Plains Pest Management Association

Integrated Pest Management Program

Hale, Swisher, and Floyd Counties

2014 Annual Report

Prepared by:

Blayne Reed

Extension Agent-IPM

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2014 Plains Pest Management Newsletters available at: http://hale.agrilife.org/

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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.

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Plains Pest Management 2013 Advisory Committee

Ronald Groves	Kent Springer	Jerry Rieff
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2014 Plains Pest Management AG IPM

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 16 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 2014. During the year the activities included:

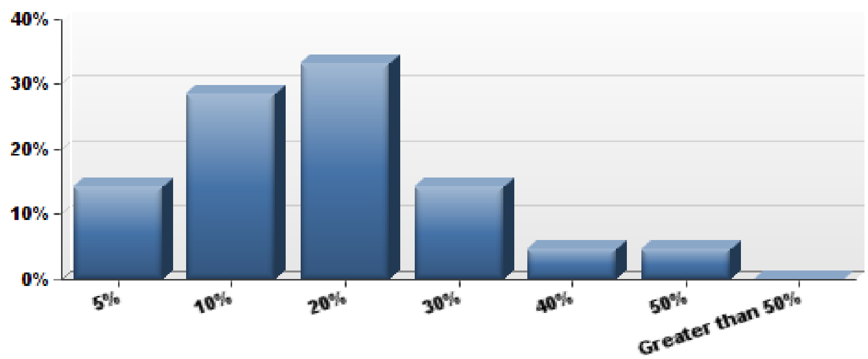
- Weekly field scouting for insect, weed, and disease problems of the 16 participating grower member's fields (≈6,400 acres of all crops) were conducted over the 2014 growing season.
- Information from this field scouting was shared, interpreted, and IPM solution recommendations given to the participating 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. (19 issues, 272 subscribers).
- Conducted locally 25 independent agriculture IPM related research trials and shared results rapidly through newsletters, blogs, radio programs, and direct interaction.
- Made 4 Pest Patrol Hotline submissions summing a current pest situation nearing problem status area wide and gave IPM recommendations.
- IPM and its implementation, current pest pressure, emerging pests, and control recommendations were major topics for all weekly Ag radio programs conducted. Two weekly on the 1090 AgriPlex Report and one weekly on Fox Talk 950's IPM report. Gave 1 IPM related television interview.
- Gave IPM presentations at 4 grower meetings, 2 turn-row meetings, 6 Progressive Grower Meetings, and 2 Field Scout Schools where IPM was a topic (where 29 CEUs were offered total).

- Assisted with district IPM research trials and gave resulting data rapid dissemination of results through newsletters, blogs, radio programs, and direct interaction.

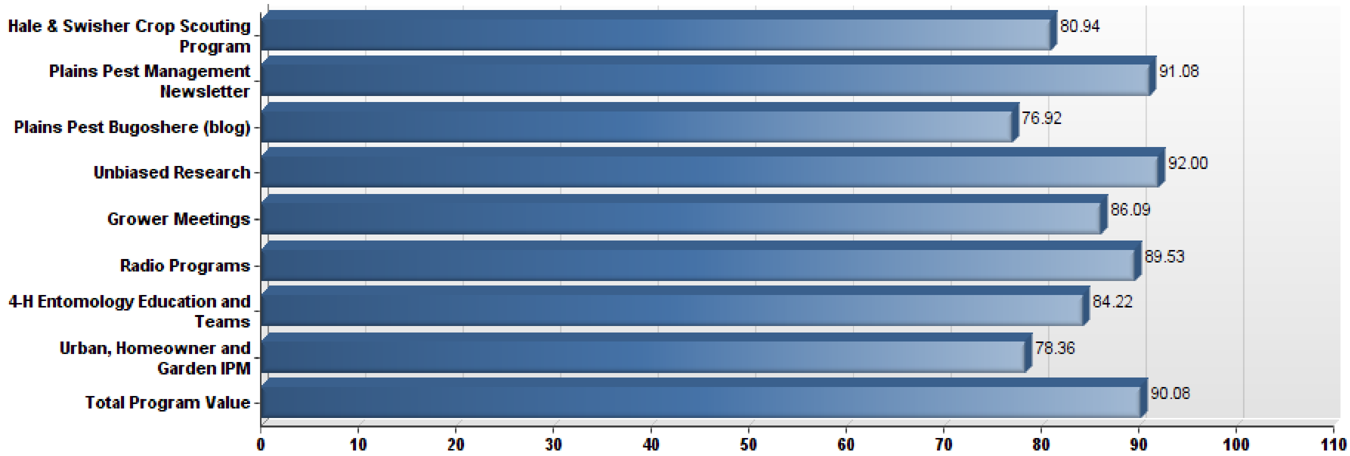
Results

A retrospective post evaluation instrument was distributed to the subscribers of the Plains Pest Management Newsletter. The survey responders were 44% Ag producers, 19% independent crop consultants, 19% Ag industry, 11% Ag retail, and 7% other.

- **93% of the responders believed that IPM reduced the risk associated with crop production**.
- **85% indicated that Texas IPM Programs had reduced pesticide use during recent years**.
- Those that responded yes were then asked to estimate how much pesticide use had been reduced. The majority of responders, over 30%, believed that pesticide use had decreased by 20%.

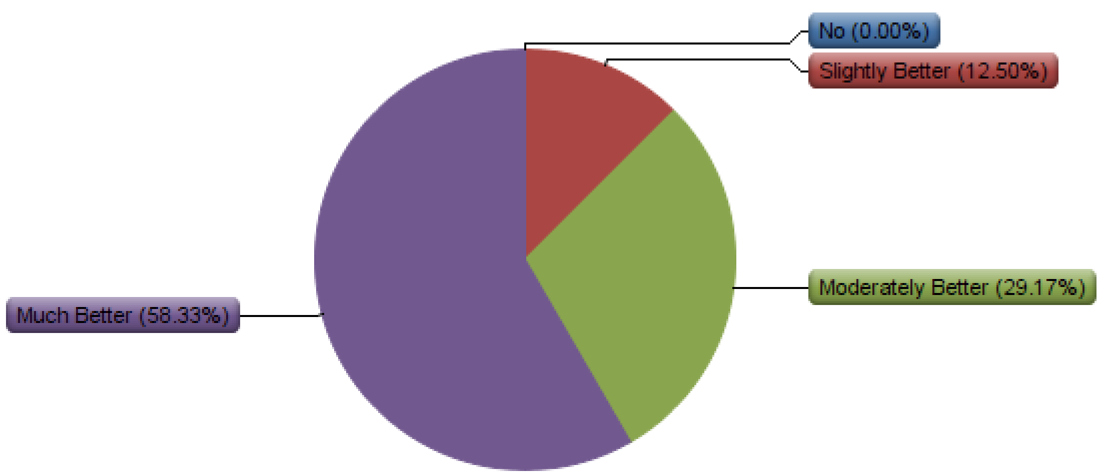


The survey responders were then asked to rate all of the major efforts of the 2014 Hale and Swisher IPM Program's on a 0-100 scale.

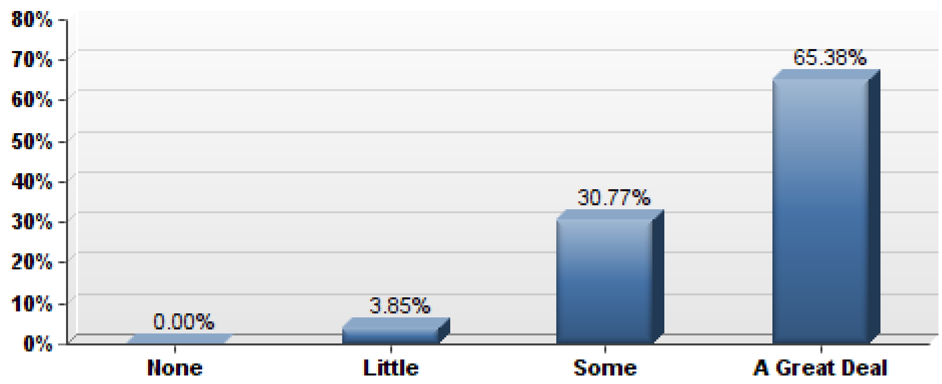


Survey responders were asked what they felt the per acre monetary value of the Plains Pest Management Association was in 2014. The average value for all responders was **$44.54 per production acre**.

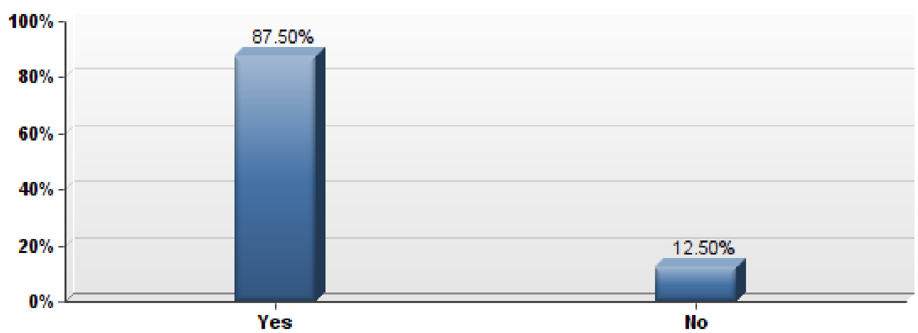
Survey responders were then asked, "Due to the 2014 efforts of the Hale & Swisher IPM Program in Corn and Sorghum management, do you feel you will be better prepared to meet your future challenges in these areas?"



Responders were also asked how much benefit the IPM Program's independently conducted local weed research trials had to the area.



Responders were then asked if they had modified their weed IPM strategy in any way as a result of the IPM Program's efforts in recent years.



Summary

The IPM Program in Hale & Swisher Counties is proving to have real value and impact in the Hale & Swisher production agriculture economy. If the survey responder estimated $44.54 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 $**5,942,671.56 potential impact** figure emerges. Even if this purposely conservative survey based estimate proved to be high, the Plains Pest Management Association is still not only important to the production agriculture economy in the Hale & Swisher area, but is a significant part of that economy's maintenance and function.

2014 Hale & Swisher Corn & Sorghum IPM Education Outcome

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

Relevance

Production agriculture is the foundation of the economies of both Hale and Swisher Counties. These counties are among the most diverse and prolific in Texas agricultural production. A large portion of that production is devoted to the rapidly advancing corn and sorghum production areas. Producers continually need and often seek educational opportunities about the latest advancing technologies and evolving pest pressure issues associated with these two vital area crops to better improve their operations.

Response

The Plains Pest Management Association, made up of 16 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 corn and sorghum IPM related information a priority in 2014. During the year activities included:

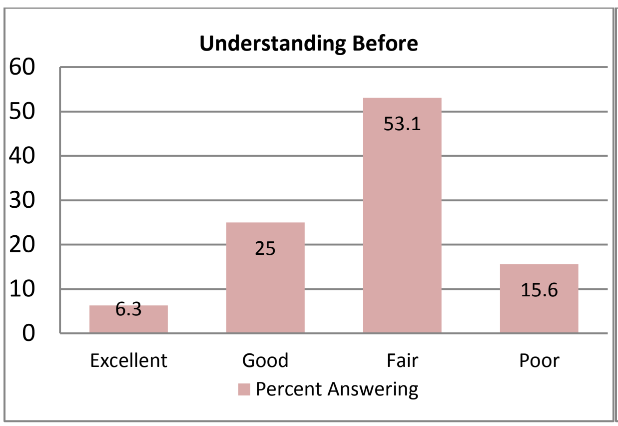
- Weekly field scouting, which included corn and sorghum evaluations, of the participating grower member's fields (≈6,400 acres of all crops) was conducted over the 2014 growing season.
- Information from this field scouting was shared, interpreted, and IPM solution recommendations were given to the participating growers via scouting report and direct interaction.
- Data generated from the field scouting, pertinent corn and sorghum IPM research, along with successful and proven IPM recommendations were shared through the Plains Pest Management Newsletter weekly throughout the growing season and periodically during the offseason. (19 issues, 272 subscribers).
- Conducted 10 local corn and sorghum IPM related independent research trials and shard new information rapidly through newsletters, blogs, radio programs, and direct interaction.
- Corn and Sorghum IPM and its implementation were a major topic of interest for the weekly Ag radio programs conducted. Two weekly on the 1090 AgriPlex Report and one weekly on Fox Talk 950's IPM report.
- Gave corn and sorghum related IPM presentations at 2 grower meetings (141 attendees, 10 CEUs offered), 1 turn-row meeting (12 attendees, 3 CEUs offered), and held 6 Progressive Grower Meetings where corn and sorghum IPM was a topic.
- Wrote 2 newspaper articles offering options and control methods for corn and sorghum IPM (circulation of 7,500), conducted 5 magazine and newspaper interviews, and made 3 corn and sorghum related Pest Patrol Hotline submissions summing a current pest situation nearing problem status area wide and gave IPM recommendations.

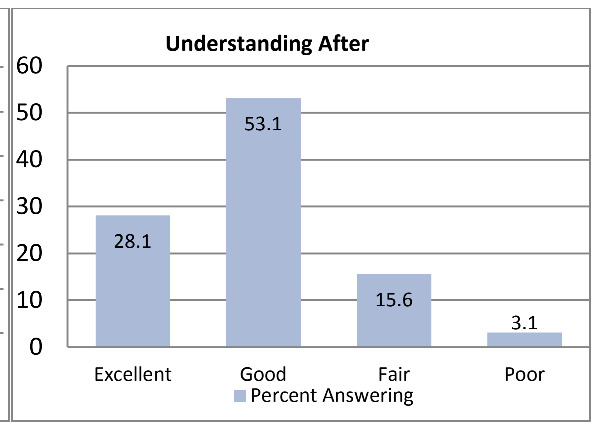
- Assisted with district and regional corn and sorghum IPM related research and data dissemination of results through newsletters, blogs, radio programs, commodity groups, and direct interaction.

Results

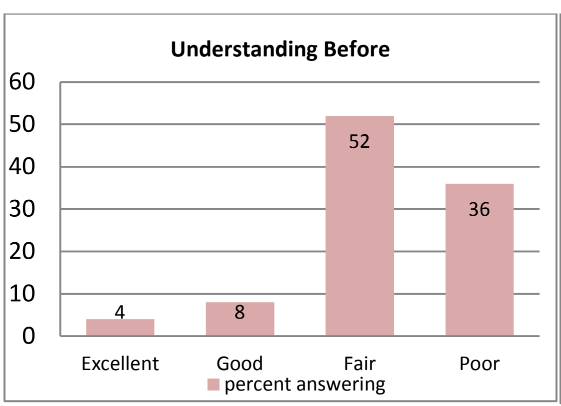
A retrospective post evaluation instrument was distributed to the subscribers of the Plains Pest Management Newsletter via email and paper retrospective evaluations were given at all applicable meetings and field days through 2014.

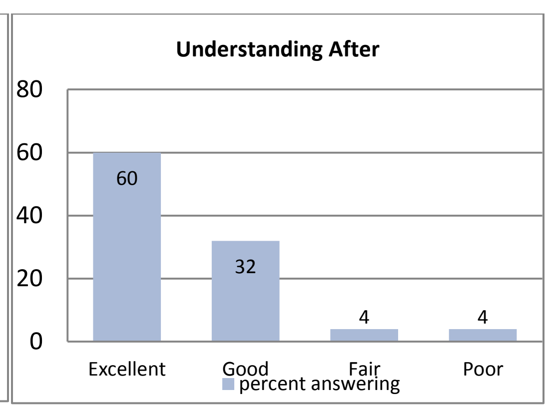
On February 10, 2014 at the Hale / Swisher Ag Day, attendees were asked to evaluate retrospectively their understanding of when and under what conditions to use insecticides in corn and sorghum both before the meeting and following.



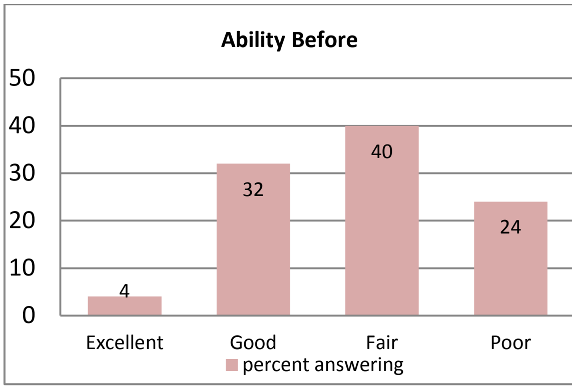


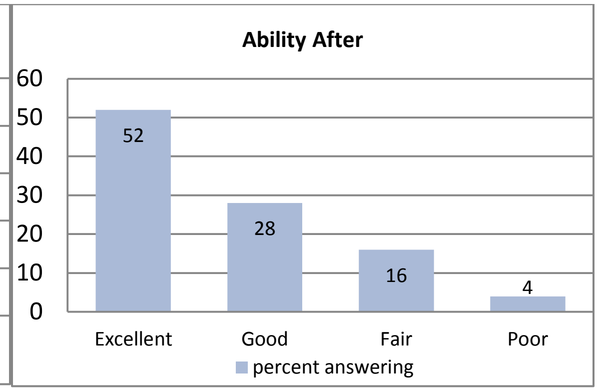
On August 21, 2014 at the Swisher County Corn and Sorghum Field Tour, attendees were asked to evaluate retrospectively their understanding of proper sorghum midge sampling techniques.



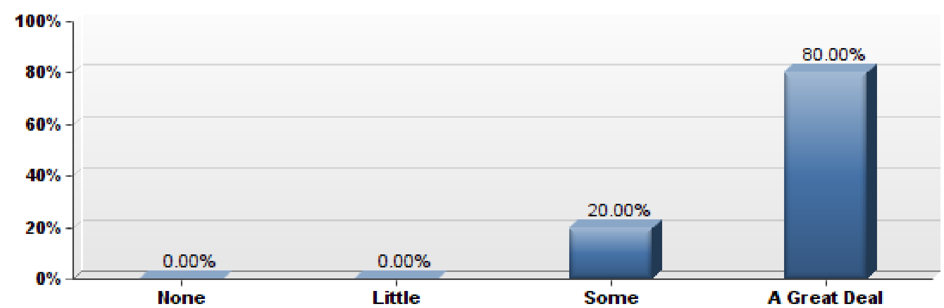


Also at the Swisher County Corn and Sorghum Field Tour, attendees were asked to evaluate retrospectively their ability to identify fall armyworms, bollworms, and the sorghum headworm complex.

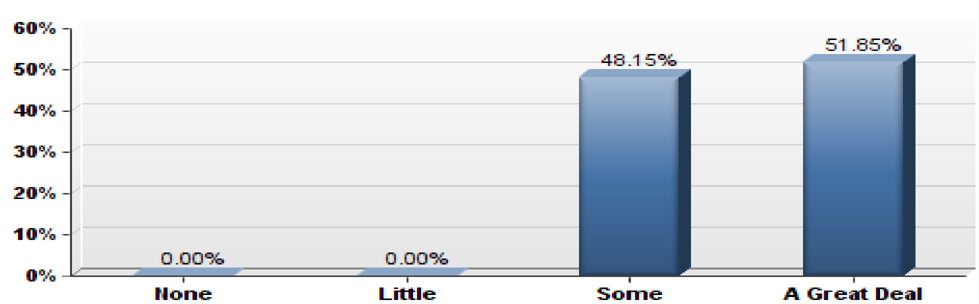




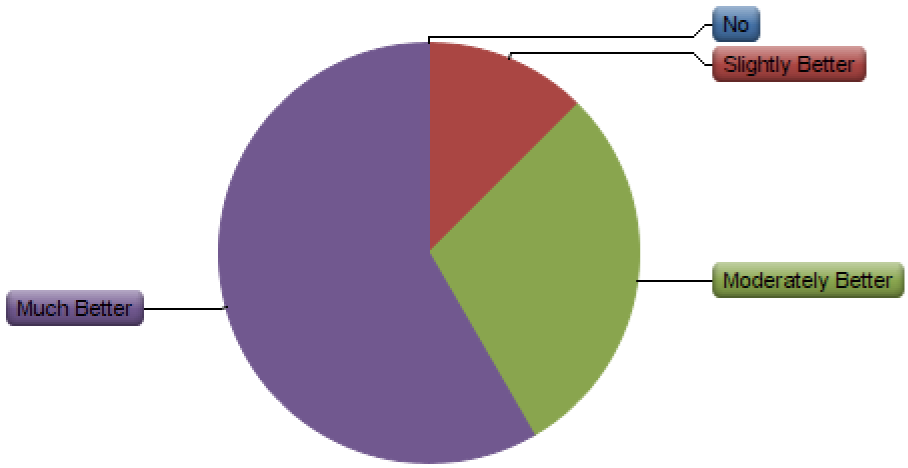
Responders to the online end of year IPM survey were asked, “How much impact do you think the Plains Pest Management IPM Program's 2014 Corn and Sorghum research trials (listed below) will have on your future corn and sorghum production considerations?”



Responders were then asked how much impact they felt the IPM Program had on their operations from sharing district, regional, and State corn and sorghum IPM research.



Responders were also asked,” Due to the 2014 efforts of the Hale & Swisher IPM Program in Corn and Sorghum management do you feel you will be better prepared to meet your future challenges in these areas?”



Responders were also asked to rate the dollar per crop production acre value of the Hale and Swisher IPM Program to the area. The average of the responses was **$44.54 per acre benefit to crop production** in the two counties.

Summary

Responders to both the distributed retrospective post evaluation instrument and surveys taken at meetings and field tours through the year indicated a solid increase in corn and sorghum IPM knowledge and intended application as a result of the IPM Program’s focused efforts. When the $44.54 per acre benefit figure is multiplied by half the irrigated summer row crop production acres in Hale and Swisher County, a $5,942,671.56 potential economic benefit figure for the area arises. This purposefully conservative calculated benefit figure represents a real mark of impact for a single year of effort.

2014 General Horticulture, Homeowner, & Gardening 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 pantries. 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 16 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 2014. During the year activities included:

- Bed bug and mosquito control articles released to the local press (newspaper circulation of 7,500), one current insect situation article on the Plains Pest Bugoshere (blog), and several articles in the weekly Plains Pest Management Newsletter.

- One presentation on IPM and common garden pest identification to the Hale County Master Gardeners (8 attendees). Two bed bug presentations given at Plainview Kiwanis Club and District 2 TEEA meeting (77 attendees). IPM education and spray drift management presentations given at North Region Right of Way Conference (141 attendees, 5 CEUs offered). IPM education and ornamental / horticulture pest presentations given at Amarillo Area Ornamental and Turf Conference (137 attendees, 5 CEUs offered). Two IPM and garden pest control presentations to Plainview Area Farmer's Market Meetings (27 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, 21 office contacts, and 42 phone calls).

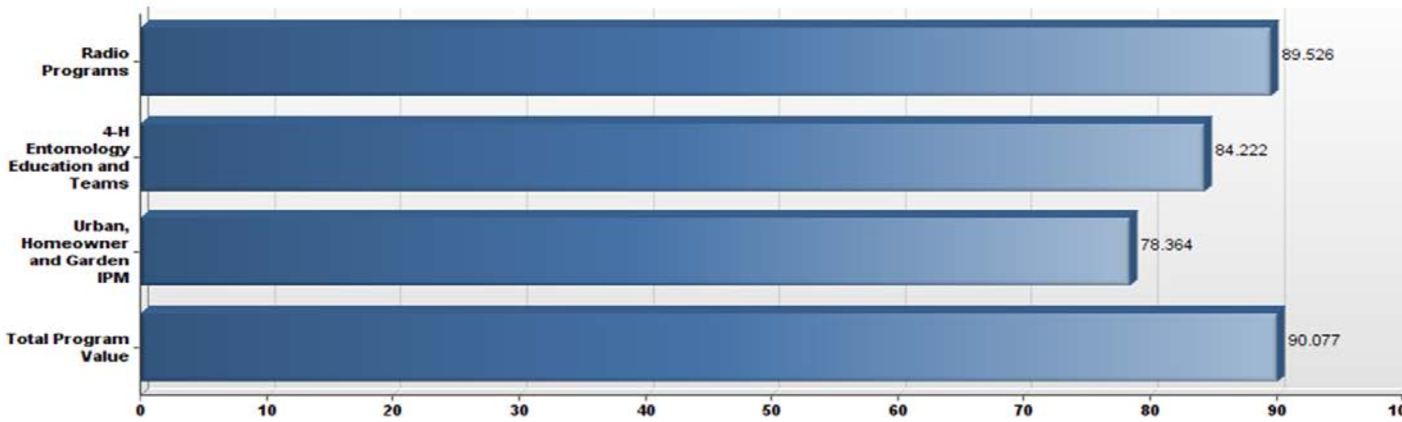
- IPM principles and its implementation for home, office, horticulture, agriculture, and gardening were common topics for all of the weekly Ag radio programs conducted. Two weekly on the 1090 AgriPlex Report.

- Participation in the Hale County Ag Fair in presenting IPM presentation to 285 area youth, participation in and coaching of the Hale & Swisher 4-H Entomology ID Teams, led Hale & Swisher new 4-H insect collection projects, and taught one class to Hale County Jr. Master Gardeners.

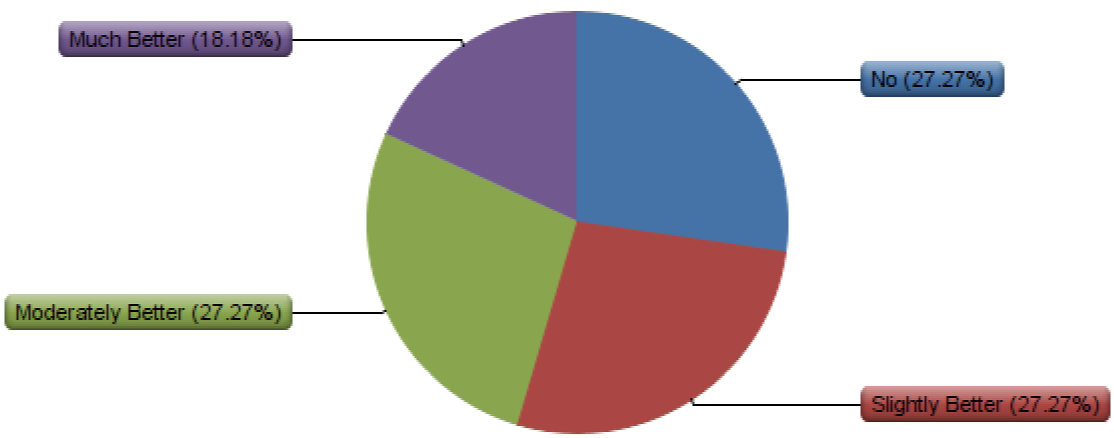
Results

A retrospective post evaluation instrument was distributed to the subscribers of the Plains Pest Management Newsletter. There were 27 responders to the horticulture, homeowner, and gardening IPM sections of the survey.

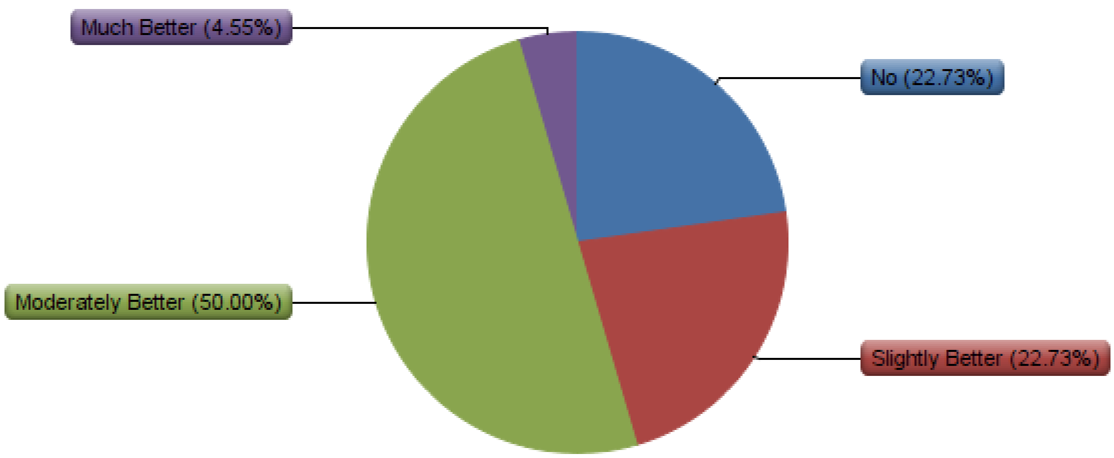
Responders were asked to rate the IPM Program's efforts and impacts in 2014. The following graph indicates their responses to the IPM Program's efforts in horticulture, homeowner, and gardening IPM education.



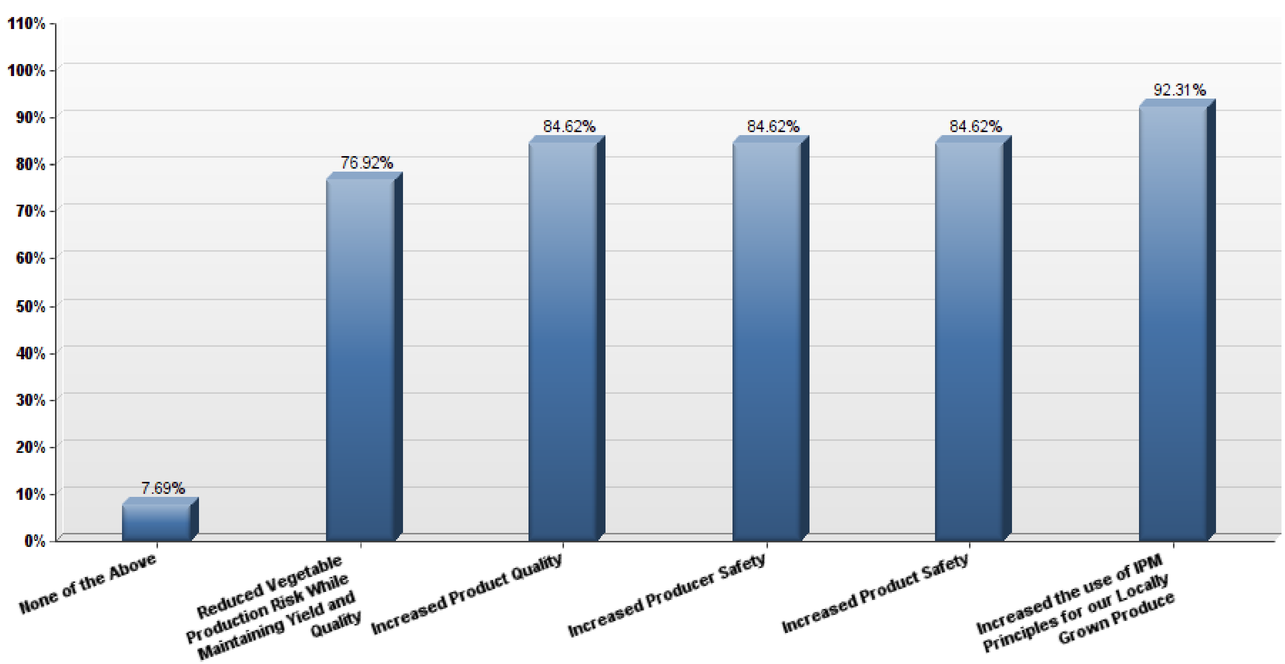
In response to the question, "Due to the 2014 educational efforts of the IPM Program that you will be better prepared to prevent the infestation of your home from bed bugs?" The responses are shown in the following graph.



Responders were then asked, “Due to the 2014 educational efforts of the IPM Program, will you be better prepared to control mosquitoes at your home or business?”



Responders were also asked to choose what they felt the impact would be from of the IPM Program working closely with the Plainview Area Farmer’s Market and other area vegetable producers throughout 2014.



Summary

The vast majority of responders to the retrospective post survey represented the various agricultural production sectors in Hale and Swisher County more than the general citizenry. Still the IPM Program's efforts in horticulture, homeowner, and gardening IPM education received high marks for value from these agricultural sectors, proving an importance placed for general IPM education in the area. Meanwhile, bed bugs and mosquitoes are tough pests to control, but our educational efforts offered a 72.73% increase in bed bug prevention skills and a 77.27% increase in mosquito IPM knowledge. The IPM Program's work with the area farmer's market and others in garden IPM education received high marks for increasing the use of IPM principles for our locally grown produce, increasing product safety, increasing producer safety, increased product quality, and reducing risk associated with vegetable production while maintaining yield and quality for our locally grown produce.

2014 Educational Activities

Farm Visits	2,043
Number of Newsletters Released	19
Newsletter Recipients	4,769
Direct Contacts	5,427
Radio Programs	115
Blog Releases	11
Television Spots	2
Ag Consultants and Field Scouts Trained	36
Newspaper / Magazine / online Magazine articles written or interviewed for	35
Result Demonstration Trials Initiated	25
Result Demonstration Trials Supported	5
Presentations / Programs / Field Days Made for Adults	19
Presentations Made to Youth	14
Pest Patrol Hotline Alerts	4
Articles for other blogs	5

Activity Highlights

Plains Pest Management Scouting Program (6,403 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
SET
FOCUS on South Plains Agriculture

Plains Pest Management Newsletter
Plains Pest Management Bugoshere (blog)
Hale & Swisher Ag Day
Hale County Wheat Field Day
Swisher Spring Ag Day
Amarillo Farm & Ranch Show
Hale County BLT Program Support
Progressive Growers Breakfasts
Entomological Society of America
Field Scout School
Site Scouting and IPM Recommendations
Pest Patrol Hotline
Hale / Swisher Mobile Field Tour

2014 at a Glance

The following is a brief overview of the 2014 growing season in Hale & Swisher Counties. Copies of the Plains Pest Management Newsletters published in 2014 are available at http://hale.agrilife.org/ for a more in-depth look at specific pest pressure, weed situations, crop conditions, and environmental conditions at any given week.

The 2014 growing season was an interesting and uniquely challenging crop year for drought, weather, weeds, and pests. The crop season started in severe drought with dry cold fronts damaging the wheat crop for the second consecutive season. Cotton planting was either delayed or early planted fields failed to establish a profitable stand due to prolonged cold and wet weather during the latter part of May. Late planted corn and sorghum fields flourished early as a result of the rain and lost cotton acres. Timely hand to mouth rainfall events aided all surviving crops through June and July but also flushed waves of hard to control weeds season long. Rainfall through the critical month of August was very limited stressing most crops at sensitive stages only to return in September with a copy of May's extended cool and wet period. This September's cool, wet spell was a boon to 2015 wheat plantings, but was late for most summer crops and caused most to delay development and harvest. This now delayed crop then experienced a delayed killing freeze date that did not fall until well into November. The heat units the crop received between the September cold, wet spell and the November killing freeze were critical in avoiding crop disasters, but were short of providing ample crop development.

Traditional pest species pressure were generally the lightest imaginable during 2014 while beneficial arthropod populations were generally high. Fall Armyworm populations were the highest in memory or on record attacking whorl stage sorghum and corn only to seemingly vanish on the late crop's critical reproductive stages began. Spider mite populations in corn and a few sorghum fields reached threshold levels, but predators moved into the area and cleaned most mite pest problems up before any serious damage was made. Thrips and fleahopper were the only pests noteworthy in the surviving cotton for the entire season and those populations were lighter than normal.

Throughout the summer entomologists were still kept very busy with an influx of harmless to potentially dangerous 'oddity pests' passing through or moving in throughout the growing season. In June *Mozena obtuse*, a little known leaf footed bug in the family Coreidae, which typically feeds only on mesquite made its appearance into the region. *Mozena obtuse* quickly covered all available mesquite and overflowed onto peas and some limited cotton threatening terminal development. In late June and early July, hordes of white lined sphinx moth larva moved through the region targeting lush weed species but leaving all crops and pastures untouched. This left producers understandably nervous about the larva passing through their fields and pastures but no economic damage was found. By early September the new and invasive species the sugarcane aphid made its unwelcome arrival in the area threatening soon to be harvested sorghum. The impact of this aphid's arrival very late in the growing season was felt widespread but overall economic damage was isolated to individual fields and not as widespread as it could have been thanks to quickly employed pest management options and a widespread call for awareness. While it was determined that this aphid did not overwinter in the area, area sorghum will likely see this pest again and IPM precautions are being made for the 2015 area's sorghum crop.

2014 Applied Research and Demonstration Projects

2014 Population Monitoring of Adult Bollworms in Hale & Swisher Counties

2014 Residual Herbicide Efficacy in Swisher County Cotton

2014 Herbicide Weed Wipe Efficacy Trial in Cotton

Managing Maturity for Harvest in Late or Growthy Texas High Plains Cotton with Aim Treatments

2014 Cotton Harvest Aid Demonstration Trial, Swisher County

2014 Velum Total in Swisher/Hale County Cotton for Nematode & Thrips Control

2014 Phytogen Low Input Cotton Production Variety Trail – Swisher County

2014 Micronutrient Fertilizer Efficacy on High Input Cotton

MAP Coated, Timed Release Fertilizer Applications to Calcium Carbonate Soils for Profitable Cotton Production in Hale & Swisher 2014

2014 Spider Mite Product Control and Efficacy in Grain Sorghum

2014 Impact of Sorghum Planting Date on Integrated Pest Management - First Year of a Three Year Study on Pest Trends, Irrigation Management, and Economic Impact

2014 Sorghum Partners Grain Sorghum Variety Trial

2014 Huskie Herbicide Weed Control, Damage, and Yield Response in West Texas Grain Sorghum with Relation to Rate, Herbicide Premix, and Foliar Iron Chelate Treatments

2014 Spider Mite Product Efficacy Evaluation in Corn

MAP Coated, Timed Release Fertilizer Applications to Calcium Carbonate Soils for Profitable Corn Production in Hale & Swisher 2014

2014 Population Monitoring of Adult Bollworms in Hale & Swisher Counties
Texas A&M AgriLife Extension Service
Hale & Swisher Counties
Cooperator: Jeremy Reed and Joe McFerrin
Blayne Reed EA-IPM Hale, Swisher, & Floyd, Dr. Pat Porter, Dr. Ed Bynum, and Dr. Charles Allen

Summary

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 2014 bollworm population in Hale and Swisher should be lower than an 'average' to 'average' for a summer growing season. This concurred with what our scouting program was finding via egg lay and young larva in our area crops fields soon afterwards.

Objective

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.

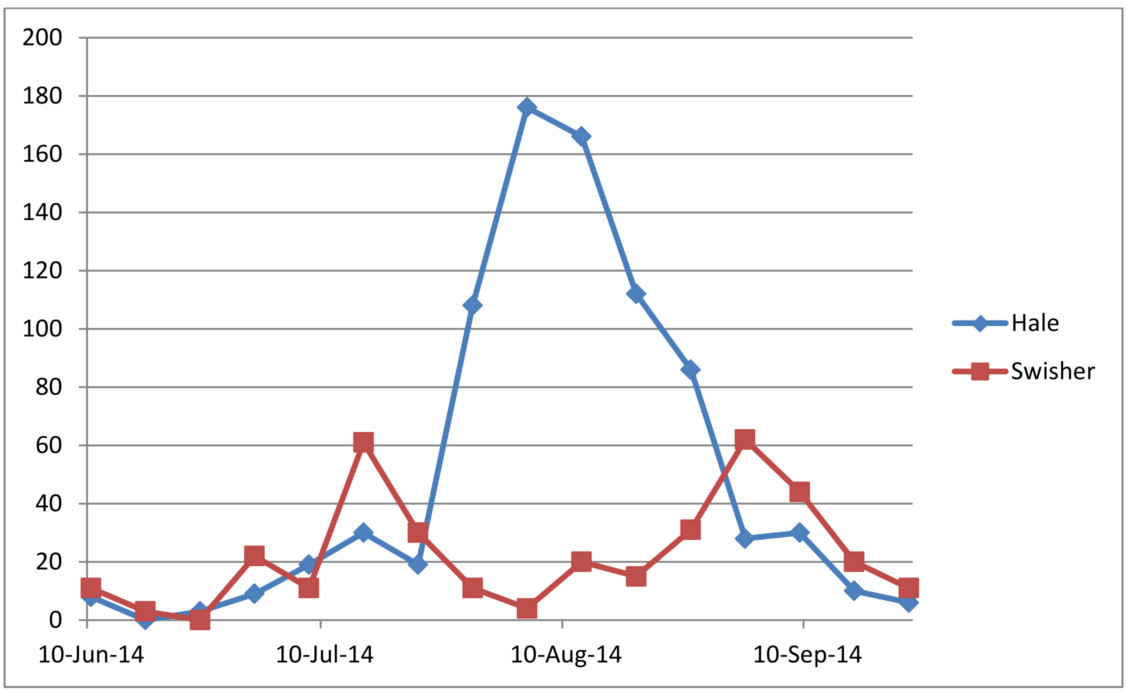
Materials and Methods

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

The Hale County trap only experienced one major bollworm population peak on August 14, 2014 with a moth trap count of 176. The Swisher County trap experienced two minor peaks on July 15, 2014 with 61 moths and September 2, 2014 with 62 moths. These population trends were also noted as pest larva by the Plains Pest Management Scouting Program as short time later.



Graph 1. 2014 adult bollworm population trap catches for Hale & Swisher.

Conclusions

Our 2014 adult bollworm trap numbers and population distributions seem to deviate from what many consider a historical normal. There were not multiple, ever increasing in moth numbers, generational peaks as the growing season progressed. Reasons for this chance can be all hypothetical from this vantage point, but could include an increased in the use of Bt, increase in winter tillage, an increase in later planted grain crops, or several other factors.

The large adult bollworm population peak in Hale County on August 5 coincided with peak attractiveness of some of the preferred food host plants, such as local later planted corn and sorghum. There was a higher than usual occurrence of these late grain crops in Hale in 2014 due to weather events that limited cotton acres. The same factor holds true for Swisher County, but sorghum was much more predominantly replanted.

The Plains Pest Management Scouting program in 2014 discovered a fairly high population of bollworms pressuring corn at all stages where the pest is of no consequence. The scouting program only found a few bollworms in any other crop for the season and no crop neared economic levels for this pest. These field findings agree with the adult population moth trappings about the light to average population of bollworms for Hale and Swisher Counties in 2014.

Acknowledgements

I would like to extend thanks to Reed Farms and Joe McFerrin Farms for cooperating with us to gather this data. I would also like to thank Dr. Ed Bynum and Dr. Pat Porter for sharing wisdom and thoughts. I would like to thank Dr. Charles Allen and the Texas A&M Department of Entomology for moth trapping supplies and the 2014 Plains Pest Management Field Scouts for data collection and labor associated with this trial: Jonathan Thobe, Jim Graham, and Kevin Duarte. Thank you all.

2014 Residual Herbicide Efficacy in Swisher County Cotton
Texas A&M AgriLife Extension Service
Hale & Swisher County
Cooperator: Jeremy Reed, Reed Farms
Blayne Reed, EA-IPM Hale, Swisher, & Floyd / John Villalba, CEA- Swisher / Dr. Wayne Keeling, Weed Agronomist District 2.

Summary

Five different base residual herbicide options were chosen as treatments for the trial, including an untreated check. A later applied herbicide, intended to be evaluated alone and as an additional residual herbicide layer was also added forcing the treatment into a 10 treatment factorial trial. The trial was replicated four times with small plots utilizing a randomized block design. Pre-plant herbicides were applied in mid-March while the additional residual herbicide was applied post-planting, but pre-emergence in early May. Data on weed emergence was collected from April, through the mid-point of the growing season concluding with a field day open to all producers on July 16, 2014. All data was evaluated utilizing ARM (P=0.05).

Returns upon residual herbicide investment, when compared to the untreated check, began with early weed emergence in late March throughout April, peaking following a pre-irrigation treatment to the field and continued with dividends for all treatments until late May. At that time, some pre-plant residual herbicides began playing out and were no longer significantly different from the untreated check. Other herbicides continued to offer significant differences from the untreated check throughout the remainder of the trial.

The addition of the layered or second herbicide also paid additional significant dividends that lasted throughout the remainder of the trial when compared to both the untreated check and the use of all pre-plant residual herbicides alone.

Objective

Palmer weed control has always been a numbers game. A single female pigweed can mature 100,000–600,000 seeds. The residual herbicides utilized in this trial are designed to lessen the amount of surviving pigweeds that producers must control in season.

This trial was designed to be both a showcase for residual herbicide’s potential in local cotton for area producers, and to capture contemporary efficacy data of weed control from these herbicides at a local level.

Materials and Methods

Five different residual herbicide options were chosen for the trial, including an untreated check and a later applied herbicide that could be utilized alone, or in conjunction with other herbicides. The addition of the second, layered treatment turned this demonstration into a 10 treatment factorial trial. The trial was replicated four times into small plots utilizing a RBD. The five herbicides utilized for the trial were: Untreated Check, Prowl H2O, Treflan, Valor, and a locally popular premix of Prowl H2O and Treflan. The layered herbicide chosen for the trial was Cotoran. Label listed maximum rates were utilized for all treatments except the premix of Prowl H2O and Treflan which were half rates of each.

Trial Map Treatment Description

Trt	Trt Code	Trt Description
1	CHK	1 Untreated Check
2		2 Prowl H2O 3 PT/A
3		3 Treflan 3 PT/A
4		4 Valor 2 OZ WT/A
5		5 Prowl H2O 1.5 PT/A;5 Treflan 1.5 PT/A
6		6 Cotoran 4 4 PT/A
7		7 Prowl H2O 3 PT/A;7 Cotoran 4 4 PT/A
8		8 Treflan 3 PT/A;8 Cotoran 4 4 PT/A
9		9 Prowl H2O 1.5 PT/A;9 Treflan 1.5 PT/A;Cotoran 4 4PT/A
10		10 Valor 2 OZ WT/A;10 Cotoran 4 4 PT/A

401 5	402 6	403 4	404 10	405 1	406 2	407 8	408 3	409 9	410 7
301 8	302 5	303 7	304 6	305 3	306 9	307 4	308 1	309 2	310 10
201 1	202 2	203 8	204 9	205 6	206 4	207 10	208 7	209 5	210 3
101 9	102 4	103 10	104 7	105 2	106 3	107 1	108 5	109 6	110 8

Figure 1. Detail of treatments used and field map showing randomization.

Each plot was 4 rows wide (40 inch rows, 1.016 meters) by 36 feet long (10.97 meters). All treatments were made via CO2 propelled backpack sprayer at 10.5 GPA with a walking ground speed of 3.5 miles per hour and a pressure of 32 PSI. Pre-plant residual herbicides were applied according to label ideal timing on March 12, 2014 and incorporated by the producer utilizing a lister cultivator on that same date. On April 4 the plots were treated with a flood type pre-irrigation. The plots were subjected to a 'rod-weeding' cultivation during early May in preparation for planting. Cotoran herbicide was applied on May 14, 2014 following the planting of the field earlier that day. Cotton stand failed to establish due to weather events and was 'rod-weeded' again in early June and replanted to cotton on June 2, 2014.

Data was collected roughly every two-weeks but weekly during key weed control periods. From late March through early June, each weed species was carefully counted and recorded from each plot and statistically compared for treatment results. As weed pressure continued to increase, a weed pressure rating system recommended by Dr. Wayne Keeling was implemented and utilized for data until the final data collection date of the trial on July 7, 2014.

Results and Discussion

Significant differences between the untreated check and any residual herbicide treatment were noted very early in the trial. These differences between the residual herbicide treated and the untreated check deepened following the pre-irrigation treatment in April that flushed the emergence of many more young weeds.

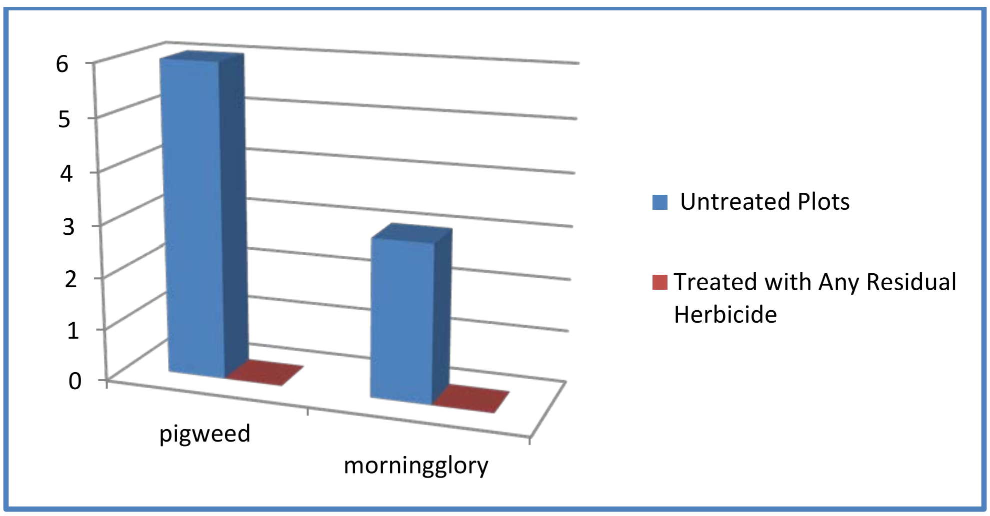


Figure 2. Graph from April 21, 2014 highlighting the average number of emerged weeds per plot in untreated plots compared to plots that had been treated with any residual herbicide for two problematic weed species.

This trend of separation generally held true for future weed counts until field planting on May 14. At about that time, the field was 'rod-weeded' and all previously surviving weeds were destroyed. The Cotoran treatment (factorial) was applied on that date to what was now weed free plots. By May 29, 2014 significant differences in a very high number of freshly emerging weeds were noted.

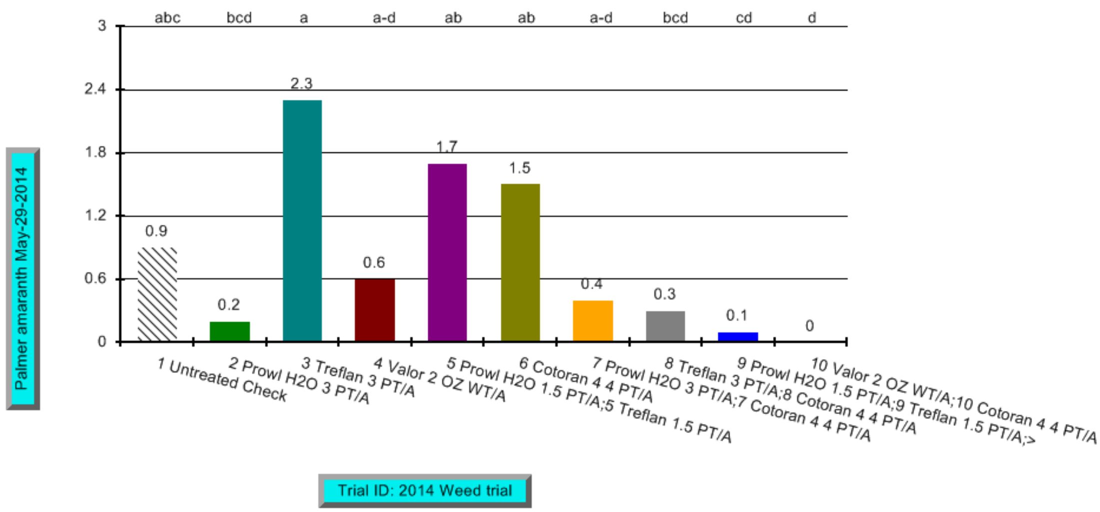


Figure 3. Number of emerged pigweeds per plot on May 29, 2014 (P=0.0432, LSD=5.3t).

Unfortunately the cotton stand failed to establish due to the adverse weather conditions in late May, 2014 in Swisher County. The field was 'rod-weeded' again and replanted on June 2. All of the freshly emerged seedling weeds were destroyed by the additional 'rod-weeding.' By June 5, significant differences in number of still fresher emerging pigweeds, both between treatments and compared to the untreated check, were recorded. No significant differences in any other weed species other than pigweed were recorded for the remainder of this trial.

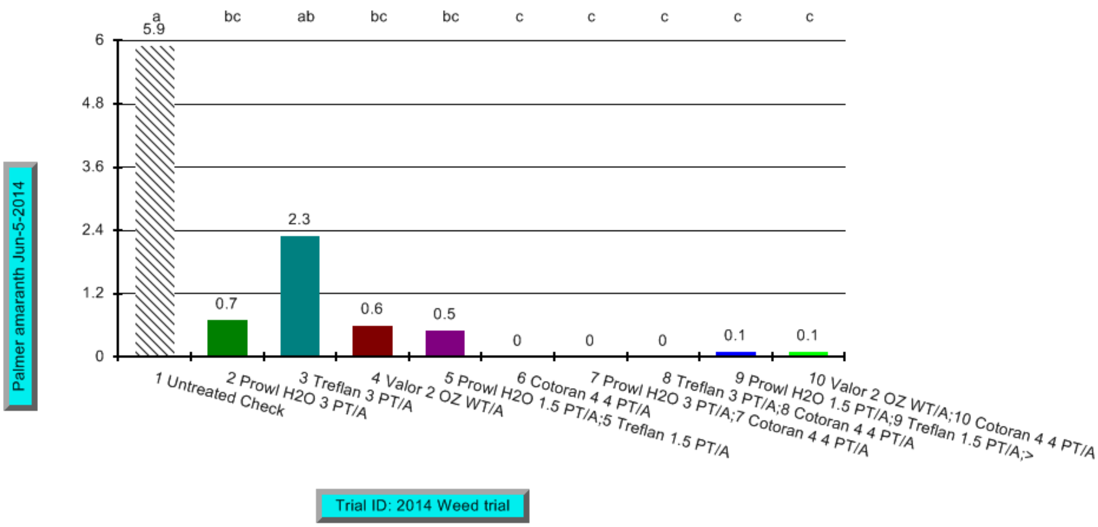


Figure 4. Number of emerged pigweeds per plot on June 5, 2014 (*P*=0.0034, LSD=6.79*t*).

These significant differences in number of freshly emerged pigweed continued for the next several weeks. Valor and Treflan alone quickly began to not only fail to be statistically significant from the untreated check, they also numerically began to look very similar to the untreated check. Prowl H2O, the combination of Prowl H2O and Treflan and all combinations with the more recently applied Cotoran, alone or as a stacked or layered herbicide consistently outperformed the untreated check and failing treatments.

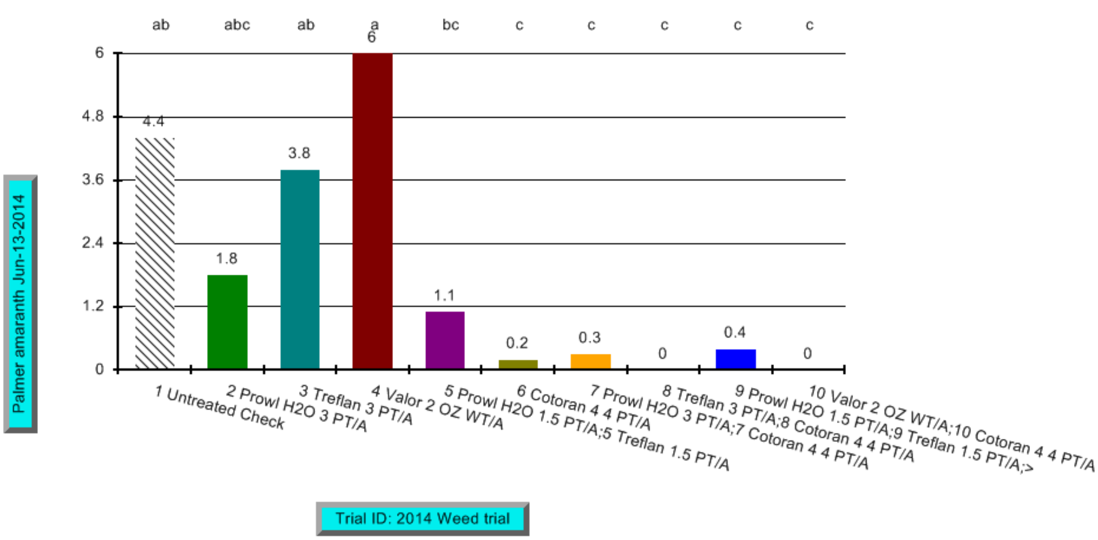


Figure 5. Number of emerged pigweeds per plot on June 13, 2014 (P=0.0015, LSD=0.45t).

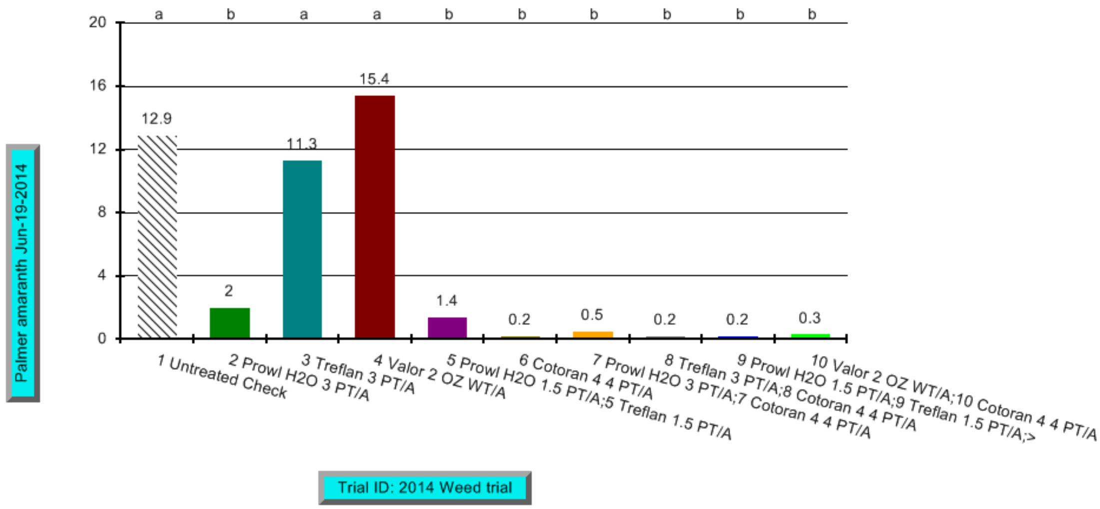


Figure 6. Number of emerged pigweeds per plot on June 19, 2014 (P=0.0003, LSD=0.60t).

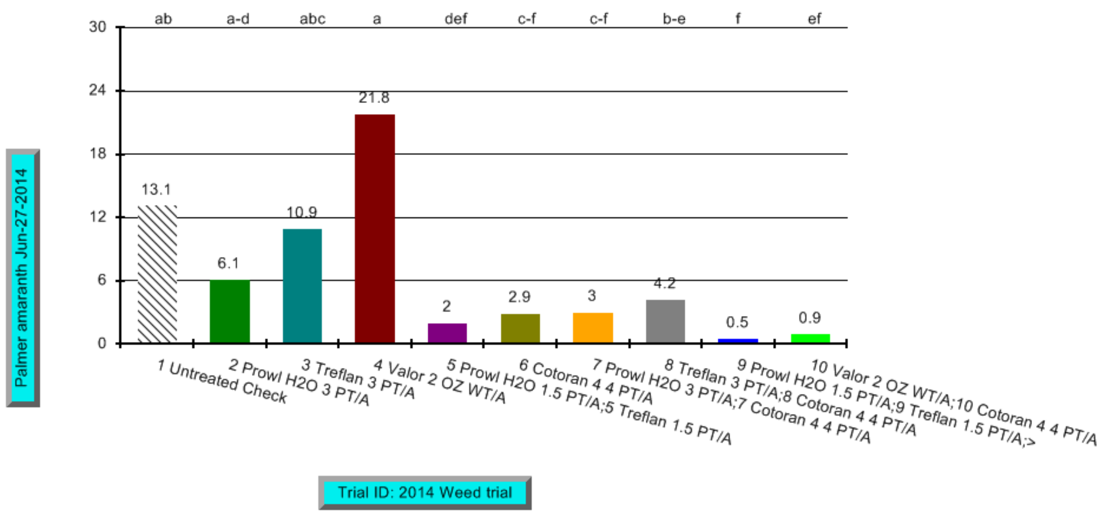


Figure 7. Number of emerged pigweeds per plot on June 27, 2014 (P=0.0012, LSD=0.53t).

On July 7, the final data collection date, weed data was gathered in terms of percent total control compared to the untreated check for each replication which cancelled the effect of outlier plots with unusually high amounts of weed present. When analyzed this way, the result was a very true picture of overall residual herbicide performance. The mixed treatment of Prowl H2O and Treflan, Cotoran alone, and all layered factorial treatments including Cotoran significantly outperformed the untreated checks, and other treatments. Prowl H2O, Treflan, and Valor outperformed the untreated checks.

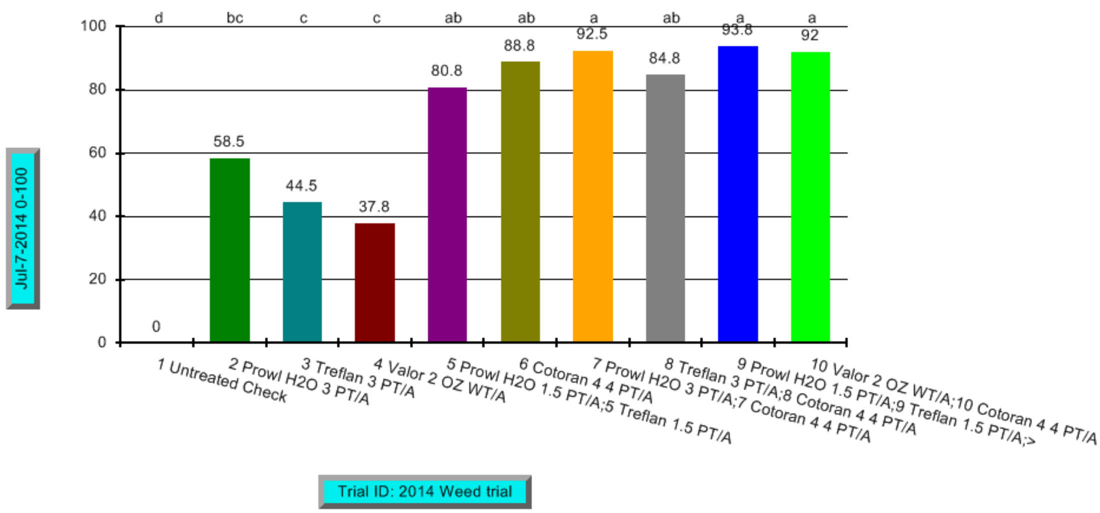


Figure 8. Percent weed control compared to the untreated checks, July 7, 2014 (*P*=0.0001, LSD=33.39).

Conclusions

The April 21 data comparing untreated plots to all herbicide treatments (Figure 2) clearly highlight the value of any labeled, properly timed residual herbicides at solid rates to cotton production and weed IPM, particularly to production systems with limited tillage.

The performance of Prowl H2O, Treflan, and Valor on July 7 (Figure 8) over the untreated check confirms the longevity of residual herbicide treatments' usefulness in reducing the amount of germinating weeds that must be controlled in-season. The heightened performance of all staked or layered Cotoran treatments on July 7 both proves the need to utilize some type of additional residual mode of action in weed IPM and the need to blanket cover a cotton crop with residual weed control for the entire growing season.

Undoubtedly the addition of an extra 'rod-weeding' cultivation following the failed establishment of a cotton stand aided all treatments in control by cleaning the plots of existing weeds. The Cotoran only treatment likely benefited the most from this additional cultivation. Without it, there would have been a very high established population of pigweed that could have rendered the treatment futile. The significantly proven success of all variances of this treatment (Figures 4-8) following the cultivation can be viewed as a call to include at least one more method of control option, such as cultivation or hoeing, in producer's weed IPM management plans.

The performance of mixing the two products Prowl H2O and Treflan was a surprise (Figure 4-8). These results prove the claims of several area producers and herbicide dealers that mixing these two products does increase weed control over Treflan alone. Not only was there generally a better control for each data collection date, but the differences continued throughout the term of the trial, even rivalling the percent control of the layered, second treatments that included Cotoran. The reason for this increase remains speculative but perhaps is tied to the differences in the product's differing mobility through the soil following incorporation with the mix giving a wider band of weed seedling germination control than either product would alone.

The trial placement into a full-tillage situation was not an ideal location for Valor to perform well and was plainly out of its element. Valor is typically a more soil mobile product much better suited to no-till / heavy cover situations where it can be held in place by organic matter and used with gentler incorporation practices. Because of Valor's wide acceptance and use in the area it was included in this trial. Valor was out performed by other residual treatments starting on June 13 and continuing through the remainder of the trial (Figure 5-7). Valor did perform admirably, given its weaknesses in this type of situation, throughout March, April, and into May (Figure 2-4) and remained significantly different from the untreated check on July 7 (Figure 8) and significantly undifferentiated with its pre-plant competitors.

Treflan's performance was somewhat disappointing given that the trial's situation, being a conventional-till field it should be typically ideal for Treflan's incorporation needs. While not differentiating from its pre-plant competitors included in this trial and while remaining significantly separated from the untreated checks on most data collection dates, Treflan did numerically falter more than hoped as the trial progressed.

Prowl H2O did not significantly separate from its pre-plant contemporaries but on a few data collection occasions. When Prowl H2O did significantly separate, it showed to be superior while maintaining a numerical superiority of all March 12 applied residual herbicides.

Acknowledgements

I would like to extend thanks everyone at Reed Farms for cooperating with us to complete this trial: Jeremy, Jimie, Johnie, Joe, and Jeff Reed. I would also like to thank Dr. Wayne Keeling for sharing products, wisdom, and opinions. The 2014 Plains Pest Management Field Scouts for the operation, data collection, and labor associated with this trial: Jonathan Thobe, Jim Graham, and Kevin Duarte. Finally, I would like to thank John Villalba for his cooperation and promotion of this trial's results.

2014 Herbicide Weed Wipe Efficacy Trial in Cotton

Texas A&M AgriLife Extension Service
Hale & Swisher County
Cooperator: Ronald Groves
Blayne Reed EA-IPM Hale, Swisher, & Floyd / Gary Cross CEA-Hale

Summary

Four herbicides including Gramoxone, Envoke, Sharpen, and Staple were tested against an untreated check for weed kill efficacy with a rope-wick, or chemical wipe type application in an RBD design with four replications. The rates for the treatments were Gramoxone at 33% solution, Envoke at 0.5% solution, Sharpen at 25% solution, and Staple at 50% solution.

Significant differences in percent weed control were found at 6 and 13 DAT with Gramoxone causing the most mortality at 6 DAT (P=0.0001) with an average of 26.2% control and Staple leading at 13 DAT (P=0.0225) with 39.5% control and Gramoxone increasing to 34.5% control. No significant differences in crop damage were found but Gramoxone had the highest numerically measured damage level.

While significant differences were found between treatments and compared to the untreated check, none of the percent control numbers can be viewed as an acceptable level of control for any product tested in the trial. Additional research is required to find an acceptable product for this desperately needed method of control.

Objective

Determine if a rope-wick treatment of Paraquat dichloride, or Gramoxone, a contact only herbicide, truly was effective against Palmer amaranth and other weeds surviving previous glyphosate applications in area cotton compared to an untreated check and other contemporary herbicide options.

Materials and Methods

Four herbicides were selected to be statistically compared to an untreated check for weed kill efficacy with a rope-wick, or chemical wipe type application in an RBD design with four replications. The products and rates chosen for the treatments were Gramoxone at 33% solution, Envoke at 0.5% solution, Sharpen at 25% solution, and Staple at 50% solution. A dryland cotton field belonging to Ronald Groves in Hale County was identified and selected as a good target field with large numbers of glyphosate application surviving pigweed.

Each plot was laid into an area four 32-inch rows wide X 32 feet long. Application was made by wrapping a roughly 18 foot section of absorbent nylon rope presoaked in the treatment solution around a 72-inch moisture probe, taping the wrapped rope firmly at each end of the moisture probe, and two applicators carrying by hand the ‘rope wick’ width wise over each plot just a few inches above the cotton crop canopy. After two plots were treated, the ‘rope wick’ was recharged by pouring additional treatment solution to the ‘wick’ and additional recharging was done as needed. Between treatment applications, previously utilized ‘ropes’ were discarded, moisture probe triple rinsed with water and made ready for the next treatment ‘rope’ to be soaked, wrapped, and taped into place.

All plots were blind evaluated at 6 DAT and again at 13 DAT for percent weed control and for crop damage. All data was analyzed via ARM for AOV and LSD at *P*=0.05.

Trial Map Treatment Description

Trt	Trt Code	Trt Description
1	CHK	Untreated Check not treated
2		Gramoxone SL 0.33 % V/V
3		Envoke .005 % V/V
4		Sharpen 0.25 % V/V
5		Staple LX 0.5 % V/V

Figure 1. Trial map highlighting randomization and treatment location.

Results and Discussion

Significant differences in percent weed control were found at 6 and 13 DAT with Gramoxone causing the most mortality at 6 DAT (*P*=0.0001) with an average of 26.2% control and Staple leading at 13 DAT (P=0.0225) with 39.5% control and Gramoxone increasing to 34.5% control. No significant differences in crop damage were found due to careful application methods. No significant differences were found between Envoke, Sharpen, or the untreated check.

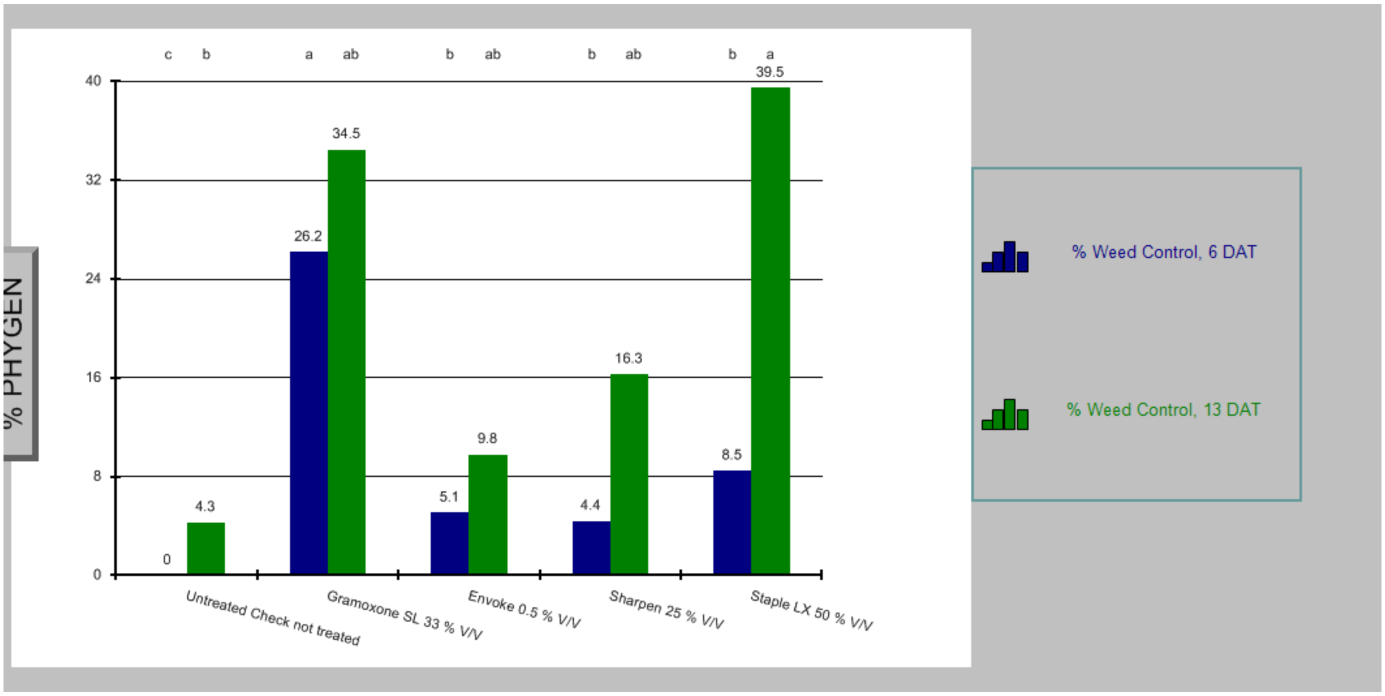


Figure 2. Percent weed control by treatment at 6 DAT (P=0.0001, LSD=0.29t) and 13 DAT (P=0.0225, LSD=23.06).

Conclusions

While significant differences were found between treatments and compared to the untreated check, none of the percent control numbers can be viewed as an acceptable level of control for any product tested in the trial.

The percent control shown by Staple in this trial (39.5%) is roughly similar to what can be experienced by an over-the-top application in cotton of Staple at labeled rates to weeds of similar size and resistant history. Envoke and Sharpen should not be considered for an application of this type.

Gramoxone performed better than was expected for a contact only herbicide in killing 34.5% of the weeds within the treatment area. This is an unacceptable level of control for a potential treatment option via rope-wick. It is also likely or possible that originally designed rope-wick herbicide application equipment might get better coverage and thus a slightly better control level. It could also increase the risk of crop damage via faster application. Based upon this data, any hypothetical increase in Gramoxone's efficacy as a rope-wick herbicide option in cotton would not reach near the needed 98% or better control. Additional research is required to find an acceptable product for this desperately needed rope-wick method of weed control in cotton.

Acknowledgements

I would like to extend thanks to Ronald Groves for cooperating with us to complete this trial, Dr. Wayne Keeling and Dr. Peter Dotray for supporting, providing products, and offering guidance for the trial, the 2014 Plains Pest Management Technician, Jonathan Thobe, for help in the labor associated with placing this trial, and Gary Cross for envisioning the need for the trial and partnership in its operation. Thank you all.

Managing Maturity for Harvest in Late or Growthy Texas High Plains Cotton with Aim Treatments

Texas A&M AgriLife Extension Service / FMC
Hale & Swisher County
Cooperator: Mike Goss
Blayne Reed EA-IPM Hale, Swisher, & Floyd / Don Johnson, FMC

Summary

Trial was established as a RBD factorial with Aim at 0.375 oz. /ac. (Aim Managed Maturity) as the added factor applied ten days ahead of two harvest aid treatments, Prep at 32 oz. /ac. and Prep at 32 oz. /ac. plus Aim at 1 oz. /ac., which were to be applied as a lone treatment harvest aid treatment. All treatments for this trial totaled of four. Plots were 4 40 inch rows wide X 38 feet long and were arranged in an RBD design. Data on percent open boll, percent attached green boll, percent defoliated, percent stuck leaves, and a regrowth rating were taken seventeen days following the final harvest aid treatment and were statistically compared using ARM utilizing AOV and LSD (P=0.05).

In terms of percent open boll the Aim Managed Maturity factorial treatments numerically, but not significantly, outperformed the standard harvest aid treatments alone. In percent green leaf, the Aim Managed Maturity followed by Prep alone outperformed all other treatments. In percent defoliated leaves, the Aim Managed Maturity followed by Prep treatment outperformed both harvest aid treatments alone, and the Aim Managed Maturity followed by Prep and Aim and the Prep and Aim treatment outperformed the Prep alone treatment. In percent 'stuck' leaves there were no significant differences found. All numeric differences in plant regrowth rating on the standard 0-10 scale were very small but the Prep alone harvest aid treatment did show an increase in regrowth potential compared to all other treatments.

These results indicate that under the right conditions, such as late, growthy, or otherwise considered 'rank' cotton can receive good benefit from an Aim Managed Maturity treatment making the cotton more harvest aid and harvest ready sooner.

Objective

Determine if a late, rank, or otherwise growthy cotton field in the Texas High Plains can be managed for maturity and profitability with a very light dose of the herbicide / harvest aid Aim prior to the main harvest aid treatment. This trial was also utilized to demonstrate the effect of this light dose of Aim 10 days prior to harvest aid treatment on 'rank' cotton to growers, gin managers, FMC personnel, and Texas A&M AgriLife personnel at the Swisher County Field Day on October 9, 2014.

Materials and Methods

A higher input, drip irrigated cotton field that had been delayed throughout the growing season due to weather events belonging to Mike Goss that was five miles northwest of Kress, Texas was identified as being an ideal candidate for an Aim Managed Maturity application was identified in late September. On September 26, 2014 the factorial treatment of Aim at 0.375 oz. / acre with 1% COC V/V was applied to the properly designated plots within the trial. Ten days later on October 6, 2014 the producer selected standard treatments of Prep at 32 oz. / acre with 1% NIS V/V and Prep at 32 oz. / acre plus Aim at 1 oz. / acre with 1% COC V/V were applied.

Trial Map Treatment Description

Trt	Trt Code	Trt Description
1	MM	Prep 32 FL OZ/A;NIS 0.25 % V/V;Aim 0.375 FL OZ/A;COC 1 % V/V
2		Prep 32 FL OZ/A;NIS 0.25 % V/V;Untreated Check not treated
3	MM	Prep 32 FL OZ/A;Aim 1 FL OZ/A;COC 1 % V/V;Aim 0.375 FL OZ/A;COC 1 % V/V
4		Prep 32 FL OZ/A;Aim 1 FL OZ/A;COC 1 % V/V;Untreated Check not treated

401 2 A1 B2	402 1 A1 B1	403 4 A2 B2	404 3 A2 B1
301 1 A1 B1	302 4 A2 B2	303 3 A2 B1	304 2 A1 B2
201 4 A2 B2	202 2 A1 B2	203 1 A1 B1	204 3 A2 B1
101 3 A2 B1	102 1 A1 B1	103 2 A1 B2	104 4 A2 B2

Table 1. 2014 Aim Managed Maturity Trial plot map.

On October 9 differences in treatments were shown to attendees of the Swisher County Cotton Day. On October 21, 15 DAT from the producer standard harvest aid application, field data were taken on percent open boll, percent attached green boll, percent defoliated, percent stuck leaves, and a regrowth rating.

All plots were 4 40 inch rows wide X 38 feet long and were arranged in an RBD design. All treatment applications were made via CO2 propelled backpack sprayer at 10.5 GPA with a walking ground speed of 3.5 miles per hour and a pressure of 32 PSI. All field gathered data was statistically compared using ARM utilizing AOV and LSD (*P*=0.05). No harvest data was collected from this trial.

Results and Discussion

In percent open boll the Aim Managed Maturity factorial treatments clearly outperformed the producer standard treatments numerically but were not statistically significant at the *P*=0.05 level.

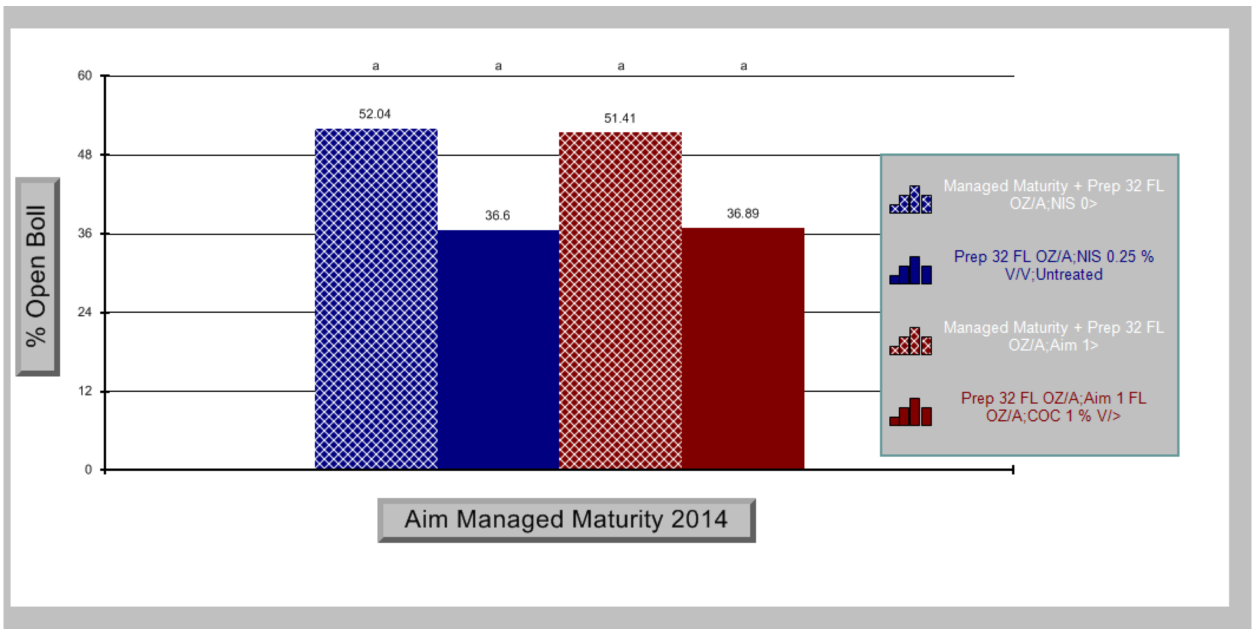


Figure 1. Percent open boll by treatment at 15 DAT from harvest aid treatment. (*P*=0.1555)

In percent green leaves still attached, the Aim Managed Maturity followed by Prep alone outperformed all other treatments while the Aim Managed Maturity treatment followed by Prep alone harvest aid treatment and the Prep and Aim harvest aid treatment outperformed the Prep alone harvest aid treatment.

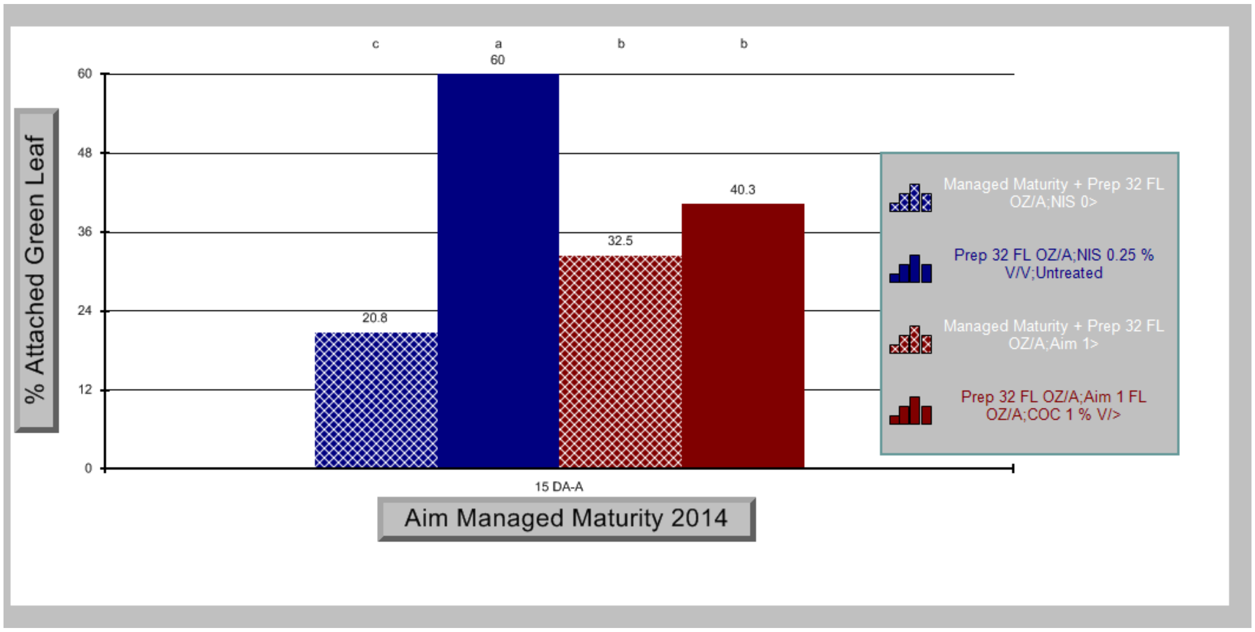


Figure 2. Percent Attached and Green Leaves by treatment 15 DAT from the harvest aid treatment. (*P*=0.0001, LSD=9.54)

In percent defoliated leaves, the Aim Managed Maturity followed by Prep treatment outperformed both harvest aid treatments alone, and the Aim Managed Maturity followed by Prep and Aim and the Prep and Aim treatment outperformed the Prep alone treatment.

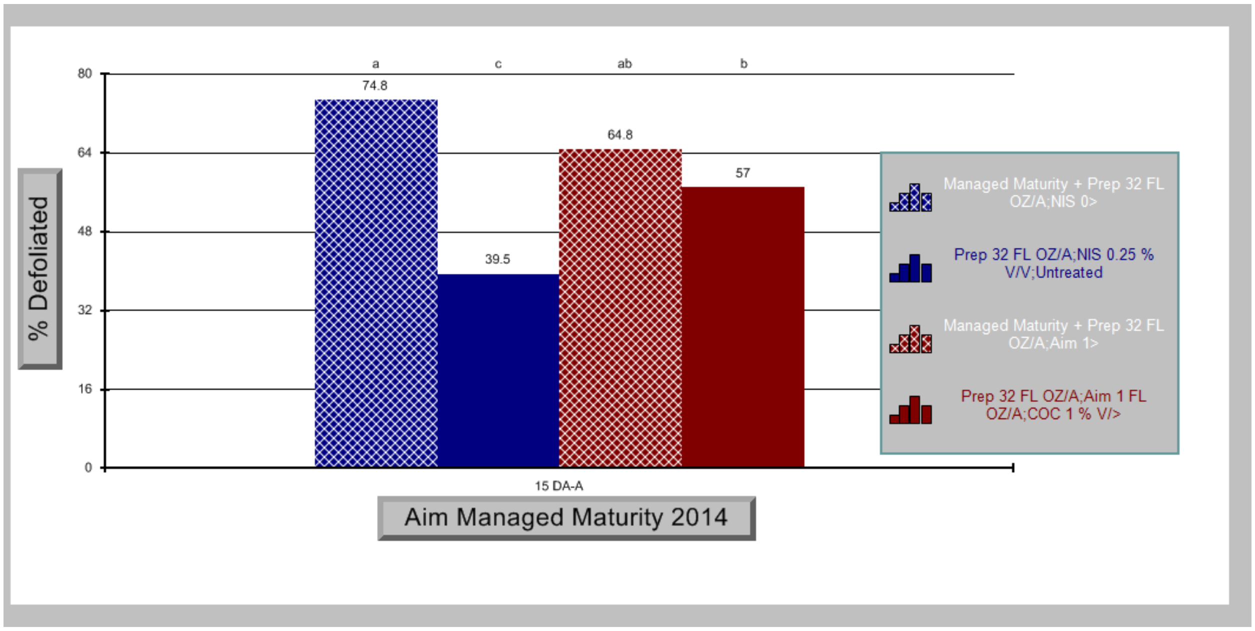


Figure 3. Percent Defoliated Leaves by treatment 15 DAT from the harvest aid treatment. (*P*=0.0002, LSD=10.15)

In terms of percent desiccated or ‘stuck’ leaves, there were no statistically significant differences, but there were very small numeric differences.

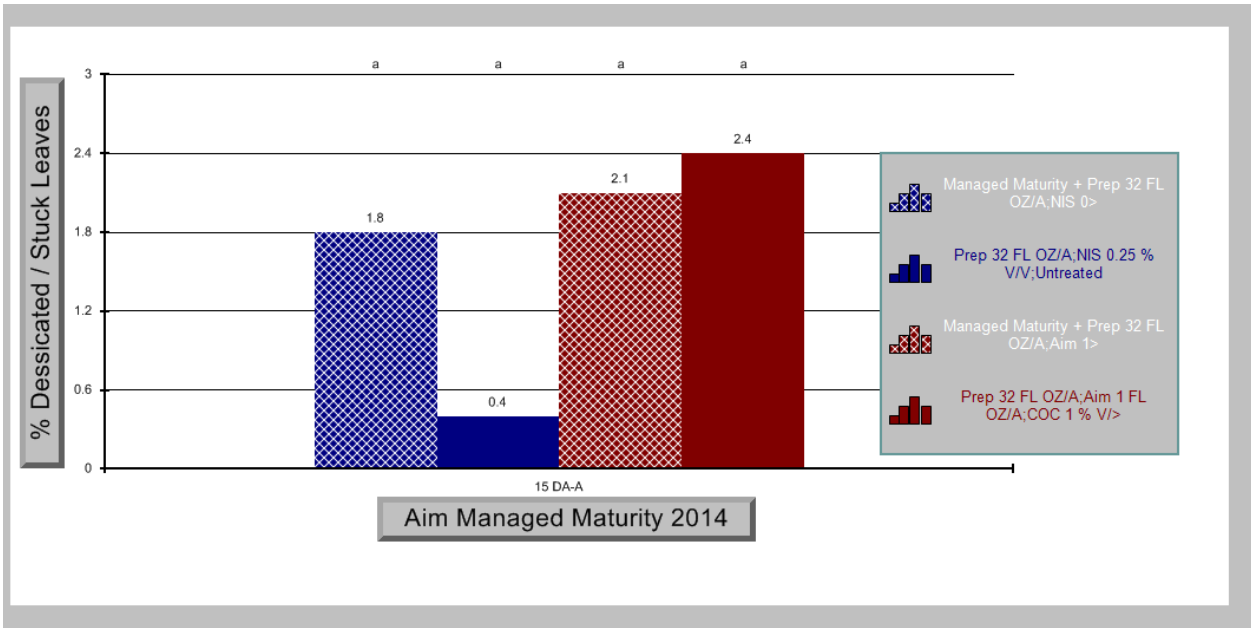


Figure 4. Percent Desiccated Leaves by treatment 15 DAT from the harvest aid treatment. (*P*=0.1068)

All numeric differences in plant regrowth rating on the standard 0-10 scale were very small but the Prep alone harvest aid treatment did show an increase in regrowth potential.

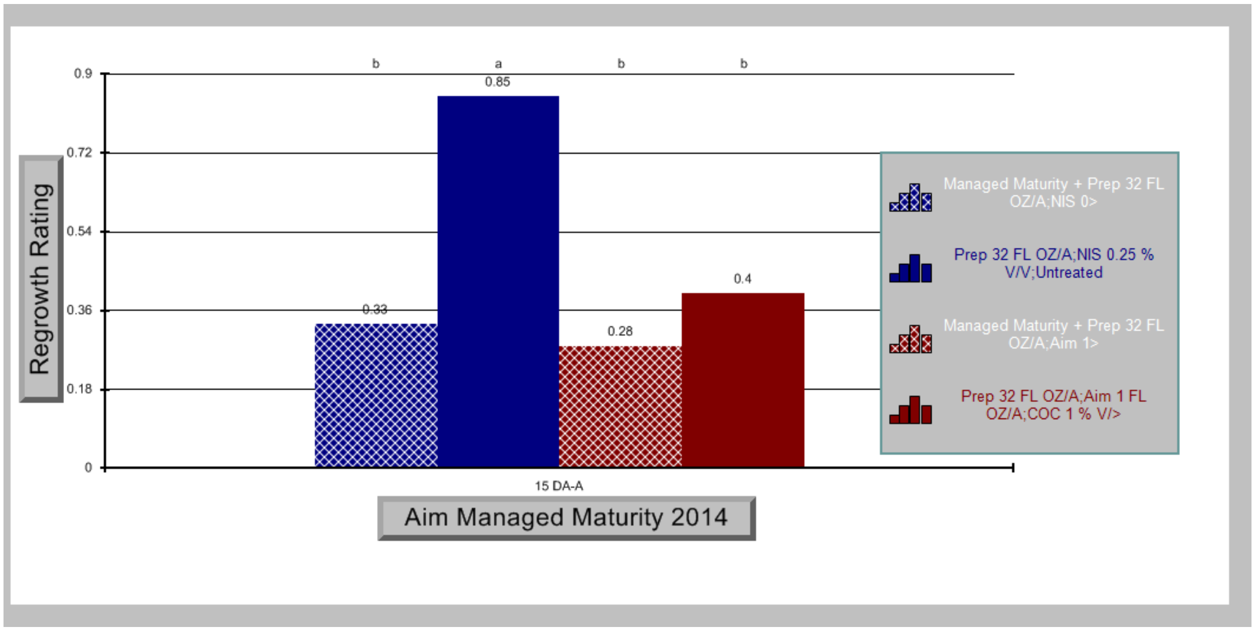


Figure 5. Average Regrowth Rating by treatment 15 DAT from the harvest aid treatment. (*P*=0.0005, LSD=0.208)

Conclusions

These results indicate that under the right conditions, such as late, 'growthy', or otherwise considered ‘rank’ Texas High Plains cotton can receive good benefit from an Aim Managed Maturity treatment. There were no statistical differences in the percent open boll data (Figure 1). The large numerical differences along the Aim Managed Maturity treatment line are worth noting, as is the actual analysis for its nearness to being significant (P=0.155). In all other factors of importance, the Aim Managed Maturity pre-harvest aid treatments look to have proven to be a significant aid in maturing ‘rank’ cotton without causing undue ‘leaf stick’.

It should also be of note that none of the treatments could be considered harvest ready 15 DAT of the harvest aid treatment by contemporary standards and that an additional harvest aid treatment or killing freeze event would be required before the field could be harvested. It should remain clear that the addition of the Aim Managed Maturity treatments are much closer to being harvest aid ready compared to those treatments with the pre-harvest aid treatment.

Acknowledgements

I would like to extend thanks to Mike Goss for cooperating with us to complete this trial. I would also like to thank Don Johnson, Paul Pilsner, and Randy Childress of FMC for sharing wisdom and products to complete this trial. The 2014 Plains Pest Management Field Scouts for the operation, data collection, and labor associated with this trial: Jonathan Thobe and Jim Graham. Finally, I would like to thank John Villalba for his cooperation and promotion of this trial’s results and the hosting of the field day with this trial as one of its highlights.

2014 Cotton Harvest Aid Demonstration Trial, Swisher County

Texas A&M AgriLife Extension Service
Hale & Swisher County
Cooperator: Trent Finck
Blayne Reed EA-IPM Hale, Swisher, & Floyd / John Villalba CEA- Swisher / Dr. Mark Kelley District 2 Cotton Agronomist

Summary

Seven different cotton harvest aid treatment combinations, including an untreated check, were compared to each other in a small plot RBD trial with four replications. A 6 pound Ethephon product was the base boll opener for all six treatments at a rate of 32 oz. per acre with only one exception. A once commonly used standard rate of 24 oz. per acre Ethephon was paired with Folex at 8 oz. per acre as a reference treatment and to see if that older treatment rates could still be of use. One treatment consisted of the locally popular Ethephon at 32 oz. alone. The four treatments paired with the Ethephon at 32 oz. treatment were: Aim at 1 oz., Sharpen at 1 oz., Sharpen at 1 oz. plus Folex at 8 oz., and Display at 1 oz.

The trial was placed on September 26 and utilized as a demonstration plot for the Swisher Cotton Field Day 14 DAT on October 9, 2014. Data on percent open boll, percent defoliated, percent green leaves, percent desiccated, and regrowth were taken 17 DAT. All data was evaluated utilizing ARM (P=0.05).

Significant differences for all data categories, except regrowth ratings, were found between differing treatments and compared to the untreated check. It was found that for the 2014 growing season, a minimum rate of 32 oz. per acre Ethephon would be needed. With all varying significant factors considered, the Ethephon at 32 oz. plus Aim at 1 oz. performed the most consistently. The Ethephon and Folex treatment defoliated the cotton best. Ethephon alone and Ethephon with Folex treatments had the least amount of sticking desiccated leaves. Ethephon with Sharpen and Folex treatment had the least amount of green leaves still on the plants.

Objective

The objective of this trial was to both offer a preemptive view of a wide range of cotton harvest aid products to producers as harvest aid season began and determine with local research data which harvest aid product would be most effective this season for the area. This was also the first time the new cotton harvest aid products Display or Sharpen would be available for producers and local researchers to analyze. Sharpen was of particular interest to area producers for its knock down and residual weed control properties that could possibly go beyond its cotton harvest aid value.

Materials and Methods

Seven different cotton harvest aid treatment combinations, including an untreated check, were compared to each other in a small plot RBD trial with four replications. A 6 pound Ethephon product was the base boll opener for all six treatments at a rate of 32 oz. per acre with only one exception. A once commonly used standard rate of 24 oz. per acre Ethephon was paired with Folex at 8 oz. per acre as a reference treatment and to see if that older treatment rates could still be of use. One treatment consisted of the locally popular Ethephon at 32 oz. alone. The other four treatments were paired with Ethephon at 32 oz. These treatments were: Aim at 1 oz., Sharpen at 1 oz., Sharpen at 1 oz. plus Folex at 8 oz., and Display at 1 oz. MSO or NIS were utilized as surfactants at label suggested pairings with treatments and rates.

At the time of trial placement, the field was not fully ready for harvest aid treatments, but needed to be placed for the October 9 field day date. Each plot was 4 rows wide (40 inch rows, 1.016 meters) by 36 feet long (10.97 meters). All treatments were made via CO2 propelled backpack sprayer at 10.5 GPA with a walking ground speed of 3.5 miles per hour and a pressure of 32 PSI.

The trial was placed on September 26 and utilized as a demonstration plot for the Swisher Cotton Field Day 14 DAT on October 9, 2014. The field used belonged to Trent Finck and is located on the western edge of Tulia, Texas. Tillage utilized is conventional and irrigation type is minimal flood. Data on percent open boll, percent defoliated, percent green leaves, percent desiccated, and regrowth were taken all taken in a one day event 17 DAT. Data was collected on knock down weed control at 14 DAT.

Trial Map Treatment Description

Trt	Trt Code	Trt Description
1	CHK	Untreated Check not treated
2		Ethephon 32 FL OZ/A;NIS 0.25 % V/V
3		Ethephon 32 FL OZ/A;Aim 1 FL OZ/A;MSO 1 % V/V
4		Ethephon 24 FL OZ/A;Folex 8 FL OZ/A;NIS 0.25 % V/V
5		Ethephon 32 FL OZ/A;Sharpen 1 FL OZ/A;MSO 1 % V/V
6		Ethephon 32 FL OZ/A;Sharpen 1 FL OZ/A;Folex 8 FL OZ/A;MSO 1 % V/V
7		Ethephon 32 FL OZ/A;Display 1 FL OZ/A;MSO 1 % V/V

401 5	402 7	403 6	404 4	405 2	406 3	407 1
301 7	302 6	303 4	304 1	305 5	306 2	307 3
201 6	202 5	203 3	204 2	205 4	206 7	207 1
101 3	102 7	103 2	104 5	105 1	106 6	107 4

Figure 1. Detail of treatments used and field map showing randomization and location.

Results and Discussion

No differences in knock down weed control were noted at the 14 DAT evaluation.

All treatments proved to be statistically significant in percent open bolls compared to the untreated check. There were no significant differences between treatments, although large numeric differences were noted and quite visible in the field.

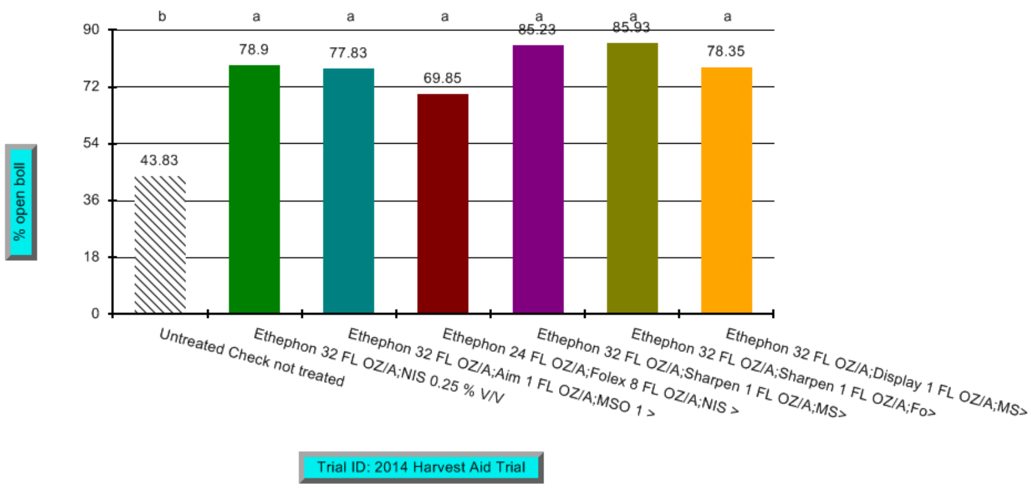


Figure 2. Percent open of harvestable bolls by treatment 17 DAT (*P*=0.0102, LSD=21.483).

All treatments were significantly different from the untreated check in terms of percent green leaves still on the plants. In this category, there were several significant differences between treatments.

All other treatments significantly performed better than Ethephon alone in this category. The treatment of Ethephon, Sharpen, and Folex combined significantly outperformed all other treatments in this category.

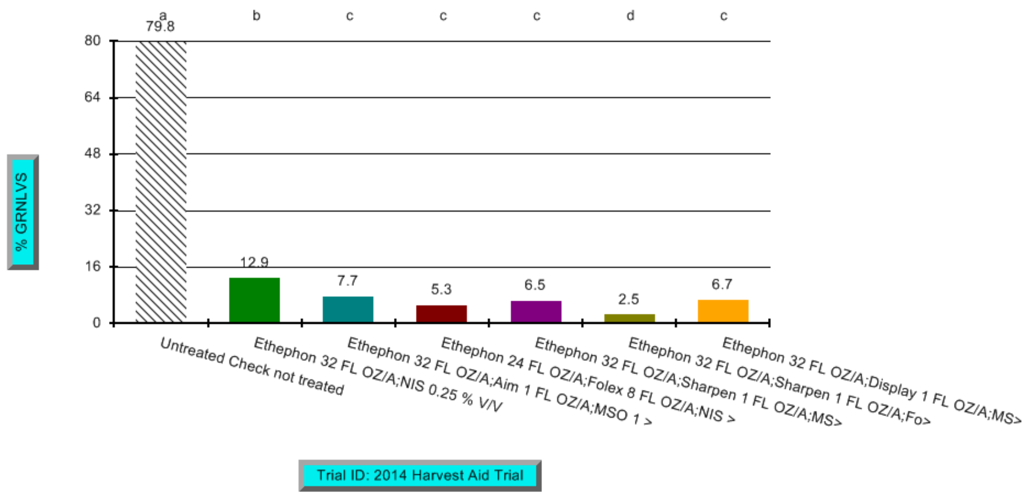


Figure 3. Percent green leaves still attached to the plants by treatment 17 DAT (*P*=0.0001, LSD=0.20t).

In terms of percent defoliation, all treatments again separated significantly from the untreated check. The treatment of Ethephon and Folex outperformed all other treatments except Ethephon and Aim which also proved to be similar to the other harvest aid treatments.

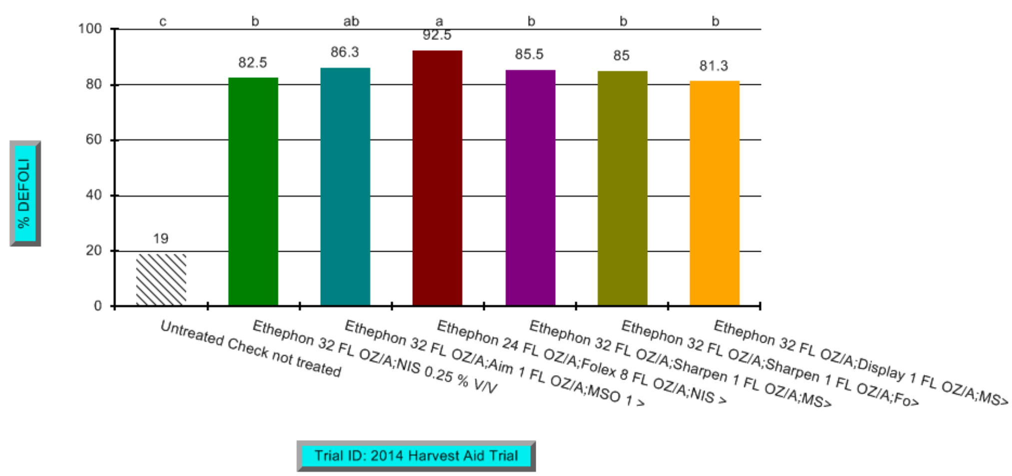


Figure 4. Percent defoliated leaves by treatment 17 DAT (*P*=0.0001, LSD=6.35).

The percent desiccated leaves still attached to the plant broke differently but significantly. Ethephon alone treatment and the Ethephon with Folex treatment had no more 'stuck' and desiccated leaves than did the untreated check. The Ethephon and Aim treatment and the Ethephon, Sharpen, and Folex treatment had significantly more desiccated and sticking leaves than all other treatments except the Ethephon, Sharpen, and Folex treatment.

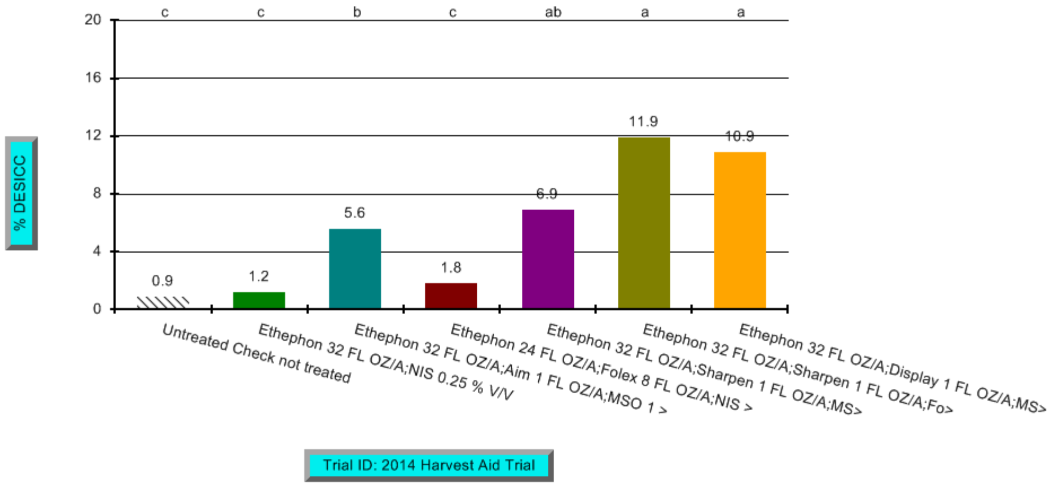


Figure 5. Percent desiccated and sticking leaves by treatment 17 DAT (*P*=0.0001, LSD=0.22t).

There were no significant differences in any treatment in terms of regrowth rating at 17 DAT. Any regrowth found on any treatment was also noted to be very light.

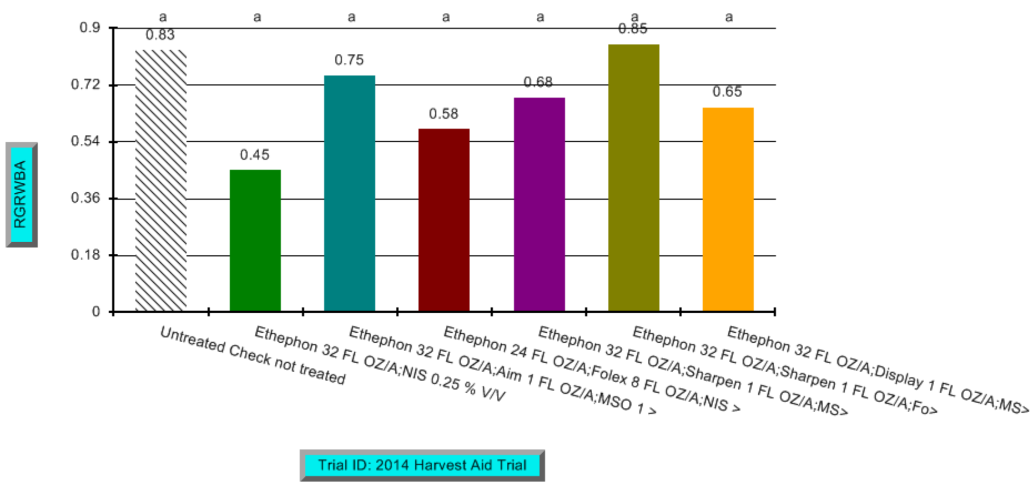


Figure 6. Regrowth rating by treatment at 17 DAT (*P*=0.8032, LSD=0.596).

Conclusions

One of the main conclusions that should be drawn from this trial is that no single treatment had their respective plots of cotton harvest ready at 17 DAT. To truly be harvest ready for the 2014 growing season, a second harvest aid treatment would be needed with a potentially killing freeze counting as a treatment.

Another consideration is that no amount of Ethephon below 32 oz. per acre should be considered for use in 2014. The Ethephon with Folex treatment, the only treatment in this trial not to use the 32 oz. rate, was not significantly different in terms of percent open boll, but did exhibit a large numerical failing that could be clearly seen in-field. This in-field amount of harvestable bolls still green and unopened would likely lead to several days' worth of waiting on these harvestable bolls to fully open.

When all measured factors are considered jointly, the 'winning' treatment for this trial was likely the Ethephon at 32 oz. and Aim at 1 oz. treatment. This treatment performed equally to all other treatments in terms of percent open boll (Figure 2). In percent green leaves still attached it outperformed the untreated check and Ethephon alone, and was only outperformed by much more the expensive Ethephon, Sharpen, and Folex treatment (Figure 3). In defoliation percent, it was significantly equal to all treatments and separated from the untreated check (Figure 4). This treatment did have significantly more 'stuck' leaves than the untreated check and Ethephon alone at 5.6% but was significantly less than the Ethephon with Display, and Ethephon with Sharpen treatments (Figure 5).

It is hard to argue against the value of the Ethephon at 32 oz. alone treatment. This treatment proved its worth by being significantly separating from the untreated check at every measurable data point by large margins (Figures 2-5) except in regrowth rating, just like its more expensive competitors. All of these competitors significantly outperformed Ethephon alone in percent green leaves still attached but the numeric differences between this treatment and others were relatively low for this measurement (Figure 3). The opinioned view from the field of this treatment was that the amount of green leaves still attached could be managed, especially if a second treatment would be required anyway. This treatment was only significantly outperformed in defoliation percent by the Ethephon with Folex treatment (Figure 4) and did not 'stick' any significant number of desiccated leaves on the plants (Figure 5).

The Ethephon and Folex treatment, which was utilized as an older standard since replaced, proved to still have some merit, especially with the improvement of Folex over the old product Def. In terms of percent defoliation, this treatment separated from all other treatments except Ethephon and Aim and was additionally numerically superior (92.5% defoliated). In addition, there were no significant differences in stick leaves compared to the untreated check. All totaled, if the rate of Ethephon had been equal to other treatments to raise the percent open boll, many at the field day believe that this could have been a very viable treatment.

Ethephon and Sharpen together seemed to work fairly well. Ethephon and Sharpen separated from the untreated treatment as well as most other treatments proving to be a viable harvest aid option. Where this treatment fell behind other treatments was in percent desiccated and stuck leaves (Figure 5). Without being able to show significant added value for weed control in this trial likely held this treatment from becoming more of a popular option for producers. The added benefit of residual weed control was not and could not be gaged for this trial.

Ethephon, and Sharpen, with the addition of Folex as a treatment, a Sharpen label recommend mix, did fair significantly better than all other treatments did in percent green leaves remaining on the plant (Figure 3). This is the only standout significant difference for this treatment. This treatment was in the grouping of treatments that significantly stuck the most leaves. With the higher price of a three product mix with no majorly impactful improvements upon other treatments, this treatment is not showing to be a good value for producers through this trial. No weed control differences from Sharpen were noted from this treatment either. Any added benefit of residual weed control from Sharpen was not and could not be gaged for this trial.

The Ethephon and Display treatment, planned to be the eventual industry replacement for all Ethephon and Aim mixes, proved to be significantly equal to, not superior of, its predecessor in four out of five measured areas of this trial. This treatment did however underperform the Ethephon, Aim mix in percent leaves stuck to the plant (Figure 5).

Acknowledgements

I would like to extend thanks to Trent Finck for cooperating with us to complete this trial. I would also like to thank Dr. Mark Kelley for sharing products, wisdom, and opinions. The 2014 Plains Pest Management Field Scouts for the operation, data collection, and labor associated with this trial: Jonathan Thobe and Jim Graham. Finally, I would like to thank John Villalba for his cooperation and promotion of this trial's results and the hosting of the field day with this trial as one of its highlights.

2014 Velum Total in Swisher/Hale County Cotton for Nematode & Thrips Control
Texas A&M AgriLife Extension Service / Bayer Crop Science
Hale & Swisher County
Cooperator: Kent Springer
Blayne Reed EA-IPM Hale, Swisher, & Floyd / Russ Perkins

Summary

Three differing rate treatments of Bayer Crop Science's new nematicide Velum, one high rate treatment of Velum with a Movento MPC over spray, one standard rate of Temik, and one untreated check were compared for thrips and nematode control in this trial. The three differing rates of Velum were 10, 14, and 18 ounces per acre. The rates for the Velum / Movento were 18 and 8 ounces per acre respectively and the Temik rate was 5 pounds per acre. This trial was set up in an RBD design with four replications. Plots were planted in a pivot irrigated field belonging to Kent Springer on the Hale / Swisher County line north of Edmonson on May 12, 2014. All Temik, Velum, and untreated treatments were made on the May 12 date at planting by a combination of turned on or off chemical boxes on the planter that had been recently calibrated, or were made as a liquid in-furrow with a CO2 backpack sprayer, also turned on and off as needed, that was rigged, fitted, and attached to the planter with a four row modified soil injector boom. Plots were planted four rows at a time with a through and equipment was set for needed application between plots. Both Movento applications were made over the top via backpack sprayer at pinhead square stage on June 28, 2014 and again fourteen days later on July 12, 2014. Once the field established, data collection began immediately with per acre stand counts and continued with weekly thrips counts until the field developed passed economic thrips damage. Nematode counts began roughly sixty days post planting but ended quickly due to lack of nematode pressure.

All treatments outperformed Temik in plant stand counts on May 29 (P=0.005) and significant differences were found between Temik, the 18 ounce rate of Velum and all other treatments in thrips numbers on June 12 (*P*=0.0354). No nematodes or nematode damage was found in any plot and it was assumed there was no nematode pressure in field. No other significant differences were found throughout the trial, which included yield data. No numeric differences of note arose to follow the trend of the significant differences in thrips counts that were found on June 12. 2014 was a very light thrips season for the area and differences could have been coincidental. At this time any thirps control possibly offered by Velum remains tantalizingly promising but unconfirmed.

Objective

Since the loss of Temik to producers in seedling cotton for thrips and nematode control there has been a shortcoming of tools to control these cotton pests. For 2015 Bayer Crop Science plans to release Velum, an in-furrow liquid product for nematode control that could also offer some protection for thrips. Actual field trial data for Velum's performance was in short supply, especially in terms of thrips control. This company designed protocol was one of a few planned in 2014 in Texas to capture that data. This trial conducted in Swisher County was specifically designed to capture some much needed data on thrips particularly.

Materials and Methods

This company conceived protocol required three differing rates of Velum, 10, 14, and 18 ounces per acre, one 18 ounce rate of Velum to be over sprayed with 8 ounces per acre of Movento at pinhead square and again at 10-14 days later, a 5 pound rate of Temik, and an untreated check. This trial was set up in an RBD design with four replications. Plots were planted in a pivot irrigated field belonging to Kent Springer on the Hale / Swisher County line north of Edmonson on May 12, 2014.

Trial Map Treatment Description

Trt	Trt Code	Trt Description
1	CHK	1 CHK Untreated Check
2		2 INSE Temik 15G 5 LB/A
3		3 INSE Velum Total 10 OZ/A
4		4 INSE Velum Total 14 OZ/A
5		5 INSE Velum Total 18 OZ/A
6		6 INSE Velum Total 18 OZ/A;6 INSE Movento MPC 8 OZ/A

Figure 1. Field Map of Trial with treatments listed.

All Temik, Velum, and untreated treatments were made on the May 12 date at planting by a combination of turned on or off chemical boxes on the planter that had been recently calibrated, or were made as a liquid in-furrow with a CO2 backpack sprayer, also turned on and off as needed, that was rigged, fitted, and attached to the planter with a four row modified soil injector boom. Plots were planted four rows at a time with a through and equipment was set for needed application between plots. Both Movento applications were made over the top via backpack sprayer at pinhead square stage on June 28, 2014 and again fourteen days later on July 12, 2014. Plots were 4 rows wide by 40 feet in length.

Data collection began with stand counts and thrips data once field stand was established. On May 29, 2014 data on stand counts were taken by measuring 1/1000 of an acre three times within each plot, counting live cotton seedlings per area, and adjusting counts to a per acre basis. Thrips counts were conducted by making five whole plant inspections for each plot and recording number of adult and nymph thrips present. Thirps data collection continued weekly until thrips were no longer an economic threat to the field on June 19.

Nematode counts were made on just one date, July 19, due to lack of pressure. Nematode data was collected by carefully digging 5 random plants from the outside two rows of each plot, carefully removing and dusting roots clean, and inspecting for the cotton roots for nematodes and nematode damage.

Harvest was conducted on October 27 by hand stripping ten consecutive feet from the one of the inside two rows from each plot. Samples were stored until ginning at the Texas A&M AgriLife Research Cotton Improvement Lab in Lubbock on December 23, 2014. Data was collected on burr weight, seed weight, and lint weight. All data was statistically analyzed via ARM at *P*=0.05 utilizing AOV / LSD.

Results and Discussion

Significant stand count differences appeared on the May 29 when the Temik treatment was outperformed by all other treatments, including the untreated check.

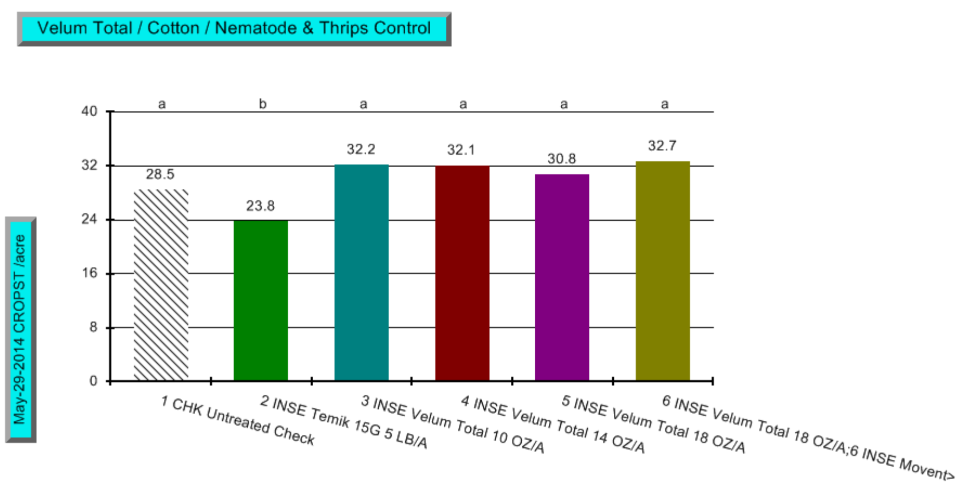


Figure 2. Stand Counts in Plants per Acre May 29, 2014.

On the May 29 date, very few thrips were present in field and no significant differences were noted.

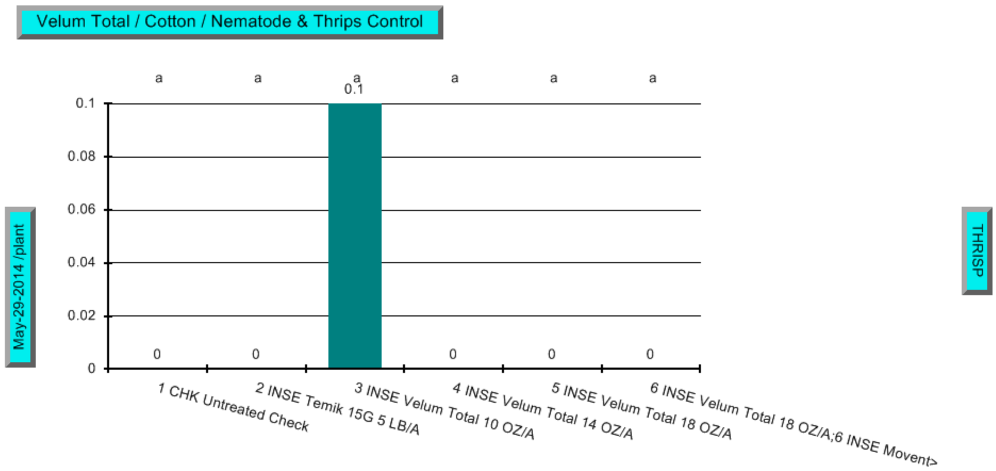


Figure 3. Thrips per Plant on May 29, 2014 (*P*=0.4509).

By the June 5 date, thrips had begun moving in-field, but were still very light and no significant differences were noted.

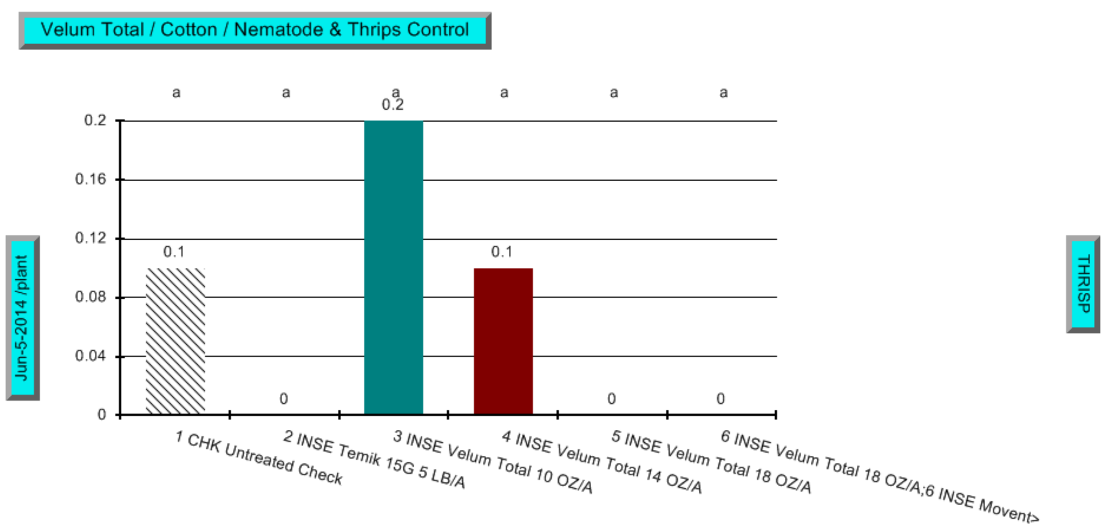


Figure 4. Thrips per Plant on June 5, 2014 (*P*=0.3199).

On the June 12 thrips data collection date, a spotty population of thips had arrived in field and significant differences in treatments were found. The 18 ounce per acre treatment of Velum and the 5 pound per acre Temik treatment outperformed the untreated check and the 14 ounce per acre treatment of Velum. This data was held in suspicion as the thips population was so spotty and light across the treatment area and the field in whole.

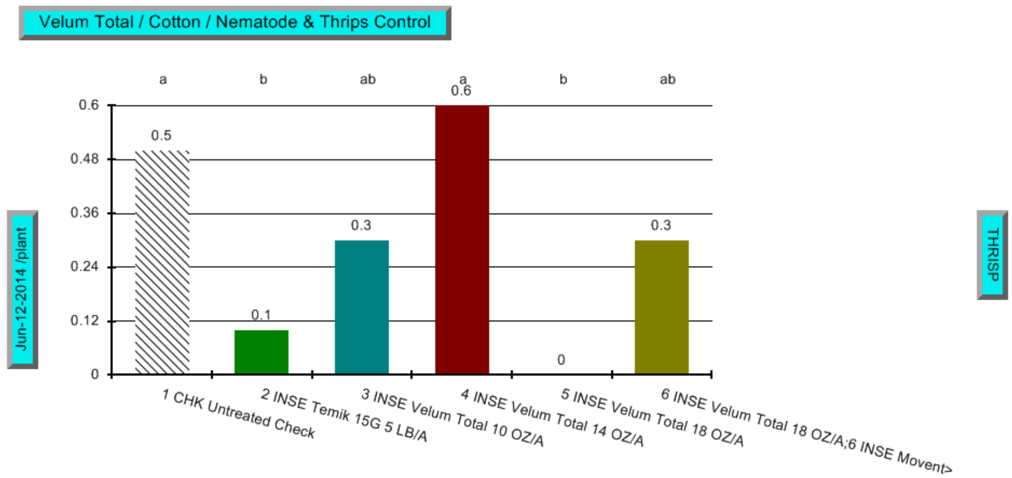


Figure 5. Thrips per Plant on June 12, 2014 (*P*=0.0354, LSD=2.30t).

By the June 19 date thrips had increased slightly but the population remained light and thrips had begun to migrate to other newly available area food sources and by this time the plants had developed passed economic thrips damage. There were no significant differences found on this date.

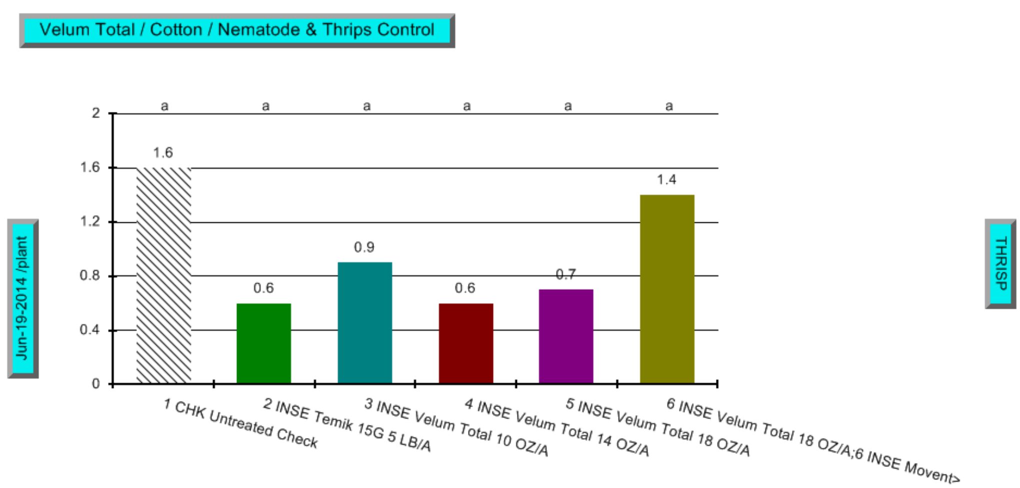


Figure 6. Thrips per Plant on June 19, 2014 (*P*=0.1468).

On the lone nematode check date of July 19 there were no nematodes or nematode damage found in any plot or treatment. No other nematode checks were taken due to lack of pressure. Yield data failed to find any significant differences between treatments for any data measure.

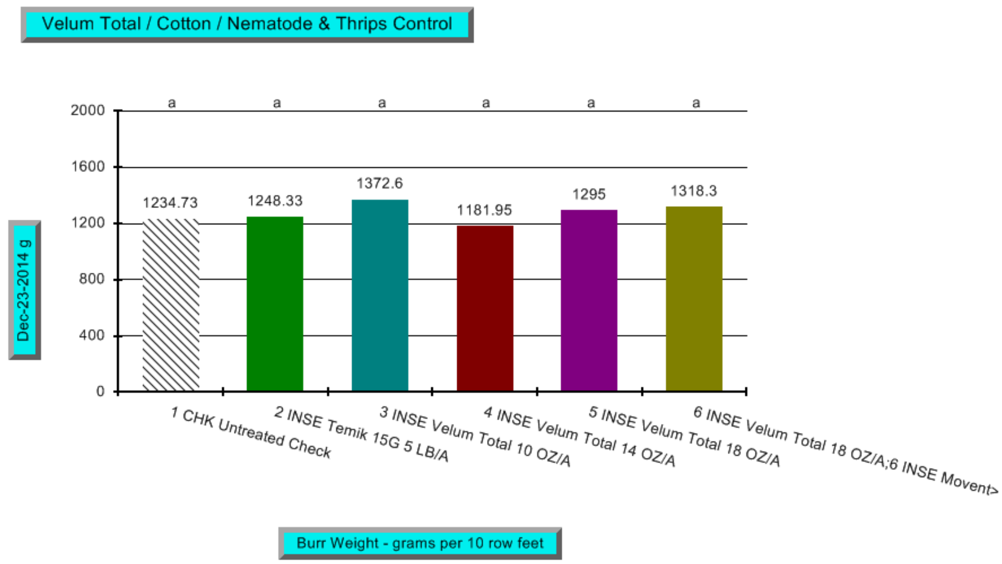


Figure 7. Grams burr weight cotton per 10 foot sample by treatment (*P*=0.7017).

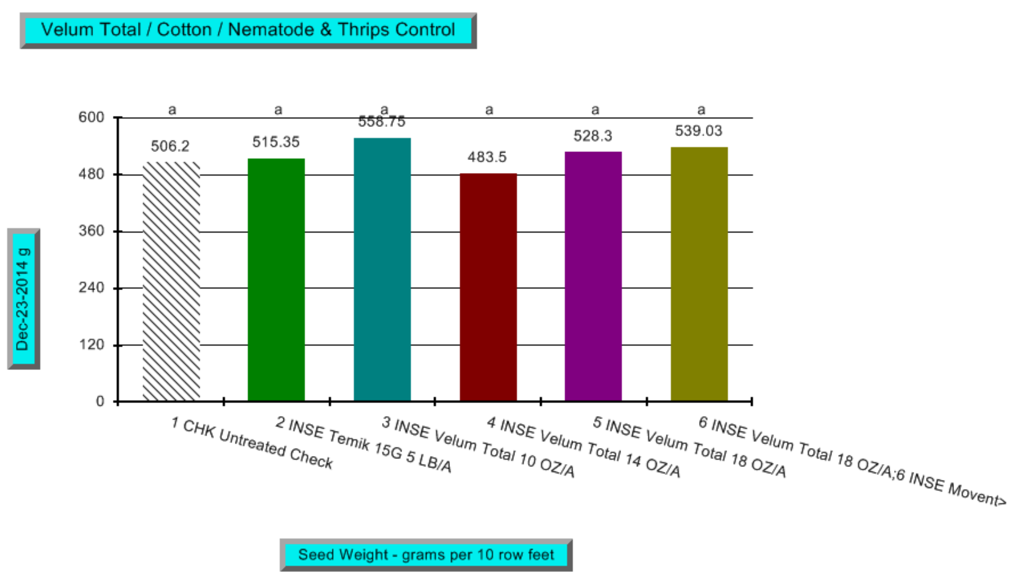


Figure 8. Grams ginned cotton seed per 10 foot sample by treatment (*P*=0.7660).

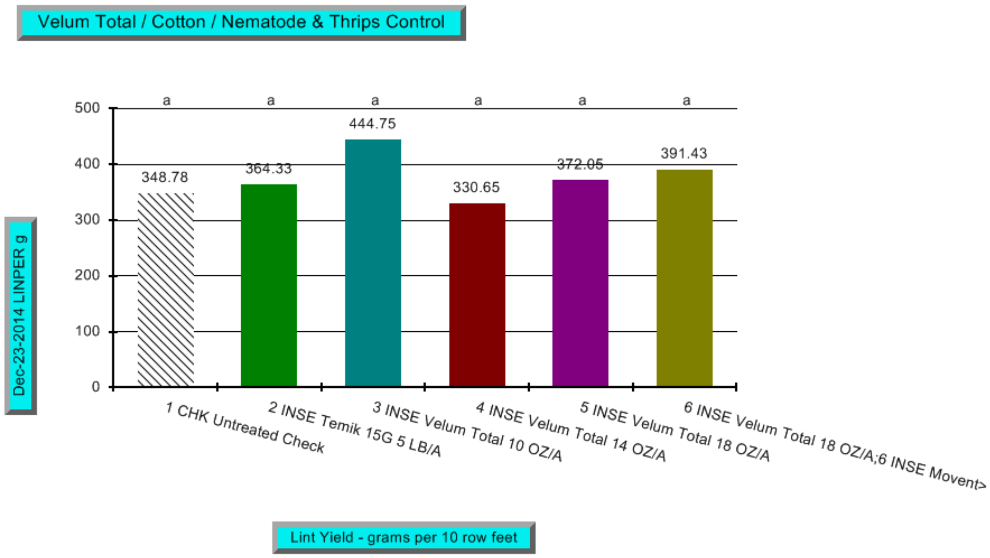


Figure 9. Grams ginned cotton lint per 10 foot sample by treatment (*P*=0.2101).

Conclusions

Conclusions about this trial are difficult to gleam due to lack of pest pressure. Unseasonably cool and wet conditions at the start of the 2014 growing season, combined with a light and somewhat early terminated wheat crop in the area severely impacted the thrips population to a point that there never was adequate pressure to make a true evaluation of Velum's thrips control potential. While nematode control and data collection was part of this protocol, and was followed, damaging nematode populations are not typically expected or experienced in the area. Not finding any was no surprise and the true effort of the trial was to see if nematode treatments of Velum could have any impact on thrips control in the Hale & Swisher County areas.

The significant differences that were found in this trial cannot be ignored. The June 12 thrips data did show significant differences in thrips by treatment. Seeing Temik, a known performer for thrips control, perform well was no surprise. Having the 18 ounce per acre treatment of Velum performed just as well as Temik was promising and it was hopped that this trend would continue in a heavy pest pressure situation over the next few weeks. This assumption was never able to be tested as the already light population of thrips moved to other, more desirable host plants as they became available. It is possible that the differences in thrips population on June 12 could be little more than a weak and light population of thrips not distributing evenly through the trial, or they could be completely valid. Today the promise of thrips control from Velum remains tantalizing.

The significant differences in stand count look to be affiliated with Temik hindering stand establishment somehow and not an improved quality that Velum adds as none of the Velum treatments performed any better than the untreated check.

Acknowledgements

I would like to extend thanks to Kent Springer Farms for cooperating with us to complete this trial. Russ Perkins for sponsoring and supporting this trial. I would also like to thank Dr. Ed Bynum for sharing spray equipment, wisdom, and opinions. The 2014 Plains Pest Management Field Scouts for the operation, data collection, and labor associated with this trial: Jonathan Thobe, Jim Graham, and Kevin Duarte. Thank You all.

2014 Phytogen Low Input Cotton Production Variety Trail – Swisher County
Texas A&M AgriLife Extension Service / Dow
Hale & Swisher County
Cooperator: Trent Finck
Blayne Reed, EA-IPM Hale, Swisher, & Floyd / Scott Fuchs, PhytoGen Seed

Summary

Four Phytogen Cotton Varieties, PHY 367 WRF, PHY 333 WRF, PHY 339 WRF, and PHY 222 WRF were tested against the locally popular Fibermax Cotton Variety FM 2011 GT in a severely limited irrigation input and potentially heat unit limited situation in northern Swisher County. The trial was designed as a large block RBD with each plot representing 8 full through rows of a single cotton variety. The field was planted on May 16, received only 12.5 supplemental flood irrigation inches including 6.7 pre-irrigation and one in-season irrigation of 5.8 inches in August, and was harvested on November 25. Burr weight was taken for each plot and grab samples were pulled in-field. Grab samples were ginned by Phyotogen via company sample gin.

In yield and crop overall value, which was light due to the field environment, Phytogen 367 WRF numerically won the trial by a substantial difference with a yield of 418 pounds lint per acre and a $240 per acre value. FM 2011 GT numerically placed second in yield and overall crop value with a lint per acre yield of 388 pounds and a $222 per acre value. A compilation of in-season agronomic traits shown that the more determinate varieties, FM 2011 GT and PHY 222 WRF, reached cut-out earlier and were not able to take full advantage of the limited available irrigation. These in-season agronomic differences did not translate directly into yield and crop value differences for all varieties but PHY 367 WRF did seem to give return on those advantages.

Objective

The objective of this company initiated protocol was to evaluate four Phytogen Cotton varieties under a low input irrigated situation in a northern cotton producing area with compares to an area standard cotton variety.

Materials and Methods

Four Phytogen Cotton Varieties, PHY 367 WRF, PHY 333 WRF, PHY 339 WRF, and PHY 222 WRF were tested against the locally popular Fibermax Cotton Variety FM 2011 GT in a severely limited irrigation input and potentially heat unit limited situation in northern Swisher County belonging to Trent Finck. The trial was designed as a large block RBD with each plot representing 8 full through rows of a single cotton variety. Planting pattern was solid on 40 inch rows and with a seeding population of 59,000. Seedling vigor ratings were taken at 22 DAP. Stand count data was taken at 2nd true leaf stage.

Data on average 1st Fruiting node was taken through the growing season as the field was checked weekly and data recorded upon event. Data on NACB, NUHB, end of season plant height, total number of nodes produced, and total fruit9ing nodes capable of producing harvestable bolls was taken at 50% open boll on October 15.

In-season management was per producer management decision. Pre-plant irrigation amount was 6.7 acre inches by flood and in-season irrigation was initiated at 5.8 NAWF on August 10 with an overall amount of 5.8 acre inches applied over a 18 day period of time. Field was harvested on November 25. Burr weight was taken via weighing boll buggy for each plot and grab samples were pulled in-field and shipped to Phytogen for ginning and analysis. Grab samples were ginned by Phyotogen via company sample gin.

Results and Discussion

No variety seemed to perform superbly in terms of seedling vigor considering the seeding rate of 59,000 seeds planted per acre. FM 2011 GT did seem to hold some numerical advantage in the seedling vigor rating and average plants per acre average stand counts. In-season agronomic data trend to show the more determinate cotton varieties in the trial, FM 2011 GT and PHY 222 WRF, reached cut-out earlier than longer season varieties and sported more regrowth than the other varieties by season's end.

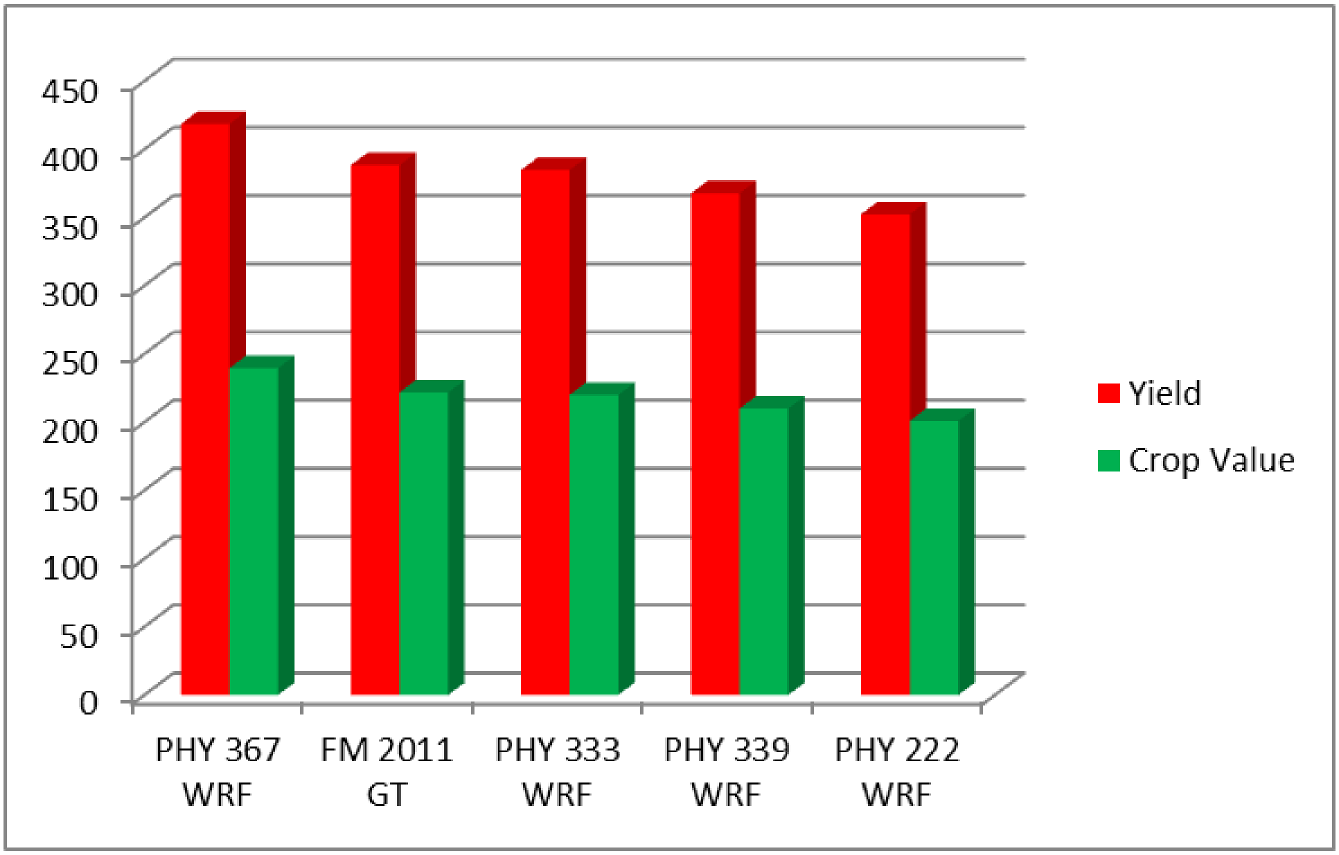
Variety	Average Seedling vigor rating	Average PPA at 2nd leaf stage	Average 1st fruiting node	NACB at 50% open boll	NUHB at 50% open boll	End of Season plant height	Total number of nodes (average)	Total fruiting nodes (average)
PHY 339 WRF	3	23,667	6.875	4.13	7.25	25.94	20.38	13.13
PHY 222 WRF	3.333	21,000	6.5	3.25	7.375	23.63	21.25	13.87
PHY 367 WRF	3.333	21,333	6	4.625	5.25	24.34	20.13	13.63
FM 2011 GT	4	29,667	5.75	1.375	10.625	26	23.25	12.63
PHY 333 WRF	3	21,000	6.625	5.125	5.125	25.4	21.13	16

Table 1. All recorded agronomic data from the trial.

These agronomic differences and regrowth problems did not seem to translate directly into lint yield or crop per acre value evenly. The variety PHY 367 WRF yielded the most and exhibited the most value, but FM 2011 GT did surpass in bottom line value two other varieties that seemed to outperform it during the growing season.

Variety	Yield	Crop Value
PHY 367 WRF	419	$240
FM 2011 GT	388	$222
PHY 333 WRF	385	$220
PHY 339 WRF	368	$210
PHY 222 WRF	352	$201

Table 2. Per Acre Lint Yield and Adjusted Crop Value per acre by variety.



Graph 2. Per Acre Lint Yield and Adjusted Crop Value per acre by variety.

Notable differences between varieties in fiber quality can be seen between varieties tested, but when all factors were considered together, the loan values were very close from variety to variety.

Variety	Turn Out	Yield	Mic	Length	Unif.	Strength	ELON.	Rd	+b	Leaf	Loan	Crop Value
PHY 367 WRF	0.321	419	4.1	34.7	81.4	29.1	8.9	79.1	9.1	2	0.5725	$240
FM 2011 GT	0.322	388	4.4	34.1	80.5	29.1	7.3	78.3	8.2	2	0.5710	$222
PHY 333 WRF	0.307	385	4.2	34.7	81.3	29.0	8.5	78.4	8.9	1	0.5715	$220
PHY 339 WRF	0.303	368	4.3	34.1	80.1	29.7	9.2	80.2	8.3	2	0.5710	$210
PHY 222 WRF	0.334	352	4.7	33.1	80.2	28.5	9.8	78.9	8.7	1	0.5700	$201

Table 3. Fiber quality by variety properties and loan rate by variety.

Conclusions

Evaluations of the seedling vigor should be made with an understanding of the harsh conditions these varieties faced during the 2014 growing season early and any difference should be taken special note of.

PHY 367 WRF seems to have taken advantage of its indeterminate growth pattern and did make the best use of the limited irritation it was supplied with by making lint and the best per acre crop value from the trial. PHY 367 WRF should be a consideration for producers using this type of cotton production growing environment. Meanwhile, FM 2011 GT has shown why it is popular locally for its performance despite reaching an early cut-out and spurring so much plant regrowth.

Acknowledgements

I would like to extend thanks to Trent Finck for cooperating with us to complete this trial, as well as Scott Fuchs for sponsoring and supporting this trial, and John Villalba for his support and promotion of this trial. I would also like to thank Dr. Mark Kelley and his crew for sharing spray equipment, wisdom, labor, and opinions. The 2014 Plains Pest Management Field Scouts for the operation, data collection, and labor associated with this trial: Jonathan Thobe, Jim Graham, and Kevin Duarte. Thank You all.

2014 Micronutrient Fertilizer Efficacy on High Input Cotton

Texas A&M AgriLife Extension Service / Everris Fertilizers
Hale & Swisher County
Cooperator: Shane Berry
Blayne Reed, EA-IPM Hale, Swisher, & Floyd / Tim Burbaker, Everris Fertilizers

Summary

Three foliar applied micronutrient products and one soil applied micronutrient product were arranged into six treatments including an UTC in an RBD with four replications to evaluate economic efficacy of applying micronutrient fertilizers in-season to high input cotton. All onetime applications were timed for a second week of bloom stage application. The treatments included two Everris Fertilizer products proven successful in the horticulture industry, Micromax Granular at 2 pounds per acre, Liquid S.T.E.M. with a onetime treatment at 1 quart per acre and a two application treatment of 1 pint per acre followed by a second identical application targeted at peak-bloom stage, and two locally standard micronutrient fertilizer applications, Max Nitro Iron at 1 quart per acre and Bio-Forge at 1 pint per acre. Data on number of squares per plant and number of bolls per plant were taken at 18 days after the first treatment and 24 days after first treatment. On September 30th, ten row feet from each plot were counted for harvestable bolls and on December 2nd, 8 row feet from each plot were hand harvested. All cotton was ginned on December 23rd at the Cotton Improvement Lab at the Texas A&M Experiment Station in Lubbock.

Squares per plant field data from August 13th and August 23rd shown interesting but not significant trends when compared to the bolls per plant data. The bolls per plant data on those dates were statistically different (P=0.0229 and P=0.0492 respectively) with Matrix Nitro Iron being statistically different form the untreated check at 18 DAT and all other treatments being numerically higher on the same date. By the September 30th boll assessment, the trial's numeric pattern had changed somewhat but numeric differences took shape and the data was very close to being significant (P=0.0766) compared to the untreated check. No significant differences were found between any treatments in the yield data for lint, seed, turnout, or burr weight cotton.

These results may indicate that some foliar micronutrient applications can aid cotton in setting fruit quickly when plants are stressed for these nutrients, but once a maximum fruit load is established, these plants will not set additional fruit over and above untreated plants if the untreated plants have time to reach that maximum fruit load. This trial indicates that the additional application of micronutrients does not consistently aid in fruit set in high potential cotton. It also leaves the question that if the maximum fruit load, plainly set by factors other than micronutrient and likely water related, could be added to, would micronutrient applications be of benefit then?

Objective

Based upon circumstantial evidence, area crop consultants and producers have been recommending and making foliar micronutrient applications to high yielding Texas High Plains cotton in conjunction with PGR treatments with beliefs in yield returns. The objective of this trial is to determine if that practice has any consistent economic impact to high input, high yielding cotton in West Texas. This is the first trial year of a locally conducted multi-year study into the subject.

Materials and Methods

A high input, drip irrigated cotton field belonging to Shane Berry near Cotton Center in Hale County was identified as a good target field to host this trial. Six total treatments were selected for this trial which were set up into an RBD with four replications. Plots were 4 40-inch rows wide by 38 feet long. Treatments included and UTC, one application of Micromax Granular at 2 pounds per acre, one application of Liquid S.T.E.M. at 1 quart per acre, two applications of Liquid S.T.E.M. at 1 pint per acre, one application of Max Nitro Iron at 1 quart per acre, and one application of Bio-Forge at 1 pint per acre.

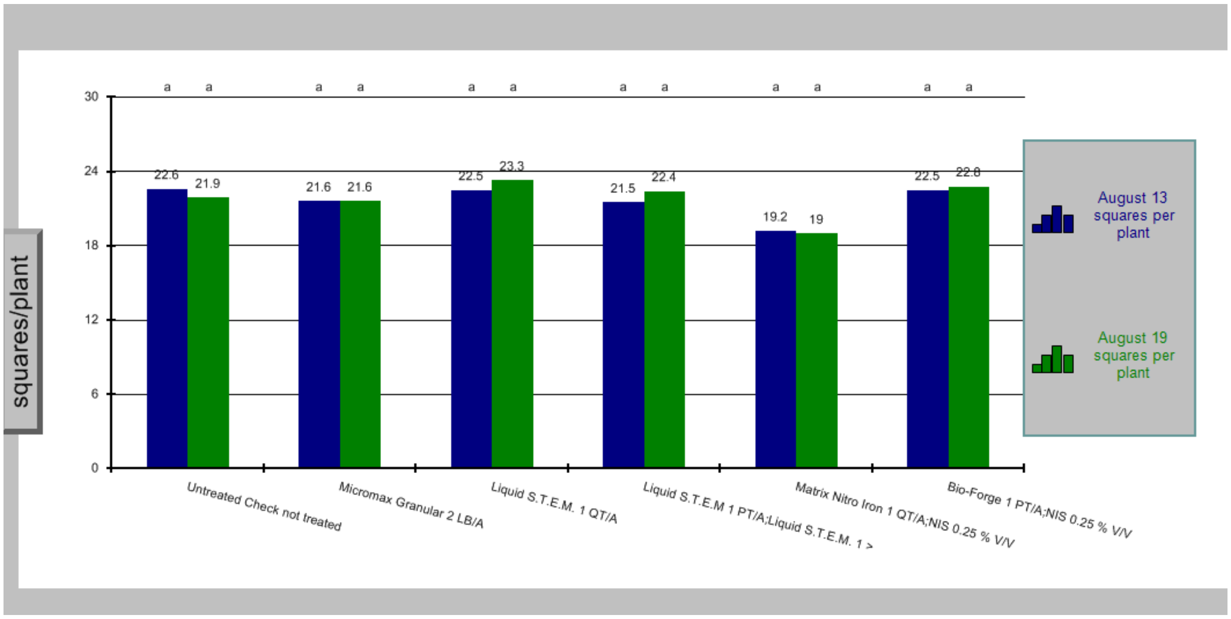
All onetime applications and the first of two applications were made on July 26th to cotton entering the second week of bloom. The Micromax application was made by hand spreading and all foliar applications were made via CO2 backpack sprayer with wand attachment at 10.3 GPA and a walking ground speed of 3.5 mph. The second application of two application Liquid S.T.E.M. treatment was made on August 20th to peak-bloom stage cotton via the same CO2 sprayer.

All field data was collected from the middle two rows of each plot to eliminate any possible treatment drift effect. Data was collected on squares per plant and bolls per plant from three randomly selected plants per plot on August 13th (18 DAT) and August 19th (24 DAT). On September 30th ten randomly selected continuous row feet from each plot were counted for number of harvestable bolls. On December 2nd, eight randomly selected continuous row feet were hand ‘stripped’ per plot and samples stored until December 23rd when all samples were ginned at the Cotton Improvement Lab at the Texas A&M Experiment Station in Lubbock. Data on burr weight, seed weight, lint weight, and percent gin turnout per sample was recorded.

All data was statistically evaluated at the P=0.05 level using ARM 9 and adjusted to pounds per acre where needed.

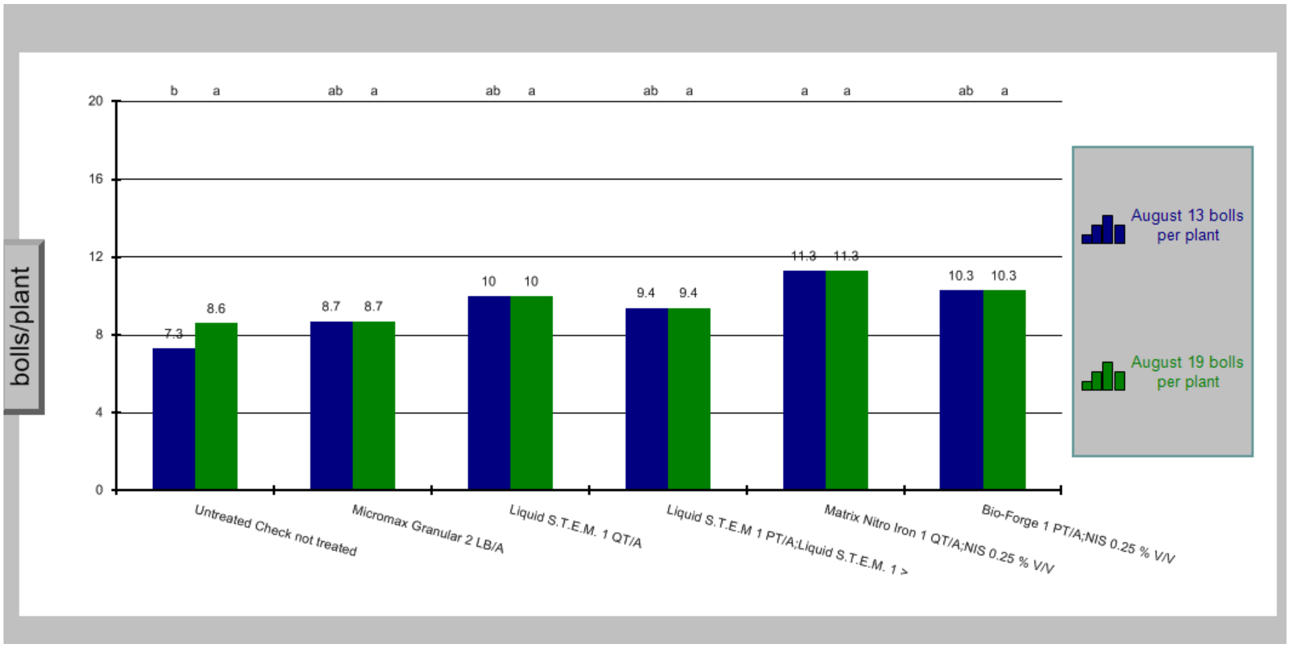
Results and Discussion

The squares per plant data shows no statistical differences between treatments (P=0.5559 and P=0.3157 by date) but does show interesting trends opposite the bolls per plant field data from the same dates.



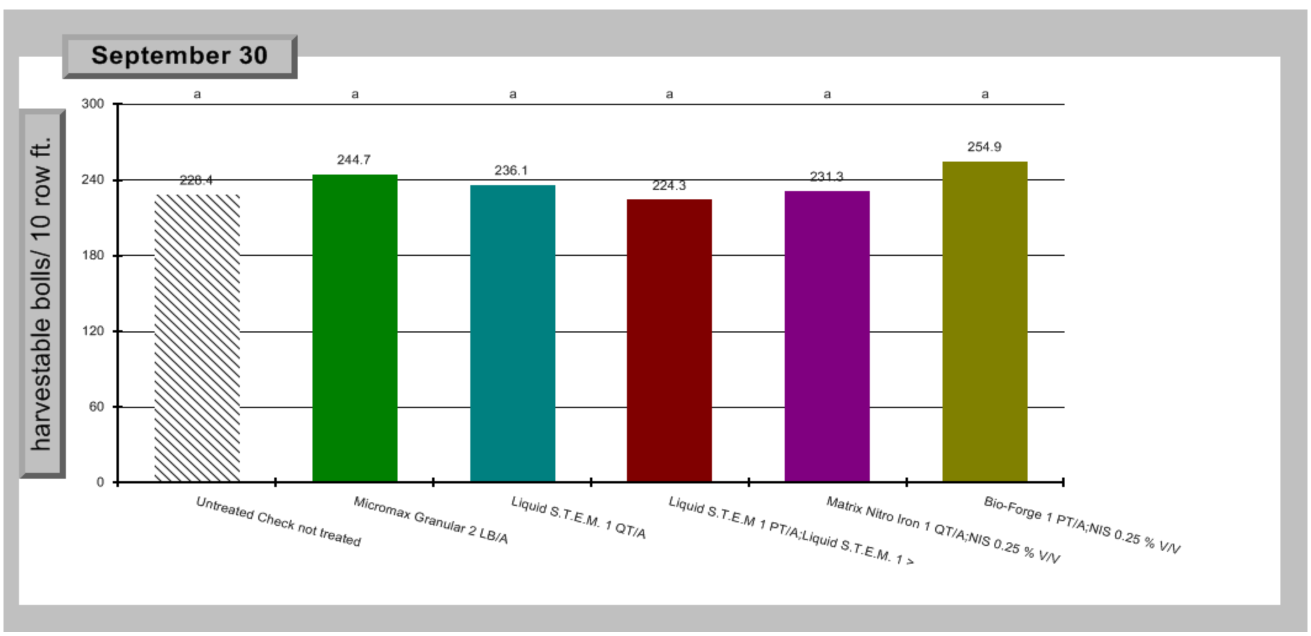
Graph 1. Squares per plant at 18 DAT and 24 DAT (P=0.5559 and P=0.3157).

Statistically significant differences were found for the 18 DAT (P=0.0229) with the Matrix Nitro Iron at 1 quart per acre being superior to the untreated check. Data from the 24 DAT proved significant also (P=0.0492) but did not separate under ARM for LSD.



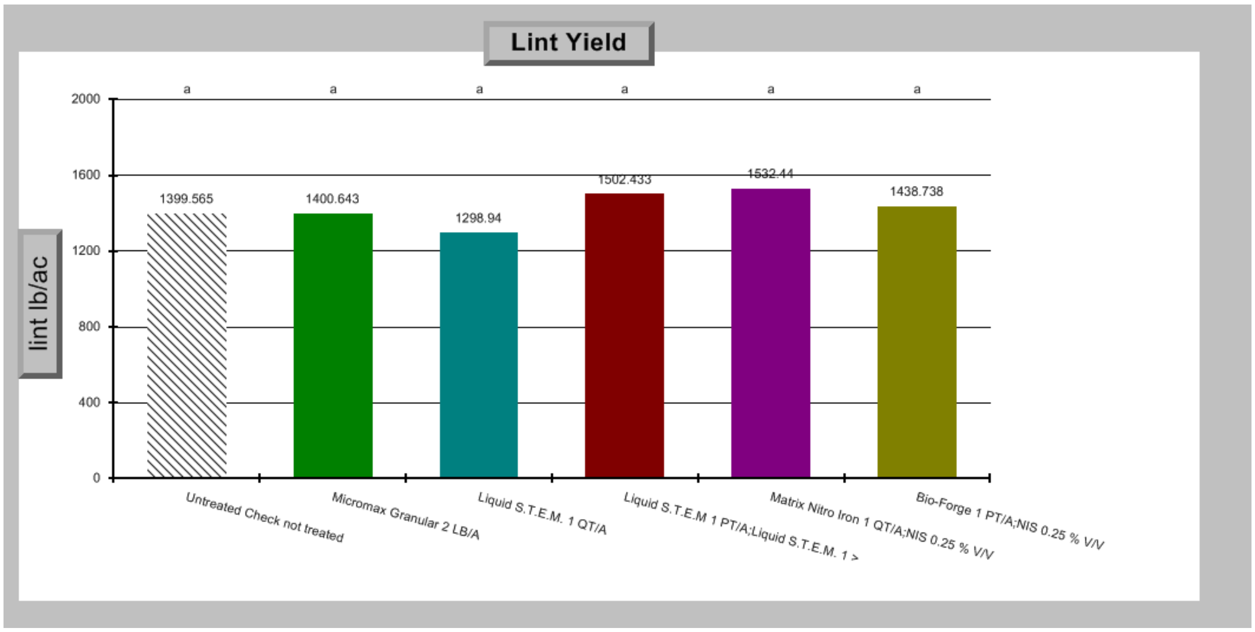
Graph 2. Bolls per plant at 18 DAT and 24 DAT (*P*=0.0229 and *P*=0.0492).

By the September 30 harvestable bolls per 10 row feet counts, numeric trends had shifted from the previous patterns. No significant differences were found (*P*=0.0766).



Graph 3. September 30 harvestable bolls per ten row feet (*P*=0.0766).

No differences in burr weight (*P*=0.5559) seed weight (*P*=0.5440), lint yield (*P*=0.3157), or percent gin turnout (*P*=0.3082) were found. Interesting numeric trends were noted with the Matrix Nitro Iron, Bio-Forge, and two application Liquid S.T.E.M treatments all out yielding the UTC by at least 100 lint pounds per acre.



Graph 4. Lint per acre yield by treatment (*P*=0.3157).

Conclusions

Based upon this single season data alone, in-season micronutrient applications do not consistently affect yield significantly. This data does hold some perplexing results that hint micronutrient applications could hold benefit under the right circumstances. The numeric differences found in lint yield per acre might prove to be significant with additional data added from future trials.

The significant differences found in the 18 DAT in-season data bolls per plant data and numeric reversal of that numeric data in the squares per plant could be indicating that micronutrient applications provide short term benefit in setting fruit faster when the plant demand for those nutrients is highest. The failure to find significant differences after that point could indicate that a maximum boll load will be reached for each plant and that micronutrient applications are not the key factor in calculating that maximum potential boll load. Most likely, water is the primary factor in setting maximum potential boll load, followed by the major nutrient availability. Eventually, the plants once short on micronutrients will have enough available to eventually set that maximum load without supplemental micronutrient applications and 'catch up' to those that have had those applications.

Limited to no information can be gleamed from the Micromax Granular treatment due to a conversion error from the horticultural greenhouses to the large scale production farm. The rate needed for this product to have any of its expected impacts needs to be 10 to 20 times higher.

In moving forward on this multi-year study the key question has now become, if the maximum potential boll load is raised by the other more primary factors, will the application of supplemental micronutrients be of consistent economic benefit? And, if so how can producers and crop consultants tell when these micronutrient applications would be best utilized?

Acknowledgements

I would like to extend thanks to Shane Berry and everyone working with him for cooperating with us to complete this trial, Dr. Mark Kelley for sharing his opinions, the 2014 Plains Pest Management Field Scouts for the operation, data collection, and labor associated with this trial: Jonathan Thobe, Jim Graham, and Kevin Duarte. Finally, I would like to thank Tim Burbaker and everyone with Everris Fertilizers for labor assistance, cooperation, and support of this trial.

MAP Coated, Timed Release Fertilizer Applications to Calcium Carbonate Soils for Profitable Cotton Production in Hale & Swisher 2014

Texas A&M AgriLife Extension Service
Hale & Swisher County
Cooperator: Joe McFerrin and Shane Berry
Blayne Reed, EA-IPM Hale, Swisher, & Floyd / Tim Burbaker, Everris

Summary

Four different rates of fertilizer treatments were applied to a typically low returning calcium carbonate soil or "caliche hillside" and were statistically compared in multiple agronomic and fruiting measurements and ratings as well as yield and turnout. The treatments included a standard farmer practice working as an untreated check, and three differing rates of Everris Fertilizer Agrocote coated and timed release 9-47-0, and 39-0-0 fertilizer products. The first treatment of Agrocote was 255 pounds per acre 9-47-0 mixed with 146 pounds per acre 39-0-0 and represented a standard fertilization rate. The second treatment of Agrocote was 510 pounds per acre 9-47-0 mixed with 292 pounds per acre 39-0-0 representing a 2X rate of fertilization. The third Agrocote treatment was 153 pounds 9-47-0 mixed with 170 pound rate of 39-0-0 representing a reduced phosphorous fertilizer rate.

Treatments were arranged into an RBD small plot design with 4 replications where each plot was four rows wide and 40 feet long with forty inch row spacings. The trial was placed on a calcium carbonate hillslope within a pivot irrigated, Hale County Cotton field. Producer standard treatments were made preplant while all Agrocote treatments were made on June 12. 2014 to cotyledon stage cotton. Ten row feet from the middle two rows of each plot were hand harvested on December 12 and stored until the trial could be ginned on December 23 at the Texas A&M Research Cotton Improvement Lab in Lubbock.

No significant differences were found in any agronomic or yield data for the trial. There are three now better known factors that could have failed this trial beyond the potential of no treatment differences. The slope of the land could have prevented enough moisture intake into the soil to completely dissolve the Agrocote coating to be of aid to the nutrient deficient plants in time, or the Agrocote fertilizer was not given enough time from application to breakdown and release, or there is the possibility that the trial was incidentally fertilized with the balance of the surrounding filed via fertigation through the pivot due to miscommunication and confusion among farm workers.

Objective

Determine if timed releasing nitrogen and phosphorous fertilizers at key periods in cotton's growth and developmental stages are an economical and practical answer for cotton production on calcium carbonate hillsides and soils that typically bind these nutrients so that they are unusable to the plant. If this proves practical and profitable on these soils in Hale and Swisher County, calcium carbonate soils across the South Plains could receive could be beneficially impacted by the use of coated fertilizer products. If significant differences could be found, studies on best coating and management practices would begin in earnest.

Materials and Methods

Four different rates of fertilizer treatments were applied to a typically low returning calcium carbonate soil or "caliche hillside" and were statistically compared in multiple agronomic and fruiting measurements and ratings as well as yield and turnout. The treatments included a standard farmer practice working as an untreated check, and three differing rates of Everris Fertilizer Agrocote coated and timed release 9-47-0, and 39-0-0 fertilizer products. The first treatment of Agrocote was 255 pounds per acre 9-47-0 mixed with 146 pounds per acre 39-0-0 and represented a standard fertilization rate. The second treatment of Agrocote was 510 pounds per acre 9-47-0 mixed with 292 pounds per acre 39-0-0 representing a 2X rate of fertilization. The third Agrocote treatment was 153 pounds 9-47-0 mixed with 170 pound rate of 39-0-0 representing a reduced phosphorous fertilizer rate.

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Agronomic data was collected on plant height, top five internode length, number of squares per plant, number of bolls per plant, nodes above white flower, and number of dropped fruit per plant were taken from five randomly selected plants from each plot on July 21, August 5, and August 13. Data on number of harvestable bolls was collected on September 30 and samples were harvested on December 12, when ten row feet from each plot was hand harvested. When the samples were ginned on December 23, data on burr weight cotton per ten row feet, lint per ten row feet and percent turnout were recorded. All data was statistically compared utilizing ARM at P=0.05 and LSD.

Results and Discussion

No treatments resulted in significant differences between treatments and no numeric trends were noted. All resulting ARM data is listed in the following tables.

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	plant height	internode leng>	number of squa>	dropped squares	NAWF	plant height
Part Rated	PLINRO C	PLINRO c	PLINRO C	PLINRO C	PLINRO C	PLINRO C
Rating Date	Jul-21-2014	Jul-21-2014	Jul-21-2014	Jul-21-2014	Aug-5-2014	Aug-5-2014
Rating Type	HEIGHT	internode	FRUITI		Plant Stage	HEIGHT
Rating Unit	IN	IN	/plant	/plant	PLANT	PLANT
Sample Size, Unit	3 PLINRO	3 PLINRO	3 PLINRO	3 PLINRO	3 PLINRO	3 PLINRO
Number of Subsamples	3	3	3	3	3	3
Assessed By	John Thobe	John Thobe	John Thobe	John Thobe	Blayne Reed	Blayne Reed
ARM Action Codes						
Trt No. / Treatment Name / Rate / Rate Unit	1	2	3	4	5	6
1 untreated	16.208a	5.396a	24.2a	0.8a	6.5a	21.917a
2 9-47-0 255 lb/a; 39-0-0 146 lb/a	16.168a	5.458a	22.4a	0.2a	6.7a	22.250a
3 9-47-0 510 lb/a; 39-0-0 292 lb/a	16.813a	5.750a	25.5a	0.7a	6.4a	22.917a
4 9-47-0 153 lb/a; 39-0-0 170 lb/a	16.583a	5.771a	23.8a	0.4a	6.5a	22.771a
LSD P=.05	1.6541	0.4933	6.16	0.55	0.73	1.6997
Standard Deviation	1.0342	0.3084	3.85	0.34	0.46	1.0627
CV	6.29	5.51	16.08	65.97	7.04	4.73
Bartlett's X2	2.313	2.21	7.222	7.124	3.176	4.001
P(Bartlett's X2)	0.51	0.53	0.065	0.068	0.365	0.261
Skewness	-0.1097	0.1168	-0.0637	0.4796	0.423	0.7163
Kurtosis	-0.9437	-0.0419	-1.2067	-0.6017	-0.1894	0.5979
Replicate F	0.167	1.832	0.273	1.000	0.297	5.315
Replicate Prob(F)	0.9157	0.2116	0.8437	0.4363	0.8270	0.0221
Treatment F	0.358	1.588	0.435	2.882	0.209	0.761
Treatment Prob(F)	0.7848	0.2594	0.7334	0.0952	0.8878	0.5438

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.

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	internode leng>	number bolls	number squares	NAWF	plant height	internode leng>
Part Rated	PLINRO C	PLINRO C	PLINRO C	PLINRO C	PLINRO C	PLINRO C
Rating Date	Aug-5-2014	Aug-5-2014	Aug-5-2014	Aug-13-2014	Aug-13-2014	Aug-13-2014
Rating Type	internode	FRUSET	FRUITI	Plant Stage	HEIGHT	internode
Rating Unit	PLANT	/plant	/plant	/plant		
Sample Size, Unit	3 PLINRO	3 PLINRO	3 PLINRO	3 PLINRO	3 PLINRO	3 PLINRO
Number of Subsamples	3	3	3	3	3	3
Assessed By	Blayne Reed	Blayne Reed	Blayne Reed	John Thobe	John Thobe	John Thobe
ARM Action Codes				AL		
Trt Treatment Rate No. Name Rate Unit	7	8	9	10	11	12
1untreated	5.604a	2.3a	29.0a	3.3a	23.023a	5.854a
29-47-0 255lb/a 39-0-0 146lb/a	5.604a	2.7a	28.3a	3.3a	22.667a	5.646a
39-47-0 510lb/a 39-0-0 292lb/a	5.979a	3.1a	29.7a	3.5a	23.375a	5.500a
49-47-0 153lb/a 39-0-0 170lb/a	5.667a	3.3a	30.6a	3.8a	24.104a	5.479a
LSD P=.05	0.6941	1.32	4.81	0.07t	2.0012	0.6339
Standard Deviation	0.4340	0.83	3.00	0.04t	1.2511	0.3963
CV	7.6	29.02	10.22	6.58t	5.37	7.05
Bartlett's X2	2.048	4.371	0.1	3.153	1.316	0.321
P(Bartlett's X2)	0.563	0.224	0.992	0.369	0.725	0.956
Skewness	-0.3288	0.1105	-0.2759	1.226*	0.6051	0.2814
Kurtosis	-1.2258	-0.7312	-1.5784	1.5388	-0.1225	-0.1716
Replicate F	0.273	1.684	0.557	2.788	1.616	1.425
Replicate Prob(F)	0.8436	0.2392	0.6566	0.1018	0.2533	0.2985
Treatment F	0.685	1.144	0.409	0.945	0.962	0.762
Treatment Prob(F)	0.5836	0.3828	0.7504	0.4590	0.4516	0.5434

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	number bolls	number squares	harvestable bo>	lint yield	seed wt.	burr wt.
Part Rated	PLINRO C	PLINRO C	AREA C	LINT C	SECOHH C	- C
Rating Date	Aug-13-2014	Aug-13-2014	Sep-30-2014	Dec-23-2014	Dec-23-2014	Dec-23-2014
Rating Type	FRUSET	FRUITI	FRUITI	LINPER	seed wt.	burr wt.
Rating Unit			10 ft			
Sample Size, Unit	3 PLINRO	3 PLINRO	10 FT	8 FT	8 FT	8 FT
Number of Subsamples	3	3	1	1	1	1
Assessed By	John Thobe	John Thobe	John Thobe			
ARM Action Codes		AL				
Trt No. Treatment Name Rate Rate Unit	13	14	15	16	17	18
1 untreated	9.5a	32.9a	278.3a	533.85a	833.50a	2007.18a
2 9-47-0 255 lb/a 39-0-0 146 lb/a	10.9a	39.7a	302.8a	518.00a	800.55a	1960.75a
3 9-47-0 510 lb/a 39-0-0 292 lb/a	10.3a	37.6a	299.3a	519.35a	804.33a	1972.58a
4 9-47-0 153 lb/a 39-0-0 170 lb/a	8.3a	31.6a	283.5a	530.78a	790.83a	1958.35a
LSD P=.05	3.51	0.15t	55.28	64.286	104.567	232.497
Standard Deviation	2.20	0.09t	34.56	40.192	65.376	145.358
CV	22.52	5.93t	11.88	7.65	8.1	7.36
Bartlett's X2	1.184	0.606	2.824	1.166	1.587	3.47
P(Bartlett's X2)	0.757	0.895	0.42	0.761	0.662	0.325
Skewness	-0.5155	0.5289	0.3343	-0.9573	-0.3073	-0.7402
Kurtosis	-0.8944	0.0119	-0.925	-0.1697	-0.6072	0.5645
Replicate F	4.978	1.259	0.927	16.564	8.292	8.380
Replicate Prob(F)	0.0264	0.3455	0.4664	0.0005	0.0059	0.0057
Treatment F	1.018	0.974	0.474	0.158	0.316	0.096
Treatment Prob(F)	0.4292	0.4470	0.7078	0.9218	0.8138	0.9603

Conclusions

There is enough evidence that the trial had errors present that were not accounted for in the working protocol that could have nullified any treatment results, had there been any. Upon close inspection on the data collection date of September 30, unopened Agrocote pellets with fertilizer still within were found within several of the trial's plots. There could be several reasons for this failure. The slope of the "caliche hillside" utilized in the trial could have been severe enough that irrigation and rainfall water might have run down slope faster than it could be absorbed where it could aid in the breaking down of the Agrocote. The treatment application of the Agrocote could have been too late in the growing season to break down or might not have been incorporated properly.

There might have also been an issue with an in-season fertigation event that could have either washed into the trial area of the field or passed through during the fertigation event due to a misunderstanding with farm workers.

There is enough outside evidence on this subject to make an additional effort in 2015 to repeat this trial and its sister trial in cotton under an improved protocol. This improved will involve a tighter control of in-season fertilization, a revision of Agrocote product thickness, and a better attempt to incorporate treatments earlier in the growing season.

Acknowledgements

I would like to extend thanks to McFerrin and Berry Farms for cooperating with us to complete this trial. Tim Burbaker and Dr. Christine Worthington for sponsoring and supporting this trial. The 2014 Plains Pest Management Field Scouts for the operation, data collection, and labor associated with this trial: Jonathan Thobe, Jim Graham, and Kevin Duarte. Thank You all.

2014 Spider Mite Product Control and Efficacy in Grain Sorghum

Texas A&M AgriLife Extension / Gowan
Hale & Swisher Counties
Cooperator: Troy Klepper
Blayne Reed EA-IPM Hale, Swisher, & Floyd / Dr. Craig Sandoski

Summary

Five miticide treatments, including an untreated check were applied to a commercial grain sorghum field experiencing economically damaging pressure of spider mites. Utilized were two rates of Onager, a low rate of 10 oz. per acre and a high rate of 12 oz. per acre, a 4 oz. per acre rate of the active ingredient Abamectin, and a pre-mix of the 10 oz. rate of Onager and the 4 oz. rate of Abamectin. Treatments were organized into a small plot RBD with four replications.

Shortly after applications were made, predator populations increased rapidly causing all mite populations to crash, including the untreated check. Despite the crash of the mite populations, significant differences between treatments and from the untreated check were shown by 7 DAT (P=0.0111) with the most treatments providing significant control. Onager at 12 oz. per acre numerically performed best and was significantly different from the Onager at 10 oz. per acre treatment. The remainder of the treatments, Abamectin at 4 oz., Onager at 10 oz. plus Abamectin at 4 oz., and the Onager at 10 oz. alone were not significantly different from each other. The Onager at 10 oz. per acre was not significantly different from the untreated check

The predator induced crash continued throughout the remainder of the trial and no other significant differences in the trial were found. Stark numerical differences between all treatments and the untreated check were noted on the 14 DAT date, but these differences were not significant (P=0.2174).

Objective

Assess for the first time regionally the efficacy of approved miticides at variable rates on economic populations of banks grass mites in grain sorghum and distribute the resulting information to producers. This was also an opportunity to assess for the first time regionally the approved active ingredient Abamectin's efficacy under field conditions for company purposes

Materials and Methods

This company conceived protocol required five miticide treatments, including an untreated check, be applied to a commercial grain sorghum field experiencing economically damaging pressure of spider mites. On July 28, 2014 substantial populations of banks grass mites were found in a commercial grain sorghum field between Edmonson and Plainview in northwestern Hale County belonging to Troy Klepper. On July 31 this population of mites was found to be an economic concern and the trial was placed in one of the heaviest mite infested areas within the field on August 2.

The five treatments utilized were an untreated check, Onager at 10 oz. per acre, Onager at 12 oz. per acre, a 4 oz. per acre rate of the active ingredient Abamectin, and a pre-mix of the 10 oz. rate of Onager and the 4 oz. rate of Abamectin. These treatments were organized into a small plot RBD with four replications. Plots consisted of six 30 inch rows wide and 36 feet long (4.572 meters X 10.97 meters) with only the middle two rows of each plot actually receiving treatment and four rows consisting of a buffer zone between treatments to prevent overspray. All treatments were made via CO_2 propelled backpack sprayer at 10.5 GPA with a walking ground speed of 3.5 miles per hour and a pressure of 32 PSI. A boom extension attachment was utilized with the backpack sprayer to make spray applications over-the-top from an altitude of 7 feet.

The spider mite population was evaluated by harvesting five randomly selected leaves per plot, transporting back to the IPM lab in Plainview for counting where all mite growth stages per leaf were carefully counted under magnification and recorded. For consistency in data collection the leaves harvested for each plot was the second leave above the mite caused leaf desiccation line. Counts were made pre-treatment on the day of applications, 7 DAT, 14 DAT, and 21 DAT. Mite damage ratings to each plot were also made at 21 DAT. All data was evaluated utilizing ARM (P=0.05).

Results and Discussion

No significant differences were found in the pretreatment counts, ensuring that the mite population was fairly evenly distributed across the trail area.

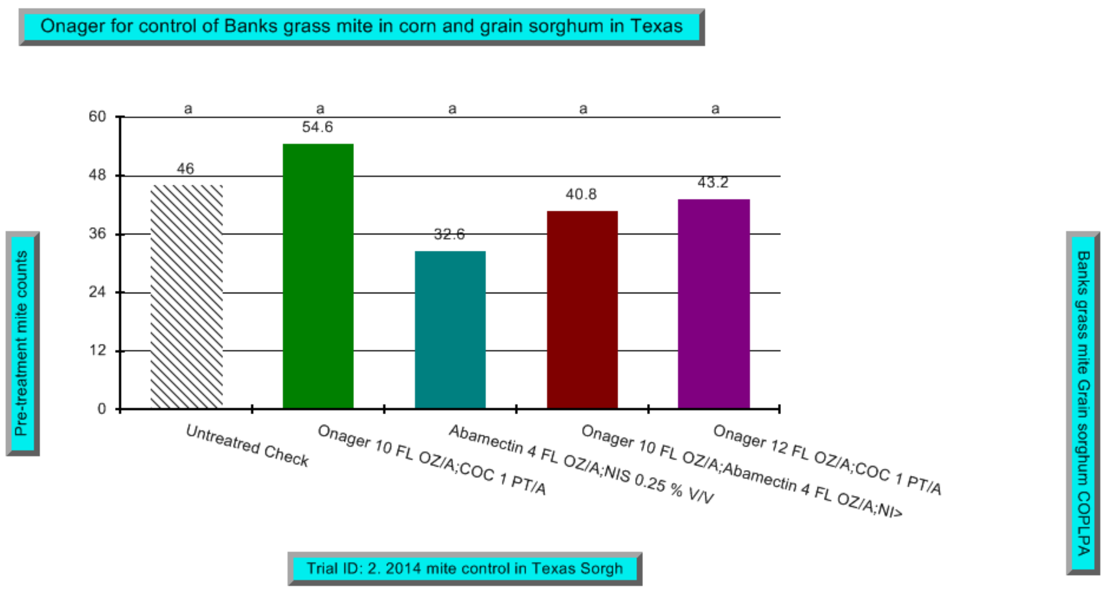


Figure 1. Pretreatment mite counts by treatment (P=0.7423, LSD=35.14).

Shortly after treatment, high amounts of mite predators moved into the trial and began causing all populations to crash. Despite heavy predation, significant differences between treatments and compared to the untreated check were found by the 7 DAT date. Onager at 12 oz. per acre outperformed the untreated check and the Onager at 10 oz. per acre treatment. Onager at 10 oz. per acre, Abamectin at 4 oz. per acre, and the premix treatment of Onager at 10 oz. per acre and Abamectin at 4 oz. per acre were not significantly different. Onager at 10 oz. per acre was not significantly different from the untreated check.

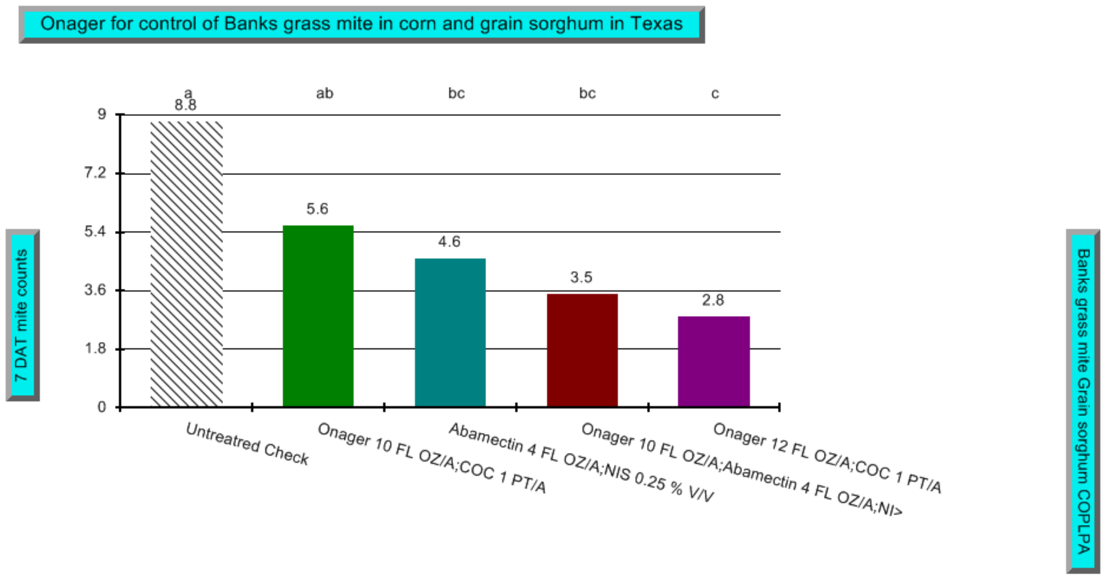


Figure 1. 7 DAT mite counts by treatment (*P*=0.0111, LSD=0.21t).

The heavy mite predation continued throughout the remainder of the trial and no additional significant differences were found. Although not significant, the 14 DAT count has shown stark numeric trends with all treatments showing similar mite populations and the untreated check being numerically higher.

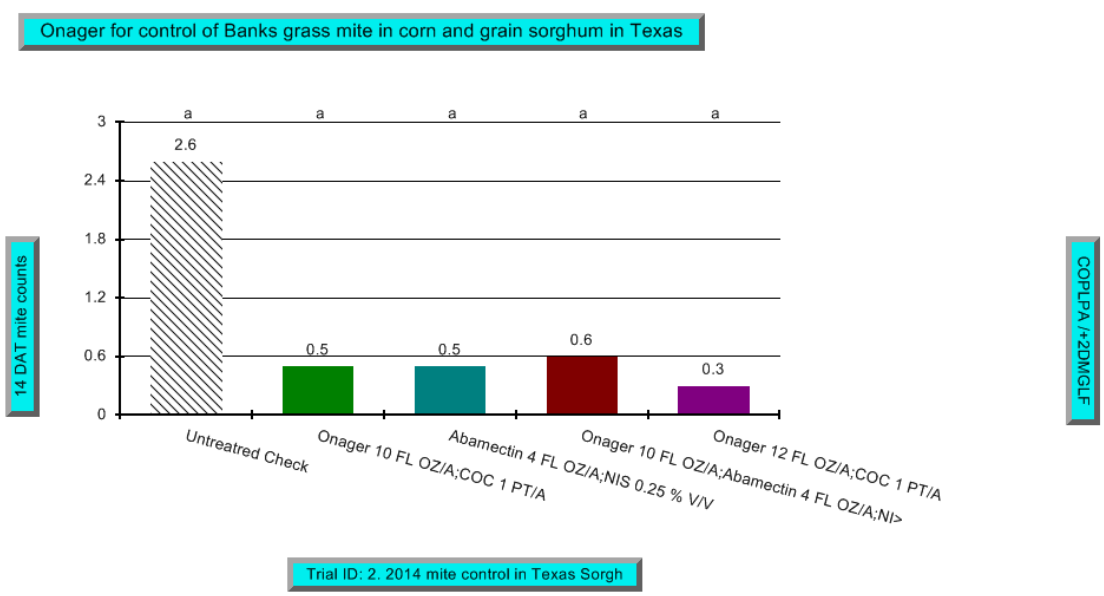


Figure 3. 14 DAT mite counts by treatment (*P*=0.2174, LSD=0.41t).

By the 21 DAT counts mite populations began to stabilize but were well below economic levels for all treatments with no significant differences or large numeric trends of note.

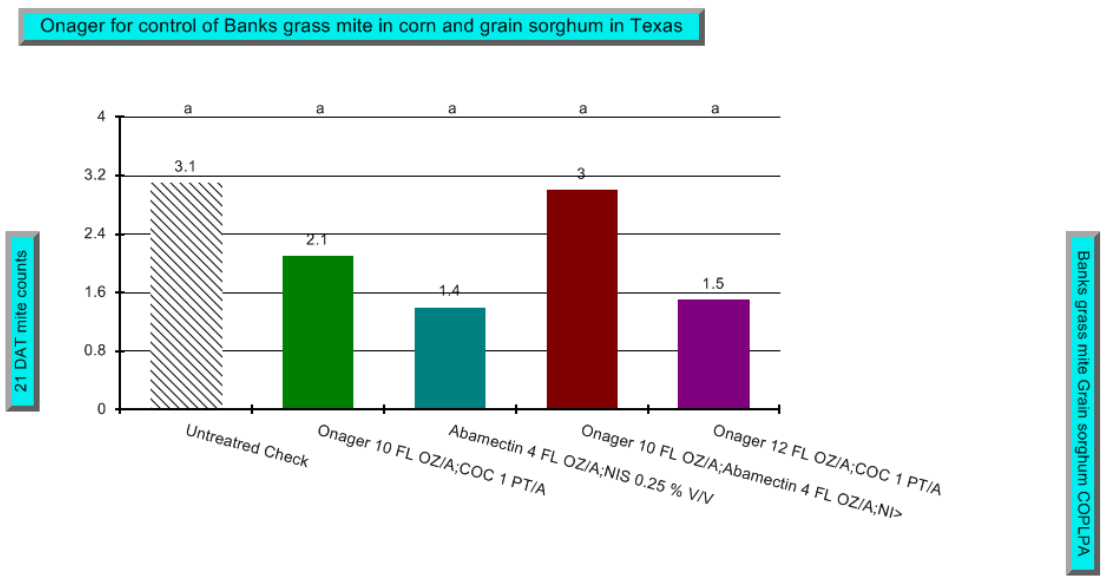


Figure 4. 21 DAT mite counts by treatment (*P*=0.7942, LSD=0.53t).

The 21 DAT mite damage ratings also have shown no significant differences, likely due to heavy predation preventing damage to the untreated check.

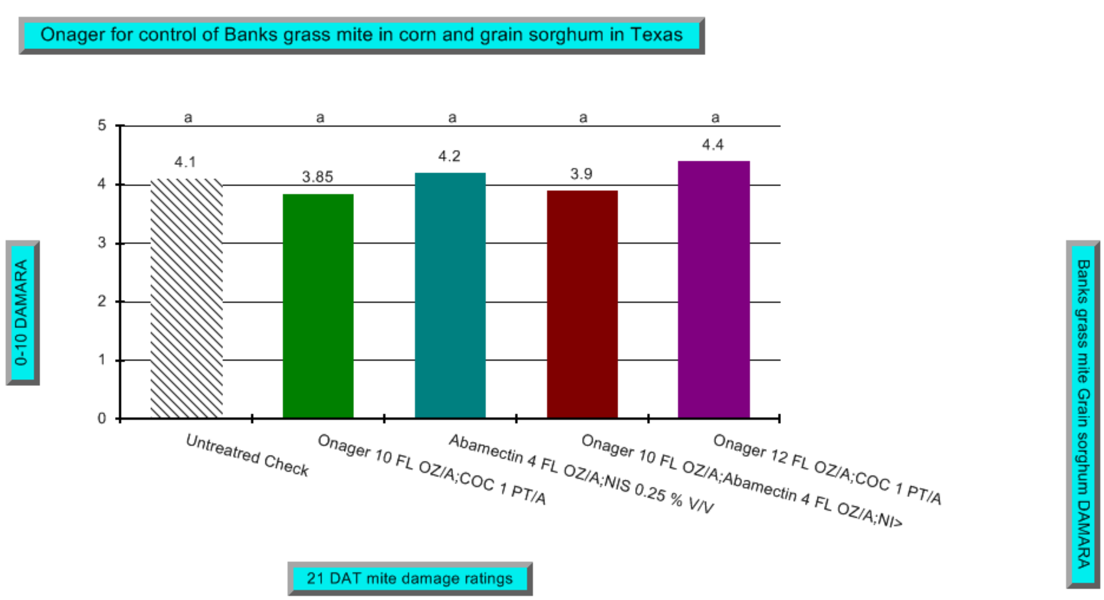


Figure 5. 21 DAT mite damage ratings by treatment (*P*=0.9466, LSD=1.652).

Conclusions

It is typical by historic standards to achieve mite control faster and easier in grain sorghum than in corn. The significant results found on the 7 DAT data proved (*P*=0.0111), for the first time publically in the region, the value of Onager at the 12 oz. rate to commercial grain sorghum experiencing economic mite pressure compared to the untreated check. The value of Abamectin and the premix of Abamectin and Onager were also proven to be useful as a mite treatment if needed or pursued.

Although the mite populations crashed due to predation and no other significant differences were found in this trial, producers should take note of the speed at which the significant differences were shown at the 7 DAT and utilize these treatments as economically needed in commercial situations.

Acknowledgements

I would like to extend thanks to Troy Klepper Farms for cooperating with us to complete this trial. Dr. Craig Sandoski for sponsoring and supporting this trial. I would also like to thank Dr. Ed Bynum and Dr. Pat Porter for sharing products, wisdom, and opinions. The 2014 Plains Pest Management Field Scouts and Lab Workers for the operation, data collection, and labor associated with this trial: Jonathan Thobe, Jim Graham, Kevin Duarte, Ember Reed, and Jerik Reed. Thank You all.

2014 Impact of Sorghum Planting Date on Integrated Pest Management - First Year of a Three Year Study on Pest Trends, Irrigation Management, and Economic Impact

Texas A&M AgriLife Extension Service
Hale & Swisher County
Texas A&M AgriLife Experiment Station - Halfway
Blayne Reed, EA-IPM Hale, Swisher, & Floyd

Summary

A 48 row pivot span at the Texas A&M AgriLife Experiment Station in Halfway, Texas was utilized for planting date comparison with 24 rows planted on May 1st and 24 rows planted on June 16th. All recommended herbicide, seeding rate, and ideal irrigation scheduling for each half of the pivot span was intended. Logistics of the plant stage targeted irrigation scheduling proved impossible for Station managers. The early planted plots received no supplemental irrigations or rainfall through the critical growth stages from flag leaf through hard dough. Meanwhile, the late planted half of the trial received 6 inches irrigation and 3.4 inches rain during the same critical developmental stages. The resulting yield and intended economic impact data was then ruined for the season.

Data on pest pressure was recorded for the entire season in each plot by the Plains Pest Management Scouting Program every week from seed germination through harvest. Pest pressure was greatly reduced in the early planted plot compared to the late planted plot for all recorded pests except spider mites. Green bugs, YSCA, sorghum midge, headworms, and the new invasive pest the sugarcane aphids all had much higher pest populations in the later planted sorghum plot. The sorghum midge and sugarcane aphid were very close to ET, but no pest officially reached that treatment level. No statistics were run on this single season lone data set.

Objective

Interest in early or earlier planted secondary or rotational crop grain sorghum has increased locally over the past several growing seasons for multiple potential agronomic and entomological benefits that have never truly been verified. This three season trial will attempt to capture these potential benefits if present. The potential gain in Integrated Pest Management Plans could include pest avoidance of migratory pests that increase in severity throughout the growing season while the agronomic benefits could include a better matching of key growth and high water need stages with seasonal rain and weather patterns.

Materials and Methods

A 48 row pivot span at the Texas A&M AgriLife Experiment Station in Halfway, Texas was utilized for planting date comparison with 24 rows planted on May 1st and 24 rows planted on June 16th. The locally popular sorghum variety Pioneer 86G32 was utilized for both early and late planted plots. The seed rate for both plots was set at 32,000 seed per acre and an attempt was made to standardize herbicide, and irrigations between plots. Supplemental deficit irrigation was to be targeted and scheduled for key sorghum developmental growth and grain maturation stages. The logistics of this target and demand upon the irrigation system proved impossible. As a result the early planted plot received no supplemental irrigations or rainfall through the critical growth stages from flag leaf through hard dough. Meanwhile, the late planted half of the trial received 6 inches irrigation and 3.4 inches rain during the same critical developmental stages.

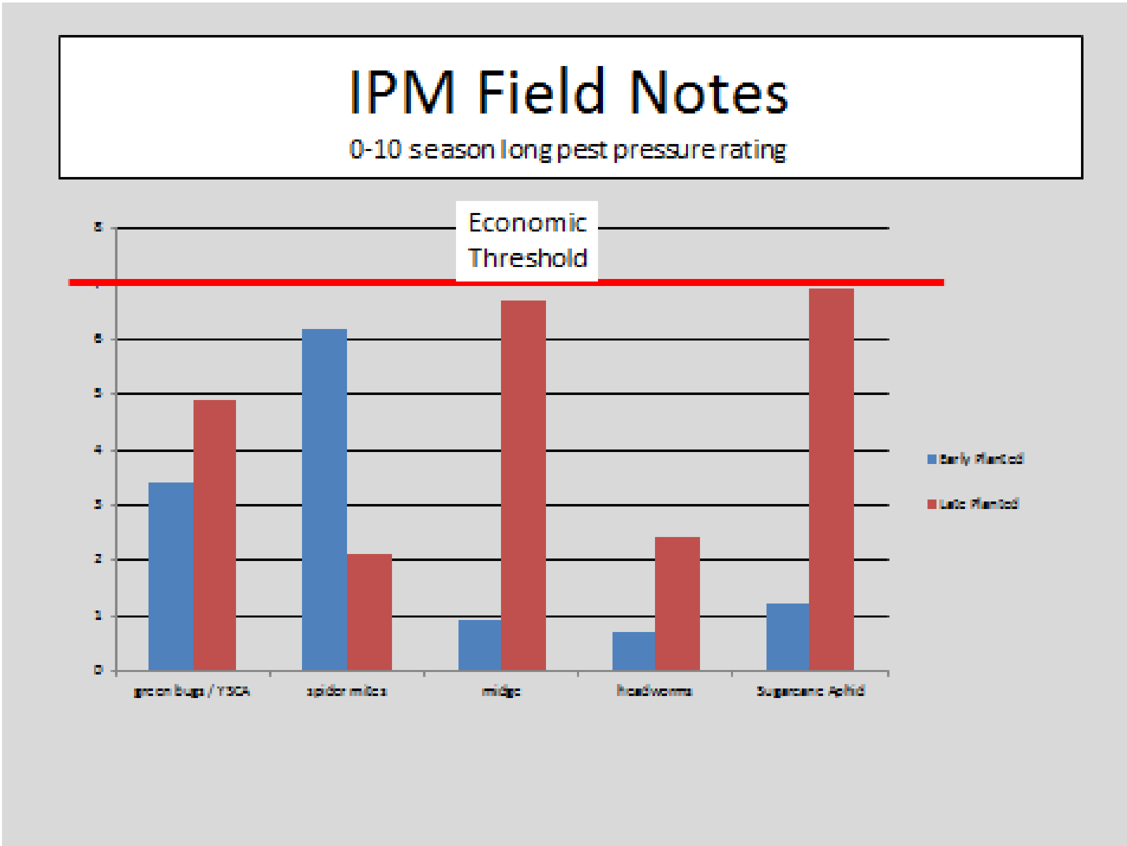
Data collection for pest populations began in each plot shortly after germination and continued through until harvest. Data was collected by the Plains Pest Management Scouting Program weekly as separate fields with normal field scouting techniques. All pest species found were recorded on field data sheets weekly. Pest populations were then rated on a 0-10 scale with ET at 7 after the season from field scouting report sheets. No statistics were run on this single season lone data set.

Results and Discussion

There were remarkable differences between early and late planted plots in pest population density as the season progressed. No pest reached an economic or action threshold treatment level but numeric and rating differences were stark with the early planted sorghum having less pest pressure overall. The greatest disparity in pest pressure for the season was in sorghum midge and the new invasive pest, the sugarcane aphid with the later planted test having far more pest pressure than the early planted. Green bugs, yellow sugarcane aphids, and headworms were also higher in the late planted plots. The only pest that had a higher pest pressure in the early planted field was spider mites.

These results seem to concur with pest population hypotheses and typical pest population dynamics.

Due to this discrepancy in irrigation treatments between the plots, no yield or full economic or agronomic analysis of this year’s trial was noteworthy.



Graph 1. Recorded sorghum pest intensity rating by common name. Data collected throughout the growing season by the PPM scouting program.

Conclusions

The first year's pest population data strongly indicate that an earlier planted sorghum crop, still within soil temperature and management guidelines, should experience less pest pressure than a later planted crop. This should prove very important as the new and invasive sugarcane aphid should migrate into the region later in the growing season. Earlier planted sorghum should have a better chance reaching a treatment level for this and several other pest species that either migrate into the area or build over a growing season.

Due to this discrepancy in irrigation treatments between the plots, no yield or full economic or agronomic analysis of this year's trial entry would be worthwhile.

Acknowledgements

I would like to thank the Plains Pest Management Field Scouts for data gathering, weed hoeing, and general accomplishment of this trial as well as Dr. Pat Porter, District 2 Entomologist, and Dr. Ed Bynum for advice and opinions regarding the importance and conducting of this trial.

2014 Sorghum Partners Grain Sorghum Variety Trial
Texas A&M AgriLife Extension Service
Hale & Swisher County
Cooperator: Troy Klepper
Blayne Reed EA-IPM Hale, Swisher, & Floyd / Phillip Thornton – Sorghum Partners

Summary

Ten early-mid and mid grain sorghum varieties were selected to take part in a local, independently conducted, variety trial. The trial was placed in a pivot irrigated field between Edmonson and Plainview belonging to Klepper Farms. A large plot RBD with three reps was placed on one through around the pivot. The large plots were 30 feet wide by 133 feet long (9.144m X 40.54m), on 30 inch rows with a solid planting pattern. All production and irrigation practices were normal as determined by the producer with consultations with the IPM agent and researcher. Varieties utilized in the trial were; Sorghum Partners SP3302, Sorghum Partners KS585, Sorghum Partners K35-Y5, Sorghum Partners NK5418, Sorghum Partners experimental X445, Sorghum Partners SPX3550, Sorghum Partners SP3425, Pioneer 86G32, Sorghum Partners NK6638, and Sorghum Partners SPX 3678.

Plots were planted on April 30, 2014. One in-season data collection was taken on August 2, 2014 when plant stage, spider mite and aphid damage was recorded, and bird feeding preference notes were taken. Harvest data was collected on October 17, 2014.

Significant differences in plant stage, spider mite damage ratings, yellow sugarcane aphid damage ratings, and bird feeding preferences were found on the lone in-season data collection date of August 2. The varieties KS585, NK6638, and SPX3678 were rated as being less advanced in growth stage (*P*=0.0024), SP3303 had the least amount of spider mite damage (*P*=0.0001), SPX3678 and SP3425 had the lowest yellow sugarcane aphid damage, and SP3303 had the highest amount of bird damage (*P*=0.0001) by the collection date.

No statistically significant differences were found in terms of yield (*P*=0.2201, LSD = 1659.595 lbs. per acre) at harvest, but large numeric differences were noted with the varieties SPX3678 and NK6638 taking the top two spots. Significant differences were found in percent moisture and bushel weight with the varieties SP3425 and NK5418 being the most dry and harvest ready (*P*=0.002, LSD=0.975%) and the varieties X445, Pioneer 86G32, and NK6638 separated themselves with the heaviest bushel weight (*P*=0.0001, LSD=1.819 lbs.).

Objective

The purpose of this trial was to obtain local, independently conducted, research information about little known but potentially commercially acceptable sorghum varieties for the benefit of area producers.

Materials and Methods

Ten early-mid and mid grain sorghum varieties were selected to take part in a local, independently conducted variety trial. The trial was placed in a pivot irrigated field between Edmonson and Plainview belonging to Klepper Farms. A large plot RBD with three reps was placed on one through around the pivot in a linear RBD pattern. The large plots were 30 feet wide by 133 feet long (9.144m X 40.54m), on 30 inch rows with a solid planting pattern. All production and irrigation practices were standard as determined by the producer with consultations with the IPM agent. Varieties utilized in the trial were; Sorghum Partners SP3302, Sorghum Partners KS585, Sorghum Partners K35-Y5, Sorghum Partners NK5418, Sorghum Partners experimental X445, Sorghum Partners SPX3550, Sorghum Partners SP3425, Sorghum Partners SPX 3678 , Sorghum Partners NK6638, and Pioneer 86G32 as a check variety.

This trial was planted on April 30, 2014 with use of the producer's 12 row planter set for 30 inch rows. Plots were checked weekly for insect weed and disease problems by the Plains Pest Management Association scouting program as a portion of the larger field. Data on variety maturity, spider mite damage, yellow sugarcane aphid damage, and bird feeding damage was collected on a single date of August 2, 2014.

Harvest was overseen by joint efforts by the producer, IPM agent and Sorghum Partners representatives and occurred on October 17, 2014. Plots were harvested by the producer individually. Grain was then transferred to a research and data collecting grain buggy belonging to Sorghum Partners where plot yield was recorded by weight. A sample of each plot's grain was tested for percent moisture and bushel weight. All data was analyzed utilizing ARM (P=0.05)

Results and Discussion

On the in-season data collection date, there were three varieties that were significantly slower in plant developmental stage ratings. They were KS585, NK6638, and SPX3678. All other varieties were not significantly different from each other and were farther in along in plant and grain development.

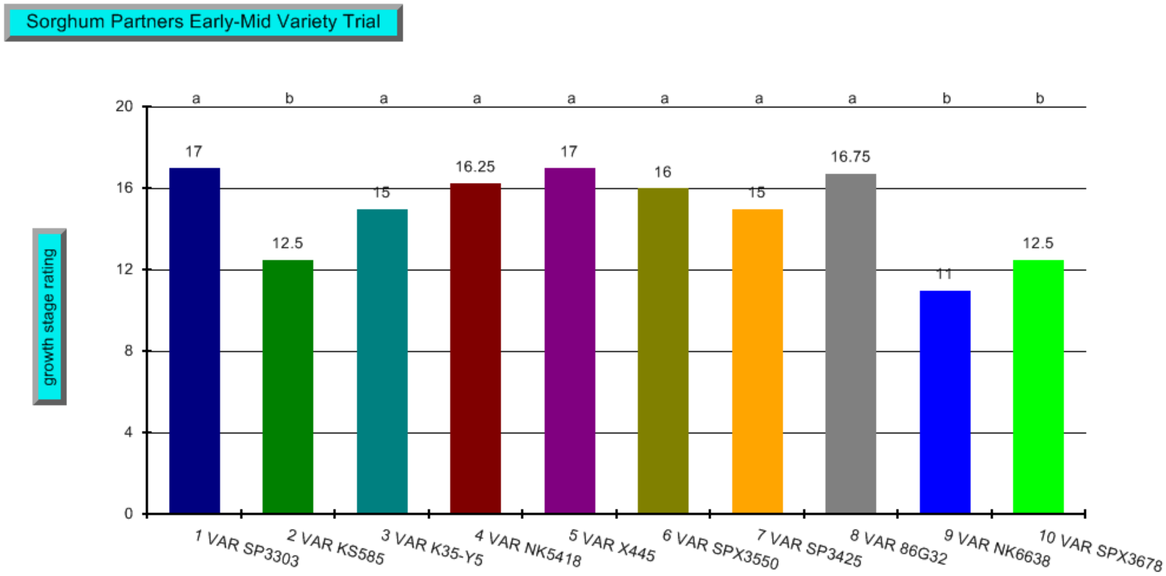


Figure 1. Numerical ratings of plant growth stage on August 2, 2014 by variety (*P*=0.0024, LSD=2.199)

There was quite a bit of variability and separation in spider mite damage ratings on the lone data collection date of August 2. Spider mite population distribution was not even throughout the field or plots and could have skewed some of these ratings but patterns did develop. The variety SP3303 sustained the least amount of feeding damage but did not significantly separate from the bulk of the other varieties performing well K35-Y5, NK5418, Pioneer 86G32, and X445. SPX3678 only outperformed KS585, SP3425, and NK6638 which had the highest mite feeding damage rating.

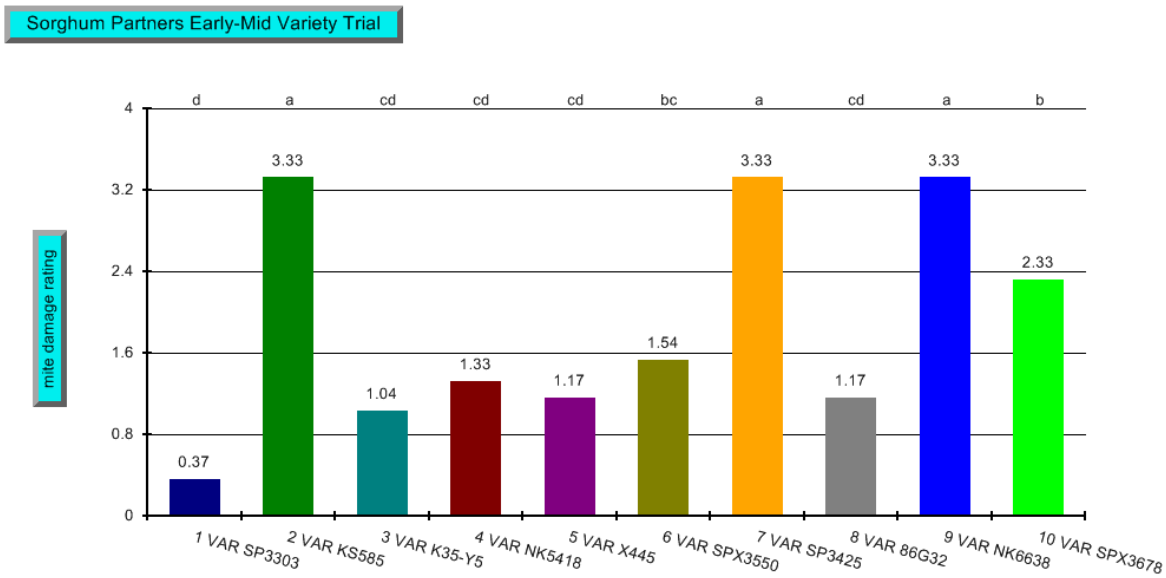


Figure 2. Spider mite damage ratings on August 2 by variety (*P*=0.0001, LSD=0.985)

The yellow sugarcane aphid population was far less spotty through the field than the spider mite populations were but never reached an economic level for the field. Definite differences in damage between varieties in terms of aphid damage ratings were recorded on August 2. The varieties SP3425 and SPX3678 significantly outperformed all other varieties except X445, KS585, and Pioneer 86G32. The varieties SP3303, K35-Y5, and SPX3550 were significantly outperformed by all other sorghum varieties in the trial.

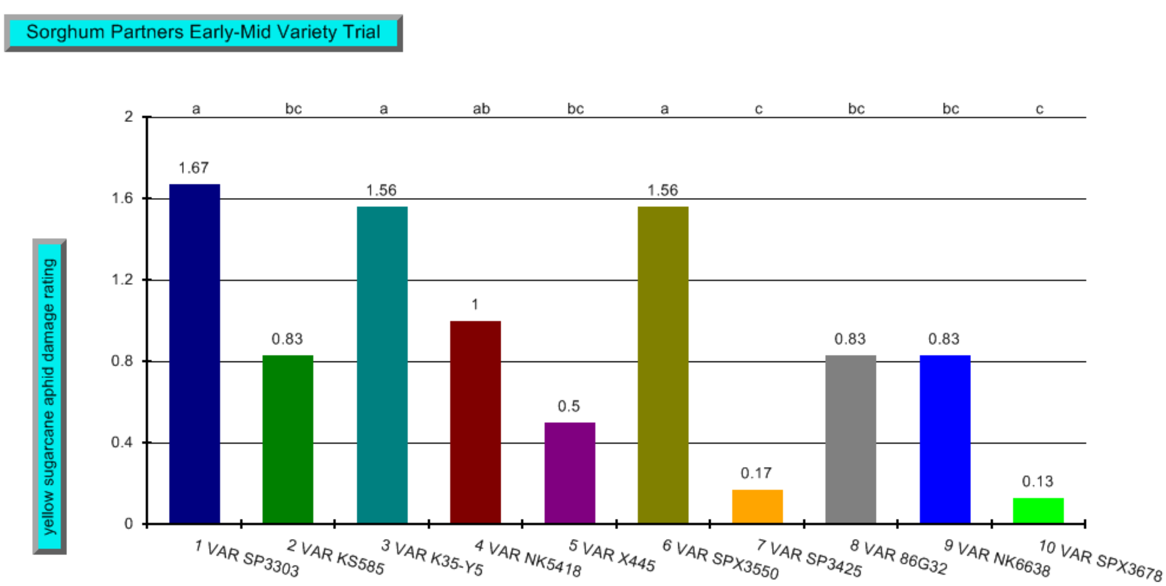


Figure 3. Yellow sugarcane aphid damage ratings on August 2 by variety (*P*=0.0016, LSD=0.711).

The potentially most impactful data collected on August 2 was for bird feeding preference. The varieties SP3303 and K35-Y5 sustained significant and notable damage to bird feeding. This feeding was impactful enough that likely adversely affected all harvest data for these two varieties. Pioneer 86G32 was not significantly different from K35-Y5 but sustained much less damage compared to SP 3303 and K35-Y5. NK5418, SPX3550, X445, and SPX3678 experienced measurable bird damage but was not statistically significant compared to KS585, SP3425, and NK 6638, none of which experienced any measureable bird feeding damage.

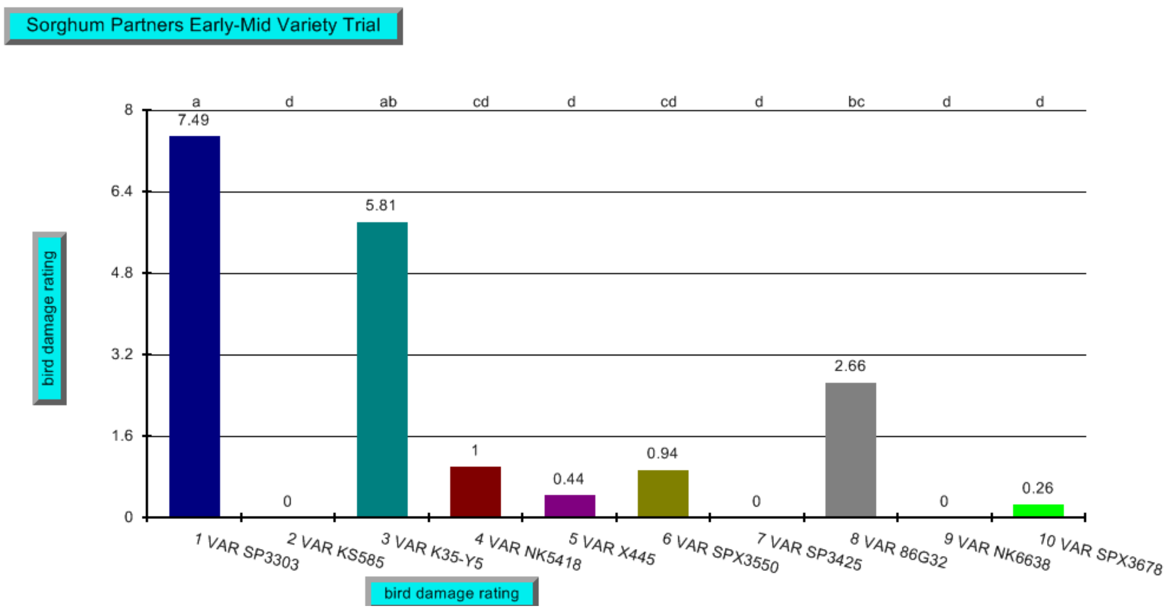


Figure 4. Bird feeding damage measured on August 2 by variety (*P*=0.0001, LSD=0.328t).

There were no statistically significant differences in harvested grain yield per acre. SPX3678 was numerically superior with a yield of 5,971.45 pounds grain yield per acre while SP3303 numerically yielded the least with 3,681.17 pounds of seriously bird feeding reduced grain yielded per acre. The check variety Pioneer 86G32, with only limited bird feeding damage, was the next numerically poorest performer with only 4,152.2 pounds of grain yield per acre.

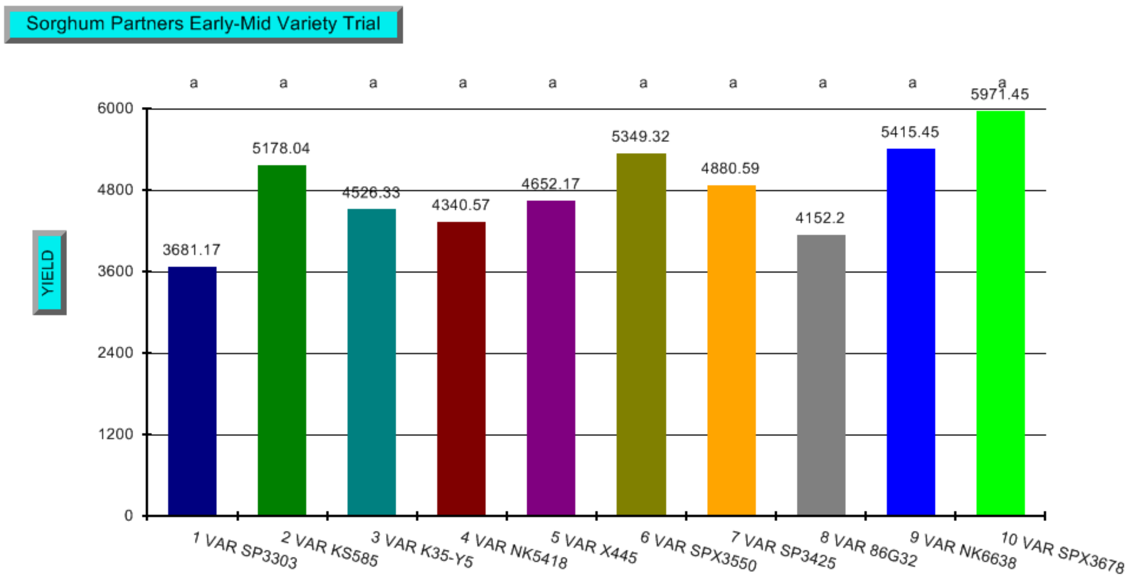


Figure 5. Grain yield per acre by variety (*P*=0.2201, LSD=1659.595).

The varieties included in this trial ranged in percent grain moisture between 12.23% down to 9.84%. All were acceptable to the standards for grain moisture held by commercial elevators in 2014. It could be inferred that the varieties with the lowest percent grain moister were likely the most harvest ready varieties. The variety SP3424 held the lowest percent grain moisture while SP3303 held the highest. Many significant differences broke throughout all varieties in the trial.

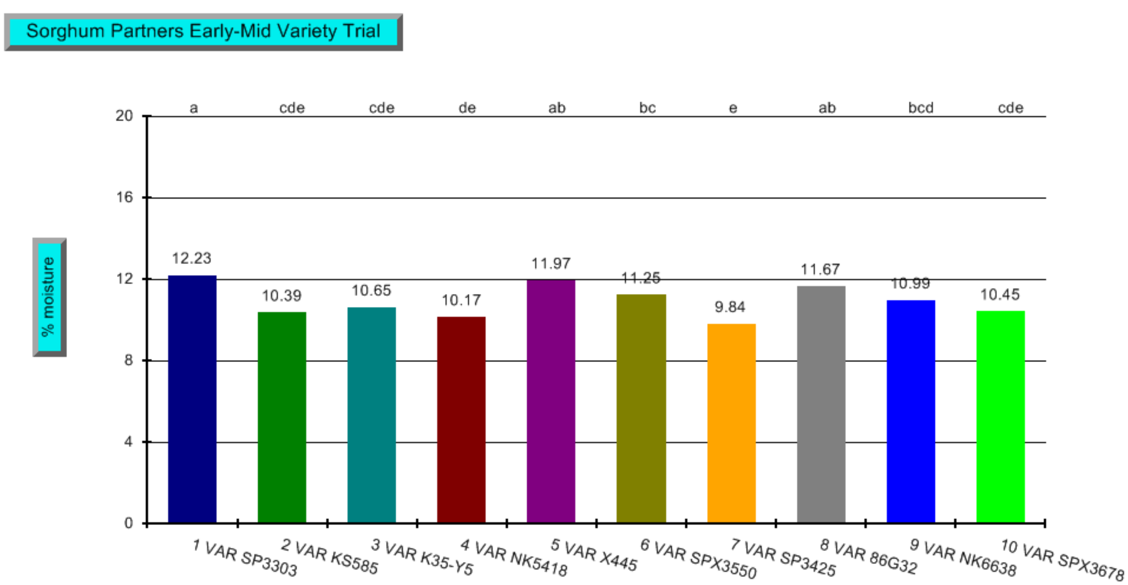


Figure 5. Percent grain moisture on harvest date, October 17, 2014 by variety (*P*=0.002, LSD=0.975).

Several Significant differences between varieties also occurred in terms of per bushel grain weight. The experimental variety X445 had the heaviest grain weight at 55.8 lbs. per bushel and K35-Y5 had the lightest with 49.81 lbs. per bushel. Differences stretched throughout all varieties with significance overlapping weight groups.

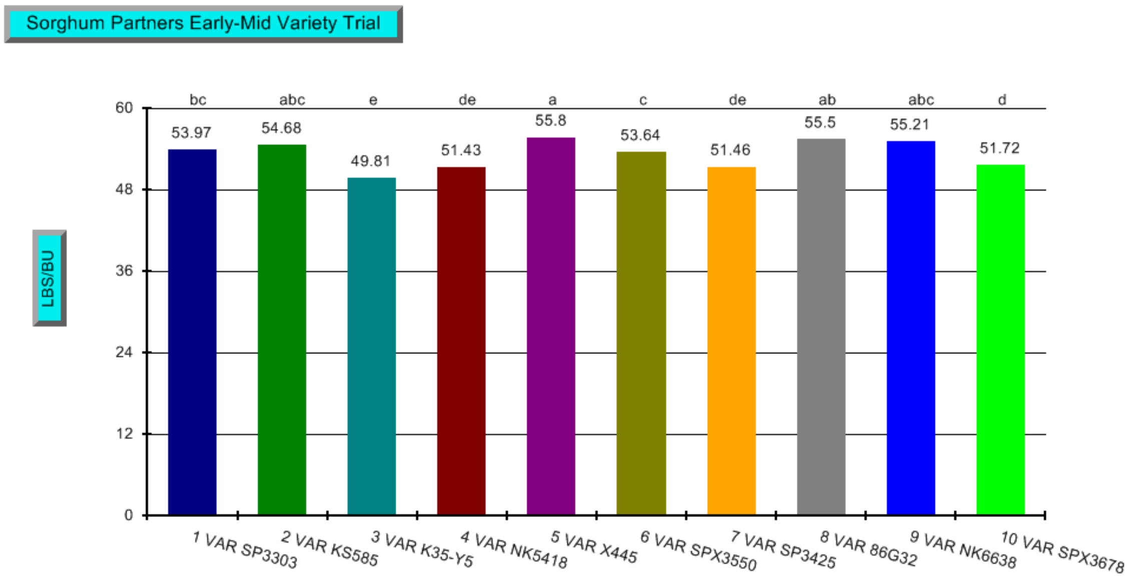


Figure 6. Pounds per bushel grain weight, October 17, 2014 by variety (*P*=0.0001, LSD=1.819 pounds).

Conclusions

The most impactful and significant information that producers can put to immediate use gathered from this trial could be the bird feeding damage rating (Figure 4). There were stark contrasts in which grain sorghum variety the native birds preferred. The variety that they consistently chose over the others was Sorghum Partners SP3303. It is likely that the bird feeding caused SP3303 to have the lowest numerical grain yield. SP3303 is food grade sorghum and thusly has many qualities that would make it a preferred food source, apparently for multiple species. This bird damage factor should be taken into consideration by any producers considering growing this variety or the variety K35-Y5, which was only numerically lower than SP3303 in bird damage.

Other management steps should be taken for bird control should be taken if these otherwise assumed well performing varieties are grown. Please note the planting date of April 30. This planting date is earlier than the current sorghum management norm. As this trial progressed, this field was much more advanced in stage than the surrounding sorghum fields. When grain development began, this field, and this trial within it, was the only field for which birds would have available in the area for sorghum grain feeding. A sharp focus of bird feeding occurred by more concentrated birds than would either occur on a larger field of SP3303 and

K35-Y5 or if other nearby fields were in a similar stage. It is assumed that if at a similar stage to surrounding fields, the impact from upon these preferred varieties would be lessened and that other areas of varietal performance would improve.

The significant variance in the numerical representation of plant stage is a good indicator of how the maturity levels of each of these early-mid and mid varieties fall out. The varieties KS585, NK6638, and SPX3678 will require a longer growing season than the remainder of the varieties.

The differences in spider mite damage and yellow sugarcane aphid damage are noteworthy, but only represent one data collection date. This particular date in relation to these subjects was opportunistic in nature for this trial. Other more in depth studies are needed or should be referenced before solid decisions are made about these varieties on these issues.

Not finding statistically significant differences in grain yield between sorghum varieties was disappointing. Finding significant differences in large plot trials is very difficult without multiple seasons and enormous data sets. Most single season large plot trials are evaluated by end users on numerical differences alone (Figure 5) and the differences in varieties in grain yield were fairly good for this trial and type (*P*=0.2201). With this in mind, the values on Figure 5 can be useful to producers, although not statistically proven to be repeatable. The numerical ranking of the varieties are:

1	SPX3678	5,971 lbs. acre
2	NK6631	5,416 lbs. acre
3	SPX3550	5,349 lbs. acre
4	KS585	5,178 lbs. acre
5	SP3425	4,881 lbs. acre
6	X445	4,652 lbs. acre
7	K35-Y5	4,528 lbs. acre
8	NK5418	4,341 lbs. acre
9	Pioneer 86G32 (check)	4,152 lbs. acre
10	SP3303	3,682 lbs. acre

Table 1. Grain Sorghum variety numerical ranking by yield performance (*P*=0.2201)

While grain yield rightfully receives the highest priority of producer's evaluations, repeatable differences in percent moisture and bushel weight are secondary considerations that need assessment. For this trial, several significant differences in these categories were noted (Figures 5 & 6). I would suggest looking closely at a variety that performs consistently in all categories.

Acknowledgements

I would like to extend thanks everyone at Klepper Farms for cooperating with us to complete this trial. I would also like to thank Phillip Thornton for sharing products and coordinating with us for this trial. Finally I would like to thank Jonathan Thobe, 2014 Plains Pest Management Head Field Scout, for assisting with data collection.

2014 Huskie Herbicide Weed Control, Damage, and Yield Response in West Texas Grain Sorghum with Relation to Rate, Herbicide Premix, and Foliar Iron Chelate Treatments

Texas A&M AgriLife Extension Service
Hale & Swisher County
Cooperator: Craig Klepper
Blayne Reed, EA-IPM Hale, Swisher, & Floyd / Russ Perkins, Bayer Crop Science

Summary

Eight differing sorghum herbicide treatments including an untreated check, six variances of herbicide mixes of Huskie both with and without iron chelate added to the mix, and one industry comparison were applied on June 19, 2014 to V9 growth stage grain sorghum. The treatments included an untreated check, Huskie at 13 oz. and Atrazine at 1 pt. with 13 oz. 1.8% Iron Chelate, Huskie at 16 oz. and Atrazine at 1 pt. with 13 oz. 1.8% Iron Chelate, Huskie at 13 oz. and Atrazine at 1 pt. plus 2, 4-D Ester at 4 oz. with 13 oz. 1.8% Iron Chelate, Huskie at 13 oz. and Atrazine at 1 pt. plus Clarity at 4 oz. with 13 oz. 1.8% Iron Chelate, Huskie at 13 oz. and Atrazine at 1 pt. plus Comit at 4.5 oz. with 13 oz. 1.8% Iron Chelate, Atrazine at 1 pt. with Buctril at 1 pt., Huskie at 16 oz. and Atrazine at 1 pt. Treatments were arranged into a small plot trial RBD with four replications. Plots were 4, 30 inch rows wide by 38 feet long. Data on crop damage was gathered at 7, 10, and 17 DAT. Data on percent weed control was measured at 17 and 45 DAT. Yield data was collected from 10 consecutive row feet from each plot on October 1, 2014 when area was hand harvested and thrashed with AMCO small plot thrasher and yield data recorded.

All treatments including Huskie herbicide, both with and without iron chelate added, shown significantly more visual crop damage than the untreated check and the industry comparison at 7 and 10 DAT. All damaged plots recovered quickly by 17 DAT in a numeric sense although there were still significant differences between all Huskie treatments and the UTC. By the 17 DAT the Huskie at 13 oz. and Atrazine at 1 pt. plus 2, 4-D Ester at 4 oz. with 13 oz. 1.8% Iron Chelate and the Huskie at 13 oz. and Atrazine at 1 pt. plus Clarity at 4 oz. with 13 oz. 1.8% Iron Chelate treatments were not significantly different from the industry comparison while all other treatments were still significantly different from that industry check treatment.

All herbicide treatments statistically outperformed the UTC in weed control. At 45 DAT the Huskie at 13 oz. and Atrazine at 1 pt. plus Clarity at 4 oz. with 13 oz. 1.8% Iron Chelate treatment outperformed the Huskie at 16 oz. and Atrazine at 1 pt. with 13 oz. 1.8% Iron Chelate in percent weed control. There were no other significant differences in percent weed control between treatments, but slight numeric differences were noted.

Despite significant differences in visual damage ratings at the 7, 10, and 17 DAT between treatments and between treatments and the UTC, no correlation could be drawn in regard to the addition of the iron chelate to the herbicide mix and grain yield. The Huskie at 13 oz. and Atrazine at 1 pt. plus Clarity at 4 oz. with 13 oz. 1.8% Iron Chelate, Huskie at 16 oz. and Atrazine at 1 pt. with 13 oz. 1.8% Iron Chelate, and Huskie at 13 oz. and Atrazine at 1 pt. with 13 oz. 1.8% Iron Chelate were significantly higher in grain yield compared to the UTC, Huskie at 13 oz. and Atrazine at 1 pt. plus Comit

at 4.5 oz. with 13 oz. 1.8% Iron Chelate, and the Atrazine at 1 pt. with Buctril at 1 pt. industry check treatments. No other significant differences were found in terms of yield, bushel weight, or percent moisture. Any significant differences between differences in yield were likely due to percent weed control differences in treatments, which between treatments was not statistically significant, but in most cases was slightly numerically noticeable.

Objective

The objective of this company derived protocol was to a) locally evaluate weed control of Huskie herbicide under a wide array of herbicide premixes compared to an untreated check and against a Huskie free herbicide blend, b) locally evaluate crop damage of Huskie herbicide alone and in the varying herbicide premixes compared to both the UTC and the Huskie free treatments both with and without an iron chelate treatment added, and c) evaluate yield impacts of the varying herbicide treatments both with and without the iron chelate added to the herbicide premixes.

Materials and Methods

Eight differing sorghum herbicide treatments including an untreated check, six variances of herbicide mixes of Huskie both with and without iron chelate added to the mix, and one industry comparison were applied on June 19, 2014 to V9 growth stage grain sorghum. The treatments included an untreated check, Huskie at 13 oz. and Atrazine at 1 pt. with 13 oz. 1.8% Iron Chelate, Huskie at 16 oz. and Atrazine at 1 pt. with 13 oz. 1.8% Iron Chelate, Huskie at 13 oz. and Atrazine at 1 pt. plus 2, 4-D Ester at 4 oz. with 13 oz. 1.8% Iron Chelate, Huskie at 13 oz. and Atrazine at 1 pt. plus Clarity at 4 oz. with 13 oz. 1.8% Iron Chelate, Huskie at 13 oz. and Atrazine at 1 pt. plus Comit at 4.5 oz. with 13 oz. 1.8% Iron Chelate, Atrazine at 1 pt. with Buctril at 1 pt., Huskie at 16 oz. and Atrazine at 1 pt. Treatments were arranged into a small plot trial RBD with four replications.

Trial Map Treatment Description

Trt	Trt Code	Trt Description
1	CHK	Untreated Check not treated
2		Huskie 13 FL OZ/A;Atrazine 1 PT/A;AMS; NIS; Iron Chelate 1.8% 13 OZ/A
3		Huskie 16 FL OZ/A;Atrazine 1 PT/A;AMS; NIS; Iron Chelate 1.8% 16 OZ/A
4		Huskie 13 FL OZ/A;Atrazine 1 PT/A;2, 4-D Ester 4OZ/A; AMS; NIS; Iron Chelate 1.8% 13 OZ/a
5		Huskie 13 FL OZ/A;Atrazine 1 PT/A;Clarity 4 OZ/A; AMS; NIS; Iron Chelate 1.8% 13 OZ/A
6		Huskie 13 FL OZ/A;Atrazine 1 PT/A;Comit 4.5 OZ/A; AMS: NIS; Iron Chelate 1.8% 13 OZ/A
7		Atrazine 1 PT/A;Buctril 1 PT/A
8		Huskie 16 FL OZ/A;Atrazine 1 PT/A;AMS; NIS

401 6	402 5	403 3	404 4	405 8	406 7	407 2	408 1
301 1	302 2	303 5	304 8	305 7	306 4	307 3	308 6
201 5	202 3	203 4	204 7	205 6	206 1	207 2	208 8
101 6	102 4	103 8	104 1	105 3	106 2	107 5	108 7

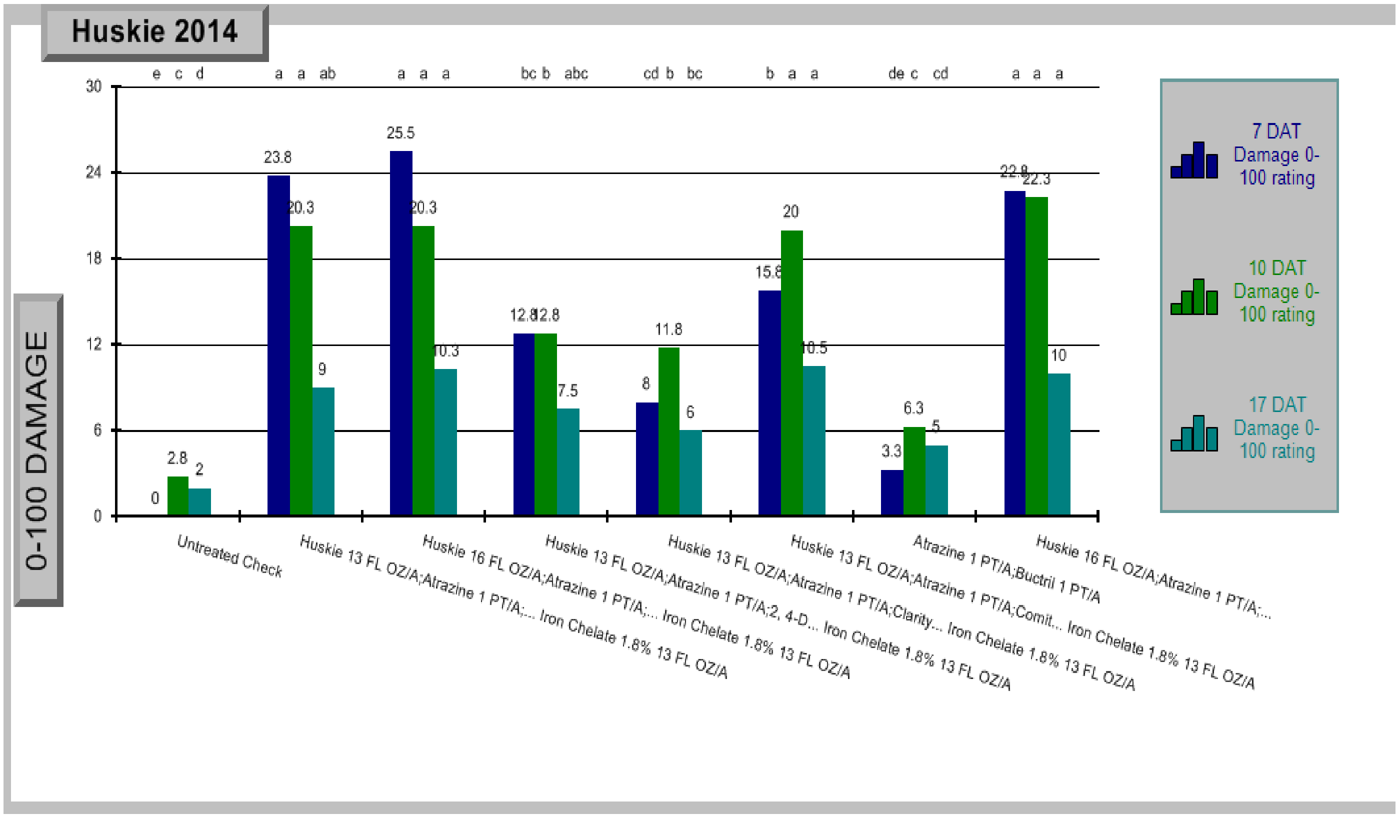
Table 1. 2014 Huskie Herbicide Trial Map with Treatment Descriptions.

Plots were 4, 30 inch rows wide by 38 feet long. All treatment applications were made via CO2 propelled backpack sprayer at 10.5 GPA with a walking ground speed of 3.5 miles per hour and a pressure of 32 PSI. All field gathered data was statistically compared using ARM utilizing AOV and LSD (*P*=0.05).

Data on crop damage ratings was gathered at 7, 10, and 17 DAT on a 0-100 rating basis. Data on percent weed control was measured at 17 and 45 DAT with UTC =0 per replication comparison. Yield data was collected from 10 consecutive row feet from each plot on October 1, 2014 when area was hand harvested and thrashed with AMCO small plot thrasher and yield data recorded. All grain samples were measured for percent moisture and bushel weight. All data was statistically compared using ARM utilizing AOV and LSD (*P*=0.05).

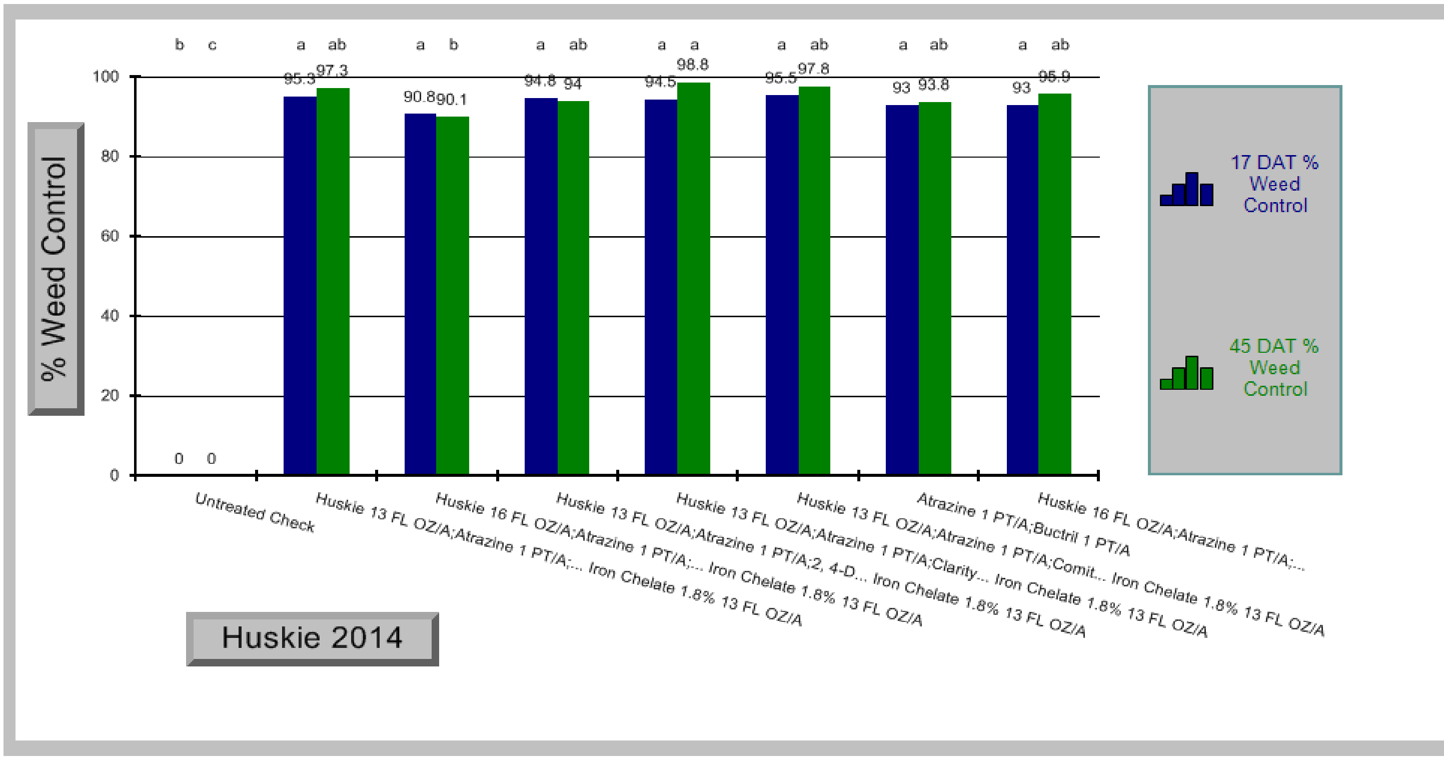
Results and Discussion

All treatments including Huskie herbicide, both with and without iron chelate added, shown significantly more visual crop damage than the untreated check and the industry comparison at 7 and 10 DAT. All damaged plots recovered quickly by 17 DAT in a numeric sense although there were still significant differences between all Huskie treatments and the UTC. By the 17 DAT the Huskie at 13 oz. and Atrazine at 1 pt. plus 2, 4-D Ester at 4 oz. with 13 oz. 1.8% Iron Chelate and the Huskie at 13 oz. and Atrazine at 1 pt. plus Clarity at 4 oz. with 13 oz. 1.8% Iron Chelate treatments were not significantly different from the industry comparison while all other treatments were still significantly different from that industry check treatment.



Graph 1. Herbicide / Crop damage ratings by treatment at 7, 10, and 17 DAT (*P*=0.0001, *P*=0.0001, *P*=0.0006)

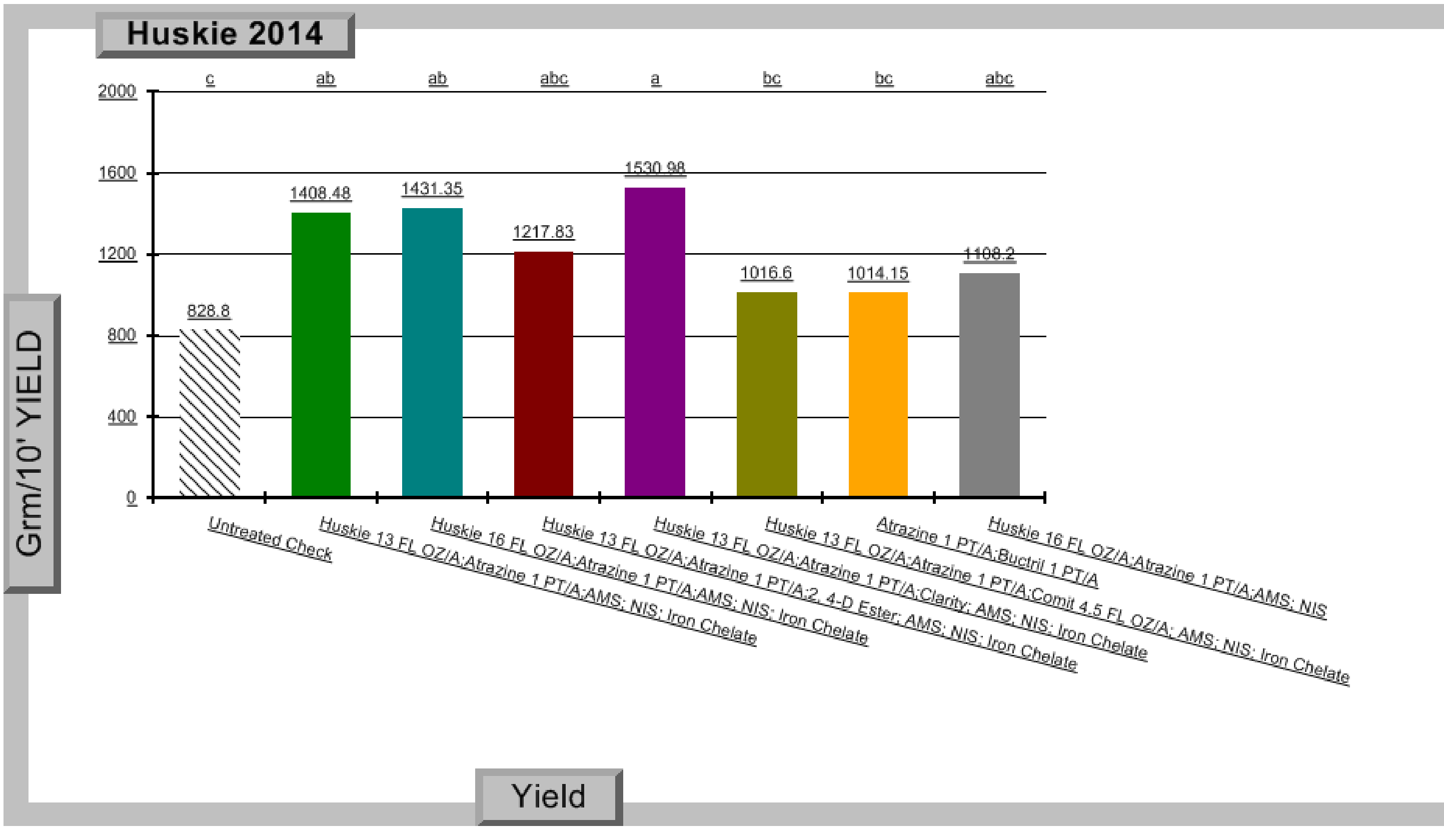
All herbicide treatments statistically outperformed the UTC in weed control. At 45 DAT the Huskie at 13 oz. and Atrazine at 1 pt. plus Clarity at 4 oz. with 13 oz. 1.8% Iron Chelate treatment outperformed the Huskie at 16 oz. and Atrazine at 1 pt. with 13 oz. 1.8% Iron Chelate in percent weed control. There were no other significant differences in percent weed control between treatments, but slight numeric differences were noted.



Graph 2. Percent weed control at 17 and 45 DAT (*P*=0.0001, *P*=0.0001)

Despite significant differences in visual damage ratings at the 7, 10, and 17 DAT between treatments and between treatments and the UTC, no correlation could be drawn in regard to the addition of the iron chelate to the herbicide mix and grain yield.

The Huskie at 13 oz. and Atrazine at 1 pt. plus Clarity at 4 oz. with 13 oz. 1.8% Iron Chelate, Huskie at 16 oz. and Atrazine at 1 pt. with 13 oz. 1.8% Iron Chelate, and Huskie at 13 oz. and Atrazine at 1 pt. with 13 oz. 1.8% Iron Chelate were significantly higher in grain yield compared to the UTC, Huskie at 13 oz. and Atrazine at 1 pt. plus Comit at 4.5 oz. with 13 oz. 1.8% Iron Chelate, and the Atrazine at 1 pt. with Buctril at 1 pt. industry check treatments. No other significant differences were found in terms of yield, bushel weight (*P*=0.0903), or percent moisture (*P*=0.0958).



Graph 1. Grain Yield in grams per 10 row feet per plot by treatment (*P*=0.0316)

Conclusions

From this trial, we cannot conclude that the addition of iron chelate to a Huskie herbicide mix will aid yield in any way. Also due to the results, we cannot state that the damage rating was aided in any significant way.

Any significant differences between treatments in yield were likely due to percent weed control differences in treatments, which between treatments was not statistically significant, but in most cases was slightly numerically noticeable. This is certainly the case for the UTC, but clearly does not follow fully the percent weed control patters. At harvest it was noted that in several treatment plots that Palmer amaranth could have affected treatment yield, but weed species was not taken into consideration for overall percent weed control.

Acknowledgements

I would like to extend thanks everyone at Klepper Farms for cooperating with us to complete this trial and letting us take over your barn with our thrashing equipment during harvesting of this trial. I would also like to thank Russ Perkins for sponsorship and furnishing products for this trial. Finally I would like to thank the Plains Pest Management Field Scouts, for assisting with data collection associated with this trial, Johnathon Thobe, Jim Graham, and Kevin Duarte.

2014 Spider Mite Product Efficacy Evaluation in Corn

Texas A&M AgriLife Extension Service / Nichino America

Hale & Swisher Counties

Cooperator: Kent Springer

Blayne Reed, EA-IPM Hale, Swisher, & Floyd / Dr. Scott Ludwig, Nichino America

Summary

Six different miticide treatments, including an untreated check, one registered miticide product, and four commercially available miticide products were evaluated for banks grass mite efficacy in a commercial corn for grain. A commercial corn field at early dough stage belonging to Kent Springer was found to be above the economic threshold for spider mites and utilized for the trial. Small plots were laid out in an RBD design with four replications. Applications were made via backpack CO2 sprayer with boom extension attachment to make spray applications over-the-top. The spider mite population was evaluated by harvesting and counting ten randomly selected zero leaves per plot for all mite growth stages. Counts were made pre-treatment on the day of applications, 7 DAT, 14 DAT, and 21 DAT. Mite damage ratings to each plot were also made at 21 DAT.

Shortly after applications were made, predator populations increased rapidly causing all mite populations to crash, including the untreated check, resulting in no significant differences between treatments at any evaluation date. While mite populations crashed rapidly, the 7 DAT counts were very close to being significant (*P*=0.0809) and numerical trends between treatments and the untreated check can be noted.

Objective

Conduct a local research trial to make current information available for area producers about the control and efficacy of available miticide products on economic populations banks grass mites in commercially grown corn for grain.

Materials and Methods

Six different miticide treatments were selected, including an untreated check, one registered miticide product, and four commercially available miticide products to be evaluated for banks grass mite efficacy in a commercial corn for grain. The products included in this trial were Portal at 32 oz. per acre, Zeal at 2 oz. per acre, Oberon at 6 oz. per acre, Onager at 10 oz. per acre, and Fenazaquin at 32 oz. per acre. All labeled surfactants were utilized at the appropriate rate and with the appropriate product.

On July 11, 2014 an economic population of banks grass mites was found by the Plains Pest Management field scouts in a commercial corn for grain field in southwestern Swisher County belonging to Kent Springer. On July 12, plots were laid out and on July 14 all treatments were applied and pretreatment counts made. Counts were made pre-treatment on the day of applications, 7 DAT, 14 DAT, and 21 DAT. The spider mite population was evaluated by harvesting ten randomly selected zero leaves per plot, transporting back to the IPM lab in Plainview for counting where all mite growth stages per leaf were carefully counted under magnification and recorded. Mite damage ratings to each plot were also made at 21 DAT.

Trial Map Treatment Description

Trt	Trt Code	Trt Description
1	CHK	Untreated Check
2		PORTAL 32 OZ/A;NIS 0.25 % V/V
3		ZEAL 2 OZ/A;NIS 0.1 % V/V
4		OBERON 6 OZ/A;DYNE-AMIC 0.25 % V/V
5		ONAGER 10 OZ/A
6		FENAZAQUIN 32 OZ/A

Figure 1. Detail of treatments used and field map showing randomization.

Small plots were laid out in an RBD design with four replications. Plots were six 40 inch rows wide and 36 feet long (6.096 meters X 10.97 meters) with only the middle two rows of each plot actually receiving treatment and four rows consisting of a buffer one between treatments to prevent overspray. All treatments were made via CO2 propelled backpack sprayer at 10.5 GPA with a walking ground speed of 3.5 miles per hour and a pressure of 32 PSI. A boom extension attachment was utilized with the backpack sprayer to make spray applications over-the-top from an altitude of 10 feet. All data was evaluated utilizing ARM (P=0.05).

Results and Discussion

Pre-treatment counts were not significantly different between plots indicating a relatively well distributed banks grass mite population. As treatments were being applied, large amounts of newly arrived predators had already begun to attack spider mite populations.

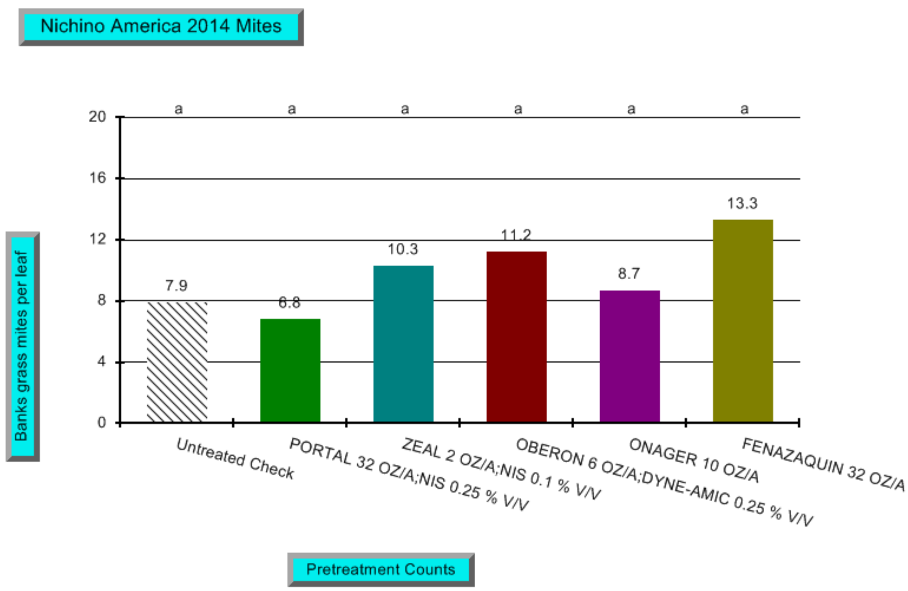


Figure 2. Pretreatment counts of spider mites by treatment (P=0.7017).

Predators worked quickly to crash spider mite populations over the next week. By the 7 DAT counts, no significant differences had emerged and all populations were dropping rapidly. There were numerical differences between treatments starting to show by that time (P=0.0809) which is rare by that time. The Portal, Zeal, Oberon and Onager treatments were numerically outperforming the untreated check and the Fenazaquin treatment.

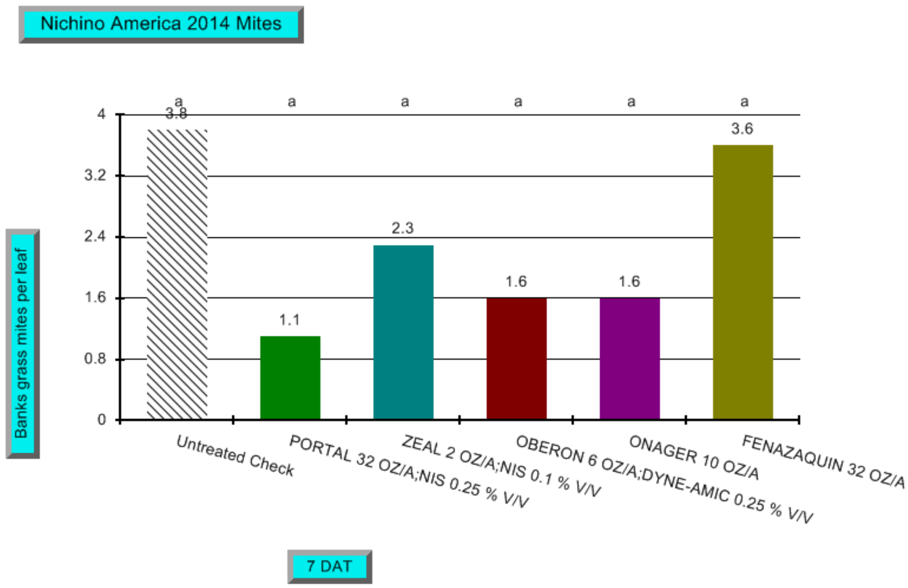


Figure 3. Spider mite counts by treatment at 7 DAT (*P*=0.0809, LSD=0.28t)

By the 14 DAT all mite populations were had dropped to a level so low that any spider mite activity at the zero leaf was difficult to find. No treatment was significantly different from each other or the untreated check. No treatment had greater than 0.2 mites per zero leaf.

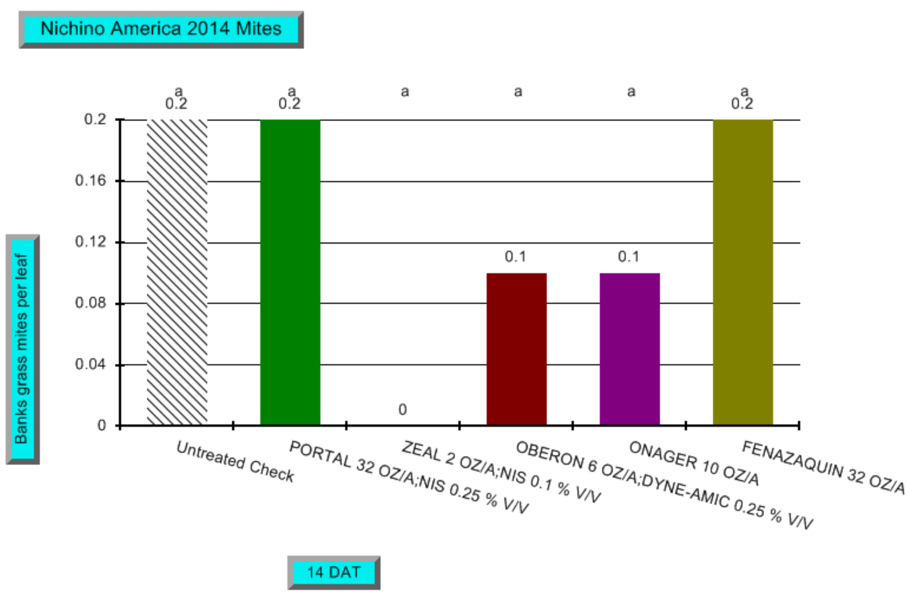


Figure 4. Spider mite counts by treatment at 14 DAT (*P*=0.1689, LSD=0.25t)

Spider mites remained difficult to find by the 21 DAT also.

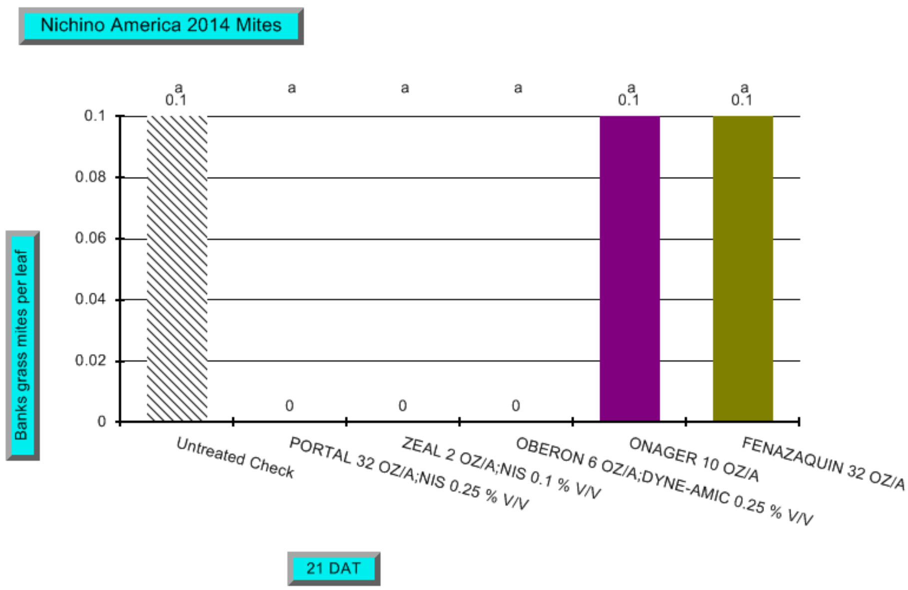


Figure 5. Spider mite counts by treatment at 21 DAT (*P*=0.7497, LSD=2.20t)

The 21 DAT mite damage rating was also shown no significant differences. Any accumulated spider mite damage was likely sustained prior to treatment applications.

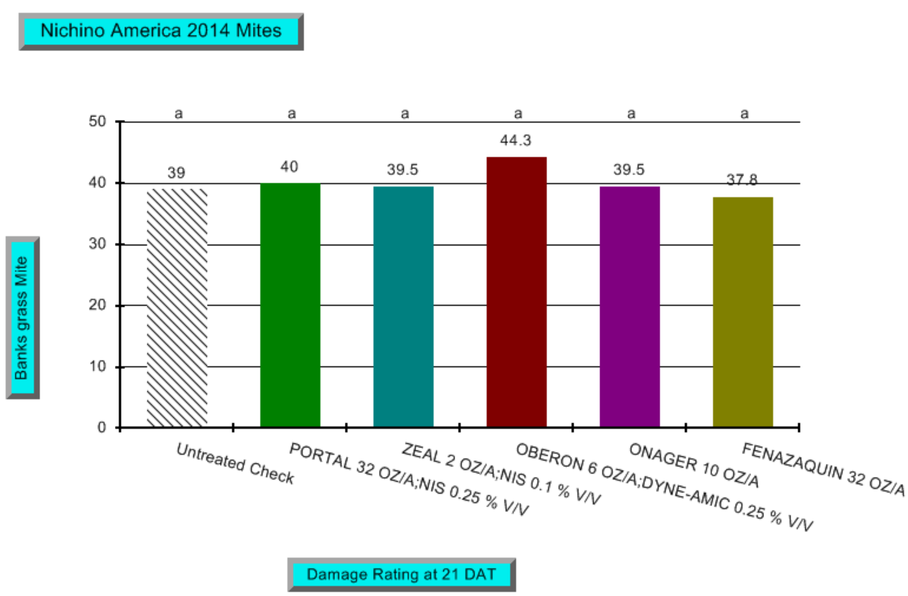


Figure 6. Spider mite damage rating (0-100) by treatment at 21 DAT (*P*=0.4769, LSD=0.686)

Conclusions

The failure of this trial to find significant differences between treatments or the untreated check at the P=0.05 level is not atypical for a miticide efficacy trial. It remains very difficult to predict if mite populations will explode or crash at the currently accepted and needed economic level. The miticides that are currently on the market are very effective but require the aid of predators and ample time to achieve control. While generally being very soft on predators, they typically require ten to fourteen days to show significant responses. For this reason, miticides must be applied before mite populations overtake the field. Determining whether or not an economic population of spider mites exists in field is very difficult and quite risky. At the time of this particular field's scouting and problem determination, very few mite predators were found. Just weeks later, predators had increased to a level that could have controlled the mites without treatment. Just as unpredictably, there could have been no predators for the duration of the trial leaving the treatments without support. If the latter situation had occurred, the treatment timeframe that was followed had to be set in place to prevent catastrophic yield losses. For this reason, companies and researchers, such as Nichino America did with this protocol, use multiple locations and multiple cooperators to find the desired answers needed to remain current with miticide applications.

For this trial, it was surprising and encouraging to see differences coming close to significance so early in the trial at the 7 DAT timeframe (Figure 3). The numerical differences shown at 7 DAT do hint at differences that should or perhaps can be expected to fully emerge by 14 DAT and later in field situations when predators alone cannot control the spider mites. All of the commercially available products for spider mite control seemed to be trending toward acceptable control at the 7 DAT count.

Acknowledgements

I would like to extend thanks to Kent Springer Farms for cooperating with us to complete this trial. Dr. Scott Ludwig for sponsoring and supporting this trial. I would also like to thank Dr. Ed Bynum and Dr. Pat Porter for sharing products, wisdom, and opinions. The 2014 Plains Pest Management Field Scouts and Lab Workers for the operation, data collection, and labor associated with this trial: Jonathan Thobe, Jim Graham, Kevin Duarte, Ember Reed, and Jerik Reed. Thank You all.

MAP Coated, Timed Release Fertilizer Applications to Calcium Carbonate Soils for Profitable Corn Production in Hale & Swisher 2014

Texas A&M AgriLife Extension Service / Everris Fertilizers (AICL Specialty Fertilizers)

Hale & Swisher Counties

Cooperator: Kent Springer

Blayne Reed, EA-IPM Hale, Swisher, & Floyd / Tim Burbaker, Everris

Summary

Four different rates of fertilizer treatments were applied to a typically low returning calcium carbonate soil or "caliche hillside" and were statistically compared in terms of grain yield, bushel weight, and percent moisture. The treatments included a standard farmer practice working as an untreated check, and three differing rates of Everris Fertilizer Agrocote coated and timed release 9-47-0, and 39-0-0 fertilizer products. The first treatment of Agrocote was 255 pounds per acre 9-47-0 mixed with 190 pounds per acre 39-0-0 and represented a standard fertilization rate. The second treatment of Agrocote was 510 pounds per acre 9-47-0 mixed with 379 pounds per acre 39-0-0 representing a 2X rate of fertilization. The third Agrocote treatment was 153 pounds 9-47-0 mixed with 221 pound rate of 39-0-0 representing a reduced phosphorous fertilizer rate.

Treatments were arranged into an RBD small plot design with 4 replications where each plot was six rows wide and 40 feet long with forty inch row spacings. The trial was placed on a calcium carbonate hillslope within a pivot irrigated, Swisher County corn field. Producer standard treatments were made preplant while all Agrocote treatments were made on June 13. 2014 to vegetative growth stage 7 corn. Ten ears from the middle two rows of each plot were hand harvested on September 12 and stored until the trial could be machine trashed at the Amarillo-Bushland Experiment Station on September 25.

There were no significant differences in grain yield (P=0.8770) bushel weight (P=0.5026) or percent grain moisture (P=0.2300) between treatments. There are three now better known factors that could have failed this trial beyond the potential of no treatment differences. The slope of the land could have prevented enough moisture intake into the soil to completely dissolve the Agrocote coating to be of aid to the nutrient deficient plants in time, or the Agrocote fertilizer was not given enough time from application to breakdown and release, or there is the possibility that the trial was incidentally fertilized with the balance of the surrounding filed via fertigation through the pivot due to miscommunication and confusion among farm workers.

Objective

Determine if timed releasing nitrogen and phosphorous fertilizers at key periods in corn's growth and developmental stages are an economical and practical answer for corn production on calcium carbonate hillsides and soils that typically bind these nutrients so that they are unusable to the plant. If this proves practical and profitable on these soils in Hale and Swisher County, calcium carbonate soils across the Great Plains could receive could be beneficially impacted by the use of coated fertilizer products. If significant differences could be found, studies on best coating and management practices would begin in earnest.

Materials and Methods

Four different rates of fertilizer treatments were applied to a typically low returning calcium carbonate soil or common "caliche hillside." All treatments were statistically compared in terms of grain yield, bushel weight, and percent moisture. The treatments included a standard farmer practice working as an untreated check, and three differing rates of Everris Fertilizer Agrocote coated and timed release 9-47-0, and 39-0-0 fertilizer products.

The first treatment of Agrocote was 255 pounds per acre 9-47-0 mixed with 190 pounds per acre 39-0-0 and replicate a standard fertilization rate. The second treatment of Agrocote was 510 pounds per acre 9-47-0 mixed with 379 pounds per acre 39-0-0 representing a 2X rate of fertilization. The third Agrocote treatment was 153 pounds per acre 9-47-0 mixed with 221 pound per acre rate of 39-0-0 representing a reduced phosphorous fertilizer rate.

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All 0f the ears from ten row feet from the middle two rows of each plot were hand harvested on September 12 and stored until the trial could be machine trashed at the Amarillo-Bushland Experiment Station on September 25. All data was evaluated utilizing ARM (P=0.05).

Results and Discussion

No treatments resulted in significant differences between treatments and no numeric trends were noted.

Pest Type	O Other	O Other	O Other
Crop Code	ZEAMX	ZEAMX	ZEAMX
BBCH Scale	BCOR	BCOR	BCOR
Crop Scientific Name	Zea mays	Zea mays	Zea mays
Crop Name	Corn	Corn	Corn
Part Rated	YIELD C	GRAIN C	GRAIN C
Rating Date	Sep-12-2014	Sep-25-2014	Sep-25-2014
Rating Type	YIELD	MOICON	WEIGHT
Rating Unit	Gram/10'	%	BU
Sample Size, Unit	10 FT	10 FT	1 SAMPLE
Number of Subsamples	1	1	1
Trt No. / Treatment Name / Rate / Rate Unit	1	2	3
1 untreated	1538.58a	17.55a	57.38a
2 9-47-0 255 lb/a; 39-0-0 190 lb/a	1430.18a	17.28a	57.25a
3 9-47-0 510 lb/a; 39-0-0 379 lb/a	1517.45a	16.90a	57.75a
4 9-47-0 153 lb/a; 39-0-0 221 lb/a	1471.55a	17.85a	58.13a
LSD P=.05	326.846	1.406	0.961
Standard Deviation	204.346	0.879	0.601
CV	13.72	5.05	1.04
Bartlett's X2	3.012	3.275	6.081
P(Bartlett's X2)	0.39	0.351	0.108
Skewness	-0.6631	0.5423	-0.354
Kurtosis	-0.2434	0.5178	-0.0725
Replicate F	1.404	6.544	3.808
Replicate Prob(F)	0.3040	0.0122	0.0517
Treatment F	0.225	0.846	1.731
Treatment Prob(F)	0.8770	0.5026	0.2300

Pest Type
O, Other, G-BYRO7, G-OthStg = Other animal or nematode
Crop Code
ZEAMX, BCOR, Zea mays, = US
Part Rated
YIELD = yield
GRAIN = grain
C = Crop is Part Rated
Rating Type
YIELD = yield
MOICON = moisture content
WEIGHT = weight
Rating Unit
% = percent
BU = bushel

FT = foot
SAMPLE = sample

Means followed by same letter do not significantly differ (P=.05, LSD)
Mean comparisons performed only when AOV Treatment P(F) is significant at mean comparison OSL.

Table 1. Full ARM statistical printout of harvest yield data. Yield data shown in grams per 10 row feet.

Conclusions

There is enough evidence that the trial had errors present that were not accounted for in the working protocol that could have nullified any treatment results, had there been any. Upon close inspection on the harvest date of September 12, unopened Agrocote pellets with fertilizer still within were found within several of the trial's plots. There could be several reasons for this failure. The slope of the "caliche hillside" utilized in the trial could have been severe enough that irrigation and rainfall water might have run down slope faster than it could be absorbed where it could aid in the breaking down of the Agrocote. The treatment application of the Agrocote could have been too late in the growing season to break down or might not have been incorporated properly.

There might have also been an issue with an in-season fertigation event that could have either washed into the trial area of the field or passed through during the fertigation event due to a misunderstanding with farm workers.

There is enough outside evidence on this subject to make an additional effort in 2015 to repeat this trial and its sister trial in cotton under an improved protocol. This improved will involve a tighter control of in-season fertilization, a revision of Agrocote product thickness, and a better attempt to incorporate treatments earlier in the growing season.

Acknowledgements

I would like to extend thanks to Kent Springer Farms for cooperating with us to complete this trial. Tim Burbaker and Dr. Christine Worthington for sponsoring and supporting this trial. I would also like to thank Dr. Ed Bynum for sharing thrashing equipment, wisdom, and opinions. The 2014 Plains Pest Management Field Scouts for the operation, data collection, and labor associated with this trial: Jonathan Thobe, Jim Graham, and Kevin Duarte. Thank You all.