

**ANNUAL PROGRESS REPORT  
TO  
NORTH CAROLINA PEANUT GROWERS ASSOCIATION, INC.**

**TITLE:** Enhanced IPM Program Development for Insect Control in Peanut  
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**REPORT:**

Insecticide development in peanuts has been very limited the past ten years despite a growing need for new products for pest control. Peanut growers have faced the loss of key insecticides, the emergence of insecticide resistance, a transition to new peanut-producing areas, and the development of new pests but have not been provided with new options for insect suppression. Currently, there are very specific needs for further insecticide evaluations to help farmers make cost effective decisions regarding insecticide use in North Carolina peanuts. This project ensures the consistency of the peanut insect control program.

This project provided increased evaluation of recently-developed products and product use beyond what the agrichemical industry has been willing to support the past ten years. Funding from this project is combined with the limited agrichemical industry funding, and funding from USAID. The following objectives are included in this project.

- Determine the most effective use and return on investment for imidacloprid (Admire Pro), and acephate (particularly 3-week post applications) as standard control for thrips and tomato spotted wilt virus (TSWV) at-plant management programming. The new generic aldicarb insecticide (Temik replacement) was also evaluated. Investigate role of Admire Pro in reducing later season leafhopper damage and its relationship to TSWV.
- Develop specific caterpillar control strategies for treatment thresholds, potential insecticide resistance, populations of budworms, and new cultivars plantings.
- Evaluate rootworm control alternatives for chlorpyrifos (Lorsban): bifenthrin and chlorotraniliprole, for rootworm control and the impact on leafhoppers and spider mites.
- Develop a comprehensive insect management plan based on insect control levels, cost effectiveness, off-target effects, impact on tomato spotted wilt virus, and integration with other practices. Continuation of simplification of insect control recommendations initiated in 2015 and continued through 2018. Establishment of an extension portal site for peanut insect control.

All trials were conducted in replicated plots (2 rows by 30 ft) on research stations (Lewiston, Rocky Mount, and Whiteville) and individual grower farms. Thrips management trials evaluated planting date, twin vs. single row, variety, in-furrow and post-emergent treatment rates for thrips control, stand, emergence, tomato spotted wilt virus, and yield. Treatments included acephate, generic aldicarb, and imidacloprid (Admire Pro) products as well as cyazapyr. Rootworm control evaluations will include chlorpyrifos, bifenthrin granules and chlorantraniliprole (Prevathon) for rootworm control. Caterpillar control trials were conducted in replicated field plots evaluating the newest chemistries against difficult to control populations (resistant

earworms and harder to control tobacco budworms). Fields were sampled for species composition to help understand the level of budworm infestations. In addition, data will be used to develop a new caterpillar control program based on species, resistance management and thresholds.

**RESEARCH RESULTS:** The thrips control studies indicate there are cost effective alternatives to aldicarb that provide excellent control of thrips on a consistent basis. Admire Pro (imidacloprid) and acephate provide excellent control of thrips. TSWV also remained low in all plots treated with Admire Pro and acephate. There is evidence that Admire Pro provides some midseason suppression leafhoppers but we have been unable to clearly demonstrate this across all plots. A second tier of treatment evaluated the additional application of acephate at three weeks post plant and this approach has consistently demonstrated a return on the investment through higher yields. Thimet (phorate) remains a good at plant thrips insecticides, but growers avoid its use due to concerns over phytotoxicity. Generic aldicarb was evaluated in 2017 and the product performed well as compared to the other recommended treatments and on par with previous performance of the Bayer Temik product.

Caterpillar control is complicated due to the presence of budworms and pyrethroid resistant earworms in North Carolina peanut fields. Our research indicates that newer chemistries (which are significantly more expensive than pyrethroids) control both budworms and pyrethroid resistant earworms. The use of pyrethroid insecticides (which are much less expensive) often provide only 60% control due to the budworms and resistant earworms. Cooperation with Virginia Tech researchers provides us with data indicating the level of resistance in earworms is often between 30-40%, but varies significantly among fields. The occurrence of budworms is typically low (<20%) but also varies across fields. These research data were used to develop a revised caterpillar control program for North Carolina peanut farmers in 2017 based upon acceptable risks. As a result of these trials over the past 3 years, we have produced a new recommendation that will be posted this winter on the peanut insect extension portal with guidance more towards the use of the more expensive "caterpillar" insecticides to ensure effective control and reduce the likelihood of spider mite outbreaks. Rootworm control studies over 3 years determined that the new chemistry Prevathon (chlorotraniliprole) does not show any consistent efficacy against southern corn rootworms despite its effectiveness against other soil insect pests such as lesser cornstalk borer. We plan to look at a different timing for application in 2018. Bifenthrin provides limited and inconsistent control of rootworms. The fact that the EPA ruled in 2017 that Lorsban (chlorpyrifos) registration will not be terminated at this time and will be available at least in the near future buys us some time to find alternatives.

Control recommendation for 2018 and the Peanut Information 2018 publication were all updated during the winter of 2017-2018 to integrate 2017 research findings in amending pest management recommendations. Current recommendations are more specific based on recent evaluation trials.

## IMPACT STATEMENT

Funding of this project has permitted a more aggressive insecticide evaluation program and provide the data necessary to make major revisions to the insect control sections for peanut production. The most notable changes are under "thrips management" and the various caterpillars control sections. These changes provide growers with the current results of trials and cost effective recommendations given the loss of standard products and the changing situation for caterpillar control. Field data was necessary to confidently make these revisions and additional field studies are required to further refine our recommendations and revise additional sections based on new varieties used in the field. We are also in the process of establishing a peanut insect control site on the extension portal.