF and Phytogen 367WRF (1.11 in). Percent uniformity ranged from a high of 81.8% for FiberMax 9180B2RF to a low

of 80.3% for Deltapine 174RF. Strength values ranged from a low of 28.1 g/tex for Stoneville 4288B2RF and a high of 30.2 g/tex for FiberMax 9180B2RF. Elongation ranged from a high of 8.0% for DynaGro 2570B2RF to a low of 6.3% for FiberMax 9180B2RF. Values for reflectance (Rd) and yellowness (+b) averaged 82.1 and 8.4, respectively.

Conclusions

These data indicate that substantial differences can be obtained in terms of net value/acre due to variety and technology selection under low to moderate root-knot nematode pressure when Temik 15G is not applied in-furrow at planting. Additional research evaluating varieties, technology, and use of nematicides such as Vydate C-LV are needed.

Acknowledgements

Appreciation is expressed to Roy Johnson for the use of his land, equipment and labor for this demonstration. Furthermore, we greatly appreciate the Texas Department of Agriculture - Food and Fiber Research for funding of HVI testing.

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Table 1. Harvest results from the cotton variety trial, Roy Johnsons Farm, Seminole, TX, 2010.

Entry	Lint turnout	Seed turnout	Bur cotton yield	Lint yield	Lint loan value	Gross return	Seed value	Technology cost	Net return
	----- % -----		----- lb/acre -----		\$/lb		----- \$/acre -----		
ST 5458B2F	32.1 bc	46.3 bc	3150.7 a	1011.5 a	0.5520 bc	557.85 a	127.50 ab	71.12	614.23 a
DG 2570B2RF	34.9 a	48.5 ab	2826.1 b	985.1 a	0.5658 ab	557.36 a	119.87 c	69.59	607.67 a
PG 367WRF	30.9 cd	45.1 c	3085.0 a	955.2 a	0.5673 a	542.04 a	121.81 bc	69.78	594.08 a
ST 4288B2F	30.4 cd	48.8 a	3053.5 a†	928.1 a	0.5600 ab	519.72 a	130.26 a	71.12	578.86 a
DP 174RF	34.2 ab	45.5 c	2822.9 b	961.7 a	0.5430 c	522.66 a	112.10 d	61.60	573.08 a
FM 9180B2F	30.0 d	48.7 a	2467.1 c	740.0 b	0.5690 a	421.19 b	105.17 d	71.12	455.24 b
CV	3.6	2.6	3.5	5.0	1.4	4.2	3.5	---	4.3
LSD	0.02	2.2	184.8	84.1	0.0139	39.3	7.5	---	44.6
p-value	0.0024	0.0173	<0.0001	0.0005	0.0155	0.0001	<0.0001	---	0.0001

† Means within a column followed by the same letter are not significantly different according to Fisher's Protected LSD.

‡ Assumptions include ginning costs of \$3.00/cwt and seed value of \$175/ton.

Table 2. HVI fiber property results from the cotton variety trial, Roy Johnson Farm, Seminole, TX, 2010.

Entry	Micronaire	Length	Uniformity	Strength	Elongation	Rd	+b
	units	inches	%	g/tex	%	reflectance	yellowness
DG 2570B2RF	4.53 b	1.11 ab	82	29.4 b	8.00 a	82.3 b	8.6 b
DP 174RF	4.50 b	1.07 c	80.3	27.1 d	7.30 b	81.4 c	8.5 b
FM 9180B2F	4.30 c	1.12 a	81.8	30.2 a	6.30 c	84.2 a	7.6 c
PG 367WRF	4.27 c	1.11 ab	81.4	28.8 b	7.47 b	82.1 b	8.4 b
ST 4288B2F	4.77 a	1.09 bc	80.8	28.1 c	7.20 b	82.0 b	8.5 b
ST 5458B2F	4.63 ab	1.09 bc	80.5	29.2 b	7.00 b	80.7 d	8.9 a
CV	2.3	1.1	1.0	1.2	4.0	0.3	1.9
LSD	0.19	0.02	NS	0.7	0.5	0.5	0.29
p-value	0.0021	0.0101		<0.0001	0.0	<0.0001	<0.0001

† Means within a column followed by the same letter are not significantly different according to Fisher's Protected LSD.



Evaluation of Variety Tolerance and Chemical Management of Root-knot Nematodes

Texas AgriLife Extension Service

Gaines County

Cooperator: Raymond McPherson

Manda Anderson, Extension Agent - IPM

Dr. Terry Wheeler, Research Plant Pathologist

Dr. Jason Woodward, Extension Plant Pathologist

Summary The southern root-knot nematode, *Meloidogyne incognita*, is an economically important parasite of cotton in Gaines County, Texas. The objectives of this research were to evaluate the performance of Stoneville (ST) 5458B2RF and Fibermax (FM) 9180 B2F planted in conjunction with AERIS, Temik 15G at 5.5 lbs/ac, Temik 15G at 7.5lbs/ac, or Temik 15G at 5.5lbs/ac plus a foliar application of Vydate C-LV at the third grown square. Adult and immature thrips whole plant counts, *M. incognita* gall counts, and nematode counts per 500cm³ soil provided further information on the impact of root-knot nematodes. Plots were machine harvested and yield, gin turnout, fiber quality, and economics of treatments were determined. Root galls caused by *M. incognita*, were decreased with the use of 5.5 lbs and 7.5 lbs per acre of Temik 15G (22 and 27 galls/root system), but not by AERIS (40 galls/root) or the untreated check (36 galls/plant). Root-knot nematode population density was affected by variety FM 9180B2F had 3083 and ST 5458B2RF had 1176/500 cm³ soil), but was not affected by chemical treatments. Net value was \$219/acre higher when ST 5458B2RF was planted rather than FM 9180B2F, and was not affected by chemical treatments. Based on these results, planting tolerant varieties was the most economical and effective method in the management of root-knot nematodes.

Objective The southern root-knot nematode, *Meloidogyne incognita*, is an economically important parasite of cotton in Gaines County, Texas. Higher populations of this pest tend to occur in sandier fields that have had consecutive cotton crops and very little rotation to a non-host, such as peanuts (Kirkpatrick, 2001). Management decisions are dependent on the level of nematode infestation and the estimated nematode-induced yield loss (Kirkpatrick, 2001). Planting partially resistant varieties is one of the most effective tools in managing this pest (Zhou et al., 2003). Temik 15G applied in-furrow at planting followed by a foliar application of Vydate C-LV has increased cotton lint yields (Siders, 2008). Seed treatments are another option for the management of nematodes. Therefore, cotton production may be optimized by planting partially resistant cotton varieties in conjunction with the use of seed treatments or Temik 15G. The objectives of this study were to evaluate the impact of two cotton varieties planted in conjunction with chemical treatments on southern root-knot nematode populations, and to compare net returns between varieties, chemicals, and their interaction.

Materials and Methods The on-farm trial was conducted in Gaines County, TX in 2010 in a field with the 6 year crop history of cotton followed by peanuts, followed by four years of cotton. The field's soil was 93% sand, 3% silt, and 4% clay. The trial was planted on 4 May. Plots had 40-inch row spacing

and were center-pivot irrigated. Plots were 8-rows wide by 400 ft. in length and were arranged in a randomized complete block design with 3 replications. See *Table 1* for a complete list of treatments. The number of adult and immature thrips were counted by visually inspecting 10 whole plants per plot on 3 June and 9 June. The number of galls caused by *M. incognita* were counted by visually inspecting 10 plant roots per plot on 9 June. Soil samples were taken on 6 August and assayed for *M. incognita*. The trial was harvested on 11 October. All plots were weighed separately using a Lee weigh wagon. Burr cotton grab samples were taken from each plot. All grab samples were weighed and ginned using a sample gin with a lint cleaner, burr extractor and stick machine. Ginned lint was weighed and lint and seed turnouts were calculated. Lint and seed yields were determined by multiplying the respective turnout by field plot weights. Lint samples were collected for fiber quality analysis. Fiber analysis was conducted by the Texas Tech University Fiber & Biopolymer Research Institute, and CCC lint loan values were determined for each plot. Total value was calculated by multiplying lint loan value by lint yield. Net value was determined by subtracting chemical cost from the total value. Statistical analysis of data was conducted using the MIXED procedure in SAS version 9.1 (SAS Institute, Cary, NC) with the Satterthwaite option for determining degrees of freedom, and the PDIFF option for comparing treatment mean estimates.

Table 1. Treatments

ST 5458B2RF ¹ Untreated
ST 5458B2RF ¹ & Aeris seed treatment (insecticide & nematicide)
ST 5458B2RF ¹ & 5.5 lbs/acre of Temik 15G ²
ST 5458B2RF ¹ & 7.5 lbs/acre of Temik 15G ²
ST 5458B2RF ¹ & 5.5 lbs/acre of Temik 15G ² & Vydate C-LV ³
FM 9180B2F ¹ Untreated
FM 9180B2F ¹ & Aeris seed treatment (insecticide & nematicide)
FM 9180B2F ¹ & 5.5 lbs/acre of Temik 15G ²
FM 9180B2F ¹ & 7.5 lbs/acre of Temik 15G ²
FM 9180B2F ¹ & 5.5 lbs/acre of Temik 15G ² & Vydate C-LV ³

¹ Trilex Advance (fungicide) seed treatment was applied to all seed

² Temik 15G was applied in-furrow at planting. Temik boxes were calibrated prior to planting

³ Vydate C-LV was applied in a band at a rate of 17 oz per acre on 4 June

Results and Discussion

Root galls caused by *M. incognita*, were decreased with the use of 5.5 lbs and 7.5 lbs per acre of Temik 15G, but not by Aeris as compared with the untreated check (*Table 3*). Variety did not affect gall number (*Table 2*). Root-knot nematode population density was affected by variety (*Table 2*), but was not affected by chemical treatments (*Table 3*). Thrips was not a limiting factor since treatments never reached the thrips threshold of 1 per true leaf (*Table 3*).

Table 2. Average number of root galls caused by *Meloidogyne incognita* on 9 June and average number of *M. incognita* per 500 cm³ soil on 6 August by variety

Variety	Average No. of Galls	Average No. of root-knot nematodes
FM 9180B2F	32.4	3083
ST 5458B2RF	27.4	1176
	<i>P</i> = 0.146	<i>P</i> = 0.0081

Table 3. Average number of root galls caused by *Meloidogyne incognita* on 9 June, average number of *M. incognita* per 500 cm³ soil on 6 August by chemical, Average number of Thrips by date and chemical

Variety	Average No. of Galls	Average No. of root-knot nematodes	Average No. of Thrips 3 June (4 True Leaves)	Average No. of Thrips 9 June (5-6 True Leaves)
Untreated	35.9 ab	2527	0.30 ab	0.07 ab
Aeris	40.2 a	2444	0.07 b	0.00 b
5.5 lbs of Temik 15G	21.7 c	2610	0.64 a	0.12 a
5.5 lbs of Temik 15G + 17 oz Vydate C-LV	26.7 bc	1337	0.60 a	0.13 a
7.5 lbs of Temik 15G	24.8 c	1730	0.37 ab	0.07 ab
	<i>P</i> = 0.0097	<i>P</i> = 0.6264	<i>P</i> = 0.0538	<i>P</i> = 0.6053

Means within the same column with the same letter are not significantly different

Yield was primarily affected by variety, with ST5458B2RF greatly out yielding FM 9180B2F (Table 4). Yield was affected to a smaller degree by chemical treatments that included Temik 15G (Table 5). Net value was \$219/acre higher when ST 5458B2RF was planted rather than FM 9180B2F (Table 4), and was not affected by chemical treatments (Table 5). There was no significant interaction between variety and chemical, indicating that the response was consistent with both varieties.

Table 4. Harvest results by variety

Variety	Lint turnout	Seed turnout	Lint yield	Seed yield	Total value	Net Value
	-----%-----		-----lb/acre-----		-----\$/acre-----	
FM 9180B2F	32.6	52.03	648	1033	365	270
ST 5458B2RF	34.2	48.6	1069	1518	585	489
	<i>P</i> = 0.0097	<i>P</i> = 0.0001	<i>P</i> = 0.0001	<i>P</i> = 0.0001	<i>P</i> = 0.0001	<i>P</i> = 0.0001

Table 5. Harvest results by chemical

Variety	Lint turnout	Seed turnout	Lint yield	Seed yield	Total value	Net Value
	-----%-----		-----lb/acre-----		-----\$/acre-----	
Untreated	34.0	50.6	783 b	1162 b	434 b	355
Aeris	32.7	50.5	824 ab	1226 ab	457 ab	369
5.5 lbs of Temik 15G	33.0	50.3	882 a	1311 a	489 a	390
5.5 lbs of Temik 15G + 17 oz Vydate C-LV	33.2	50.2	904 a	1344 a	501 a	393
7.5 lbs of Temik 15G	34.5	50.0	898 a	1335 a	497 a	392
	<i>P</i> = 0.43	<i>P</i> = 0.89	<i>P</i> = 0.04	<i>P</i> = 0.055	<i>P</i> = 0.04	<i>P</i> = 0.41

Means within the same column with the same letter are not significantly different

Conclusions

Meloidogyne incognita is one factor that can significantly impact variety performance. Based on this trial, planting tolerant varieties is the most economical and effective method in the management of nematodes. Chemical management also showed some increased control of nematodes. However, there was no additional value over the untreated plots when chemical costs were subtracted from the total value per acre.

Acknowledgements

Special thanks to Raymond McPherson for planting and harvesting this trial. Bayer CropScience funded this project.

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**Replicated LESA Irrigated Cotton Variety Demonstration
Under Verticillium Wilt Pressure
Texas AgriLife Extension Service
Gaines County
Cooperator: Froese Farms
Manda Anderson, Extension Agent - IPM
Dr. Mark Kelley, Extension Program Specialists II - Cotton
Dr. Randy Boman, Extension Agronomist - Cotton**

Summary Significant differences were observed for some yield, economic, and HVI fiber quality parameters measured (Tables 1 and 2). Lint turnout ranged from a low of 30.8% to a high of 38% for NexGen 3348B2RF and PhytoGen 375WRF, respectively. Seed turnout ranged from a high of 52.2% for NexGen 4010B2RF to a low of 46.1% for Deltapine 1032B2RF. Seed yield ranged from a high of 1973 for Stoneville 4288B2F to a low of 1523 for Deltapine 09619B2RF. Lint loan values ranged from a low of \$0.5408/lb (All-Tex 65207B2RF) to a high of \$0.5718/lb (NexGen 4010B2RF). Net value did not significantly differ among varieties. These data indicate that substantial differences were not obtained in terms of net value/acre due to variety and technology selection.

Objective The objective of this project was to compare agronomic characteristics, yields, gin turnout, fiber quality, and economic returns of transgenic cotton variety under Verticillium wilt pressure in Gaines County.

Materials and Methods

Varieties: All-Tex 65207B2RF, Deltapine 09619B2RF, Deltapine 1032B2RF, Deltapine 1034B2RF, Deltapine 1044B2RF, Deltapine 174RF, FFiberMax 9170B2F, NexGen 3348B2RF, NexGen 4010B2RF, PhytoGen 367WRF, PhytoGen 375WRF, Stoneville 4288B2F

Experimental design: Randomized complete block with 3 replications

Seeding rate: 3.5 seeds/row-ft in 36-inch row spacing

Plot size: 8 rows by variable length of field (465ft to 722ft long)

Planting date: 7-May

Soil Texture: 86% sand, 1% silt, and 13% clay

Soil pH: 7.9

Irrigation: This location was under a LESA center pivot. This trial received approximately 24.07 inches of irrigation and rainfall from 7-May to 19-October.

Date	Inches of Irrigation/Rainfall
7-May to 10-June	4.56
11-June to 15-July	10.68
16-July to 27-August	3.53
28-August to 19-October	5.3

Insecticides/
Nematicides: Temik 15G was applied infurrow at planting at a rate of 3 lb/acre.

Harvest: Plots were harvested on 19-October using a commercial picker harvester. Harvest material was transferred into a weigh wagon with integral electronic scales to determine individual plot weights. Plot yields were adjusted to lb/acre.

Gin Turnout: Grab samples were taken by plot and ginned at the Texas AgriLife Research and Extension Center at Lubbock to determine gin turnouts.

Fiber Analysis: Lint samples were submitted to the Fiber and Biopolymer Research Institute at Texas Tech University for HVI analysis, and USDA Commodity Credit Corporation (CCC) Loan values were determined for each variety by plot.

Ginning cost and
seed values: Ginning costs were based on \$3.00 per cwt. of bur cotton and seed value/acre was based on \$175/ton. Ginning costs did not include checkoff.

Seed and
technology fees: Seed and technology costs were calculated using the appropriate seeding rate (3.5 seed/row-ft) for the 36 row spacing and entries using the online Plains Cotton Growers Seed Cost Comparison Worksheet available at: <http://www.plainscotton.org/Seed/PCGseed10.xls>

Results and Discussion

Significant differences were observed for some yield, economic, and HVI fiber quality parameters measured (Tables 1 and 2). Lint turnout ranged from a low of 30.8% to a high of 38% for NexGen 3348B2RF and PhytoGen 375WRF, respectively. Seed turnout ranged from a high of 52.2% for NexGen 4010B2RF to a low of 46.1% for Deltapine 1032B2RF.

Seed yield ranged from a high of 1973 for Stoneville 4288B2F to a low of 1523 for Deltapine 09619B2RF. Lint loan values ranged from a low of \$0.5408/lb (All-Tex 65207B2RF) to a high of \$0.5718/lb (NexGen 4010B2RF). Net value did not significantly differ amount varieties.

Micronaire values ranged from a low of 3.6 for NexGen 3348B2RF to a high of 4.6 for Stoneville 4288B2F. Staple averaged 35.2 across all varieties with a low of 33.8 for All-Tex 65207B2RF and a high of 36.4 for NexGen 4010B2RF. Strength values averaged 28.2 g/tex with a high of 29.9 g/tex for NexGen 4010B2RF and a low of 26.9 g/tex for Deltapine 174RF. Elongation ranged from a high of 8.8% for Deltapine 1044B2RF to a low of 6.4% for FiberMax 9170B2F. Leaf grades ranged from 1 to 3, with a test average of 2.4. Values for reflectance (Rd) and yellowness (+b) averaged 82.4 and 8.1, respectively.

Conclusions

These data indicate that substantial differences were not obtained in terms of net value/acre due to variety and technology selection. Additional multi-site and multi-year applied research is needed to evaluate varieties and technology across a series of environments.

Acknowledgements

Appreciation is expressed to Froese Farms for the use of his land, equipment and labor for this demonstration. Furthermore, we greatly appreciate the Texas Department of Agriculture - Food and Fiber Research for funding of HVI testing.

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Table 1. Harvest results from the cotton variety demonstration under Verticillium wilt Pressure, Froese Farm, Seminole, TX, 2011

Entry	Lint turnout	Seed turnout	Bur cotton yield	Lint yield	Seed yield	Lint loan value	Lint value	Seed value	Total value	Ginning cost	Seed/technology cost	Net value
	----- % -----		----- lb/acre -----			\$/lb				----- \$/acre -----		
PhytoGen 367WRF	34.2	47.8	3797	1299	1813	0.5483	712.12	158.67	870.79	113.90	69.78	687.11
Deltapine 174RF	35.0	47.0	3608	1264	1695	0.5548	701.45	148.34	849.79	108.24	61.60	679.95
Stoneville 4288B2F	31.8	50.8	3883	1236	1973	0.5570	688.50	172.66	861.16	116.49	71.12	673.55
PhytoGen 375WRF	38.0	47.8	3317	1260	1586	0.5577	702.86	138.78	841.64	99.52	69.78	672.35
Deltapine 1044B2RF	32.3	50.6	3801	1228	1923	0.5600	687.90	168.22	856.12	114.03	70.00	672.09
NexGen 4010B2RF	31.7	52.2	3731	1181	1947	0.5718	675.21	170.35	845.57	111.92	63.59	670.06
NexGen 3348B2RF	30.8	50.7	3835	1179	1946	0.5447	642.38	170.31	812.68	115.06	63.59	634.03
Deltapine 1034B2RF	35.8	49.2	3255	1166	1600	0.5665	660.53	140.00	800.53	97.64	71.22	631.67
FiberMax 9170B2F	34.0	49.2	3424	1163	1685	0.5608	652.37	147.44	799.81	102.73	71.12	625.96
Deltapine 1032B2RF	34.5	46.1	3373	1164	1554	0.5660	658.76	136.00	794.75	101.19	72.24	621.33
Deltapine 09619B2RF	35.7	48.9	3113	1111	1523	0.5593	621.51	133.25	754.76	93.40	71.22	590.14
All-Tex 65207B2RF	33.3	50.5	3269	1088	1651	0.5408	588.66	144.50	733.16	98.08	59.15	575.93
Test average	33.9	49.2	3534	1195	1741	0.5573	666.02	152.38	818.40	106.02	67.87	644.51
CV, %	5.5	1.8	9.7	9.7	9.7	1.2	9.7	9.7	9.7	9.7	--	10.7
OSL	0.0041	<0.0001	0.1001	0.5571	0.0130	0.0004	0.5159	0.0130	0.5560	0.1001	--	0.5980
LSD	3.2	1.5	NS	NS	286	0.0115	NS	25.02	NS	NS	--	NS

For net value/acre, means within a column with the same letter are not significantly different at the 0.05 probability level

CV - coefficient of variation.

OSL - observed significance level, or probability of a greater F value

LSD - least significant difference at the 0.05 level, NS - not significant

Note: some columns may not add up due to rounding error.

Assumes:

\$3.00/cwt ginning cost.

\$175/ton for seed.

Value for lint based on CCC loan value from grab samples and FBRI HVI results.

Table 2. HVI fiber property results from the replicated cotton variety demonstration under Verticillium wilt Pressure, Froese Farm, Seminole, TX, 2010

Entry	Micronaire	Staple	Uniformity	Strength	Elongation	Leaf	Rd	+b	Color grade	
	units	32 ^{nds} inches	%	g/tex	%	grade	reflectance	yellowness	color 1	color 2
All-Tex 65207B2RF	4.2	33.8	80.6	27.6	7.3	2.7	81.4	8.4	1.7	1.0
Deltapine 09619B2RF	4.3	34.8	81.4	27.2	7.6	1.7	83.2	8.2	1.0	1.0
Deltapine 1032B2RF	4.3	35.4	80.9	28.6	7.0	1.3	83.5	7.9	1.0	1.0
Deltapine 1034B2RF	4.2	35.4	80.7	27.4	8.0	1.0	83.4	8.4	1.0	1.0
Deltapine 1044B2RF	4.2	35.0	81.3	28.8	8.8	2.7	82.6	8.1	1.3	1.0
Deltapine 174RF	4.0	35.4	80.6	26.9	7.6	3.3	81.5	8.1	2.0	1.0
FiberMax 9170B2F	4.0	36.2	79.6	29.7	6.4	2.0	84.2	7.5	1.3	1.0
NexGen 3348B2RF	3.6	35.8	82.0	29.2	6.6	4.3	80.9	7.7	2.3	1.0
NexGen 4010B2RF	4.2	36.4	81.7	29.9	7.1	2.0	82.0	8.6	1.0	1.0
PhytoGen 367WRF	4.0	34.9	80.9	28.6	7.3	3.7	81.5	8.3	1.7	1.0
PhytoGen 375WRF	4.1	34.8	80.8	27.0	7.0	1.3	82.9	8.2	1.0	1.0
Stoneville 4288B2F	4.6	34.9	82.2	27.4	7.6	2.3	82.0	8.3	1.7	1.0
Test average	4.1	35.2	81.1	28.2	7.4	2.4	82.4	8.1	1.4	1.0
CV, %	3.6	1.9	1.1	2.4	4.7	34.3	0.5	1.9	--	--
OSL	<0.0001	0.0072	0.1098	<0.0001	<0.0001	0.0009	<0.0001	<0.0001	--	--
LSD	0.3	1.1	NS	1.2	0.6	1.4	0.7	0.3	--	--

CV - coefficient of variation.

OSL - observed significance level, or probability of a greater F value.

LSD - least significant difference at the 0.05 level, NS - not significant



Replicated Cotton Seeding Rate Demonstration
Texas AgriLife Extension Service
Gaines County
Cooperator: Weldon Shook
Manda Anderson, Extension Agent - IPM
Dr. Mark Kelley, Extension Program Specialists II - Cotton
Dr. Randy Boman, Extension Agronomist - Cotton

Summary Significant differences were observed for some yield, economic, and HVI fiber quality parameters measured (Tables 1 and 2). Lint yields ranged from a high of 1250 lb/acre for 3 seed/ft to a low of 1158 lb/acre for 2 seed/ft. Lint loan values ranged from a low of \$0.5507/lb (All-Tex 65207B2RF) to a high of \$0.5738/lb (FiberMax 9170B2F). Seed yield ranged from a high of 1812 lb/acre for 3 seed/ft to a low of 1680 lb/acre for 2 seed/ft. After adding lint and seed value, total value/acre for seed rates ranged from a low of \$796 for 2 seed/ft to a high of \$864 for 2 seed/ft. When subtracting ginning, seed and technology fee costs, the net value/acre among varieties ranged from a high of \$705 (3 seed/ft) to a low of \$660 (3.5 seed/ft), a difference of \$45.31. These data indicate that substantial differences can be obtained in terms of net value/acre due to seeding rate.

Objective The objective of this project was to compare yields, gin turnout, fiber quality, and economic returns of four seeding rates under irrigated production in Gaines County.

Materials and Methods

Varieties: FiberMax 1740B2F

Seeding Rates: 2 seed/row-ft; 2.5 seed/row-ft; 3 seed/row-ft; 3.5 seed/row-ft

Experimental design: Randomized complete block with 3 replications

Seeding rate: 40-inch row spacing

Plot size: 6 rows by variable length of field (465ft to 722ft long)

Planting date: 17-May

Soil Texture: 91% sand and 9% clay

Soil pH: 7.3

Irrigation: This location was under a LESA center pivot. This trial received approximately 18.42 inches of irrigation and rainfall from 17-May to 4-November.

Date	Inches of Irrigation/Rainfall
6-May to 10-June	2.93
11-June to 15-July	6.98
16-July to 27-August	4.21
28-August to 4-November	4.3

Insecticides/
Nematicides: Temik 15G was applied infurrow at planting at a rate of 5 lb/acre.

Harvest: Plots were harvested on 4-November using a commercial picker harvester. Harvest material was transferred into a weigh wagon with integral electronic scales to determine individual plot weights. Plot yields were adjusted to lb/acre.

Gin Turnout: Grab samples were taken by plot and ginned at the Texas AgriLife Research and Extension Center at Lubbock to determine gin turnouts.

Fiber Analysis: Lint samples were submitted to the Fiber and Biopolymer Research Institute at Texas Tech University for HVI analysis, and USDA Commodity Credit Corporation (CCC) Loan values were determined for each variety by plot.

Ginning cost and
seed values: Ginning costs were based on \$3.00 per cwt. of bur cotton and seed value/acre was based on \$175/ton. Ginning costs did not include checkoff.

Seed and
technology fees: Seed and technology costs were calculated using the appropriate seeding rate for the 40 row spacing and entries using the online Plains Cotton Growers Seed Cost Comparison Worksheet available at: <http://www.plainscotton.org/Seed/PCGseed10.xls>

Results and Discussion

Significant differences were observed for some yield, economic, and HVI fiber quality parameters measured (Tables 1 and 2). Lint turnout and Seed turnout averaged 36 and 52.4, respectively. Lint yields ranged from a high of 1250 lb/acre for 3 seed/ft to a low of 1158 lb/acre for 2 seed/ft. Lint loan values ranged from a low of \$0.5507/lb (All-Tex 65207B2RF) to a

high of \$0.5738/lb (FiberMax 9170B2F). Seed yield ranged from a high of 1812 lb/acre for 3 seed/ft to a low of 1680 lb/acre for 2 seed/ft. After adding lint and seed value, total value/acre for seed rates ranged from a low of \$796 for 2 seed/ft to a high of \$864 for 2 seed/ft. When subtracting ginning, seed and technology fee costs, the net value/acre among varieties ranged from a high of \$705 (3 seed/ft) to a low of \$660 (3.5 seed/ft), a difference of \$45.31.

Leaf grades ranged from 1 to 2, with a test average of 1.3. Values for reflectance (Rd) and yellowness (+b) averaged 83.2 and 7.7, respectively.

Conclusions

These data indicate that substantial differences can be obtained in terms of net value/acre due to seeding rate. Additional multi-site and multi-year applied research is needed to evaluate varieties and technology across a series of environments.

Acknowledgements

Appreciation is expressed to Weldon Shook for the use of his land, equipment and labor for this demonstration. Furthermore, we greatly appreciate the Texas Department of Agriculture - Food and Fiber Research for funding of HVI testing.

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Table 1. Harvest results from the cotton seeding rate trial under center pivot irrigation, Weldon Shook Farm, Seminole, TX, 2010.

Entry	Lint turnout	Seed turnout	Bur cotton yield	Lint yield	Seed yield	Lint loan value	Lint value	Seed value	Total value	Ginning cost	Seed/technology cost	Net value
	----- % -----		----- lb/acre -----			\$/lb			----- \$/acre -----			
3 seed/ft	36.2	52.5	3449	1250	1812	0.5642	705.14	158.55	863.69	103.47	54.87	705.35 a
2.5 seed/ft	35.9	52.6	3303	1186	1737	0.5642	669.14	151.98	821.12	99.10	45.72	676.29 b
2 seed/ft	35.6	51.7	3250	1158	1680	0.5608	649.30	147.02	796.33	97.49	36.58	662.26 b
3.5 seed/ft	36.4	53.0	3304	1202	1749	0.5575	670.10	153.06	823.16	99.11	64.01	660.04 b
Test average	36.0	52.4	3326	1199	1745	0.5617	673.42	152.65	826.07	99.79	50.30	675.98
CV, %	2.5	2.0	2.4	2.4	2.4	1.4	2.4	2.4	2.4	2.4	--	2.6
OSL	0.7684	0.5742	0.0929 [†]	0.0392	0.0450	0.7091	0.0284	0.0450	0.0312	0.0930 [†]	--	0.0603 [†]
LSD	NS	NS	127	58	83	NS	32.20	7.31	39.51	3.81	--	27.56

For net value/acre, means within a column with the same letter are not significantly different at the 0.05 probability level

CV - coefficient of variation.

OSL - observed significance level, or probability of a greater F value

LSD - least significant difference at the 0.05 level, [†] indicates significance at the 0.10 level, NS - not significant

Note: some columns may not add up due to rounding error.

Assumes:

\$3.00/cwt ginning cost.

\$175/ton for seed.

Value for lint based on CCC loan value from grab samples and FBRI HVI results.

Table 2. HVI fiber property results from the cotton seeding rate trial under center pivot irrigation, Weldon Shook Farm, Seminole, TX, 2010.

Entry	Micronaire	Staple	Uniformity	Strength	Elongation	Leaf	Rd	+b	Color grade	
	units	32 ^{nds} inches	%	g/tex	%	grade	reflectance	yellowness	color 1	color 2
2 seed/ft	4.5	34.9	80.8	29.3	7.0	2.0	82.8	7.7	2.0	1.0
2.5 seed/ft	4.6	35.3	81.3	29.5	6.9	1.3	83.5	7.8	1.3	1.0
3 seed/ft	4.5	35.4	81.4	29.8	6.6	1.0	83.3	7.7	1.3	1.0
3.5 seed/ft	4.5	35.1	81.1	29.2	7.3	1.0	83.2	7.7	2.0	1.0
Test average	4.5	35.2	81.1	29.5	6.9	1.3	83.2	7.7	1.7	1.0
CV, %	2.5	1.2	0.9	3.8	3.7	21.7	0.3	1.8	--	--
OSL	0.7420	0.5212	0.7409	0.9077	0.0810 [†]	0.0161	0.0483	0.8371	--	--
LSD	NS	NS	NS	NS	0.4	0.6	0.5	NS	--	--

CV - coefficient of variation.

OSL - observed significance level, or probability of a greater F value.

LSD - least significant difference at the 0.05 level, [†]indicates significance at the 0.10 level, NS - not significant



Developing an Action Threshold for Thrips in the Texas High Plains, 2010

Cooperators: Chad Harris, Brad Heffington, Brad Boyd, Casey Kimbral, Tim Black, Robert Boozer, Texas AgriLife Research and Extension Center – Halfway

**David Kerns, Megha Parajulee, Monti Vandiver, Manda Cattaneo, Kerry Siders, Dustin Patman, Tommy Doederlein and Bo Kesey
Extension Entomologist-Cotton, Research Entomologist-Cotton, EA-IPM
EA-IPM Bailey/Parmer Counties, EA-IPM Gaines County, EA-IPM
Hockley/Cochran Counties, EA-IPM Crosby/Floyd Counties, EA-IPM
Dawson/Lynn Counties and Extension Program Specialist-Cotton**

High Plains

Summary:

In the Texas high plains and most of the cotton growing areas of the United States, thrips are a dominating pest during the pre-squaring stage of cotton. The most dominate thrips species affecting irrigated cotton fields in the Texas high plains is the western flower thrips, *Frankliniella occidentalis* (Pergande). In irrigated cotton where thrips populations are historically high (usually areas where there is significant acreage of wheat), many growers opt to utilize preventative insecticide treatments such as in-furrow applications or seed treatments to control thrips. However, where thrips populations are not “guaranteed” to be especially troublesome, preventive treatments may not be necessary and represent an unnecessary expense. In these situations, well timed banded foliar insecticide applications for thrips control may be more profitable. Currently, the treatment threshold for thrips on irrigated cotton in the Texas high plains occurs when the average total thrips per plant equals or exceeds the number of true leaves. This was the fourth year conducting this study. This study was conducted in irrigated cotton across the Texas high plains. Based on the data collected thus far, cotton appears to be most susceptible to thrips at the cotyledon stage and susceptibility decreases as the plant grows. It has been commonly observed that cotton suffers more damage from thrips under cool temperatures. However, cool temperatures do not make the thrips more damaging, rather the plant’s growth is slowed and remains at a more susceptible stage for a longer period of time. Although not certain, the current Texas action

threshold for thrips requires revamping to cotyledon stage = 0.5 thrips per plant, 1 true leaf = 1 thrips per plant, 2 true leaves = 1-1.5 thrips per plant, and 3-4 true leaves = 2 thrips per plant. However, more data is required to confirm these thresholds.

Objective:

To determine at what population density western flower thrips should be subjected to control tactics to prevent yield reduction and significant delayed maturity, to compare two action thresholds for thrips and to determine whether there is a relationship between thrips induced yield reduction and temperature.

Materials and Methods:

This study was conducted on irrigated cotton during 2007-2010 across 19 locations (Table 1). However, not all sites yielded usable data. In 2007-08, plots at all locations were 2-rows wide × 100-ft long, while in 2009-10 all plots were 4-rows wide × 100-ft. Plots were arranged in a RCB design with 4 replicates. The foliar treatment regimes are outlined in (Table 2). These treatments were simply a means of manipulating the thrips populations at different times in an attempt to focus on when thrips feeding is most damaging.

All foliar sprays consisted of Orthene 97 (acephate) applied at 3 oz-product/acre with a CO₂ pressurized hand boom calibrated to deliver 10 gallons/acre. Thrips were counted weekly by counting the number of larvae and adult thrips from 10 plants per plot. Whole plants were removed and inspected in the field. Each plot was harvested in its entirety in 2007, using a stripper with a burr extractor. In 2008-2009, a 1/1000th acre portion was harvested from each plot using an HB hand stripper. Yields were converted to proportion of yield relative to the highest yielding plot for each test site. Data were analyzed using linear regression (Sigma Plot 2008). Total thrips by crops stage and temperature were correlated with yield. Crops stages included cotyledon, 1 true leaf, 2 true leaves, 3 true leaves and 4 true leaves. Only leaves approximately the size of a quarter were counted as true leaves. Temperature was segregated based on minimum daily temperature. Those with minimum daily temperatures of 60° F or less were considered cold and those above that threshold were considered warm. A 10% reduction in yield was considered unacceptable.

Results and Discussion:

Under cool conditions, yield of cotton in Moore County was negatively correlated with thrips at the cotyledon stage (Figure 1, top). At this stage, based on the regression model, approximately 0.5 thrips per plant resulted in a 10% yield reduction. Results were similar for the Gaines County in 2008 (Figure 1, bottom). However, the cotton in Gaines County was approaching the 1 true leaf stage when the thrips were counted.

At the 1 true leaf stage under cool conditions, approximately 1 thrips per plant was correlated with a 10% yield reduction (Figure 2), while approximately 2 thrips per plant were required at the 2 true leaf stage (Figure 3). None of the sites experienced temperatures ≤ 60° F at the 3-4 true leaf stage.

Under warm conditions (minimum daily temperatures > 60° F), the relationship between thrips at the cotyledon stage and yield was negatively correlated, although the R^2 was low (Figure 4). Similar to the data collected under cool conditions, the model suggests that 0.4 thrips per plant resulted in a 10% yield reduction. Also, similar to the relationships observed under cool conditions, at the 1 and 2 true leaf stages, 0.9 and 1.4 thrips per plant respectively to result in a 10% yield reduction, respectively.

After 2 true leaves, under warm conditions, the cotton at all locations was rapidly growing and relationships were difficult to discern. However, in Hale County in 2008 when the cotton was a mixture of 3 and 4 true leaves, a weak but significant relationship between thrips and yield was detected (Figure 5). At this point, 2 thrips per plant appeared to result in a 10% yield reduction.

Based on these correlations, temperature did not appear to affect the number of thrips necessary to cause a 10% reduction in yield, regardless of crop stage. Because of this lack of differences, the data were pooled across temperature and sites in accordance with stage of growth (Figure 6). Although statistically significant, the R^2 values for the pooled data were much lower than desired. This was unavoidable and due to differences in field conditions, varieties, etc. across test sites. However, the pooled data continued to reflect similar trends observed at individual sites with some exception. The number of thrips necessary to result in a 10% yield reduction by crop stage were as follows: cotyledon stage = 0.65 thrips per plant, 1 true leaf stage = 0.7 thrips per plant, 2 true leaf stage = 1 thrips per plant and 3-4 true leaf stage = 2.1 thrips per plant.

It is obvious that thrips are most damaging to cotton during the early stages of growth, particularly cotyledon to 1 true leaf, and that susceptibility declines with plant growth. Additionally, common observation suggests that thrips damage is most severe during periods of cool conditions. However, the impact of cool temperatures does not appear to be an effect on the thrips as much as an impact on the plant. Additionally, cool temperatures do not necessarily make the cotton more susceptible to thrips, but appears to suppress cotton development, thus keeping the plant at a more susceptible stage for a longer period of time.

Based on the data collected thus far, it is obvious that the Texas action threshold for thrips in cotton does need to be altered, but should remain dynamic based on plant growth stage (Table 3).

Acknowledgments:

This project was funded by Cotton Incorporated, Texas State Support, and in part by the Plains Cotton Improvement Program.

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Table 1. Tests sites and reliability of data.

2007		2008		2009		2010	
Bailey	Acceptable	Bailey	Acceptable	Bailey	Hailed out	Bailey	Nematodes
		Crosby	Acceptable	Crosby	Hailed out	Crosby	Acceptable
		Gaines	Acceptable	Gaines	Insufficient thrips	Dawson	Insufficient thrips
		Hale	Acceptable	Hale	Weedy	Lamb	Acceptable
		Hockley	Acceptable	Moore	Herbicide damage	Moore	Acceptable
		Lubbock	Insufficient thrips	Lubbock	Insufficient thrips	Castro	Insufficient irrigation
						Hale	Poor stand

Table 2. Foliar treatment regime timings.

	2007	2008	2009-10
1) Untreated check	X	X	X
2) Automatic treatment on week 1	X	X	X
3) Automatic treatment on weeks 1 and 2 (only week 2 in 2008)	X		X
4) Automatic treatment on weeks 1, 2 and 3	X	X	X
5) Automatic treatment on week 2		X	X
6) Automatic treatment on weeks 2 and 3	X	X	X
7) Treatment based on the Texas AgriLife Extension Threshold ^a	X	X	X
8) Treatment based on the above threshold with 30% larvae	X	X	

^aOne thrips per plant from plant emergence through the first true leaf stage, and one thrips per true leaf thereafter until the cotton has 4 to 5 true leaves

Table 3. Threshold comparison

Threshold	Cotton Stage	No. Thrips per Plant
Old Threshold	Cotyledon – 1 true leaf	1
	2 true leaves	2
	3 true leaves	3
	4 true leaves	4
Possible New Threshold	Cotyledon	0.5
	1 true leaf	1
	2 true leaves	1-1.5
	3-4 true leaves	2

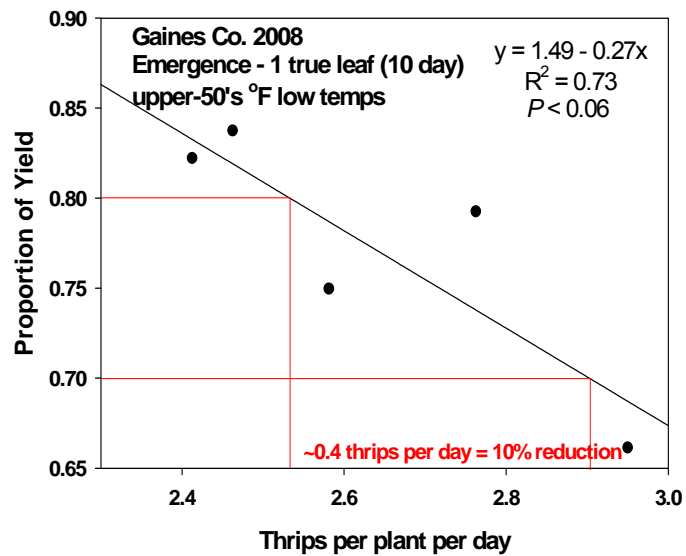
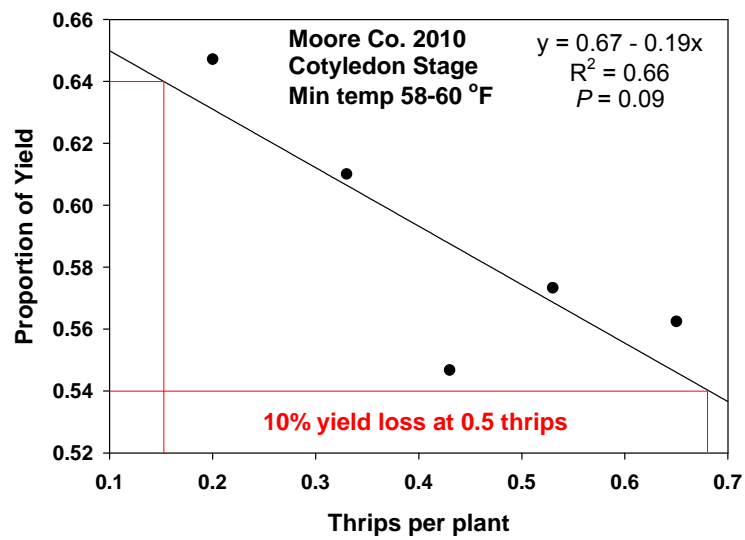


Figure 1. Relationship between thrips per plant and proportion of yield at the cotyledon stage under cool conditions in Moore (top) and Gaines (bottom) counties.

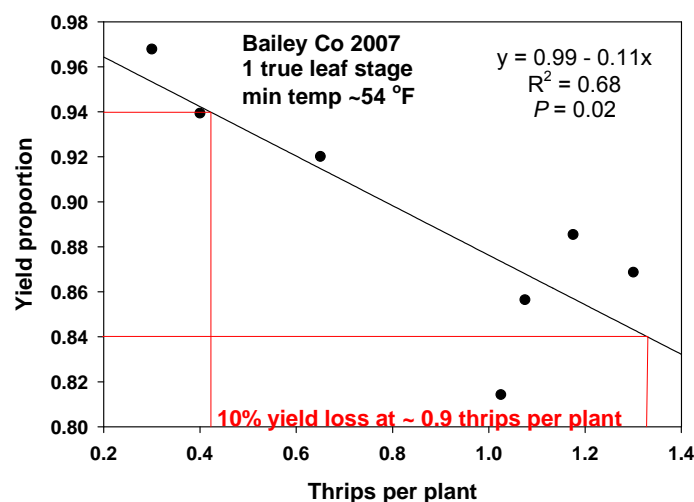


Figure 2. Relationship between thrips per plant and proportion of yield at the 1 true leaf stage under cool conditions in Bailey county.

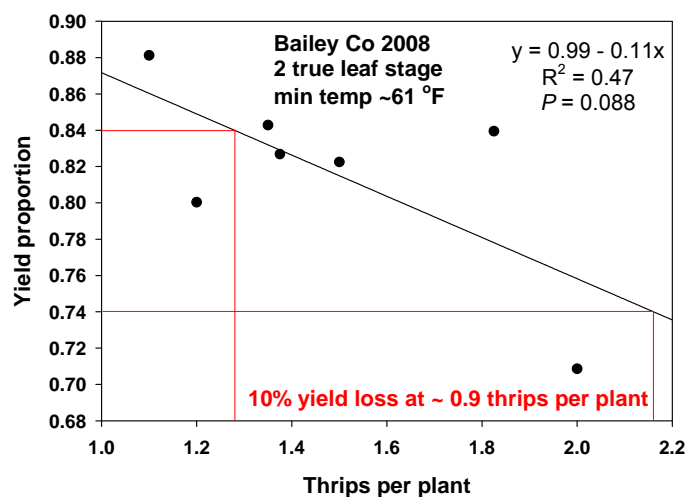
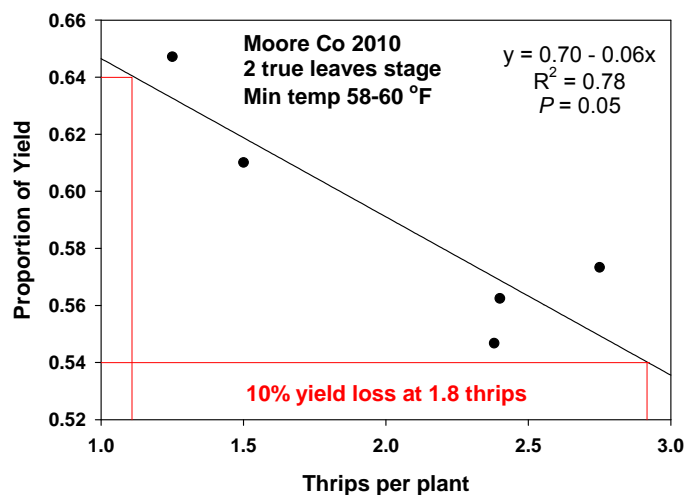


Figure 3. Relationship between thrips per plant and proportion of yield at the 2 true leaf stage under cool conditions in Moore (top) and Bailey (bottom) counties.

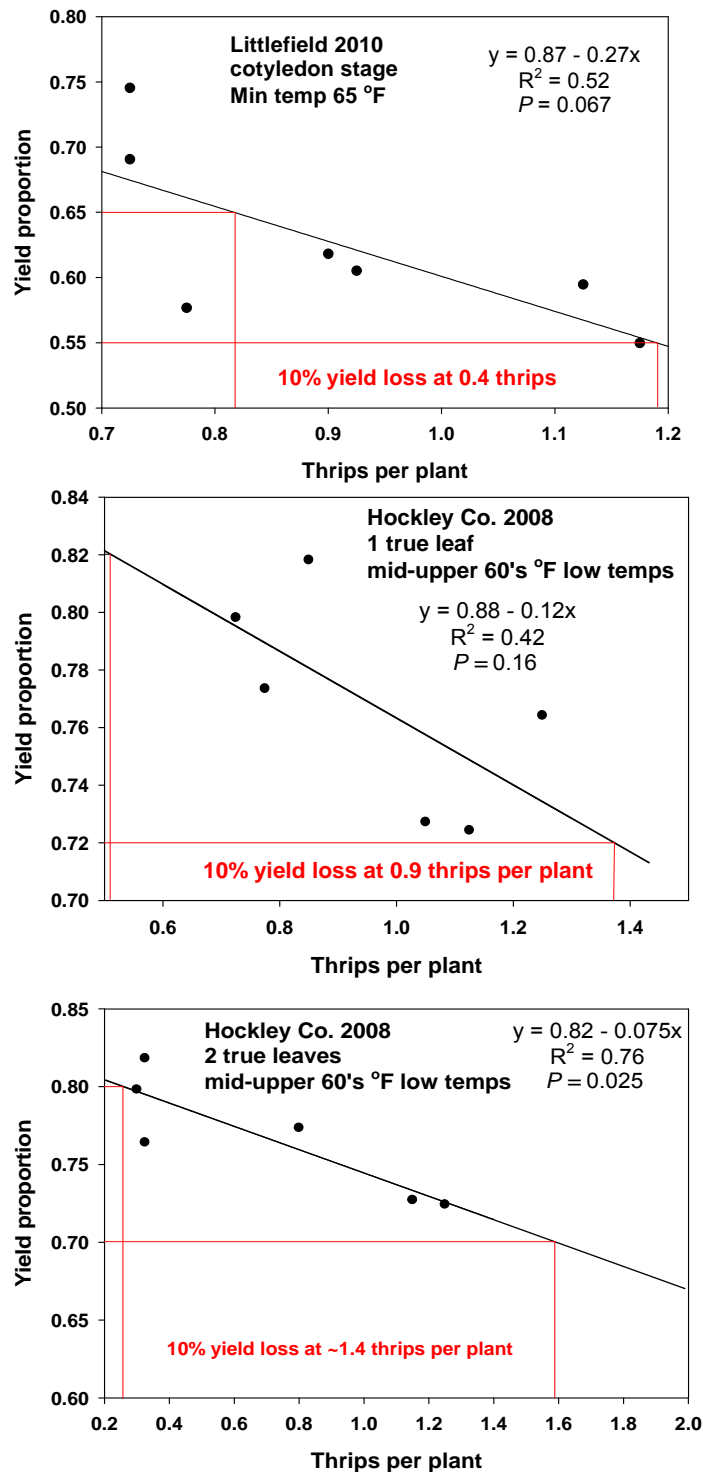


Figure 4. Relationship between thrips per plant and proportion of yield under warm conditions at the 1 true leaf stage (top), 2 true leaf stage (middle) and 3-4 true leaf stage (bottom).

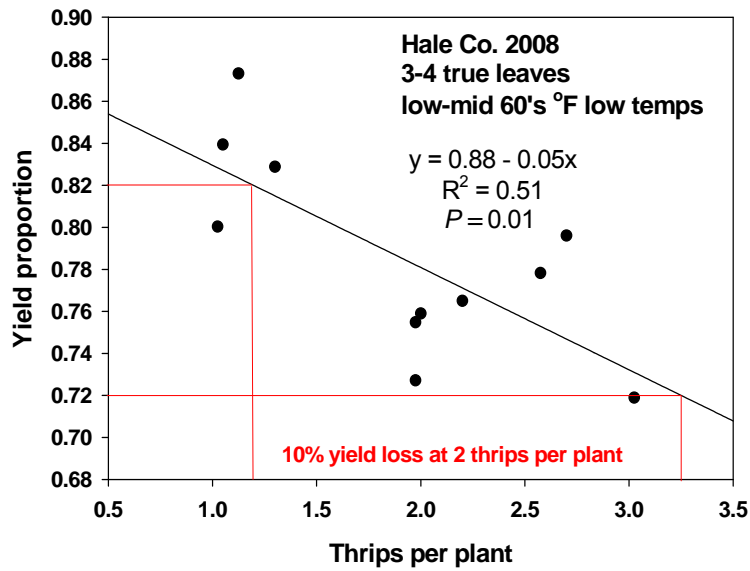


Figure 5. Relationship between thrips per plant and proportion of yield under warm conditions at the 3-4 true leaf stage.

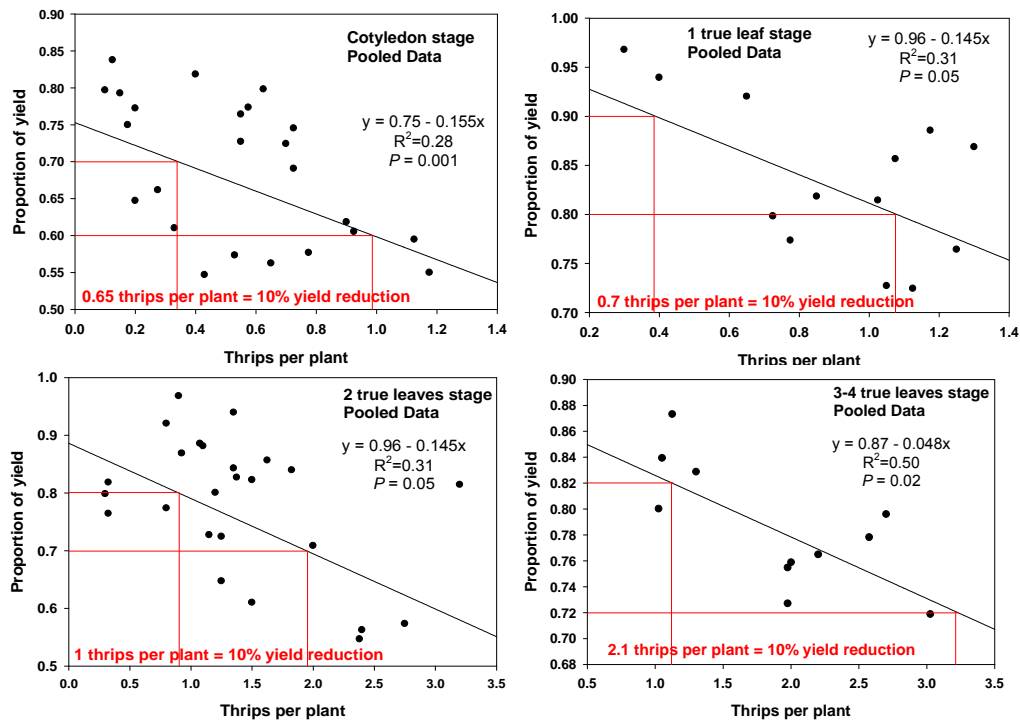


Figure 6. Relationship between thrips per plant and proportion of yield from pooled temperature data (cool and warm) at various stages of crop development.



**Control of Mixed Populations of Bollworm
and Fall Armyworm in non-Bollgard Cotton**
Texas AgriLife Extension Service
Gaines County
Cooperator: Glen Shook
Manda Anderson, Extension Agent - IPM, Gaines County
Brant Baugh, Extension Agent - IPM, Lubbock County
Dustin Patman, Extension Agent - IPM, Crosby and Floyd Counties
Dr. David Kerns, Extension Entomologist

Summary Non-Bt cotton comprises approximately 50% of the cotton acreage planted in the Texas High Plains, and damage caused by bollworms and fall armyworms often results in significant yield loss. When fall armyworms are present, they usually occur concurrently with bollworms. Bollworms are typically controlled using pyrethroid insecticides while fall armyworms are better controlled with alternative chemistries. In this study, several pyrethroids (Karate, Holster and a high and low rate of Mustang Max) were evaluated for their efficacy towards a mixed population of bollworms and fall armyworms. Additionally, an alternative chemistry, Belt, was tested at its low rate and mixed with the low rate of Mustang Max. At 7 DAT, all of the treatments had fewer medium and large bollworms than the untreated with the exception of Belt alone. There were no differences among the other treatments. Generally, Belt is thought to be relatively more efficacious towards fall armyworms than bollworms. As expected, at its lowest labeled rate, Belt did not provide effective bollworm control; especially in growthy cotton where many of the small larvae were feeding under bloom tags. Against fall armyworms, the only treatment that differed from the untreated was the tank mix of Mustang Max + Belt. Pyrethroids are generally considered weak against fall armyworms. Belt is known to have good activity towards fall armyworms. However, Belt at the lower rate (2.0 fl-oz/acre) failed to achieve adequate control. It is not certain if increasing the rate of Belt would alleviate this problem, but much of the difficulty in control may be related to the need for Belt to be consumed to maximize activity. Although Belt is translaminar, larvae moving from fruit to fruit are less likely to encounter toxicant than if it were a contact poison. Although Belt alone appeared to be ineffective, it did not differ in yield from the best performing treatment. Yield was negatively correlated with the total worm population. Based on this regression, approximately 9,000 larvae per acre resulted in a 10% yield reduction. The ratio of small larvae to medium and large larvae was approximately 7:3. Considering an action threshold of 10,000 small or 5,000 medium and large larvae per acre threshold, 9,000 total larvae per acre is close to the estimated threshold of 8,500 larvae based on the 7:3 ratio we encountered.

Objective Bt transgenic cotton varieties have resulted in a dramatic reduction in damage due to lepidopteran pests. However, the cotton bollworm, *Helicoverpa zea* (Boddie), continues to be one of the most damaging pests of cotton in the Texas High Plains, resulting in 89,440 lost bales in 2010. An estimated 220,000 acres of cotton were treated with insecticides for bollworms; most if not all of this

cotton was comprised of non-Bt varieties, which made up about 50% of the planted acreage in the Texas High Plains in 2010. Currently, pyrethroids are the products of choice for chemically controlling bollworm infestations.

In addition to bollworms, fall armyworms, *Spodoptera frugiperda* (J.E. Smith), are an occasional pest of cotton in the High Plains, and usually occur concurrently with bollworm infestations. However, unlike bollworms, fall armyworms are difficult to control with pyrethroids, but are more effectively controlled with alternative chemistries such as Belt (flubendiamid). Although the high rate of Belt (3 fl-oz/acre) has demonstrated excellent activity towards beet armyworms, *Spodoptera exigua* (Hübner), and some activity towards bollworms in the Texas High Plains, its ability to control high populations of bollworms and fall armyworms is uncertain.

Additionally, because of the high cost associated with treating cotton with Belt at the high rate (3 fl-oz/acre), many growers and consultants would prefer to utilize a lower rate of Belt (2 fl-oz/acre) and possibly tank-mix with a low cost pyrethroid.

Objectives of this study were as follows: 1. Determine the efficacy of several commonly used pyrethroids for control of bollworms and fall armyworms in cotton, 2. Determine if the low labeled rate of Belt (2 fl-oz/acre) is effective in controlling bollworms and fall armyworms, 3. Determine if tank mixing a lower rate of Belt (2 fl-oz/acre) with a pyrethroid provides cost effective control.

Materials and Methods This test was conducted on a commercial farm located in Gaines Co., south of Loop, TX. The cotton variety ‘Dyna-Grow 2400RF’ was grown on 40-inch rows and irrigated using a pivot irrigation system. Plots were 4-rows wide × 60-feet long. Plots were arranged in a randomized complete block design with 4 replicates. The insecticide treatments and rates are outlined in Table 1. Treatments were applied on 17 August 2010.

Table 1. Insecticide treatments and rates.		
Treatment ^a	Active Ingredient	Rate (product/ac)
1) Untreated	--	--
2) Mustang Max 0.83EC	Zeta-cypermethrin	3.6 fl-oz
3) Mustang Max 0.83EC	Zeta-cypermethrin	2.6 oz
4) Karate 1EC	Lambda-cyhalothrin	5.12 fl-oz
5) Holster 2.5EC	Cypermethrin	5.0 fl-oz
6) Belt 480SC	Flubendiamide	2.0 fl-oz
6) Mustang Max 0.83EC + Belt 480SC	Zeta-cypermethrin	2.6 fl-oz + 2.0 fl-oz
^a All treatments included Dyne-Amic non-ionic surfactant at 0.25% v/v.		

Bollworm and fall armyworm populations were estimated by counting the number of worms on 10 whole plants per plot.

Larvae were separated by species, and size was estimated by length: small larvae (<1/4 inch), medium larvae (1/4 to 5/8 inch) and large larvae (>5/8 inch). Small larvae were not separated by species because they could not be distinguished from one another in the field.

The test was harvested on 5 November 2010, using a 28-inch hand basket stripper. Six samples were harvested per plot and pooled. All samples were weighed, ginned and classed.

All data were analyzed using ARM and the means were separated using an F protected LSD ($P < 0.05$).

Results and Discussion

On 17 August, prior to insecticide application, the population of medium and large worms averaged 11,440 and 2,280 bollworms and fall armyworms per acre, respectively (estimated plant population = 40,000 per acre) (Figures 1A & 1B). This is well above the action threshold of 5,000 worms per acre. Although smaller worms could not be speciated, the population of small worms across both species was estimated to be 25,440 worms per acre (Figure 1C). The action threshold for small larvae is 10,000 worms per acre.

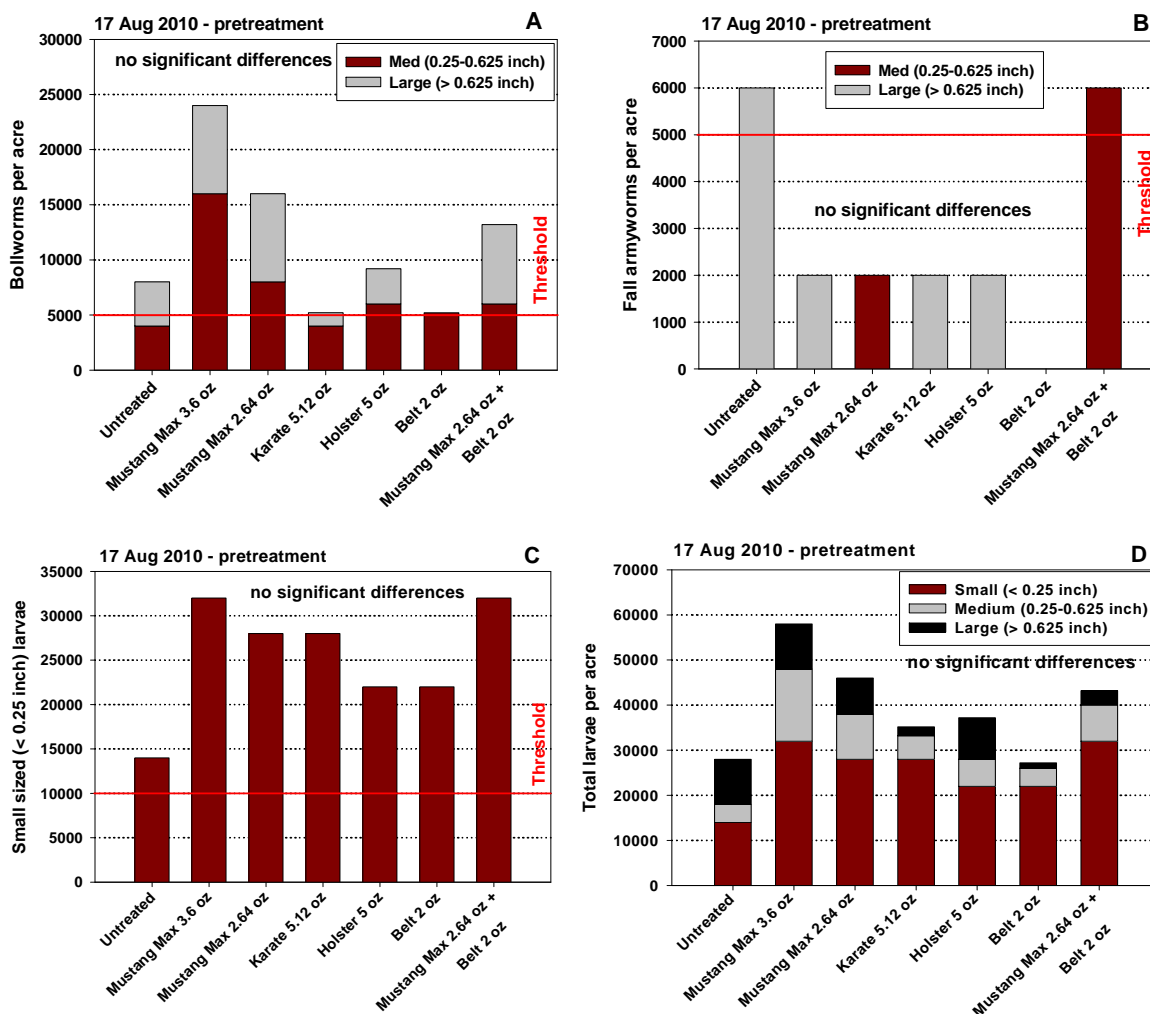


Figure 1. Number of medium and large bollworm larvae per acre before application (A), medium and large fall armyworms (B), total small larvae (C), and total larvae by size (D); no significant differences were detected among any of the treatments for any parameter based on an F protected (LSD, $P \geq 0.05$).

Using speciation of medium sized worms in the untreated plots at 7 DAT, the number of small bollworms and fall armyworms were estimated before treatment. The worm population at this test site was estimated to be ~70% bollworms. By size, bollworms comprised 52%, 85% and 73% of the small, medium and large sized larvae respectively (Figure 2). Total larvae across both species and all sizes averaged 38,840 worms per acre (Figure 1D). During pretreatment counts, it was noted that many of the small worms were feeding under bloom tags. Additionally, the cotton in this test was growthy (~46 inches in height); thus obtaining adequate insecticide coverage was likely to be difficult.

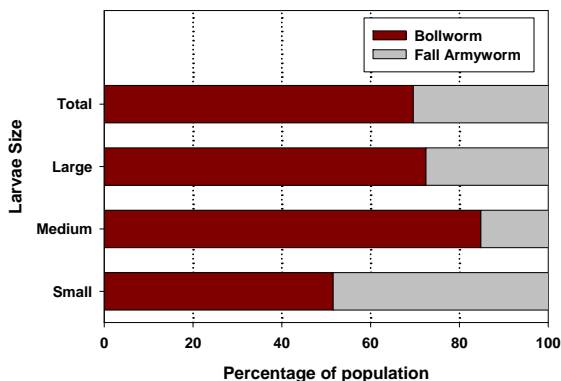


Figure 2. Percentages of bollworms and fall armyworms by size on 17 August, prior to treatment.

At 7 DAT, all of the treatments had fewer medium and large bollworms than the untreated with the exception of Belt at the lower rate (2 fl-oz/acre) (Figure 3A). There were no differences among the other treatments. Generally, Belt is thought to be relatively more efficacious towards fall armyworms than bollworms. As expected, at its lowest labeled rate, Belt did not provide effective bollworm control; especially in growthy cotton where many of the small larvae were feeding under bloom tags.

Against fall armyworms, the only treatment that differed from the untreated was the tank mix of Mustang Max + Belt (Figure 3B). Pyrethroids are generally considered weak against fall armyworms. Belt is known to have good activity towards fall armyworms. However, Belt at the lower rate (2.0 fl-oz/acre) failed to achieve adequate control. It is not certain if increasing the rate of Belt (3 fl-oz/acre) would alleviate this problem, but much of the difficulty in control may be related to the need for Belt to be consumed to maximize activity. Although Belt is translaminar, larvae moving from fruit to fruit are less likely to encounter toxicant than if it were a contact poison.

When evaluating activity across both species, because the population was predominately bollworms, the high rates of the pyrethroids and the low rate of Mustang Max + Belt all reduced the population significantly lower than the untreated (Figure 3C).

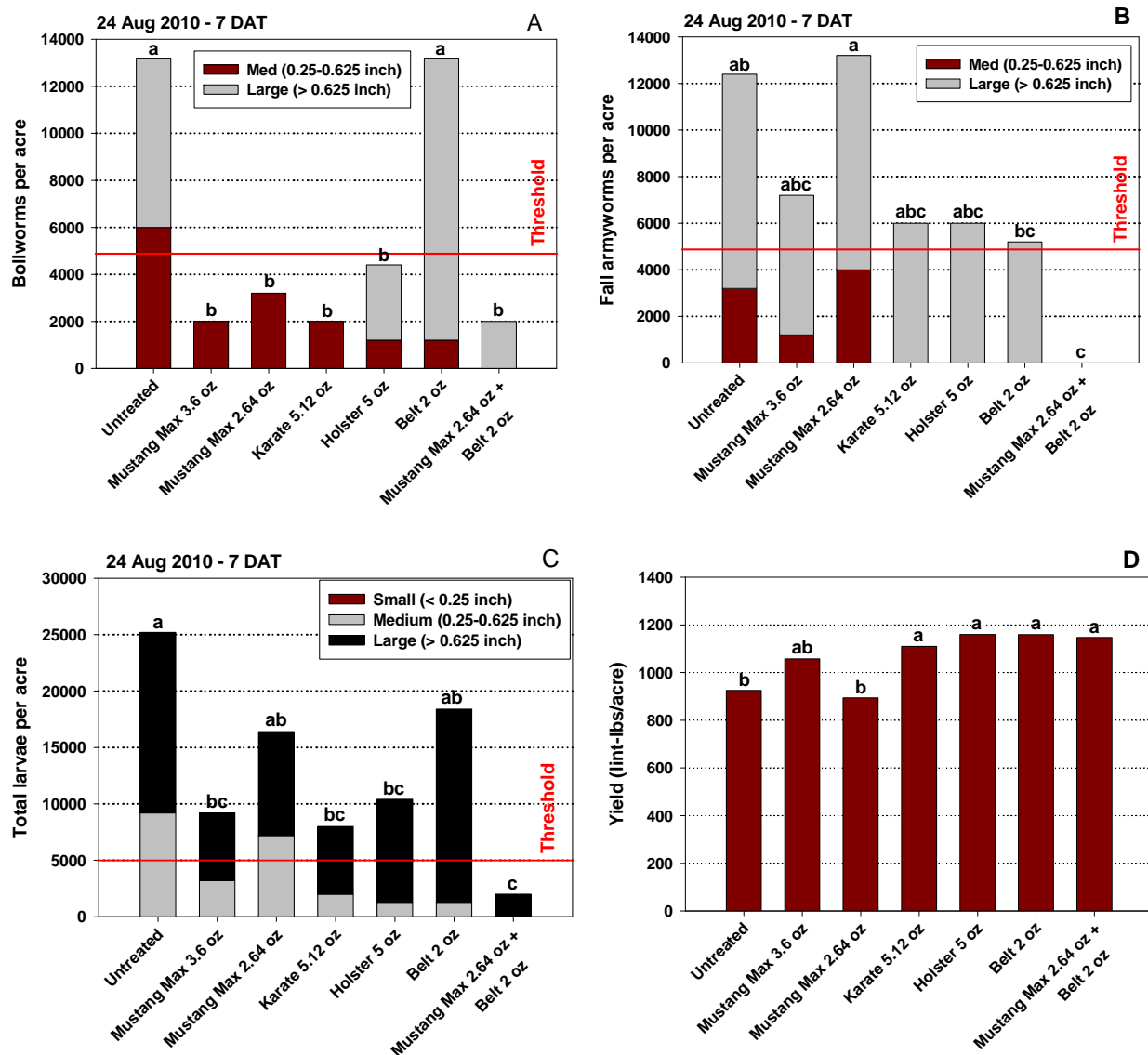


Figure 3. Number of medium and large bollworm larvae per acre 7 days after treatment (A), medium and large fall armyworms (B), total larvae (C), and yield (D); Columns within a chart capped by the same letter are not significantly different based on an F protected (LSD, $P > 0.05$).

There were no significant differences in yield among the high rates of the pyrethroids, Belt alone or the tank mix of the low rate of Mustang Max + the low rate of Belt (Figure 3D).

Although Belt alone (2.0 fl-oz/acre) appeared to be ineffective, it did not differ in yield from the best performing treatment. The reason for this is not certain; it could be an aberration in the data, or Belt may be providing undetectable control. Similar results were observed in a test conducted in 2008.

Yield was negatively correlated with the total worm population (Figure 4). Based on this regression, approximately 9,000 larvae per acre resulted in a 10% yield reduction. The ratio of small larvae to medium and large larvae was approximately 7:3. Considering an action threshold of 10,000 small or 5,000 medium and large larvae per acre threshold, 9,000 total larvae per acre is close to the estimated threshold of 8,500 larvae based on the 7:3 ratio we encountered.

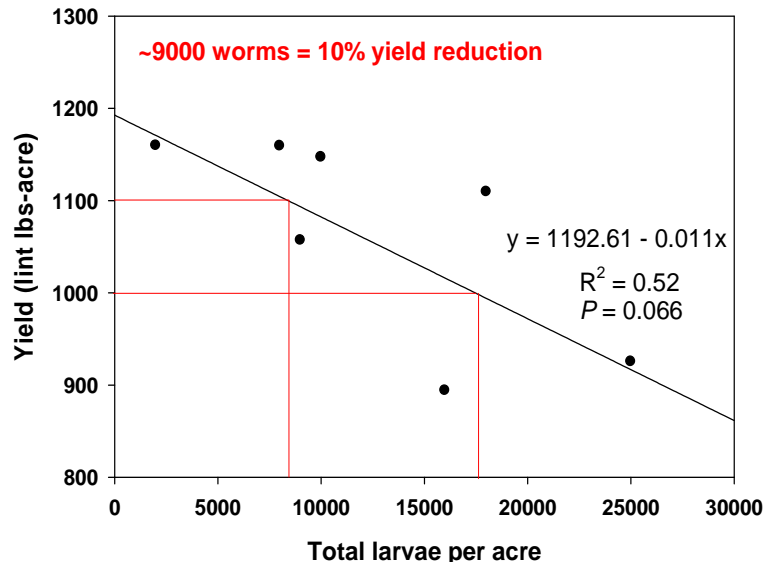


Figure 4. Linear relationship between all sizes of bollworms and fall armyworms and yield.

Conclusions

Pyrethroids continue to be highly efficacious towards bollworms when used at proper rates, but are weak towards fall armyworms. The low rate of Belt (2.0 fl-oz) appeared weak toward both bollworms and fall armyworms, but was highly efficacious towards both species when tank mixed with a pyrethroid.

Acknowledgements

Special thanks to Glen Shook for working with us on this trial. This project was funded in part by Plains Cotton Growers, Inc.

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Pink Bollworm Trapping in the Southern Plains of Texas and New Mexico

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Manda Anderson, Extension Agent - IPM, Gaines County

David Kerns, Extension Entomologist

Charles Allen, Texas IPM Program State Coordinator

Texas AgriLife Extension Service

Jane Pierce, Research and Extension Entomologist, NMSU

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Michelle Walter, USDA, APHIS, CPHST

John Westbrook, USDA, ARS

Summary

This study identified several cotton fields in southern Midland County, TX on which large numbers of pink bollworm (PBW) moths were caught. No other large concentrations of PBW were found in the region. Winds with the capability of moving moths long distances occurred during the 2010 study. Wind trajectories were appropriate to have moved moths from areas where PBW moth captures were high, to areas in which only few PBW moths were caught. These findings help to support the theory that the wild pink bollworm moths trapped in 2009 on the east side the El Paso/Trans Pecos (EP/TP) eradication zone may have originated in southern Midland County. No PBW moths were captured in trap lines between cotton growing areas in the southern plains and those in the EP/TP zone in 2010. Capture of moths in traps on the trap lines would have provided further evidence either supporting or contradicting the theory.

Objective

Pink bollworm (PBW) is one of the world's most important cotton pests. Losses to PBW prior to the availability of Bt cotton and the initiation of the eradication program were estimated at \$32 million per year (NCC 2001).

PBW eradication began in the El Paso/Trans Pecos (EP/TP) zone in Texas in 2001 and is nearing completion. It is threatened by PBW migration from the southern plains of Texas and New Mexico, areas not in eradication programs.

The Pecos Work Unit (east side of the EP/TP zone), caught no wild PBW moths in 2007 or 2008. In 2009, 669 wild moths were caught on Bt cotton fields between late September and the end of November. The question was, "Where did these moths come from?"

When PBW reproduction occurs and background populations are low, fall trap captures normally occur in "hot spots" indicating the locations of infested fields. The 2009 wild PBW moth captures were distributed over a large land area and were not indicative of one or more infested fields within the work unit. Data

from a few traps in the southern plains outside the EP/TP zone in 2009 suggested PBW infestations may have been present in Midland County - 75 to 80 miles from cotton fields in the Pecos Work Unit.

The primary objective of this project was to investigate correlation of cultural practices on PBW presence in southern plains cotton fields. A second objective was to investigate patterns of PBW movement from infested fields. Data from this and subsequent studies will be used to develop a model of pink bollworm populations in the southern plains region. The model will provide opportunities for the cotton industry to develop and implement areawide control programs which can intelligently target available resources to the fields which are likely sources of PBW reproduction and spread.

Materials and Methods

From mid-September to early November, 2010, a trapping study was conducted in four areas of the southern plains. Trapping was conducted in the Pecos Valley NM, Gaines County TX, Dawson/Martin Counties TX and Midland/ Glasscock/Upton Counties TX; cotton production areas which border the EP/TP zone on the north and east sides. Delta Sticky Traps baited with gossypure impregnated rubber septa were deployed, geo-referenced and serviced weekly. The protocol was to trap 10 Bt fields and 10 non-Bt fields – one trap per field - in each area. Data collected on each field included: producer name, trap number, latitude, longitude, elevation, planting date, variety, acres, irrigation status/type and intensity, Bt transgenic, fall/winter tillage, whether the field was planted in killed wheat, winter irrigation, lbs. nitrogen (N) fertilizer/ac, and proximity to 2009 non-Bt cotton. Dr. David Kerns, Texas AgriLife Extension Entomologist, provided trapper training and confirmed the identification of moths.

Three highway trap line loops - with traps placed at five mile intervals - were established. Each trap line extended into the EP/TP zone. As traps were inspected; date of capture, number of PBW moths caught and trap number were recorded.

In the Pecos Valley NM production area, 21 cotton fields were trapped, including ten Bt and eleven non-Bt fields. All fields were irrigated and 19 fields were tilled in the fall/winter of 2009-10. None of the fields were grown in killed wheat cover or received winter irrigation. The Carlsbad trap line had 29 traps. The trap line ran south from Carlsbad NM to Orla TX, west to the Guadalupe Mountains and White City NM and northeast to Carlsbad.

In Gaines County TX, 22 fields were trapped of which eleven were Bt and eleven were non-Bt. Twenty-one fields were irrigated and one was dryland. Five received fall/winter tillage, 18 were grown in killed wheat cover and 15 received winter irrigation. The Kermit trap line had 31 traps. It began in Seminole, TX and ran south to Gardendale TX (8 miles north of Odessa), west to Kermit TX, and north to Hobbs NM.

In western Martin and southwestern Dawson Counties 19 fields were trapped. Ten were Bt and nine were non-Bt fields. Nineteen fields were dryland and two were irrigated. Seven fields received fall/winter tillage.

In Midland, Glasscock and Upton Counties 20 fields were trapped. Nine were Bt and eleven were non-Bt fields. Nine were irrigated and eleven were dryland. All fields received fall winter tillage and all nine irrigated fields received winter irrigation. The Crane trap line had 17 traps. It started north of Rankin TX and ran south to Rankin, northwest to Crane TX, north to Odessa TX and northeast to Midland TX.

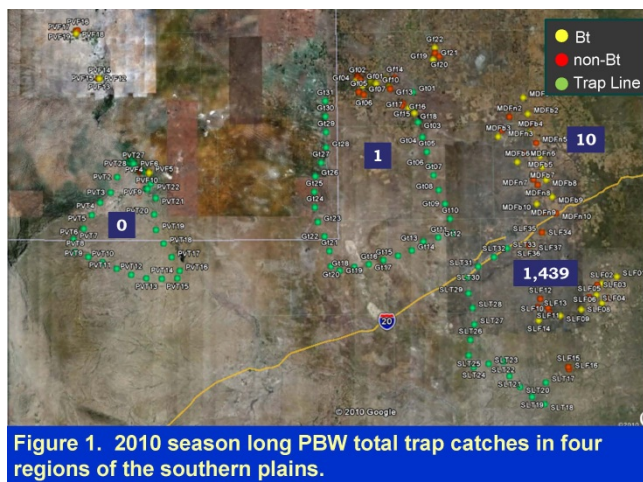


Figure 1. 2010 season long PBW total trap catches in four regions of the southern plains.

The HySPLIT Transport and Dispersion model (Draxler and Rolph 2010) was run on the Real-time Environmental Applications and Display sYstem (READY) website (Rolph 2010) of the National Oceanic and Atmospheric Administration / Air Resources Laboratory (NOAA/ARL) to determine if daily wind patterns were conducive to transport pink bollworm (PBW) moths in western Texas in the fall of 2010. Weather information for the model was obtained from the EDAS (40-km resolution) reanalysis initialization files archived at the NOAA/ARL site.

Results and Discussion

Total trap captures are shown in Figures 1, 2 and 3. Figure 1 shows the total number of moths captured in each of the four areas of the southern plains. Figures 2 and 3 show the total moths captured by trap in the Martin/Dawson area and the Midland/Glasscock/Upton area, respectively.

Pecos Valley NM

No PBW moths were caught in Pecos Valley NM cotton fields and no PBW moths were caught in the traps on the Carlsbad trap line (Fig. 1).

Gaines County

One PBW moth was caught in Gaines County (Figure 1). It was caught on October 28 on a 60 acre center pivot field which was planted on May 4 with a Bt cotton variety. The field had been tilled during the previous fall/winter, was grown in killed wheat cover, had received winter irrigation and was fertilized with 120 lbs/ac N. The Gaines County capture on Bt cotton suggests the moth moved to the field from a “source” field. No PBW moths were caught on the Kermit trap line.

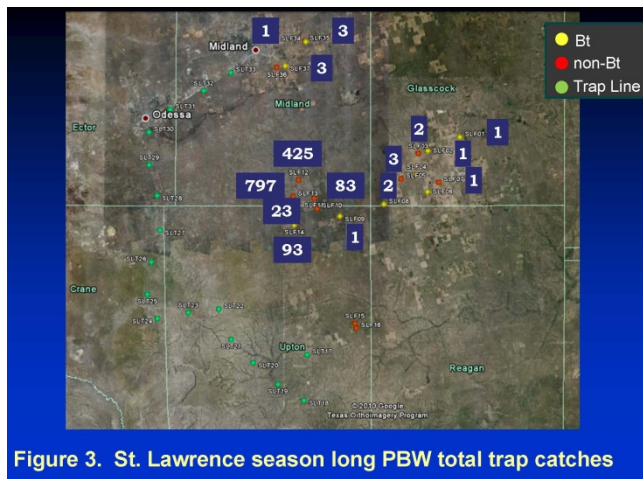
Martin/Dawson Counties

Ten PBW moths were caught from a total of six fields in the Martin/Dawson Counties from October 22 through November 5 (Fig. 2). Moths were caught on 32% of the fields trapped in the area and no field caught moths on more than one inspection date. A single moth was caught on each of four fields - one Bt and three non-Bt. Three moths were caught on each of two fields – one Bt and one non-Bt. Captures of moths on Bt cotton fields and fields capturing moths on only one inspection date suggest PBW moths moved from source fields to the fields where they were trapped.



Figure 2. Martin & Dawson season long PBW total trap catches

All catches in the Martin/Dawson area were in dryland fields planted May 11 to June 1 in which N fertilization ranged from 0 to 100 lbs/ac. Two of the fields were tilled the previous winter and two had non-Bt cotton planted in adjacent fields in 2009. One field that caught moths had non-Bt cotton planted one mile away and another had non-Bt planted four miles away in 2009.



SLF#13 - SLF #10 through 14 - caught the highest numbers of moths. Catches on these fields ranged from 23 to 797. Except for SLF#14, all of these fields were non-Bt cotton. None of the five fields received inorganic nitrogen fertilizer but all were tilled during the fall or winter of 2009-2010. The two organic fields, SLF#12 and SLF#13, were drip irrigated and received winter irrigations. SLF#10, 11 and 14 were dryland fields. Three fields - SLF#12, SLF#13 and SLF#14 - caught moths on seven consecutive inspection dates. PBW reproduction almost certainly occurred in SLF#12 and SLF#13. Despite repeated captures and relatively higher numbers of moths caught in SLF#14, the field was in Bt cotton. It is doubtful reproduction occurred there.

Of the fields that caught PBW moths, seven Bt fields caught 102 moths (7%) and eight non-Bt fields caught 1,336 moths (93%). Capture of PBW moths on Bt cotton, the spatial pattern of the captures and capture of moths on only one inspection date (eight fields) suggests moths were moving from source fields to uninfested fields.

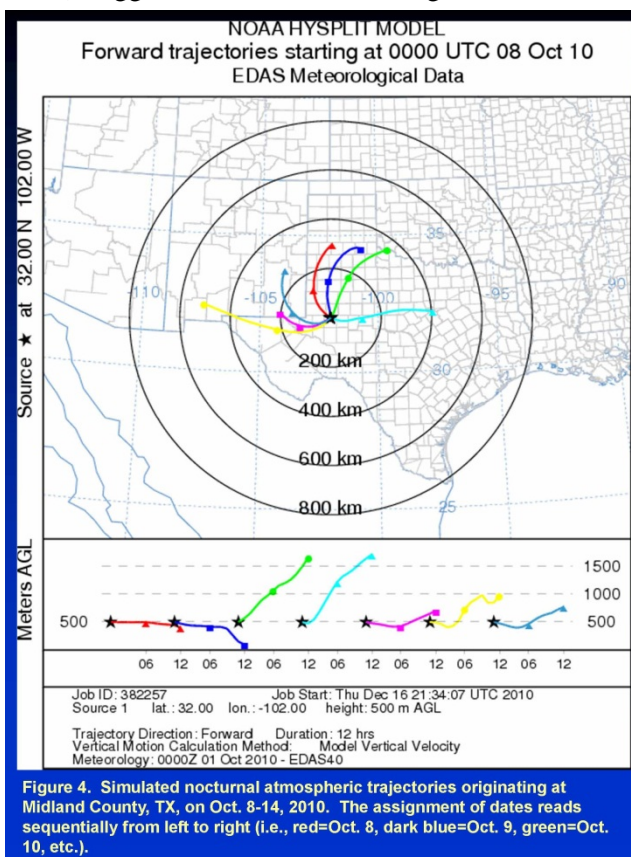
Weather Data

From a south-central Midland County source population, dispersal of PBW to southern Glasscock County would have been supported by westerly winds on Sep. 28 and Oct. 11 (Fig. 4). Dispersal from the south central Midland County source to northern Midland County would have been supported by southerly winds on Sep. 16-17, 21-24, and Oct. 2, 4-19.

Midland/Glasscock/Upton Counties

PBW moths were caught on 15 of 20 (75%) fields trapped in Midland/Glasscock/Upton Counties (Fig. 3). A total of 1,438 moths were captured. Eighty-five percent of the moths were caught on two organic fields, SLF#12 and SLF#13 located in south central Midland County. Two other organic fields, SLF#15 and SLF#16 were located in Upton County 25 miles south of SLF#12 and 13. No PBW moths were caught in the Upton County organic fields.

Five fields located within a five mile radius of



Conclusions

A total of 1,449 PBW moths were caught during the 2010 PBW trapping study in the southern plains region. Ninety-eight percent of the total moths captured, came from five fields within a five mile radius of SLF#13, an organic cotton field in southern Midland County. Two organic cotton fields within this small area, SLF#12 and 13, appeared to be the epicenter of the population in the area. Eighty-four percent of the total moths caught came from these two fields.

Moths caught on Bt cotton fields, fields that caught moths on only one inspection date and spatial patterns of moth capture strongly suggest PBW moth movement occurred during the study. During the course of the study, winds were observed which were capable of supporting PBW moth movement from fields thought to be the source of the population to fields in which only a few moths were caught.

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**Dow AgroSciences Irrigated Phytogen Innovation Trial
Seminole, TX - 2010**

Cooperator: Gregory Upton

Manda Anderson, Extension Agent - IPM, Gaines County

**Planted: 17-May
Harvested: 4-November**

Table 1. Harvest results from the Irrigated Phytogen Innovation Trial (3 replications), Gregory Upton Farms, Seminole, TX, 2010.

Variety	Lint Yield (lbs/A)	Miconaire	Staple	Uniformity	Strength	Elongation	Loan Value (¢/lb)	Value / A (\$/A)
DP 1032 B2RF	1513	4.7	35.7	83.0	29.7	7.6	0.5373	\$813
PHY 499 WRF	1443	4.6	35.6	83.5	31.4	9.1	0.5397	\$779
PHY 367 WRF	1426	4.3	34.6	82.1	29.7	8.6	0.5332	\$760
PHY 375 WRF	1380	4.4	34.8	81.6	29.0	7.9	0.5333	\$736
PHY 519 WRF	1332	4.5	35.1	81.6	30.3	8.5	0.5357	\$713
PHY 569 WRF	1330	4.6	34.4	83.1	31.1	9.6	0.5360	\$713
FM 9170 B2RF	1304	4.2	36.0	82.1	29.7	6.9	0.5355	\$698
PHY 565 WRF	1240	4.4	35.1	82.4	30.1	9.3	0.5363	\$665



**Bayer CropScience Irrigated CAP Trial
Seminole, TX - 2010**

Cooperator: Jud Cheuvront

Manda Anderson, Extension Agent - IPM, Gaines County

**Planted: 6-May
Harvested: 22-October**

Table 1. Harvest results from the Bayer CropScience Irrigated CAP Trial (1 replication), Jud Cheuvront Farms , Seminole, TX, 2010.

Variety	Lint Yield (lbs/A)	Yield Rank	Percent Turnout	Mic	Staple	Strength	Unif	Loan Value ² (¢/lb)	Value / A (\$/A)
FM 2484B2F¹	2011.7319	1	0.420	4.4	36	26.0	80.1	56.85	\$1,144
FM 9170B2F	1972.466	2	0.407	4.2	36	25.8	80.8	57.00	\$1,124
FM 9160B2F	1810.8315	3	0.405	4.3	36	26.7	81.3	56.75	\$1,028
FM 1740B2F	1801.6188	4	0.403	4.5	36	26.1	82.1	56.75	\$1,022
ST 4288B2F	1761.477	5	0.393	4.5	36	27.0	81.8	56.75	\$1,000
ST 5458B2RF	1725.2027	6	0.401	4.1	35	26.0	80.9	56.15	\$969
BCSX 1030B2F	1793.884	7	0.414	4.3	34	23.5	81.4	52.55	\$943
BCSX 1010B2F	1642.5564	8	0.373	4.5	36	26.0	81.4	56.75	\$932
FM 1740B2F-V	1715.3178	9	0.400	3.4	35	27.5	81.2	54.20	\$930
FM 9180B2F	1683.7772	10	0.378	4.5	36	24.1	79.9	55.20	\$929
BCSX 1040B2F	1442.1278	11	0.352	4.6	38	27.2	84.4	57.15	\$824

¹Tested as BCSX 1180B2F

²Loan value calculated from 2010 CCC Loan Schedule using uniform color grade of 21 and uniform leaf grade of 2



**Bayer CropScience Dryland CAP Trial
Loop, TX - 2010**

Cooperator: Ricky Mills

Manda Anderson, Extension Agent - IPM, Gaines County

**Planted: 18-May
Harvested: 3-November**

Table 1. Harvest results from the Bayer CropScience Dryland CAP Trial (1 replication), Ricky Mills Farms , Loop, TX, 2010.

Variety	Lint Yield (lbs/A)	Yield Rank	Percent Turnout	Mic	Staple	Strength	Unif	Loan Value* (¢/lb)	Value / A (\$/A)
FM 9160B2F	711	1	0.302	4.7	38	30.3	83.8	57.40	\$408
FM 9170B2F	682	2	0.317	4.7	36	30.6	81.1	57.30	\$391
FM 1740B2F	705	3	0.338	5.1	35	29.7	82.0	54.05	\$381
BCSX 1010B2F	685	4	0.319	5.1	36	30.1	81.2	54.80	\$376
FM 2484B2F ¹	647	5	0.332	4.8	38	30.1	83.5	57.40	\$372
ST 5458B2RF	668	6	0.310	5.2	36	29.6	82.3	54.80	\$366
FM 9180B2F	628	7	0.288	4.5	38	34.1	84.2	57.60	\$362
ST 4288B2F	668	8	0.304	5.4	36	28.1	82.7	53.70	\$358
BCSX 1040B2F	637	9	0.279	5.1	38	32.2	84.2	55.40	\$353
AM 1532 B2RF	607	10	0.284	4.9	37	32.0	82.9	57.50	\$349
BCSX 1030B2F	594	11	0.313	4.9	36	30.0	82.9	57.20	\$340

¹Tested as BCSX 1180B2F

²Loan value calculated from 2010 CCC Loan Schedule using uniform color grade of 21 and uniform leaf grade of 2



Appendix A

2010 Gaines County IPM Newsletters

GAINES COUNTY IPM NEWSLETTER

Manda G. Cattaneo, Extension Agent - IPM
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Volume III, No. 1



<http://gaines-co.tamu.edu>
<http://www.tpma.org>
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January 8, 2010

Upcoming Meetings

January 13, 2010

Texas High Plains Oilseeds Workshop
Sesame, Safflower, Sunflower, Winter Canola
Texas AgriLife Research and Extension Center in Lubbock, TX
from I-27, east ½ mile on F.M. 1294 (exit 11-Shallowater)

Please RSVP by January 11

(806) 775-1680; cmbrown@ag.tamu.edu; or Texas AgriLife Research & Extension
Center, Lubbock, (806)746-6101 (ext. 4806), or ctrostle@ag.tamu.edu

January 26, 2010

Alternative Crops and Profitability Workshop
Gaines County Park Party House (located between Seminole and Seagraves)
Details in upcoming newsletter

Contact: Manda Cattaneo (432) 758-8193 or mgcattaneo@ag.tamu.edu

February 2, 2010

Sandy Land Ag Conference
Gaines County Civic Building
Details in upcoming newsletter
Contact: Terry Millican (432) 758-4006 ext. 238 or gaines@ag.tamu.edu

Gaines County IPM Program Research Trial Results

2009 Evaluation of Variety Tolerance and Chemical Management for Southern Root Knot Nematode

Manda Cattaneo, Dr. Terry Wheeler, Dr. David Kerns, Dr. Jason Woodward, Dr. Mark
Kelley, and Dr. Randy Boman
Cooperator: Raymond McPherson

The objectives of this study were to:

1. Evaluate the performance of ST 5458B2F and FM 9063B2F planted in conjunction with Aeris, Avicta Complete Cotton, Temik 15G at 3.5 lbs, Temik 15G at 5lbs, or Temik 15G at 3.5lbs plus a foliar application of Vydate C-LV at the third grown square stage.
2. Compare the net returns between varieties, chemicals, and the interaction between varieties and chemicals.

Results:

Table 1. Harvest results by variety					
Variety	Lint turnout %	Seed turnout %	Lint yield Lb/acre	Gin cost	Net value
				-----\$/acre-----	
ST 5458B2F	36.2 a	48.0 a	1152 a	95.50 a	707.70 a
FM 9063B2F	33.3 b	50.8 b	778 b	70.20 b	489.89 b
	<i>P</i> < 0.0001	<i>P</i> < 0.0001	<i>P</i> < 0.0001	<i>P</i> < 0.0001	<i>P</i> < 0.0001

Table 2. Harvest results by chemical					
Chemical	Lint yield Lb/acre	Lint value	Seed value	Gin Cost	Net Value
		-----\$/acre-----			
5 lbs of Temik 15G	1062 a	602.97 a	149.03 a	90.70 a	661.30 a
3.5 lbs of Temik 15G	1034 ab	583.48 ab	145.65 a	87.88 ab	641.25 a
3.5 lbs of Temik 15G² & 17 oz of Vydate C-LV	957 bc	545.79 abc	134.47 abc	81.60 bc	598.66 ab
Aeris	979 ab	544.21 bc	138.40 ab	84.66 abc	597.95 ab
Untreated	880 c	502.05 c	124.80 cb	76.53 c	550.32 b
Avicta	878 c	499.83	119.28 c	75.8 c	543.31 b
	<i>P</i> = 0.002	<i>P</i> = 0.006	<i>P</i> = 0.004	<i>P</i> = 0.01	<i>P</i> = 0.005

Discussion:

ST 5458B2RF had significantly higher lint yield per acre and lint turnout than FM 9063B2F which resulted in a significantly higher net value per acre. However, FM 9063B2F had a significantly higher seed turnout per acre (*Table 1*).

Net value of 5 lbs of Temik 15G was not significantly different from 3.5 lbs of Temik 15G, 3.5 lbs of Temik 15G with 17 oz of Vydate, and Aeris (*Table 2*). However, 3.5 lbs of Temik with 17 oz of Vydate and Aeris did not significantly differ from the untreated and Avicta (*Table 2*).

A detailed report will be provided at the Sandyland Ag Conference. Results from the other 2009 trials will be sent out in the upcoming weeks.

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The Texas A&M University System, U.S. Department of Agriculture, and the County Commissioners Courts of Texas Cooperating

GAINES COUNTY IPM NEWSLETTER

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Volume III, No. 2

February 11, 2010

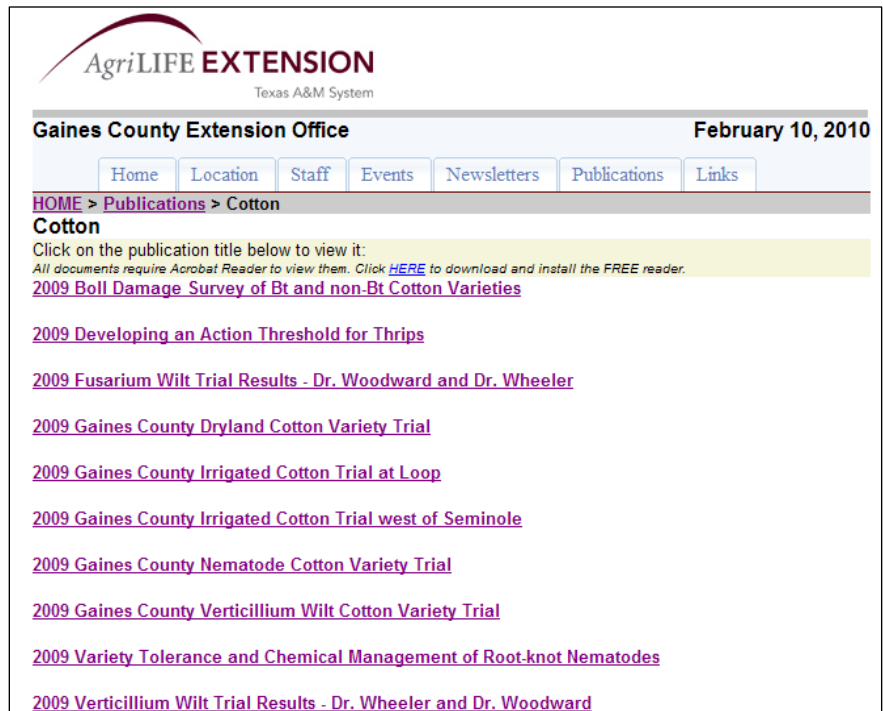
Mark your Calendars: **Texas South Plains Peanut Production Workshop**
March 1, 2010 from 9 to 2:15 in Brownfield
at the American Legion Hall, 800 Seagraves Road

Pest Management Decisions may differ from Field to Field

For those of you who were able to attend the SandyLand Ag Conference you may have noticed a re-occurring theme being discussed by the speakers "Pest management has to be done on a field by field basis." Meaning each of your fields may have a different pest complex. Therefore you have to correctly identify the pests within each field before you determine the control methods. Many people use the term "pest" to describe insects like thrips, bollworms, and pink bollworms or weeds, like Russian thistle, nutgrass, and pig weed. In addition to insects and weeds, our Gaines County producers are faced with a pest complex that encompasses plant diseases and nematodes. Therefore, we have to select varieties based on whether we want insect and weed management options included, and we also have to determine which variety will perform best under the disease pressure present in our individual fields. In 2009, several field trials were conducted in Gaines County to evaluate the performance of various cotton varieties under Verticillium wilt pressure, nematode pressure, and irrigation levels. The results of these trials have been posted on the web. Please see the next section.

Gaines County IPM Research Trials are posted on the web

The Gaines County IPM Research Trials Results and Dr. Woodward's and Dr. Wheeler's Verticillium Wilt and Fusarium Wilt Trial Results have been posted on the Gaines County website. To view these results go to <http://gaines-co.tamu.edu>. Click on the publications tab and then on cotton. Below is a snap-shot of the webpage. Please let me know if you do not have access to the web and would like a hard copy.



The screenshot shows the Gaines County Extension Office website. At the top is the AgriLIFE EXTENSION logo and the date February 10, 2010. A navigation bar includes links for Home, Location, Staff, Events, Newsletters, Publications, and Links. The 'Publications' tab is selected, showing a list of cotton-related publications. The list includes titles such as '2009 Boll Damage Survey of Bt and non-Bt Cotton Varieties', '2009 Developing an Action Threshold for Thrips', '2009 Fusarium Wilt Trial Results - Dr. Woodward and Dr. Wheeler', '2009 Gaines County Dryland Cotton Variety Trial', '2009 Gaines County Irrigated Cotton Trial at Loop', '2009 Gaines County Irrigated Cotton Trial west of Seminole', '2009 Gaines County Nematode Cotton Variety Trial', '2009 Gaines County Verticillium Wilt Cotton Variety Trial', '2009 Variety Tolerance and Chemical Management of Root-knot Nematodes', and '2009 Verticillium Wilt Trial Results - Dr. Wheeler and Dr. Woodward'.

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Volume III, No. 3



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March 30, 2010

What is the potential for wheat aphids?

Reported by Dr. Ed Bynum, Extension Entomologist in the March 26, 2010 issue of Panhandle Pest Update

I have received reports that greenbugs and Bird Cherry Oat aphids are present in fields down state and the wheat is showing symptoms of having the Barley Yellow Dwarf Virus. An IPM agent, Manda Cattaneo, for Gaines County is finding greenbugs in fields, but she is also already finding aphid mummies from the parasitic wasp (**Figure 1**). To prevent any surprises begin scouting fields now and continue scouting weekly. The following is a description and photographs of common wheat aphids to help in identifying them when scouting.

GREENBUG, *Schizaphis graminum* (Rondani) Mature wingless female greenbugs are approximately 1/16 inch long with the typical “pear” shaped of aphids. They are pale green with a darker green stripe down the middle of the back. The legs and cornicles “tail pipes” are also green, except for the tips which are usually black.



Figure 1. Greenbug and an Aphid Mummy

RUSSIAN WHEAT APHID, *Diuraphis noxia* (Mordvilko) This aphid is less than 1/16 inch long. It is greenish with an elongated, spindle “cigar” shaped body. It is distinguished from other common aphids by its short antennae and by the absence of prominent cornicles. It has a fleshy projection above the cauda (or tail) which gives the aphid a “double tail” appearance when observed from the side.



Figure 2. Russian Wheat Aphid
Photo By Monti Vandiver

Freeze/Desiccation on Wheat Leaves

I have noticed a few fields that have some freeze damage on the leaf tips (**Figure 3**). This likely occurred over the March 20th weekend when our minimum temperatures were below freezing. I did not observe any damage to the growing point. A yellow leaf or necrotic leaf emerging from the whorl would indicate that the growing point was damaged. For further information on wheat freeze injury please refer to the Texas AgriLife Extension Service "*Freeze Injury on Wheat*" publication which can be found on the web at <http://lubbock.tamu.edu/wheat>.



Figure 3. Freeze damage on leaf tips

Cotton Diseases

Reported by Dr. Jason Woodward, Extension Plant Pathologist, in the March 15, 2010 issue of Focus on South Plains Agriculture

Rhizoctonia solani and *Pythium* spp. are the predominant causes of seedling disease in the region. Both *R. solani* and *Pythium* spp. can occur as seed decay (which occurs prior to germination), pre-emergence damping off (which occurs between germination and emergence), and post-emergence damping-off or sore shin (which typically occurs on older plants). Symptoms associated with *R. solani* and *Pythium* spp. are similar and can be observed on young seedlings. Initial symptoms consist of sunken lesions at the soil level, resulting in girdling and collapse of the stem.

In addition, black root rot (caused by *Thielaviopsis basicola*) can be experienced on the Southern High Plains. Plants infected with *T. basicola* may also exhibit severe necrosis on roots, severe stunting and swelling of the cortex; however, plants are rarely killed. Black root rot is most commonly found in heavier soils, and is more severe in the presence of the root-knot nematode.

Because of the nature of the pathogens involved, varietal resistance is not an option for managing seedling disease. Looses can be minimized by delaying planting until soil temperature (at the 4 inch depth is above 65°F for three consecutive days, and using high quality, fungicide treated seed. All commercially available seed is treated with fungicides; however, various combinations are available for these seedling diseases. For further information on seedling disease please refer to the Texas AgriLife "Management of Seedling Diseases of Cotton" publication which can be found on the web at http://lubbock.tamu.edu/focus/focus_2010/March_15/Seedling_Diseases.pdf.

Target pathogen(s)	Fungicides
<i>Rhizoctonia solani</i>	Baytan, Vortex ¹ , Argent, Nuflow-M, Vitavax-PCNB, Dynasty CST ² , and Trilex Advanced ²
<i>Pythium</i> spp.	Allegiance FL, Apron XL, Dynasty CST ² , and Trilex Advanced ²
<i>Thielaviopsis basicola</i>	Baytan, Nuflow-M, and Trilex Advanced ²
¹ Vortex (Ipconazole) is a new compound developed by Bayer CropScience and will be a component of seed treatment fungicides on FiberMax and Stoneville cotton varieties in 2009. ² Dynasty CST and Trilex Advanced are over treatments that are applied in addition to a standard or base fungicide treatment.	

Selecting Cotton Varieties to Fit Your Farm

When selecting varieties it is important to identify the strengths of a variety, as well as it's limitations. This will help you to determine which varieties will perform best under various pest pressures and management practices. I highly recommend that growers and consultants refer to the Texas AgriLife Extension and Research Trial Results when they are trying to determine which variety will perform best under individual field conditions. Results of these trials can be found on the web at <http://gaines-co.tamu.edu/> and at <http://lubbock.tamu.edu/>. Several of these reports have also been included in the "2009 Cotton, Peanut, and Wheat Management Reports" which can be picked up at your local gins or ag chemical stores or at our office.

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As you are looking through the results you may want to note the strengths and limitations of each variety. Below are some examples of comparisons:

- *Variety A* may be partially resistant to root-knot nematode, but susceptible to Verticillium wilt.
- *Variety B* may be tolerant of Verticillium wilt, but susceptible to Fusarium wilt.
- *Variety C* may have the best return under irrigation, whereas *Variety D* may have the best return in dryland production
- Another consideration is whether you are prepared to scout for pink bollworms and bollworms. A non-bollgard variety, needs to be scouted on a weekly basis for "worm" populations that can cause economical damage.

Preplant Weed Control in Cotton

Reported by Dr. Peter Dotray, Extension Weed Scientist, and Dr. Wayne Keeling, Research Weed Scientist in the March 15, 2010 issue of Focus on South Plains Agriculture

One of the major challenges of using herbicides pre-plant is to ensure that herbicide activity in soil will not reduce crop germination and emergence. A second challenge is to select the proper herbicide(s) for the weeds that need to be controlled. The use of Prowl (pendimethalin) or Treflan (trifluralin) is the first step towards successful weed management programs in cotton. The strength of these dinitroaniline (DNA) herbicides is annual grass control (barnyardgrass, crabgrass, foxtails, panicums, etc.) and control of small-seeded broadleaf weeds such as Palmer amaranth (careless and other pigweed species), Russian thistle (tumbleweed), and kochia (ironweed). Most larger-seeded broadleaf weeds, like annual morningglories, cocklebur and sunflowers, and perennial weeds are not controlled by these herbicides.

The rate of each DNA herbicide is dependent on soil type. The sandier the soil, the lower the recommended rate. If soil conditions are dry and large clods are present during mechanical incorporation, herbicide performance will be less effective. Keep in mind that when Treflan was first used over 35 years ago, farmers were diligent with two-pass incorporation prior to bedding and planting. This resulted in thorough mixing of the herbicide and excellent weed control. In recent years many farmers have cut back on incorporation to save time and money. Some have still achieved adequate weed control while others have observed that poor incorporation caused herbicide failures. In cotton, Prowl EC rates range from 1.2 to 3.6 pints per acre in conventional or minimal tillage and from 1.8 to 4.8 pints per acre in no-tillage. Rates for Treflan and other trifluralin products (formulated at 4 pounds per gallon) range from 1/2 to 1 pint per acre for sandy soils, and up to 2 pints per acre on other soils. The DNA herbicides may be incorporated by mechanical means or by irrigation. A double-pass method of incorporation is recommended and is most commonly used. Mechanical implements used to incorporate these herbicides include a springtooth harrow, a disk, a double or single stalkcutter, and a rolling cultivator to name a few. The better the implement mixes and uniformly distributes the herbicide in the upper 1- to 2- inches of soil, the better the weed control.

Treflan should be incorporated within 24 hours after application. Prowl must be incorporated within 7 days after application, but the sooner the better. Prowl EC may be surface applied and then incorporated by rainfall or irrigation. Three-quarters to one-inch of irrigation is necessary to incorporate (activate) these herbicides. Both Prowl EC and Treflan may be chemigated into the soil. These applications may not be the best way to incorporate Prowl or Treflan, but may be the only way to use these herbicides in a reduced tillage or no-tillage crop production system. Always carefully read and follow label recommendations.

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Volume III, No. 4

June 1, 2010

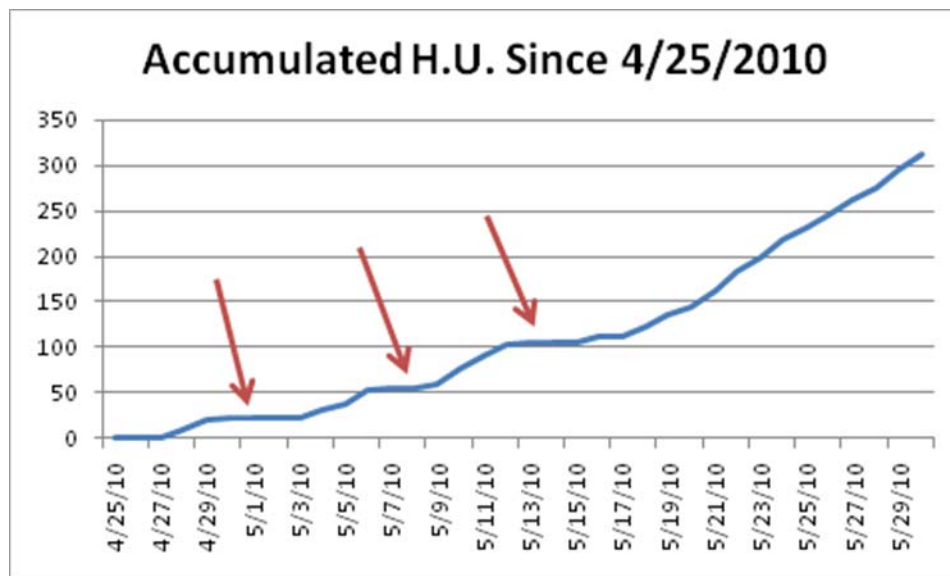
General Situation

The wet fall and winter built up high expectations for this year's crop. As we drew closer to planting time expectations began to dwindle as we did not receive the much needed planting rains. During the past month we have watched several storms detour around Gaines County. As a result we have not received any significant rainfall since March.

Despite the dry conditions cotton and peanut production for the 2010 is well underway. Most of the irrigated acreage has been planted and growers are working on planting their dryland production fields. The final planting date for Insurance Purposes in Gaines County is June 5. Current cotton stages range from just emerged to 3 true leaf stage, with a majority of the cotton at 1 true-leaf stage.

Heat Unit Accumulation

Cotton planted in late April and early May has faced several weather fluctuations. The graph below depicts Heat Unit (H.U.) accumulation since April 25. We have had several cold spells in which no heat units were accumulated during a 1 to 3 day period (as indicated by the red arrows). As a result, emergence was slow in early planted cotton and peanut fields.



I have seen some seedlings that have reduced vigor due to "big shank". Several of these plants have succumbed to fungal pathogens, and therefore have reduced the plant stand in a few fields.



Figure 1. Example of "Big Shank"

Thrips

I have observed several adult thrips in cotton during the last week, but I have not seen any immature thrips. This indicates that the seed treatments or soil applied insecticides are holding thus far in these fields. However, growers should be monitoring their fields on a weekly basis to detect a potentially damaging thrips population. Thrips populations can develop quickly in fields that did not receive an at-planting insecticide. Thrips are slender, straw colored insect about $\frac{1}{15}$ inch long. Adults are winged. Thrips attack leaves, leaf buds, and very small squares and may cause a silverying of the lower leaf surface. When scouting for thrips, be sure to tease open any closed leaves, because thrips love to hide in the curled up leaves. At our current weather conditions, it may be beneficial to treat for thrips when the average number of thrips is equal to the number of true leaves. For example: If you have 2 true leaves, then your action threshold is 2 thrips per plant.

False Wireworms



Figure 2. False Wireworm larvae

We have received several reports of stand reduction that is being caused by false wireworms feeding on cotyledon cotton. I was able to confirm the false wireworms in a couple of fields in the southwestern section of the county. Preventative seed treatments are the best means of managing wireworms.



Figure 3. Wireworm feeding damage on cotyledon cotton

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Volume III, No. 5

June 10, 2010

General Situation

Dry conditions prevail in a majority of the county. Far western Gaines County received some rain during the last week and we have received some reports of hail from this area. Cotton stages range from cotyledon to 6 true leaves, with some plants starting to put on squares. A majority of the peanuts are looking good and we have seen a few blooms in some fields.

Root-Knot Nematode



Root-knot nematodes are already taking their toll in some fields. We have observed stunting associated with severe nematode populations in some fields. The stunting is occurring in fields that did not have a nematicide applied at planting and in fields that had a nematicide applied at-planting. Presence of root-knot nematodes can be confirmed by digging up plant roots and examining the roots for galls (See [Figure 1](#)). Root-knot nematode galls are formed when juvenile nematodes penetrate cotton roots and pierce the vascular cells. Their feeding causes cells to enlarge and the knots or galls become apparent. This impairs root function by inhibiting the uptake of water and nutrients.

Figure 1. Cotton root with numerous root-knot nematode galls

Management options vary depending on the level of nematode infestations. Crop rotation to a non-host is the best method in managing root-knot nematodes. Other options include seed treatments or Temik 15G applied in-furrow at planting followed by foliar application of Vydate C-LV. Planting partially resistant varieties is one of the most effective management options.

Beet Armyworm

We have observed some Beet Armyworm damage in the non-Bt cotton fields that we are scouting. However, larval survival is low, with one larva surviving in some cases but in most cases no larvae are surviving. Therefore, an insecticide application was not justified in these fields. Below are some pictures of beet armyworm feeding. One classic characteristic is the "window pane". Young larvae will chew the green layer from the leaves, which causes a "window paned" appearance.



Figure 2. Beet armyworm feeding on cotyledon leaves that caused the "Window Paned" appearance



Figure 3. Beet armyworm feeding on the underside of the cotyledon leaves

Thrips



Figure 4. Curling of the leaves caused by heavy thrips feeding

We have reached treatable levels in some fields and are starting to see leaf and terminal damage. However, a majority of the fields have low thrips pressure or are growing fast enough to out run developing thrips populations.

Monitoring your fields closely will allow you to detect when seed treatments or at planting insecticides have worn out. If you start picking up immature thrips, then your at planting insecticides or seed treatments have likely run out. Treatments may be justified when you are averaging one thrips per leaf. Timing is the most important component of foliar applications. If considerable damage occurs prior to treatment, then you may have missed your opportunity to have the most effect. Once you reach 5 true leaves, then treatments are probably unjustified because there is enough leaf mass and you are likely safe from economic damage.

Rhizobium Nodulation in Peanuts

We have observed a few fields with low nodulation levels. Below is a chart that can be used to rate your nodulation levels at 5 to 6 weeks after planting. If early nodulation is good, you can expect it to continue to increase toward peak nodulation (usually August), but if early nodulation is poor it probably isn't going to improve. Minimal or nonexistent *Rhizobium* nodulation points toward the need for supplemental N to achieve desired yields.

Table 1. Early season *Rhizobium* nodulation rating for peanuts.

Nodules per Plant	Early Season Nodulation Rating	Management Consideration
More than 20	Excellent	This field will likely have excellent late-season nodulation. Therefore, a response from supplemental (mid-season) nitrogen is doubtful.
16 to 20	Very Good	Late-Season nodulation should also be strong. Therefore, you should reduce your mid-season nitrogen application.
11 to 15	Good	Will produce a good crop but may consider some reduction in your mid-season nitrogen application.
6 to 10	Fair	We would like to see higher nodulation than this. Therefore, a mid-season nitrogen application is a good bet.
Less than 5	Poor	These nodules may be from <i>Rhizobium</i> that are not specific for peanuts. A mid-season nitrogen application is essential. Try to determine why the nodulation was poor in this field.

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Meeting Announcement

Texas AgriLife Extension Service in Terry County is holding a series of meetings titled **"Management of Insects and Diseases in Peanuts."** The first meeting will be **Tuesday June 15 from 9 to 11 at Birdsong Peanuts (1564 CR 474) in Brownfield.** Speakers include Dr. Jason Woodward and Scott Russell. 2 IPM CEUs will be offered. There will be a tour of the shelling plant after the meeting. For further information please contact Chris Bishop, County Extension Agent - Ag in Terry County at 806-637-4060.

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Information for this newsletter was obtained from the following publications:

- *Compendium of Cotton Diseases*, Second Edition. APS Press, 2001. Kirkpatrick, T.L. and C.S. Rothrock, ed.
- *Texas Peanut Production Guide*. Texas AgriLife Extension Service.

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Volume III, No. 6

June 17, 2010

Cotton General Situation

Hail storms during the last week have damaged some isolated cotton fields. Damage ranges from minor leaf damage to complete stand loss. For the most part, the cotton has benefited from the warm temperatures and it is starting to stack on several new nodes. Cotton stages range from four true leaves to 8 true leaves. Several fields are starting to put on squares. As we start moving into the squaring stage, we need to keep an eye out for lygus bugs and fleahoppers. I have read several reports from down state indicating high fleahopper populations.

We are still picking up an occasional beet armyworm and we have also found a few yellow striped armyworms. As reported in last week's newsletter, the armyworms have not reached economically damaging levels. Thrips pressure has decreased and a majority of the cotton is past the point at which thrips can cause economic damage. The presence of southern root-knot nematodes is becoming more evident in some fields. Stunting and uneven stands are some of the best indicators of nematode presence. Be sure to examine the roots for nematode galls before concluding that nematodes are the cause of the stunting. Stunting and stand loss can also be associated with diseases, herbicide damage, planting too deep, and other cropping issues.

Peanuts General Situation

Peanuts are looking good and we have seen a few blooms in some fields. *Rhizobium* nodulation has increased in some peanut fields, but we are still seeing low nodulation levels in a couple of the fields we are scouting. Low populations of white grub worms have been found in a couple of fields. Grubs are the immature stage of June beetles. White grubs feed on the secondary or feeder roots of the plant, leaving the tap root intact. Plants appear to die of drought stress because there are no hair roots left to draw water. The beetle larvae do not travel far horizontally, but they do move a great deal vertically within the soil moisture profile. Grubs are usually found in pockets within a field. To locate damaging populations, sift 1 row foot of soil to a depth of 12 inches at each site. White grub larvae are generally whitish to grayish in color, have a tan to black head, and often have a dark area near the end of the abdomen. The key field identification characteristic is that they curl into a "C-shape" when disturbed. White grubs cannot be effectively controlled with approved insecticides.

Weeds and Herbicides Applications

Weeds are quickly becoming a major pest in several fields. In last week's *FOCUS on South Plains Agriculture* newsletter, Dr. Randy Boman (Texas AgriLife Extension Service - Agronomist) discussed the importance of timely weed control. He said the following: "With the Roundup Ready Flex system, more or less, producers have the option of making glyphosate applications essentially full season, and at higher rates to target more difficult to control weeds. Caution should be taken here to not allow the larger weed size to cause competition losses in the cotton."

Herbicides need to be applied when the weeds are actively growing. If the weeds are stressed, then herbicides will be less effect. The success of herbicides applied postemergence is largely dependent on weed size and coverage, which often go hand in hand. Be careful not to exceed weed size restrictions according to herbicide label. Use an appropriate carrier volume to ensure thorough spray coverage on the weed. A weed that does not come in contact with the herbicide will not be controlled. Controlling weeds early is when you can achieve your biggest bang for your buck. (Reported by Dr. Peter Dotray, Dr. Todd Baughman, and Dr. Wayne Keeling in the Crop Production Guide Series, a supplement to Focus on Entomology newsletter)



Figure 1. Herbicide carry over caused severe stunting in some plants, while other plants were able to escape the herbicide injury and are growing normally.

Herbicide Injury

We have also seen a lot of herbicide injury in both cotton and peanuts. In several cases there has been stand loss and stunting associated with the herbicide injury (See [Figure 1](#)).

It is very important to understand the potential causes of herbicide injury. The following is a list of potential causes: improper incorporation, spray-tank contamination, improper sprayer calibration, excessive herbicide rate for the soil type, improper herbicide application timing or method, failure to adhere to crop rotation restrictions, interaction with other pesticides or spray additives, application of herbicide to crops under stress, off-target drift of herbicides labeled for use in other crops, small concentration of herbicides in irrigation water, and normal herbicide symptomology. (Reported by Dr. Peter Dotray, Dr. Todd Baughman, and Dr. Wayne Keeling in the Crop Production Guide Series, a supplement to Focus on Entomology newsletter)

Garden Webworms

We have found several Garden Webworms in a non-Bt cotton field south of Seminole. Garden webworms are green, have several black dots along their sides, a light stripe down the back, and a narrow head (See [Figure 2](#)). In comparison to a beet armyworm, garden webworms are a thinner worm. The webworms are mainly feeding on leaves. They are skeletonizing leaves and chewing large holes in the leaves (See [Figure 4](#)). There was extensive webbing associated with the webworm feeding and lots of black frass. In some cases, the larvae were drawing leaves together and forming a web between the leaves (See [Figure 5](#)).



Figure 2. Garden Webworm



Figure 3. Side view of a garden webworm



Figure 4. Garden webworm feeding on a leaf



Figure 5. Extensive webbing and frass around a garden webworm

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Information for this newsletter was obtained from the following publications:

- May 6, 2004 Crop Production Guide Series, a supplement to Focus on Entomology Newsletter
- June 11, 2010 Focus on South Plains Agriculture Newsletter
http://lubbock.tamu.edu/focus/focus_2010/June_11/June_11.pdf

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Volume III, No. 7

June 25, 2010

General Situation

Overall the cotton and peanut fields are looking pretty good. Most fields have received some rainfall and are benefiting from the warm temperatures. Some fields in the Loop area are struggling after being hit with a severe hail storm on June 10 and heavy rainfall on June 20.

Peanut fields are blooming and we have some pegs starting to form. Cotton stages range from 5 leaves to 12 leaves. Square set is ranging from 79% to 100%, with a majority of the fields setting closer to 100%. During the last two weeks we have accumulated approximately 330 heat units. It takes 300 to 350 heat units for a square to become a white flower. Therefore, any day now, we should start seeing a few white blooms in our more advanced fields.

Overall, insect pressure has been low during the last week. The garden web worms that we found last week have cycled out and they are no longer being found. We are continuing to find grubs in a peanut field east of Seagraves. However, we have not noticed any wilting due to the grubs feeding on the roots and reducing water uptake in the plants.

Weed pressure is increasing in several fields. Nematode pressure is increasing in several fields too.

During the last week, I have been in a couple of fields that may benefit from a plant growth regulator application. In most cases these are fields that have received significant rainfall and are on the high end as far as fertility and irrigation levels. I would not recommend that plant growth regulators be applied in a field that is struggling due to nematode pressure, diseases, lack of fertility, and/or low irrigation levels.

IPM Radio Program

Be sure to tune in to Ag Talk on KJTV, radio 950 AM, on Wednesdays from 1:00 to 2:00. The Extension Agents-IPM from around the area discuss evolving pest situations and current cropping conditions.

Plant Growth Regulators (PGR)

In the June 18 edition of FOCUS on South Plain Agriculture, Randy Boman, Extension Agronomist, provided the following information on mepiquat-based (Pix, Pix Plus, Mepex, Mepichlor, Mepiquat Chloride, Mepex GinOut, Stance, and others) plant growth regulators (PGRs). Mepiquat chloride reduces production of gibberellic acid in plant cells that in turn reduces cell expansion, ultimately

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resulting in shorter internode length. Mepiquat chloride will not help the plants compensate for earlier weather or disease damage by increasing growth rate. It may under good growing conditions increase fruit retention, control growth, and promote earliness.

Determination of application rates is generally more "art" than "science" for these products. Applications should begin when 50% of the plants have one or more matchhead squares (see specific product label for more information). It is best to get a handle on excessive growth potential early if conditions favor excessive growth for an extended period of time. Herein lies the High Plains dilemma: It is unknown at this time as to how weather will affect the crop in July and on into early August. Will we get 100+ degree temperatures, southwest winds of 30 mph at 10% relative humidity? If so, those conditions will limit plant growth in many fields with low irrigation capacity. Watch high growth potential varieties and fruit retention. If a high growth potential variety has been planted and has encountered low fruit retention, then mepiquat chloride rate should be increase, especially under high water, fertility, and good growth conditions. One should target applications to fields with high growth potential. Some newer varieties may need aggressive management under high irrigation capacity and/or if heavy rainfall conditions are encountered. Visit with your seed company representative to determine which new varieties should be watched closely for mepiquat chloride needs under field-specific conditions.

Southern Root-Knot Nematodes

Figure 1 is a picture from a trial where we are evaluating a susceptible cotton variety and a tolerant cotton variety in a high nematode pressure field. We are seeing noticeable difference in plant height.



Figure 1. Susceptible cotton variety on the left and tolerant/partially resistant cotton variety on the right

We are also seeing added good growth in another field that was planted in mid-May and that had Temik 15G applied in-furrow (*Figure 2*). Essentially, the Temik 15G bought some time and the roots were able to grow a lot before nematodes began infesting the roots. In the picture, notice how the nematode galls are lower on the root.

Growers have several options to choose from for at-planting nematicides, including seed applied nematicides and nematicides applied in-furrow at planting. Use of nematicides should be based on nematode pressure within each field.

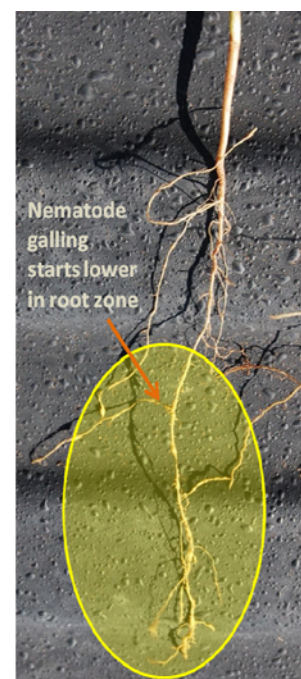


Figure 2. Nematode galls occurring lower on the root

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Fusarium wilt in Cotton



Figure 3. Leaf with Fusarium wilt symptoms



Figure 4. Plant with Fusarium wilt symptoms

Fusarium wilt has started to hit in some cotton fields. *Figure 3 and 4* are pictures of a plants with symptoms of Fusarium wilt. If you had stand loss in your field last year but you where not sure what caused it, then now is the time to confirm whether or not it was likely caused by Fusarium wilt. As the saying goes "The best thing a farmer can put on his field is his shadow." This is the only way you are going to locate plants that may be dieing from Fusarium wilt. Be sure to dig up the dieing plants and examine the roots for nematode galls. Nematode infestations make the plants more susceptible to Fusarium wilt. Please feel free to give me a call if you would like me to look at a field. We can work with you to try and determine if it is Fusarium wilt. If Fusarium wilt is confirmed in your field, then you need to select a variety that performs best under Fusarium wilt pressure for your 2011 crop.

In FOCUS on South Plains Agriculture, Dr. Jason Woodward provided the following information on Fusarium wilt. Alone Fusarium wilt, is a weak pathogen, and damage caused by the Root-knot nematode is needed to induce this disease. Therefore, management options that are employed to minimize nematode damage are often integrated into Fusarium wilt management strategies. For example, the use of nematicides results in higher stands, lower disease incidence, and greater yields. While nematicides have no direct effect on Fusarium wilt, the benefit comes from

reducing damage caused by nematode. Furthermore, results from trials conducted in fields infested with Fusarium wilt have found that varieties which posses partial resistance or improved tolerance to Root-knot nematode consistently perform well. In addition, varieties with no known nematode resistance also perform well.

Cotton Fleahoppers

Several people have been asking about fleahopper (*Figure 5*) populations. We have not found any damaging fleahopper populations in the fields that we are scouting. We have seen a few scentless plant bugs (*Figure 6*) in the cotton fields. However, scentless plant bugs are not known to cause damage in cotton. Be sure not to confuse these for lygus bugs.



Figure 5. Fleahopper adult (top) and nymph (bottom)



Figure 6. Scentless plant bug (top) and Lygus bug (bottom)

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Beet Armyworms

On Monday we found a few beet armyworm egg masses in a non-Bt cotton field south of Seminole. I revisited the field this morning and the larvae are now approximately three days old (*Figure 7*). Several things need to be considered before applying an insecticide, such as, what percentage of the plants are infested, what is the larval survival rate, what are the beet armyworms feeding on, and are there beneficial insects present? In this particular field I found a few "hits" where larval survival was high. But larval survival was low for a majority of the "hits." We decided to hold off treating this field since less than 1% of the plants are infested and we are finding several beneficial insects (including ladybird beetles, assassin bugs, and spiders) feeding at the "hit" sites. Additionally, the beet armyworm larvae are feeding on the leaves and we have not observed any damage to the plant's terminals. This particular field has just started to put on squares and we would like to allow the beneficial insects time to increase. The beneficial insects will help to lower larval survival as we progress through the season. The beet armyworms are likely coming from a weed patch near this field.



Figure 7. Beet armyworm "hit"

We have not seen any beet armyworm activity in Bt cotton.

Southern Blight

A crop consultant found a few plants infected with Southern Blight. However, we do not believe that a fungicide application is justified at this time since the disease seems to be confined to these few plants and is not spreading down the rows.

This disease is characterized by feathery sheaths of fungal mycelia and spherical-shaped, brown sclerotia (*Figure 8*).



Figure 8. Southern blight in peanuts

Information for this newsletter was obtained from the following publications:

- March 15, 2010 Focus on South Plains Agriculture Newsletter
- June 18, 2010 Focus on South Plains Agriculture Newsletter
<http://lubbock.tamu.edu/focus>

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Volume III, No. 8

July 8, 2010

IPM Radio Program Ag Talk on KJTV, radio 950 AM, on Wednesdays from 12:30 to 2:00.

General Situation

Rain, Rain, and more Rain! The Fourth of July weekend brought us some slow drizzling rainfall. We recorded 4 1/2 to 6 inches of rainfall at our research plots scattered throughout the county and we received some reports of up to 9 inches. For the most part, the rainfall was able to soak into our sandy soils. However, there were wash outs in some fields. Monday and Tuesday brought us some drier weather, but that all changed on Wednesday afternoon. In Seminole we have received 2+ inches since yesterday afternoon. We are very thankful for the rainfall, but it has added an extra challenge for our producers. Several producers need to apply preventative fungicides in their peanuts, herbicides in their peanut & cotton fields, and plant growth regulators on their cotton. This cool wet weather is the perfect environment for disease development. I would highly encourage growers to scout their peanut fields for pod rot diseases, foliar diseases, and blights.

Insect pressure has been low during the last two weeks. Square set is averaging around 90% in a majority of our fields. Plants may start shedding a few small squares if the soil remains saturated and the cloudy conditions persist for much longer. Scouting your fields on a regular basis will enable you to determine if a low square set is caused by insects or weather related factors.

Gearing -Up for Pod Rot

Reported by Dr. Jason Woodward

It is time to consider preventative applications for soilborne diseases. Two different fungi (*Rhizoctonia solani* and *Pythium spp.*) are the primary components of the pod rot complex. These fungi may occur alone, but are often found together. Positive disease identification is necessary to ensure maximum economic returns for chemical applications. Subtle differences between symptoms caused by the two can be observed. *Pythium* infections may include blackened decay with a greasy appearance (See [Figure 1](#)); whereas, *Rhizoctonia* infections may have more of a dry-textured appearance (See [Figure 2](#)). Laboratory confirmation is often required for a complete diagnosis.

Preventative fungicide applications are generally administered 60 to 90 days after planting; however, early initial applications may result in the need for an additional application late in the season if conducive environmental conditions persist. Several factors must be considered when applying pod rot fungicides:

1. **Growth Stage** - Applications made before the formation of pegs and development of pods may limit the amount of product that is ultimately deposited in the pegging zone. Therefore, it is important to monitor peg development and delay applications accordingly.
2. **Pathogen Pressure** - The identification of which pod rot pathogen you are dealing with will dictate fungicide selection.



Figure 1. Symptoms of *Pythium* pod rot



Figure 2. Symptoms of *Rhizoctonia* pod rot

3. **Fungicide Selection** - Pod rot fungicides with activity against **Rhizoctonia** consist primarily of Abound, Artisan, and Convoy. Other fungicides such as Folicur (and other generic formulations of tebuconazole) and Provost are labeled for *Rhizoctonia* pod rot; however, their labels specify that applications are made in a 4-block regime (that is more congruent with practices in the Southeastern US). Additional fungicides are labeled for use against *Rhizoctonia*; however, efficacy data of these products is limited. Fungicide options for **Pythium** are limited to Ridomil (several formulations including a liquid and a granule are available), and Abound (suppression only, at the maximum label rate of 24.5 fl oz/A).
4. **Application Method** - The activity of these products can be increased substantially when applied via chemigation; however, the banding of initial applications are often more cost effective. Broadcast applications result in fungicide treating bare ground which may be wasteful. Increasing carrier volumes (>20 gallons per acre) will improve deposition into the lower canopy, especially when applying liquid Ridomil formulations (as that product binds very quickly to the leaf). Administering irrigation soon after fungicide applications will also help to redistribute fungicides deposited on the foliage and increase concentrations delivered to the pegging zone.

Sclerotinia blight

Reported by Dr. Jason Woodward

In addition to pod rot, consideration must be given to preventative applications for *Sclerotinia* blight. *Sclerotinia minor*, the causal agent *Sclerotinia minor*, are most prevalent in parts of Gaines, Collingsworth, Hall, and Erath Counties. The disease generally appears as rows begin to lap with the first symptoms being flagging of foliage in the upper



Figure 3. Bleached & shredding appearance



Figure 4. Black angular shaped sclerotia

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portion of the plant. Examination of the lower canopy in the early morning will reveal white fluffy mycelia. Stems of infected plants will have a bleached shredded appearance (See [Figure 3](#)) with small, black, angular shaped sclerotia (See [Figure 4](#)) forming on and in them. Sclerotinia blight is best managed through an integrated approach. Adequate crop rotation (3-4 years) will help diminish densities of sclerotia in the soil. The use of partially resistant varieties (such as Tamrun OL07) is advised in fields with a history of the disease. Applications of the fungicide Omega and/or Endura can help reduce losses associated with the disease. A list of fungicide registered for use in peanut can be found on the web at <http://peanut.tamu.edu> click on "Texas Peanut Production Guide"

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- **March 15, 2010 Focus on South Plains Agriculture Newsletter**
- **June 18, 2010 Focus on South Plains Agriculture Newsletter**
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Volume III, No. 9

July 19, 2010

Gaines County Peanut Tour

The Gaines County Peanut Tour will be held on July 27, 2010 beginning at the Gaines County Extension Office located at 101 S. Main, Courthouse, Rm. B-6 in Seminole. Registration will begin at 8:45 a.m. with the tour departing at 9:15 a.m.

The Program will conclude at 1:00 p.m. at the Gaines County Party House located at the Gaines County Park. Individuals with pesticide applicators licenses will be awarded three (3) general Continuing Education Units (CEU's) for attending this program. For more information contact Terry Millican with the Texas AgriLife Extension at (432) 758-4006 x 238 or Manda Cattaneo at (432)788-0800.

Individuals with disabilities who require an auxiliary aid, service or accommodations in order to participate in an Extension sponsored activity are encouraged to contact the Gaines County Extension Office at (432) 758-4006 x 238.

General Situation

Cotton and Peanut fields are looking good. Several cotton fields are blooming. Nodes Above White Flower (NAWF) is ranging from 8 to 10 NAWF in several fields. This indicates that there is potential for a good yield, as long as Mother Nature cooperates with us and the plants are able to maintain and mature out the high fruit load.

We are picking up populations of bollworms and aphids in the cotton fields we are scouting. Verticillium wilt is becoming very prevalent in fields that are known to have a history of Verticillium wilt. We are also picking up a little cotton rust and bacterial blight.

Peanuts are pegging and forming pods. A majority of the peanut fields have several pegs and again this is indicating a good yield potential. However, these fields will use a lot of water to fill out all of the pods.

We are closely monitoring our scouting fields for Rhizoctonia and Phythium pod rot. A majority of the infected pegs/pods that we have taken into the lab have come back as Rhizoctonia. A very small percentage has come back as Phythium.

Bollworms

Bollworm populations have reached treatable levels in half of the non-Bt fields that we are scouting. On Friday we were finding 1 to 3 day old worms and damaged squares in the mid to upper canopy.

Moths usually lay single eggs on the tops of young, tender terminal leaves in the upper third of the plant. Eggs are pearly white to cream color and about

half the size of a pinhead. Eggs hatch in 3 to 4 days, turning light brown before hatching. Young worms usually feed for a day or two on tender leaves, leaf buds and small squares in the terminal before moving down the plant to attach larger squares and bolls. When small worms are in the upper third of the plant, they are most vulnerable to insecticides. Sometimes moths deposit eggs on squares, bolls, stems, and in lower parts of the plant. This may occur when cotton plants are stressed and making little new growth, or during periods of high temperature and low humidity. Detection of eggs and control of small worms are more difficult when eggs are deposited in these locations.

Cotton fields should be scouted carefully every 3 to 5 days. Eggs and newly hatched worms are usually found in the plant terminals and indicate possible outbreaks. Natural mortality agents such as weather and predators frequently control these pests before any damage occurs. Once worms have grown to larger than 1/2 inch long, natural and insecticidal control are less effective. Insecticides applied to control 1/2 inch long worms are only moderately effective.

Conventional insecticides often kill beneficial insects and spiders, thus opening the door for secondary pests. Avoid making conventional insecticide treatments on the basis of egg numbers or first signs of crop damage.

The entire plant should be search for bollworm larvae and injury. A proper sample includes squares, white blooms, pink blooms, bloom tags, and bolls. Count the number of eggs, worms, and key predators. Predators and parasites are very important in reducing the numbers of eggs and larvae.

Table 1. Bollworms Action Threshold

Cotton Stage	Worm size	Cotton Type	
		Non-Bt	BT
Before Bloom	All	30% damaged squares and worms are present	
After boll formation	¼ inch or less	10,000 worms/acre	Do not Treat
	Larger than ¼ inch	5,000 worms/acre	5,000 worms/acre with 5-15% damaged fruit

Verticillium Wilt

Over the past week, Verticillium wilt has become very evident in some cotton fields. There are no fungicides that can be applied to reduce Verticillium wilt incidence. Be sure to make a note of which fields have Verticillium wilt, so that you can plant a tolerant cotton variety in the future.

Cotton Aphids

Cotton aphid populations are starting to build in some fields. Most of the reports that I have received are from eastern Gaines County. We are mainly seeing them in fields that have a skippy stand. Aphids are usually found on the underside of leaves, on stems, in terminals, and sometimes on fruit. Heavy and prolonged infestation can cause leaves to curl downward, older leaves to turn yellow and shed, squares and small bolls to shed and bolls to be reduced in size, resulting in incomplete fiber development.

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Natural control by unfavorable weather, predators, parasites, and pathogens can be effective in holding populations below damaging levels. Sometimes aphid numbers increase to moderate or heavy levels and then decline for no apparent reason.

Fields should be scouted twice a week for developing aphid populations and beneficials. If you find a high population of aphids, be sure to also make note of the number of beneficials present. Then come back in 3 to 4 days and determine if the aphid populations and beneficial populations are increasing or decreasing. This will help you to determine if the field needs to be treated or if the natural enemies will be able to reduce your aphid populations below treatable levels.

Dr. David Kerns applied an aphid insecticide trial in eastern Gaines County this past Thursday (July 15). A fairly high population of ladybird beetles were present when the insecticide was applied. Below are the preliminary results.

Table 2. Percent reduction in **aphid** populations from July 15 to July 19

Treated Plots	~90% reduction
Untreated Plots	~61% reduction

Table 3. Percent change in **ladybird** beetle populations from July 15 to July 19

Treated Plots	~63% reduction
Untreated Plots	~54% increase

PGR Applications based on Height to Node Ratio

Several fields have plants that are hip high but I would caution growers in making PGR applications. We are starting to see some signs of wilting during the heat of the day. Even though the plants are tall, their growth may have already started to slow down due to moisture stress and heat stress.

Height to Node Ratio is average internode length and can be determined by dividing the height of the plant in inches by the number of nodes - SO. Nodes measure plant age and height is a measure of plant vigor. Early season plant vigor is reflected in the relative spacing of nodes on the plant; a node develops approximately each 45-55 heat units (DD-60's). This approximation is accurate enough in early season to approximate the age of an emerged plant by counting nodes. Plant height, or spacing between nodes, is a measure of how rapidly the plant is growing.

Within reason, node development is insensitive to environmental stress and accurately measures plant age. The section of stem between each node (internode) is insensitive to plant age, and very sensitive to environmental conditions. This makes internode length a reliable indicator of plant growth and vigor. By evaluating the node-internode relationship, the amount of stress, and the approximate time period of stress can be determined. In order to utilize this information, a method of assigning numbers to this relationship is needed. This number is called the height/node ratio.

When the developing plant is stressed the height/node ratio will be low. Plant height is measured from the plant's cotyledon leaves (or scars) to the top of

the plant. Cotyledon leaves are the leaves that appear at emergence of the plant. They are the only leaves on the stem that are exactly opposite each other.

As a general rule, height/node ratio prior to early bloom should be in the 0.8 (dryland) to 1.5 (irrigated) range. After mid bloom, the height/node ratio will start decreasing due to increasing fruit load stresses placed on the plant. This is normal and expected. If this ratio remains high, or increases, after mid bloom, this indicates the plant is experiencing excessive vegetative growth due to lack of fruit set or excessive nitrogen fertilization. This cotton will normally benefit from an application of plant growth regulator such as Pix.

Information for this newsletter was obtained from the following publications:

- **Managing Cotton Insects in the High Plains, Rolling Plains, and Trans Pecos Areas of Texas**

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Volume III, No. 10

July 28, 2010

Mark Your Calendars-- August 24th Gaines County Ag Tour

General Situation

Cotton stages range from 5 to 10 Nodes Above White Flower (NAWF), with a majority of the fields averaging 7 to 8 NAWF. We have seen the NAWF drop rapidly in some fields. This is a good indication that the plants are stressed. Irrigation may not have been started back quick enough and the plants experienced some water stress.

Peanuts are continuing to peg and form pods. We have seen a few large pods in some fields. Several fields are loaded with pegs and pods and it will be a challenge to keep up with the irrigation demands of this crop. Growers need to make sure that they do not get behind on their irrigation.

Verticillium wilt incidence has increased in cotton fields and we are starting to see evidence of Verticillium wilt in peanuts.

Bollworms in Peanuts

Anyone scouting peanuts will not have to look hard to find bollworms and yellow striped armyworms in the foliage. Both of these pests are feeding on the leaves and causing noticeable leaf loss. Worm counts range from 0 to 4 per foot of row, with several fields averaging around 1 bollworm per foot of row. We have not observed any fields that warrant an insecticide treatment. Most of the worms that we found this week were 1 inch or larger and are fixing to cycle out. This means that we may get another heavy egg lay within the next two weeks.

Peanut plants can tolerate extensive foliage loss before there is a significant yield loss. Spanish and Valencia peanuts can tolerate approximately 6 to 8 medium to large larvae per foot of row. Runners and Virginias have more foliage area and can tolerate 10 to 12 worms per foot of row. Be sure to scout your fields to determine if an economically damaging population is present. If chemical control measures become necessary, apply when worms are small. After insecticides are applied be sure to continually monitor the field for secondary pests such as spider mites.

Bollworms in Cotton

Bollworm egg lays have decreased significantly over the last two weeks and a majority of the worms that we are currently finding in non-Bt cotton are 1/2 inch

(medium size) or longer. Insecticides applied to 1/2 inch long worms are only moderately effective.

Currently, we are finding 0 to 5 eggs per 100 plants in non-Bt cotton. Small worm counts range from 0 to 5 worms per 100 plants. Medium to large worm counts range from 0 to 10 worms per 100 plants. I am expecting the egg lay to gradually increase over the next 2 weeks. So be sure to scout all non-Bt fields to pick up eggs and small larvae.

We have found an occasional bollworm in Bt cotton, but we have not seen any significant damage.

Cotton Aphids

Cotton aphids are present in most fields; however, a majority of the populations are starting to dwindle due to the heat and beneficial insects. We are finding several ladybird beetles, green lacewings, and spiders. Scouting fields every three to four days will help you to determine if aphid populations are increasing or decreasing. Be sure to scout the whole field and do not focus solely on the hot spots. Sample leaves from the top portion of the plant and the middle portion of the plant, and determine the average number of aphids per leaf. The threshold for aphids is 50 aphids per leaf.

Peanut Pod Rot

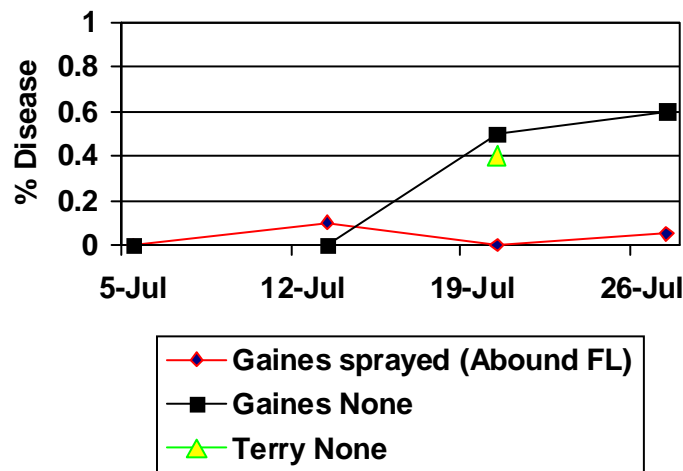
Pod rot is starting to show up in more peanut fields. Most of the pod rot thus far has been caused by *Rhizoctonia*, but we are also picking up some pod rot caused by *Pythium*. Pods infected with *Pythium* usually have greasy dark brown-black lesions and pods may have a wet loose white fungus mat. Whereas, pods infected with *Rhizoctonia* have a drier dull dark brown lesion.



Figure 1. *Pythium* pod rot on the left. *Rhizoctonia* pod rot on the right.

The graph on the left represents the percentage of disease pods in a Gaines County field that has plots sprayed with Abound and plots that have not been sprayed with Abound, and a Terry County field that has not be sprayed with Abound.

There is almost no pod rot where the Abound was applied. We are seeing approximately 0.6% pod rot where the Abound was not applied.



Early Leaf Spot in Peanuts

Early leaf spot is increasing in some peanut fields. Below is information on early leaf spot management provided by Dr. Jason Woodward in the July 28, 2009 edition of *Peanut Progress*. Applications of Abound for pod rot will have some activity on leaf spot; however, leaf spot control may be reduced if applications are made in the rain or followed immediately with irrigation to maximize pod rot control. Initial symptoms of leaf spot generally occur in the lower canopy and consist of small, chlorotic flecks on the leaf surface. As the disease progresses lesions become evident throughout the canopy. Chemical burns can often be confused with leaf spot. The production of microscopic spores within the lesion can be used in the diagnosis of leaf spot. Spores from the lesions are disseminated by wind, rain, or irrigation. New lesions from secondary infections appear after 10 to 14 days after infections occur.



Figure 2. Early Leaf Spot

Solenopsis mealybug or cotton mealybugs

Earlier this week we found a small area in a cotton field that had a few cotton mealybugs on the underside of the cotton leaves. There was no noticeable damage to the plants. However, this is a major pest in many parts of the world. They start on the root and then move to the foliage. The adults are about 5mm long. Give me a call or bring some samples by my office if you find some in your fields. At this time we are not recommending that any insecticides be applied, we would just like to closely monitor this pest.



Figure 3. Immature cotton mealybug. Size ~ 3mm

Nematodes

The impact of cotton root-knot nematodes is very evident in a lot of cotton fields this year. I have seen severe stunting, which will likely impact yields. Cotton root-knot nematodes will continue to be a major player in these fields as long as there is a suitable host. Rotation to a non-host such as peanuts will help to reduce your cotton root-knot nematode populations. Small grains will also have an impact on your nematode populations. If you decided to plant cotton in these fields in 2011, then be sure to choose a variety that is nematode tolerant and use an at-planting nematicide. Below is a picture of a tolerant variety and a susceptible variety.



A picture of the same trial was included in the June 25 Gaines County IPM Newsletter. As you can see, the differences in plant height are even more evident.

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GAINES COUNTY IPM NEWSLETTER

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Volume III, No. 11



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August 6, 2010

Upcoming Meetings

August 13th - Management of Insects and Diseases in Peanuts

9am to 11am in Brownfield at Tejas Peanuts, 1681 FM 403

Speakers: Dr. Jason Woodward and Scott Russell

For further information please contact Chris Bishop at 806-637-4060

August 24th Gaines County Ag Tour

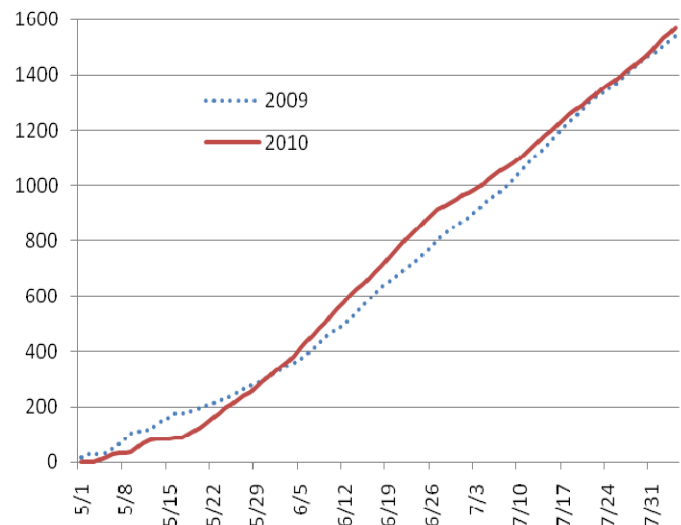
Details to follow

Cotton General Situation

We have not received any significant rainfall since early July. The plant's water use increases dramatically from first bloom to open boll. Once blooming starts, cotton prefers frequent, low-volume applications of water rather than large, less frequent amounts. This strategy minimizes the degree of water stress between rain or irrigation and thus increases fruit retention.

Cotton stages range from 3 to 8 Nodes Above White Flower (NAWF), with a majority of the fields averaging 5.5 NAWF. Several fields have reached cutout, which is 5 NAWF. The crop is maturing quickly due to the hot conditions. It takes approximately 1640 Heat Units (H.U.) from planting to first open boll. Since May 1 we have accumulated 1569 H.U.

Accumulated Heat Units (H.U) from May 1 to August 4, 2009 and 2010



Peanut General Situation

Large pods have formed and growers need to make sure that they do not get behind on their irrigation. Pod rot caused by Pythium is starting to show up in more peanut fields. Pods infected with Pythium usually have greasy dark brown-black lesions and pods may have a wet loose white fungus mat. Varying levels of early leaf spot is also present in a majority of the peanut fields. Verticillium wilt is present in peanut and cotton fields.

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Peanut Crop Update - Reported by Dr. Todd Baughman, State Extension Peanut Specialist

The peanut crop is in full swing now with the crop setting a heavy pod load. Maintaining irrigation will be the key to successfully fulfilling the yield potential of this crop at this stage of the season. With the increase in daytime highs we are already starting to see the crop exhibit signs of stress (upturned leaves and a silver cast to the field).

In addition with the heavy rainfall this year nitrogen stress is showing up in many of our fields. If you are considering applying additional nitrogen, don't apply more than 30lbs/acre in one application and do not apply any nitrogen too late in the season. High applications rates of nitrogen or late applications can lead to increased pod rot and decreased maturity issues.

Leaf Spot Management in Peanuts - Reported by Dr. Jason Woodward, Extension Peanut Pathologist

We are seeing moderate levels of early leaf spot across the region. Early leaf spot, caused by *Cercospora arachidicola*, is the predominant leaf spot in most fields. Several questions have been made regarding post-infection (i.e. after leaf spot lesions are observed) fungicide options for leaf spot.

Work conducted by Dr. Albert Culbreath at the University of Georgia, Coastal Plain Experiment Station in Tifton indicates that several fungicide options are available for post-infection situations.

Headline (9.0 fl oz/A) provided adequate control of leaf spot under post-infection conditions; however, use of Headline in such a manner would not be recommended for fields where Abound is being used in pod rot programs. This is due to the potential for development of fungicide resistance to strobilurin fungicides in the leaf spot pathogen. The addition of Topsin 4.5FL (5.0 fl oz/A) as a tank-mix partner with other fungicides, such as Folicur or other tebuconazole formulations, Tilt/Bravo or other propiconazole/chlorothalonil formulations, or Provost has performed similar to Headline. Despite the activity of Topsin 45FL at 5.0 fl oz as a tank mix partner, applications of Topsin alone are not recommended due to the potential for insensitive populations. Furthermore, no more than two tank-mixes comprised of Topsin should be used within a season, due to concern for fungicide resistance development.

Best management options for minimizing the development of leaf spot resistance include alternating chemical classes (i.e. fungicide groups), utilizing fungicides with multiple modes of action, and properly timing fungicide applications.

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Cotton Aphids and Beneficial Insects

Cotton aphids have increased in all of the fields that we are scouting. Fields that were treated for bollworms have had the greatest increase in aphid populations. Fields that were not treated for bollworms have had a minor increase in aphid populations. Beneficial insect counts are also up in a majority of the fields. Beneficial insect counts range from 0.2 beneficials per plant to 0.73 beneficials per plant. Monitoring the aphid populations and beneficial insect populations will help you to determine if the beneficial insects (See *Figure 1*) are having an impact on your aphid populations or if your aphid populations have reached the 50 per leaf threshold and are increasing rapidly. When counting aphids do not count the light-colored shed skins (see *Figure 2*). Like other insects, aphids shed their skin as they grow.



Figure 2. Aphid shed skins

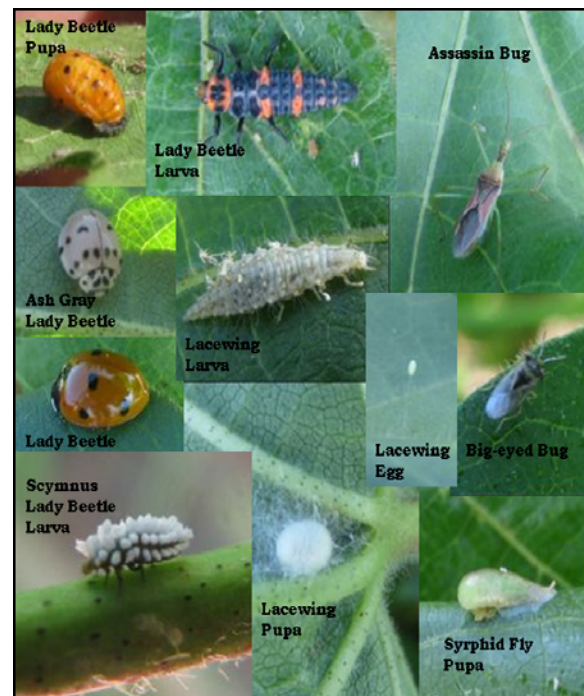


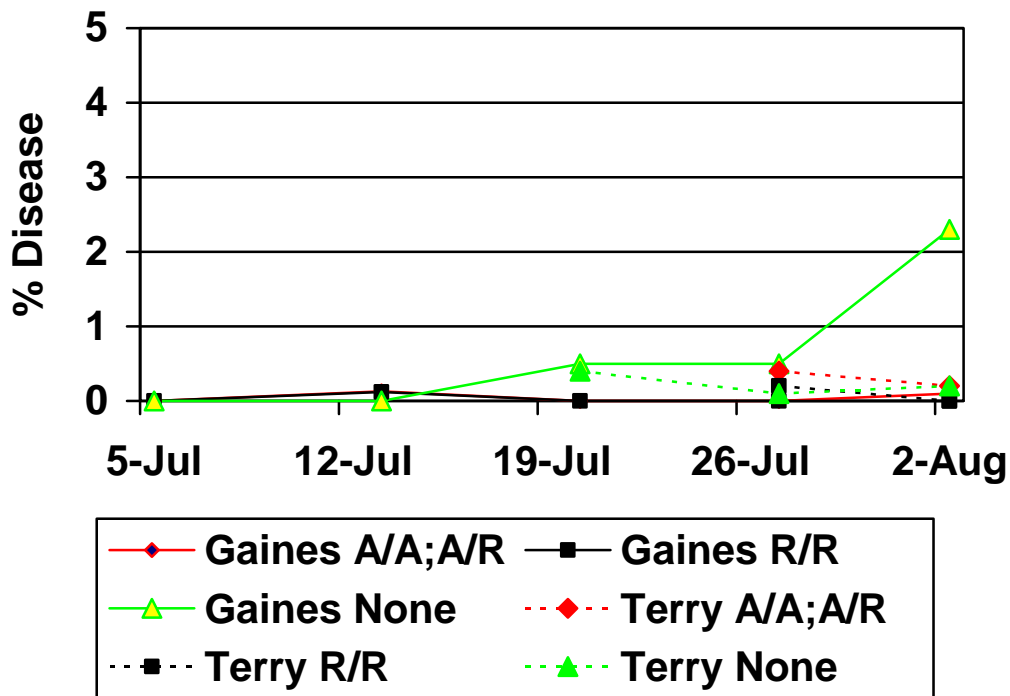
Figure 1. Beneficial Insects

Peanut Pod Rot Research

Dr. Terry Wheeler, Dr. Jason Woodward, Scott Russell, and I are working on a research project to evaluate economical return of fungicide applications and peanut pod rot thresholds. Two commercial production fields are being evaluated in this study. The first is a runner market type peanut field in Gaines County that was planted on April 27. The second is a Virginia market type peanut field in Terry County that was planted on May 11. We are evaluating eight different chemical treatments. Each treatment is replicated three times in the field and the plots will be machine harvested at the end of the season to determine the economical return. Treatments in this test include calendar based timings and pod rot level treatments. The calendar based treatments are Abound followed by Abound, Abound followed by Ridomil plus Provost, and Ridomil plus Provost followed by Ridomil plus Provost and they are applied at approximately 75 and 110 days after planting. The pod rot level treatments are applied when the pod rot levels reach 2% (low threshold), 4% (medium threshold), and 6% (high threshold). Each week we are intensively sampling each of these fields to determine the pod rot levels in each plot. Below is a graph that depicts the results thus far. This week the Gaines County field reached the low threshold of 2% pod rot in the untreated plots. In plots which were treated with Abound at approximately 75 days after planting, there was essentially no pod rot (0.1%). The Terry County field received the 75 days after planting treatment on July 27th and had 0.2% pod rot or less in all the treatments. Pythium was the most abundant pathogen in these two fields this week.

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Volume III, No. 12



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August 13, 2010

Upcoming Meetings

August 24th Gaines County Ag Tour

Details to follow

Cotton General Situation

Cotton stages range from 2 to 6 Nodes Above White Flower (NAWF), with a majority of the fields at 4 to 5 NAWF.

We are picking up cotton bollworms, cotton square borers, beet armyworms, and fall armyworms at various levels in some of our non-Bt (conventional) cotton fields. Worms need to be correctly identified because different insecticides are need for the different worms.



Figure 1. Beet armyworm etching on square and square bracts

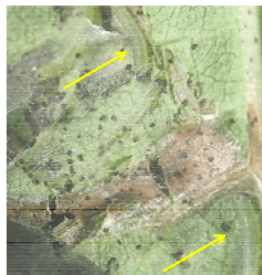


Figure 2. Beet armyworms feeding on a leaf

Beet armyworm stages range from just hatched to 1/4 inch. Beet armyworms are usually light green and hairless. They also have a small black dot on each side of the body near the head. Right now the beet armyworms are mainly feeding on the leaves and square bracts. However, we are also seeing square damage when there are two or more beets on the same square. They also seem to be more likely to feed on flowers when they are in the candle stage.

Bollworm moth trap catches have increased significantly this week. Small bollworm counts ranged from 0 to 25 per 100 plants, with a majority of the fields at 0 to 5 small worms per 100 plants. We have only treated one third of the non-Bt fields that we are scouting. Also, remember fields treated for worms will likely be hit with secondary pests, such as, aphids.



Figure 3. Cotton Bollworm

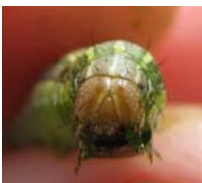


Figure 4. Fall Armyworm

Fall armyworms color varies from light tan to shade of green. The head is brown or black with a prominent white line between the eyes which forms an inverted "Y". They also have four large spots that form a square on the upper surface of the last segment of its body. We are finding fall armyworm egg masses and egg masses with hatching larvae.

Infestations seem to be sporadic throughout the county. Fields within a mile of each other had very different levels of worm pressure. Therefore, fields should be scouted on an individual basis to determine if there is a treatable population.

Low aphid populations continue to be present in a majority of the fields.

We have not seen any worm activity in the Bt (transgenic) cotton.

Peanut General Situation

We have passed our peak blooming period in peanuts and very few blooms are being found at this time. Like the cotton, the peanut plants are concentrating more on maturing the fruit load. We have received some reports of growers finding southern corn root worm damage. The larvae of the southern corn root worm feed on the pods. The adult is a small lime green beetle with black spots on its back. As with any insect, make sure the insect is still present, do not apply insecticides when you are only finding the damaged pods. The decision to treat a field should be made on a field by field bases and not on what is being found in neighboring fields. Be cautious when applying insecticides in peanuts because you increase your chances of flaring secondary pests such as spidermites. The pictures below are from the <http://Peanut.tamu.edu>



Figure 5. Southern corn root worm damage



Figure 6. Southern corn root worm larvae

"Worm" Management - Reported by Dr. David Kerns

Bollworms are continuing to hit non-Bt fields. Most of what we are seeing are light to moderate populations, but be careful; these are the ones that will get you in trouble. It is not uncommon to get several egg lays over a week's time that results in a treatable bollworm population. Problem is, by the time you reach your treatment point; you may have difficulty controlling the old/larger worms. Remember the treatment threshold for < 1/4 inch long worms is 10,000 worms per acre and 5,000 larger worms per acre. In my opinion, pyrethroids are still the best option to deal with the larger worms, but use higher rates, and maximize coverage the best you can by using a ground rig and/or increased spray volume. If you are dealing with larger bollworms you may also consider using one of the "refined" pyrethroids. These are pyrethroids where they have removed the less active chemical isomers and "heated" the chemical up. For instance, Ammo or cypermethrin has been refined to Mustang Max or zeta-cypermethrin. Others include Baythroid, or cyfluthrin to Baythroid XL or beta-cyfluthrin, cyhalathrin to lambda-cyhalothrin or Karate and Proaxis or gamma-cyhalothrin.

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If treating a field for bollworms with a pyrethroid that also contains some aphids, be prepared to make a follow-up application of an aphicide in 7-12 days. Alternatively, include an aphicide with your pyrethroid. If your aphid population is 20 per leaf or less, you can use reduced rates of Intruder or Centric. You may also consider using one of the premixes such as Endigo (Pyrethroid + Centric), Leverage (Pyrethroid + Trimax Pro) or Bidrin XP (Pyrethroid + Bidrin).

Unfortunately we do not have a research based threshold for **fall armyworms**, but we do have some good guesses based on experience. This late in the season in non-Bt cotton, if you are picking up small (<1/4 inch long) fall armyworms in the upper portions of the plant feeding in the terminal tissue or blooms, then 8,000-10,000 worms per acre is a good threshold. However, if the worms are feeding deep in the canopy or if they are larger than 1/4 inch in length, then a threshold of 5,000 worms per acre is probably a better choice.

Pyrethroids are weak against fall armyworms, especially if the worms are deep in the canopy or have much size to them. If you have a mix of fall armyworms and bollworms, a pyrethroid should kill the bollworms but will miss the armyworms. Intrepid and Tracer on-the-other hand are weak on bollworms but better on fall armyworms. Belt or Coragen may prove to be good alternatives.

They both have shown activity towards fall armyworms and although somewhat weaker, they do have activity toward bollworms. Regardless of what you use, maximize coverage and try to target those worms while exposed in the blooms in the upper portion of the plant. All of the fall armyworm products mentioned above are most effective if eaten by the worm. Tracer, Coragen and Belt all have translaminar activity.

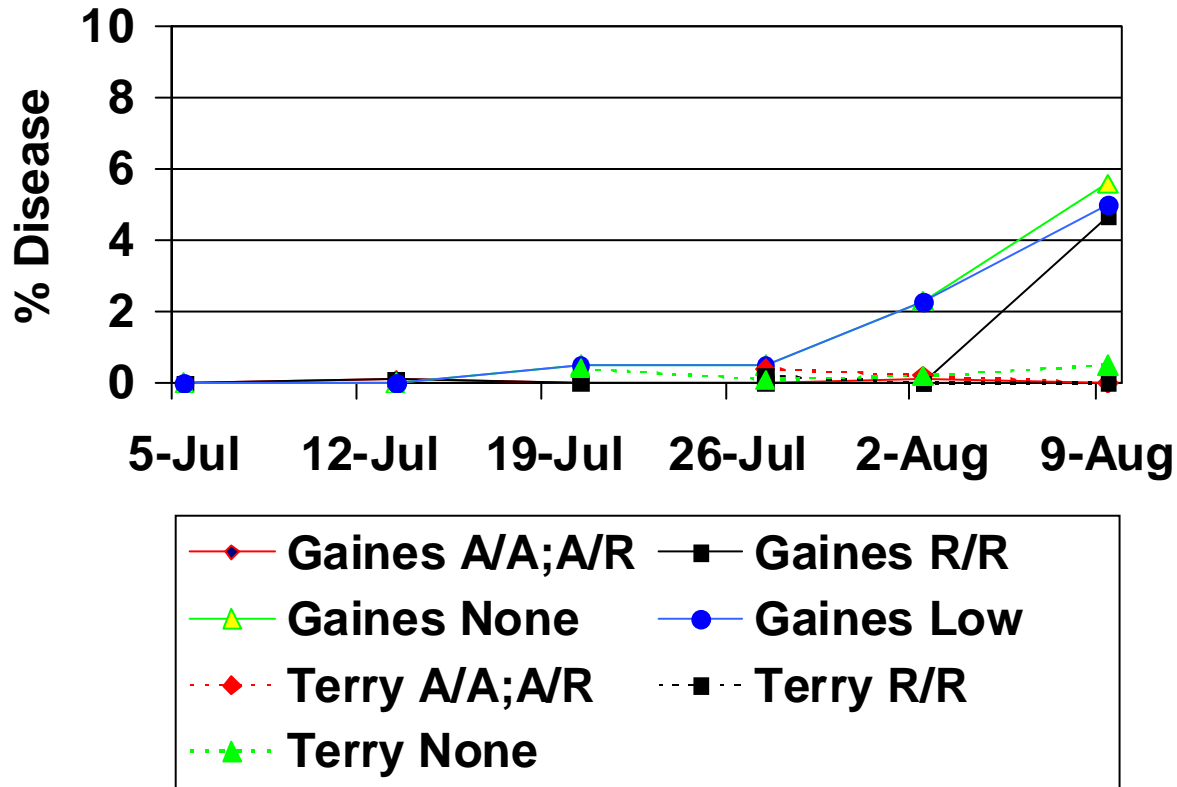
When dealing with worm populations that are predominately **beet armyworms**, there are a number of highly effect insecticides available including: Diamon, Denim, Intrepid, Steward, Belt, and Tracer. If the beets are hitting the fruit, or if the cotton is growthy or rank, coverage may be an issue and some products will be more sensitive to coverage than others. Products that have translaminar activity, which means they "soak" into the leaf tissue, tend to be less coverage sensitive since they can contact the upper side of a leaf and still kill worms feeding on the underside of the leaf. Translaminar insecticides will also provide a greater degree of rain and irrigation fastness since they are absorbed within a few hours after application. All of the previously mentioned insecticides except Intrepid are translaminar. For Intrepid, the worm must eat the product off the surface of the plant tissue. Regardless of the insecticide used, good coverage may be essential to achieve desired results. If coverage is a concern, or the beet armyworm population is comprised of a large percentage of large worms, high-end rates are probably advisable. Don't expect these insecticides to kill the worms immediately after application. Denim, Steward, and Tracer usually require 2-3 days to see good results, and Diamond and Intrepid, since they affect insect growth and development, amy require as many as 5 days.

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Peanut Pod Rot Research

Below are the results from the on-going pod rot peanut research trials that are being conducted in Gaines County and in Terry County. We are evaluating eight different chemical treatments. Treatments in this test include calendar based timings and pod rot level treatments. The calendar based treatments are Abound followed by Abound, Abound followed by Ridomil plus Provost, and Ridomil plus Provost followed by Ridomil plus Provost and they are applied at approximately 75 and 110 days after planting. The pod rot level treatments are applied when the pod rot levels reach 2% (low threshold), 4% (medium threshold), and 6% (high threshold).



Things to NOTE:

- 1) Almost all pod rot is Pythium. We are also picking up a lot of secondary fungi (fungus that infect pods previously infected with another fungi).
- 2) Last week (August 2nd) we applied the fungicide on the low threshold plots in Gaines County. Therefore the Aug. 9 low threshold numbers represent the effects one week after spraying. It can take around two weeks before we see the effects of a fungicide application.
- 3) Terry county has not shown any increase in pod rot yet. It appeared to be pure Pythium this week, so fields must be scouted individually, we cannot infer when one field will increase pod rot based on the increase in another field, even if both have Pythium. The fields may not have the same species of Pythium.

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Information for this newsletter was obtained from the following publications:

- **July 30, 2010 Focus on South Plains Agriculture**
- **August 21, 2009 Focus on South Plains Agriculture**
- **August 15, 2008 Focus on South Plains Agriculture**

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Volume III, No. 13



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August 19, 2010

Upcoming Meetings

August 24th Gaines County Ag Tour
8:00 to 8:30 Registration at the Gaines County Civic Building
8:30 Depart for Ag Tour
12:00 Return to Gaines County Civic Building for a meal

Tour stops will include a peanut Verticillium Wilt trial at Chuck Rowland's farm, a nematicide/variety trial for management of nematodes at Raymond McPherson's farm, a cotton Verticillium Wilt variety trial at Froese Farms, and an irrigated cotton variety trial at Jud Cheuvront's farm.

Dr. Calvin Trostle will cover Gaines County wheat variety trial results and grain sorghum.

Speakers: Dr. Jason Woodward, Dr. Todd Baughman, Dr. David Kerns, Dr. Randy Boman, and Dr. Calvin Trostle.

Please contact Terry Millican at (432) 758-4006 ext. 238 or Manda Cattaneo at (432) 788-0800.

Cotton General Situation

Worm activity continues to be the most important issue in non-Bt (conventional) cotton. The bollworms that we were finding in peanuts in late July/early August have developed into moths. My bollworm moth trap catches have held steady the last two weeks and we are seeing several bollworm moths in the cotton fields. We are finding several small worms underneath the bloom tags that are stuck on the bolls. The moths are laying their eggs in the bloom and when the worm hatches it immediately enters the tip of the boll and begins feeding. So be sure to check blooms and underneath the bloom tags for tiny worms and worm damage.

At this point we are seeing chronic worm infestations. During the last two weeks we have had a continuous egg lay, which has resulted in worm sizes ranging from just emerged to 1 1/2 inches within the same field. A majority of the worms range from 1 day old to 1/2 inch. Last week several fields were below threshold. Moving into this week several more worms have hatched in these fields. The combination of last weeks' worms plus the worms that hatched this week has driven us past threshold in several fields. These chronic infestations are the hardest to control and timing of insecticide applications can be very challenging. My guess is that we are going to have at least another week of heavy bollworm egg lays. This means that growers need to be scouting their non-Bt fields every 4 days at minimum to determine the optimum time for an insecticide application and to catch the worms before they reach 1/2 inch. Insecticides applied to control 1/2 inch long worms are only moderately effective.

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In addition to the bollworms we are also finding fall armyworms and beet armyworms. Please see last week's newsletter for information on thresholds and insecticide recommendations.

We are also picking up a few lygus bug nymphs and stink bugs. The threshold for lygus bugs is 4 per 6 foot of row. The threshold for stinkbugs is 1 per 6 foot of row.

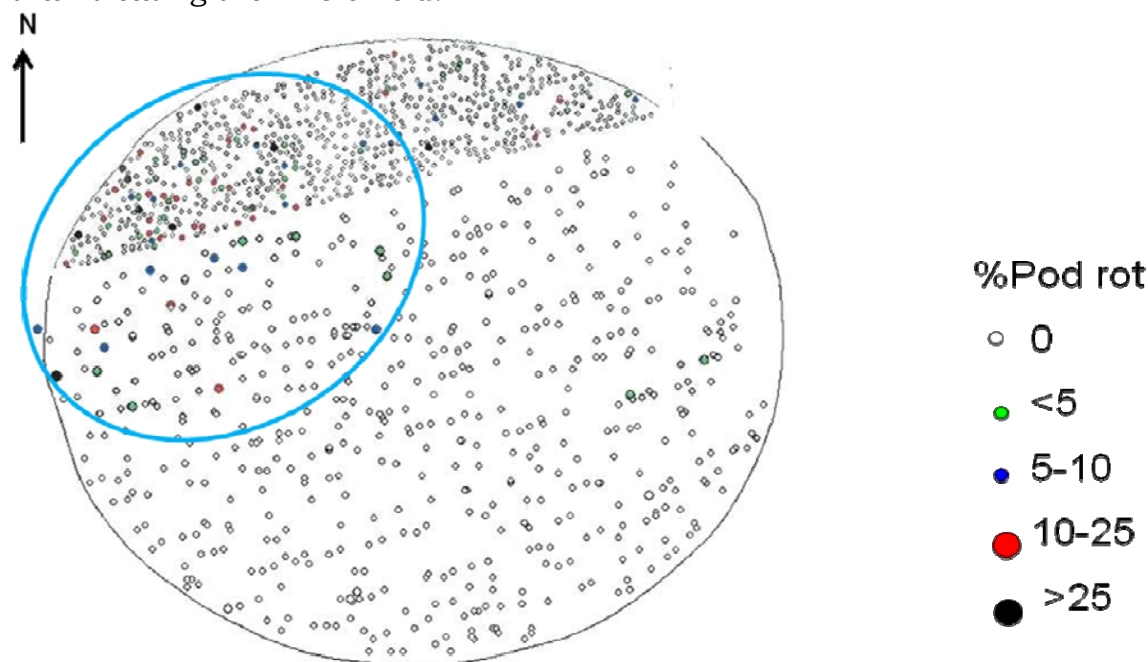
Peanut General Situation

Pod rot is present in several fields. The preventative fungicides and the dry weather seem to be keeping the pod rot in check. But growers need to continuously sample their fields on a weekly basis for pod rot development.

Pod rot is one of those diseases that is hard to scout for because there are no symptoms above ground. Additionally, pod rot is not always evenly distributed throughout the field. One section of the field may have more pod rot than the rest of the field. Therefore fields need to be scouted thoroughly.

Below is a picture of the Gaines County field that we are sampling for a pod rot research trial. We started sampling this field on July 5 and we have sampled it on a weekly basis. Each dot represents a spot that we have sampled. The various colors of the dots represent different levels of pod rot. There is a high concentration of pod rot in the northwest area of this field (this is not a low spot in the field).

I know no body can check this many spots in a field. The point of this illustration is to not just check the low spots or the same spots each week, but to check random spots all over the field. This will help you to determine if the pod rot is evenly distributed throughout the field or if it is concentrated in one area. If it is concentrated in one area, then you may be able to do site specific applications rather than treating the whole field.



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GAINES COUNTY IPM NEWSLETTER

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Volume III, No. 14



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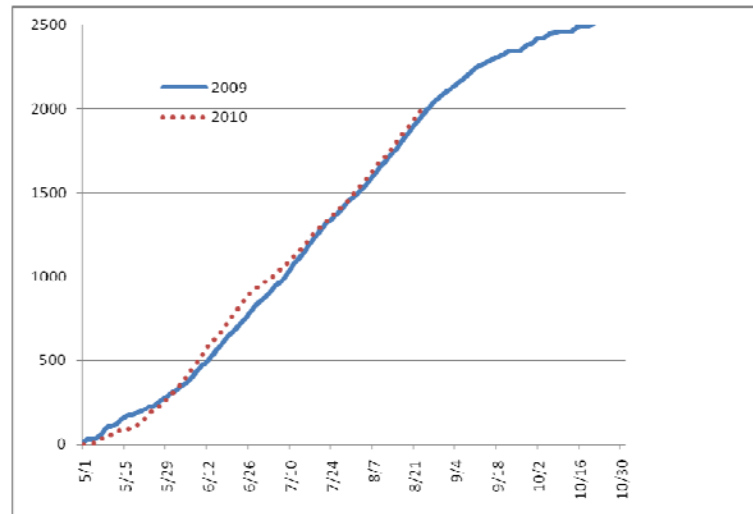
August 27, 2010

General Situation

Cotton and peanut fields are looking good for the most part. Peanut fields have formed pods that are maturing rapidly. We are starting to see cracked bolls in some cotton fields.

At this point in the season, there is a very low likelihood that any blooms past this point will develop into a mature boll. It takes approximately 850 heat units for a white flower to develop into an open boll. In 2009, from August 26 to October 31 we accumulated 523 heat units.

Accumulated Heat Units (H.U.) from May 1 to August 25, 2009 and 2010



Spider Mites

Spider mites are being found in non-Bt (conventional) and Bt (transgenic) cotton fields at varying levels. We have not treated any fields for spider mites. For the most part, the thrips are helping to suppress the spider mite populations. Right now thrips are not considered a pest, they are actually a beneficial because they feed on the spider mite eggs.

Spider mites infest the undersides of leaves, where they remove the sap from the plant and cause the leaves to discolor. They may also infest bracts of squares and bolls, causing the bracts to desiccate and squares or small bolls to shed. Severe infestations can defoliate the cotton plant. Mites may be moved by high winds or equipment from nearby crops which already have heavy infestations.

We found the heaviest population of spider mites in a field that was treated for bollworms, fall armyworms, and beet armyworms last week. Therefore, there were very few live insects (including beneficials and thrips) left in the field. This opened the door for the spider mites and they have successfully colonized in the field and are spreading. Spider mites usually tend to start on the outer edges of the fields and spread inward. In this particular field, we found lighter populations on the edge of the field and heavier populations as we walked further into the field.

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Spider mites can be an economically damaging pest in cotton and peanuts.

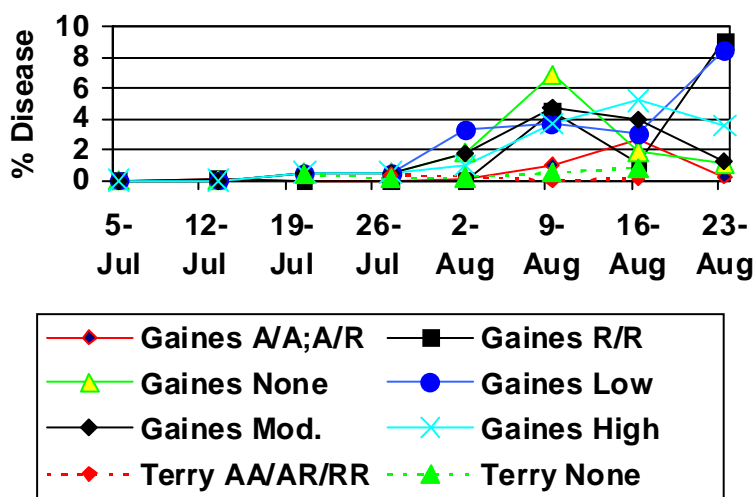
Therefore, growers who have treated their cotton or peanut fields for worms or other pests should keep a close eye on the field. Since spider mites live on the underside of the leaves you have to actually get out into the field and look at the undersides of the leaves to determine if you have a developing spider mite population. Treat when you have at least 50 percent of your plants infested. Treatments should be applied **before** the damage is evident from the roadside. Otherwise it is too late and the treatment will only be a revenge treatment because you may not be able to reduce the spider mite populations below economically damaging levels.

Peanut Diseases

Pod rot is still present in peanut fields at various levels. We are also picking up some early leaf spot. The hot dry weather is helping to suppress most of these diseases. But cool wet weather could change this scenario very quickly. Scouting fields will also help you to determine if another fungicide application is justified once your initial fungicide applications have played out.

Below are the results from the on-going pod rot peanut research trials that are being conducted in Gaines County and in Terry County. We are evaluating eight different chemical treatments. Treatments in this test include calendar based timings and pod rot level treatments. The calendar based treatments are Abound followed by Abound, Abound followed by Ridomil plus Provost, and Ridomil plus Provost followed by Ridomil plus Provost and they are applied at approximately 75 and 110 days after planting. The pod rot level treatments are applied when the pod rot levels reach 2% (low threshold), 4% (medium threshold), and 6% (high threshold).

Currently, all of the treatments are below 2% disease pressure with the exception of the Low Threshold Treatment, the High Threshold Treatment, and the Ridomil followed by Ridomil Treatment.



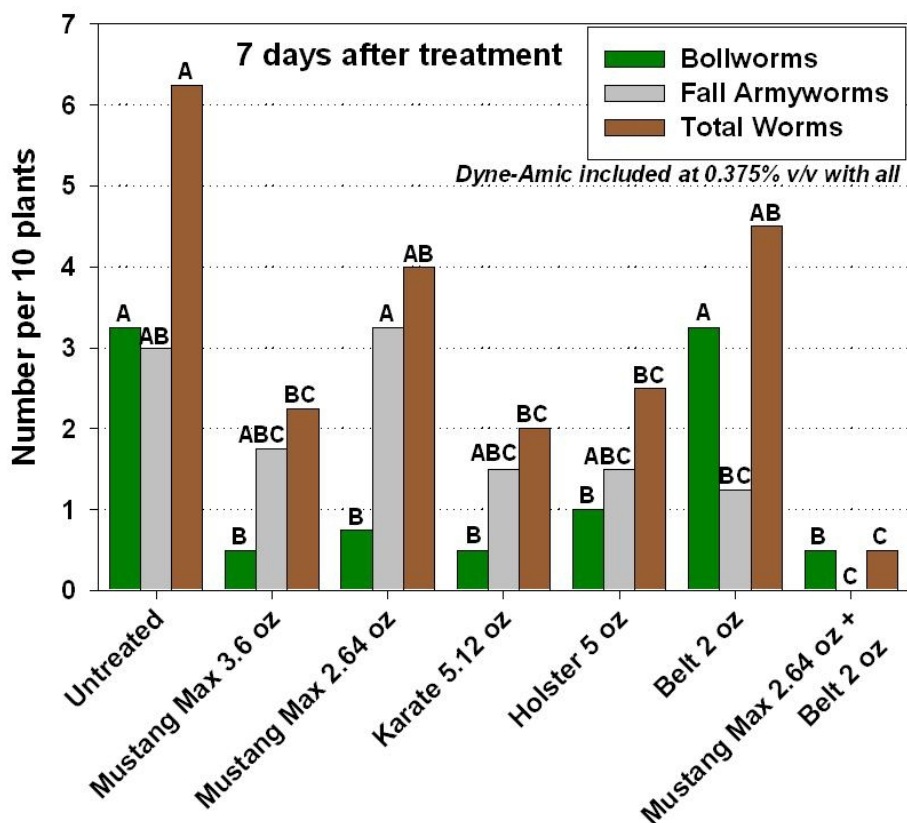
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"Worms" in Cotton

We only found one field in southwestern Gaines County that had small worms (less than 1/2 inch). Hopefully this indicates that we are at the end of this worm cycle. A majority of the Bollworm, Fall Armyworm, and Beet armyworm that we found this week were 1 inch or longer, which indicates that the worms are fixing to cycle out and the bollworm moths are laying less eggs. My bollworm trap catches have also declined this week.

One Tuesday August 17 Dr. David Kerns group (including Brant Baugh, Extension Agent-IPM for Lubbock County and Dustin Patman, Extension Agent-IPM for Crosby/Floyd Counties) and I put out a bollworm/fall armyworm insecticide trial in Gaines County. We did the post treatment counts on August 24. Below are the results.



- **The combination of Mustang Max at 2.64 oz & Belt at 2 oz gave us the best control on Bollworms and Fall Armyworms.**
- Mustang Max at 3.6 oz, Mustang Max at 2.64 oz, Karate at 5.12 oz, Holster at 5 oz, and the combination of Mustang Max & Belt had significantly fewer **bollworms** than the untreated plots.
- Belt at 2 oz and the combination of Mustang Max & Belt had significantly fewer **fall armyworms** than the untreated plots.
- Mustang Max at 3.6 oz, Karate at 5.12 oz, Holster at 5 oz and the combination of Mustang Max & Belt had significantly fewer **total worms** than the untreated plots.

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