398/1401 2015

Mississippi Peanut Growers Association

Funding Year: 2015 Final Report

Impact of Insect Pests on Peanut Yields and Management Options

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Objectives:

1) **To determine the efficacy of at-planting insecticides against thrips and other early season insect pests in peanut, and determine their impact on yield.**
2) **To determine the impact of foliar feeding insect pests on peanut yields using field cages and manual defoliation experiments.**
3) **To evaluate foliar insecticides for control of early season insect pests (thrips) and mid-season insect pests (corn earworm, cutworm, fall armyworm, etc.) and their impact on yields.**

Summary of Results

Multiple experiments were conducted during the 2015 growing season to evaluate insect management in peanut. For the first objective, experiments were conducted to evaluate Admire Pro, Velum Total, Thimet, and Cruiser. Admire Pro and Velum Total were applied as in-furrow sprays. Thimet was applied as an in-furrow granule, and Cruiser was applied as a seed treatment. In all trials, all insecticide treatments were compared to peanuts with no at-planting insecticide. All seed in these experiments had a fungicide seed treatment including the untreated control. Various counts of plant vigor, thrips densities, and plant stands were made weekly throughout the seedling stage. Peanuts were harvested at the end of the season and yields per acre were determined. Overall, thrips pressure was relatively light in these trials. However, all at-planting insecticides significantly reduced thrips numbers and damage ratings compared to the untreated control except Cruiser. Despite the low thrips numbers in these trials, all at-planting insecticides resulted in greater peanut yields than the untreated control including Cruiser. Yield increases relative to the untreated control were 541 lbs for Cruiser, 881 lbs for Thimet, 1190 lbs for Admire Pro, and 1143 lbs for Velum Total. These results suggest that thrips management can be important for maximizing yields in peanut. Additionally, control of other seedling pests that were not measured appears to be equally important. Based on these results, use of an at-planting insecticide should be used in Mississippi to minimize economic losses from early season pests.

For objective 2, field cage experiments were not completed. Insects released into cages did not successfully establish and defoliation from insect feeding was minimal. Manual defoliation trials were also conducted in 2015. In the first experiment, different levels of defoliation were evaluated at two timings. The levels of defoliation included 0% (no defoliation), 20%, 40%, 60%, 80%, and 100% at 40 days and 80 days after emergence. At Starkville, defoliation at 40 days after emergence did not cause a reduction in peanut yields relative to the no defoliation. In contrast, all of the levels of defoliation at 80 days after emergence resulted in significant yield reductions relative to the no defoliation. As expected, the greatest yield losses occurred for 100% defoliation at 80 days after emergence. Results from Stoneville were similar to those observed in Starkville. The greatest yield reductions occurred at 80 days after emergence. In a separate experiment, the impact of defoliation timing on peanut yields was evaluated. Peanuts were defoliated to 100% at 35, 50, 65, 80, 95, and 110 days after emergence and compared to a non-defoliated control. In Starkville, no reductions in yield were observed from 100% defoliation except at 95 and 110 days after emergence. In Stoneville, significant yield reductions were observed for defoliation that occurred at 50 to 110 days after emergence. The greatest yield losses were observed when defoliation occurred from 80 to 110 days after emergence. These data will be important for developing a defoliation threshold for peanuts in Mississippi.

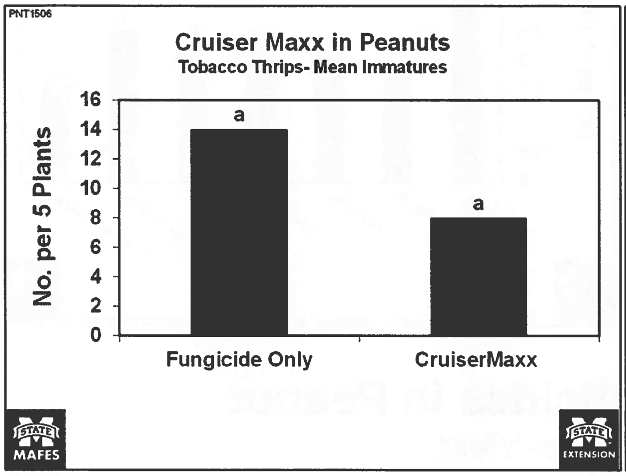
For objective 3, multiple experiments were conducted against various insect pests. Multiple defoliating caterpillars occurred in these tests in 2015. In general, soybean looper was the most common species. Some bollworm pressure was also experienced in some tests at moderate levels. In general, Prevathon, Belt, and Intrepid Edge provided very good control of all caterpillar pests. Dimilin and DoubleTake (Dimilin + Karate) did not provide acceptable control of soybean looper or bollworm, but did reduce populations of granulate cutworm and fall armyworm. In one test, Prevathon provided very good control of soybean looper up to 22 days after application. Overall, populations declined to extremely low levels across all plots and we were not able to evaluate control beyond 22 days. Defoliation levels remained very low and no differences in yield were observed in these tests.

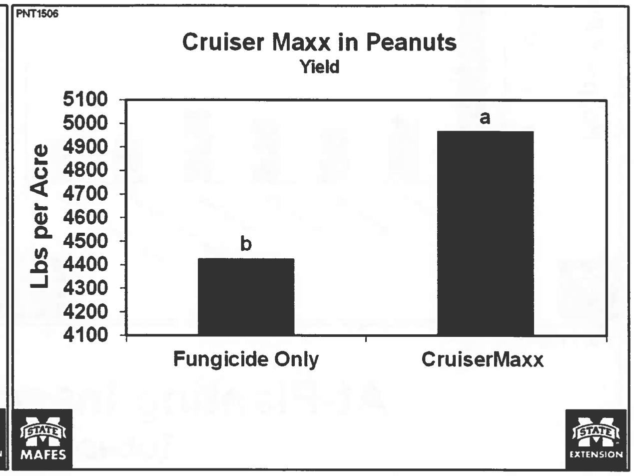
In separate tests thrips control was evaluated following various herbicide treatments. In general, management of thrips with acephate in peanuts where Valor was used as a pre-emerge herbicide improved plant growth and yield compared to peanuts that did not receive a foliar application of acephate. A similar test was also conducted with Gramoxone applied post-emerge. Application of acephate applied as a tank mix with the Gramoxone or sprayed 1 to 3 weeks after Gramoxone reduced thrips populations and improved plant growth and development. No significant difference were observed in this test, but peanut yields were numerically lower where Gramoxone was sprayed without the use of acephate to manage thrips.

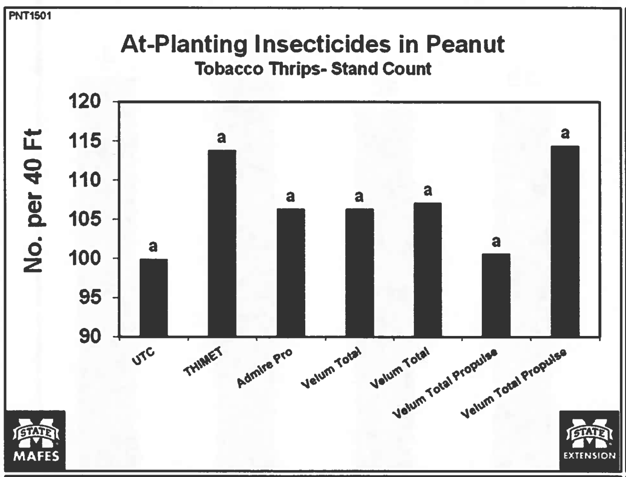
Results from all of these experiments will be used to improve the overall integrated pest management plan for insects in Mississippi peanuts. All of these trials will be repeated in 2016 and 2017 as part of a graduate student project.

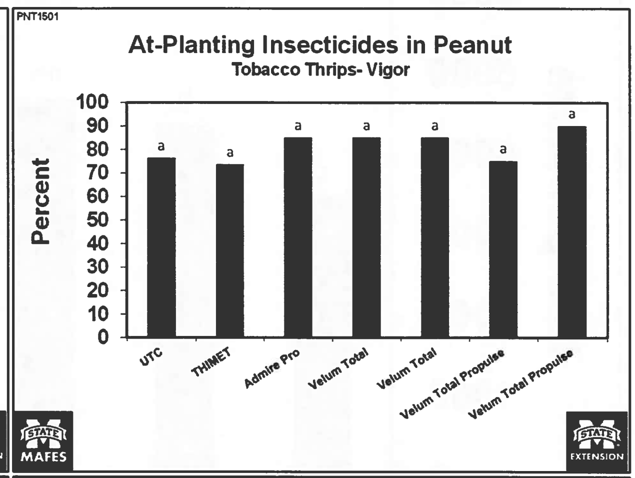
APPENDIX 1

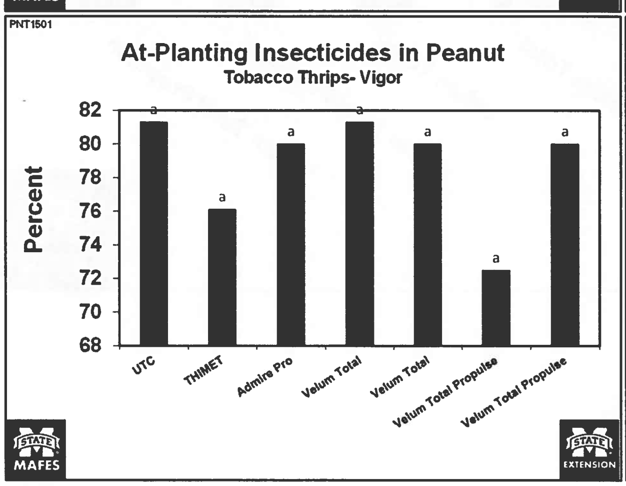
Detailed Results for Objective 1

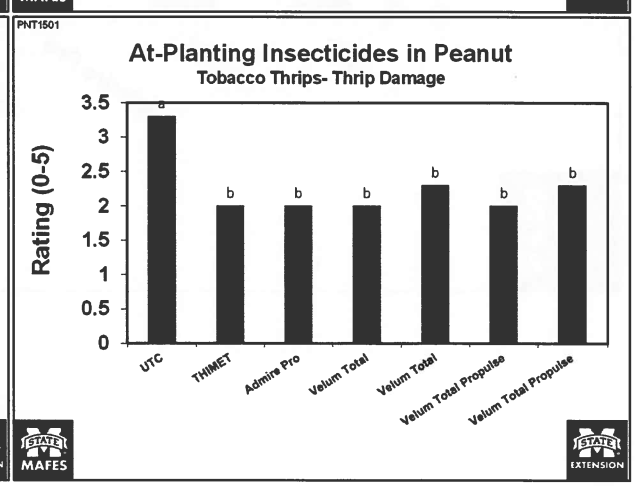


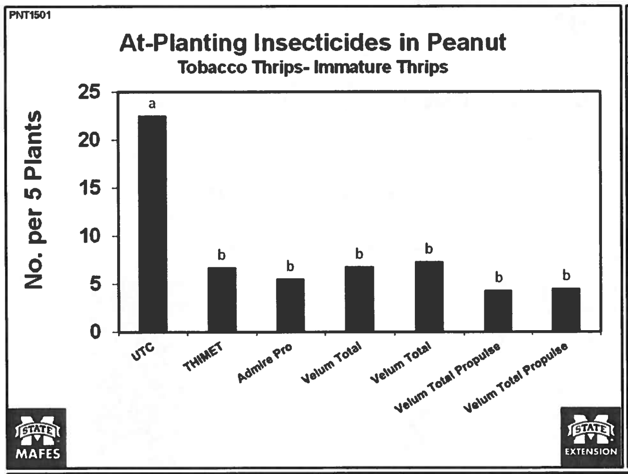








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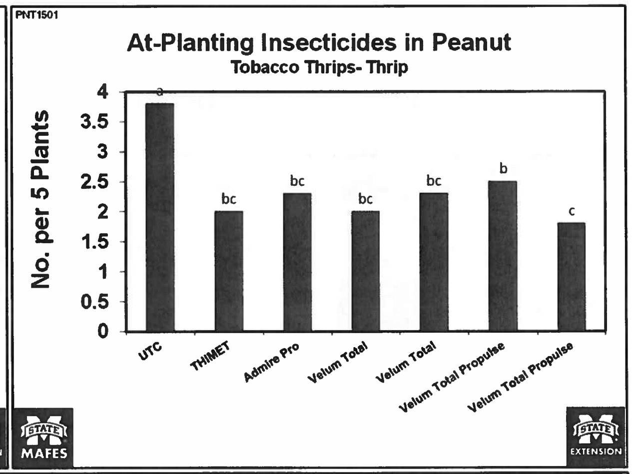
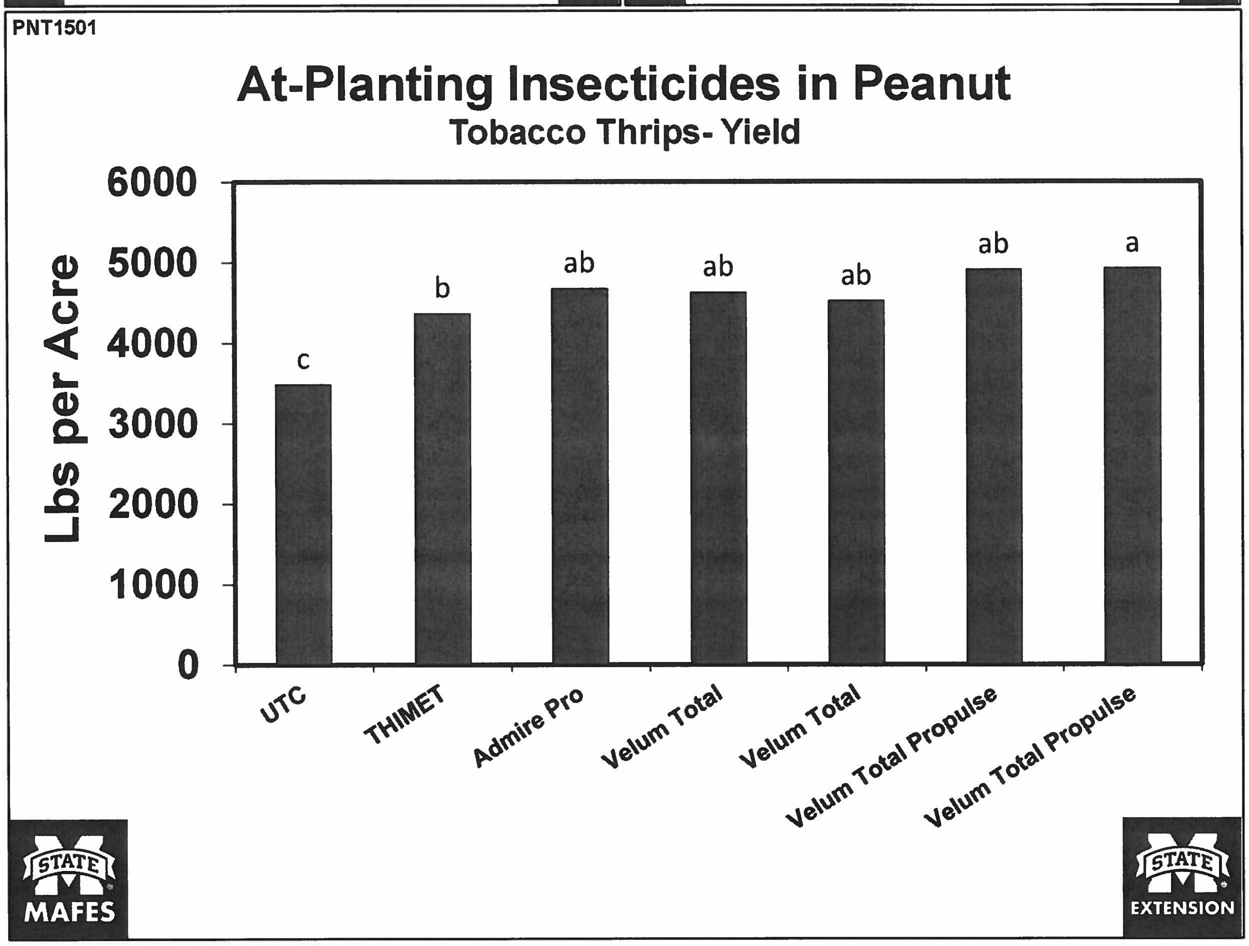
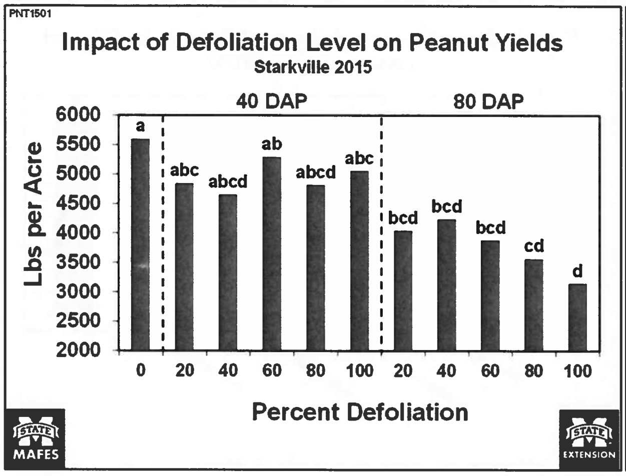
At-Planting Insecticides in Peanut
Tobacco Thrips- Immature Thrips
No. per 5 Plants
25
20
15
10
5
0
a
b
b
b
b
b
b
UTC
THIMET
Admire Pro
Velum Total
Velum Total
Velum Total Propulse
Velum Total Propulse
MAFES
EXTENSION

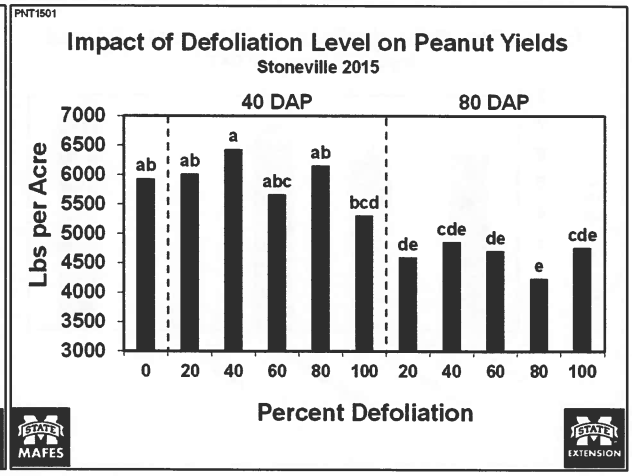

PNT1501
At-Planting Insecticides in Peanut
Tobacco Thrips- Thrip
No. per 5 Plants
4
3.5
3
2.5
2
1.5
1
0.5
0
a
bc
bc
bc
bc
b
c
UTC
THIMET
Admire Pro
Velum Total
Velum Total
Velum Total Propulse
Velum Total Propulse
MAFES
EXTENSION

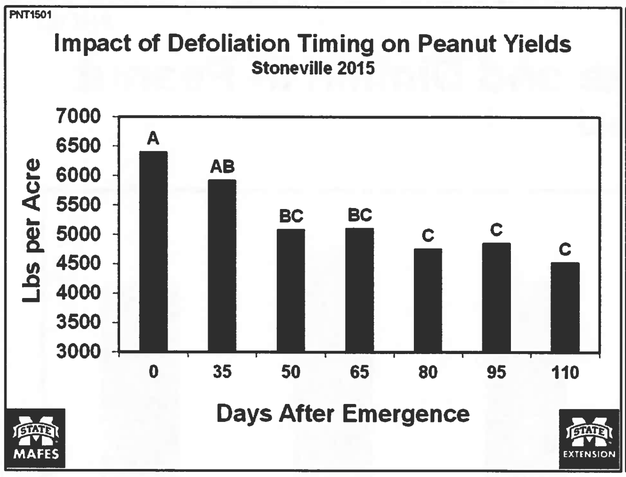

PNT1501
At-Planting Insecticides in Peanut
Tobacco Thrips- Yield
Lbs per Acre
6000
5000
4000
3000
2000
1000
0
c
b
ab
ab
ab
ab
a
UTC
THIMET
Admire Pro
Velum Total
Velum Total
Velum Total Propulse
Velum Total Propulse
MAFES
EXTENSION

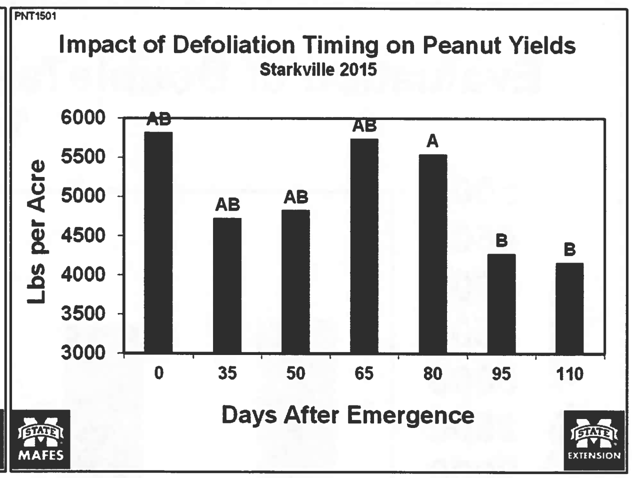
APPENXIX 2

Detailed Results for Objective 2



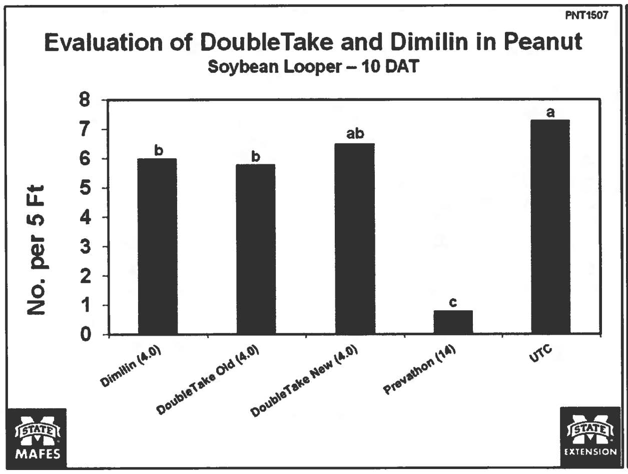


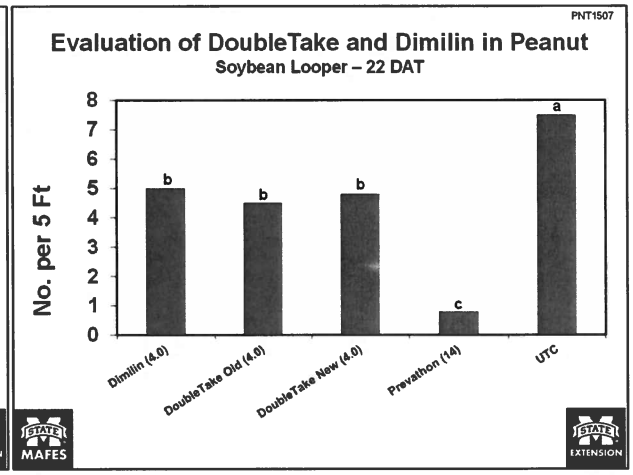


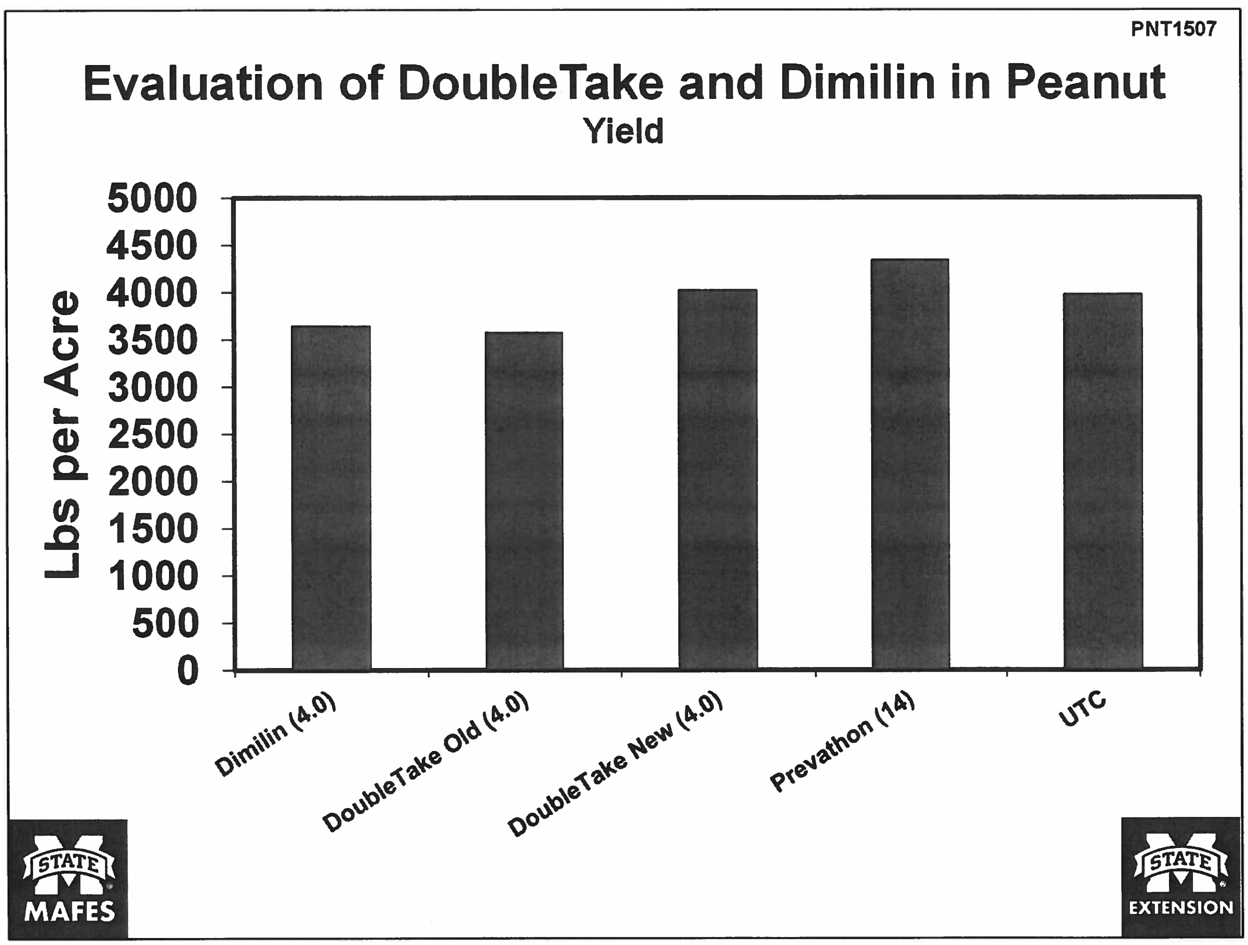


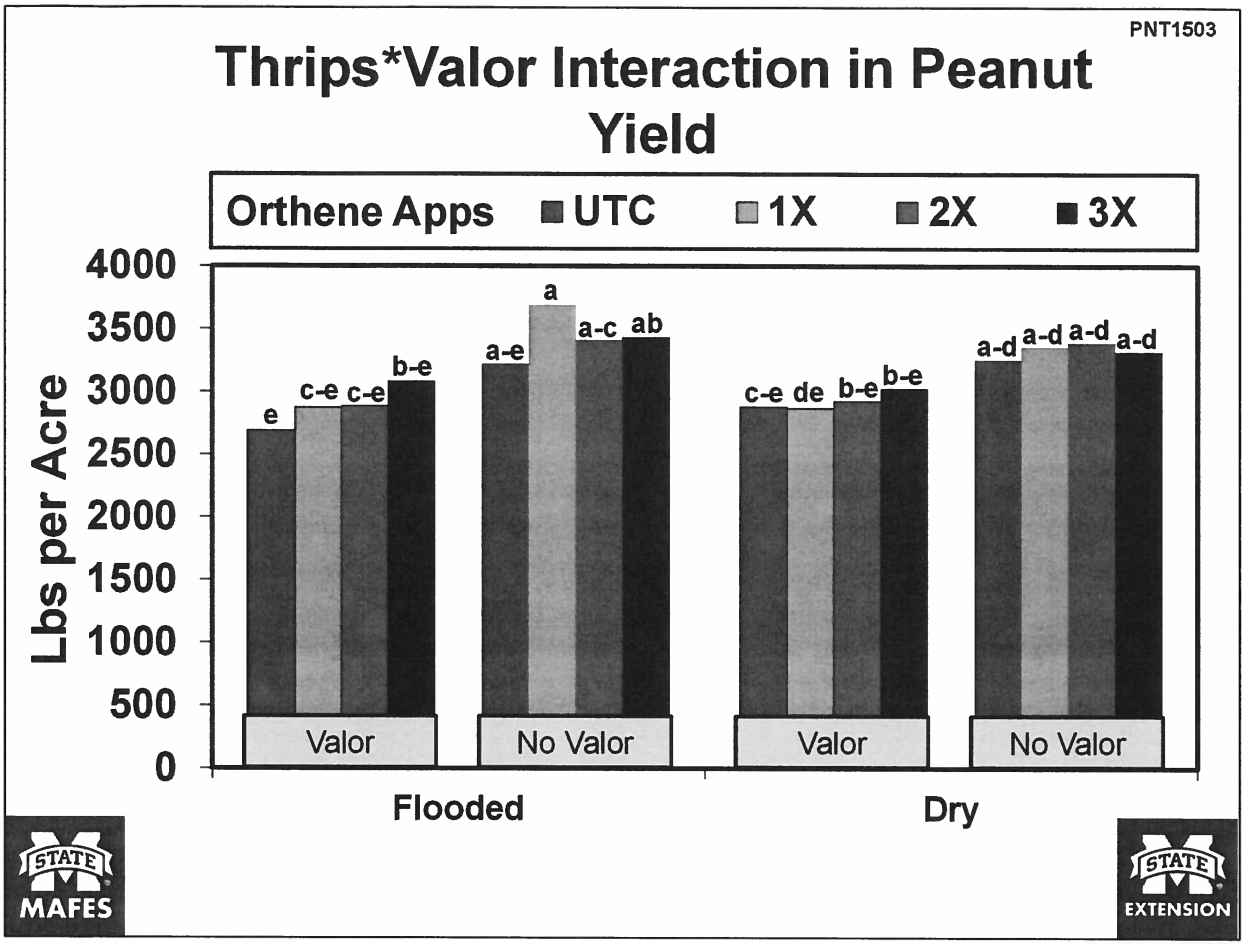
APPENDIX 3

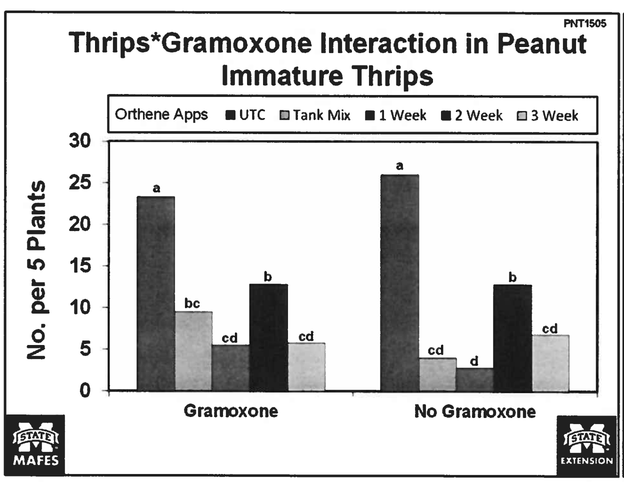
Detailed Results for Objective 3

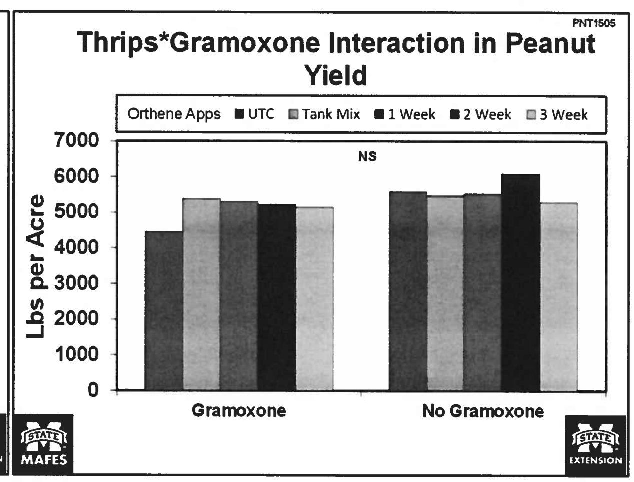







PNT1503
Thrips*Valor Interaction in Peanut Yield
Orthene Apps UTC 1X 2X 3X
4000
3500
3000
2500
2000
1500
1000
500
0
Lbs per Acre
e c-e c-e b-e
a-e a a-c ab
c-e de b-e b-e
a-d a-d a-d a-d
Valor
No Valor
Valor
No Valor
Flooded
Dry
STATE
MAFES
STATE
EXTENSION


PNT1505
Thrips*Gramoxone Interaction in Peanut Immature Thrips
Orthene Apps UTC Tank Mix 1 Week 2 Week 3 Week
30
25
20
15
10
5
0
No. per 5 Plants
a bc cd b cd
a cd d b cd
Gramoxone
No Gramoxone
STATE
MAFES
STATE
EXTENSION


PNT1505
Thrips*Gramoxone Interaction in Peanut Yield
Orthene Apps UTC Tank Mix 1 Week 2 Week 3 Week
7000
6000
5000
4000
3000
2000
1000
0
Lbs per Acre
NS
Gramoxone
No Gramoxone
STATE
MAFES
STATE
EXTENSION