NATIONAL PEANUT BOARD/VIRGINIA PEANUT GROWERS ASSOCIATION— EXECUTIVE SUMMARY, 2010

PROJECT TITLE: Thrips Management in Peanuts: Evaluation of New Insecticides and Assessment of Varietal Susceptibility

TERM OF PROJECT: 1 year (January 1, 2010-December 31, 2010)

PROJECT INVESTIGATOR: D. Ames Herbert, Jr.

LOCATION: Virginia Tech Tidewater Agricultural Research and Extension Center, Suffolk, VA

OBJECTIVE:

1. To evaluate new insecticides for management of thrips

RESULTS:

In 2010, we continued evaluations of DPX-HGW86 20SC applied in-furrow, and also began our first year of evaluating a 10 OD formulation applied as an additional broadcast at late ground cracking. All products had significantly fewer immature thrips relative to the untreated control on May 25 and June 1, with no differences between treatments. Thrips injury ratings were generally lowest (best) in the Temik, Temik plus Orthene, Thimet, and DPX-HGW86 20SC at 0.134 lb ai/A (liquid in-furrow) plus DPX-HGW86 10 OD at 0.088 lb ai/A (broadcast at late ground cracking) plots. All products significantly reduced the incidence of TSWV relative to the untreated control. Yields were not significantly different, but DPX-HGW86 20SC at 0.134 lb ai/A (liquid in-furrow) plus DPX-HGW86 10 OD at 0.088 lb ai/A (broadcast at late ground cracking) yielded 4728 lb/A, numerically similar to both Temik 15G at 7 lb/A (4790 lb/A) and Thimet 20G at 5 lb/A (4714 lb/A).

We evaluated several experimental seed treatments from Syngenta in 2009 and continued this research in 2010. In general, immature thrips numbers in the peanut seed treatments (Cruiser 70WS, Cruiser 5FS, A17461-a) were similar to, but slightly higher than, the in-furrow insecticides (Temik, Thimet). The seed treatments kept thrips injury ratings low through June 2, while Temik and Thimet maintained low thrips injury ratings through at least June 17. All treatments had higher yields than the untreated control and Dynasty alone, with no significant differences between the insecticides.

Our research has found that some of the products evaluated, as well as several new chemistries, provide excellent levels of thrips control in peanut and result in high yields. Additional work is planned to encourage labeling of some of these alternatives for use in peanut before Temik is no longer available. The work detailed in this report should bring this closer to reality.

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NATIONAL PEANUT BOARD
FINAL REPORT
OCTOBER 2010

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TERM OF PROJECT: 1 year (January 1, 2010-December 31, 2010)

PROJECT INVESTIGATOR: D. Ames Herbert, Jr.

LOCATION: Virginia Tech Tidewater Agricultural Research and Extension Center, Suffolk, VA

OBJECTIVES:

1. To evaluate new insecticides for management of thrips
2. To assess peanut varieties and developing lines for susceptibility to thrips (Note: this objective was submitted to and funded by the Virginia Peanut Board, so will be reported to that Board)

METHODS:

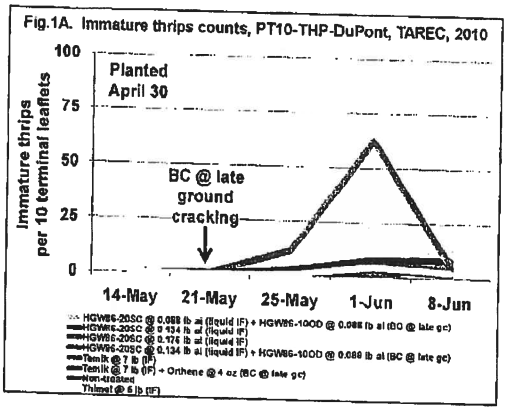
Research was conducted at the Tidewater Agricultural Research and Extension Center. Randomized complete block experimental designs were used, with 4 replicates and 4-row plots x 35 ft. Conventional seeding rates and weed, disease, and late-season insect (leafhopper and corn earworm) management practices were used. Insecticides included liquid in-furrow applications of DPX-HGW86 20SC, with and without foliar broadcasts applications of DPX-HGW86 10 OD. We also evaluated experimental seed treatments including Cruiser 70WS, Cruiser 5FS and several numbered compounds. Conventional in-furrow (Temik, Thimet) and foliar-applied (Orthene) insecticides were included in the tests for comparison. Thrips counts were taken during late May and June by collecting ten unopened terminal leaflets per plot in vials containing 30 ml soapy water. The soapy water was examined under a stereoscope and adult and immature thrips were recorded. Thrips injury to plants was determined during late May and June by visually rating injury using the following 0 to 10 scale:

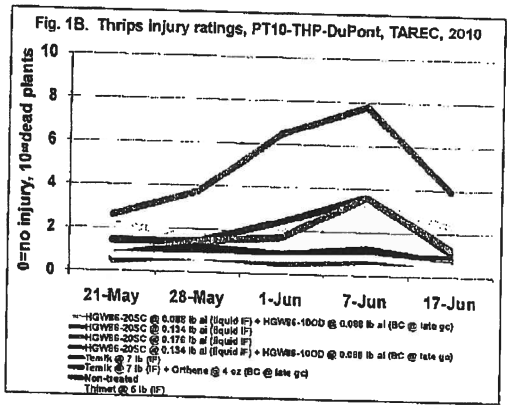
- 0 = no thrips induced plant injury
- 1 = 10% injured leaves
- 2 = 20% injured leaves
- 3 = 30% injured leaves
- 4 = 40% injured leaves
- 5 = ≥50% injured leaves + ≤5% terminal buds injured
- 6 = ≥ 50% injured leaves + 25% terminal buds injured
- 7 = ≥ 50% injured leaves + 50% terminal buds injured
- 8 = ≥ 50% injured leaves + 75% terminal buds injured
- 9 = ≥ 50% injured leaves + 90% terminal buds injured
- 10 = dead plants

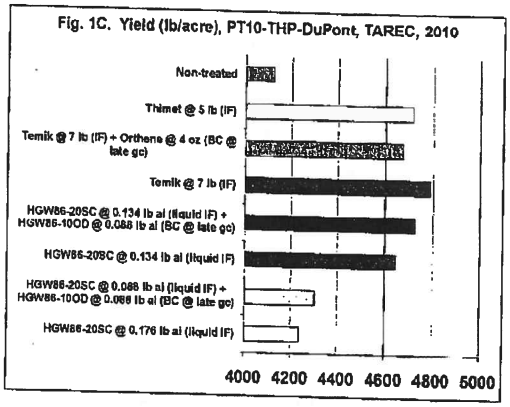
Yield was determined from digging and picking peanuts from 2 rows of each plot. Data were analyzed using ANOVA and LSD statistical procedures.

RESULTS:

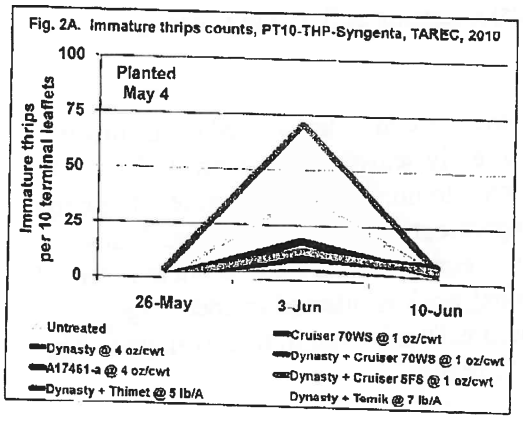
We evaluated a new at-plant product, DPX-HGW86 20SC (cyantraniliprole, an anthranilic diamide insecticide by DuPont), at three rates as a liquid in-furrow in 2008 and 2009. In 2010, we continued evaluations of DPX-HGW86 20SC applied in-furrow, and also began our first year of evaluating a 10 OD formulation applied as an additional broadcast at late ground cracking. All products had significantly fewer immature thrips relative to the untreated control on May 25 and June 1, with no differences between treatments (Fig. 1A). Thrips injury ratings were generally lowest (best) in the Temik, Temik plus Orthene, Thimet, and DPX-HGW86 20SC at 0.134 lb ai/A (liquid in-furrow) plus DPX-HGW86 10 OD at 0.088 lb ai/A (broadcast at late ground cracking) plots (Fig. 1B). All products significantly reduced the incidence of TSWV relative to the untreated control. Yields were not significantly different, but DPX-HGW86 20SC at 0.134 lb ai/A (liquid in-furrow) plus DPX-HGW86 10 OD at 0.088 lb ai/A (broadcast at late ground cracking) yielded 4728 lb/A, numerically similar to both Temik 15G at 7 lb/A (4790 lb/A) and Thimet 20G at 5 lb/A (4714 lb/A) (Fig. 1C).

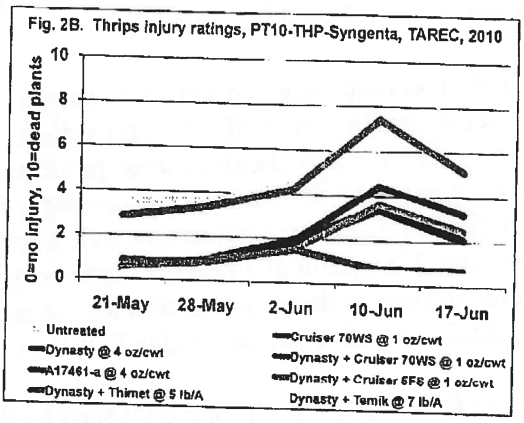


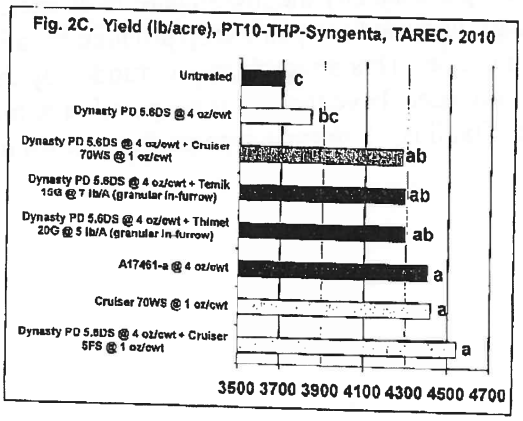




We evaluated several experimental seed treatments from Syngenta in 2009 and continued this research in 2010. In general, immature thrips numbers in the peanut seed treatments (Cruiser 70WS, Cruiser 5FS, A17461-a) were similar to, but slightly higher than, the in-furrow insecticides (Temik, Thimet) (Fig. 2A). The seed treatments kept thrips injury ratings low through June 2, while Temik and Thimet maintained low thrips injury ratings through at least June 17 (Fig. 2B). All treatments had higher yields than the untreated control and Dynasty alone, with no significant differences between the insecticides (Fig. 2C).







DISCUSSION and IMPACT:

The imminent loss of Temik 15G for use in peanut necessitates finding effective and economic alternatives. In peanut some of the primary functions of Temik 15G are to reduce thrips numbers, to minimize plant damage caused by direct thrips feeding, and to reduce incidence of *Tomato spotted wilt virus* (TSWV) transmission by thrips. Previous research has shown that thrips migrate into peanut fields early in the season and feed extensively on seedlings. Feeding results in killed leaflets and terminals, reduced plant canopy height and width, reduced root growth, delayed maturity and most importantly, significant yield reductions even in the absence of TSWV transmission. When TSWV is transmitted, disease develops in some percentage of plants which further contributes to yield and kernel quality reductions. Over the past 20 years, this program has evaluated many potential thrips management alternative options. Until recently, there have been only two that have been competitive with Temik 15G, that is, have provided near equal levels of thrips control and TSWV suppression: Thimet 20G applied as a granule in-furrow at planting, and Orthene 97 applied as a liquid in-furrow at planting. Although effective, each of these alternatives has some disadvantages. Thimet 20G allows a little more thrips damage compared with Temik and consistently causes a phytotoxic response that expresses as leaflet tip yellowing, and in extreme cases, causes leaflet death and shed. These extreme responses seem to be more prevalent in fields with sandier soils, or when plants undergo early season water stress. The disadvantage of the Orthene 97 liquid in-furrow alternative is one of mechanics, that is, it requires that growers mount additional spray tanks, pumps and tubing to accommodate the in-furrow liquid delivery. Another drawback we have noticed is that unless

properly designed, the liquid can often wet the planter disks causing soil 'caking' which interferes with soil-seed coverage.

In many other crops (e.g., cotton, corn, wheat, soybean), there are insecticide seed or in-furrow delivered alternatives available that provide good levels of early season insect control. In general, the active ingredients in these products are less toxic to non-target species, less toxic to the user, and can be used at much lower rates of active ingredient per acre. Our research has found that some of these products, as well as several new chemistries, provide excellent levels of thrips control in peanut and result in high yields. Additional work is planned to encourage labeling of some of these alternatives for use in peanut before Temik is no longer available. The work detailed in this final report should bring this closer to reality.

Findings from this research were published by the investigator in quarterly and annual reports, discussed in production meetings, and used to update crop production information provided by the Virginia Peanut Production Guide. This research project funded by the National Peanut Board should help ensure that producers have the best tools possible to make informed decisions which can lead to improved profitability of virginia-type peanuts grown in the area.