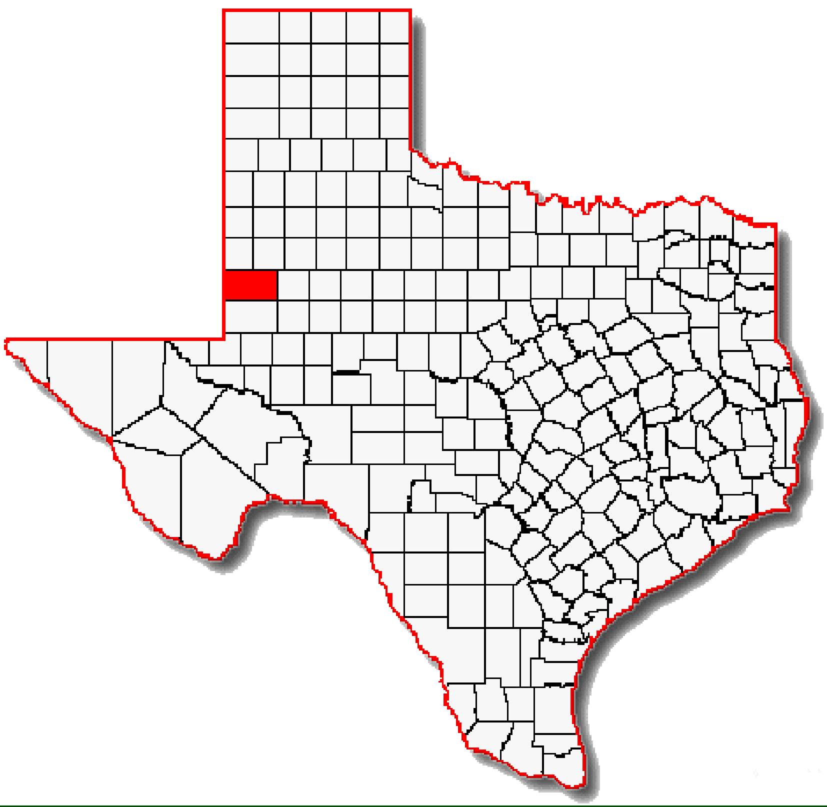
INTEGRATED PEST MANAGEMENT



Gaines County
IPM Program
2009

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GAINES COUNTY
INTEGRATED PEST MANAGEMENT PROGRAM

2009 ANNUAL REPORT

Prepared by

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Gaines County

in cooperation with

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and

Texas Pest Management Association

Gaines County Integrated Pest Management Steering Committee

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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 Cattaneo, Extension Agent – IPM. The local IPM 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 22 and November 19, 2009 to determine local priorities including education programming, applied research and result demonstration priorities, and to evaluate the 2009 Gaines County IPM Program.

In 2009 the Gaines County IPM Program ran a survey scouting program which encompassed cotton, peanuts, and wheat. This survey scouting program was funded by twenty-five business sponsors who brought in over $9,650. Fourteen 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 278 growers, ginners, crop consultants and agriculture industry representatives. The Gaines County IPM Program also conducted thirteen on-farm trials to evaluate cotton variety performance, disease management, insect management, and use of plant growth regulators. Results from these trials will be provided to the growers in a book titled “2009 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

Integrated Pest Management (IPM) Steering Committee

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

2009 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

2009 Gaines County IPM Program Sponsors and Contributors

Carter & Co. Irrigation Inc.
Oasis Gin Inc.
Ocho Gin Company
TriCounty Producers Gin
AG Aero
Nolen AG Services Inc.
Ocho Corp. Crop Plus Insurance
Western Peanut Growers
Agriliance
Anderson Welding Pump and Machine
Birdsong Peanuts
City Bank in Lubbock
Crop Production Services, Inc.
First United Bank
Five Points Gin
Gaines County Farm Bureau
Ten High Gin Inc.
Valley Irrigation & Pump Service Inc.
West Gaines Seed and Delinting Inc.
West Texas Agriplex, Inc.
Whittenburg Crop Insurance
McKenzie Insurance
Moore-Haralson Agency PC
Seminole Butane Co. Inc.
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)
Syngenta (provided chemical for research)

Producers who planted, maintained, and harvested Research Trials

Raymond McPherson
Max McGuire
Jud Cheuvront
Chuck Rowland
Shelby Elam
Jimbo Grissom
Ricky Mills
Gregory Upton
Markus Crow
Larry Nelson
Tim Neufeld
Michael Todd

Producers who participated in the IPM Scouting Program

Shelby Elam
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Cody Walters
Doyle Fincher
Markus Crow
Jimbo Grissom
Max McGuire
Michael Todd
Scotty Johnson
Peter Froese
David Dyck

Field Scout/Research Aides

Jim Belt and Kamie Zamora

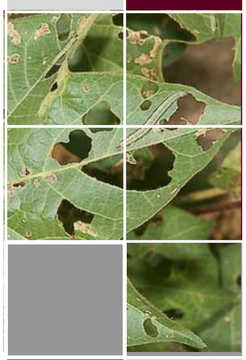
The field scout was responsible for the weekly monitoring and reporting of insect populations, disease status and crop development. They were also responsible with helping establish and collect data from research plots. Special appreciation is extended to the field scouts for their dedication.

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

Dr. Kevin Heinz............................	Head of Entomology Department, College Station
Dr. Charles Allen..........................	IPM Coordinator, San Angelo
Dr. Chris Sansone.........................	Assoc. Head of Entomology Department, San Angelo
Dr. Galen Chandler…...................	Regional Program Director, Lubbock
Miles Dabovich.............................	District Extension Administrator, 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, Lubboc
Scott Russell..................................	Extension Agent - IPM, Brownfield
Dr. Jackie Smith…………………	Extension Ag Economist, Lubbock
Jay Yates………………………...	Extension Risk Management Specialist, Lubbock
Dr. Dana Porter………………….	Extension Ag Engineering Specialist, Lubbock
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.



2009 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 254,587 and 39,531 planted acres of cotton and peanuts in 2009, respectively. These producers are being faced with increased crop production cost, increased scarcity of water, and increased plant disease prevalence. Water and economic development are two of the top three critical issues identified by the Texas Community Futures Forum for Gaines County. Additionally, the Gaines County IPM Steering Committee has identified crop water use and disease management as the main focus of the Gaines County IPM Program.

For these reasons, the Texas AgriLife Extension Service 2009 Gaines County IPM Program targeted cotton and peanut producers and agriculture industry representatives to work with and to provide education on current crop and pest management tools and techniques in order to maintain yields and net profit.

Response

The Gaines County IPM Steering Committee (made up of producers, agriculture industries, and private consultants) is the fundamental local support unit for the program. This committee determines local priorities for the program including educational programming and applied research priorities. In cooperation with this steering committee, the Gaines County IPM Program developed the following activities to address these relevant issues:

- Compilation and dissemination of the "2008 Gaines County, Texas Cotton, Peanut, and Wheat Research Reports" book
- Presentation on "Gaines County IPM Program and 2008 Research Results" at the SandyLand Ag Conference (January 26)
- Two newspaper articles published in the Seminole Sentinel "The Keys to Growing a Peanut Crop" (March 15) and "Decent Crop Year Coming to End in Gaines County" (September 16)
- Gaines County IPM Newsletter (16 issues from February 2 thru October 27)
- Presentation on "Gaines County Integrated Pest Management (IPM) Program" at the Seminole Lions Club meeting (June 2)
- Weekly field scouting of IPM Program cotton and peanut fields to monitor crop development and monitor pest and beneficial populations (May thru September)
- Presentations during the Ag Tour (August 5)

Additionally, research trials were conducted on-farm to provide relevant, unbiased, and timely information to our local producers:

- Peanut Pod Rot research in cooperation with Dr. Terry Wheeler, Dr. Jason Woodward, and Scott Russell
- Evaluation of 11 cotton varieties under Irrigation, Limited Irrigation, and non-Irrigated Production
- Evaluation of 11 cotton varieties under Verticillium Wilt pressure in cooperation with Dr. Jason Woodward and Dr. Terry Wheeler

- Evaluation of 12 cotton varieties under Nematode pressure in cooperation with Dr. Terry Wheeler
- Evaluation of 4 Plant Growth Regulators in a limited irrigation field in cooperation with Scott Russell
- Evaluation of 2 varieties in combination with 4 at-planting nematicides, for nematode management in cooperation with Dr. Terry Wheeler, Dr. Jason Woodward, and Dr. David Kerns
- Evaluation of thresholds for early season thrips management in cooperation with Dr. David Kerns
- Evaluation of Valor Herbicide on peanut production in cooperation with Dr. Peter Dotray

An evaluation instrument (post survey approach) was utilized to measure programmatic impact. Twenty-one individuals responded to the survey (88% response rate). Of those responding 15 were producers (71%) and 6 agriculture industry representatives (29%).

Results

(100%) 21 of 21 individuals said the Gaines County IPM Newsletter information helped them make better decisions about their farming practices, pest management, and variety selection.

(87%) 13 of 15 producers said they plan to take action or make changes based on information provided by the Gaines County IPM Newsletter.

(93%) 14 of 15 producers said they anticipate benefiting economically as a direct result of what they learned from the IPM Program. Seven growers responded with the following dollar values per acre:

$750 per acre (1 individual)
$50 per acre (1 individual)
$20 per acre (2 individuals)
$10 per acre (1 individual)
$5 per acre (1 individual)
$2 per acre (1 individual)

When asked what the most significant thing they learned or helped them the most:

38% of respondents said disease identification and management information.
29% of respondents said insect identification and management information.
19% of respondents said everything was very important and useful.
19% of respondents said results of cotton variety trials.
19% of respondents said the Gaines County IPM Newsletter county wide assessment.
5% of respondents said instant on-line availability.
5% of respondents said information on weed management.
5% of respondents said information on crop development according to heat units.
5% of respondents said the information provided by the scouting program.

***Table 1.* The following percentages represent the number of individuals who said the Gaines County IPM Newsletter mostly or completely increased their knowledge of the following items:**

	# of Responses	Percent
Peanut Disease Identification	18 of 20	90%
Peanut Disease Management	18 of 20	90%
Cotton Disease Identification	19 of 21	91%
Use of Tolerant/Resistant Cotton Varieties to Manage Cotton Diseases	19 of 21	91%
Weed Management	19 of 21	91%
Cotton Insect Identification and Management	19 of 21	91%
How Heat Units (H.U.) are Related to Crop Development	18 of 21	86%
How to Evaluate Crop Development and Whether or Not a Plant Growth Regulator Should be Applied	18 of 21	86%
How to Evaluate Crop Maturity Based on Nodes Above White Flower	19 of 21	91%
Description of Cropping Conditions in the Gaines County IPM Newsletter	20 of 21	95%

Table 2. **The following percentages represent the number of individuals who said the following items were mostly or very valuable to their operations:**

	# of Responses	Percent
Gaines County IPM Newsletter	21 of 21	100%
2008 Gaines County, Texas Cotton, Peanut, and Wheat Research Reports Book	20 of 21	95%
Cotton and Peanut Ag Tour	15 of 16	94%

Results indicate that Gaines County producers and agriculture industry representatives highly value the information provided by the Gaines County IPM Program. The following are testimonials from individual producers:

> "Doing a great job!! Very impressed with quality of newsletter."
>
> "Perfect - keep up the good work."
>
> "It's perfect."

The results of this survey are included in the 2009 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.

Ackowledgements

Other Texas AgriLife Extension Service Staff that assisted with our educational activities: Dr. Jason Woodward, Dr. Terry Wheeler, Dr. David Kerns, Dr. Randy Boman, Dr. Todd Baughman, Dr. Calvin Trostle, and Dr. Peter Dotray.

We would also like to thank the following producers for planting, maintaining and harvesting the Gaines County IPM Program on-farm research trials: Jimbo Grissom, Jud Cheuvront, Rick Mills, Gregory Upton, Max McGuire, Raymond McPherson, Michael Todd, Chuck Rowland.

We also appreciate the support of the following businesses who sponsored and the 2008 Gaines County IPM Program: Carter & Co. Irrigation Inc., Oasis Gin Inc., Ocho Gin Company, TriCounty Producers Gin, AG Aero, Nolen AG Services Inc., Ocho Corp. Crop Plus Insurance, Western Peanut Growers, Agriliance, Anderson Welding Pump and Machine, Birdsong Peanuts, City Bank in Lubbock, Crop Production Services, Inc., First United Bank, Five Points Gin, Gaines County Farm Bureau, Ten High Gin Inc., Valley Irrigation & Pump Service Inc., West Gaines Seed and Delinting Inc., West Texas Agriplex, Inc., Whittenburg Crop Insurance, McKenzie Insurance, Moore-Haralson Agency PC, Seminole Butane Co. Inc., 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; Jim Belt and Kamie Zamora-Gaines County IPM Program summer scouts; Gaines County Judge-Tom Keyes; and the County Commissioners: Danny Yoakum-Precinct 1; Craig Belt-Precinct 2; Blair Tharp-Precinct 3; Charlie Lopez-Precinct 4.

Educational Activities

Newsletters	
No. Issues Written	16
No. Non-Extension Clientele on Mailing List	111
No. Non-Extension Clientele on E-mail List	112
Total Non-Extension Clientele	223
TV Interviews	1
Peer Review Publications	1
Scientific Presentations/Posters	3
Newspaper Articles	
No. Prepared	4
No. Newspaper Carrying	3
Farm Visits	457
Scouts Trained	2
Consultants Trained	0
CEU Credits Offered	8
Pest Management Steering Committee Meetings	2
Presentations Made	
County Meetings	2
Field Days/Tours	1
Schools	2
Civic Clubs	1
4-H Clubs	0
Professional Meetings	1
No. Applied Research/Demonstration Projects	13
No. Involving Cotton	12
No. Direct Ag. Contacts	3,067
Other Direct Contacts	469

Funds Leveraged

Grants and Contracts

No. Grants as Cooperator/Collaborator..	1
No. Dollars Received for Your Use..	$12,971
Support Dollars you Generated to Support other Educational Efforts..........	$15,150
Retail Value of "In-Kind" Contributions (See Appendix C).........................	$30,054
Total Dollars Generated for Your Program...	**$58,175**

Gaines County IPM Program

2009 Financial Report

Income		
	Balance from 2008[1]	**$26,249.85**
	Scouting Program Sponsors	**$9,650.00**
	Peanut Pod Rot Research	**$3,171.00**
	Irrigated Cotton Variety Trial West of Seminole	**$1,100.00**
	Dryland Cotton Variety Trial	**$1,200.00**
	Limited Irrigated Cotton Variety Trial at Loop	**$1,100.00**
	Verticillium Wilt Cotton Variety Trial	**$1,100.00**
	Variety & Chemical Management of Nematodes Trial[2]	**$1,000.00**
	Bayer CropScience CAP Trials[3]	**$4,000.00**
	Monsanto FACT Trials	**$5,000.00**
	Monsanto Boll Damage Survey	**$800.00**
	Transfer from 86 Account	**$2,150.24**
	Interest	**$37.42**
	Total Income	**$52,058.51**
Expenses		
	Administrative Fees	**$3,543.15**
	Dues & subscriptions	**$403.44**
	Membership Paid	**$2,280.00**
	Bank and USB/Service Fee	**$10.00**
	Postage	**$195.10**
	Scout Payroll	**$5,804.35**
	Payroll Tax Expenses	**$548.40**
	Mileage for Scouts	**$2,664.93**
	Mileage for IPM Agent	**$8,310.77**
	Mileage for Directors	**$267.55**
	Telephone	**$1,428.22**
	Conference & Meetings	**$337.48**
	Auto Expenses	**$144.83**
	Miscellaneous	**$32.82**
	Office Supplies	**$878.14**
	Scouting Supplies	**$254.31**
	Public Relations	**$33.24**
	Maintenance and Repairs	**$138.29**
	Research /Demo Project	**$573.87**
	Transfer to 66 Account	**$2,150.24**
	Total Expenses	**$29,999.13**
Balance as of December 31, 2009		**$22,059.38**

[1] $23569.85 (Balance from 2008) + $2680 (Payment in 2009 for a 2008 Project)

[2] $500 received in 2010 for a 2009 Project

[3] $4000 received in 2010 for a 2009 Project

2009 started off with dry conditions and low commodity prices. This had growers deliberating over their planting intentions. Several growers expressed an interest in planting alternative crops such as soybeans, safflowers, seasame, and sunflowers. By the time planting season rolled around growers had decided to plant some safflowers but a majority of the acreage was planted to cotton and peanuts, which total 254,587 and 39,531 acres, respectively. This was a slit shift from the 2008 season in which we had 244,240 and 69,573 planted acres of cotton and peanuts, respectively.

February to March

In February and March Russian Wheat Aphids were observed in several wheat fields throughout the county. Russian wheat aphids inject a toxin into the leaves while they are feeding. This toxin causes purple streaks on the wheat leaves. Several wheat fields were treated to control Russian Wheat Aphids.

End of May to mid-June

By the end of May, most dryland fields had not received their much needed planting moisture and were dry planted. Parts of the county received a slow soaking rain in mid-June, which totaled between 1.5 and 4 inches. Unfortunately these rains did not come soon enough for the dryland cotton and hail storms took out a couple of fields throughout the county. On the plus side, these rains provided timely moisture for peanuts and irrigated cotton. Cotton stages were ranging from cotyledon to 11 true leaves, with a majority of the cotton around the 6 true leaf stage and starting to square. A field in western Gaines County had some plants that were starting to show signs of stress from the wilt diseases. We also started observing root-knot nematode galls on cotton roots in several fields. Peanuts were starting to bloom.

Late June

Irrigated cotton and peanut crops had put on significant growth during the last two weeks of June. Cotton stages were ranging from 2 true leaves to 13 true leaves. More peanut fields were starting to bloom and some fields had started pegging. Some peanut fields had a low level of Rhizobium nodulation. Supplemental nitrogen needed to be applied in these fields, since it was to late to increase nodulation in the current crop. Bollworm eggs and damaged squares were being observed in non-Bt cotton fields throughout the end of June and beginning of July. However, beneficial insects were helping to keep most insect pests at bay.

Early July

During the second week of July we started entering into the period of highest water demand, which is during the blooming period for cotton and blooming, pegging and pod fill for peanuts. Peanut disease reports were also starting to increase. Southern blight, caused by *Sclerotium rolfsii*, had been observed in several peanut fields in Western portions of the county. Aspergillus crown rot, caused by *Aspergillus niger,* had also been observed in some peanut fields. Fusarium wilt, caused by the soilborne fungus *Fusarium oxysporum* f. sp. *vasinfectum,* was being observed in several cotton fields. Development of Fusarium wilt requires wounding by the root-knot nematode (*Meloidogyne incognita*), which was also being observed in several cotton fields. Scattered fields in Gaines County were also exhibiting symptoms of a unique foliar disease. Bright yellow to orange colored lesion with a maroon border were being observed on the upper leaf surface. On the lower leaf surface, yellow to orange structures (aecia) containing spores were being found. These symptoms were characteristic of Southwestern cotton rust, caused by *Puccinia cacabata*. While this disease commonly occurs in fields in the Trans Pecos area, it had not been reported on the Southern High Plains. Unlike other plant rusts (i.e. stem rust of wheat), the spores produced on infected cotton leaves cannot re-infect cotton. The epidemiology of this Southwestern rust is complicated; however, the presence of an alternate host, specifically grama grasses (*Bouteloua* spp.), are required for disease development in cotton. Efforts in locating infected grama grasses near fields exhibiting symptoms of Southwestern rust were unsuccessful.

Mid-July to the End of July

In a 13 day period, from July 8 to July 20, we accumulated 296 Heat Units. This rapid accumulation of Heat Units and dry conditions caused plant stress in several fields. These stresses reduced main stem growth which resulted in less fruit and square production. As a result some cotton fields were headed towards an early cutout. However, significant rainfall on July 22 and 23 and cooler temperatures may have saved these fields from reaching cutout prematurely. By the end of July, a majority of the cotton fields were blooming and peanuts were pegging and forming pods. Verticillium wilt had been noted in several cotton fields and pod rot was starting to show up in some peanut fields. Severe wind storms had hit Gaines County. A few fields had severe wind damage; however, a majority of the fields had minimal damage. Insect pressure remained low.

Early August

In the first week of August Nodes Above White Flower (NAWF) ranged from 3 to 8 with a majority of the cotton fields at 6 NAWF. Peanuts were continuing to peg and had small to large pods. Disease incidence had increased during the last couple of weeks. Pythium pod rot had been observed in several peanut fields. Sclerotinia Blight, caused by *Sclerotinia minor*, has also been observed in some peanut fields. Verticillium wilt continued to be observed in cotton fields. However, the Verticillium wilt incidence seemed less prevalent this year than the same time last year. Nematodes were very active in a lot of cotton fields. In addition to these diseases, we also observed limited amounts of Alternaria stem blight and Bacterial blight was identified in a small section of one field near Loop.

Mid-August

In mid-August peanuts were forming small to large pods. Pod rots, Sclerotinia Blight, Southern Blight, Early Leaf Spot, and Verticillium wilt continued to be found in peanuts. Verticillium wilt pressure was increasing in cotton. Nodes Above White Flower (NAWF) ranged from 0 to 7 with a majority of the cotton fields at 4 to 5 NAWF. Cotton plants were starting to shed squares and small bolls. We observed a few non-Bt fields with economically damaging bollworm populations, however; we did not observe any economically damaging populations in Bt cotton. Lygus nymphs were observed colonizing some cotton fields.

End of August

By the end of August, a majority of the cotton and peanut fields were exhibiting symptoms of stress caused by the dry and hot conditions that had prevailed for the last several weeks. A majority of the cotton fields had cutout and bolls were starting to open in several cotton fields. In non-Bt cotton, we were finding larger bollworm larvae (½ inch to ¾ inch) that were likely feeding in the bolls when insecticides were applied. These bollworms were feeding in bolls lower in the canopy and could only be found if you were doing whole plant inspections. Along with the bollworms we also observed smaller populations of fall armyworms and beet armyworms. Most of the fall armyworms were observed feeding in the blooms. The beet armyworms were feeding on leaves, squares, small bolls and bracts. Fusarium wilt was being observed in several cotton fields. This is a little unusual since Fusarium wilt is *usually* observed prior to bloom. We were also starting to observe more Rhizoctonia pod rot along with Pythium pod rot in peanut fields.

Mid-September

Despite the dry conditions during the start of the season, by mid-September we had ended up with a decent cotton and peanut crop load. Yields in most fields were directly related to the irrigation capacity. However, June and July's rains greatly benefited the crop by adding valuable soil moisture that helped to carry the crop a little further. The hot dry conditions during August sped up crop maturity at the cost of some yield loss. Cotton plants had shed excess squares and small bolls in the top 2 to 5 nodes. The plants only kept those bolls which it could carry or mature out. During the first two weeks of September we accumulated an average of 14 H.U. per day. Therefore crop maturity was not proceeding as quickly as it did during August. Insect pressure was light, with the exception of a few aphid populations in some cotton fields. Pod rots caused by the soil borne pathogen Rhizoctonia were being found in some peanut fields. Sclerotinia blight, Southern Blight, and Early and late leaf spot were also being observed in some peanut fields. At this point in the season growers needed to weigh the cost and determine if a fungicide application was justified since they would be digging peanuts within the next 2 to 3 weeks.

End of September

The last part of September was marked with a cold front that slowed things down. Several were holding off and waiting for a warm spell before they applied cotton defoliants and started harvesting peanuts. A majority of the cotton fields had open cotton, but some fields still needed several days of warm sunny weather before they would be ready for defoliation.

During the month of September we caught a very low population of pink bollworms in a trap that was located approximately 10 miles east of the Gaines County Park. These low numbers did not represent a problem nor did they require an insecticide application. However, they did indicate that pink bollworms are present in the area and growers need to monitor their non-Bt fields.

End of October

By the end of October, a majority of the peanut crop was harvested and cotton harvesting was progressing as fast as the weather would allow. Some rainfall events had slowed and delayed harvesting schedules. However, the wheat producers were thankful for the early winter rains.

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

					Avg. Monthly H.U.						Avg. Monthly Accumulated H.U.
Month	05	06	07	08	09		05	06	07	08	09	
May	307	437	194	319	310	313	307	437	194	319	310	313
June	565	598	427	626	549	553	872	1035	621	945	859	866
July	612	646	513	586	613	594	1484	1681	1134	1531	1472	1460
August	546	576	588	536	619	573	2030	2257	1722	2067	2091	2033
September	473	264	417	260	295	342	2503	2521	2139	2327	2386	2375
October	121	109	201	105	118	131	2624	2630	2340	2432	2504	2506
November	18	10	24	16	6	15	2642	2640	2364	2448	2510	2521

2009 Research Reports

Disclaimer Clause:

Reference to commercial products or trade names is made with the understanding that no discrimination is intended and no endorsement by the Texas A & M University System is implied. Readers should realize that results from field experiments do not represent conclusive evidence that the same response would occur where conditions vary.

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

Terry Wheeler, Texas AgriLIFE Research Plant Pathologist
Jason Woodward, Texas AgriLIFE Extension Plant Pathologist
Scott A. Russell, Extension Agent-IPM, Terry and Yoakum Counties
Manda Cattaneo; Extension Agent-IPM, Gaines County

Cooperators: Mr. Jimbo Grissom and Mr. Tommy Mason

Summary:

The scouting protocol portion of this trial intensely monitored two area peanut fields by sampling 101 random locations weekly. At each location, the sample consisted of 1.5 row feet of peanut pegs and pods. Peg rot was first observed in the Gaines County field 6 July 2009; in the Terry County field 26 July. The incidence of pod rot increased in both field through mid-August, reaching highs between 8 and 10 percent. From late July through 10 August, pod rot was severe when present. However, the next week, when disease had peaked for the summer, pod rot was a mixture of severely rotted and superficially rotted pods. From that point forward, most of the new infections appeared superficial, and most of the severely rotted pods were from old infections. Fungicide applications were applied in the Mason Field, Terry County, based on the grower's practice or one of three thresholds. These thresholds were two to three percent infestation as a low threshold, four to five percent as a medium threshold and six percent for a high threshold. The grower based treatment and the medium threshold each received two chemical applications, while the low threshold received three treatments and the high threshold only received one treatment. Chemicals utilized in the treatments were Abound FL or Ridomil Gold plus Provost. Pod rot protection was best with the producer timed application (the earliest that went out) and the low threshold treatment. The delay in the first application was associated with poorer control. Plots were dug and inverted on 16 October. Plots were harvested on 28 October 2009. An analysis was done comparing the seven fungicide treatments with pod rot,

averaged from 29 July through 23 August, yield, percentage of extra large kernels, grade, percentage of damaged kernels, and value of the crop (minus fungicide costs) per acre. There were significant differences between treatments in some grade categories and in yield. However, when chemical costs were subtracted from the value per acre, there were no significant differences.

Objective:

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. The first objective of this project was to determine the optimal number of samples to collect in a peanut field to best describe the extent of peanut pod rod infestation. The second objective is to develop an economic threshold for peanut pod rot in the Texas South Plains region.

Materials and Methods:

Sampling Protocol

Two fields with a history of pod rot were scouted at weekly intervals, starting on 6 July 2009 (Grissom field, Gaines County) and 15 July 2009 (Mason field, Terry County). At each sampled point, 1.5 ft. of row was dug, and if any pods or pegs were found with symptoms of rot, then all the pegs and pods were counted, and any pegs or pods with discoloration were transported back to the laboratory for counting and fungal isolation. The percentage of symptomatic pegs and pods was determined for each sampling location. As the peanuts shifted to having more pods than pegs, eventually only pods with symptoms were counted and pegs were not. Sampling continued through mid-September.

At the Grissom field, 101 points were selected at random each week within the 120-acre field for sampling. At the Mason field, seven chemical treatments were imposed over a 168-row study area. Within this area, there were three replications of each treatment. This field was planted in a circular row pattern, on one-fourth of the pivot (30 acres), therefore plot lengths were not the same. A total of 101 random points were selected each week for evaluation in the test area, with a minimum of 3 to a maximum of 7 points within each 8-row plot. As the plots got longer, more points were sampled per plot.

Developing an Economic Threshold for Pod Rot of Peanut

Chemical applications to aid in developing an economic threshold for pod rot of peanut were conducted on the Mason field in Terry County. Plots were eight rows wide and of varying lengths, due to the circular row pattern. The timing of chemical applications involved seven treatments, based on either a calendar application or a trigger based on the percent infected pods.

The fungicide treatments were as follows:

AA: Abound FL applied twice at the producer's normal time (based on a calendar schedule)

RR: Ridomil Gold EC **+** Provost applied twice at the producer's normal time (calendar schedule)

AR: Abound FL applied once and Ridomil Gold EC **+** Provost applied once (calendar schedule)

LT: Low threshold, RR applied 3 times based on a threshold of 1-2% pod rot

MT: moderate threshold, RR applied 2 times based on a threshold of 3-4% pod rot

HT: high threshold, Abound FL was applied one time, based on a threshold of 5-6% pod rot

N: no fungicide applied.

Results and Discussion:

At both fields, pod rot began to increase during the week of the 27th of July and increased through the week of 17 August (*Fig. 1*). There was a dramatic change in symptoms during the week of 17 August. Prior to that sampling week, pod rot symptoms had been characteristic of *Pythium*, with a very black, soft rot, and every pod with symptoms was completely consumed by the rot. However, from 17 August onwards, in both fields, a percentage of pods were identified with a more superficial rot, often of a lighter color. *Rhizoctonia* was only isolated in low frequencies from the Mason field, and hardly ever from the Grissom field, so it is likely that the more superficial discolorations were caused by unsuccessful *Pythium* attacks. *Pythium* was isolated from rotted pods frequently during this study. The rating during the week of 17 August included both rotted and superficially rotted pods. However, after that week, two categories were created, and only those pods with significant rot were included in the pod rot category. Pod rot decreased gradually from a high of 8% on 17 August to 3% by 21 September for the Grissom field (*Fig. 1*). Newly infected pods were identified weekly, but after 17 August, most of the rotted pods were due to old infections. All sampling points for the Grissom field are seen in *Figure. 2*.

In the Mason field, there were seven different treatments that were mapped weekly. Mason A/R (Abound FL applied initially, followed by Ridomil Gold + Provost applied for the second application) was one of the most effective at reducing pod rot, while the treatment with no fungicide had more pod rot, particularly from 19 August through the rest of the season (*Fig. 1*). An analysis was done comparing the seven fungicide treatments with pod rot, averaged from 29 July through 23 August, yield, percentage of extra large kernels, grade, percentage of damaged kernels, and value of the crop (minus fungicide costs) per acre. Percent pod rot was higher for the no fungicide treatment and for the moderate and high thresholds than for the calendar applied treatments (*Table 1*). The low threshold had less pod rot than the no fungicide treatment, but was not significantly different than the other treatments (*Table 1*). The percent of extra large kernels was lowest for the no fungicide treatment compared with all but the high threshold treatment (*Table 1*). Grades were higher for the calendar treatment with Abound FL applied twice, than for the no fungicide treatment (*Table 1*). The percent damaged kernels was lower for the Abound FL calendar treatment applied twice than for the no fungicide and high threshold treatments (*Table 1*). Yield was higher for the calendar treatment with Abound FL, rotated with Ridomil Gold + Provost, and for the low threshold treatment compared to the no-fungicide treatment (*Table 1*). However, once fungicide costs were subtracted for each treatment, the gains in yield were offset by cost of products, and there were no treatment differences for value of the crop (dollars /acre) (*Table 1*). All sampling points are seen in *Figure 3*, once pod rot was found. Prior to 29 July, pod rot had not been seen.

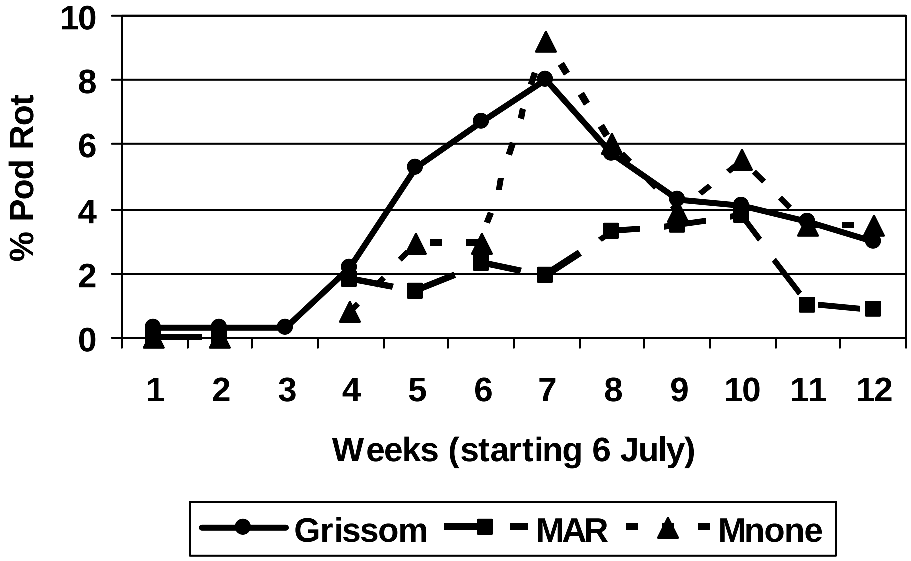


Figure 1. **Percent pod rot based on weekly sampling at the Grissom field (●)**, Mason field with Abound FL/Ridomil Gold + Provost (MAR) fungicide treatment (■), and Mason field with no fungicide treatment (none) (▲).

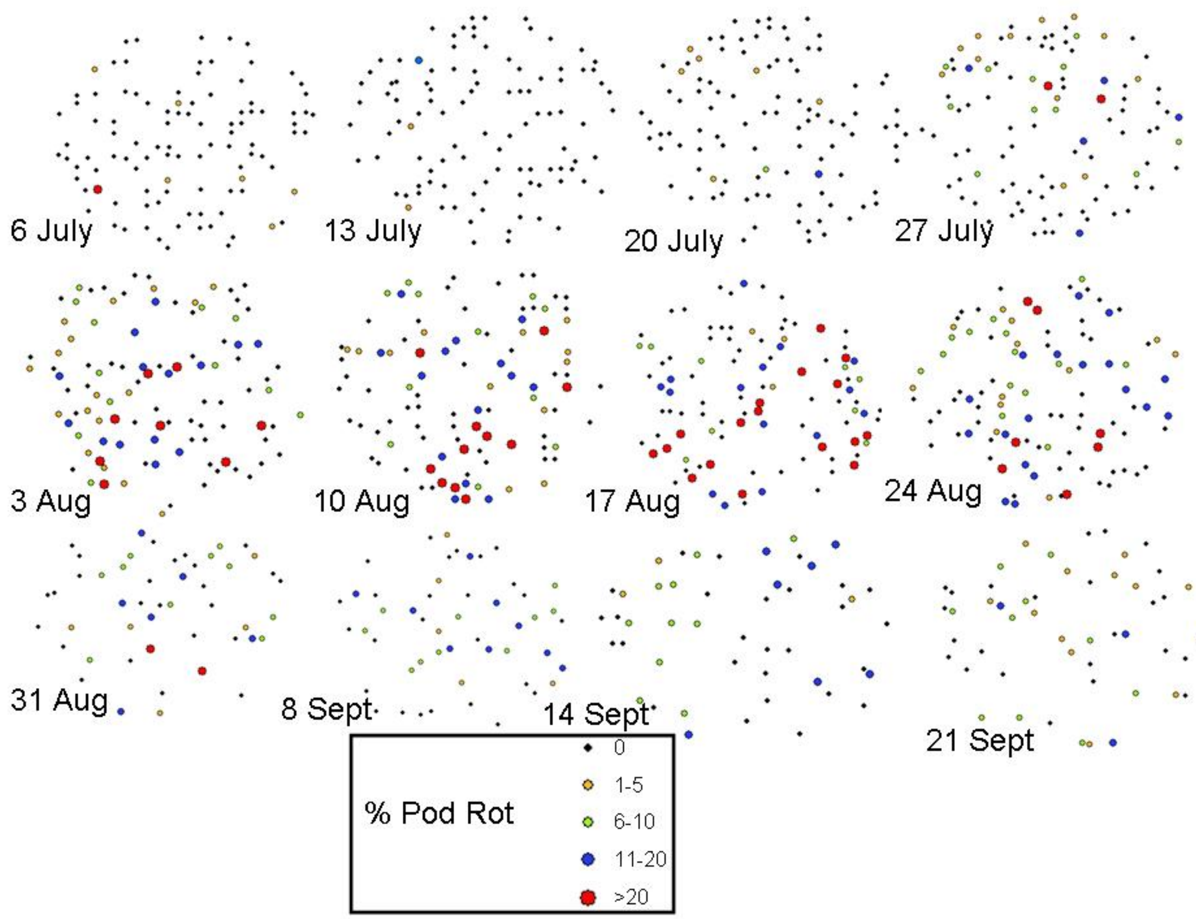


***Figure 2*. Location of sampling points at the Grissom field during the 2009 season, and amount of pod rot present at each point.**

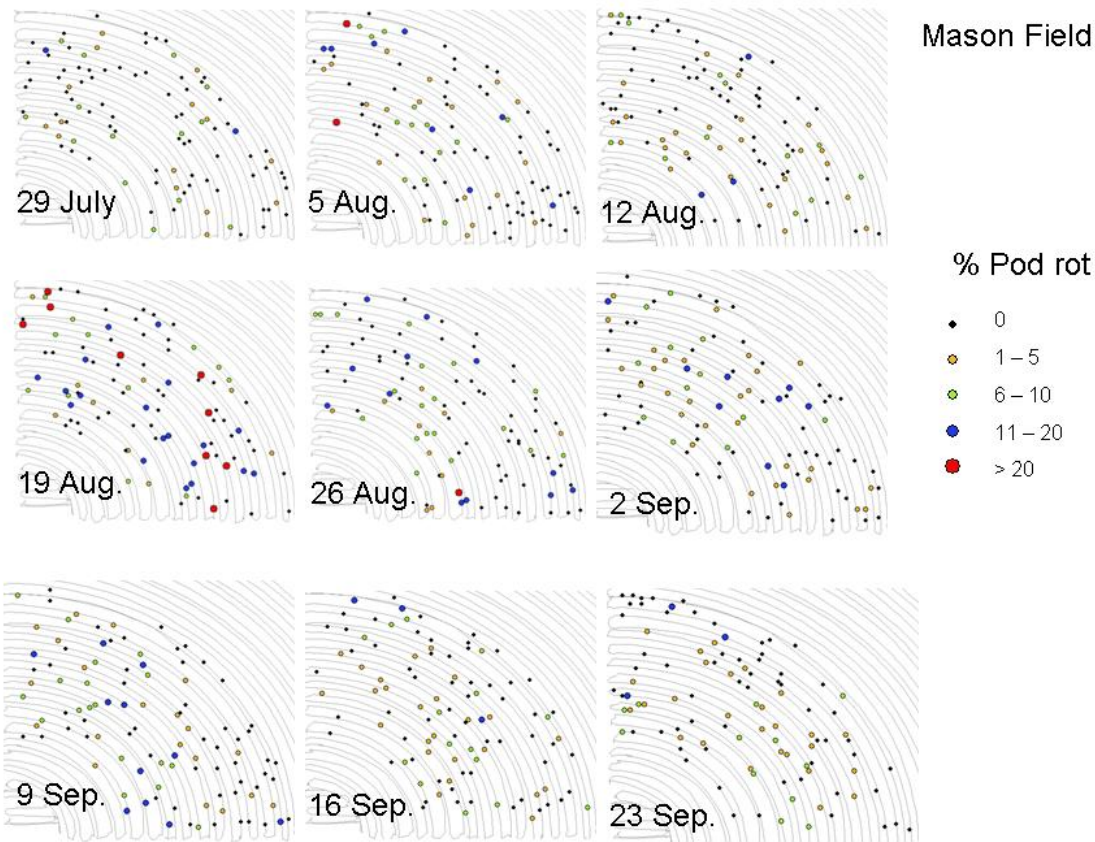


***Figure 3*. Location of sampling points during weeks when pod rot was identified at the Mason field in 2009.**

***Table 1*. Affect of fungicide treatment on pod rot, yield, and value of the crop/acre.**

Treatment[a]	# of sprays	% Pod rot[b]	% ELK[d]	Grade	%DK[e]	Yield Lbs/a	Fungicide Costs ($/a)[f]	Value[g] $/acre
AA	2	1.8 c[c]	43 a	70.4 a	0.4 b	5,653 ab	60.54	964
AR	2	2.0 c	42 a	69.8 ab	0.5 ab	5,851 a	67.29	984
RR	2	1.8 c	44 a	68.7 ab	0.7 ab	5,486 ab	74.04	910
LT	3	2.6 bc	43 a	69.6 ab	0.5 ab	5,876 a	111.06	948
MT	2	3.6 ab	42 a	69.6 ab	0.9 ab	5,769 ab	74.04	956
HT	1	3.5 ab	40 ab	69.5 ab	1.0 a	5,584 ab	30.27	966
None	0	3.8 a	35 b	66.8 b	1.0 a	5,346 b	0	917

[a]AA is Abound FL applied twice during the season based on calendar dates decided by the producer. AR was similar to AA, except Abound Fl was applied on the first application and Ridomil Gold + Provost was applied on the second application. RR was similar to AR except Ridomil Gold + Provost was applied for both applications. LT stands for low threshold and Ridomil Gold + Provost was applied three times during the season when the pod rot threshold initially reached 1-2%, and then at least once every three weeks if pod rot was > 2%. MT was a moderate threshold, where Ridomil Gold + Provost were applied when pod rot initially reached 3-4%, and then a second application was made three weeks later when the pod rot was still around 4%. HT is high threshold, and Abound FL was applied when pod rot reached 5-6% initially. None indicates no fungicides for pod rot were applied.

[b]%Pod rot was combined across sampling dates from 29 July through 23 September.

[c]Letters that are different indicate that treatments were significantly different at $P < 0.05$.

[d]ELK = extra large kernels.

[e]DK = damaged kernels.

[f]Abound FL was applied at 24.6 oz/acre banded over 20-inch row spacing, with a cost of $315/gallon. Ridomil Gold was applied at 8 oz/acre, at a cost of $795/gallon, and Provost was applied at a rate of 10.7 oz./acre, at a cost of $291.50/gallon.

[g]Value/acre is the (%ELK x $0.35/ton) + (grade x $4.949/ton) + (% other kernels x $1.4/ton) – ($3.40/ton if %DK = 2%) – fungicide costs/acre.

***Table 2*. Percent pod rot for each fungicide treatment at the Mason field over time.**

Trt[a]	7/29	8/5[b]	8/12	8/19	8/26	9/2	9/9	9/16	9/23
AA	1.0	4.0	1.0	7.9	1.4	0.5	0.6	1.1	0.5
AR	1.8	1.4	2.3	1.9	3.3	3.5	3.8	1.0	0.9
RR	0.7	4.1	1.5	4.4	1.3	1.9	2.6	1.3	1.8
LT	2.1	3.6	1.7	6.7	3.5	2.5	2.7	0.9	2.4
MT	3.0	2.7	2.1	7.5	5.1	3.5	4.5	4.1	3.1
HT	2.5	4.3	2.6	7.1	4.8	4.8	4.3	2.6	2.2
None	0.8	2.9	2.9	9.2	6.0	3.9	5.5	3.5	3.5

[a]AA is Abound FL applied twice during the season based on calendar dates decided by the producer. AR was similar to AA, except Abound Fl was applied on the first application and Ridomil Gold + Provost was applied on the second application. RR was similar to AR except Ridomil Gold + Provost was applied for both applications. LT stands for low threshold and Ridomil Gold + Provost was applied three times during the season when the pod rot threshold initially reached 1-2%, and then at least once every three weeks if pod rot was > 2%. MT was a moderate threshold, where Ridomil Gold + Provost were applied when pod rot initially reached 3-4%, and then a second application was made three weeks later when the pod rot was still around 4%. HT is high threshold, and Abound FL was applied when pod rot reached 5-6% initially. None indicates no fungicides for pod rot were applied.
[b]*Pythium* was isolated from the majority of pods tested and from all samples with pod rot, but *Rhizoctonia* was isolated from three samples on 5 Aug, from 3 samples on 12 Aug., four samples on 19 Aug., three samples on 2 Sept., six samples on 9 Sept., four samples on 16 Sept., and two samples on 23 Sept.

***Table 3*. Percent pod rot and frequency of pod rot from the Grissom field over time.**

Date	% Pod rot	% Samples With pod rot
7/6	0.3	6.9
7/13	0.3	3.0
7/20	0.3	7.9
7/27	2.2	29.7
8/3	5.3	50.5
8/10	6.7	48.0
8/17	8.0	43.6
8/24	5.7	50.5
8/31	4.3	48.0
9/8	4.1	48.0
9/14	3.6	44.0
9/21	3.0	52.0

**Rhizoctonia* was isolated from 1 sample on 8/10, and from one sample on 9/21. *Sclerotium rolfsii* was isolated from one sample on 9/21. *Pythium* was isolated from rotted pods at all sampling times when rotted pods were found.

***Table 4*. Timing of fungicide sprays at the Mason and Grissom fields.**

Field	**Treatment**	**Spray 1**	**Spray 2**	**Spray 3**
Grissom	Abound Fl, followed by Ridomil	7 July	28 July	
Mason	Calendar sprays (AA, AR, RR)	25 July	19 Aug	
Mason	Low Threshold	31 July	29 Aug	10 Sept.
Mason	Moderate Threshold	7 Aug	10 Sept.	
Mason	High Threshold	19 Aug		

Acknowledgments:

Texas ArgiLIFE would like to thank Mr. Jimbo Grissom and Mr. Tommy Mason for cooperation in this project. Thanks are also expressed to Syngenta and Bayer Crop Science for providing chemical for fungicide treatments. Funding for this research was provided by a grant through Texas Peanut Producers Board.

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Peanut Tolerance to Valor Herbicide Applied Preemergence at Seminole, TX, 2009

Cooperator: Chuck Rowland

Manda Cattaneo - IPM Agent, Gaines County
Peter Dotray - Professor
Lyndell Gilbert - Technician II

MATERIALS AND METHODS:

Plot Size:	24 rows by 200 feet, 4 replications
Soil type:	Sandy loam
Planting Date:	April 29
Variety:	Flavorrunner 458
Application Date:	Preemergence, May 5
Digging Date:	October 6
Harvest Date:	October 28

RESULTS AND DISCUSSION:

Valor SX was registered for use in peanut in 2001. According to the Valor SX label, weeds controlled include kochia, common lambsquarter, several pigweed species including Palmer amaranth, golden crownbeard, and several annual morningglory species including ivyleaf morningglory. Valor SX may be applied prior to planting or preemergence. Preemergence applications must be made within 48 hours after planting and prior to peanut emergence. Applications made after plants have begun to crack or after they have emerged may result in severe injury. Splashing from heavy rains or cool conditions at or near emergence may also result in injury and even delayed maturity and yield loss. In 2009, several studies were conducted across the High Plains to gain experience and confidence with this relatively new peanut herbicide. At this location in west Gaines County (Mr. Chuck Rowland), Flavorrunner 458 was planted on April 29, and Valor SX at 3 ounces per acre (oz/A) was applied on May 5. Irrigation totaling 1 inch was applied (0.5 inches followed by 0.5 inches) immediately after the herbicide application. An untreated control was used for comparison purposes. Plant stand and peanut injury was evaluated on May 21 (16 days after application) and no difference was observed between the non-treated control and the Valor-treated plots (Table 1). Peanut canopy width was recorded on May 21, June 3, June 22, and September 9. No canopy width differences were noted between the Valor-treated and the non-treated control (Table 1). Peanuts were dug on October 6 and harvested with a small-plot peanut thrasher on October 28. Peanut yield following Valor SX at 3 oz/A was 6174 lb/A and was not different from the non-treated control (6367 lb/A). Grade was also evaluated and there was no difference when the Valor-treated were compared to the non-treated control. Results from this study and several others across the High Plains suggest that Valor is a safe option to peanut producers in our region. Although peanut injury has been observed in other states and in the High Plains when rates exceeded labeled recommendations, we feel that this herbicide is a good option for peanut growers for early-season weed control (4 to 6 weeks of soil residual activity).

Table 1. Peanut injury and yield as affected by Valor applied preemergence in Seminole, TX, 2009[a].

Treatment	Rate	Prod.	Timing	Stand	Peanut Injury	Peanut Canopy Width				Yield	Grade
				May 21	May 21	May 21	Jun 3	Jun 22	Sep 9		
	lb ai/A	oz/A		Plants/3ft.	%	--------------------inches-------------------				lb/A	
Non-treated	---	---	---	10.2	0	4.5	5.6	15.9	39	6367	76
Valor SX	0.096	3	PRE	10.5	0	4.3	5.3	15.3	39.9	6174	76
CV				1.79	0.0	4.81	4.35	6.58	6.06	5.31	1.71
pValue				0.1273	1.0000	0.3004	0.1703	0.4500	0.6112	0.4715	1.0000
$LSD_{(0.10)}$				NS	NS	NS	NS	NS	NS	NS	NS

[a]Abbreviations: NS, non-significant; PRE, preemergence

Developing an Action Threshold for Thrips in the Texas High Plains-2009

Cooperators: Tyler Black, Tim Black, Chuck Rowland, Bruce Turnipseed, Justin Crownover - Cotton Growers / Stephen Cox – Private Consultant / Texas AgriLife Extension Service

David Kerns, Megha Parajulee, Ed Bynum, Monti Vandiver, Manda Cattaneo, Kerry Siders and Dustin Patman
Extension Entomologist-Cotton, Research Entomologist-Cotton, Extension Entomologist, EA-IPM Bailey/Parmer Counties, EA-IPM Gaines County, EA-IPM Hockley/Cochran Counties, EA-IPM Crosby County

South Plains & 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 on the Texas High Plains is the western flower thrips, *Frankliniella occidentalis* (Pergande). This was the third year conducting this study. The purpose of this study was 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 thrips induced yield reduction and temperature. This study was conducted in irrigated cotton across the Texas High Plains. Based on limited data; it appears that when the daily maximum temperature is at or below 83° F for a 4-5 day period, the current action threshold of 1 thrips/true leaf appears to be too high and that a better threshold should probably be about 0.5 thrips/true leaf. When the daily maximum temperature is > 83° F, the current action threshold of 1 thrips/leaf appears to be acceptable or possibly too high when temperatures exceed 90° F.

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 thrips induced yield reduction and temperature.

Materials and Methods:

This study was conducted in irrigated cotton in Bailey County in 2007, in Bailey, Crosby, Gaines, Hale, Hockley and Lubbock counties in 2008, and in Gaines, Lubbock and Hale counties in 2009. In 2007-08, plots at all locations were 2-rows wide × 100-ft long, while in 2009 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 1). 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 CO_2 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 entirety in 2007, using a stripper with a burr extractor, and a 1/1000th acre portion was harvested from each plot using an HB hand stripper from tests in 2008-09. Data were analyzed using linear regression models and PROC MIXED with means separated using an F protected LSD ($P \leq 0.05$) (SAS Institute 2003).

Results and Discussion:

In 2007, we only had one test site. At this location the thrips numbers were relatively low throughout the test period (Figure 1A). The thrips did not exceed the action threshold in the untreated plots until week 3. All of the treatment regimes that were sprayed during week 1 yielded significantly more lint than the untreated (Figure 1B), although the thrips populations were below 0.5 thrips/plant during this period (Figure 1A). Although both of the threshold treatment regimes were sprayed at the same time, and did not differ from each other, the threshold regime that did not depend on the occurrence of thrips larvae yielded significantly more than the untreated. The treatment regime sprayed on weeks 2 and 3 failed to produce significantly more lint than the untreated.

There was a significant correlation between yield and thrips density at week 2 or 1 true leaf stage (Figure 2A) and week 3 or 2 true leaf stage (Figure 2B). Week 3 exhibited the closest correlation with an R^2=0.97 probably because it represents cumulative damage over the entire time period. On both graphs yield reduction appeared to level off at approximately 1 thrips per plant. At the 1 true leaf stage, the decline in yield appeared to lessen at approximately 0.5 thrips/plant (Figure 2A) while at the 2 true leaf stage yield reduction appeared to lessen at about 1 thrips per plant (Figure 2B). Regardless of growth stage, 0.5 thrips/true leaf appears to be the most suitable threshold in this test, which is 50% of the current recommended threshold.

For the 2008 tests, the data for thrips densities and yields were pooled across locations for presentation. Additionally, yields were normalized across locations to account for variation due to other factors. Overall thrips densities were higher in 2008 than in 2007, particularly during the first 2 weeks of development (Figure 3A). There were significant differences in the thrips populations among treatments during weeks 2 and 3. Invariably, plots receiving an insecticide application the previous week tended to have lower thrips numbers than those that were not treated. Despite higher thrips numbers, unlike 2007 there were no significant differences in yield across tests when pooled, or by test that could be attributed to thrips damage despite obvious injury due to thrips at several locations (Figure 3B). Similarly, regression analyses of the 2008 data could not detect any significant relationships between thrips density and yield.

The lack of impact of thrips on yield in 2008, despite higher thrips densities during the first few weeks of plant development (critical time period based on 2007), appears to be related to temperature and subsequent rapidity of plant growth (Table 2). Although sites such as Hale County in 2008 had temperatures similar to those experienced at week 1 in Bailey County in 2007, cool temperatures were short lived and subsequent temperatures were much warmer.

In 2009, thrips density at our test sites were lower than desired with the highest numbers being encountered at the Hale County site where thrips density approached 1.5, 1.75 and 0.4 thrips/plant during weeks 1, 2, and 3 respectively (Figure 4A). Additionally temperatures at Hale County were initially cool with lows and highs of 56 and 74 °F, but warmed considerably within a few days (Table 2). Although yield differences could not be detected among the various treatments, significant correlations for thrips density and yield were observed. The best correlation occurred at week 2 (Figure 4B). Based on this correlation, the highest yields were observed when thrips averaged approximately 1.5/plant. At week 2 the cotton was at the 2 true leaf stage and the recommended threshold at this time is 2 thrips/plant. Thus it appears that the recommended thrips threshold may be slightly too high under these circumstances.

When looking at thrips densities pooled across locations in 2009, the overall thrips density was lower than in 2008 (Figure 5A). These values were especially suppressed by data from the Gaines County site which had very low thrips numbers. Similar to 2008, we could not detect any differences in yield within sites or across sites, however, unlike 2008 significant correlations between pooled thrips density and pooled normalized yields were observed. When thrips density for week 3 and yield for 2009 are regressed, a highly significant correlation is observed (Figure 5B). This suggests that thrips populations at any one period in time during 2009 were too low to impact yield, but since week 3 represents an accumulation of damage over a 3 week period, a trend towards yield loss did occur. In this model, yield declines until thrips reach 0.5 to 1.0 thrips/plant. Due to the cumulative damage effect, it is difficult to identify a specific action threshold based on this data, but it appears that thrips populations should be maintained at least below 1 thrips/plant.

Acknowledgments:

Appreciation is expressed to Cotton Incorporated, Texas State Support, and Plains Cotton Growers, Inc. for financial support of this project.

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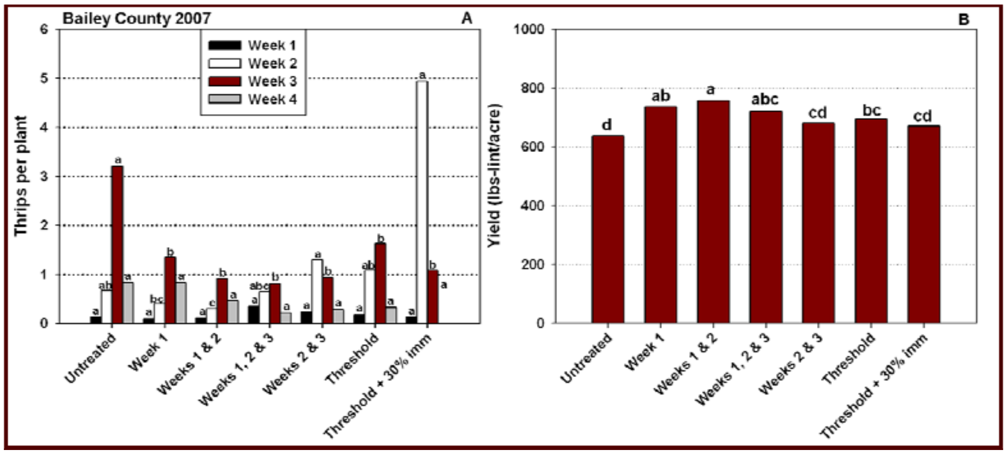
Table 1. Foliar treatment regime timings.			
	2007	2008	2009
1) Untreated check	X	X	X
2) Automatic treatment on week 1	X	X	X
3) Automatic treatment on weeks 1 and 2 (only week 2 in 2008)	X		X
4) Automatic treatment on weeks 1, 2 and 3	X	X	X
5) Automatic treatment on week 2		X	X
5) Automatic treatment on weeks 2 and 3	X	X	X
6) Treatment based on the Texas AgriLife Extension Threshold[a]	X	X	X
7) Treatment based on the above threshold with 30% larvae	X	X	
[a]One 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 2. Test sites plant growth and climatic conditions.				
	Week 1	**Week 2**	**Week 3**	**Week 4**
	Growth stage	**Growth stage**	**Growth stage**	**Growth stage**
County	**Avg Temp ^oF (min-max)**	**Avg Temp ^oF (min-max)**	**Avg Temp ^oF (min-max)**	**Avg Temp ^oF (min-max)**
2007				
Bailey	Cotyledon	1 true leaf	2 true leaves	4 true leaves
	52-79	54-82	57-82	56-86
2008				
Bailey	Cotyledon	2 true leaves	4 true leaves	6 true leaves
	68-100	61-93	62-97	62-90
Crosby	Cotyledon	2 true leaves	5 true leaves	--
	68-102	66-95	67-98	--
Gaines	Cotyledon	1 true leaf	2 true leaves	5 true leaves
	59-95	63-91	68-102	65-95
Hale	Cotyledon	1 true leaf	3 true leaves	5 true leaves
	56-74	58-93	57-93	60-94
Hockley	Cotyledon	2 true leaves	4 true leaves	6 true leaves
	67-103	64-95	67-100	63-90
Lubbock	Cotyledon	2 true leaves	4 true leaves	5 true leaves
	61-91	68-96	65-95	70-99
2009				
Gaines	Cotyledon	2 true leaves	4 true leaves	6 true leaves
	56-81	59-87	65-93	--
Hale	Cotyledon	2 true leaves	4 true leaves	5 true leaves
	56-74	58-88	61-93	--
Lubbock	Cotyledon	2 true leaves	4 true leaves	5 true leaves
	58-82	58-82	58-88	64-92



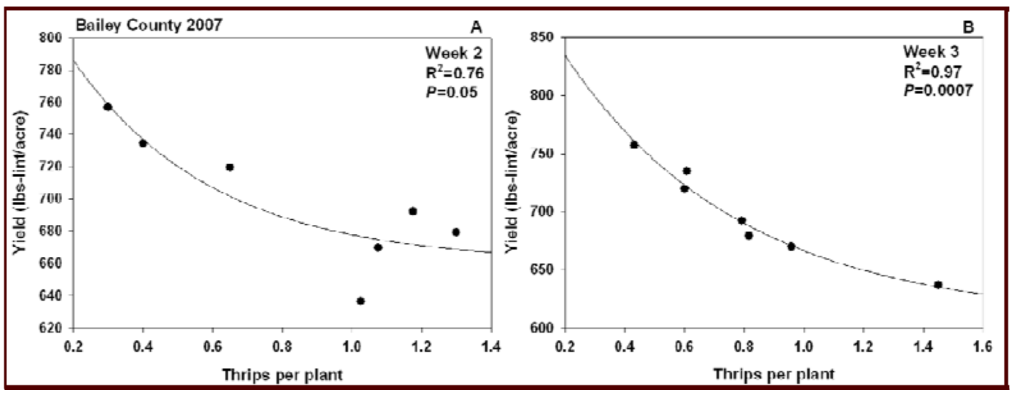


Figure 2. Linear relationship between thrips per plant and yield

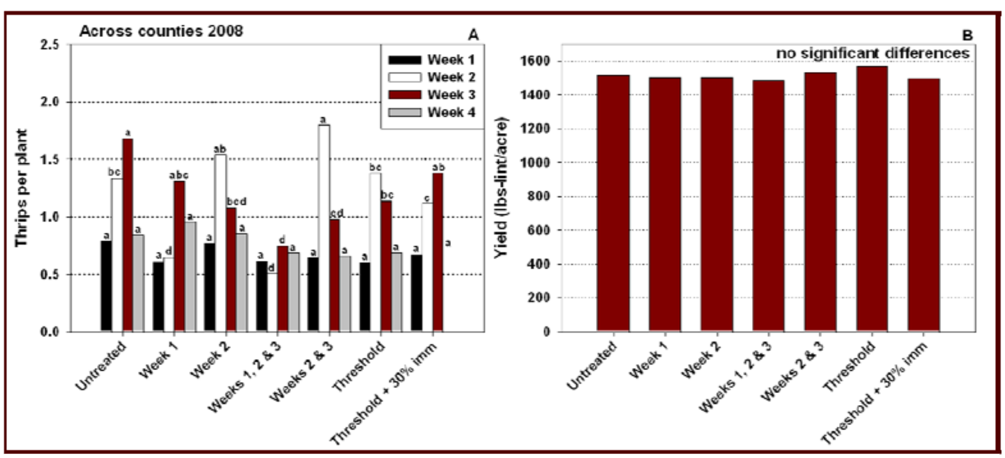


Figure 3. (A) Number of thrips per plant at various treatment regimes. (B) Yield of cotton exposed to various treatment regimes for thrips. Same colored bars capped with the same letter are not significantly different based on LSMEANS and a *F* protected (LSD, $P < 0.05$).

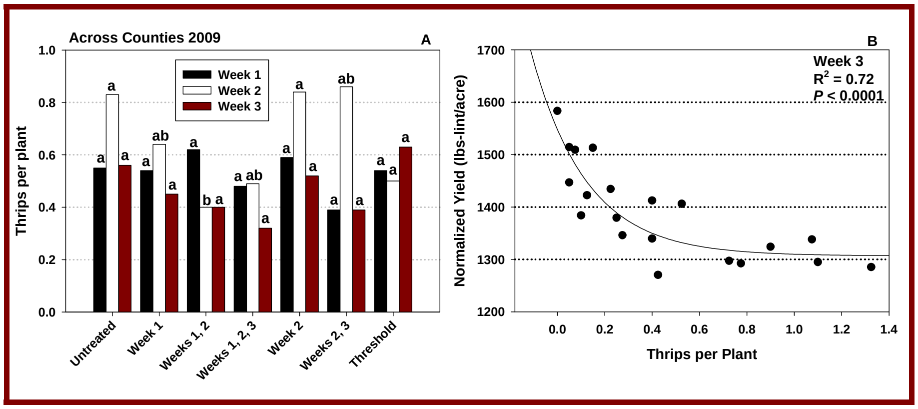


Figure 4. (A) Number of thrips per plant at various treatment regimes; same colored bars capped with the same letter are not significantly different based on LSMEANS and a *F* protected (LSD, P < 0.05). (B) Linear relationship between thrips per plant and yield.

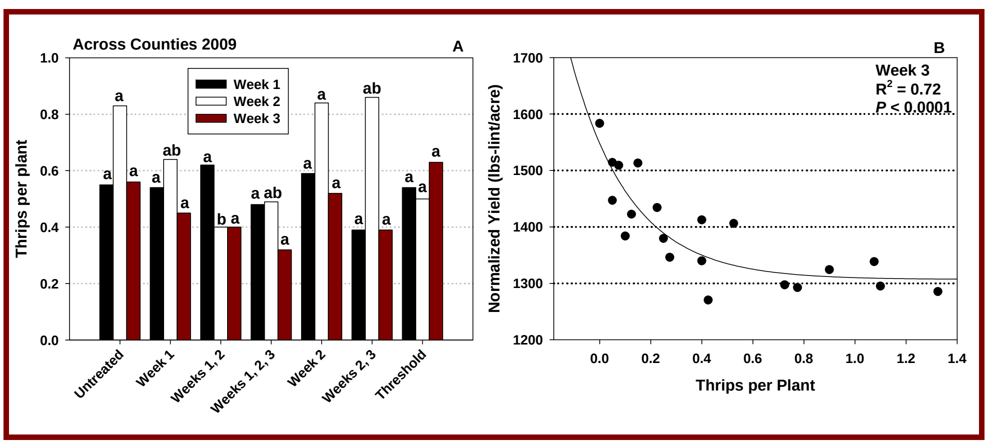


Figure 5. (A) Number of thrips per plant at various treatment regimes; same colored bars capped with the same letter are not significantly different based on LSMEANS and a *F* protected (LSD, P < 0.05). (B) Linear relationship between thrips per plant and yield.

Boll Damage Survey of Bt and Non-Bt Cotton Varieties in the South Plains Region of Texas 2007-09

Cooperators: Texas AgriLife Extension Service

David Kerns, Monti Vandiver, Emilio Nino, Tommy Doederlein, Manda Cattaneo, Greg Cronholm, Kerry Siders, Brant Baugh, Scott Russell and Dustin Patman
Extension Entomologist-Cotton, EA-IPM Bailey/Parmer Counties, EA-IPM Castro/Lamb Counties, EA-IPM Lynn/Dawson Counties, EA-IPM Gaines County, EA-IPM Hale/Swisher Counties, EA-IPM Hockley/Cochran Counties, EA-IPM Lubbock County, EA-IPM Terry/Yoakum Counties and EA-IPM Crosby/Floyd Counties

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 lepiopterous pests, and the number of bolls damaged by sucking pests in 2009. Boll damage was light in 2007; however, more damaged bolls where 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.

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 and 2009, 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. 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 contained about 20% fall armyworms and 80% bollworms. 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.

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 where 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 lepipoterous 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 for the cotton.

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 for financial support of this project and the Plains Cotton Growers, Inc. for financial support of this project.

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 University System is implied. Readers should realize that results from one experiment do not represent conclusive evidence that the same response would occur where conditions vary.

Table 1. Number of fields sampled by county and Bt trait in 2007-09.

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

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 ($P \leq 0.10$).
[a]Number of fields sampled.
[b]Percentage of damaged bolls from three locations in each field, 100 bolls sampled per locations, 300 bolls per field.
[c]Mean 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 ($P \leq 0.10$).
[a]Number of fields sampled.
[b]Percentage of damaged bolls from three locations in each field, 100 bolls sampled per locations, 300 bolls per field.
[c]Mean 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 ($P \leq 0.05$).

[a]Number of fields sampled.

[b]Percentage of worm or sucking bug damaged bolls from three locations in each field, 100 bolls sampled per locations, 300 bolls per field.

[c]Mean number of insecticide applications targeting lepidopterous pests per site.

AgriLIFE EXTENSION
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Replicated Irrigated Cotton Variety Demonstration, Seminole, TX - 2009

Cooperator: Gregory Upton

Manda Cattaneo, Mark Kelley, Randy Boman, and Scott Russell
EA-IPM Gaines County, Extension Program Specialist II - Cotton, Extension Agronomist - Cotton, EA-IPM Terry and Yoakum Counties

Gaines County

Summary: Significant differences were observed for all yield and economic and most HVI fiber quality parameters measured. Lint turnout ranged from a low of 32.5% and a high of 36.9% for NexGen 3348B2F and Deltapine 0935B2F, respectively. Lint yields varied with a low of 1140 lb/acre (NG3348B2F) and a high of 1367 lb/acre (Phytogen 375WF). Lint loan values ranged from a low of $0.5555/lb (NexGen 2549B2F) to a high of $0.5698/lb (Deltapine 174F). Net value/acre among varieties ranged from a high of $754.84 (Deltapine 174F) to a low of $636.61 (NG2549B2F), a difference of $118.23. Micronaire values ranged from a low of 4.0 for FiberMax 9160B2F and NexGen 2549B2F to a high of 4.6 for Deltapine 0924B2RF. Staple averaged 35.4 across all varieties with a low of 34.2 for Deltapine 0935B2F and a high of 36.5 for FiberMax 9180B2F and FiberMax 9160B2F. Percent uniformity ranged from a high of 82.5% for NexGen 3348B2F to a low of 80.7% for Phytogen 375WF. Strength values averaged 29.1 g/tex with a high of 31.2 g/tex for FiberMax 9180B2F and a low of 27.8 g/tex for Deltapine 0935B2F. 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 varieties under irrigated production in Gaines County.

Materials and Methods:

Varieties: All-Tex Apex B2F, Deltapine 174F, Deltapine 0935B2F, Deltapine 0924B2F DynaGro 2570B2F, FiberMax 9160B2F, FiberMax 1740B2F, FiberMax 9180B2F, NexGen 2549B2F, NexGen 3348B2F, Phytogen 375WF

Soil Texture and pH:	91% sand, 1% silt, and 8% clay; pH of 7.8
Experimental design:	Randomized complete block with 3 replications
Seeding rate:	3 seeds/row-ft in 40-inch row spacing
Plot size:	8 rows by variable length of field (1863 - 2625 ft long)
Planting date:	18 May in terminated wheat
Irrigation:	This location was under a center pivot
Irrigation & Rainfall:	Pre-bloom irrigation and rainfall totaled ~5.63 inches Bloom to harvest rainfall totaled ~8.15 inches
Insecticides:	No insecticides were applied
Weed Management:	1 pt of Caparol in early July and 3 applications of roundup in-season
Fertilizer Management:	200 lbs of 33-0-0-12
Plant Growth Regulators:	8 oz of pix early season
Harvest Aides:	1 qt of Prep and 2 oz of ET
Harvest:	Plots were harvested on 5 & 6-November using a commercial stripper harvester with field cleaner. Harvested material was transferred to a weigh wagon with integral electronic scales to determine individual plot weights. Plot yields were subsequently 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 Texas Tech University - Fiber and Biopolymer Research Institute 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 $160/ton. Ginning costs did not include checkoff.
Seed and technology fees:	Seed and technology costs were calculated using the appropriate seeding rate (4.0 seed/row-ft) for the 40-inch 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 and economic and most HVI fiber quality parameters measured (Tables 1 and 2). Lint turnout ranged from a low of 32.5% and a high of 36.9% for NexGen 3348B2F and Deltapine 0935B2F, respectively. Seed turnout ranged from a high of 52.7% for NG2549B2F to a low of 47.9% for Deltapine 174F. Bur cotton yields averaged 3636 lb/acre with a high of 3789 lb/acre for Deltapine 0924B2F, and a low of 3421 lb/acre for FiberMax 9180B2F. Lint yields varied with a low of 1140 lb/acre (NG3348B2F) and a high of 1367 lb/acre (Phytogen 375WF). Lint loan values ranged from a low of $0.5555/lb (NexGen 2549B2F) to a high of $0.5698/lb (Deltapine 174F). After adding lint and seed value, total value/acre for varieties ranged from a low of $790.81 for NexGen 2549B2F to a high of $918.58 for Dyna-Gro 2570B2F. When subtracting ginning, seed and technology fee costs, the net value/acre among varieties ranged from a high of $754.84 (Deltapine 174F) to a low of $636.61 (NG2549B2F), a difference of $118.23.

Micronaire values ranged from a low of 4.0 for FiberMax 9160B2F and NexGen 2549B2F to a high of 4.6 for Deltapine 0924B2RF. Staple averaged 35.4 across all varieties with a low of 34.2 for Deltapine 0935B2F and a high of 36.5 for FiberMax 9180B2F and FiberMax 9160B2F. Percent uniformity ranged from a high of 82.5% for NexGen 3348B2F to a low of 80.7% for Phytogen 375WF. Strength values averaged 29.1 g/tex with a high of 31.2 g/tex for FiberMax 9180B2F and a low of 27.8 g/tex for Deltapine 0935B2F. Elongation ranged from a high of 10.0% for Dyna-Gro 2570B2F to a low of 7.2% for FiberMax 9160B2F. There was no significant different in leaf grades. Values for reflectance (Rd) and yellowness (+b) averaged 82.2 and 7.9, respectively. This resulted in color grades of mostly 11s and 21s.

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.

Acknowledgments:

Appreciation is expressed to Gregory Upton for the use of his land, equipment and labor for this demonstration. Further assistance with this project was provided by the Fiber and Biopolymer Research Institute, Texas Tech University. Furthermore, we greatly appreciate the Texas Department of Agriculture - Food and Fiber Research for funding of HVI testing.

Disclaimer Clause:

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Table 1. Harvest results from the replicated irrigated cotton variety demonstration, Gregory Upton Farms, Seminole, TX, 2009

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 --						
DP 174F	36.3	47.9	3714	1348	1780	0.5698	767.83	142.40	910.23	111.42	43.96	754.84	a
DG 2570B2F	36.1	50.6	3767	1360	1907	0.5633	766.00	152.59	918.58	113.00	50.78	754.81	a
PHY 375WF	36.5	48.6	3747	1367	1823	0.5567	760.75	145.84	906.59	112.42	50.76	743.41	a
DP 0935B2F	36.9	48.8	3680	1357	1795	0.5470	742.67	143.61	886.28	110.39	51.72	724.17	ab
FM 1740B2F	35.7	49.2	3676	1314	1808	0.5645	741.60	144.68	886.28	110.27	52.12	723.89	ab
AT Apex B2F	33.7	51.6	3713	1250	1916	0.5667	708.51	153.28	861.79	111.39	50.70	699.70	bc
DP 0924B2F	33.8	50.7	3789	1281	1919	0.5500	704.38	153.49	857.87	113.66	51.72	692.49	bc
FM 9160B2F	33.8	50.0	3546	1200	1773	0.5693	683.16	141.87	825.03	106.37	52.12	666.54	cd
FM 9180B2F	33.6	51.6	3421	1149	1764	0.5737	658.97	141.16	800.13	102.62	52.12	645.39	d
NG 3348B2F	32.5	52.1	3513	1140	1830	0.5687	648.50	146.44	794.94	105.39	51.12	638.43	d
NG 2549B2F	33.9	52.7	3436	1163	1812	0.5555	645.86	144.95	790.81	103.09	51.12	636.61	d
Test average	34.8	50.3	3636	1266	1830	0.5623	711.66	146.39	858.05	109.09	50.75	698.21	
CV, %	3.8	1.6	2.7	2.7	2.7	1.7	3.4	2.7	3.2	2.7	--	3.6	
OSL	0.0041	<0.0001	0.0006	<0.0001	0.0037	0.0363	<0.0001	0.0037	<0.0001	0.0006	--	<0.0001	
LSD	2.2	1.4	168	59	84	0.0162	40.83	6.75	46.69	5.03	--	42.28	

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.
$160/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 irrigated cotton variety demonstration, Gregory Upton Farms, Seminole, TX, 2009.

Entry	Micronaire	Staple	Uniformity	Strength	Elongation	Leaf	Rd	+b	Color grade	
	units	32nds inches	%	g/tex	%	grade	reflectance	yellowness	color 1	color 2
DP 174F	4.1	36.0	81.4	28.1	9.2	1.3	81.7	8.1	2.0	1.0
DG 2570B2F	4.4	35.0	81.0	28.7	10.0	1.0	82.1	8.1	2.0	1.0
PHY 375WF	4.3	35.0	80.7	28.2	8.8	1.0	81.9	8.4	1.7	1.0
DP 0935B2F	4.5	34.2	81.0	27.8	8.8	1.3	82.6	8.3	1.7	1.0
FM 1740B2F	4.4	35.3	80.8	29.2	8.3	1.3	82.8	7.4	2.0	1.0
AT Apex B2F	4.2	35.9	81.5	28.8	8.6	1.3	82.2	8.0	2.0	1.0
DP 0924B2F	4.6	34.7	81.5	29.0	9.2	2.0	81.2	7.7	2.7	1.0
FM 9160B2F	4.0	36.5	80.7	29.1	7.2	1.3	82.7	7.4	2.0	1.0
FM 9180B2F	4.2	36.5	82.2	31.2	7.9	1.0	83.9	7.5	1.7	1.0
NG 3348B2F	4.1	36.3	82.5	30.6	8.6	2.3	80.9	8.0	2.3	1.0
NG 2549B2F	4.0	34.5	81.8	29.9	9.8	2.3	82.0	7.9	2.0	1.0
Test average	4.3	35.4	81.4	29.1	8.8	1.5	82.2	7.9	2.0	1.0
CV, %	4.2	1.8	0.6	2.7	6.6	43.7	0.8	2.5	--	--
OSL	0.0140	0.0011	0.0011	0.0007	0.0005	0.1266	0.0028	<0.0001	--	--
LSD	0.3	1.1	0.8	1.3	1.0	NS	1.2	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, †indicates significance at the 0.10 level, NS - not significant.

Replicated Irrigated Cotton Variety Demonstration, Loop, TX - 2009

Cooperator: Ricky Mills

Manda Cattaneo, Mark Kelley, Randy Boman, and Scott Russell
EA-IPM Gaines County, Extension Program Specialist II - Cotton, Extension Agronomist - Cotton, EA-IPM Terry and Yoakum Counties

Gaines County

Summary: Significant differences were observed for most of the yield, economic and HVI fiber quality parameters measured. Lint turnout was significant at the 0.10 probability level and ranged from a low of 26.3% and a high of 31.3% for NexGen 3348B2F and Deltapine 164B2F, respectively. Lint yields varied with a low of 823 lb/acre (FiberMax 9160B2F) and a high of 1183 lb/acre (Deltapine 174F). Lint loan values did not significantly differ. Net value/acre among varieties ranged from a high of $611.68 (Deltapine 174F) to a low of $294.98 (NG3348B2F), a difference of $316.70. Micronaire values ranged from a low of 3.2 for NexGen 2549B2F to a high of 4.4 for Deltapine 0935B2RF, Deltapine 164B2F, and Phytogen 375WRF. Staple averaged 35.2 across all varieties with a low of 33.0 for NexGen 2549B2F and a high of 36.4 for FiberMax 9160B2F. Strength values averaged 29.2 g/tex with a high of 31.0 g/tex for FiberMax 9180B2F and a low of 26.8 g/tex for All-Tex ApexB2F. Elongation ranged from a high of 9.5% for Dyna-Gro 2570B2F to a low of 6.4% for FiberMax 9160B2F. Leaf grades were relatively high with a range of 1 to 5, with a test average of 3.1. 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 varieties under irrigated production in Gaines County.

Materials and Methods:

Varieties: All-Tex Apex B2F, Deltapine 174F, Deltapine 164B2F, Deltapine 0935B2F, DynaGro 2570B2F, FiberMax 9160B2F, FiberMax 9170, FiberMax 9180B2F, NexGen 2549B2F, NexGen 3348B2F, Phytogen 375WF

Field Soil Texture and pH:	93% sand, 3% silt, and 4% clay; pH of 7.9
Experimental design:	Randomized complete block with 3 replications
Seeding rate:	3 seeds/row-ft in 40-inch row spacing
Plot size:	8 rows by variable length of field (0.42 - 2.06 acre)
Planting date:	6 May in terminated wheat
Irrigation:	This location was under a LESA center pivot
Irrigation & Rainfall:	Pre-bloom irrigation and rainfall totaled ~6.71 inches Bloom to harvest rainfall totaled ~10.38 inches
Insecticides:	Temik was applied infurrow at planting at 3.5 lbs/acre
Weed Management:	Field was treated with Treflan at 1 1/3 pt broadcast pre-plant and 1 1/3 pt banded on at planting. 2 roundup applications during the season.
Fertilizer Management:	48 units phosphate and 120 units of Nitrogen
Plant Growth Regulators:	At pinhead square applied 2 oz Mepex
Harvest Aides:	First application: 1 pt of Def and 1 pt of Prep. Second application: 12.8 oz of Gramoxone
Harvest:	Plots were harvested on 20 October using a commercial stripper harvester. Harvested material was transferred to a weigh wagon with integral electronic scales to determine individual plot weights. Plot yields were subsequently 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 Texas Tech University - Fiber and Biopolymer Research Institute 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 $160/ton. Ginning costs did not include checkoff.
Seed and technology fees:	Seed and technology costs were calculated using the appropriate seeding rate (3 seed/row-ft) for the 40-inch 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 was significant at the 0.10 probability level and ranged from a low of 26.3% and a high of 31.3% for NexGen 3348B2F and Deltapine 164B2F, respectively. Seed turnout ranged from a high of 44.0% for FiberMax 9160B2F to a low of 39.9% for Deltapine 174F. Bur cotton yields were significant at the 0.10 probability level and averaged 3392 lb/acre with a high of 4013 lb/acre for Deltapine 174F, and a low of 2971 lb/acre for FiberMax 9160B2F. Lint yields varied with a low of 823 lb/acre (FiberMax 9160B2F) and a high of 1183 lb/acre (Deltapine 174F). Lint loan values did not significantly differ. After adding lint and seed value, total value/acre for varieties ranged from a low of $449.12 for NexGen 3348B2F to a high of $776.03 for Deltapine 174F. When subtracting ginning, seed and technology fee costs, the net value/acre among varieties ranged from a high of $611.68 (Deltapine 174F) to a low of $294.98 (NG3348B2F), a difference of $316.70.

Micronaire values ranged from a low of 3.2 for NexGen 2549B2F to a high of 4.4 for Deltapine 0935B2RF, Deltapine 164B2F, and Phytogen 375WRF. Staple averaged 35.2 across all varieties with a low of 33.0 for NexGen 2549B2F and a high of 36.4 for FiberMax 9160B2F. Percent uniformity did not significantly differ. Strength values averaged 29.2 g/tex with a high of 31.0 g/tex for FiberMax 9180B2F and a low of 26.8 g/tex for All-Tex ApexB2F. Elongation ranged from a high of 9.5% for Dyna-Gro 2570B2F to a low of 6.4% for FiberMax 9160B2F. Leaf grades were relatively high with a range of 1 to 5, with a test average of 3.1. Values for reflectance (Rd) and yellowness (+b) averaged 80.2 and 7.9, respectively. This resulted in color grades of 21s and 31s.

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.

Acknowledgments:

Appreciation is expressed to Ricky Mills for the use of his land, equipment and labor for this demonstration. Further assistance with this project was provided by the Fiber and Biopolymer Research Institute, Texas Tech University. 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 replicated irrigated cotton variety demonstration, Ricky Mills Farms , Loop TX, 2009

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 --						
DP 174F	29.5	39.9	4013	1183	1601	0.5477	647.93	128.09	776.03	120.38	43.96	611.68	a
DP 164B2F	31.3	46.0	3458	1081	1588	0.5698	616.35	127.08	743.43	103.73	50.82	588.88	a
DG 2570B2F	29.7	46.1	3402	1010	1567	0.5542	558.68	125.40	684.08	102.05	50.78	531.25	ab
PHY 375WF	30.2	42.0	3324	1004	1394	0.5572	559.05	111.55	670.60	99.73	50.76	520.11	ab
AT Apex B2F	27.1	42.5	3612	979	1534	0.5587	547.85	122.70	670.54	108.37	50.70	511.48	abc
DP 0935B2F	30.5	42.0	3344	1018	1406	0.5363	549.00	112.46	661.45	100.32	51.72	509.42	abc
FM 9170B2F	29.3	42.6	3170	928	1351	0.5652	524.09	108.09	632.18	95.10	52.12	484.95	abc
FM 9180B2F	27.1	44.7	3369	912	1506	0.5653	515.45	120.51	635.96	101.08	52.12	482.75	abc
FM 9160B2F	27.7	44.0	2971	823	1309	0.5335	438.72	104.70	543.42	89.13	52.12	402.17	bcd
NG 2549B2F	27.0	45.4	3212	866	1456	0.4642	402.15	116.48	518.63	96.36	51.12	371.15	cd
NG 3348B2F	26.3	45.7	3434	904	1571	0.3988	323.48	125.64	449.12	103.02	51.12	294.98	d
Test average	28.7	43.7	3392	973	1480	0.5319	516.61	118.43	635.04	101.75	50.67	482.62	
CV, %	7.1	2.7	9.7	9.4	9.5	13.9	16.5	9.5	13.8	9.7	--	17.6	
OSL	0.0774	<0.0001	0.0948	0.0058	0.1833	0.1955	0.0064	0.1836	0.0066	0.0948	--	0.0068	
LSD	2.9	2.0	462	156	NS	NS	145.40	NS	149.44	13.86	--	144.77	

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.
$160/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 irrigated cotton variety demonstration, Ricky Mills Farms , Loop TX, 2009.

Entry	Micronaire	Staple	Uniformity	Strength	Elongation	Leaf	Rd	+b	Color grade	
	units	32^{nds} inches	%	g/tex	%	grade	reflectance	yellowness	color 1	color 2
DP 174F	4.0	35.6	80.3	28.1	8.8	3.7	79.5	7.8	3.0	1.0
DP 164B2F	4.4	35.6	80.8	29.3	7.9	1.7	81.7	7.8	2.0	1.0
DG 2570B2F	4.2	34.5	80.9	29.3	9.5	2.3	80.5	8.4	2.0	1.0
PHY 375WF	4.4	34.7	81.1	28.0	8.3	2.3	79.8	8.2	2.3	1.0
AT Apex B2F	4.2	35.2	80.4	26.8	8.5	2.7	80.6	8.2	2.3	1.0
DP 0935B2F	4.4	33.7	80.1	28.0	8.6	1.7	81.0	8.4	2.0	1.0
FM 9170B2F	3.8	36.1	80.8	30.9	7.4	3.0	81.6	7.3	2.3	1.0
FM 9180B2F	3.7	36.1	81.1	31.0	7.6	3.0	81.0	7.3	2.7	1.0
FM 9160B2F	3.7	36.4	81.3	30.3	6.4	4.3	80.3	7.5	2.7	1.0
NG 2549B2F	3.2	33.0	80.6	29.7	8.7	5.0	77.4	7.9	3.0	1.0
NG 3348B2F	3.7	35.9	81.3	29.3	8.1	4.7	78.6	7.8	3.0	1.0
Test average	4.0	35.2	80.8	29.2	8.2	3.1	80.2	7.9	2.5	1.0
CV, %	5.2	1.9	0.7	1.9	3.5	34.3	1.0	2.6	--	--
OSL	<0.0001	<0.0001	0.2297	<0.0001	<0.0001	0.0081	<0.0001	<0.0001	--	--
LSD	0.3	1.1	NS	0.9	0.5	1.8	1.4	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, †indicates significance at the 0.10 level, NS - not significant.

Replicated Dryland Cotton Variety Demonstration, Seminole, TX - 2009

Cooperator: Jud Cheuvront

Manda Cattaneo, Mark Kelley, Randy Boman, and Scott Russell
EA-IPM Gaines County, Extension Program Specialist II - Cotton, Extension Agronomist - Cotton, EA-IPM Terry and Yoakum Counties

Gaines County

Summary: This location was initially LESA irrigated for stand establishment. No subsequent irrigations were applied. Significant differences were observed for all yield, economic, and HVI fiber quality parameters measured. Lint turnout ranged from a low of 31.4% and a high of 38.5% for Deltapine 164B2F and All-Tex EpicF, respectively. Lint yields varied with a low of 426 lb/acre (Deltapine 164B2F) and a high of 557 lb/acre (All-Tex EpicF). Lint loan values ranged from a low of $0.5017/lb (FiberMax 1740B2F) to a high of $0.5683/lb (Deltapine 164B2F). Net value/acre among varieties ranged from a high of $285.92 (All-Tex EpicF) to a low of $209.19 (FiberMax 9180B2F), a difference of $76.73. Micronaire values ranged from a low of 4.0 for NexGen 3410F to a high of 4.8 for FiberMax 1740B2F. Staple averaged 34.2 across all varieties with a low of 32.0 for FiberMax 1740B2F and a high of 35.4 for Deltapine 164B2F. Percent uniformity ranged from a high of 81.1% for FiberMax 9160B2F to a low of 79.6% for FiberMax 1740B2F. Strength values averaged 29.1 g/tex with a high of 30.9 g/tex for FiberMax 9180B2F and a low of 27.4 g/tex for FiberMax 1740B2F. 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 varieties under dryland production in Gaines County.

Materials and Methods:

Varieties: All-Tex EpicF, Americot 1532B2F, Deltapine 174F, Deltapine 164B2F, Deltapine 0924B2F, DynaGro 2570B2F, FiberMax 1740B2F, FiberMax 9180B2F, FiberMax 9160B2F, NexGen 3348B2F, NexGen 3410F, Phytogen 375WF

Soil Texture and pH:	88% sand, 3% silt, and 9% clay; pH of 7.4
Experimental design:	Randomized complete block with 3 replications
Seeding rate:	2.5 seeds/row-ft in 36-inch row spacing
Plot size:	6 rows by variable length of field (757 - 2243 ft long)
Planting date:	1 June
Irrigation:	This site was irrigated twice using LESA center pivot irrigation to aid in stand establishment, and no further irrigation was applied.
Irrigation & Rainfall:	Pre-bloom irrigation and rainfall totaled ~5.47 inches Bloom to harvest rainfall totaled ~2.05 inches
Insecticides:	Applied 5.0lbs/acre Temik in-furrow at planting.
Weed Management:	7 oz of Cotton Pro and 7 oz of Diuron were applied on 5 June. 40 oz of Glystar was applied on 25 June. 36 oz of Glyphosate was applied on 11 August.
Fertilizer managment:	20 Gallons per acre of 28-0-0-4 was coultered on in-between the rows at the end of June.
Harvest aids:	1 ½ pt of Boll Buster and 1 oz of Aim was applied on 23 October.
Harvest:	Plots were harvested on 10-November using a commercial stripper harvester with field cleaner. Harvested material was transferred to a weigh wagon with integral electronic scales to determine individual plot weights. Plot yields were subsequently 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 Texas Tech University - Fiber and Biopolymer Research Institute 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 $160/ton. Ginning costs did not include checkoff.
Seed and technology fees:	Seed and technology costs were calculated using the appropriate seeding rate (2.5 seed/row-ft) for the 36-inch 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 31.4% and a high of 38.5% for Deltapine 164B2F and All-Tex EpicF, respectively. Seed turnout ranged from a high of 54.7% for All-Tex EpicF to a low of 49.1% for FiberMax 9180B2F. Bur cotton yields averaged 1397 lb/acre with a high of 1520 lb/acre for FiberMax 1740B2F, and a low of 1320 lb/acre for Phytogen 375WF. Lint yields varied with a low of 426 lb/acre (Deltapine 164B2F) and a high of 557 lb/acre (All-Tex EpicF). Lint loan values ranged from a low of $0.5017/lb (FiberMax 1740B2F) to a high of $0.5683/lb (Deltapine 164B2F). After adding lint and seed value, total value/acre for varieties ranged from a low of $298.17 for FiberMax 9180B2F to a high of $368.77 for All-Tex EpicF. When subtracting ginning, seed and technology fee costs, the net value/acre among varieties ranged from a high of $285.92 (All-Tex EpicF) to a low of $209.19 (FiberMax 9180B2F), a difference of $76.73.

Micronaire values ranged from a low of 4.0 for NexGen 3410F to a high of 4.8 for FiberMax 1740B2F. Staple averaged 34.2 across all varieties with a low of 32.0 for FiberMax 1740B2F and a high of 35.4 for Deltapine 164B2F. Percent uniformity ranged from a high of 81.1% for FiberMax 9160B2F to a low of 79.6% for FiberMax 1740B2F. Strength values averaged 29.1 g/tex with a high of 30.9 g/tex for FiberMax 9180B2F and a low of 27.4 g/tex for FiberMax 1740B2F. Elongation ranged from a high of 11.6% for Dyna-Gro 2570B2F to a low of 9.0% for FiberMax 9160B2F. Leaf grades ranged from 1 to 3, with a test average of 1.6. Values for reflectance (Rd) and yellowness (+b) averaged 80.7 and 8.8, respectively. This resulted in color grades of mostly 11s and 21s.

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.

Acknowledgments:

Appreciation is expressed to Jud Cheuvront for the use of his land, equipment and labor for this demonstration. Further assistance with this project was provided by the Fiber and Biopolymer Research Institute, Texas Tech University. 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 replicated dryland cotton variety demonstration, Jud Cheuvront Farms, Seminole, TX, 2009

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 --						
AT EpicF	38.5	54.7	1447	557	791	0.5475	305.47	63.29	368.77	43.41	39.44	285.92	a
DG 2570B2F	35.1	51.5	1454	510	749	0.5408	275.99	59.94	335.93	43.61	47.02	245.30	b
FM 1740B2F	36.5	49.4	1520	555	750	0.5017	278.34	60.02	338.36	45.62	48.26	244.48	bc
NG 3348B2F	34.9	50.4	1448	504	730	0.5383	271.45	58.41	329.86	43.43	47.33	239.10	bcd
DP 174F	35.3	49.3	1333	471	657	0.5472	257.52	52.54	310.07	40.00	40.71	229.36	bcde
DP 0924B2F	34.1	51.0	1430	487	729	0.5348	260.35	58.34	318.69	42.89	47.89	227.91	bcde
NG 3410F	33.6	50.7	1351	453	685	0.5565	252.22	54.83	307.05	40.53	39.42	227.10	bcde
FM 9160B2F	34.8	50.1	1344	468	673	0.5507	258.23	53.81	312.04	40.32	48.26	223.45	cde
AM 1532B2F	32.8	51.8	1401	459	725	0.5543	254.29	58.03	312.32	42.04	47.33	222.94	de
PHY 375WF	36.0	49.9	1320	476	659	0.5253	249.89	52.69	302.58	39.61	47.00	215.97	e
DP 164B2F	31.4	53.5	1355	426	725	0.5683	242.32	57.96	300.28	40.65	47.05	212.58	e
FM 9180B2F	32.4	49.1	1357	440	667	0.5568	244.82	53.34	298.17	40.71	48.26	209.19	e
Test average	34.6	50.9	1397	484	712	0.5435	262.57	56.94	319.51	41.90	45.66	231.94	
CV, %	3.9	3.6	3.9	3.8	3.9	1.7	4.6	3.9	4.4	3.9	--	5.5	
OSL	0.0002	0.0250	0.0027	<0.0001	<0.0001	0.0250	0.0001	<0.0001	0.0001	0.0027	--	<0.0001	
LSD	2.3	3.1	91	31	47	0.0152	20.51	3.76	24.03	2.74	--	21.49	

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.
$160/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 dryland cotton variety demonstration, Jud Cheuvront Farms, Seminole, TX, 2009.

Entry	Micronaire	Staple	Uniformity	Strength	Elongation	Leaf	Rd	+b	Color grade	
	units	32nds inches	%	g/tex	%	grade	reflectance	yellowness	color 1	color 2
AT EpicF	4.5	34.3	80.6	29.3	11.0	1.0	80.9	9.3	1.0	1.0
DG 2570B2F	4.5	34.1	80.7	29.5	11.6	1.0	79.7	9.5	1.3	1.0
FM 1740B2F	4.8	32.0	79.6	27.4	10.6	1.0	80.7	8.6	1.7	1.0
NG 3348B2F	4.4	33.8	80.9	29.4	9.8	2.7	80.0	8.5	2.0	1.0
DP 174F	4.4	34.4	80.4	28.2	10.6	1.3	79.9	8.8	2.0	1.0
DP 0924B2F	4.6	33.9	80.7	29.5	11.1	1.0	80.2	9.2	1.7	1.0
NG 3410F	4.0	34.7	80.8	30.2	10.0	3.0	79.2	8.7	2.3	1.0
FM 9160B2F	4.3	34.4	81.1	29.9	9.0	1.3	82.1	8.4	1.3	1.0
AM 1532B2F	4.3	34.6	80.7	27.4	10.7	1.7	81.5	8.8	1.0	1.0
PHY 375WF	4.6	33.4	80.2	28.4	10.6	2.0	80.3	9.2	2.0	1.0
DP 164B2F	4.3	35.4	80.5	29.7	9.7	1.0	81.5	8.7	1.3	1.0
FM 9180B2F	4.6	34.8	80.8	30.9	9.8	1.7	82.6	8.1	1.3	1.0
Test average	4.4	34.2	80.6	29.1	10.4	1.6	80.7	8.8	1.6	1.0
CV, %	2.1	1.0	0.5	1.9	2.9	44.6	0.7	3.4	--	--
OSL	<0.0001	<0.0001	0.0303	<0.0001	<0.0001	0.0153	<0.0001	0.0003	--	--
LSD	0.2	0.6	0.7	0.9	0.5	1.2	0.9	0.5	--	--

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.

AgriLIFE EXTENSION
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Replicated Irrigated Cotton Variety Demonstration Under Root-Knot Nematode Pressure, Seminole, TX - 2009

Cooperator: Gregory Upton

Manda Cattaneo, Mark Kelley, Terry Wheeler, Randy Boman, and Scott Russell
EA-IPM Gaines County, Extension Program Specialist II - Cotton, Research Plant Pathologist, and Extension Agronomist - Cotton, EA-IPM Terry and Yoakum Counties

Gaines County

Summary: The varieties with the lowest nematode reproduction were NexGen 3348B2F with 2960 eggs, NexGen 2549B2F with 4000 eggs, Deltapine 174F with 4035 eggs, and All-Tex ApexB2F with 4311 eggs 500cm^3 soil. Significant differences were observed for all yield and economic parameters, and most of the HVI fiber quality parameters measured. Lint turnout ranged from a low of 28.7% and a high of 37.0% for All-Tex ApexB2F and Dyna-Gro 2570B2F, respectively. Lint yields varied with a low of 1009 lb/acre (FiberMax 9180B2F) and a high of 1396 lb/acre (Deltapine 174F). Lint loan values ranged from a low of $0.5313/lb (NexGen 2549B2F) to a high of $0.5727/lb (FiberMax 9160B2F). Net value/acre among varieties ranged from a high of $766.41 (Deltapine 174F) to a low of $559.05 (FiberMax 9180B2F), a difference of $207.36. Staple averaged 35.26 across all varieties with a low of 33.1 for NexGen 2549B2F and a high of 36.6 for FiberMax 9160B2F. Percent uniformity ranged from a high of 82.5% for FiberMax 9160B2F and FiberMax 9180B2F to a low of 80.7% for Deltapine 0935B2F and All-Tex ApexB2F. Strength values averaged 30.3 g/tex with a high of 32.3 g/tex for FiberMax 9180B2F and a low of 28.6 g/tex for All-Tex ApexB2F. 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 varieties under nematode pressure in Gaines County.

Materials and Methods:

Varieties:	All-Tex ApexB2F, Deltapine 174F, DynaGro 2570B2F, FiberMax 9160B2F, FiberMax 1740B2F, FiberMax 9180B2F, Stoneville 5458B2F, Deltapine 0924B2F, Deltapine 0935B2F, NexGen 2549B2F, NexGen 3348B2F, Phytogen 375WF
Soil Texture and pH:	93% sand, 1% silt and 6% sand; pH of 7.6
Experimental design:	Randomized complete block with 3 replications
Seeding rate:	3 seeds/row-ft in 40-inch row spacing
Plot size:	8 rows by variable length of field (833 - 2536 ft long)
Planting date:	19 May in terminated wheat
Irrigation:	This location was under a LESA center pivot
Irrigation & Rainfall:	Pre-bloom irrigation and rainfall totaled ~5.63 inches Bloom to harvest rainfall totaled ~8.15 inches
Insecticides:	No insecticides were applied
Weed Management:	1 pt of Caparol in early July and 3 applications of roundup in-season
Fertilizer Management:	200 lbs of 33-0-0-12
Plant Growth Regulators:	8 oz of pix early season
Harvest Aides:	1 qt of Prep and 2 oz of ET
Harvest:	Plots were harvested on 6 & 7-November using a commercial stripper harvester with field cleaner. Harvested material was transferred to a weigh wagon with integral electronic scales to determine individual plot weights. Plot yields were subsequently 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 Texas Tech University - Fiber and Biopolymer Research Institute 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 $160/ton. Ginning costs did not include checkoff.

Seed and technology fees: Seed and technology costs were calculated using the appropriate seeding rate (3.0 seed/row-ft) for the 40-inch 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:

Nematode reproduction was measured by the number of nematode eggs per 500cm^3 soil (Table 1). The varieties with the lowest nematode reproduction were NexGen 3348B2F with 2960 eggs, NexGen 2549B2F with 4000 eggs, Deltapine 174F with 4035 eggs, and All-Tex ApexB2F with 4311 eggs.

Significant differences were observed for all yield and economic parameters, and most of the HVI fiber quality parameters measured (Tables 2 and 3). Lint turnout ranged from a low of 28.7% and a high of 37.0% for All-Tex ApexB2F and Dyna-Gro 2570B2F, respectively. Seed turnout ranged from a high of 53.3% for NexGen 2549B2F to a low of 44.6% for Deltapine 174F. Bur cotton yields averaged 3458 lb/acre with a high of 4034 lb/acre for Deltapine 174F, and a low of 3139 lb/acre for FiberMax 9180B2F. Lint yields varied with a low of 1009 lb/acre (FiberMax 9180B2F) and a high of 1396 lb/acre (Deltapine 174F). Lint loan values ranged from a low of $0.5313/lb (NexGen 2549B2F) to a high of $0.5727/lb (FiberMax 9160B2F). After adding lint and seed value, total value/acre for varieties ranged from a low of $705.33 for FiberMax 9180B2F to a high of $931.40 for Deltapine 174F. When subtracting ginning, seed and technology fee costs, the net value/acre among varieties ranged from a high of $766.41 (Deltapine 174F) to a low of $559.05 (FiberMax 9180B2F), a difference of $207.36.

Micronaire values did not significantly differ. Staple averaged 35.26 across all varieties with a low of 33.1 for NexGen 2549B2F and a high of 36.6 for FiberMax 9160B2F. Percent uniformity ranged from a high of 82.5% for FiberMax 9160B2F and FiberMax 9180B2F to a low of 80.7% for Deltapine 0935B2F and All-Tex ApexB2F. Strength values averaged 30.3 g/tex with a high of 32.3 g/tex for FiberMax 9180B2F and a low of 28.6 g/tex for All-Tex ApexB2F. Elongation ranged from a high of 11.7% for Dyna-Gro 2570B2F to a low of 8.8% for FiberMax 9160B2F. There was no significant difference in leaf grades. Values for reflectance (Rd) and yellowness (+b) averaged 82.8 and 7.9, respectively. This resulted in color grades of 11s and 21s.

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.

Acknowledgments:

Appreciation is expressed to Gregory Upton for the use of his land, equipment and labor for this demonstration. Further assistance with this project was provided by the Fiber and Biopolymer Research Institute, Texas Tech University.

Furthermore, we greatly appreciate the Texas Department of Agriculture - Food and Fiber Research for funding of HVI testing.

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Table 1. Nematode reproduction from replicated nematode cotton variety demonstration, Gregory Upton Farms, Seminole, TX, 2009.

Entry	Nematode Reproduction Eggs per 500cm3 soil
DP 174F	4035
ST 5458B2F	8640
DG 2570B2F	7200
DP 0924B2F	11295
DP 0935B2F	11295
PHY 375WF	12800
FM 1740B2F	12040
FM 9160B2F	11480
NG 3348B2F	2960
NG 2549B2F	4000
AT Apex B2F	4311
FM 9180B2F	14560

Table 2. Harvest results from the replicated nematode cotton variety demonstration, Gregory Upton Farms, Seminole, TX, 2009

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 --						
DP 174F	34.6	44.6	4034	1396	1798	0.5645	787.58	143.82	931.40	121.02	43.96	766.41	a
ST 5458B2F	33.8	51.1	3946	1333	2017	0.5607	747.27	161.31	908.58	118.38	52.12	738.07	a
DG 2570B2F	37.0	51.5	3539	1310	1823	0.5693	745.43	145.81	891.24	106.16	50.78	734.30	a
DP 0924B2F	33.1	51.5	3708	1226	1910	0.5667	694.82	152.81	847.64	111.24	51.72	684.68	b
DP 0935B2F	36.3	49.4	3448	1249	1704	0.5547	692.07	136.35	828.42	103.44	51.72	673.26	b
PHY 375WF	35.6	49.6	3218	1144	1596	0.5663	648.69	127.71	776.40	96.53	50.76	629.11	c
FM 1740B2F	36.0	50.1	3143	1131	1575	0.5463	618.97	126.02	744.99	94.28	52.12	598.59	cd
FM 9160B2F	33.4	50.7	3222	1077	1634	0.5727	616.68	130.70	747.37	96.67	52.12	598.58	cd
NG 3348B2F	33.4	53.0	3186	1063	1687	0.5725	608.49	134.94	743.42	95.57	51.12	596.73	cd
NG 2549B2F	32.3	53.3	3351	1081	1786	0.5313	573.74	142.85	716.59	100.53	51.12	564.94	d
AT Apex B2F	28.7	51.4	3562	1021	1830	0.5612	572.82	146.40	719.21	106.85	50.70	561.66	d
FM 9180B2F	32.2	52.1	3139	1009	1635	0.5695	574.51	130.82	705.33	94.15	52.12	559.05	d
Test average	33.9	50.7	3458	1170	1750	0.5613	656.76	139.96	796.72	103.74	50.86	642.12	
CV, %	3.9	4.6	3.7	3.7	3.6	2.3	3.6	3.6	3.5	3.7	--	3.8	
OSL	<0.0001	0.0200	<0.0001	<0.0001	<0.0001	0.0250	<0.0001	<0.0001	<0.0001	<0.0001	--	<0.0001	
LSD	2.3	4.0	214	73	106	0.0219	40.01	8.50	46.94	6.42	--	41.61	

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.
$160/ton for seed.
Value for lint based on CCC loan value from grab samples and FBRI HVI results.

Table 3. HVI fiber property results from the replicated nematode cotton variety demonstration, Gregory Upton Farms, Seminole, TX, 2009.

Entry	Micronaire	Staple	Uniformity	Strength	Elongation	Leaf	Rd	+b	Color grade	
	units	32nds inches	%	g/tex	%	grade	reflectance	yellowness	color 1	color 2
DP 174F	4.1	35.9	81.5	29.0	11.0	2.7	82.5	8.0	1.7	1.0
ST 5458B2F	4.1	35.1	81.1	31.6	10.0	3.0	80.9	8.6	2.0	1.0
DG 2570B2F	4.6	35.3	82.0	30.0	11.7	1.3	82.8	8.2	1.0	1.0
DP 0924B2F	4.2	35.2	81.9	30.6	11.0	1.7	82.8	8.1	1.3	1.0
DP 0935B2F	4.3	34.5	80.7	29.0	10.8	1.0	82.7	8.4	1.0	1.0
PHY 375WF	4.3	35.3	81.6	29.4	10.4	2.0	82.7	8.0	1.7	1.0
FM 1740B2F	4.5	34.1	80.8	30.0	10.3	1.3	83.8	7.7	1.0	1.0
FM 9160B2F	4.2	36.6	82.5	31.8	8.8	2.3	84.0	7.6	1.7	1.0
NG 3348B2F	4.3	35.8	82.2	31.5	10.0	2.0	81.6	7.6	2.3	1.0
NG 2549B2F	4.3	33.1	81.8	29.6	11.2	2.0	82.0	7.9	1.7	1.0
AT Apex B2F	3.9	35.7	80.7	28.6	10.9	2.0	83.4	8.0	1.3	1.0
FM 9180B2F	4.2	36.5	82.5	32.3	9.3	2.7	84.2	7.1	2.0	1.0
Test average	4.26	35.26	81.6	30.3	10.5	2.0	82.8	7.9	1.6	1.0
CV, %	5.5	1.6	0.9	2.1	3.8	43.7	0.8	3.0	--	--
OSL	0.1474	<0.0001	0.0471	<0.0001	<0.0001	0.2300	0.0001	<0.0001	--	--
LSD	NS	0.97	1.3	1.1	0.7	NS	1.1	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.

AgriLIFE EXTENSION
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Evaluation of Variety Tolerance and Chemical Management of Root-Knot Nematode
Seminole, TX - 2009

Cooperator: Raymond McPherson

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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 ST 5458B2F and FM 9063B2F planted in conjuction with Aeris, Avicta Complete Cotton, Temik 15G at 3.5 lbs/ac, or Temik 15G at 5lbs/ac. Adult and immature thrips whole plant counts, *M. incognita* gall counts, second-stage juvenile and eggs counts per 500cm^3 soil, and plant height and number of node counts 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. ST 5458B2F had significantly fewer galls per root and significantly fewer second-stage juveniles and egg counts per 500cm^3 soil than FM 9063B2F. Plants from plots treated with Temik 15G at 3.5 lbs and 5lbs had significantly fewer galls per root than plants from seed treated with Aeris, Avicta, and the untreated check. ST 5458B2F had significantly higher lint yield per acre than FM 9063B2RF which resulted in a significantly higher net value per acre. Net value of 5 lbs of Temik 15G was not significantly different from 3.5 lbs of Temik 15G, and Aeris. 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). 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 study were to evaluate the impact of two cotton varieties planted in conjunction with chemical treatments on southern root-knot nematode populations and the resulting effect on plant development, and to compare net returns between varieties, chemicals, and the interaction between varieties and chemicals.

Materials and Methods:

Treatments:	See Table 1
Cropping History:	5 year crop history of cotton, peanuts, cotton, cotton, cotton
Field Soil Texture:	93% sand, 3% silt, and 4% clay
Experimental design:	randomized complete block design with 3 replications
Seeding rate:	3.8 seed/row-ft in 40-inch row spacing
Plot size:	8-rows wide and 400 ft in length
Planting date:	7 May in terminated wheat
Irrigation:	This location was under LESA center pivot
Irrigation & Rainfall:	Pre-bloom irrigation and rainfall totaled ~5.72 inches Bloom to harvest rainfall totaled ~9.16 inches
Weed Management:	8 oz of Trifluralin was banded on pre-plant. Roundup was applied twice during the season.
Fertilizer Management:	First application: 25 gallons of a 4-10-10 acid fertilizer Second application: 85 units of Nitrogen and 15 units of sulfur
Plant Growth Regulators:	No plant growth regulators were applied to this trial.
In-Season Data Collection:	The number of adult and immature thrips was counted by visually inspecting 10 whole plants per plot on 20 May, 27 May, 3 June, and 10 June. The number of galls caused by *M. incognita* was counted by visually inspecting 10 plant roots per plot on 10 June. Soil samples were taken on 16 July to count *M. incognita* second-stage juveniles (J2) and eggs per 500cm^3 soil. Plant height, number of nodes, and Nodes Above White Flower (NAWF) were counted on ten plants per plot on 14 August.
Harvest:	Plots were harvested on 19 October using a commercial stripper harvester with field cleaner. Harvested material was transferred to a weigh wagon with integral electronic scales to determine individual plot weights. Plot yields were subsequently 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 Texas Tech University - Fiber and Biopolymer Research Institute 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 $160/ton. Ginning costs did not include checkoff.

Seed and technology fees: Seed and technology costs were calculated using the appropriate seeding rate (3.6 seed/row-ft) for the 40-inch 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:

ST 5458B2F had significantly fewer galls per root than FM 9063B2F (*Table 2*). Temik 15G at 3.5 lbs and Temik 15G at 5 lbs had significantly fewer galls per root than Aeris, Avicta, and the untreated (*Table 3*). There was no significant interaction between variety and chemical, indicating that the response was consistent with both varieties. ST 5458B2F had significantly fewer egg per 500 cm^3 soil than FM 9063B2F (*Table 2*). There was no significant effect by chemical (*Table 3*) or by the interaction between variety and chemical.

Plant height did not significantly differ between FM 9063B2RF and ST 5458B2RF on 14 August (*Table 4*). However, FM 9063B2F had significantly more nodes per plant than ST 5458B2RF (*Table 4*). Plant height and number of nodes did not significantly differ between chemical treatments (*Table 5*). Nodes Above White Flower (NAWF) had a significant interaction between variety and chemical (P = 0.05). Due to the variety by chemical interaction, NAWF data is reported as interaction means (*Table 6*).

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 7*).

Net value of 5 lbs of Temik 15G was not significantly different from 3.5 lbs of Temik 15G and Aeris (*Table 8*). However, Aeris did not significantly differ from Avicta, and Untreated (*Table 8*).

The untreated plots had significantly more adult thrips on 20 May and immature thrips on 3 June than the other treatments (*Table 12*). Avicta seed treatment immature thrips did not significantly differ from the untreated plots on 3 June (*Table 12*). On 10 June the 5 lbs Temik 15G had significantly more adult thrips than the other treatments (*Table 12*). Thrips were not a limiting factor since treatments never reached the thrips threshold of 1 per true leaf.

Summary:

Meloidogyne incognita, is one factor that can significantly impact variety performance. FM 9063B2F had significantly more galls early-season and second-stage juveniles & eggs mid-season. This likely decreased crop potential and contributed to a lower yield at the end of the season. Therefore, based on this trial, planting tolerant varieties is the most economical and effective method in the management of nematodes. Chemical management also resulted in some increased control of nematodes. However, differences in chemical control were not as clearly defined as the variety effect. More research is needed in order to determine optimal variety and chemical management for nematodes across years.

Acknowledgments:

Appreciation is expressed to Raymond McPhersonfor the use of his land, equipment and labor for this demonstration. Further assistance with this project was provided by the Fiber and Biopolymer Research Institute, Texas Tech University. Furthermore, we greatly appreciate the Texas Department of Agriculture - Food and Fiber Research for funding of HVI testing.

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References:

Kirkpatrick, T. L. and C. S. Rothrock, ed. Compendium of Cotton Diseases, second Edition. APS Press, 2001.

Zhou, E. and J. L. Starr. 2003. A comparison of the Damage Functions, Root Galling, and Reproduction of Meloidogyne incognita on Resistant and Susceptible Cotton Cultivars. Journal of Cotton Science. 7:224-230.

Table 1. Treatments

ST 5458B2RF[1] Untreated
ST 5458B2RF[1] & Aeris seed treatment (insecticide & nematicide)
ST 5458B2RF & Avicta Complete Cotton seed treatment (insecticide, nematicide, and fungicide)
ST 5458B2RF[1] & 3.5 lbs/acre of Temik 15G[2]
ST 5458B2RF[1] & 5 lbs/acre of Temik 15G[2]
FM 9063B2RF[1] Untreated
FM 9063B2RF[1] & Aeris seed treatment (insecticide & nematicide)
FM 9063B2RF & Avicta Complete Cotton seed treatment (insecticide, nematicide, and fungicide)
FM 9063B2RF[1] & 3.5 lbs/acre of Temik 15G[2]
FM 9063B2RF[1] & 5 lbs/acre of Temik 15G[2]

[1] Trilex Advance (fungicide) seed treatment was applied to all seed (with the exception of the Avicta seed treatment plots)
[2] Temik 15G was applied in-furrow at planting. Temik boxes were calibrated prior to planting the trial.

Table 2. Average number of root galls caused by *Meloidogyne incognita* on 10 June and average number of *M. incognita* second-stage juveniles and eggs per 500 cm^3 soil on 16 July by variety

Variety	Average No. of Galls	Average No. of J2	Average No. of Eggs
FM 9063B2RF	30.5	639	5720
ST 5458B2RF	24.8	333	3298
Test average	26.2	486	4509
CV %	27.6	96.1	74.2
OSL	0.054	0.06	0.04

CV – coefficient of variation
OSL – observed significance level, or probability of a greater F value

Table 3. Average number of root galls caused by *Meloidogyne incognita* on 10 June and average number of *M. incognita* second-stage juveniles and eggs per 500 cm^3 soil on 16 July by chemical

Variety	Average No. of Galls	Average No. of J2	Average No. of Eggs
Untreated	35.6 ab	500	5460
Avicta	38.9 a	700	4760
Aeris	29.2 b	200	3120
3.5 lbs of Temik 15G	18.1 c	483	4253
5 lbs of Temik 15G	15.6 c	367	5180
Test average	26.2	486	4509
CV %	27.6	96.1	74.2
OSL	<0.0001	0.46	0.86

Means within the same column with the same letter are not significantly different
CV – coefficient of variation
OSL – observed significance level, or probability of a greater F value

Table 4. Average plant height and number of nodes on 14 August by variety

Variety	Average Plant Height (inches)	Average No. of Nodes
FM 9063B2RF	18.1	16.7
ST 5458B2RF	18.6	15.5
Test average	18.4	16.1
CV %	5.9	3.6
OSL	0.21	<0.0001

CV – coefficient of variation
OSL – observed significance level, or probability of a greater F value

Table 5. Average plant height and number of nodes on 14 August by chemical

Variety	Average Plant Height (inches)	Average No. of Nodes
Untreated	17.9	16.1
Avicta	17.7	16.0
Aeris	18.3	15.8
3.5 lbs of Temik 15G	19.6	16.7
5 lbs of Temik 15G	18.6	15.9
Test average	18.4	16.1
CV %	5.9	3.6
OSL	0.09	0.11

CV – coefficient of variation
OSL – observed significance level, or probability of a greater F value

Table 6. Average Nodes Above White Flower (NAWF) on 14 August for variety by chemical interaction means

Variety	Chemical	Average No. NAWF	
ST 5458B2F	Untreated	2.4	ab
ST 5458B2F	Aeris	2.8	a
ST 5458B2F	Avicta	1.9	c
ST 5458B2F	3.5 lbs of Temik 15G	2.5	ab
ST 5458B2F	5 lbs of Temik 15G	2.5	ab
FM 9063B2RF	Untreated	2.6	a
FM 9063B2RF	Aeris	2.2	bc
FM 9063B2RF	Avicta	2.4	ab
FM 9063B2RF	3.5 lbs of Temik 15G	2.6	a
FM 9063B2RF	5 lbs of Temik 15G	2.6	a
Test average		2.4	
CV %		11.9	
OSL		0.0736	

CV – coefficient of variation
OSL – observed significance level, or probability of a greater F value

Table 7. Harvest results by variety

Variety	Lint turnout	Seed turnout	Bur cotton yield	Lint yield	Seed yield	Lint loan value	Lint value	Seed value	Total value	Ginning cost	Seed and Technology cost	Net Value
	---------%---------		---------------lb/acre--------------			$/lb	---$/acre---					
ST 54548B2F	36.2	48.0	3183	1152	1529	0.5647	650.32	152.87	803.20	95.49	67.57	620.57
FM 9063B2F	33.3	50.8	2341	778	1188	0.5688	442.45	117.66	560.12	70.23	67.57	402.75
Test average	34.7	49.4	2762	965	1359	0.5668	546.39	135.27	681.66	82.86	-	511.66
CV %	3.7	2.32	8.9	8.4	9.0	2.03	8.8	9.49	8.8	8.9	-	10.42
OSL	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	0.30	<0.0001	<0.0001	<0.0001	<0.0001	-	<0.0001

CV – coefficient of variation
OSL – observed significance level, or probability of a greater F value

Assumes:
$2.45/cwt ginning costs
$150/ton for seed
Value for lint based on CCC loan value from grab samples and FBRI HVI results
Net Value was determined by subtracting ginning cost, seed and technology cost and treatment cost ($19.57/acre, data not shown) from total value.

Table 8. Harvest results by chemical

Chemical	Lint turnout	Seed turnout	Bur cotton yield	Lint yield	Seed yield	Lint loan value	Lint value	Seed value	Total value	Ginning cost	Treatment cost	Net Value
	--------%--------		---------------lb/acre--------------			$/lb	-------------------------------------$/acre--------------------------------------					
5 lbs of Temik 15G	35.0	49.4	3023 a	1062 a	1490 a	0.5679	602.97 a	149.03 a	752.00 a	90.70 a	25.11	568.63 a
3.5 lbs of Temik 15G	35.2	50.0	2930 ab	1034 ab	1457 a	0.5636	583.48 ab	145.65 a	729.13 a	87.88 ab	20.16	553.52 ab
Aeris	34.7	49.4	2822 abc	979 ab	1384 ab	0.5583	544.21 bc	138.40 ab	682.61 ab	84.66 abc	17.33	513.06 abc
Untreated	34.4	49.2	2551 c	880 c	1248 bc	0.5711	502.05 c	124.80 bc	626.84 c	76.53 c	8.61	474.14 c
Avicta	34.5	48.7	2527 c	878 c	1228 c	0.5700	499.83 c	119.28 c	619.11 b	75.80 c	15.70	460.04 c
Test average	34.7	49.4	2762	965	1359	0.5668	546.39	135.27	681.66	82.86	-	511.66
CV %	3.7	2.32	8.94	8.4	9.0	2.03	8.8	9.49	8.8	8.9	-	10.42
OSL	0.87	0.42	0.01	0.002	0.005	0.39	0.006	0.004	0.005	0.01	-	0.01

Means within the same column with the same letter are not significantly different
CV – coefficient of variation
OSL – observed significance level, or probability of a greater F value

Assumes:
$2.45/cwt ginning costs
$150/ton for seed
Value for lint based on CCC loan value from grab samples and FBRI HVI results
Net Value was determined by subtracting ginning cost, seed and technology cost ($67.57/acre, data not shown) and treatment cost from total value.

Table 9. HVI fiber property results by variety

Variety	Micronaire	Staple	Uniformity	Strength	Elongation	Leaf	Rd	+b
ST 5458B2F	4.7	36.0	80.5	30.0	8.0	2.1	80.3	8.1
FM 9063B2F	4.3	37.8	81.6	31.3	7.0	2.1	83.3	7.1
Test average	4.6	36.9	81.0	30.6	7.5	2.1	81.8	7.6
CV %	3.8	2.3	0.7	2.2	4.4	41.0	1.4	3.7
OSL	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	1.0	<0.0001	<0.0001

CV – coefficient of variation
OSL – observed significance level, or probability of a greater F value

Table 10. HVI fiber property results by chemical

Chemical	Micronaire	Staple	Uniformity	Strength	Elongation	Leaf	Rd	+b
5 lbs of Temik 15G	4.6	36.9	81.3	30.6	7.6 ab	2.0	81.4	7.6
3.5 lbs of Temik 15G	4.3	36.3	81.0	30.5	7.8 a	1.8	81.4	7.8
Aeris	4.6	36.8	80.7	30.4	7.6 ab	2.8	81.6	7.5
Untreated	4.6	37.0	80.8	31.0	7.2 b	2.0	82.3	7.7
Avicta	4.6	37.1	81.3	30.4	7.5 ab	1.7	82.2	7.5
Test average	4.6	36.9	81.0	30.6	7.5	2.1	81.8	7.6
CV %	3.8	2.3	0.7	2.2	4.4	41.0	1.4	3.7
OSL	0.06	0.61	0.29	0.61	0.05	0.26	0.63	0.49

Means within the same column with the same letter are not significantly different
CV – coefficient of variation
OSL – observed significance level, or probability of a greater F value

Table 11. Average number of adult (A) and immature (I) thrips 20 May, 27 May, 3 June, and 10 June by variety

	Date							
	20 May		27 May		3 June		10 June	
Variety	A	I	A	I	A	I	A	I
FM 9063B2F	0.04	0.02	0.04	0.00	0.07	0.01	0.10	0.07
ST 5458B2F	0.05	0.01	0.06	0.01	0.07	0.08	0.06	0.11
Test average	0.04	0.01	0.05	0.00	0.07	0.04	0.08	0.09
CV %	172.6	374.3	146.3	600.0	117.4	146.1	95.2	124.9
OSL	0.67	0.35	0.52	0.33	0.84	0.006	0.14	0.32

CV – coefficient of variation
OSL – observed significance level, or probability of a greater F value

Table 12. Average number of adult (A) and immature (I) thrips 20 May, 27 May, 3 June, and 10 June by chemical

	Date							
	20 May		27 May		3 June		10 June	
Variety	A	I	A	I	A	I	A	I
Untreated	0.15 a	0.05	0.05	0.00	0.05	0.12 a	0.07 b	0.07
Avicta	0.05 b	0.00	0.02	0.00	0.08	0.08 ab	0.02 b	0.12
Aeris	0.02 b	0.00	0.07	0.00	0.08	0.03 cb	0.07 b	0.07
3.5 lbs of Temik 15G	0.05 b	0.01	0.08	0.00	0.10	0.00 c	0.07 b	0.13
5 lbs of Temik 15G	0.00 b	0.00	0.03	0.00	0.07	0.00 c	0.18 a	0.03
Test average	0.04	0.01	0.05	0.00	0.07	0.04	0.08	0.09
CV %	172.6	374.3	146.3	600.0	117.4	146.1	95.2	124.9
OSL	0.02	0.53	0.70	0.44	0.74	0.03	0.03	0.56

Means within the same column with the same letter are not significantly different
CV – coefficient of variation
OSL – observed significance level, or probability of a greater F value

Replicated Irrigated Cotton Variety Demonstration
Under Verticillium Wilt Pressure
Seminole, TX - 2009

Cooperator: Max McGuire

Manda Cattaneo, Mark Kelley, Jason Woodward, Terry Wheeler, and Randy Boman
EA-IPM Gaines County, Extension Program Specialist II - Cotton, Extension Plant Pathologist, Research Plant Pathologist, and Extension Agronomist - Cotton

Gaines County

Summary: Significant differences were observed for most yield and economic and HVI fiber quality parameters measured. Lint yields varied with a low of 1153 lb/acre (FiberMax 9180B2F) and a high of 1637 lb/acre (Deltapine 174F). Lint loan values ranged from a low of $0.5327/lb (NexGen 2549B2F) to a high of $0.5643/lb (Deltapine 174F). Net value/acre among varieties ranged from a high of $896.76 (Deltapine 174F) to a low of $616.91 (NexGen2549B2F), a difference of $279.85. Staple averaged 36.4 across all varieties with a low of 34.1 for NexGen 2549B2F and a high of 37.7 for FiberMax 9170B2F. Strength values averaged 30.2 g/tex with a high of 32.3 g/tex for FiberMax 9170B2F and a low of 28.2 g/tex for Americot 1532B2F. Percent uniformity and values ranged from a high of 82.8% for FiberMax 9160B2F to a low of 80.3% for Deltapine 0935B2F. 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 varieties under Verticillium Wilt pressure in Gaines County.

Materials and Methods:

Varieties: All-Tex Patriot F, Americot 1532B2F, Deltapine 174F, Deltapine 164B2F, Deltapine 0935B2F, FiberMax 9160B2F, FiberMax 9170B2F, FiberMax 9180B2F, NexGen 2549B2F, NexGen 3348B2F, Phytogen 315F

Field Soil Texture and pH:	87% sand, 3% silt, and 10% clay; pH 7.7
Experimental design:	Randomized complete block with 3 replications
Seeding rate:	3.6 seeds/row-ft in 40-inch row spacing
Plot size:	8 rows by variable length of field (0.91 acres to 1.48 acres)
Planting date:	29 April in terminated wheat
Irrigation:	This location was under LESA center pivot
Irrigation & Rainfall:	Pre-bloom irrigation and rainfall totaled ~7.10 inches Bloom to harvest rainfall totaled ~8.70 inches
Insecticides:	Applied Temik at 3.5 lbs/acre in-furrow at planting
Harvest:	Plots were harvested on 8 & 9-October using a commercial stripper harvester with field cleaner. Harvested material was transferred to a weigh wagon with integral electronic scales to determine individual plot weights. Plot yields were subsequently 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 Texas Tech University - Fiber and Biopolymer Research Institute 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 $160/ton. Ginning costs did not include checkoff.
Seed and technology fees:	Seed and technology costs were calculated using the appropriate seeding rate (3.6 seed/row-ft) for the 40-inch 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 yield and economic and HVI fiber quality parameters measured (Tables 1 and 2). Lint turnout were significant at the 0.10 probability level and ranged from a low of 30.8% and a high of 35.3% for FiberMax 9180B2F and Phytogen 315F, respectively. There was no significant different in seed turnout. Bur cotton yields averaged 3850 lb/acre with a high of 4801 lb/acre for Deltapine 174F, and a low of 3623 lb/acre for Phytogen 315F. Lint yields varied with a low of 1153 lb/acre (FiberMax 9180B2F) and a high of 1637 lb/acre (Deltapine 174F). Lint loan values ranged from a low of $0.5327/lb (NexGen

2549B2F) to a high of $0.5643/lb (Deltapine 174F). After adding lint and seed value, total value/acre for varieties ranged from a low of $794.35 for NexGen 2549B2F to a high of $1093.90 for Deltapine 174F. When subtracting ginning, seed and technology fee costs, the net value/acre among varieties ranged from a high of $896.76 (Deltapine 174F) to a low of $616.91 (NexGen2549B2F), a difference of $279.85.

Micronaire values were significant at the 0.10 probability level and ranged from a low of 3.7 for NexGen 2549B2F and NexGen 3348B2F to a high of 4.3 for Deltapine 164B2RF. Staple averaged 36.4 across all varieties with a low of 34.1 for NexGen 2549B2F and a high of 37.7 for FiberMax 9170B2F. Percent uniformity and values ranged from a high of 82.8% for FiberMax 9160B2F to a low of 80.3% for Deltapine 0935B2F. Strength values averaged 30.2 g/tex with a high of 32.3 g/tex for FiberMax 9170B2F and a low of 28.2 g/tex for Americot 1532B2F. Elongation ranged from a high of 8.9% for NexGen 2549B2F to a low of 6.6% for FiberMax 9160B2F. Although there was one 4 observed, leaf grades were 1s and 2s for most varieties. Values for reflectance (Rd) and yellowness (+b) averaged 81.9 and 8.0, respectively. This resulted in color grades of mostly 11s and 21s.

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.

Acknowledgments:

Appreciation is expressed to Max McGuire for the use of his land, equipment and labor for this demonstration. Further assistance with this project was provided by the Fiber and Biopolymer Research Institute, Texas Tech University. Furthermore, we greatly appreciate the Texas Department of Agriculture - Food and Fiber Research for funding of HVI testing.

Disclaimer Clause:

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Table 1. Harvest results from the replicated Verticillium Wilt cotton variety demonstration, Max McGuire Farms, Seminole, TX, 2009

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 --						
DP 174F	34.1	44.6	4801	1637	2141	0.5643	922.64	171.27	1093.90	144.02	53.12	896.76	a
DP 164B2F	31.9	47.7	4050	1292	1933	0.5740	741.88	154.65	896.53	121.50	61.40	713.63	b
FM 9170B2F	33.9	48.1	3830	1298	1840	0.5692	739.60	147.21	886.81	114.89	62.98	708.93	b
PHY 315F	35.3	48.7	3623	1280	1765	0.5632	721.16	141.17	862.32	108.68	53.10	700.55	bc
FM 9160B2F	33.4	47.8	3655	1221	1747	0.5748	702.02	139.73	841.74	109.64	62.98	669.12	bcd
AT PatriotF	31.8	50.5	3728	1187	1882	0.5727	679.80	150.57	830.37	111.84	51.46	667.07	bcd
AM 1532B2F	32.4	48.7	3656	1186	1780	0.5710	677.06	142.35	819.42	109.68	61.77	647.97	bcd
NG 3348B2F	31.6	48.9	3739	1183	1831	0.5640	667.71	146.50	814.21	112.16	61.77	640.28	bcd
DP 0935B2F	33.4	45.9	3665	1223	1683	0.5512	674.54	134.61	809.15	109.95	62.49	636.71	bcd
FM 9180B2F	30.8	48.4	3746	1153	1811	0.5737	661.12	144.90	806.01	112.37	62.98	630.66	cd
NG 2549B2F	31.4	48.8	3856	1209	1881	0.5327	643.92	150.43	794.35	115.67	61.77	616.91	d
Test average	32.7	48.0	3850	1261	1845	0.5646	711.95	147.58	859.53	115.49	59.62	684.42	
CV, %	5.3	5.5	5.3	5.4	5.3	1.6	6.2	5.3	6.0	5.3	--	6.6	
OSL	0.0964	0.4278	<0.0001	<0.0001	0.0018	0.0004	<0.0001	0.0018	<0.0001	<0.0001	--	<0.0001	
LSD	2.4	NS	350	116	166	0.0155	74.72	13.30	87.68	10.51	--	77.48	

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.
$160/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 Verticillium Wilt cotton variety demonstration, Max McGuire Farms, Seminole, TX, 2009.

Entry	Micronaire	Staple	Uniformity	Strength	Elongation	Leaf	Rd	+b	Color grade	
	units	32^{nds} inches	%	g/tex	%	grade	reflectance	yellowness	color 1	color 2
DP 174F	4.1	37.1	82.0	30.0	7.9	2.7	81.3	8.1	2.3	1.0
DP 164B2F	4.3	37.2	81.9	30.3	7.3	1.0	83.3	8.2	1.0	1.0
FM 9170B2F	3.8	37.7	81.9	32.3	6.9	1.0	83.9	7.3	2.0	1.0
PHY 315F	3.9	35.4	81.1	29.1	8.1	2.0	81.1	8.5	2.0	1.0
FM 9160B2F	4.0	37.3	82.8	31.0	6.6	2.0	82.7	7.6	1.7	1.0
AT PatriotF	4.1	36.5	81.6	29.6	8.6	1.3	81.7	8.2	2.0	1.0
AM 1532B2F	4.0	36.1	81.9	28.2	8.6	2.0	82.2	8.1	1.7	1.0
NG 3348B2F	3.7	36.2	82.1	30.9	7.9	2.7	80.1	7.9	2.7	1.0
DP 0935B2F	3.8	35.0	80.3	29.0	8.5	1.7	82.3	8.4	1.3	1.0
FM 9180B2F	4.1	37.5	82.6	31.5	7.4	1.3	82.4	7.5	2.0	1.0
NG 2549B2F	3.7	34.1	82.6	29.8	8.9	4.0	79.6	8.0	2.3	1.0
Test average	4.0	36.4	81.9	30.2	7.9	2.0	81.9	8.0	1.9	1.0
CV, %	5.4	1.7	0.9	2.9	5.2	37.5	1.5	3.6	--	--
OSL	0.0672	<0.0001	0.0261	0.0005	<0.0001	0.0026	0.0143	0.0007	--	--
LSD	0.3	1.1	1.3	1.5	0.7	1.3	2.1	0.5	--	--

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.

Replication Plant Growth Regulator Performance on Cotton Demonstration, Seminole, TX - 2009

Cooperator: Michael Todd

Manda Cattaneo, Scott Russell, Mark Kelley, and Randy Boman,
EA-IPM Gaines County, EA-IPM Terry and Yoakum Counties, Extension Program Specialist II - Cotton, and Extension Agronomist - Cotton

Gaines County

Summary: No significant differences were observed for all yield, economic, and HVI fiber quality parameters measured (Tables 1 and 2). These data indicate that substantial differences are not obtained in terms of net value/acre due to plant growth regulator selection.

Objective: The objective of this project was to evaluate the performance of commercially available plant growth regulators (PGR) on a medium to tall cotton variety, FiberMax 9160B2F, in Gaines County.

Materials and Methods:

Treatments: 4 fl oz of Mepex, 4 fl oz of Mepex GinOut, 4 fl oz of Pentia, 2 fl oz of Stance

Soil Texture and pH: 84% sand, 5% silt, and 11% clay; pH of 7.8

Experimental design: Randomized complete block with 3 replications

Seeding rate: 3.5 seeds/row-ft in 38-inch row spacing

Plot size: 8 rows by variable length of field (552 - 1115 ft long)

Planting date: 15 May in terminated wheat

Irrigation: This location was under a LESA center pivot

Irrigation & Rainfall: Pre-bloom irrigation and rainfall totaled ~9.81 inches
Bloom to harvest rainfall totaled ~10.80 inches

Weed Management:	½ pt per acre Treflan banded on pre-plant and three application of Roundup in-season
Insecticides:	3 oz of Orthene applied early season
Fertlizer Management:	15 gallons of 10-34-0 preplant and 30 gallons of 28-0-0-5 in-season
Harvest Aides:	2 pts of Prep and 1 1/4 pt of Def
PGR applicaation:	The PGRs were applied on 7 July with flat fan nozzles and a spry volume of 10.4 gallons per acre.
Plant Mapping Results:	Plant height, number of nodes, and Nodes Above White Flower (NAWF) were counted on ten plants per plot on 24 July. There was no significant difference between treatments for these measurements.
Harvest:	Plots were harvested on 11-November using a commercial stripper harvester with field cleaner. Harvested material was transferred to a weigh wagon with integral electronic scales to determine individual plot weights. Plot yields were subsequently 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 Texas Tech University - Fiber and Biopolymer Research Institute 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 $160/ton. Ginning costs did not include checkoff.
Seed and technology fees:	Seed and technology costs were calculated using the appropriate seeding rate (3.0 seed/row-ft) for the 40-inch 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:

No significant differences were observed for all yield, economic, and HVI fiber quality parameters measured (Tables 1 and 2). These data indicate that substantial differences are not obtained in terms of net value/acre due to plant growth regulator 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.

Acknowledgments:

Appreciation is expressed to Michael Todd for the use of his land, equipment and labor for this demonstration. Further assistance with this project was provided by the Fiber and Biopolymer Research Institute, Texas Tech University. 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 replicated plant growth regulator cotton demonstration, Michael Todd Farms, Seminole, TX, 2009.

Entry	Lint turnout	Seed turnout	Bur cotton yield	Lint yield	Seed yield	Lint loan value	Lint value	Seed value	Total value	Ginning cost	Net value
	-------- % --------		------------- lb/acre -------------			$/lb	-------------------------------------- $/acre --------------------------------------				
Mepex	34.0	50.2	3758	1279	1884	0.5662	724.35	188.42	912.77	112.73	800.04
Mepex_GinOut	33.9	49.6	3741	1271	1859	0.5605	712.30	185.84	898.15	112.23	785.92
Pentia	33.4	48.2	3671	1225	1768	0.5615	687.82	176.79	864.62	110.15	754.46
Stance	32.8	50.9	3636	1194	1849	0.5637	672.56	184.90	857.45	109.07	748.38
Untreated	32.7	49.3	3623	1184	1788	0.5662	670.24	178.84	849.09	108.70	740.38
CV, %	4.2	2.7	2.9	5.2	3.7	1.0	5.7	3.7	5.2	2.9	5.7
OSL	0.6885	0.2299	0.4647	0.3310	0.2766	0.6652	0.4174	0.2766	0.4222	0.4666	0.4482
LSD	NS	NS	NS	NS	NS	NS	NS	NS	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.
$160/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 plant growth regulator cotton demonstration, Michael Todd Farms, Seminole, TX, 2009.

Entry	Micronaire	Staple	Uniformity	Strength	Elongation	Leaf	Rd	+b	Color grade	
	units	32nds inches	%	g/tex	%	grade	reflectance	yellowness	color 1	color 2
Mepex	3.6	37.0	81.2	29.6	7.0	2.3	82.8	6.6	2.3	1.0
Mepex GinOut	3.6	36.8	81.9	29.9	7.0	1.7	82.5	6.6	3.0	1.0
Pentia	3.7	36.4	81.0	29.2	6.9	2.7	82.2	6.7	3.0	1.0
Stance	3.8	36.5	81.4	29.0	6.8	2.7	82.0	6.9	2.7	1.0
Untreated	3.7	36.7	81.3	29.4	7.0	2.3	82.6	6.7	2.7	1.0
CV, %	3.6	1.0	1.1	0.6	3.3	27.1	0.8	3.6	--	--
OSL	0.3815	0.3688	0.3442	0.3189	0.6303	0.3640	0.5897	0.4722	--	--
LSD	NS	NS	NS	NS	NS	NS	NS	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.

AgriLIFE EXTENSION
Texas A&M System

Deltapine Cotton Variety Trial
Seminole, TX - 2009

Cooperator: Tim Neufeld

Manda Cattaneo, Extension Agent - IPM, Gaines County

Gaines County

Table 1. Harvest results from the Deltapine Irrigated Cotton Variety Trial (1 replication), Tim Neufeld Farms , Seminole, TX, 2009.

Variety	Fiber Uniformity	Elongation	Fiber length	Micronaire	Fiber Strength	Fiber Color +B	Fiber Color RD	Lbs Lint / acre	Crop Value ($/acre)
DP 0935 B2RF	84.9	6.8	1.110	5.52	30.4	7.0	77.0	2238	$1,173.52
09R468B2R2 **	85.4	9.9	1.116	4.49	29.0	6.7	78.4	2156	$1,132.26
09R621B2R2 **	83.2	8.7	1.150	4.75	30.2	7.0	79.5	2160	$1,131.90
ST 5458 B2RF	84.5	7.9	1.055	5.24	32.3	6.9	77.2	2131	$1,114.64
DP 1050 B2RF *	85.0	8.6	1.183	3.65	30.7	6.9	80.1	2017	$1,056.43
DP 0949 B2RF	86.2	8.5	1.177	5.10	31.5	5.7	79.0	1878	$ 991.41
09R564B2R2 **	83.6	9.0	1.182	4.26	30.1	6.6	80.9	1873	$ 982.89
09R555B2R2 **	86.7	7.7	1.224	3.91	33.2	6.4	78.2	1726	$ 908.88

* Designates new Class of 10 Deltapine variety

** Designates Deltapine experimentals that were not advanced into commercial varieties in 2010

AgriLIFE EXTENSION
Texas A&M System

FiberMax Cotton Variety Trial
Seminole, TX - 2009

Cooperator: Jud Cheuvront

Manda Cattaneo, Extension Agent - IPM, Gaines County

Gaines County

Table 1. Harvest results from the FiberMax Irrigated Cotton Variety Trial (1 replication), Jud Cheuvront Farms , Seminole, TX, 2009.

Variety	Lint Yield (lbs/A)	Yield Rank	Percent Turnout	Mic	Staple	Strength	Unif	Loan Value* (¢/lb)	Value / A ($/A)
FM 9170B2F	1750	1	40.5%	3.84	39	32.0	81.9	54.00	$945
DP 0924 B2RF	1735	2	41.0%	4.00	36	29.4	83.4	53.75	$933
FM 1740B2F	1703	3	42.8%	3.92	37	30.8	81.4	54.00	$919
ST 4498B2RF	1651	4	40.6%	4.10	37	30.6	84.0	54.30	$897
ST 5458B2RF	1627	5	40.4%	4.15	36	32.3	82.2	54.00	$879
BCSX 1010B2F	1617	6	40.3%	4.01	37	31.9	82.0	54.00	$873
FM 9160B2F	1614	7	40.7%	3.61	38	31.5	82.8	54.05	$873
DP 0935 B2RF	1604	8	42.6%	4.04	36	28.8	81.5	53.55	$859
ST 4288B2F	1576	9	38.6%	4.09	37	30.2	81.5	53.80	$848
FM 9180B2F	1537	10	40.0%	4.26	37	31.7	82.4	54.00	$830
ST 5288B2F	1530	11	41.1%	4.09	37	29.8	82.7	54.00	$826

* Loan Value based on 2009 CCC Loan Schedule using a uniform color grade of 41 and leaf grade of 4.

FiberMax Cotton Variety Trial
Seagraves, TX - 2009

Cooperator: Larry Nelson

Scott Russell, Extension Agent - IPM Terry and Yoakum Counties
and Manda Cattaneo, Extension Agent - IPM Gaines County

Yoakum County

Table 1. Harvest results from the FiberMax Irrigated Cotton Variety Trial (1 replication), Larry Nelson Farms , Seminole, TX, 2009.

Variety	Lint Yield (lbs/A)	Yield Rank	Percent Turnout	Mic	Staple	Strength	Unif	Loan Value* (¢/lb)	Value / A ($/A)
ST 4288B2F	1935	1	35.5%	4.60	37	30.5	83.9	54.15	$1,048
FM 9170B2F	1785	2	37.8%	3.84	39	33.9	82.5	54.20	$967
ST 4498B2RF	1702	3	34.4%	3.32	38	32.6	83.0	52.30	$890
FM 1740B2F	1690	4	37.1%	4.16	37	30.1	82.8	54.00	$913
FM 9160B2F	1634	5	37.2%	3.95	37	31.7	83.1	54.20	$886
DP 0935 B2RF	1631	6	38.3%	3.88	35	29.3	81.8	53.05	$865
ST 5458B2RF	1628	7	34.5%	3.44	37	32.4	81.2	52.10	$848
DP 0924 B2RF	1609	8	35.8%	3.61	37	32.0	83.5	54.15	$871
FM 9180B2F	1598	9	36.1%	4.53	38	31.4	83.2	54.05	$864
BCSX 1010B2F	1440	10	33.2%	3.40	37	30.7	82.3	52.10	$750

* Loan Value based on 2009 CCC Loan Schedule using a uniform color grade of 41 and leaf grade of 4.

Appendix A

2009 Gaines County IPM Newsletters

GAINES COUNTY IPM NEWSLETTER

Manda G. Cattaneo, Extension Agent - IPM
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Volume II, No. 3 February 23, 2009

General Situation

The dry conditions and low commodity prices have growers deliberating over their 2009 planting intentions. Several growers have expressed an interest in planting alternative crops such as soybeans, safflowers, seasame, and sunflowers. Several of these crops are not well tested in our area and may not yield as promised. I would highly recommend that growers visit with an Extension Agronimist before planting these alternative crops. And like the saying goes “Never put all of your eggs in one basket.” This will help you to minimize your risks.

Extension Workshop to Help Producers Compare Profitabilty of Crops

For those growers considering alternative crops, I would highly recommend attending the March 5th Extension Workshop that will focus on helping Producers Compare the Profitabiltiy of Crops. This workshop will be held on March 5th in Lubbock at the Texas AgriLife Research and Extension Center located north of the Airport. The address is 1102 E. FM 1294 (½ mile east of I-27). You can also refer to http://southplainsprofit.tamu.edu for more information on Extension Ag Economics, FARM Assitance, Master Marketer, Market Outlook, Futures Charts and Prices, resources on budgets, and other ag economic information.

Soybeans

The following is information provided by Dr. Calvin Trostle and Dr. Todd Baughman, Extension Agronimists. The amount of irrigation required to produce soybeans may result in yields that tend to be unsatisfactory. Some literature suggests that full irrigation soybeans may take as much as 80% of the irrigation required for corn production. Heat and humidity is another problem with trying to make soybeans yield where they need to for Gaines County. Heat and humidity cannot be controlled and this is why we see very little soybeans in the southern plains and rolling plains. Heat and low humidity at bloom can hurt soybeans even more than peanuts. If growers go ahead and decide to plant soybeans, then they may consider planting Group IV or Group V soybeans. Early Group IV soybeans will have the potential advantage of shortening the season. If growers plant early Group IV soybeans early in the season then they may not last too far into the summer. If growers plant an early Group IV later in the season then they still have the potential to mature and produce a yield. The seeding rate needs to be a much heavier seeding rate than most growers are willing to plant. Growers also need to make sure that they have some way to timely harvest the soybeans, so that they do not lose many to shattering.

Cotton Seed Cost and Technology Fee Comparisons

The Plains Cotton Growers website http://www.plainscotton.org has a link to the “2009 Plains Cotton Growers Seed Cost Calculator.” Growers can determine their seed per acre by simply entering their row spacing and number of seed per foot. Then growers can scroll down the spreadsheet see what the seed and technology fees are for the various cotton varieties.

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Russian Wheat Aphid

Russian Wheat Aphids have been observed in scattered wheat fields in Gaines County (*Figure 1*). The Russian wheat aphid is lime green. Whereas the Greenbug is pale green with a dark green stripe on the back (*Figure 2*).

***Figure 1.* Russian Wheat Aphids on Wheat**

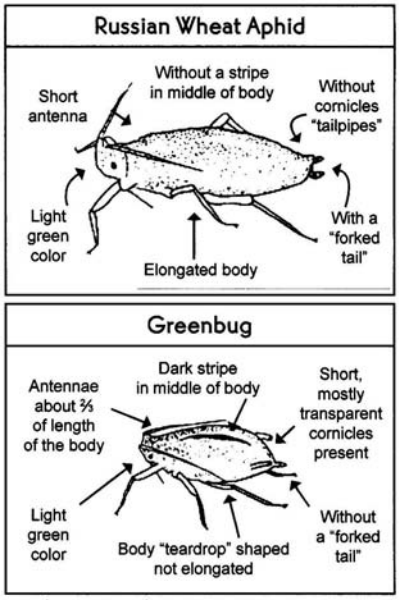

***Figure 2*. Russian Wheat Aphid and Greenbug comparison**

Russian wheat aphids inject a toxin while feeding, causing white and purple logitudinal streaks on leaves (*Figure 3*). Heavily infested plants appear flattened, and leaf edges roll inward, giving the entire leaf a tube-like appearance. Natural predators and parasites are important in suppressing these aphids and fields should be managed to conserved these natural enemies.

When scouting for Russian wheat aphids, randomly select 100 tillers, each from a different site in the field. Be sure to randomly select the tillers so that you don't bias your sample. Carefully look at each tiller and record it as infested if one or more Russian wheat aphids are present. Then determine the percentage of infested tillers. Use Table 1 to determine if a treatment is justified. For example, if the market value of the crop is projected to be $50 per acre and control costs are $9 per acre, the treatment threshold is 36% infested tillers.

***Figure 3.* Wheat with white and purple streaks on leaves**

Table 1. Russian Wheat Aphid Economic Threshold Using Percent Infested Wheat Tillers as the Sampling Unit.

Control cost per acre $	Market Value of Crop ($) per Acre					
	50	100	150	200	250	300
	Percent infested tillers					
4	16	8	5	4	3	3
5	20	10	7	5	4	3
6	24	12	8	6	5	4
7	28	14	9	7	6	5
8	32	16	11	8	6	5
9	36	18	12	9	7	6
10	40	20	13	10	8	7
11	44	22	15	11	9	7
12	48	24	16	12	10	8

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Topdressing Nitrogen Fertilizer

Growers who want to get the most out of their irrigated wheat crop should consider topdressing nitrogen fertilizer before jointing occurs. In wheat fields with poor stands, topdressing nitrogen will not be a big issue unless we get some much need rainfall. In the February 23 issue of Focus on South Plains Agriculture, Dr. Calvin Trostle explains that we are quickly approaching the time at which topdressed nitrogen needs to be applied.

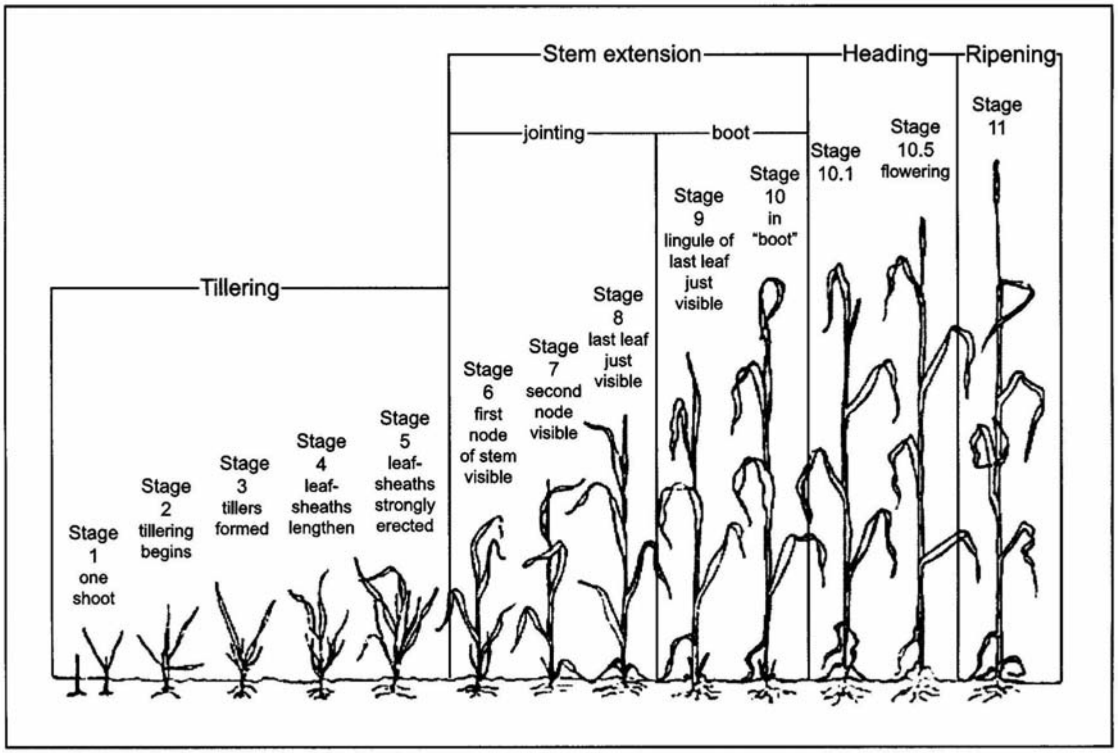

Figure 4. **Stages of small grain development**

Around March 1st (plus or minus 7 days), the growing point in wheat differentiates from producing leaves to determining how many spikelets and seeds per spikelet your crop can potentially have. The goal is to have the nitrogen available for plant uptake when the number of spikelets and number of seed is being determined ("Stage 5" in *Figure 4*).

Nitrogen applied after jointing will <u>not</u> affect the potential number of seed per head. Jointing ("Stage 6" in *Figure 4*) is when the first node of the stem is visible. If you cut the stem you will be able to see the head which is being pushed upward and will eventually be exerted from the boot (*Figure 5*).

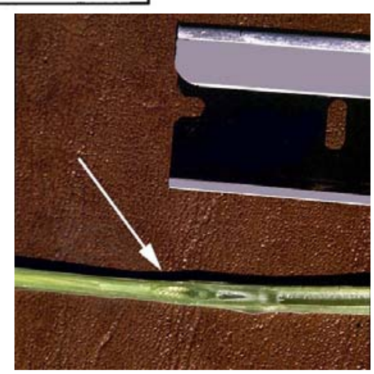

Figure 5. Hollow stem in wheat several days after jointing has begun. Picture from "Focus on South Plains Agriculture."

Information for this newsletter was obtained from the following publications:

- Texas AgriLife Extension Service, "Managing Insect and Mite Pest of Texas Small Grains"
- Growth Stages of Wheat: Identification and Understanding Improve Crop Management http://sanangelo.tamu.edu/agronomy/wheat/whtmang.htm
- February 23, 2009 Focus on South Plains Agriculture http://lubbock.tamu.edu/focus/focus2009/Feb_23/Feb_23.pdf

These publications can be found on the web at http://agrilifebookstore.org.

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GAINES COUNTY IPM NEWSLETTER

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Volume II, No. 4 March 20, 2009

General Situation

Dry conditions prevail despite the traceable amount of rain that we received last week. Russian wheat aphids and wheat leaves with purple streaks (the purple streaks are a result of the Russian wheat aphids injecting a toxin into the leaves while they are feeding) continue to be observed in wheat fields. Please see the March 23rd issue of the *Gaines County IPM Newsletter* for a description of this pest and economic thresholds.

Variety selection is the most important decisions a grower can make during the season. Variety selection is made only once during the season and that selection will dictate the management (insecticide use, herbicide use, plant growth regulator use, and water) of the field for the entire season.

Preplant weed control is one of the keys for successful weed management in field crops. Successful weed management starts with correctly identifying the weeds you are tying to control. Many weeds look similar, but may respond differently to mechanical and chemical weed control. There are several weed identification references available in text and on the internet. Winter weeds and early-emerging summer weeds, like tumbleweed, should not be present at the time the crop is emerging. Early-season weed competition can slow crop growth and compete for water and nutrients. The most critical time for weed control is the first 4 to 6 weeks after emergence. This is the time that weeds can have the greatest impact on yield.

Up Coming Meetings

April 2 – Private Applicator Training and Worker Protection Standard (WPS) Handler Training

Beginning at 8:00 a.m. at the Gaines County Civic Building

The private applicators license allows an individual to apply restricted use pesticides to their own property for the production of an agriculture commodity. The Workers Protection Standard requires that any worker who handles or works around pesticides and is not a Private Applicator must receive training on pesticide handling and chemical safety. These workers and handlers must be re-trained every five years.

If you are interested in these trainings please call the Texas AgriLife Extension Office at (432)758-4006 ext. 238 by March 23rd.

April 7 – Farm Bill Meeting

9:00 a.m. to 12 p.m. at the Gaines County Civic Building

The Texas A&M Agricultural and Food Policy Center has developed an online software decision-aid program that will allow producers to enter all the necessary data to compare the possible benefits of ACRE with the possible costs of signing into the program. At the meeting, Extension Economists and Risk Management Specialists will be discussing the ACRE program, demonstrating the online decision-aid software tool and the data necessary to run the program. The online

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program will enable a producer to enter his own data by FSA farm number along with what he expects to plant and what he expects prices to be. With the data entered, the program will calculate the expected benefits of ACRE compared with what he has to give up to get those benefits. Extension will be supporting USDA-FSA by providing assistance in the use of the software. Each producer should leave the meeting knowing how to access the program online from his own computer and understand what data is needed and how to interpret the results. There are many factors that determine whether the ACRE program will be beneficial to area producers and using the online software will help in the understanding of this complicated decision.
Please contact the Texas AgriLife Extension Office at (432)758-4007 ext. 238 for further details.

April 16 – Homeowner Horticulture Training
6:00 p.m. to 8:30 p.m. at the Gaines County Civic Building
This training will cover general horticulture lawn and gardening practices.
Please contact the Texas AgriLife Extension Office at (432)758-4007 ext. 238 for further details.

April 18 – Water Wise Landscape Workshop
8:00 a.m. to 12 p.m. at the First Christian Church in Brownfield
The workshop features expert presenters on rainwater harvesting and water wise landscaping. Contact the South Plains UWCD at (806)-637-7467.

Cotton Variety Selection

In the March 12th issue of *Focus on South Plains Agriculture* talked about the importance of matching variety characteristics with specific field conditions. There are several new varieties on the market that have high yield potentials and a good fiber package. However, growers are encouraged to plant a relatively small acreage of these new varieties before deciding to plant the whole farm to a new variety. This will help to spread your risks and help you evaluate the new varieties in your fields with your farming practices.

Variety selection also needs to take in consider the presence of diseases (Verticillium wilt and/or Fusarium Wilt) and nematodes in fields. Some varieties have shown tolerance to these disease and nematodes. However, one variety may perform better in the presence of Verticillium wilt, were as a different variety may perform better in the presence of Fusarium wilt. Therefore, growers need to make variety selection based on individual field's presence or absence of these diseases and nematodes. To read more from the *Focus on South Plains Agriculture* go to http://lubbock.tamu.edu/focus/.

2008 Research Trial Results

Results from the cotton, peanut, and wheat trials conducted in Gaines County can be found on the Gaines County Texas AgriLife Extension web site http://gaines-co.tamu.edu/. Click on the "Publications" tab.

The Lubbock AgriLife Research and Extension website http://lubbock.tamu.edu/ has results from trials conducted throughout the Texas High Plains. Below is a list of some of their publications:

- Applied Cotton Insect and Disease Pest Management Evaluations in the Texas High Plains
- 2008 AG-Cares Annual Report
- 2008 Cotton Performance Tests
- 2008 Systems Agronomic and Economic Evaluation of Cotton Varieties in the Texas High Plains

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Preplant Weed Control in Cotton

(Reported by Dr. Peter Dotray and Dr. Wayne Keeling in the March 12th issue of *Focus on South Plains Agriculture*)

Much has been written and spoken over the past few years on the development of Roundup-resistant weeds, namely Palmer amaranth (carelessweed). To date, there are 15 different weeds worldwide that have been confirmed to be resistant to Roundup. One of the main reasons for the selection of herbicide-resistant weeds is the sole reliance on a single herbicide to control weeds over the course of several years.

Growers on the Texas High Plains have done a good job of using several weed management strategies to control weeds and not relying on Roundup as the only tool. Although the amount of cultivation has declined for understandable reasons, we still see plowing and cultivation as an effective strategy against the development of herbicide resistant weeds. We also see the benefit of using other “mode-of-action” herbicides as an important part of successful weed management and as an effective weed-resistance strategy. One of the key herbicide timings with an alternative mode-of-action is the use of preplant herbicides. Effective preplant weed control will conserve soil moisture, allow planting operations to occur without the interference of weeds, and help to provide the critical weed free periods for the first six to eight weeks after crop emergence. One of the major challenges of using herbicides preplant is to ensure the 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 (carelessweed 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 ½ 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. Incorporation methods vary widely across the High Plains and state. 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

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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. When surface applications followed by irrigation or chemigation methods are used, herbicide rates are generally higher when compared to mechanically incorporated methods. Research conducted at the AG-CARES farm north of Lamesa by researchers with Texas AgriLife Research suggested that Prowl EC provided more consistent weed control when compared to Treflan when surface applied and watered in, but Treflan performed better than Prowl EC when chemigated.

Prowl H20 is the newest formulation of pendimethalin. One gallon of Prowl H20 contains 3.8 pounds of pendimethalin formulated as an aqueous capsule suspension. Since it formulated at a higher concentration than Prowl 3.3 EC, less product is needed on a per acre basis in general. In cotton, Prowl H20 may be applied in conventional, minimum, stale seedbed, or no-till systems as a preplant surface, preplant incorporated, preemergence, or at layby. It may be applied by ground, air, or chemigation. Use rates vary from 1 to 3 pints per acre in conventional or minimal tillage and 2 to 4 pints in no-till depending on soil texture.

Valor is a new burndown option for use preplant in cotton. Valor may be used at 1 to 2 ounces per acre with labeled burndown herbicides like Roundup and 2,4-D to enhance the speed of burndown, widen the spectrum of weed control, and provide residual weed control. Do not till after application or the residual weed control may be reduced. A minimum of 30 days and 1 inch of rainfall/irrigation must pass between application and planting in conventionally tilled cotton. In no-till or strip-till cotton, a minimum of 14 days plus 1 inch of rainfall/irrigation must occur between application and planting when 1 ounce of Valor is used or 21 days must occur between application and planting when 1.5 to 2 ounces is used. Valor has soil residual activity on several broadleaf weeds including chickweed, dandelion, henbit, marestail, pigweed, primrose, mustard, and sheperdspurse.

DuPont FirstShot may be applied as a burndown treatment to control emerged weeds prior to planting. FirstShot at 0.5 to 0.6 ounces per acre may be applied in tank mix with other registered burndown herbicides (Roundup, 2,4-D, Ignite, paraquat) or may be applied at 0.5 to 0.8 ounces alone. Sequential treatments not to exceed 1 ounce per acre may be made during one pre-plant cropping season and allow at least 30 days between applications. FirstShot has good activity on several weeds including cutleaf eveingprimrose, marestail, and prickly lettuce. There is a 14 day preplant interval between application and planting.

Always carefully read and follow label recommendations.

Information for this newsletter was obtained from the following publications:

- May 6, 2004 Focus on Entomology, For South Plains Agriculture
- March 12, 2009 Focus on South Plains Agriculture

Crop Management publications can be found on the web at http://agrilifebookstore.org.

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Volume II, No. 5 May 6, 2009

General Situation

The 2009 Gaines County cropping season has began, despite the dry conditions and limited planting moisture. Safflowers will be added into the crop mixture this year. Safflowers are a favorite host of Lygus Bugs. Lygus Bugs may build up in the safflower fields and then migrate to neighboring cotton fields. Therefore, cotton fields boarding safflower fields should be monitored closely for Lygus Bugs and their damage.

Private Pesticide License Training & Testing

Wednesday, May 13, 2009
Training: 8:00 a.m.
Testing: 1:00 p.m
At the Center for Housing & Community Development (1400 Avenue K, Takoka) RSVP by Monday, May 11 by calling the Lynn County Texas AgriLife Extension Office at (806)561-4562

Texas AgriLife Peanut Seed Quality Testing--Samples Needed

Calvin Trostle, Extension agronomist, Lubbock is conducting an assessment of 2009 peanut seed quality for West Texas. This project is funded by Texas Peanut Producers Board. Farmers can assist by saving a 2 lb sample of any of their peanut seed. Samples for each variety can be placed in a ziploc or paper bag along with the seed certification and fungicide tags. Write the farmers name, county, and if the seed is for a seed block on the seed tag. Save the seed at room temperature out of the heat.

Samples will be assessed for seed size, splits, immature kernels, Texas Dept. of Agriculture warm/cold germination, seedling vigor test, etc.. The objective is to assess the overall quality of peanut seed in Texas, and we have particular interest in germination.

As many as 90 samples are needed from the South Plains. If you would like to save seed for this testing, you can drop any seed sample by your local Extension office or call or e-mail Calvin Trostle, (806)746-6101, ctrostle@ag.tamu.edu, and his staff will arrange to pick up the sample.

Successful Weed Management Systems

(Reported by Dr. Todd Baughman, Extension Peanut Specialist; Dr. Peter Dotray, Extension Weed Specialist; Dr. Wayne Keeling, Systems Agronomist; and Dr. Paul Baumann, Extension Weed Specialist in the April 27, 2009 issue the *Peanut Progress*)

The use of dinitroaniline herbicides (Prowl, pendimethalin; Treflan, trifluralin; or Sonalan, ethalfluralin) often referred to as the yellow herbicides is the first step towards successful weed management programs in peanut and cotton production systems. 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 (carelessweed and other pigweed species), Russian thistle (tumbleweed), and kochia (ironweed). Most larger-seeded broadleaf weeds, like annual morningglories, cocklebur, devil's claw,

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sunflowers, and perennial weeds (silverleaf night shade, filed bindweed, lakeweed) 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). High rates in sandy soil may injure crops. Check label for proper use rates and application methods for your soil type and cropping situation. If soil conditions are extremely dry and large clods are present herbicide performance will be less effective with these herbicides. Keep in mind that when the DNA's were first introduced over 30 years ago, farmers were diligent with a 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. Adequate weed control often occurs with these methods but herbicide failures have also arisen due to poor incorporation.

The DNA herbicides may be incorporated by mechanical means or by irrigation. Incorporation methods vary widely across the state. A double-pass method of incorporation is recommended on most labels with the second incorporation made at an angle to the first incorporation, but a single-pass 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, Sonalan within 48 hours, and Prowl EC within 7 days. Prowl H_2O must be incorporated prior to weed seed emergence. However, it is best not to delay this application at all if possible.

Prowl and Sonalan 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. These products are very water insoluble and larger amounts of irrigation help to move them into the weed germination zone. Both Prowl and Treflan may be chemigated into the soil. These applications may not be the best way to incorporate Prowl, Sonalan, or Treflan, but may be the only way to use these herbicides in a reduced tillage or no-tillage crop production system. It is still better to apply these herbicides in this method then to not include them at all. When surface applications followed by irrigation or chemigation methods are used, herbicide rates are generally higher when compared to mechanically incorporated methods. Research conducted at the AG-CARES farm north of Lamesa by researchers with the Texas AgriLife Research suggested that Prowl provided more consistent weed control when compared to Treflan when surface applied and watered in, but Treflan performed better than Prowl when chemigated.

Weed resistance to many of our postemergence herbicides has become a greater concern in recent years. Many areas of the country are experiencing more problems with weed resistances than most of Texas. This is likely due to the continued use of the dinitroanaline herbicides. Continued diligent and proper use of the dinitroanaline herbicides is one of the biggest tools we have to combat weed resistance issues. Always carefully read and follow label recommendations.

Selecting Quality Wheat Seed

(Reported by Dr. Gaylon Morgan, Dr. Brent Bean, and Dr. Todd Baughman in a report sent out on April 23, 2009)

Most of the Texas wheat crop has endured drought and late-season freezes this year. Both of these environmental stresses can be detrimental to seed quality, especially the late-season freezes. Each of these factors should be considered before keeping, purchasing, and planting seed this fall. Remember,

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good seed equates to better plant stands, better fall growth, and higher grain yields, especially when planting conditions are less than ideal.

With the freezes that occurred on March 28-29 and April 5-6, much of the wheat crop across the state was at susceptible growth stages to be injured by freezing temperatures. Based on observations, Central Texas, the Blacklands, Northeast Texas, the Rolling Plains, and portions of the High Plains the late freezes will likely affect seed quality in these regions. In these regions, much of the wheat had headed or was very close to heading when the freezes occurred. At this stage, even temperatures as mild as 30-32 degrees can result in sterile flowers and halt seed development. If the flower was sterilized, no seed will be developed. However, if the wheat plant was in the seed development stage, much of the seed will be very small, shriveled, and will not likely germinate. So, special precautions should be considered this year before saving seed for planting or when purchasing seed. While there is most definitely reason for concern over next year's seed quality, availability, and price, there is no reason to panic at this point. As long as we take time to look at our potential seed quality and use some judicial precautions (listed below) we should be able to insure that our seed is worth keeping and planting.

There are several questions a person should ask before keeping or purchasing seed this year, including:

1. Does the seed look healthy? Plump seeds with good color are ideal. Large, plump seeds contain more energy and thus result in better plant stands and early season forage growth, than smaller shriveled seed. In addition, larger seeds are more forgiving on deeper planting depths and provide better seedling vigor. Keep in mind when comparing seed size that some varieties just naturally produce a larger seed than others. Always compare seed size of the same variety.

2. What is the test weight (bushel weight)? Test weight is a good initial indicator of seed quality, but is not an absolute. If the bushel weight is below 58 lbs/bu, then this warrants further investigation into the seed quality. If you are purchasing certified seed, the seed tags should state the test weight. Also, be aware that small shriveled seeds can sometimes have a high test weight due to being more densely packed into a given volume (lbs/bu). So, test weight should always be considered along with seed size. Below as an example of the importance of test weight on germination, emergence, and yield. **See Table 1 below.**

3. Does the seed have good germination? Unfortunately, a germination test should not be conducted immediately following harvest because winter wheat has a natural seed dormancy mechanism that prevents the seed from germinating for about 4 weeks after harvest (some varieties even longer). So, the only option for determining the seed viability immediately after harvesting is to have a TZ (tetrazolium) test run through the TDA (Texas Department of Agriculture) seed laboratory or a private seed laboratory. The TDA laboratory locations are listed below, and the TZ test costs $15/sample and requires 1 lb of seed. This TZ test is <u>not</u> equivalent to a germination test, but it can provide a good idea of the "viability" of the seed immediately following harvest. <u>If producers run a TZ test or an early season germination test, they should still consider running a second test prior to planting to insure that the seed possesses a good level of germination.</u>

   Good quality seed should have a >85% germination. Seed (1 lb.) can be sent to the TDA Seed Quality Lab for a germination test and/or a vigor test (accelerated aging) for $9 and $12, respectively. See addresses below.

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For additional details on sending samples to TDA for testing, go to: http://www.tda.state.tx.us/vgn/tda/files/1848/10887_procedures_and_fees_for_submitting_seed_samples_for_testing.pdf

Texas Department of Agriculture seed testing locations:

1. TDA Seed Testing Lab, P. O. Box 629, Giddings, Texas 78942, 979-542-3691
2. TDA Seed Testing Lab, 4502 Englewood Av, Lubbock, Texas 79414, 806-799-0017
3. TDA Seed Testing Lab, 241 East McNeil St, Stephenville, Texas 76401, 254-965-7333

4. What are the cleaning and storage factors to consider? Extra care should be taken in storing, conditioning, and cleaning seed this year. Producers should ask seed cleaners to set screens to insure that all shriveled and damaged seed is removed from planting seed this year. This is especially important this year since this shriveled and damaged seed will likely be of poor germination. Growers should also consider only treating seed immediately prior to planting. Seed that is of poor quality that is not treated can still be sold or fed, while treated seed will have to be properly destroyed. Remember the start to a successful wheat crop next year starts at planting and with the quality of seed that is placed in the ground.

Table 1. Relationship between wheat test weight (lb/bu) and seed quality characteristics and yield of the variety Wichita. Modified from Laude, 1950. Kansas State University.

	Heavy Seed	**Light Seed**
Test Wt (lbs/bu)	**62.4**	**53.1**
Germination	**92%**	**86%**
Emergence	**68.0%**	**48.4%**
Days to Emergence	**21**	**25**
Heads per plant	**2.9**	**2.8**
Test Wt of Crop	**61.9**	**62.0**
Yield (bu/acre)	**50**	**45**

Information for this newsletter was obtained from the following publications:

- **April 27, 2009 Peanut Progress** **http://varietytesting.tamu.edu/peanuts/index.htm#newsletter**
- **April 23, 2009 Selecting Quality Wheat Seed Report** **http://varietytesting.tamu.edu/wheat/index.htm#newsletter**

Crop Management publications can be founds on the web at http:/agrilifebookstore.org

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GAINES COUNTY IPM NEWSLETTER

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Volume II, No. 6 June 5, 2009

General Situation

We have had some reports of hail damage in cotton and one report of hail damage in a pecan orchard. A majority of Gaines County still remains excessively dry. The final planting date for insurance purpose in Gaines County is June 5th. As a result, most dryland fields did not receive their much needed planting moisture and were dry planted.

The town of Seminole has received 2-3 inches of rainfall in the past month. However, the rest of Gaines County has missed several of these rainstorms. Parts of western Gaines County received 1 inch of rain this past weekend. This was the first significant rainfall this year. With the recent rains we have had a flux of emerging weeds, including Russian thistle (tumble weeds), Kochia, nut grasses, and Palmer Amaranth (pigweed). These weeds will have the greatest impacts on yields, because they can slow crop growth and compete for water and nutrients.

Thrips have been observed in several cotton fields and some peanut fields. However, an insecticide application for thrips on peanuts is usually not recommended due to the increase possibility of secondary pest outbreaks and likely will not result in increased yields.

Figure 1. Adult Thrips

Cotton stages range from emerging to 5 true leaves. Cotton fields planted during the later part of April have accumulated 433 Heat Units and will likely start squaring next week. Growers can use a Heat Unit (H.U.) formula to monitor cotton development in relation to the amount of useful energy available to plants each day. Cotton's base temperature is 60 degrees.

H.U. = (daily high + daily low/2) – base temperature

Table 1. Cotton Development by Heat Units

Growth Interval	Accumulated Heat Units
Planting to:	
Stand establishment	78
Squaring	526
First bloom	1064
First open boll	1641
95% mature bolls	2271

Grain Sorghum Production Workshop

June 15, 2009 from 9 a.m. until 11:30 at the Coleman Park Party House in Brownfield. Topics include: Variety selection, herbicide use, planting rates, fertility & water needs, and insect pests. (2.5 CEUs). Contact the Terry County Extension Office if you have any questions 806-637-4060.

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Properly Timed Postemergence Herbicides are Most Effective

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 the herbicide label. Use crop oil concentrates or other adjuvants if specified on the 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. Not all herbicides have broad-spectrum activity, so match the postemergence herbicide with the weeds you are trying to control. Postemergence herbicides will be more effective when applied to non-stressed weeds, which often coincides with the first part of the growing season. Controlling weeds early is when you can achieve your biggest bang for your buck, the time at which weed competition is at its peak.

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)*

Thrips in Cotton

Cotton fields should be monitored weekly for adult and immature thrips up to the 5th true leaf stage. The threshold is 1 thrips per true leaf. Thrips prefer to feed on the young tender leaves and on the underside of leaves. Thrips, particularly the immature stages, are somewhat cryptic and like to hide in curled leaves. Therefore when scouting for thrips be sure to tease open the curled and folded leaves using a knife or sharp pencil to find the thrips hiding inside. These tiny immature thrips will be an indication of whether or not the thrips are reproducing. If there is reproduction then this is an indication that the soil applied insecticide or seed treatment has played out. If this occurs, then a foliar insecticide application may be justified. *(Reported by Dr. David Kerns, in the Focus on South Plains Agriculture Newsletter).*

Figure 2. Immature Thrips

Heat Unit Accumulation

In 2008 we accumulated 423 Heat Units between April 25th and June 4th. In 2009, we have accumulated 433 Heat Units in the same time period. However, Heat Units accumulated at more of a consistent rate in 2009. In 2008, we had several cool days from April 25th to May 18th. This was followed by an exceptionally warm days, with several day above 100°F. This resulted in slow Heat Unit accumulation during the first part of the growing season, and rapid Heat Unit Accumulation from May 19th onward (See Table 2 and Graph).

Table 2. Distribution of Heat Unit Accumulation Between April 25th and June 4th, 2008 & 2009

	2008	2009
Heat Unit Accumulation from April 25th to May 18th	127	243
Heat Unit Accumulation from May 19th to June 4th	316	180
Total Heat Unit Accumulation from April 25th to June 4th	443	423

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Volume II, No. 7 June 19, 2009

General Situation

Things are starting to look a little better around Gaines County. Parts of the county received a slow rain last night that soaked into the ground and we have more rain forecasted for tonight and tomorrow. See the table on the right for last night's rain totals. Unfortunately these rains did not come soon enough for the dryland cotton and some cotton fields along the Texas/New Mexico border were hailed on. Hail storms last weekend also took out a couple of fields between Seagraves and Loop.

Location	Inches
Seminole	0.6
Between Seminole and Hobbs	1
Southwest of Seminole	1 to 2
South of Seminole	0.3 to 0.5
Southeast of Seminole	0.3
East of Seminole	0.2
Seagraves	0.5
Loop	0

These rains will provide timely moisture for peanuts and irrigated cotton. Cotton ranges from cotyledon to 11 true leaves, with a majority of the cotton around the 6 true leaf stage and starting to square. Peanuts have started to bloom and will start putting down pegs soon.

Weeds and wind are the main concern in a majority of the cotton and peanut fields. Thrips populations are low to non-existent in most field and several fields have 5 or more true leaves and therefore are no longer susceptible to thrips damage. The threshold for thrips is 1 thrips per true leaf.

A cotton field in western Gaines County has some plants showing symptoms of either Fusarium or Verticillium wilt. Fusarium and Verticillium wilt cause very similar symptoms and can not be differentiated in the field. Therefore, these plants were taken to a lab and will be cultured out to determine which disease is causing the chlorosis on these leaves. If you are seeing similar symptoms in your fields, please contact me or take them to a lab to determine which disease is present. Certain varieties are more tolerate to Fusarium wilt and other varieties are tolerant to Verticillium wilt. Knowing which disease is present in your field will help you to determine which varieties to plant in the future.

Figure 1. Leaves with symptoms of Fusarium or Verticillium wilt

Safflower and Lygus

Safflower is a preferred host of Lygus bugs. We sampled a couple of safflower fields this week and found a low population of Lygus adults and immatures. We will continue monitoring these fields throughout the season and keep you updated on the development of Lygus populations.

Figure 2. Safflower field

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Root-knot Nematode

We are starting to see root-knot nematode cysts on the roots of cotton plants. Therefore the window of opportunity for an over-the-top application of Vydate C-LV for nematodes is quickly closing.

Kerry Siders, IPM Agent for Hockley and Cochran Counties provide the following information in his last issue of the West Plains IPM Update newsletter. "They are starting to find root cyst from the southern root-knot nematodes. This would indicate either no use of at-plant nematicide or that those products used at-plant are playing out. Vydate C-LV at 17 oz per acre has provided excellent protection against yield loss especially following the use of Temik. Timing is critical though. An application should be made on the heals of when Temik's effectiveness is lessening."

Figure 3. The cotton plant on the right had 5 lbs of Temik 15G applied at planting and the cotton plant on the left had no Temik applied at planting

Non-Bt Cotton and Pink Bollworm

The Gaines County IPM Program is focusing on scouting non-Bt fields since there may be more "worm" pressure due to the increased number of irrigated fields that were planted to non-Bt cotton varieties. Additionally we have set-up 8 pink bollworm traps around the county (please see the map below for trap locations). A local crop consultant has also set-up pink bollworm traps and he is keeping a close eye on other non-Bt fields.

Figure 4. Map of Gaines County. The stars indicate the location of pink bollworm traps that are being monitored by the Gaines County IPM Program.

Table 2. Number of pink bollworm moths per trap

Trap	**Week of June 15**
1	**0**
2	**0**
3	**3**
4	**1**
5	**0**
6	**3**
7	**0**
8	**2**

Grain Sorghum

Timely planting of grain sorghum can make the difference between a field reaching its full yield potential and a field not having enough heat at the end of the season to fully mature. Please see Table 3 for the last recommended planting dates for Gaines County.

For more information on planting dates, planting rates, irrigation, fertilization and herbicide please see the ***2009 Alternative Crop Options after Failed Cotton & Late Season Crop Planting for the***

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Texas South Plains publication. This publication can be found on the web at http://lubbock.tamu.edu/cotton/pdf/cropreplantoptions09.pdf

Table 3. Recommended Last Planting Dates for Gaines County

Grain Sorghum Maturity Class	Days to ½ Bloom	Approximate Days to Physiological Maturity*	Recommended Last Planting Date for Gaines County
Early	≤58	<90	July 15
Medium-early	59-63	90-96	July 10
Medium	64-68	97-103	July 5
Medium-late	69-73	104-110	June 30
Late	≥74	111+	June 25

*Uses ~32-35 days for grain fill to maturity (flowering to black layer) for all hybrids. This is different (and shorter) than harvest maturity.

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TEXAS IPM Partners with Nature

Volume II, No. 8 June 26, 2009

General Situation

The irrigated cotton and peanut crops have put on significant growth during the last week. Cotton stages range from 2 true leaves to 13 true leaves. The earlier planted fields should start blooming next week. More peanut fields have started to bloom and some fields have started to peg.

Last weekend rains were a blessing for the irrigated cotton crops. The county received between 1.5 to 4 inches of rain. However, some fields were hit with hail and the dryland fields may be caught up in the dilemma of late emerging cotton.

We found a few bollworm eggs and damaged squares in non-Bt cotton this week. However, for the most part cotton and peanut fields are insect free. Lygus counts remain low in the safflower fields that we are monitoring.

Plant Growth Regulator Use in Cotton

Several growers have started applying or are considering applying mepiquat-based (Pix, Mepex, Mepichlor, Mepiquat Chloride, Mepex GinOut, Stance, and others) plant growth regulators (PGRs). Mepiquate chloride (MC) reduces production of gibberellic acid in plant cells that in turn reduces cell expansion, ultimately resulting in shorter internode length. MC 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. MC should not be applied if crop is under any stresses including moisture; weather; insect or nematode damage; disease stress; herbicide injury; or fertility stress. Applications must begin no earlier than 50% matchhead square. 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. We may get 100+ degree temperatures, southwest winds at 30 mph at 10% relative humidity. If so, those conditions will limit plant growth in many fields with low irrigation capacity.

Growers should target applications to fields with high growth potential. Some picker 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 plant growth regulator needs under field-specific conditions.

The information on Mepiquate-based Plant Growth Regulator Use was reported by Randy Boman in the July 14, 2008 Focus on South Plains Agriculture Newsletter, which can be found on the web at http://lubbock.tamu.edu/focus/Focus2008/July_14/July_14.pdf.

Rhizobium Nodulation in Peanuts

Some peanut fields have a low level of *Rhizobium* nodulation. Growers who have a low level of *Rhizobium* nodulation may need to apply supplemental nitrogen. Below is information from the

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Peanut Progress Newsletter, which can be found on the web at http://peanut.tamu.edu/pdfs/PeanutProgress3-09.pdf.

Growers should check their taproot *Rhizobium* nodulation. Use a shovel to dig plants from different rows and field locations. If nodulation is deemed poor, nothing can be done to increase nodulation in the current crop. In West Texas 20 to 25% of fields annually may be undernodulated, or worse have only a few nodules per plant. Poor *Rhizobium* nodulation calls for supplemental nitrogen to achieve desired yield potential.

Active nodules are pink to dark red inside. If nodules are white inside they are not yet active-check again in 7 to 10 days. Nodules no longer active are black, gray, and may be mushy (you will see a few of these nodules starting in late July). Nodules which never turn pink or red inside are from soil *Rhizobium* that may not be specific for peanuts. You need to differentiate these types of nodules, which are usually on the lateral roots. Versus the mass of "supernodulation" on the taproot, which is evidence that your inoculant worked.

For West Texas, the following guideline rates nodulation levels 5 to 6 weeks after planting. We are particularly interested in any developing clusters of nodules on the taproot. If early nodulation is good you can expect it to continue to increase toward peak nodulation (usually early August), but if early nodulation is poor it probably isn't going to improve.

If a producer intends to apply 80 lbs of nitrogen per acre mid-season, but early signs suggest that nodulation is very good, then this producer may want to reduce his target nitrogen application by as much as 50%. It has been well documented that high levels of early season nitrogen, or even moderate levels as low as 30 lbs nitrogen per acre can reduce nodulation in a peanut crop. Higher mid-season nitrogen levels also can curtail *Rhizobium* nitrogen production as the plants are 'lazy' and take fertilizer nitrogen instead of fostering the desired relationship with the bacteria to give you 'free' nitrogen. See the table below for evaluating nodulation and use of supplemental nitrogen.

Table 1. Evaluation of nodulation and use of supplemental (mid-season) nitrogen

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 Rhizobium 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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Volume II, No. 9 July 8, 2009

General Situation

The irrigated cotton and peanut crops have benefited from our recent rains. We are entering into the period of highest water demand, which is during the blooming period for cotton and blooming, pegging and pod fill for peanuts. We have found a few bollworms and cotton square borers in cotton. Bollworm eggs have also been observed. Non-Bt fields should be monitored closely for bollworm populations. Beneficial insects (ladybird beetles, lacewings, minute pirate bugs) are helping to keep most insect pests at bay. Before an insecticide is applied, growers need to take into account the work of Mother Nature and the beneficial insects which will likely take out several small "worms".

Gaines County Disease Update from Dr. Jason Woodward, Texas AgriLife Extension Plant Pathologist

***Peanut*:** There has been an increase in the number of disease reports following the rain and cooler temperatures experienced the past several days. Southern blight, caused by *Sclerotium rolfsii*, has been observed in several peanut fields in Western portions of the county *(See Figure 1)*. This disease is characterized by the feathery sheaths of fungal mycelia and spherical-shaped, brown sclerotia that are produced on or near infected plants. A general chlorosis and wilting of lateral branches or main stems results from light to dark brown lesions that form near the soil line. Aspergillus crown rot, caused by *Aspergillus niger*, has also been observed in some peanut fields *(See Figure 2)*. This disease is favored by hot, dry conditions and can kill plants throughout the growing season; however, losses associated with crown rot are minimal. Crown rot is easily identified by the production of black spores on the stem at the soil line.

Figure 1. Southern blight

Figure 2. Aspergillus crown rot

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Most peanut plants are beginning to set pods, thus, close attention should be paid to fields with a history of pod rot. The pod rot complex is comprised of several pathogens; however, *Rhizoctonia solani (See Figure 3).* and *Pythium* spp. are most prevalent. Subtle differences in the appearance of the two diseases can be observed. For example, pods infected with *R. solani* exhibit a dry rot; whereas, pods infected with *Pythium* spp. have more of a greasy, water-soaked appearance. Despite differences in appearance field diagnosis of pod rot is difficult, especially at advanced stages of pod decay, or when both pathogens are present. Under the right environmental conditions, *S. rolfsii* can also incite a pod rot. In this case pods have an ashy, grey color. Several of the fungicides used for Rhizoctonia pod rot have activity against Southern blight, but keep in mind that most Ridomil formulations are only recommended for *Pythium* spp.

Figure 3. Rhizoctonia pod rot

Sclerotinia blight, caused by *Sclerotinia minor*, is another disease to be on the lookout for at this time *(See Figure 4)*. Symptoms of Sclerotinia are similar to those of Southern blight; however, the characteristics of *S. minor* can be used to differentiate the two. Mycelia of this fungus are aerial, fluffy, and have a cottony appearance. Furthermore, sclerotia of *S. minor* are small, black, and have an angular shape. Fungicide options for management of Sclerotinia blight are limited and more costly; therefore, an accurate diagnosis is critical. In addition to the aforementioned diseases, early leaf spot (*Cercospora arachidicola*) has been reported in the area *(See Figure 5)*. In general, leaf spot lesions first develop on the lower portions of the plant. Small flecks appear seven to ten days after initial infections take place. These flecks enlarge to form light brown to reddish colored lesions. Spores of *C. arachidicola* may be present in the middle of the lesion, and appear as a clear to grey colored mold. Damage caused by early season herbicides, or some systemic insecticides can cause confused with early leaf spot; however, these spots are lighter in color, and lack fungal growth in the center. Again, many of the fungicides used for pod rot will also be active against leaf spot; however, additional applications may be required later in the season. A detailed list of fungicides labeled for use in peanut can be found in the Texas peanut Production Guide located at http://peanut.tamu.edu/.

Figure 4. Sclerotinia blight

Figure 5. Early leaf spot

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Cotton. Fusarium wilt, caused by the soilborne fungus *Fusarium oxysporum* f. sp. *vasinfectum*, has been observed over the past few weeks. Symptoms include a yellowing and wilting on the leaf margin *(See Figures 6 & 7)*. This results from the fungus clogging the vascular system of the plant. Seedling mortality may also be observed *(See Figure 6)*. Development of Fusarium wilt requires wounding by the root-knot nematode (*Meloidogyne incognita*); thus, disease severity can be reduced through the use of at-plant nematicides. Fusarium wilt can be confused with Verticillium wilt, caused by *Verticillium dahliae (See Figure 8)*. However, Verticillium wilt is typically observed after cotton plants begin to bloom. Plants infected with *V. dahliae* may appear stunted, and the leaves of infected plants are chlorotic, necrotic and premature defoliation may occur. Examination of the vascular tissue will reveal a brown discoloration that is indicative of wilt diseases; however, laboratory observations may be required for an accurate diagnosis. Varieties with partial resistance or improved tolerance to Fusarium or Verticillium wilt are commercially available. Field trials evaluating the performance of these varieties are being conducted this season.

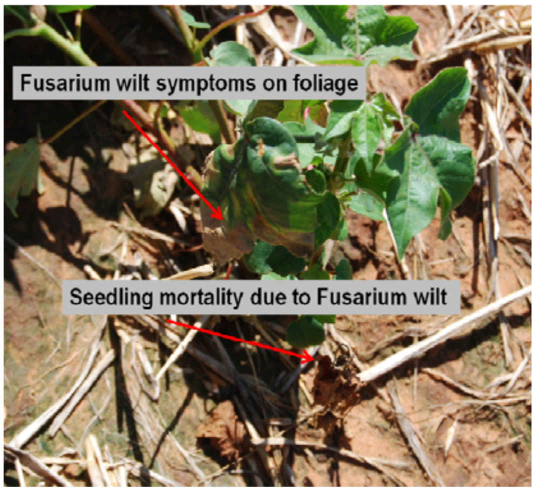

Figure 6. Fusarium wilt

Figure 7. Fusarium wilt


Figure 8. Verticillium wilt

Several fields in western Gaines County are exhibiting symptoms of a unique foliar disease. Bright yellow to orange colored lesion with a maroon border can be observed on the upper leaf surface *(See Figure 9)*. On the lower leaf surface, yellow to orange structures (aecia) containing spores can be found *(See Figure 10)*. These symptoms are characteristic of Southwestern cotton rust, caused by *Puccinia cacabata*. While this disease commonly occurs in fields in the Trans Pecos area, it has not been reported on the Southern High Plains. Unlike other plant rusts (i.e. stem rust of wheat), the spores produced on infected cotton leaves cannot re-infect cotton. The epidemiology of this Southwestern rust is complicated; however, the presence of an alternate host, specifically grama grasses (*Bouteloua* spp.), are required for disease development in cotton. Efforts at locating infected grama grasses near fields exhibiting symptoms of Southwestern rust were unsuccessful; however, close attention should be paid to ditches, fallow areas, and CRP fields adjacent to cotton fields. Severe yield losses associated with this disease can occur, but are sporadic in nature. The forecasted weather conditions (hot and dry) will help to slow the spread of this disease; however, subsequent infections may occur if we experience frequent rainfall throughout the season. While fungicides have been effective at controlling this disease in other cotton production areas, **it is unlikely that fungicide applications will be warranted in this case**. However, we are


Figure 9. Southwestern cotton rust lesions on upper leaf surface

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Figure 10. Pustules of Southwestern cotton rust on lower leaf surface.

evaluating the use of fungicides in this situation. If you are experiencing, or have any questions regarding this disease, please contact Manda Cattaneo, Extension Agent IPM at 432-788-0800, or Jason Woodward, Texas AgriLife Extension Plant Pathologist at 806-632-0762.

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GAINES COUNTY IPM NEWSLETTER

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Volume II, No. 10 July 24, 2009

General Situation

Figure 1. Severe wind damage

A majority of the cotton fields are blooming and peanuts are pegging and forming pods. Verticillium wilt has been noted in several cotton fields and pod rot is starting to show up in some peanut fields. Severe wind storms hit Gaines County this past Friday and Saturday. A few fields have severe wind damage; however, a majority of the fields had minimal damage. Insect pressure remains low. We are still finding a few bollworms in cotton and peanuts. Growers need to continue scouting fields for these and other insect pest.

Several fields started blooming at 7 to 8 Nodes Above White Flower (NAWF). It takes approximately 300 to 350 Heat Units for a square to develop into a flower (which usually takes 20 to 25 days). In a 13 day period, from July 8 to July 20, we accumulated 296 Heat Units. This rapid accumulation of Heat Units was evident in some fields that are now at 4 to 6 NAWF. The dry conditions and high temperatures that prevailed from July 8 to July 20 stressed these fields. These stresses reduced mainstem growth which resulted in less fruit and square production. As a result some fields were headed towards an early cutout. However, significant rainfall on July 22 and 23 and cooler temperatures may have saved these fields from reaching cutout prematurely. In Seminole we received approximately 2 inches of rain. We received reports of 1.5 to 2+ inches of rainfall in western Gaines County. The recent rains will be very beneficial for cotton and peanut growth and development; however, growers need to be on the look out for disease development. The cool wet temperatures created an environment that will support disease development.

Nodes Above White Flower (NAWF)

Nodes Above White Flower (NAWF) is generally used to define how much "horsepower" a plant has during the blooming stage. A field is considered to be cutout when the average NAWF is equal to 5. To determine NAWF, count the number of nodes above the upper most first position white flower on a cotton plant. The last node counted on a plant will have a leaf equal to the size of a quarter.

Peanut Disease Update from Dr. Jason Woodward, Texas AgriLife Extension Plant Pathologist

The recent rainfall and a break from extremely hot temperatures experienced on the southern High Plains are greatly welcome. Despite this relief, these same conditions are conducive for the development of peanut diseases, such as pod rot, leaf spot, and Sclerotinia blight. One of the difficulties in managing peanut pod rot is getting the fungicide you are applying to the target-site (i.e. soilborne pathogens causing disease). I have had several questions regarding the application of pod rot fungicides in light rain. Producers commonly apply irrigation to redistribute fungicides after an application. The architecture of a peanut plant actually aids in the redistribution of fungicides around the pegs and crown. If pod rot is the main disease you are targeting, then applying fungicides to wet

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foliage in the rain should result in improved control. However, if intense rainfall is received shortly after the application the fungicide may be leached out of the pegging zone.

Minor levels of early leaf spot have been reported in many fields throughout the area. While the >100° degree temperatures slowed progression of foliar diseases, attention should be paid to leaf spot over the next few weeks. 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 to maximize pot 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 these lesions are disseminated by wind, rain, or irrigation. New lesions from secondary infections appear after 10 to 14 days after infections occur.

The risk of Sclerotinia blight development will also increase with the cooler daytime temperatures we are experiencing. The majority of Omega or Endura applications should have been made within the past two weeks. Typical application intervals for these products are approximately 30 days; however, scouting should continue in fields with a history of disease pressure. If you have any questions regarding peanut diseases, contact Jason Woodward @ 806-632-0762, or via e-mail jewoodward@ag.tamu.edu.

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Information for this newsletter was obtained from the following publications:

- **July 1990 Physiology Today Newsletter**
  http://www.cotton.org/tech/physiology/cpt/plantphysiology/upload/High-Temperature-Effects-on-Cotton.pdf
- **Managing Cotton Insects in High Plains, Rolling Plains, and Trans Pecos Areas of Texas 2009**
  http://agrilifebookstore.org/tmppdfs/viewpdf_23_65528.pdf?CFID=1655155&CFTOKEN=69ae560de54647cd-83E6F309-7E93-35CB-845E092B6093F7D6&jsessionid=8e30ea9c9f093a440a57

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Volume II, No. 11 August 7, 2009

General Situation

Nodes Above White Flower (NAWF) ranges from 3 to 8 with a majority of the cotton fields at 6 NAWF. Peanuts are continuing to peg and have small to large pods. Disease incidence has increased during the last couple of weeks. Pythium pod rot has been observed in several peanut fields. Sclerotinia Blight, caused by *Sclerotinia minor*, has also been observed in some peanut fields. Verticillium wilt continues to be observed in cotton fields. However, the Verticillium wilt incidence seems less prevalent this year than the same time last year. Nematodes have been very active in a lot of fields. In addition to these diseases, we have also observed limited amounts of Alternaria stem blight and Bacterial blight was identified in a small section of one field near Loop.

Peanut Disease Update from Dr. Jason Woodward, Texas AgriLife Extension Plant Pathologist

***Figure 1*. Pythium pod rot**

My phone has been ringing off the hook with calls regarding Pythium pod rot. Most of the calls pertain to management options; however, there is also interest in proper diagnosis. Pythium pod rot can be caused by several *Pythium* spp. with *P. irregulare*, *P. myriotylum*, and *P. ultimum* being most prevalent in the region. There are no above ground symptoms associated with Pythium pod rot; however, symptoms can be observed on the pods. Pythium generally has a greasy, wet appearance. Rotted pods dark black and often have soil adhering to them (see *Figure 1*). Similar symptoms can be seen with Rhizoctonia pod rot; however, this disease is typically characterized by a dry-rot appearance. Field diagnosis of peanut pod rot is difficult, as advanced stages of diseased pods result in complete decay. Conformation in the laboratory is often required in diagnosing pod rot. Products are limited and unfortunately costly when it comes to management of Pythium. According to producers I have spoken with the performance of Ridomil has been more consistent than Abound in the past. While Abound is registered for use in peanut, the label only indicates suppression of Pythium pod rot. Several things should be considered when it comes to applying Ridomil. One should first refer to the fungicide label as there are several formulations of the product. While I have limited experience working with Ridomil, studies have shown that the fungicide is quickly absorbed by the leaf. When applying liquid formulations of Ridomil chemigation is the preferred application method. If applied by ground rig, every attempt at getting the fungicide delivered to the pod zone should be utilized (i.e. increasing carrier volumes, increasing the size of droplets, and applying irrigation immediately after fungicides applied). When using granular formulations, such as Ridomil/PCNB applications should be made to dry foliage as the granules may get tied up on the leaves. Activity of the fungicide will consist of lesions drying up and having a leathery appearance; however, it may take several days before this is observed. Keep in mind that reducing use rates may shorten the level of residual activity need later in the season; therefore, you must continue to diligently scout fields after applications are made. A subsequent application may be warranted later in the

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season. The use of Abound at this time may suppress disease development until harvest, while offering some level of control for other diseases such as leaf spot, and southern stem rot. If you have any questions regarding Pythium pod rot or any other peanut diseases contact me at jewoodward@ag.tamu.edu, or 806-632-0762.

Description of Alternaria stem blight in Cotton

Described by Dr. Jason Woodward in the August 22, 2008 *FOCUS on South Plains Agriculture* Newsletter

Alternaria stem blight, caused by *Alternaria macrospore*, is a disease characterized by a circular pattern in the field, which may often be confused with a lightning strike. These areas range in size from a few feet in diameter to approximately ¾ of an acre. Infected areas do not significantly increase in size, nor does the disease spread throughout the field. Initial infections occur on the leaf margin and exhibit a distinct purple discoloration. As the disease progresses, this discoloration becomes apparent on the mid-rib, continuing down the petiole, into the stem. Infected stems become necrotic, and the terminals have a curved appearance (see *Figure 2*). Overall, *A. macrospore* is considered a weak pathogen, and typically requires some form of stress for the disease to develop. Results from lab experiments indicated that *A. macrospore* can carryover on cottonseed; therefore, considerations may need to be made with regard to infected seed blocks. This disease has been observed on both conventional and transgenic varieties from both stripper and picker backgrounds.

***Figure 2.* Necrotic terminal of a cotton planted infected with Alternaria stem blight**

Description of Bacterial Blight

Described by Dr. Terry Wheeler in the August 10, 2001 *Focus on Entomology* Newsletter

The foliar phase of the disease is termed "angular leaf spot." Leaf symptoms are angular, dark, shiny spots, which follow the outline of the cells, hence the name Angular Leaf Spot (see *Figure 3*). Symptoms on bolls appear as small and waxy-looking, sunken, rounded to irregular, water lesions. As the infection progresses, the lesions will enlarge and may blacken. Once the carpel wall of the boll is breached, secondary microorganisms can colonize the boll. Subsequently, the lint may be discolored, resulting in staining and thus low grades. This disease can be very devastating to susceptible varieties given the correct environmental conditions. These bacteria may originate from debris of diseased cotton plants or planting seed. Plants may get infected when bacteria from infected plants are carried by insects or when infested soil gets splashed up onto leaves, bolls or other plant parts. Bacteria may enter stomata on the leaves or wounds cuased by insects, hail, blowing sand, equipment, etc. The primary method of controlling bacterial blight is by planting resistant varieties. The Texas AgriLife Research and Extension ***2009 cotton Bacterial blight Recommendations*** by Dr. Terry Wheeler, Research Plant Pathologist, and Dr. Jason Woodward, Extension Plant Pathologist can be found at http://lubbock.tamu.edu/cotton/pdf/2009Bacterial.pdf

***Figure 3*. Bacterial blight on cotton**

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Recap of the Gaines County Ag Tour

Specials *Thanks* to our Program Sponsors: Captial Farm Credit, Carter & Company Irrigation, Inc., Commercial State Bank, Danley Insurance, Birdsong Peanuts/Gaines County Farm Supply, Kubecka Operating Co./Ag Aero, Nolen Ag Services, Inc., TriCounty Producers Coop – Loop, Valley Irrigation & Pump Service, Inc., Western Peanut Growers Assocation, and Wittenburg & Higginbotton, J.V.

I would also like to thank State Representative Delwin Jones for attending our field day and for his continuous support of Agriculture.

Dr. David Kerns, Extension Entomologist, covered the insect situation. David said that Lygus numbers have not been high in Gaines County cotton but they are present in low number in a number of fields. Populations tend buildup primarily in high input, growthy cotton where the canopy is full and there is a lot of shading. Based on drop cloth samples, if the total number of Lygus equals or exceeds 4 per 6 row-ft (2 per drop cloth sample); then an insecticide application is justified. Bolls less than 1 inch in diameter are susceptible to Lygus damage, and these small harvestable bolls should be protected. In a study conducted in 2008, Lygus infesting cotton in late August and early September resulted in a loss of 238 lbs of lint due primarily to Lygus induced small boll shed.

Bollworms continue to be a threat to non-Bt cotton. Several area fields have been treated for bollworms over the past few weeks. As the season progresses we can expect to see bollworms to increase. Pyrethroids continue to be the standard insecticides for bollworm control. However, there has been at least one control failure incident with pyrethroids targeting bollworm in Gaines County. The reason for the poor control is not certain but may be related to coverage. There has been some speculation that resistance may also be playing a role. Bollworms on the Texas High Plains, historically have not expressed resistance to pyrethoids. However, recent data from Swisher County suggest that some low level of resistance may exist. Even if a low level of pyrethroid resistance does exit, control with a pyrethroid should still be possible along as coverage is adequate, and the insecticide rate is not too low. Where achieving adequate coverage is problematic (rank cotton), increase the rate of the pyrethroid and if possible, spray the field using a ground sprayer. If you have to go out by air, use at least 5 gallon of spray per acre. As an alternative to a pyrethroid, you may consider using Belt or Coragen. However, choosing these products over a pyrethroid will not necessarily alleviate problems associated with coverage.

Dr. Randy Boman, Extension Agronomist, covered the importance of soil sampling prior to applying fertilizers and his areawide effort to determine amounts of residual nitrogen that growers need to account for when they are trying to figure out how much nitrogen to apply in a particular field.

Dr. Terry Wheeler, Research Plant Pathologist, discussed a pod rot project that Dr. Jason Woodward, Scott Russell and I are collaborating with her on. The pod rot project is designed to determine if we can more successfully treat pod rot when fungicide applications are made based on a 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 sprays (our treatment thresholds are 1-2%, 3-4%, and 5-6%); and determine how many samples must a consultant take to successfully identify the threshold. We are intensively sampling (101 locations) two peanut fields each week that have a history of Pythium pod rot and we are applying fungicides based on producer application dates (calendar dates) and based on disease thresholds in one of the two fields. In both fields, we observed a rapid increase from very few locations with pod rot, to our lowest threshold. In Gaines co. we went

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from 0.2%, 0.2%, 0.3%, to 2.2% and then to 5.3% pod or peg damage in a five week period. At 2.2% and 5.3% damage we had pod or peg rot showing up at 30 and 50% of the sampling locations, respectively.

Figure 4. **Sclerotinia blight white tufts of cottony-like fungal growth at leaf axils. Later stages of the disease show up as bleaching and severe shredding of the stem accompanied by the production of small black sclerotia that resemble mouse droppings.**

Scott Russell, Extension Agent – IPM for Yoakum and Terry Countys discussed his and Dr. Jason Woodwards research on Sclerotinia blight. Sclerotinia blight of peanut, caused by the pathogen *Sclerotinia minor*, is a very devastating disease in West Texas Peanut production. Once present in a field it is essentially impossible to rid one self of the fungus entirely. Sclerotinia blight is a significant pest of peanuts, quickly reducing yields by 10%, upwards to as much as 50% through pod loss at harvest. *Sclerotinia minor* is a soil borne pathogen with the ability to survive extended periods even in the absence of a host. The fruiting bodies (sclerotia) remain viable in the soil for several years, thus limiting crop rotation options. The objective of their research is to develop a forecast model to predict environmental conditions conducive to the development of sclerotinia blight and therefore the most efficient timing of chemical control methods. Environmental factors monitored included: soil temperature at a depth of 4 inches, rainfall or irrigation, and humidity within the canopy. Values are assigned to each factor based on its impact on the development of Sclerotinia blight. If the value of the factor (temperature, humidity etc) had little impact on the development of SB it was assigned a value of zero. The greater the factor's impact the higher the value assigned. They use these values to come up with a daily risk index and this value was summed over five days to calculate a "Five Day Risk Index" (FDI). The FDI was utilized as a trigger (threshold) to initiate a fungicide spray application. Eight treatments were evaluated for the management of Sclerotinia blight of peanut. We will send out results of this research when it becomes available.

The 2009 Nematode and Thrips Trial planted at Raymond McPherson has began to show significant differences between treatments (see *Figure 5*). I would like to thank Dr. Terry Wheeler and Dr. David Kerns for assisting me with this project. The treatments consist of ST 5458B2RF and FM 9063B2RF being coupled with AERIS, AVICTA, Temik 15G at 3.5 lb, Temik 15G at 5 lbs, or no treatment. Gall ratings were conducted on June 10 and soil samples were pulled from each plot on July 17 for nematode counts.

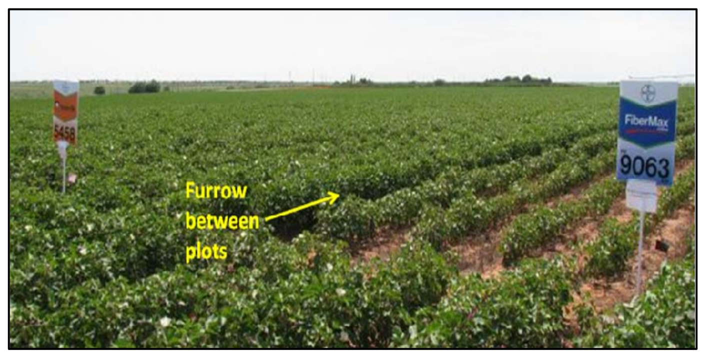

Figure 5. **ST 5458B2RF plot on the left and FM 9063B2RF on the right**

Gall Ratings by Chemical (conducted June 10)

Chemical	Galls/root
Untreated	35.6 ab
AERIS	29.2 b
AVICTA	38.9 a
Temik 15G 3.5 lb AI/A	18.1 c
Temik 15G 5 lb AI/A	15.6 c
Temik 15G 3.5 lb AI/A + Vydate	19.5 c

Gall Ratings by Variety (conducted June 10)

Variety	Average Number of Galls/root
FM 9063B2RF	30.5 a
ST 5458B2RF	24.8 b

Nematode Counts (conducted July 17th)

Variety	Nematodes
FM 9063B2RF	5720 a
ST 5458B2RF	3298 b

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We also visited two of the cotton variety performance by water research fields and the Verticillium wilt cotton variety trial. I would like to thank Dr. Randy Boman, Dr. Jason Woodward, and Dr. Terry Wheeler for assisting me with these research fields. Below is a list of the cotton varieties being testing at each location. We are collecting rainfall and irrigation amounts at each of the fields. This will assist us in comparing variety performance as it relates to water availability. Due to time constraints we were not able to visit the nematode cotton variety site, however, I included the list of varieties being tested at this site in the table below.

Please feel free to contact me at mgcattaneo@ag.tamu.edu or 432-788-0800 if you would like to look at these fields.

Variety	**Dryland**	**Limited Irrigation**	**Irrigated**	**Verticillium Wilt**	**Nematode**
Cooperator	Jud Cheuvront	Ricky Mills	Gregory Upton	Max McGuire	Gregory Upton
FM 9160B2RF	x	x	x	x	x
FM 9170B2RF		x		x	
FM 9180B2RF	x	x	x	x	x
FM 1740B2RF	x		x		x
ST 5458B2RF					x
DP 174RF	x	x	x	x	x
DP 164B2RF	x	x		x	
DP 0924B2RF	x		x		x
DP 0935B2RF		x	x	x	x
NG 3348B2RF	x	x	x	x	x
NG 3410RF	x				
NG 2549B2RF		x	x	x	x
AM 1532B2RF	x			x	
PHY 375WRF	x	x	x		x
PHY 315RF				x	
All-Tex ApexB2RF		x	x		x
All-Tex EpicRF	x				
All-Tex PatriotRF				x	
DG 2570B2RF	x	x	x		x

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GAINES COUNTY IPM NEWSLETTER

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Volume II, No. 12 August 19, 2009

General Situation

Peanuts are continuing to form small to large pods. Pod rots, Sclerotinia Blight, Southern Blight, Early Leaf Spot, and Verticillium wilt continue to be found in peanuts. Verticillium wilt pressure is increasing in cotton. Growers need to continue monitoring their fields for these diseases even if they have already treated their fields. To read more about these diseases and management, please refer back to the August 7, July 24, and July 8 *Gaines County IPM Newsletters* which can be found on the web at http://gaines-tx.tamu.edu/newscat.cfm?COUNTY=Gaines&CatID=593.

Nodes Above White Flower (NAWF) ranges from 0 to 7 with a majority of the cotton fields at 4 to 5 NAWF. It takes approximately 850 Heat Units (H.U.) for a white flower to develop into a fully mature boll. Although an expectable boll that may have low micronaire can be produced with 750 H.U. In 2007 we accumulated 850 from August 20 to October 31. However, in 2006 and 2008 flowers produced around August 20 only accumulated 550 to 580 H.U. by October 31. Therefore, we are at the point at which the likelihood of a bloom developing into harvestable boll is very low.

The cotton plants have started to shed squares and small bolls. Naturally shed bolls may be confused as worm damaged bolls, therefore, growers need to confirm that the shed bolls and squares have evidence of worm feeding (frass and feeding damage) and that the worms are still present in the field (see *Figure 1*). We have observed a few non-Bt fields with economically damaging bollworm populations however; we have not observed any economically damaging populations in Bt cotton. Thresholds for non-Bt and Bt cotton are discussed below in the section titled "*Bollworms*".

Figure 1. **Bollworm larvae feeding on a square. Grains of frass (excrement) can also be seen.**

Lygus nymphs have been observed colonizing some fields. Bolls less than 1 inch in diameter are susceptible to Lygus damage, and these small harvestable bolls should be protected. Please see the section below titled "*Lygus*" for identification, sampling and thresholds.

Nodes Above White Flower

Growers need to be monitoring their Nodes Above White Flower. When the field is 4 to 5 NAWF the field is considered cutout. Knowing when a field cutout can provide valuable crop management information. At 400 to 500 H. U. after cutout irrigation can be terminated without affecting yield and quality. At 350 H.U. after cutout a field is no longer susceptible to Lygus damage. At 450 H.U. after cutout the field is no longer susceptible to first or second instar bollworm/tobacco budworm larvae. *Table 1* indicates the number of H.U. accumulated since August 1, August 5, August 10, August 15, 2009. Growers can use this table to determine how many H.U. they may have accumulated since their field cutout.

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***Table 1*. Accumulated Heat Units (H.U.) from August 1, August 5, August 10, and August 15 to August 18, 2009**

	Date			
	August 1	**August 5**	**August 10**	**August 15**
Accumulated Heat Units	369	301	197	95

Collection of Agriculture Waste Pesticides - October 14, 2009

Location: Agriliance – 101 Loop Hwy., Seagraves, TX 79359
Contact: Terry Millican, 432-758-4006, ext. 238 or at gaines@ag.tamu.edu

Bollworms

Good coverage is essential for good control of bollworms, and this can be difficult to achieve in growthy cotton. If treating a growthy field or if treating a field with bollworms that are greater than ¼ inch, use a ground rig if possible. If you can't get a ground rig in the field and you have to go out by air, try to use a spray volume of at least 5 gallons and consider using a higher rate of the pyrethroid. Before you apply an insecticide make sure that you have reached the action threshold (see *Table 2*). The action threshold is based on the number of worms per acre. Determining the number of worms per acre is really easy. First you have to determine your number of plants per acre. You do this by counting the number of plants in: 13 ft for 40 inch rows, 13.75 ft for 38 inch rows, 14.5 ft for 36 inch rows. Then multiple this number by 1000.
For example: You have 38 inch row spacing and you are averaging 43 plants in 13.75 feet of row.
43 X 1000 = 43,000 plants per acre

Then to calculate the number of worms, eggs, or predators per acre simply divide your plant population by the number of plants you checked and multiply by the number of worms or eggs or predators that you counted.
For example: You looked at 40 plants and found a total of 5 worms.
43,000/40 X 5 = 5,375 worms per acre

***Table 2*. Bollworms Action Threshold**

Cotton Stage	Worm size	Cotton Type: Non-Bt	Cotton Type: BT
After boll formation	¼ inch of 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

Always evaluate your beneficial insect counts before applying an insecticide application when you have small worms. The smaller larvae (less than ¼ inch) are susceptible to these the predatory insects. If your field has already reached cut-out (4-5 NAWF) and started shedding small squares and bolls, then you may want to increase your thresholds to account for the fact that these worms may be feeding on fruit that has little chance of making a good quality boll. Scouting your fields will help you to determine if this is the case in your particular field. Once the worms reach ½ inch they are less susceptible to natural mortality (predators and weather) and insecticide control.

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Lygus

Reported by Dr. David Kerns in the August 7, 2009 *Focus on South Plains Agriculture* Newsletter.

At this point in the season, the best technique for sampling Lygus is with a drop cloth (see *Figure 2*). Preferentially, black drop cloths works better than white ones since small light colored insects such as Lygus nymphs (see *Figure 3*) show up better on the black drop cloths. When counting Lygus nymphs be sure not to count cotton fleahoppers (see *Figure 4*). The small Lygus nymphs can be confused with cotton fleahoppers. Simply place the drop cloth between the rows and vigorously shake and beat about 1.5 row-ft for each side onto the drop cloth and then quickly inspect the cloth. Most adult Lygus will be stunned, but watch for those able to quickly fly. Two drop cloth samples constitute a single sample unit. Take at least four samples units or eight drop cloth samples per field. If the total number of Lygus equals or exceeds 4 per 6 row-ft (2 per drop cloth sample); then an insecticide application is justified.

***Figure 2.* Sampling for lygus using a black drop cloth.**

Don't be in too big of a hurry to spray populations composed primarily of adults. Most of the situations where the population was primarily adults have not resulted in significant damage. For the most part the adults appear to be coming in, laying eggs and leaving within 2-3 days; they do not appear to be doing much feeding. However, if you have growthy cotton that is shading the middles, they may want to stay and, in that scenario an insecticide application may be justified if at threshold. Once you begin to pick up predominately nymphs, be careful. It is at this point where high levels of damage can occur.

For the most part, Lygus on the Texas High Plains are fairly easy to control with the right insecticide. Last year we conducted several Lygus management tests looking at Carbine, Ammo, Orthene, Vydate, Centric, and Diamond. All of the products have some Lygus activity, although based on our data, Centric appears to be a little weak. Syngenta, the company that produces Centric, does not recommend Centric for Lygus control on the Texas High Plains. If you use a pyrethroid, such as Ammo, Orthene, or Vydate, you can expect an immediate kill while Carbine and Diamond act more slowly. Carbine is an anti-feedent, so the insect will essentially have to starve to death which may take up to 5 days depending on temperature. Diamond is an insect growth regulator and will only express activity on Lygus nymphs; it will not kill the adults. Thus if you have a Lygus population composed primarily of adults, Diamond is probably not your best choice. Similar to Carbine, Diamond may take 3-5 days to kill the Lygus; death from this product occurs during the molting process.

***Figure 3.* From top to bottom, a 1st instar, 4th instar, and adult Lygus.**

One thing to be wary of when selecting a product for Lygus control is it impact on beneficial insects and the likelihood of flaring secondary pests such as aphids. Of the products we looked at in 2008, Carbine and Diamond are least likely to cause secondary pest outbreaks. Both of these products are easy on beneficials. Also, Carbine has good aphid activity while Diamond has good activity on armyworms.

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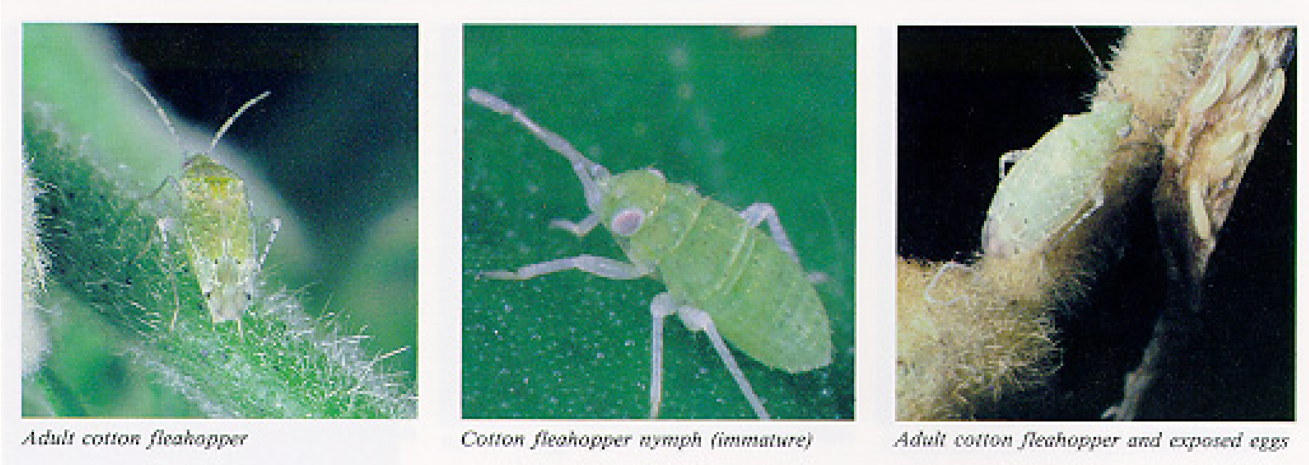

Figure 4. **Cotton Fleahopper adults and nymph**

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Information for this newsletter was obtained from the following publications:

- **Dr. David Kerns information on Bollworm and Lygus as report in the August 7, 2009 *FOCUS on South Plains Agriculture* Newsletter**
  http://lubbock.tamu.edu/focus/Focus2008/August_22/August_22.pdf

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Volume II, No. 13 August 27, 2009

General Situation

A majority of the cotton and peanut fields are exhibiting symptoms of stress caused by the dry and hot conditions that have prevailed for the last several weeks. A majority of the cotton fields have cutout. Bolls are starting to open in several cotton fields. High winds, very little rain, and severe hail damage was associated with a thunderstorm that passed through Gaines County last Thursday.

Please see *Table 1* to determine the amount of Heat Units (H.U.) that your crop has accumulated since it cutout. For example: If you field cutout around August 10th, then it has accumulated around 366 H.U. and should no longer be susceptible to lygus. However, it is still susceptible to first and second instar bollworm larvae.

We have not found any significant “worm” populations in Bt or Widestrike cotton. In non-Bt cotton we have not found any first and second instar bollworm larvae this week. However, we are still finding larger bollworm larvae (½ inch to ¾ inch) that were likely feeding in the bolls when insecticides were applied last week. These bollworms are feeding in bolls lower in the canopy and can only be found if you are doing whole plant inspections. Along with the bollworms we have also observed smaller populations of fall armyworms and beet armyworms. Most of the fall armyworms have been observed feeding in the blooms. The beet arymworms have been feeding on leaves, squares, small bolls and bracts.

***Table 1*. Accumulated Heat Units (H.U.) from August 1, August 5, August 10, and August 15 to August 18, 2009**

	Date				
	August 1	**August 5**	**August 10**	**August 15**	**August 20**
Accumulated Heat Units	538	469	366	263	148

Fusarium wilt

This year is a little unusual in the fact that we have found a lot of cotton fields that Fusarium wilt has come on late in the season. Fusarium wilt is *usually* observed prior to bloom. However, during the last 2 weeks we have taken plants from several fields to the Texas AgriLife Extension and Research Center in Lubbock where Dr. Jason Woodward’s lab has confirmed that these plants are infected with Fusarium wilt. Growers do not have any options for management of the disease in the current crop. However, confirmation of whether they are dealing with Fusarium or Verticillium wilt will aide them in variety selection in future years. *Figure 1* is a picture of a Fusarium wilt susceptible cotton variety and a tolerant variety. This picture was taken in Dr. Terry Wheeler’s Gaines County Fusarium wilt test plot last year.

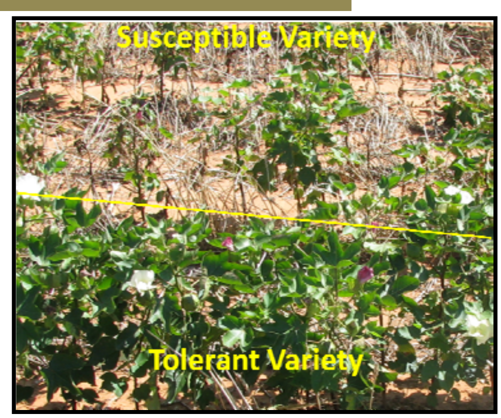

***Figure 1*. Stand loss in a cotton variety that is susceptible to Fusarium wilt.**

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Rhizoctonia Pod Rot

We are starting to observe more Rhizoctonia Pod Rot along with Pythium pod rot in peanut fields. 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 (see *Figure 2*). It is very hard to determine whether you are dealing with Rhizoctonia or Pythium pod rot in the field. Laboratory confirmation is the only way to positively determine which pathogen you are dealing with.

***Figure 2*. Pythium pod rot on the left. Rhizoctonia pod rot on the right.**

Collection of Agriculture Waste Pesticides - October 14, 2009

Location: Agriliance – 101 Loop Hwy., Seagraves, TX 79359
Contact: Terry Millican, 432-758-4006, ext. 238 or at gaines@ag.tamu.edu

Damaged Cotton Leaves

I received a couple of call from growers who were observing some unusual leaf damage in their limited irrigation and dryland cotton fields south of Loop. The leaf damage was observed 2-3 days following a ½ inch to ¾ inch rainfall that occurred on Saturday August 15th. Prior to this rain event, the fields were suffering from low soil moisture. Since water availability was limiting, this resulted in the leaf cells having very little water in them and high levels of ions (sucrose). When the rainfall came, the cells starting observing a lot of water quickly and as a result the cells ruptured (see *Figure 3*). Of course, I am an entomologist trying to explain plant physiology. So please see the paragraph below for a scientific explanation from retired Cotton Physiologist and Professor at Texas Tech University, Dr. Dan Krieg.

***Figure 3*. Cotton leaf with ruptured cells**

"The problem is common across a lot of dryland and lightly irrigated fields in many years when we get rain after prolonged drought. It was evident in my dryland this year following a 0.5 inch rain in late August. It is the result of excessive accumulation of osmotica in the leaves as a result of severe soil water shortages. The plant must ocmotically adjust in order to maintain cellular integrity when the soil water supply declines from -0.2MPa toward -1.5MPa. The source of osmotica is both organic molecules and inorganic ions. When fresh water (Rain) hits the leaf, the water is immediately taken into the cells in response to a very steep potential gradient. The volume that can be accumulated exceeds the ability of the mesophyll cell walls to contain the volume and cell rupture occures. The salts were in the leaves prior to the rain and not as a result of the rain. It takes 2-3 days for the death symptoms to become visible. The sympotoms are usually more pronounced at the leaf margins because those cells usually have more starch and sucrose in them because they can't get it out due to distance from the vascular system. As the cells rupture and organic molecules are released, various bacteria and fungi have a food source and become obvious. This problem occurs every year in the hot dy areas."

Fall armyworms

Reported by Dr. David Kerns in the August 21, 2009 edition of Focus on South Plains Agriculture
Fall armyworms (see *Figure 4*)are being picked up in moderate numbers in non-Bt cotton in Gaines County. They may be in other areas, but I can't be certain. The worms we have been seeing have been feeding primarily in the blooms. If you have Bt cotton, and notice fall armyworms feeding in the

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blooms, watch them closely. Bollgard II or Widestrike varieties do have activity towards fall armyworm. But the blooms do not express the Bt toxin as high as in other portions of the plant and under very high populations, enough worms may survive long enough to gain enough size to take a small boll or two before dying. If you are growing an older Bollgard variety (not BG2), watch these fields very closely; research has shown that Bollgard (BGI) is not very effective towards fall armyworms.

***Figure 4*. Fall armyworm**

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 small (< ¼ inch long) fall armyworm in the upper portions of the plant feeding in 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 ¼ inch in length, then a threshold of 5,000 worms per acre is probably a better choice. If possible target these worms while they are feeding in those upper blooms and exposed. Once they start moving into that canopy, good coverage and control may be difficult.

Currently, we do not have much information on insecticide efficacy towards fall armyworm in cotton. However, Intrepid and Tracer have both demonstrated good activity in the past. 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 much better on fall armyworms. Belt or Coragen may prove to be good alternatives. They both have shown activity towards armyworms and although somewhat weaker, they do have activity towards bollworms. However, we do not have much data on these products; none for fall armyworms in cotton. Regardless, of what you use, maximize coverage and again, 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. This means that the plant tissue will absorb them and then when that portion of the plant is eaten, the worm will consume the poison. Intrepid is not translaminar and thus tends to be more coverage sensitive. For Intrepid, the worm must eat the product off the surface of the plant tissue.

Lygus

Reported by Dr. David Kerns in the August 21, 2009 edition of Focus on South Plains Agriculture

Lygus are becoming more prevalent throughout the region, mostly in low, sub-economically damaging levels. The threshold at which you should consider treating for Lygus time of year is 4 Lygus per 6 ft-row based on drop cloth sampling, or 15-20 Lygus per 100 sweeps.

Adult Lygus appear to be very transitory, moving into the field, laying eggs and vacating within a few days. These populations are easily missed, and what we are detecting in the cotton are populations comprised of about 80% nymphs and 20% adults. Be careful, small Lygus and small cotton fleahoppers are very difficult to tell apart. If you have a lot of very small plant bugs and you are not sure if they are Lygus or fleahopper, don't panic and spray. At this point in time of the season the small Lygus are not likely to be able to cause much damage. Their mouthparts are simply too small to consistently pierce the carpal wall of the boll. Fields I have been in that were infested with very small Lygus had plenty of bolls with external stings, but none of them went through into the inner boll to cause damage to the lint. So, if you have a lot of small Lygus and/or fleahoppers and you can't tell what is what, wait a few days for the Lygus to gain a little size and then you will be able to get an accurate assessment of the population.

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Lygus will feed on both squares and bolls, but at this point in the season we are not too concerned with square damage, it's the boll damage we need to watch for. Fruit susceptibility is size of fruit and size of Lygus dependent. For instance, research has shown that 1st-3rd instar Lygus are not capable of feeding on the anther sacs of large squares (those over 0.3-inch in diameter). Regarding boll susceptibility, data is currently limited but Dr. Megha Parajulee's lab is working on this matter. However, I would suspect that the larger the boll, the less susceptible it is to feeding, especially to small nymphs. We do know that once a boll accumulates about 350 heat units (a boll about 1-inch in diameter), it is no longer considered susceptible to Lygus damage. So essentially we need to protect those bolls that are 1-inch in diameter or smaller, and capable of maturing.

***Figure 5*. Dark specking is a symptom of Lygus feeding on a boll**

***Figure 6*. Darkened lint at a Lygus feeding site indicates successful carpal wall penetration and feeding**

Lygus damaged bolls will have small, dark, sunken lesions on them (see *Figure 5*). Each spot represents where the Lygus' mouthparts penetrated into the carpal wall. Now just because you find Lygus stings on a boll doesn't necessarily mean you have sustained damage. Small Lygus may be incapable of fully penetrating the carpal wall or the Lygus may have simply been superficially probing. To determine if a boll is damaged you will need to dissect it with a knife. If the Lygus penetrated the carpal wall you will see a spot on the inside of the wall and stained lint (see *Figure 6*). When a boll is internally damaged, the lock may not develop properly and may be stained or have other quality issues. Small bolls that are fed upon will often be aborted by the plant, especially if the boll has multiple feeding sites on it.

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Volume II, No. 14 September 14, 2009

General Situation

The end of the 2009 growing season is quickly approaching. Despite the dry conditions during the start of the season, we have ended up with a decent crop load in both cotton and peanuts. Yields in most fields are directly related to the irrigation capacity. However, June and July's rains greatly benefited the crop by adding valuable soil moisture that helped to carry the crop a little further. The hot dry conditions during August sped up crop maturity at the cost of some yield loss. Cotton plants shed excess squares and small bolls in the top 2 to 5 nodes. The plants only kept those bolls which it could carry or mature out. Insect pressure has been light during the last couple of weeks. We have found a few aphid populations in some cotton fields.

A majority of the cotton fields have accumulated 500+ Heat Units since cutout and therefore, are no longer susceptible to worms. See *Table 1* to determine the amount of Heat Units that your crop has accumulated since it cutout.

***Table 1*. Accumulated Heat Units (H.U.) from August 1, August 5, August 10, August 15 and August 20 to September 14, 2009**

	Date				
	August 1	**August 5**	**August 10**	**August 15**	**August 20**
Accumulated Heat Units	802	734	630	528	412

We accumulated an average of 21 Heat Units (H.U.) per day during the month of August. During the last two weeks we have accumulated an average of 14 H.U. per day. Therefore crop maturity will not proceed as quickly as it was during August.

1st Annual Gaines County Ag Fair (September 16, 2009) and 2009 Gaines County Ag and Oil Day Appreciation Day Celebration (September 17, 2009)

For further information please contact Seminole Area Chamber of Commerce at 432-758-2352

Texas AgriLife Extension and Research Center - Lubbock Centennial Celebration and Field Day – September 17, 2009 starting at 10:00

For further information please call 806-746-6101 or http://lubbock.tamu.edu/Centennial

Collection of Agriculture Waste Pesticides - October 14, 2009

Location: Agriliance – 101 Loop Hwy., Seagraves, TX 79359
Contact: Terry Millican, 432-758-4006, ext. 238 or at gaines@ag.tamu.edu

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Peanut Diseases

Currently we are finding pod rots caused by the soil borne pathogen Rhizoctonia. Sclerotinia blight, Southern Blight, and Early and late leaf spot have also been observed in some peanut fields. The cooler wet humid conditions are conducive for the growth and development of these pathogens. Before a fungicide is applied growers need to correctly identify the pathogen and determine if the pathogen is progressing or leveled off. They also need to weigh the cost and determine if the application is justified since we will be digging peanuts within the next 2 to 3 weeks. If a fungicide is justified then growers need to determine the spectrum of disease that they are trying to control. Not all of the products with activity against foliar diseases have activity against soil-borne diseases. Additionally, farmers need to pay close attention to the pre-harvest intervals of the various fungicides. Refer to product labels for this information. To maximize yields and reduce harvest losses growers should be checking maturity of their peanut fields using the hull scrape method described in the 2007 Texas Peanut Production Guide. Please contact the Texas AgriLife Extension Office in Gaines County to obtain a copy of this publication.

Cotton Defoliation

Premature crop termination has been shown to reduce lint yield, seed quality, micronaire, and fiber strength. Nodes above cracked boll is a tool that can be used to time harvest aid application. If the uppermost first position-cracked boll is within three nodes of the uppermost harvestable first position boll then no lint weight will be lost if a defoliant-type harvest aid is applied at that time. However, if the uppermost harvestable first position boll is four or more nodes above the uppermost first position cracked boll, then potential for some lint loss exists. The following factors will help to increase the performance of harvest-aid chemicals: Warm & sunny weather, soil moisture relatively low but sufficient to maintain cotton plant in active growth condition without moisture stress, low soil nitrogen levels, little or no secondary growth evident on plants, and plants with a high percentage of open bolls that have shed some mature leaves. Conversely some of the factors which negatively affect harvest-aid chemical performance include: applications made under cool (below 60°) cloudy conditions, prolonged periods of wet weather following treatment, plants in vegetative growth state with low fruit set, plants severely moisture stressed with tough leathery leaves at time of treatment, high soil moisture and nitrogen levels which contribute to rank dense foliage, and plants exhibiting secondary growth (regrowth).

The following pages are from the *2009 High Plains and Northern Rolling Plains Cotton Harvest-Aid Guide* by Dr. Randy Boman, Dr. Mark Kelley, Dr. Wayne Keeling, Dr. John Wanjura, and Dr. Todd Baughman. Please contact me if you would like a hard copy of this publication or you can obtain it on the web at http://lubbock.tamu.edu/cotton/pdf/2009HarvestAid.pdf

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GAINES COUNTY IPM NEWSLETTER

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Volume II, No. 15 September 23, 2009

General Situation

Harvest time is here! The cold front that passed through the High Plains yesterday may have slowed things down a bit, but growers are itching to get started. Several growers with fields that are ready to be harvested are holding off and waiting for a warm spell before they apply defoliants and start harvesting peanuts. A majority of the cotton fields have open cotton. Several fields still need several days of warm sunny weather before they will be ready for defoliation. Some peanuts have already been dug and a few cotton fields have been harvested. Growers should have cut off the water on their cotton by now and peanuts should only be watered to keep them fresh and aid in digging.

Number of Heat Units required to produce a mature boll

It takes approximately 850 Heat Units (H.U.) for a bloom to develop into a mature boll. Although 750 H.U. can produce an acceptable boll that may have low micronaire. Growers can use Table 1 to estimate the number of H.U. a boll has accumulated since it was a white flower. For example: An August 1st white flower has accumulated 875 H.U., and therefore it has accumulated more than enough H.U. to develop into a mature boll. However, an August 15th white flower has only accumulated 600 H.U., and therefore it has not accumulated enough H.U. to become a mature boll.

***Table 1*. Accumulated Heat Units (H.U.) from August 1, August 5, August 10, August 15 , August 20, and August 25 to September 23, 2009**

	Date					
	August 1	August 5	August 10	August 15	August 20	August 25
Accumulated Heat Units	875	806	702	600	485	378

Pink Bollworms

During the last month we have caught a total of 8 pink bollworms in a trap that was located approximately 10 miles east of the Gaines County Park (We have not caught any moths in the other traps that I have been monitoring throughout the county). These low numbers do not represent a problem nor does it require an insecticide application. However, it does indicate that pink bollworms are present in the area and growers need to monitor their non-Bt fields. Cutting bolls and inspecting them is the best way to monitor your fields for pink bollworm populations. Bolls that are 30 days old and rock hard in firmness are generally immune to newly hatched pink bollworm larvae. Small pink bollworm larvae have difficulty entering the more mature bolls and surviving in the dry fibers. Insecticide or pheromone treatment decisions should be based primarily on boll sampling and percent boll infestation. Collect and examine 40 to 50 small bolls per field. Newly set bolls about the size of a quarter should be pulled from the plant and carefully cut and examined for pink bollworms. Newly infested bolls have a small clear bump or wart on the inside of the bur wall at the site where the larva entered the boll. The developing lint surrounding the wart is depressed or sunken in to accommodate the wart. The tiny, threadlike white worm can be found in the depressed area. The black head and

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movement of the larvae will make them easier to spot. Sampling bolls this size indicates the current status of the infestation. Bolls which have been infested for several days are much easier to spot. The larvae are larger, fecal material is easily seen, and the feeding damage is more extensive. For more information on pink bollworms please refer to the Texas AgriLife Extension Service "Pink Bollworm Management in Texas" publication, which can be found on the Texas AgriLife Extension Bookstore website at https://agrilifebookstore.org

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Volume II, No. 16 October 27, 2009

General Situation

A majority of the peanut crop is harvested and cotton harvesting is progressing as fast as the weather will allow. Recent rainfall events have slowed and delayed harvesting schedules. Wheat producers are thankful for the recent rainfall.

Agronomics for Wheat for Grain

Reported by Dr. Calvin Trostle in the October 26, 2009 edition of FOCUS on South Plains Agriculture

With this week's rains many South Plains acres now have moisture to plant wheat at an optimum time for establishment and yield potential. The optimum range of planting date for wheat grain in the lower South Plains is around October 25. This target represents a typical planting date that would allow for good stand establishment before cold can diminish germination, stands, and tillering. On the other hand significantly earlier planting may not enhance yields and can in fact reduce yield or economic potential due to more water use, more insect pressure in warm temperatures, etc. Producers can achieve similar yields in most years planting after this dates, but at some point yield potential does decline.

Recent recommendations for irrigated wheat at optimum planting dates target 60 lbs of seed per acre. Research has consistently shown that little to no yield increase has resulted from seeding rates above 60 lbs per acre. If you have top end irrigation, you might bump it up a bit. Planting more than 3 to 4 weeks after your optimum planting date may require you begin increasing the seeding rate. If seeding after Thanksgiving it is advisable to increase the target seeding rate 50% to compensate for potential lack of tillering.

For dryland seeding rates 30 lbs per acre should be adequate for most conditions, however, if seed bed and soil moisture is only fair, then a producer should err on the safe side to 40 lbs per acre to ensure the stand is achieved.

There are two rules of thumb for nitrogen (N) in wheat depending on if you have soil test information available:

- No soil test: 1.2 lbs N per bushel of yield goal
- With soil test: 1.5 lbs N per bushel of yield goal, then adjust fertilizer N according to soil test results

If residual fertility is good then you may choose to delay all N till you topdress in February and early March. Otherwise 1/3 of N in the fall pre-plant or at planting will ensure that tillering, etc. is not limited.

In future newsletters we will discuss the critical timing of topdressing N for late winter applications before and up to jointing, which will affect potential seed number per spikelet and spikelet number per head. Applications after this growth stage will not have as much potential impact on yield.

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