Plains Pest Management Association

Integrated Pest Management Program

Hale and Swisher Counties

2013 Annual Report

Prepared by:

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Extension Agent-IPM

TEXAS IPM

Partners with Nature

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Acknowledgements

A successful Extension IPM program hinges upon strong support, active participation, and a desire to advance and improve IPM practices from area producers, agribusiness, gardeners, and homeowners.

Appreciation is extended to the participating members of the Plains Pest Management Association for their cooperation, support, and participation in the 2013 Plains Pest Management Program:

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John Starnes	Joe Reed	Joe McFerrin	Troy Klepper	Kent Springer
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Calvin Trostle	Extension Agronomist, Lubbock
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Ember Reed	Plains Pest Management, Lab Assistant

Plains Pest Management 2013 Advisory Committee

Ronald Groves	Kent Springer	Jerry Rieff
Jimie Reed	Jimmy Sageser	Joe McFerrin

2013 Plains Pest Management IPM Program

Blayne Reed, Extension Agent – IPM, Hale & Swisher Counties

Relevance

Production agriculture is the foundation of the economies of both Hale and Swisher Counties. Pests continually threaten production agriculture and persistently develop to overcome existing control measures. Integrated Pest Management (IPM) is an affective and environmentally sound approach to pest management that uses a combination of evolving control practices to maintain economic and environmental stability in production agriculture. The Plains Pest Management IPM Program is an educational program that strives to educate the producers of Hale & Swisher Counties about the latest IPM principles and to help implement sound IPM control strategies into producer's operations in Hale & Swisher Counties.

Response

The Plains Pest Management Association, made up of 14 participating grower members and steered by a chairing committee and the IPM agent, made informing the producers in Hale and Swisher Counties about the latest IPM principles, control methods and options a priority in 2013. During the year the activities included:

- Weekly field scouting for insect, weed, and disease problems of the 14 participating grower member's fields (5,223 acres of all crops) were conducted over the 2013 growing season.
- Information from this field scouting was shared, interpreted, and IPM solution recommendations given to the participating growers via scouting report and direct interaction.
- Data generated from the field scouting, along with pertinent IPM research and successful recommendations were shared through the Plains Pest Management Newsletter weekly throughout the growing season and monthly during the offseason. (21 issues, 325 subscribers).
- IPM and its implementation, current pest pressure, emerging pests, and control recommendations were major topics for all of the weekly Ag radio programs conducted. Two weekly on the 1090 AgriPlex Report and one weekly on Fox Talk 950's IPM report.
- Gave IPM presentations at 3 grower meetings, 1 turn-row meeting, 9 Progressive Grower Meetings, and 1 Field Scout School where IPM was a topic (where 9 CEUs were offered total).
- Assisted with 3 district IPM research trials and gave resulting data rapid dissemination of results through newsletters, blogs, radio programs, and direct interaction.

Results

A retrospective post evaluation instrument was distributed to the subscribers of the Plains Pest Management Newsletter. There were twenty five responses to the survey which included, 11 producers, 8 independent crop consultants, 4 Ag industry, and 1 Ag retail responders. Based upon respondent's answers to the total amount of acreage produced, or influenced, **each respondent represented 26,881 acres of crop production**.

- **92% of the responders believed that IPM reduced the risk associated with crop production**.
- **96% responded that IPM increased yields while reducing input costs**.
- **71% of the responders indicated that the 2013 efforts of the Plains Pest Management Association had reduced their pesticide use this season**.
- Those responders that indicated a reduction of pesticide use this season **estimated that their pesticide use had dropped 25.3% through the use of IPM on their farms or on their in influenced acres in 2013**.

The respondents were asked to rate the various educational efforts of the Plains Pest Management Association in 2013 to their respective operations on a scale of 0 to 100:

The respondents were then asked to assign an estimated per acre dollar value to the Hale & Swisher County IPM Program to their respective operations. The average value of those estimates was **$45.72 per production acre**.

Summary

The IPM Program in Hale & Swisher Counties is proving to have real value for the Hale & Swisher production agriculture economy. If the survey responder estimated $45.72 per production acre estimate of the value of the IPM program is multiplied by half of the irrigated commodity production acres in Hale and Swisher Counties, a $6,100,110.99 potential impact figure emerges. Even if this purposely conservative survey based estimate proved to be high, the Plains Pest Management Association is not only important to production agriculture economy in the Hale & Swisher area, but is a significant part of that economy's maintenance and function.

2013 Plains Pest Management Applied Research

Blayne Reed, Extension Agent – IPM, Hale & Swisher Counties

Relevance

Production agriculture is the foundation of the economies of both Hale and Swisher Counties. Pests continually threaten production agriculture and persistently develop to overcome existing control measures. Integrated Pest Management (IPM) is an affective and environmentally sound approach to pest management that uses a combination of evolving control practices to maintain economic and environmental stability in production agriculture. The Plains Pest Management IPM Program is an educational program that strives to educate the producers of Hale & Swisher Counties about the latest IPM principles and to help implement sound IPM control strategies into producer's operations in Hale & Swisher Counties. A key component to that education is the local applied research effort.

Response

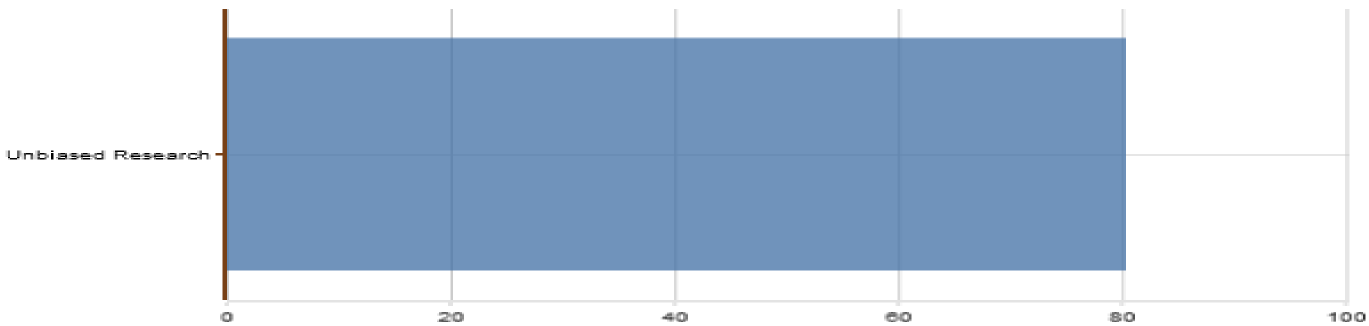
The Plains Pest Management Association, made up of 14 participating grower members and steered by a chairing committee and the IPM agent, annually makes sharing the pertinent research results of others and conducting replicated field trials conducted locally with the goal of understanding the evolving pest situations, developing and understanding new control practices, new products, and to understand their implementation a high priority. Research and research sharing activities for 2013 included:

- Three spider mites in corn product and new product research protocols accepted and conducted, one thrips in cotton new product research protocol accepted and conducted, and one encapsulated fertilizer on calcium soils for cotton was conducted.
- Assisted district researchers with one green bug in wheat new product control protocol, two thrips control studies in cotton, and one multi-year fall armyworm in corn study.
- All trial results were major topics for all of the weekly Ag radio programs conducted. Two weekly on the 1090 AgriPlex Report and one weekly on Fox Talk 950's IPM report.
- All trial results, as they became known, were also shared in the weekly Plains Pest Management Newsletter (21 issues, 325 subscribers) and with the with the Plains Pest Management participating growers through direct interaction (14).
- Gave IPM presentations at and / or hosted 3 grower meetings, 1 turn-row meeting, 9 Progressive Grower Meetings, and 1 Field Scout School where IPM was a topic (where 9 CEUs were offered total).

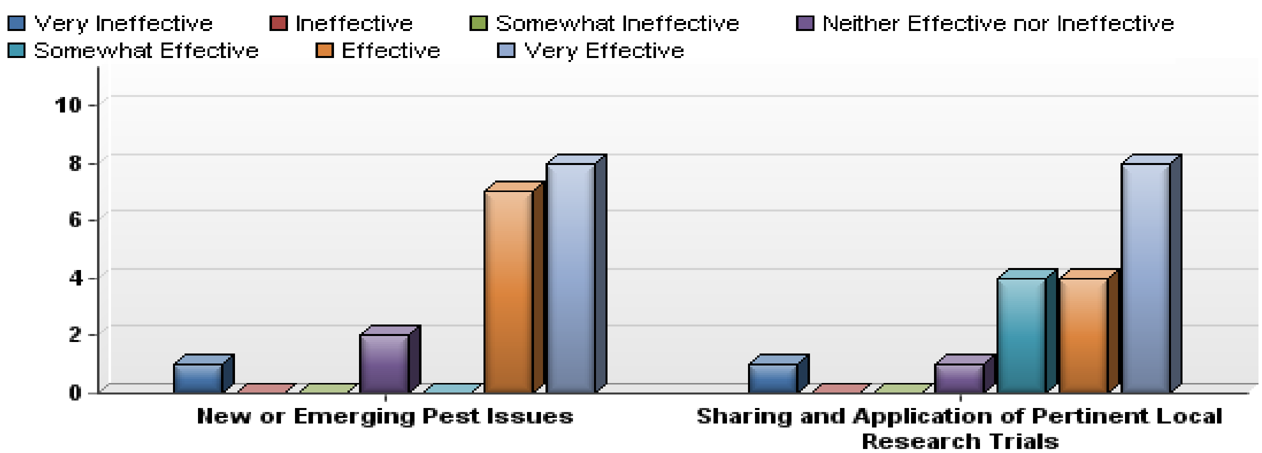
Results

A retrospective post evaluation instrument was distributed to the subscribers of the Plains Pest Management Newsletter. There were twenty five responses to the survey which included, 11 producers, 8 independent crop consultants, 4 Ag industry, and 1 Ag retail responders. Based upon respondent's answers to the total amount of acreage produced, or influenced, **each respondent represented 26,881 acres of crop production**.

Respondents were asked to assign a **value of to the unbiased research** conducted by the Plains Pest Management Association on a 0 to 100 scale. The average value is shown below. The value of the unbiased research ranked 3rd of the 8 major efforts of the IPM Program.



18 of the 25 respondents answered the questions, "How effective was the Plains Pest Management Association in improving your awareness of new or emerging pest issues?" and "How effective was the Plains Pest Management Association in Sharing and Application of Pertinent Local Research Trials?"



The respondents were then asked to assign an overall estimated per acre dollar value to the Hale & Swisher County IPM Program to their respective operations. The average value of those estimates was **$45.72** per production acre**.**

Summary

The respondent's estimated $45.72 per production acre value of the Plains Pest Management Association, multiplied conservatively to half of Hale & Swisher County's irrigated commodity acres offers a $6.1 million overall impact of the IPM Program. The high value and the 3rd highest ranking of the applied research within the IPM Program's 8 total efforts indicates an important premium placed upon the locally conducted IPM research trials conducted by the IPM Program by the area producers, consultants, Ag Industry, and Ag Retailers.

TEXAS A&M AGRILIFE EXTENSION

Making a Difference

2013 Plains Pest Management Weed IPM

Blayne Reed, Extension Agent – IPM, Hale & Swisher Counties

Relevance

Production agriculture is the foundation of the economies of both Hale and Swisher Counties. Over the 2011 & 2012 growing seasons palmer amaranth, often referred to as pig-weed or careless-weed, was confirmed to have resistance to glyphosate in Hale & Swisher County. The region's heavy reliance upon this herbicide for weed control, particularly over the top in glyphosate tolerant cotton, fundamentally threatened the sustainability of the agricultural economy of these two counties and the region. It is imperative that this new threat be met with sound IPM principles that offer environmentally sound solutions that maintain profitability.

Response

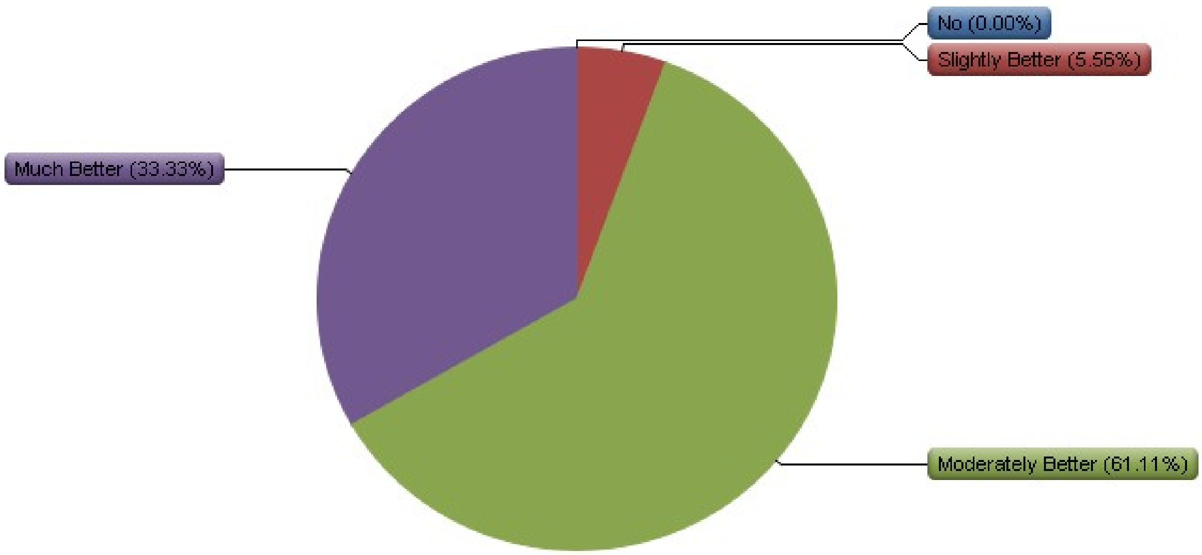
The Plains Pest Management Association, made up of 14 participating grower members and steered by a chairing committee and the IPM agent, made informing the producers in Hale and Swisher Counties about weed IPM principles, control methods and options a priority in 2013. During the year the activities included:

- Weekly field scouting, which included weed evaluations, of the participating grower member's fields (5,223 acres of all crops) were conducted over the 2013 growing season.
- Information from this field scouting was shared, interpreted, and IPM solution recommendations given to the participating growers via scouting report and direct interaction.
- Data generated from the field scouting, along with pertinent weed IPM research and successful recommendations were shared through the Plains Pest Management Newsletter weekly throughout the growing season and monthly during the offseason. (21 issues, 325 subscribers).
- Weed IPM and its implementation was a major topic of interest for all of the weekly Ag radio programs conducted. Two weekly on the 1090 AgriPlex Report and one weekly on Fox Talk 950's IPM report.
- Gave weed IPM presentations at 3 grower meetings, 1 turn-row meeting, and held 9 Progressive Grower Meetings where weed IPM was a topic (where 9 CEUs were offered total).
- Wrote 2 newspaper articles offering options and control methods for weed IPM.
- Assisted with county (2) and district (1) weed control research and data dissemination of results through newsletters, blogs, radio programs, and direct interaction.

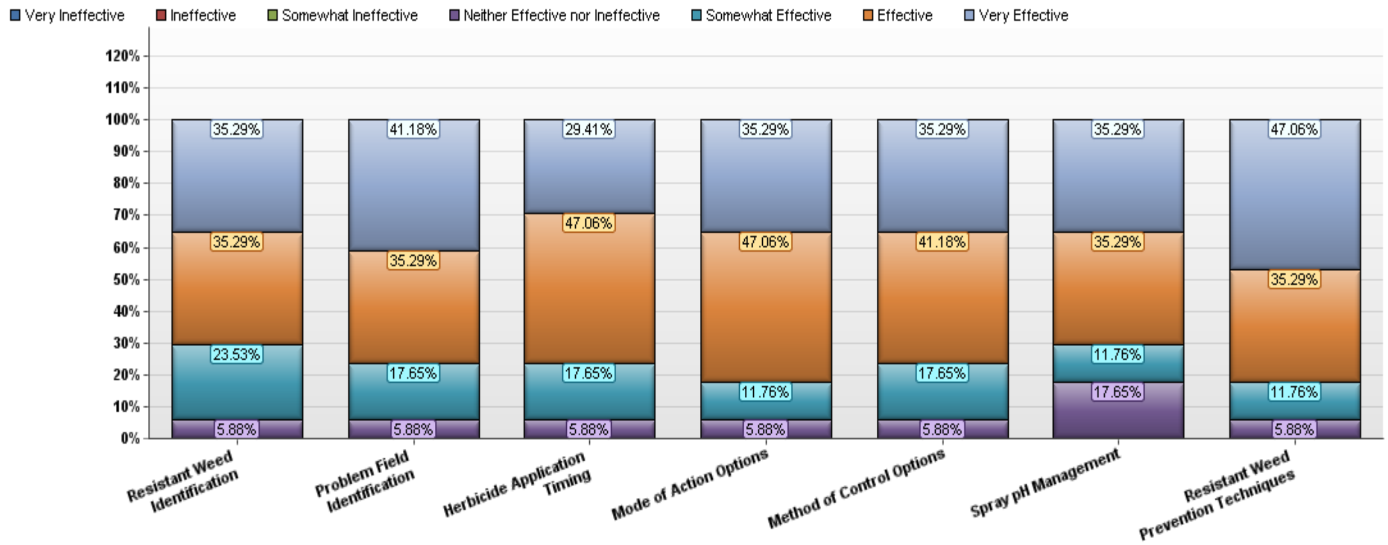
Results

A retrospective post evaluation instrument was distributed to the subscribers of the Plains Pest Management Newsletter. There were twenty five responses to the survey which included, 11 producers, 8 independent crop consultants, 4 Ag industry, and 1 Ag retail responders. Based upon respondent's answers to the total amount of acreage produced, or influenced, each respondent represented 26,881 acres of crop production.

- In response to the question, "Due to the efforts of the IPM Program in weed management, do you feel you will be better prepared to meet the weed challenges on your production or influenced crop acres in the future?"



- In response to the question, "Please select the column that best reflects the impact of the 2013 IPM Program's weed management educational efforts in resistant weed control for your situation as you prepare for the 2014 growing season."



- Respondents answered that prior to the development of glyphosate resistant weeds 94% mainly focused their weed control efforts on glyphosate applied over-the-top in season as their primary weed control method of choice while only 39% utilized any pre-season residual herbicides and 61% utilized any in-season residual herbicides.

- Respondents indicated that due to the efforts in weed control IPM of the 2013 Plains Pest Management Association they intended to implement in 2014 a :

50% increased use in preseason residual herbicides

33% increased use in post-season residual herbicides

50% increase in in season over-the-top mode of action rotation

50% increase in crop rotation

16% increase in hoeing

16% increase in in-season tillage

Summary

The battle to control weeds in our crops will likely never be over, and for Hale & Swisher Counties the battle with glyphosate resistant palmer amaranth has just begun. Nor will the Plains Pest Management cease in weed IPM educational and research efforts. Nonetheless, the efforts in 2013 Plains Pest Management Weed IPM seem to have had an impact upon producers, consultants, Ag industry, and Ag retail in this area.

EXTENDING KNOWLEDGE
Providing Solutions

2013 Plains Pest Management General IPM Education

Blayne Reed, Extension Agent – IPM, Hale & Swisher Counties

Relevance

Pests affect all aspects of human life. Pests continually threaten production agriculture, stored grain, human health, households, and even the stored foods in our panties. Meanwhile, these same pests persistently develop to overcome existing pest control measures. Integrated Pest Management (IPM) has a thirty plus year history of proven environmentally sound and affective approaches to pest management by utilizing a combination of established principles and evolving specific control practices to maintain pest control. The Plains Pest Management IPM Program is an educational program that strives to educate the producers and citizens of Hale & Swisher County about the IPM principles and the latest IPM control methods to help implement IPM into our daily pest control strategies.

Response

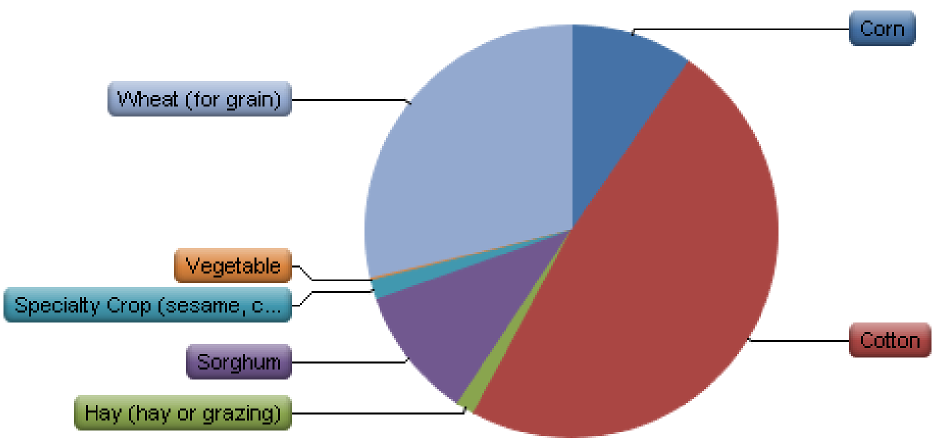
The Plains Pest Management Association, made up of 14 participating grower members and steered by a chairing committee and the IPM agent, made informing the general populace of Hale and Swisher County about IPM principles and implementation into our daily pest control habits one of the IPM Program's focus in 2013. During the year activities included:

- Three Pantry Pest Presentations in conjunction with the Better Living for Texas (BLT) Program (46 attendees).
- Two mosquito control articles released to the local press and one on the Plains Pest Bugosphere (blog) (circulation of 15,100).
- One presentation on IPM and common garden pest identification to the Hale County Master Gardeners (8 attendees).
- Direct interaction with customer base through site inspections, phone calls, office visits, and customer questions. All interactions included IPM recommendations (18 home / horticulture inspections, 1 drug rehab facility, 11 office contacts, and 22 phone calls).
- IPM principles and its implementation for home, office, horticulture, agriculture, and gardening were common topics for all of the weekly Ag radio programs conducted. Two weekly on the 1090 AgriPlex Report and one weekly on Fox Talk 950's IPM report.
- Participation in the Hale County Ag Fair in presenting IPM presentation to 235 area youth.
- Participation in and coaching of the Hale & Swisher County 4-H Entomology Teams.

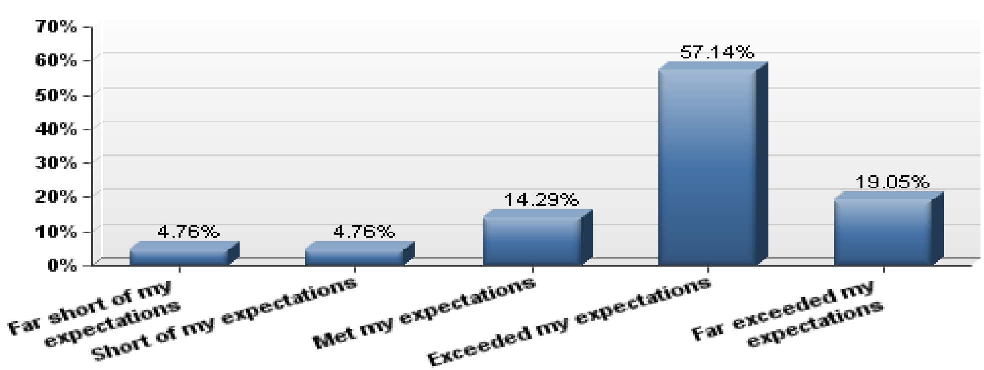
Results

A retrospective post evaluation instrument was distributed to the subscribers of the Plains Pest Management Newsletter. There were twenty five responses to the survey which included, 11 ag producers, 8 independent crop consultants, 4 Ag industry, and 1 Ag retail responders. Based upon respondent's answers to the total amount of acreage produced, or influenced, each respondent represented 26,881 acres of production.

Responders were asked how many acres of each crop they produced or influenced during 2013. The commodities cotton, corn, wheat, and sorghum held a hefty bulk of the acres produced or influenced by our responders, meanwhile vegetables (1012 acres) and specialty crops (sesame, canola, grapes, fruit trees, etc.) (8,987 acres) made an impressive mark.



Responders were asked to provide an overall view of the IPM Program in 2013.



Responders were asked to estimate a 0 to 100 value for the IPM Program's efforts in 4-H entomology and home & garden IPM.

4-H Entomology Education and Teams
Homeowner and Garden IPM
0
20
40
60
80

Summary

The vast majority of responders to the retrospective post survey represented the various agricultural production sectors in Hale and Swisher County and not the general citizenry. The IPM Program's efforts in 4-H entomology education and home & garden IPM still received high marks for value from these agricultural sectors, proving an importance placed for general IPM education. Meanwhile, the respectable appearance of vegetable and specialty crops in this survey's responses proves an extending and diverse need for IPM to reach beyond the commodity markets in Hale & Swisher Counties. When we consider the higher value of these vegetable and specialty crops, the increased need and desire for 'farmer's markets' and fresh, locally grown, and reliably available produce by the populace, the increased value placed upon food safety and consumer health, combined with the nature of pests to attack every aspect of human life and the demand for IPM education for all sectors of the populace can only increase in the future.

EXTENDING KNOWLEDGE
Providing Solutions

TEXAS A&M AGRILIFE EXTENSION

TEXAS IPM
Partners with Nature

2013 Educational Activities

Farm Visits	350
Number of Newsletters Released	21
Newsletter Recipients	2,331
Direct Ag Contacts	447
Other Direct Contacts	318
Radio Programs	109
Blog Releases	25
Ag Consultants and Field Scouts Trained	35
Newspaper articles written	5
Result Demonstration Trials Initiated	5
Result Demonstration Trials Supported	9
Presentations Made to Adults	14
Presentations Made to Youth	17

Activity Highlights

Plains Pest Management Scouting Program (6,000 acres)
Applied Research Projects
Weekly Radio Programs
Hale County Summer Crop Field Day
Swisher Fall Ag Conference
Hale & Swisher 4-H youth Entomology Projects
Hale County Master Gardner Trainings
Hale County Water Wise
High Plains Association of Crop Consultants
CEU training
Texas Pest Management Association

Plains Pest Management Newsletter
Plains Pest Management Bugosphere (blog)
Hale & Swisher Ag Day
Hale County Wheat Field Day
Swisher Spring Ag Day
Briscoe County Crops Conference
Hale County BLT Program Support
Progressive Growers Breakfasts
Entomological Society of America
Field Scout School
Site Scouting and IPM Recommendations

2013 at a Glance

The following is a brief overview of the 2013 growing season in Hale & Swisher Counties. Copies of the Plains Pest Management Newsletters published in 2013 have been included in the appendix of this report for a more in-depth look at specific pest pressure, weed situations, crop conditions, and environmental conditions at any given week.

The 2013 growing season was a mixed bag wrapped by a prevailing and domineering drought. A large amount of wheat was planted during the fall of 2012. Throughout the winter, this wheat did receive some sustaining moisture. These wheat fields were then met in the late winter and through the spring with multiple northern cold fronts that were particularly late, dry, cold, and harsh. Repeated efforts were made to assess the damage to the grain only to have another damaging cold weather even, the latest taking place in early May. Very little of the area's wheat was harvested for grain as a result of the weather events and drought conditions.

Plantings of summer crops were also delayed due to the colder weather until soil temperatures rebounded latter in May. Area producers shifted many summer acres to sorghum and corn following rapidly swinging market forces. These acres were taken away from cotton, but cotton plantings remained strong. There was not enough moisture available to establish dry-land acres crops of any type in appreciable amounts. The area did receive several timely rain events that aided all summer crop development and yields aiding yields for irrigated fields. Several of these rain events came with violent hail and high, damaging winds. Large portions of the area's primary crop were destroyed by these events which resulted in a comparatively large amount of acreage going toward a late secondary crop also consisting largely of sorghum and corn. Weed pressure was unusually heavy, flushed by the rain events and spurred by possible herbicide resistance. Producers had great difficulty in controlling weeds with many weed escapes regardless of crop.

2013 Weed Pressure:

Overall	moderate to very heavy

Cotton

As a result of the drought, and with the high amount of pest preferred grain crops planted in 2013 acting as a 'catch' for many Lepidopteron pests, cotton experienced the lightest pest pressure growing season in memory. While acres were down, irrigated cotton yields were comparatively high for both Hale & Swisher. Yields ranged from 500 pounds per acre to over 2,000 pounds per acre with most fields falling in a range of 950 to 1,400 pounds per acre. Fields that were subjected to additional hail weather events in early and mid-August primarily constituted the lowest yielding fields. A freeze event occurred on October 11 that capped several late fields, significantly damaging fiber quality and grades. Otherwise, fiber quality and grades were very good.

2013 Pest Pressure:

Overall	very light to light
Thrips	moderate to very heavy
Cotton Fleahopper	very light to light
Lygus	light
Aphids	very light
Bollworms	very light to light

Sorghum

It could be said that Hale and Swisher Counties had two full crops of sorghum. Sorghum was planted as a primary crop in higher amounts than normal and there was a substantial late, secondary sorghum crop planted behind a failed primary crop. Pest pressure remained light for early planted sorghum, while late sorghum was exposed to heavy populations of headworms. Despite the early October 11 freeze event, yields and weights remained good for all but the latest of fields.

2013 Pest Pressure:

Overall	moderate
Sorghum Midge	light
Greenbugs	light
Yellow Sugarcane Aphids	light to moderate
Spider Mites	light
Headworms	light to heavy late
Fall Armyworms	light to very heavy late

Corn

Corn was also planted heavily as a primary crop and as a secondary crop following weather destroyed cotton. Differences in irrigation pumping capacities between fields were genuinely highlighted this season in terms of yield response. Hale County averaged 185.6 bu. / acre and Swisher averaged 164.7 bu. / acre according to NASS. While still steeped in drought conditions, all fields benefited from timely rain events. Later planted fields tended to yield less with lighter grain while some select primary crop corn fields set producer best yield records. Spider mites were the lone corn pest to reach treatable economic significance while fall armyworm populations only caused interested concern for late planted corn fields.

2013 Pest Pressure:

Overall	light to moderate
Southwestern Corn Borer	very light
Spider Mites	moderate to moderately heavy
Fall Armyworms	light to moderate

Wheat

Due to the late, dry, cold weather events, only a small portion of the area's winter wheat went for grain harvest. The fields that were taken to harvest were primarily done so out of a need for 2014 planting seed. Most other fields were grazed, hayed, or used for silage. The alternate use of these various forages went immediately toward rebuilding the area's drought stricken cow-calf numbers and thus filled a dire need quickly. Greenbug populations, along with some pockets of Russian Wheat Aphids, did reach economic levels in the majority of area wheat. Most of these fields were left untreated due to the poor economic prospect of the cold and drought damaged wheat.

2013 Pest Pressure:

Overall	moderate
Greenbugs	moderate to heavy
Russian Wheat Aphids	light to moderate
Fall Armyworms	light
Disease	moderate to heavy

2013 Applied Research and Demonstration Projects

- 2013 Population Monitoring of Adult Bollworms in Hale & Swisher County, Jeremy Reed Farms & Joe McFerrin Farms

- Foliar Efficacy Comparison of Radiant (spinetoram) on Economic Populations of Thrips on Seedling Cotton Compared to Commercial Standards, Mike Goss Farms

- 2013 Efficacy Evaluation of Commercial Miticide Products on Economic Populations of Banks Grass Mites in Corn, Joe McFerrin Farms

- Everris Encapsulated & Time Released Fertilizer's Impact on Irrigated Cotton Planted in Calcium Carbonate Soils in Swisher County, Mike Goss Farms

2013 Population Monitoring of Adult Bollworms in Hale & Swisher County

Blayne Reed, Kate Harrell, Pat Porter, Ed Bynum, and Charles Allen
Texas A&M AgriLife Extension

Cooperators: Jeff Rodgers, Jeremy Reed, and Joe McFerrin

Summary

This effort was made in order to monitor the adult bollworm (corn earworm, sorghum headworm) population trends throughout the summer growing season in Hale and Swisher County both for immediate and historical use. While adult Lepidopteron pest monitoring is not a guarantee of pest presence or economic problem predictability, trends can be noted and timely alerts for potential egg lay and volume of the area bollworm pest populations can be extrapolated. Assumptions based upon known pest biology combined with this effort can infer aspects about general adult bollworm movement, immigration, and emergence. In an effort to help monitor for this major pest of multiple crops the information generated from this effort was shared with district and regional researchers, crop consultants, agribusiness, and area producers through the Plains Pest Management Newsletter, discussions on our weekly radio programs, and freely shared independently as requested. If compiled with similar efforts completed in the past, historical trends for the bollworm might be established.

The data generated from this effort indicated that the 2013 bollworm population in Hale and Swisher should be lower than an 'average' summer growing season. This concurred with what our scouting program was finding via egg lay and young larva in our area cotton, corn, sorghum, and tomato fields soon afterwards.

Methods and Sites

The Swisher County trap was placed 4 ½ miles north of Kress, Texas and 6 miles south of Tulia, Texas on a farm belonging to Jeff Rodgers and operated by Jeremy Reed. The site was near irrigated cotton fields with irrigated sorghum silage less than a mile away and only a few dozen yards from the banks of the South Tule Draw. The Hale County trap was placed 1 mile east of Cotton Center, Texas on a farm belonging to Joe McFerrin that lays 5 ½ miles northeast of the Black Water Draw. The Hale trap was near primary crop planted corn and secondary crop planted corn and sorghum.

The traps utilized were standard wireframe Lepidopteron traps suspended upon rebar posts at a height of roughly 4 ½ feet to the top of the trap. Standard Helicoverpa *zea*, pheromone was utilized to attract adult moths. Traps were checked, moths counted, recorded, and traps emptied weekly, and pheromone was changed bi-weekly.

Results and Discussion

Trap numbers indicated a 'light' bollworm year with some distinct peaks and population curves that roughly matched and preluded our scouting data from the field. The Hale County trap yielded a fairly typical population curve with just a few variations. A later than expected l peak occurred on September 3, 2013 when 76 moths were trapped that week. This peak in Hale coincided with an economic population of sorghum headworms attacking the late planted sorghum crop in that area two to three weeks after the peak Hale County peak. The Swisher County population roughly followed a general population curve, but experienced more wild variations and three distinct peaks and valleys. The first peak occurred on July 2, 2013 with 43 moths. This preceded a small outbreak of economic bollworm problems attacking area tomatoes bound for local farmer's markets and a mild problem of unusually heavy damage in whorl stage sorghum. The second wild peak occurred July 30, 2013, with 112 moths trapped which preceded a large infestation of ears in area field corn. The final wild peak occurred over a two week period from August 13 to August 20, 2013 when 108 and 146 moths were trapped respectively. This peak coincided with an economic infestation in headed sorghum in Swisher that began shortly after the moths were trapped.

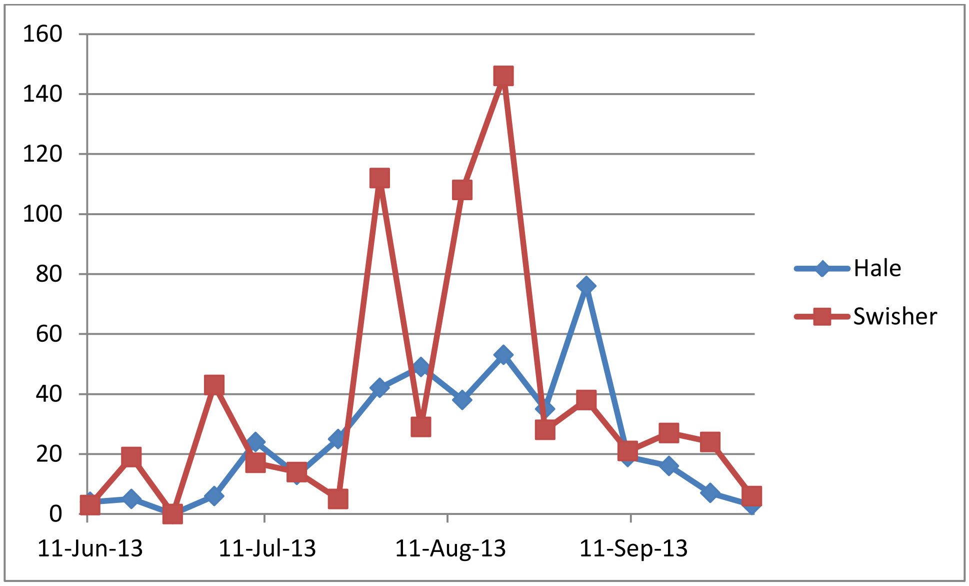


Figure 1. Hale & Swisher 2013 Bollworm trap catches

All field observations and confirmations of bollworm larva occurrences mentioned were made through the Plains Pest Management scouting program of nearby and area fields, area crop consultants, and area producers. Due to the results and information generated by these efforts there is considerable interest in continuing the bollworm monitoring program in 2014 and utilizing this tool to aid in estimation and rough predictor of future bollworm pest problems.

2013 Foliar Efficacy Comparison of Radiant (spinetoram) on Economic Populations of Thrips on Seedling Cotton Compared to Commercial Standards

Blayne Reed, Mike Lovelace[2], Apurba Barman, Kate Harrell, Johnathon Thobe, Jacob Smith, and Demi Loya

Texas A&M AgriLife Extension and Dow Chemical[2]

Cooperator: Mike Goss

Introduction

Economic populations of thrips remain an annual pest to freshly emerged seedling cotton on the Texas High Plains. Thrips feeding on the leaves and growing point causes significant feeding damage to the leaves, terminals, and even early fruiting sites if populations remain unchecked for lengthy periods of time. Thrips typically migrate from drying wheat fields into nearby cotton fields shortly after cotton emergence. Once cotton reaches squaring, thrips are rarely an issue as both the plants can tolerate thrips feeding better and there become more acceptable host plants available for thrips to migrate to. This situation creates a window early in the cotton plant's development for economic thrips damage.

Standard grower practices for thrips control often include various seed treatments that offer systemic control of thrips. These seed treatments often loose residual before cotton is past economic thrips damage. Once field scouting confirms thrips are still a problem in young cotton fields and any applied seed treatment's residual has expired, producers often opt for an over-the-top foliar application combined with a herbicide treatment. The most common foliar thrips treatment used is acephate (Orthene). Acephate typically controls thrips with outstanding knockdown, but has limited residual capacity. In many cases cotton fields must be treated repeatedly or mild economic damage is allowed to occur rather than making additional foliar applications.

New for 2013 Dow offers spinetoram (Radiant) for a foliar option in thrips control that was expected to offer longer residual thrips control when compared to standard commercial practices of foliar thrips control once seed treatment residual expires.

Methods and Site

On June 11, 2013 field scouts of the Plains Pest Management Association scouted a field belonging to Mike Goss Farms in Swisher County containing an average population of 28 thrips per plant. This field was surrounded on three sides by drying wheat fields, at 4th true leaf stage, and had the applied seed treatment's residual expire. The field was confirmed to be an ideal candidate for the Radiant thrips protocol and the trial was placed and treatments made on June 13.

The small plot trial was established as an randomized block design with four treatments, Radiant @ 1.5 oz./ac, Radiant @ 1.5 oz./ac. + Roundup Powermax @ 22 oz./ac., Orthene at 1 oz./ac., and an untreated check and was replicated four times. The plot size was two 40" rows X 36' long.

Texas A&M AgriLife Extension

Radiant Thrips Protocol 2013

Trial ID: Dow Thrips Trial 2013 Location: Mike Goss Farm, Swish. Trial Year: 2013
Protocol ID: Dow Protocol 2013 Investigator: Blayne Reed
Project ID: Study Director:
Sponsor Contact: Mike Lovelace

Trial Map Treatment Description

Trt	Trt Code	Trt Description
1	I	Radiant 1.5 FL OZ/A;COC 1 % V/V
2	I	Radiant 1.5 FL OZ/A;Roundup Powermax 22 FL OZ/A;COC 1 % V/V
3	I	Orthene 1 OZ WT/A;COC 1 % V/V
4	CHK	Untreated Check

Figure 2. Radiant Thrips Trial Plot Map

Pretreatment thrips counts were made prior to treatment on June 13 and thrips counts began 4 days after treatment (DAT) on June 17. Thrips counts continued at 7 DAT, and 11 DAT. At 11 DAT plots were also rated for thrips damage, and plant stage data was recorded. All data was analyzed for significant differences utilizing AOV LSD through ARM.

Results

The following are the resulting ARM printouts from this trial:

Texas A&M AgriLife Extension

Radiant Thrips Protocol 2013

Trial ID: Dow Thrips Trial 2013 — Location: Mike Goss Farm, Swish. — Trial Year: 2013
Protocol ID: Dow Protocol 2013 — Investigator: Blayne Reed
Project ID: — Study Director:
Sponsor Contact: Mike Lovelace

	Rate									
Pest Type		I Insect	I Insect	I Insect	I Insect	I Insect	I Insect	I Insect	I Insect	I Insect
Pest Name		Thrips sp.	Thrips sp.	Thrips sp.	Thrips sp.	Thrips sp.	Thrips sp.	Thrips sp.	Thrips sp.	Thrips sp.
Crop Code		GOSHI	GOSHI	GOSHI	GOSHI	GOSHI	GOSHI	GOSHI	GOSHI	GOSHI
Crop Name		American uplan>	American uplan>	American uplan>	American uplan>	American uplan>	American uplan>	American uplan>	American uplan>	American uplan>
Part Rated		ADULT -	LARVA -	ADULT -	LARVA -	ADULT -	LARVA -	FEEDAM -	ADULT -	LARVA -
Rating Type										
SE Group No.		1	2	3	4	5	6	7	8	9
Rating Timing		pretreatment	pretreatment	4DAT	4DAT	7DAT	7DAT	7DAT	11DAT	11DAT
ARM Action Codes				AA	AA		AA			AA
Treatment Name	Rate	1	2	3	4	5	6	7	8	9
Radiant COC	1.5 1	10.0 a	4.5 a	0.4 b	0.1 b	0.4 a	0.0 a	3.0 a	0.9 a	0.0 a
Radiant Roundup Powermax COC	1.5 22 1	10.5 a	2.5 a	0.1 c	0.0 b	0.5 a	0.0 a	3.0 a	0.9 a	0.0 a
Orthene COC	1 1	11.1 a	3.8 a	0.0 c	0.0 b	0.5 a	0.0 a	2.9 a	1.0 a	0.0 a
Untreated Check		7.6 a	3.3 a	1.1 a	0.6 a	1.1 a	0.1 a	3.3 a	1.0 a	0.0 a
LSD (P=.05)		6.92	2.79	1.74t	2.52t	0.70	1.74t	0.65	0.65	0.88t
Standard Deviation		4.33	1.74	1.09t	1.58t	0.44	1.09t	0.41	0.41	0.55t
CV		44.26	49.34	34.36	105.42	71.63	210.12	13.55	44.13	98.71
Bartlett's X2		1.5	1.121	6.424	16.572	3.747	11.988	0.75	7.382	2.27
P(Bartlett's X2)		0.682	0.772	0.093	0.001*	0.29	0.002*	0.861	0.061	0.518
Skewness		0.7352	0.3567	1.0724	2.122*	0.8908	2.5911*	0.6251	0.5164	1.1789*
Kurtosis		0.2011	-1.0475	0.5578	3.9269*	0.3476	6.3813*	-0.6031	0.5178	2.0695
Replicate F		2.412	2.625	5.621	0.815	1.996	0.500	13.672	1.370	0.082
Replicate Prob(F)		0.1341	0.1145	0.0189	0.5172	0.1852	0.6916	0.0011	0.3131	0.9679
Treatment F		0.493	0.974	15.361	6.548	2.203	1.937	0.592	0.090	1.581
Treatment Prob(F)		0.6962	0.4467	0.0007	0.0122	0.1572	0.1942	0.6360	0.9637	0.2610

Means followed by same letter do not significantly differ (P=.05, LSD)
t=Mean descriptions are reported in transformed data units, and are not de-transformed.
Mean comparisons performed only when AOV Treatment P(F) is significant at mean comparison OSL.

Radiant Thrips Protocol 2013

Trial ID: Dow Thrips Trial 2013
Protocol ID: Dow Protocol 2013
Project ID:

Location: Mike Goss Farm, Swish. Trial Year: 2013
Investigator: Blayne Reed
Study Director:
Sponsor Contact: Mike Lovelace

Pest Type		I Insect	I Insect
Pest Name		Thrips sp.	Thrips sp.
Crop Code		GOSHI	GOSHI
Crop Name		American uplan>	American uplan>
Part Rated		FEEDAM -	SQUARE -
Rating Type			GROSTA
SE Group No.		10	11
Rating Timing		11DAT	11DAT
ARM Action Codes			
Treatment Name	Rate	10	11
Radiant COC	1.5 1	2.4 a	1.669 a
Radiant Roundup Powermax COC	1.5 22 1	2.2 a	1.781 a
Orthene COC	1 1	2.1 a	1.675 a
Untreated Check		2.6 a	1.556 a
LSD (P=.05)		0.51	0.3295
Standard Deviation		0.32	0.2060
CV		14.02	12.33
Bartlett's X2		2.697	6.185
P(Bartlett's X2)		0.441	0.103
Skewness		-0.5743	0.1162
Kurtosis		-0.3089	0.4601
Replicate F		1.086	2.176
Replicate Prob(F)		0.4034	0.1607
Treatment F		1.876	0.796
Treatment Prob(F)		0.2041	0.5263

Radiant Thrips Protocol 2013

Trial ID: Dow Thrips Trial 2013
Protocol ID: Dow Protocol 2013
Project ID:

Location: Mike Goss Farm, Swish. Trial Year: 2013
Investigator: Blayne Reed
Study Director:
Sponsor Contact: Mike Lovelace

<u>Pest Type</u>
I, Insect, G-BYRI7, G-InsStg = Insect
<u>Crop Code</u>
GOSHI, BCOT, Gossypium hirsutum, = US
<u>Part Rated</u>
ADULT = adult
LARVA = larva
FEEDAM = feeding damage
SQUARE = square
<u>Rating Type</u>
GROSTA = growth stage
<u>ARM Action Codes</u>
AA = Automatic arcsine square root % transformation

Late on the evening of June 16th the Radiant thrips trial plot received 0.8" rain. This rain event lowered thrips numbers, likely by washing them from the plants, for all plots and treatments. On the 4 DAT date the treatments Radiant @ 1.5 oz. /ac., Radiant @ 1.5 oz./ac. + Roundup Power Max @ 220oz./ac., and Orthene did show significantly average fewer adult (*P*=.007) and larval thrips (*P*=.0122) per plant compared to the untreated check despite the rain event. The treatments Radiant @ 1.5 oz. /ac. + Roundup PowerMax @ 22 oz. /ac also separated significantly from the other treatment with fewer adult thrips per plant.

Ultimately the 4 DAT thrips counts were the only counts that yielded significantly different data for the entire test. Once the thrips numbers dropped due to the rain event, the pest numbers never rebounded or returned to the trial. It is likely other more attractive thrips hosts plants were made available after the rain event. Visual differences between treatments were noted by all researchers taking thrips counts. Attempts were made to capture the perceived differences between treatments at 11 DAT when the thrips feeding damage was rated, and the plant stage via square size was measured. Numerical differences were found but none of the differences were found to be significant.

This study verified that spinetoram (Radiant) does provide significant knockdown of economically damaging thrips populations in seedling cotton. This study also verified that spinetoram (Radiant) may be tank mixed with Roundup Powermax and can achieve knockdown of thrips as well as the commercial standard acephate. The commercial standard acephate also proved to still have significant knockdown control of thrips. We were not able to confirm any added length of spinetoram's (Radiant) residual due to the rain event 'washing' and lowering the overall thrips population within the trial. There is great interest in repeating this trial in 2014 in an effort to confirm or refute this possible potential.

2013 Efficacy Evaluation of Commercial Miticide Control Products on Economic Populations of Banks Grass Mites in Corn

Blayne Reed, Scott Ludwig[2], Monti Vandiver, Craig A. Sandoski[3], Russ Perkins[4], Kate Harrell, Johnathon Thobe, Jacob Smith, Demi Loya, Ember Reed, Ed Bynum, Pat Porter

Texas A&M AgriLife Extension, Nichino America[2], Gowan[3], and Bayer Crop Science[4]

Cooperator: Joe McFerrin

Introduction

Due to Bt trait corn hybrids, most of the region's traditional field corn pests, the southwestern corn borer, European corn borer, and others, are no longer primarily problematic in the sense for a need to annually apply pesticides for these pests. Despite Bt technology's resulting decrease in reliance and use of harsh pesticides that commonly 'flare' mite populations, spider mites have remained a significant pest of field corn. While not as severe a pest as in the northern and western Texas Panhandle regions, spider mites are an annual concern for Hale & Swisher County corn producers. These corn pests are capable of developing resistance to pesticide control measures quite rapidly and the need for annual local efficacy evaluations is implicit.

Modern miticides rely upon scouting, timeliness of application and a healthy beneficial arthropod population, in addition to the expected knockdown and residual, to curb mite populations and prevent economic damage. This study is a combination of three miticide trial protocols designed to evaluate the efficacy of each product versus other competitive standards. The similarities of the three protocols allowed all protocols to be combined into one large spider mite trial.

Methods and Site

A sustaining population of banks grass mites was confirmed by Plains Pest Management Association scouting program in Joe McFerrin's field corn one mile northeast of Cotton Center, Texas. This population was not high enough yet to be considered economic. Mr. McFerrin allowed the Plains Pest Management Association to mark and place a trial within his field where within the trial's plots, the mites would be 'flared' with an unnecessary pesticide application. On July 27, 2013, plots were marked and treated with Asana XL via CO_2 backpack sprayer to destroy mite predation and allow the spider mite population to build rapidly. Nine days later the spider mites reached economic threshold within the trial's plots. Pre-treatment counts were then taken and various miticide treatments made. The trial's treatments consisted of Oberon @ 4 oz. / ac., Portal @ 32 oz. / ac., Zeal @ 2 oz. / ac., Onager @ 10 oz. / ac, and an untreated check. Post treatment mite counts were made at 3 DAT, 10 DAT, and 17 DAT while mite damage was rated at 24 DAT. All mite counts were made by 'harvesting' 10 ear leaves from each plot and returning to the lab where mites per leaf were counted under magnification. All data was analyzed for significant differences utilizing AOV LSD through ARM.

Results

By 3 DAT, the mite populations in the untreated check had continued to rise, while all other treatments had leveled off, but there were no significant differences on that date. At 10 DAT we began seeing significant differences in mite numbers between the Portal, Oberon, and Onager treatments compared to the untreated check (P=.0265). The Zeal treatment was numerically lower than the untreated check, but was not statistically different from any other treatment. This is the type of behavior we expect to see from a successful miticide treatment to an economic infestation of spider mites. The 'slower,' and for this trial not significant, mite's response to Zeal is likely due to the 'slower but increased residual' nature of that product. For this trial, this assumption for the Zeal product could not be measured. By 17 DAT predators had moved back into all treatments and mite numbers began crashing rapidly. The plot / mite damage rating data taken at 24 DAT showed no significant differences between treatments, although numeric differences were noted.

All ARM printouts and generated graph of data follow:

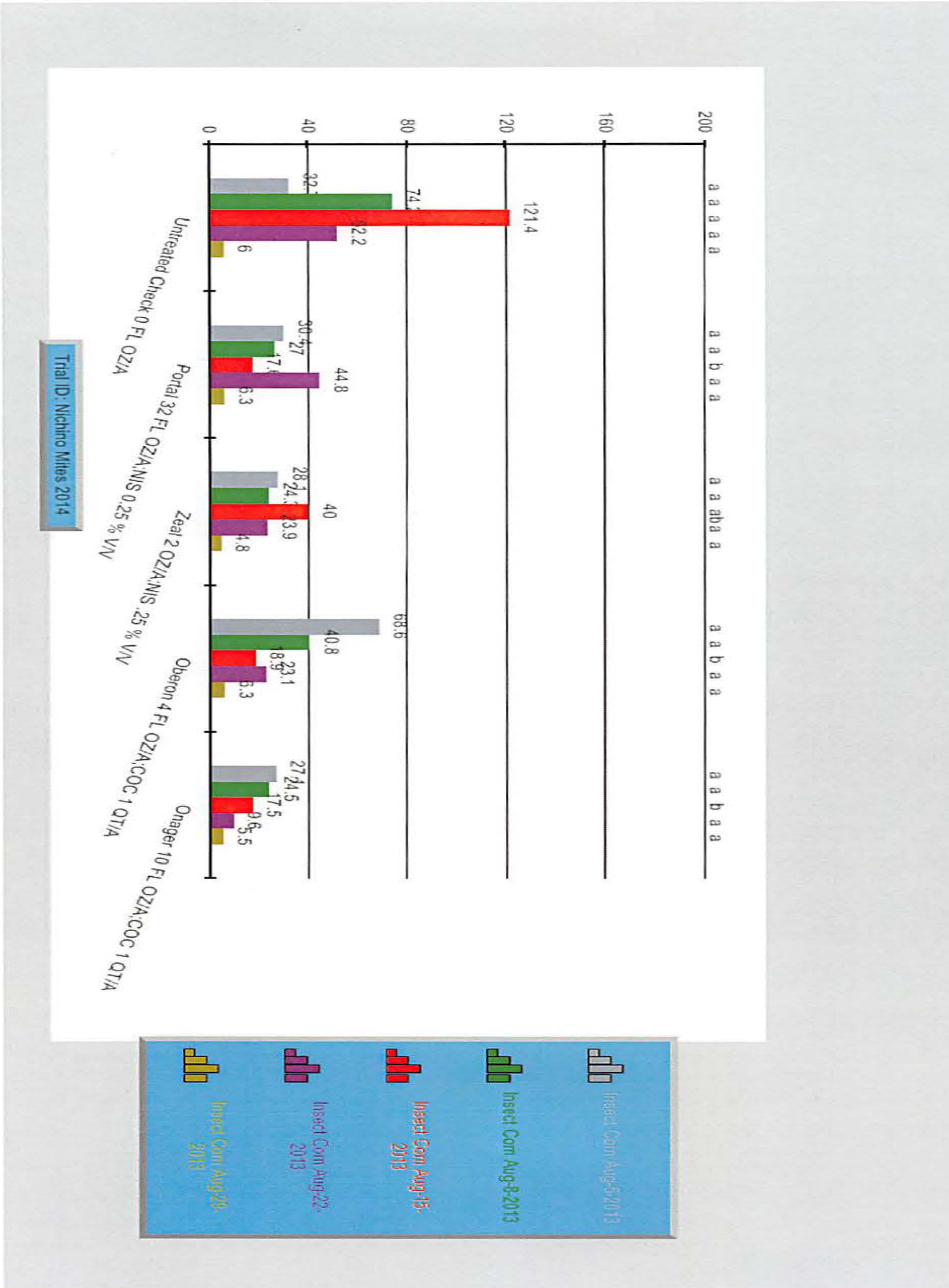
Trial ID: Nichino Mites 2014 Location: Hale Trial Year: 2013
Protocol ID: Nichino 2013 Investigator: Blayne Reed
Project ID: Study Director:
Sponsor Contact:

Pest Type		I Insect	I Insect	I Insect	I Insect	I Insect
Pest Name		Banks grass mi>	Banks grass mi>	Banks grass mi>	Banks grass mi>	Banks grass mi>
Crop Code		ZEAMX	ZEAMX	ZEAMX	ZEAMX	ZEAMX
Crop Name		Corn	Corn	Corn	Corn	Corn
Part Rated		MOTILE P	MOTILE P	MOTILE P	MOTILE P	PLOT -
Rating Date		Aug-5-2013	Aug-8-2013	Aug-15-2013	Aug-22-2013	Aug-29-2013
Rating Type		COUNT	COUNT	COUNT	COUNT	DAMAGE
Rating Unit		NUMBER	NUMBER	NUMBER	NUMBER	0-10
Sample Size, Unit		1 LEAF	1 LEAF	1 FLAGLE	1 FLAGLE	1 PLOT
Assessed By						Blayne Reed
SE Group No.		1	2	3	4	5
Trt-Eval Interval		0 DA-A	3 DA-A	10 DA-A	17 DA-A	24 DA-A
ARM Action Codes		AL	AL	AL	AL	
Treatment Name	Rate	1	2	3	4	5
Untreated Check	0	32.7 a	74.2 a	121.4 a	52.2 a	6.0 a
Portal NIS	32 0.25	30.4 a	27.0 a	17.6 b	44.8 a	6.3 a
Zeal NIS	2 0.25	28.1 a	24.3 a	40.0 ab	23.9 a	4.8 a
Oberon COC	4 1	68.6 a	40.8 a	18.9 b	23.1 a	6.3 a
Onager COC	10 1	27.1 a	24.5 a	17.5 b	9.6 a	5.5 a
LSD (P=.05)		0.39t	0.64t	0.54t	0.47t	1.86
Standard Deviation		0.25t	0.41t	0.35t	0.31t	1.21
CV		16.33	26.71	23.02	21.32	21.0
Bartlett's X2		4.574	5.511	6.295	2.329	3.547
P(Bartlett's X2)		0.334	0.239	0.178	0.676	0.471
Skewness		-0.01	-0.1668	0.1921	-0.08	-0.3475
Kurtosis		-1.0925	0.2713	0.8042	-1.2734	0.5468
Replicate F		4.585	0.202	2.914	1.955	0.400
Replicate Prob(F)		0.0232	0.8929	0.0821	0.1747	0.7555
Treatment F		1.644	0.957	4.194	3.259	1.114
Treatment Prob(F)		0.2271	0.4653	0.0265	0.0500	0.3945

Pest Type
I, Insect, G-BYRI7, G-InsStg = Insect
Crop Code
ZEAMX, BCOR, Zea mays, = US
Part Rated
MOTILE = motile
PLOT = plot
P = Pest is Part Rated
Rating Type
COUNT = count
DAMAGE = damage
Rating Unit
NUMBER = number
0-10 = 0-10 index/scale

LEAF = leaf
FLAGLE = flagleaf
PLOT = total plot
ARM Action Codes
AL = Automatic log transformation of X+1

Means followed by same letter do not significantly differ (P=.05, LSD)
t=Mean descriptions are reported in transformed data units, and are not de-transformed.
Mean comparisons performed only when AOV Treatment P(F) is significant at mean comparison OSL.
Missing data estimates are included in columns:Yates=3



Trial ID: Nichino Mites 2014
0
40
80
120
160
200
a a a a a
a a b a a
a a aba a
a a b a a
a a b a a
121.4
52.2
6
44.8
6.3
27
40
23.9
4.8
68.6
40.8
23.1
18.9
6.3
24.5
17.5
9.6
5.5
Untreated Check 0 FL OZ/A
Portal 32 FL OZ/A;NIS 0.25 % V/V
Zeal 2 OZ/A;NIS .25 % V/V
Oberon 4 FL OZ/A;COC 1 QT/A
Onager 10 FL OZ/A;COC 1 QT/A
Insect Com Aug-5-2013
Insect Com Aug-8-2013
Insect Com Aug-15-2013
Insect Com Aug-22-2013
Insect Com Aug-29-2013

Everris Encapsulated & Time Released Fertilizer's Impact on Irrigated Cotton Planted in Calcium Carbonate Soils in Swisher County

Blayne Reed, Tim Burbacker[2], Kate Harrell

Texas A&M AgriLife Extension and Everris Fertilizer[2]

Cooperator: Mike Goss

Introduction

Calcium carbonate, or caliche, soils are notorious for binding, or tying up, important nutrients making them inaccessible for plant roots to uptake in field crop situations. Most famously calcium carbonate soils deny plants the amount of phosphorous they may require even though phosphorus could be in that soil. There are several other nutrients that calcium carbonate soils bind also. The results for crops planted into these shallow caliche soils are reduced yields and poor plant health. Attempts have been made locally for decades to rectify the calcium carbonate soil issue with very limited economic success leaving these calcium carbonate soils as yield 'holes' and undesirable for row crop production.

Early in 2013 representatives from Everris Fertilizers, a partner of Scott Fertilizers and horticulture, potted plant, and high return vegetable fertilizer industry standard, approached the Plains Pest Management Association about conducting an economic evaluation of their encapsulated and time released fertilizers in Texas High Plains cotton. Encapsulated fertilizers have traditionally been cost prohibitive for large scale commodity producers. An estimate was needed on the feasibility of Everris' encapsulated fertilizers to enter the row crop market at some level with the agricultural industry's invigorated efforts at precision nutrient management. It was decided that some of the Texas High Plains calcium carbonate soils might contain a need for timed release fertilizers, thus avoiding the calcium carbonate's ability to bind the much needed nutrients by making the nutrient available to the plant's root system only at the time the plant would need the nutrients. There remained large economic feasibility questions about the added cost associated with encapsulated fertilizers in row crop production. A simple apply and let's see protocol was quickly organized.

Methods and site

A cotton field with shallow, calcium carbonate soils belonging to Mike Goss was identified and plots placed on May 24, 2013. The trial included three fertilizer treatments and was designed as a RCBD with four replications. Plots sizes were 4, 40 inch rows and they were 36 ft. long, but only the two middle rows within each plot would be sampled. Treatments included an untreated check, a 1X rate of 255 pounds per acre 9-47-0 plus 146 pounds per acre 39-0-0 both Osmocote encapsulated fertilizers, and a 2X rate of 510 pounds per acre 9-47-0 plus 292 pounds per acre 39-0-0 both Osmocote encapsulated fertilizers. Fertilizer application was conducted by hand and data collection began on July 25. In-season field data collection was to take place every two weeks and was designed to find typical plant growth, maturity, and fruiting site differences between treatments. This data included NAWF, plant height, internode length, number of squares, maturity of squares, and number of bolls. In addition, tissue samples were to be collected at peak bloom stage and at cut-out. Preharvest data was to be collected by October 10 and included a yield estimate based upon number of bolls per foot, percent open boll, and boll maturity to detect differences. Harvest was to be done by hand from randomly selected 10 foot portions within each plot. Samples were to be weighed for burr weight, ginned with the Texas A&M AgriLife Research – Cotton Improvement Lab in Lubbock where percent turnout, seed weight and lint weights were to be taken. A standard fiber analysis was to be conducted on the lint samples at the Texas Tech Textiles Lab in Lubbock.

On the night of August 8, just a few hours before our scheduled data collection date, the field containing this trial received a violent hail storm. The field was not completely hailed out, but severe damage was sustained. All field data collection stopped as the plants were far too damaged for measurement. In an effort to salvage some useful information from this trial, harvest, ginning, and fiber analysis stages of the trial continued. The trial was harvested on November 1, ginned on November 18 and lint samples were delivered to the textile lab on the same date.

Results

After all harvest and fiber quality data had returned, the data was analyzed for significant differences utilizing AOV LSD through ARM. The only field collected data taken on July 25 was included in the analysis. A slight numeric difference in lint yield of 80 pounds was noted between the 1X rate and the untreated check, but no significant differences were found. Surprisingly there were significant differences in square maturity between all three treatments with the 1X rate being the most advanced and the 2X rate also differing from the untreated check (*P*=.0066). There was also a significant difference on July 25 for plant height with the 1X rate separating from the other two treatments (*P*= .0262). These significant differences so early in the growing season could hint to possible differences in yield that could be better quantified into economic viability. Unfortunately, it is felt that the hail event prevented any possible differences from being realized.

At this time the economic feasibility of encapsulated fertilizers on calcium carbonate soils is still not known. The significant differences found in square maturity and the numeric only bump in yield has given Everris hope that true differences might be found in 2014. This study is to be repeated with additional micronutrient treatments added and will be conducted on two differing locations to hopefully avoid potential hail events.

All ARM printouts of data follow:

Everris Fertilizer Trial 2013

Trial ID: Everris Protocol 2013   Location: Mike Goss Farm   Trial Year: 2013
Protocol ID: Everris Protocol 2013   Investigator: Blayne Reed
Project ID: Study Director: Blayne Reed
Sponsor Contact: Tim Burbaker

Pest Type		O Other	O Other	O Other	O Other	O Other	O Other
Crop Code		GOSHI	GOSHI	GOSHI	GOSHI	GOSHI	GOSHI
BBCH Scale		BCOT	BCOT	BCOT	BCOT	BCOT	BCOT
Crop Scientific Name		Gossypium hirs>	Gossypium hirs>	Gossypium hirs>	Gossypium hirs>	Gossypium hirs>	Gossypium hirs>
Crop Name		American uplan>	American uplan>	American uplan>	American uplan>	American uplan>	American uplan>
Description		Square Maturity	Plant Height	Internode Leng>	Number Sq. / P>	Number Bolls />	Burr Wt.
Part Rated		- C	- C	- C	- C	- C	- C
Rating Date		Jul-25-2013	Jul-25-2013	Jul-25-2013	Jul-25-2013	Jul-25-2013	Nov-18-2013
Sample Size, Unit		1 PLINRO	- PLB	- PLB	- PLB	- PLB	- PLOT
Collection Basis, Unit		1 SQUARE	- PLINRO	- PLINRO	- SQUARE	- BOLL	- PLOT
Number of Subsamples		3	3	3	3	3	1
Pest Density, Unit		- 0-1	- PLANT	- PLANT	- PLANT	- PLANT	- PLOT
Assessed By		Harrel, K.	Harrel, K.	Harrel, K.	Harrel, K.	Harrel, K.	Reed, B.
Rating Timing		MD	MD	MD	MD	MD	H1
ARM Action Codes				EC		ET2	
Number of Decimals		2	2	2	2	2	1
Treatment Name	Rate	1	2	3	4	5	6
Untreated Check		0.66 c	15.67 b	4.79	22.42 a	0.00 a	996.8 a
Treatment 1	146	0.81 a	17.00 a	4.85 a	22.50 a	0.17	1299.7 a
Treatment 1	255						
Treatment 2	292	0.75 b	16.71 a	4.63 a	23.25 a	0.00 a	1213.9 a
Treatment 2	510						
LSD (P=.10)		0.060	0.723	0.647	3.359	0.000	284.05
Standard Deviation		0.043	0.526	0.389	2.445	0.000	206.75
CV		5.86	3.2	8.21	10.76	0.0	17.67
Bartlett's X2		3.051	1.441	0.791	1.376	0.0	3.171
P(Bartlett's X2)		0.217	0.486	0.374	0.503	.	0.205
Skewness		0.1546	-0.9065	-0.2317	0.0401	.	0.9376
Kurtosis		-1.2305	1.1304	-0.9574	-0.4738	.	0.54
Replicate F		4.919	1.501	0.159	1.262	0.000	0.778
Replicate Prob(F)		0.0467	0.3069	0.9176	0.3685	1.0000	0.5479
Treatment F		12.990	7.095	0.694	0.141	0.000	2.280
Treatment Prob(F)		0.0066	0.0262	0.4659	0.8713	1.0000	0.1834

Means followed by same letter do not significantly differ (P=.10, LSD)
t=Mean descriptions are reported in transformed data units, and are not de-transformed.
Mean comparisons performed only when AOV Treatment P(F) is significant at mean comparison OSL.

Everris Fertilizer Trial 2013

Trial ID: Everris Protocol 2013
Protocol ID: Everris Protocol 2013
Project ID:

Location: Mike Goss Farm Trial Year: 2013
Investigator: Blayne Reed
Study Director: Blayne Reed
Sponsor Contact: Tim Burbaker

Pest Type	O Other	O Other	O Other	O Other	O Other	O Other
Crop Code	GOSHI	GOSHI	GOSHI	GOSHI	GOSHI	GOSHI
BBCH Scale	BCOT	BCOT	BCOT	BCOT	BCOT	BCOT
Crop Scientific Name	Gossypium hirs>	Gossypium hirs>	Gossypium hirs>	Gossypium hirs>	Gossypium hirs>	Gossypium hirs>
Crop Name	American uplan>	American uplan>	American uplan>	American uplan>	American uplan>	American uplan>
Description	Seed Wt.	Lint Yield	% turnout	MIC	Fiber Length	Fiber Uniformi>
Part Rated	- C	- C	- C			
Rating Date	Nov-18-2013	Nov-18-2013	Nov-18-2013	Dec-2-2013	Dec-2-2013	Dec-2-2013
Sample Size, Unit	- PLOT	- PLOT	- PLOT	- SAMPLE	- SAMPLE	- SAMPLE
Collection Basis, Unit	- PLOT	- PLOT	- PLOT	- SAMPLE	- SAMPLE	- SAMPLE
Number of Subsamples	1	1	1	1	1	1
Pest Density, Unit	- PLOT	- PLOT	- PLOT			- 1-100
Assessed By	Reed, B.	Reed, B.	Reed, B.	Texas Tech	Texas Tech	Texas Tech
Rating Timing	H1	H1	H1			
ARM Action Codes		AL				
Number of Decimals	1	1	1	1	2	1
Treatment Name / Rate	7	8	9	10	11	12
Untreated Check	422.0 a	211.0 a	21.4 a	3.7 a	1.17 a	82.5 a
Treatment 1 146 Treatment 1 255	499.7 a	248.3 a	19.9 a	3.5 a	1.18 a	82.9 a
Treatment 2 292 Treatment 2 510	522.8 a	239.4 a	20.0 a	3.6 a	1.19 a	83.0 a
LSD (P=.10)	101.96	0.07t	5.03	0.47	0.026	0.73
Standard Deviation	74.21	0.05t	3.66	0.35	0.019	0.53
CV	15.41	2.22	17.93	9.59	1.63	0.64
Bartlett's X2	1.475	4.087	0.774	0.215	0.941	1.07
P(Bartlett's X2)	0.478	0.13	0.679	0.898	0.625	0.586
Skewness	1.1781	1.1501	-0.9424	0.2242	0.6007	-0.0875
Kurtosis	0.9803	0.7759	0.5131	-1.7424	-0.2305	-1.0875
Replicate F	1.361	3.093	0.666	2.182	0.636	0.200
Replicate Prob(F)	0.3412	0.1111	0.6027	0.1912	0.6185	0.8929
Treatment F	2.024	1.979	0.218	0.441	1.182	0.992
Treatment Prob(F)	0.2129	0.2188	0.8103	0.6629	0.3692	0.4244

Everris Fertilizer Trial 2013

Trial ID: Everris Protocol 2013 Location: Mike Goss Farm Trial Year: 2013
Protocol ID: Everris Protocol 2013 Investigator: Blayne Reed
Project ID: Study Director: Blayne Reed
Sponsor Contact: Tim Burbaker

Pest Type		O Other	O Other	O Other	O Other	O Other
Crop Code		GOSHI	GOSHI	GOSHI	GOSHI	GOSHI
BBCH Scale		BCOT	BCOT	BCOT	BCOT	BCOT
Crop Scientific Name		Gossypium hirs>	Gossypium hirs>	Gossypium hirs>	Gossypium hirs>	Gossypium hirs>
Crop Name		American uplan>	American uplan>	American uplan>	American uplan>	American uplan>
Description		Fiber Strength	Fiber Elongati>	Rd.	+b	Leaf Grade
Part Rated						
Rating Date		Dec-2-2013	Dec-2-2013	Dec-2-2013	Dec-2-2013	Dec-2-2013
Sample Size, Unit		- SAMPLE	- SAMPLE	- SAMPLE	- SAMPLE	- SAMPLE
Collection Basis, Unit		- SAMPLE	- SAMPLE	- SAMPLE	- SAMPLE	- SAMPLE
Number of Subsamples		1	1	1	1	1
Pest Density, Unit						- 0-5
Assessed By		Texas Tech	Texas Tech	Texas Tech	Texas Tech	Texas Tech
Rating Timing						
ARM Action Codes				AA		
Number of Decimals		1	1	1	1	0
Treatment Name	Rate	13	14	15	16	17
Untreated Check		31.7 a	7.9 a	77.7 a	8.4 a	2 a
Treatment 1 Treatment 1	146 255	32.0 a	8.0 a	79.0 a	8.4 a	2 a
Treatment 2 Treatment 2	292 510	31.6 a	7.4 a	74.9 a	8.8 a	3 a
LSD (P=.10)		0.84	0.68	3.77t	0.83	1.3
Standard Deviation		0.61	0.49	2.75t	0.60	0.9
CV		1.93	6.35	4.46	7.08	36.5
Bartlett's X2		0.391	2.231	3.482	4.468	2.055
P(Bartlett's X2)		0.823	0.328	0.175	0.107	0.358
Skewness		0.1898	-0.3093	-1.2733	1.0766	0.3877
Kurtosis		-1.1786	-1.0211	0.4586	1.3497	-0.9738
Replicate F		0.192	1.663	1.287	0.490	1.094
Replicate Prob(F)		0.8983	0.2725	0.3614	0.7019	0.4212
Treatment F		0.349	1.330	1.068	0.741	1.500
Treatment Prob(F)		0.7191	0.3326	0.4010	0.5158	0.2963

Everris Fertilizer Trial 2013

Trial ID: Everris Protocol 2013
Protocol ID: Everris Protocol 2013
Project ID:

Location: Mike Goss Farm
Investigator: Blayne Reed
Study Director: Blayne Reed
Sponsor Contact: Tim Burbaker

Trial Year: 2013

Pest Type
O, Other, G-BYRO7, G-OthStg = Other animal or nematode
Crop Code
GOSHI, BCOT, Gossypium hirsutum, = US

C = Crop is Part Rated

PLINRO = plant - in row
PLOT = total plot
SAMPLE = sample

SQUARE = square
PLINRO = plant - in row
BOLL = boll
PLOT = total plot
SAMPLE = sample

0-1 = 0-1 index/scale
PLANT = per plant
PLOT = per plot
1-100 = 1-100 index/scale
0-5 = 0-5 index/scale
Rating Timing
MD = Mid
H1 = 1st Harvest
ARM Action Codes
EC = Do not analyze untreated check, while still reporting treatment mean on AOV Means Table
ET2 = Excluded treatment 2
AL = Automatic log transformation of X+1
AA = Automatic arcsine square root % transformation

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