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THRIPS BIOCONTROL IN PEANUTS: FINAL RESULTS FROM TESTS AT FAIRHOPE & HEADLAND

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This is a report on the incidence of thrips and tomato spotted wilt virus (TSWV) in a biological control field study conducted at the Gulf Coast Research and Extension Center (GCREC), Fairhope, AL and the Wiregrass Research and Extension Center (WREC), Headland, AL. Goal is to reduce heavy usage of synthetic granular insecticides (Temik 15G and Thimet 20G - all restricted use pesticides) by integration with bio-based insecticides. Establishing a strong bio-based IPM system in peanuts for Alabama producers is the final goal of this initiative.

Methodology: **Georgia Green**, a moderately spotted wilt susceptible variety, was planted throughout the test.

Insecticides in the study were:

1. BotaniGard ES with 1.0% BW439 (a microbial insecticide with feeding stimulant)
2. QRD452 (Requiem – a botanical insecticide containing extract from *Chenopodium ambrosioides*), and
3. Radiant (spinetoram- an isomer of spinosyn).

Plot size is 30 ft length and four rows with 22 inch row spacing. There were four replications to all treatments. Foliar sprays were applied weekly after thrips were detected and continued for 3 weeks to provide early suppression and limit virus transmission.

PEANUT TEST AT FAIRHOPE

Planting date: 22 May 2009

Foliar spray dates (weekly): 12 June, 18 June, 29 June

TSWV rating was completed on 4 August 2009.

Sampling procedure at GREC: Ten plants (5 from each outer row) were sampled destructively for thrips counts by putting plants in a transparent Ziploc bag and vigorously shaking the bag 20 times. Organic debris was removed from the bag before counting thrips in field. Only cumulative thrips numbers (nymphs+ adults) are reported in Table 1. Virus hits were visually counted after thoroughly checking symptoms two times in the season; only the final TSWV count is reported herein.

Results from the preliminary trial at Fairhope in 2009 (Table 1):

- There were significant differences ($F = 1.93$; $df = 19$; $P = 0.0279$) in treatment means for thrips counts at $P = 0.05$.
- There were no statistical differences ($F = 0.95$; $df = 19$; $P = 0.5250$) in treatment means for TSWV hits at $P = 0.05$.
- Plant stands were uniform and no phytotoxicity after insecticide applications was noticeable in the test.
- Untreated check plots had the highest thrips numbers (40 thrips per plot) and also the highest TSWV incidence (2 per 60 foot row) compared to other treatments indicating moderate insect pressure at Fairhope.
- Temik or Thimet applied in furrow at reduced rates had high thrips population density (> 30 thrips per plot) that was statistically similar to the population density in the untreated check.
- Four out of five top treatments (circled in Table 1) based on thrips counts consisted of Radiant as one of the IPM partner. Average thrips numbers in the top four Radiant treatments was under 10 per plot. So Radiant (a new spinosyn product) appears to be a promising insecticide for thrips management. **It is currently not registered for application on peanuts in Alabama.**
- Thimet (planting time application at reduced rate) followed by Radiant at half the recommended rate significantly decreased thrips populations compared to untreated check (i.e., 6 thrips/plot vs. 40 thrips/plot). This Thimet + Radiant combination was the best integrated treatment among all others. TSWV incidence also was minimal in this treatment combination.

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Table 1. Various IPM regimes incorporating microbial and botanical insecticides as rotation partner for thrips management in peanuts, GREC, Fairhope, AL, 2009. Treatments are arranged in the order of increasing thrips numbers. Five treatments with lowest spotted wilt levels appear in bold.

		Average thrips numbers per plot (whole plant sampling at 7 DAT)	TSWV hits (average per 60 foot of row)
	IPM regime	June 19	August 4
1.	Thimet (half rate) + Radiant (half rate)	6.0 f	0.5
2.	Karate Z (full rate) alternated with Radiant (full rate)	9.0 ef	1.0
3.	Radiant (<u>full</u> rate) foliar sprays only	10.6 def	0.8
4.	QRD452 (<u>full</u> rate) foliar sprays only	13.6 def	1.3
5.	Temik (half rate) + Radiant (<u>half</u> rate)	14.0 cdef	1.3
6.	Thimet (half rate) + Radiant (<u>full</u> rate)	14.6 cdef	0.9
7.	Thimet (half rate) + BotaniGard (<u>full</u> rate with Coax 1%)	17.6 bcdef	0.6
8.	Thimet (half rate) + QRD452 (<u>full</u> rate)	18.0 bcdef	1.0
9.	BotaniGard (<u>full</u> rate with Coax 1%) foliar sprays only	19.6 abcdef	1.1
10.	Temik (half rate) followed by Karate (full rate)	20.0 abcdef	1.1
11.	Karate Z (full rate) alternated with BotaniGard (<u>full</u> rate with Coax 1%)	22.6 abcdef	1.4
12.	Karate Z (full rate) alternated with QRD452 (<u>full</u> rate)	25.6 abcdef	1.6
13.	Karate Z (full rate) foliar sprays only	26.0 abcdef	1.6
14.	Thimet (half rate) + QRD452 (<u>half</u> rate)	29.0 abcde	0.6
15.	Temik (half rate) only at planting	30.0 abcd	1.4
16.	Temik (half rate) + BotaniGard (<u>half</u> rate with Coax 1%)	34.0 abc	1.6
17.	Thimet (half rate) only at planting	34.0 abc	0.8
18.	Thimet (half rate) + BotaniGard (<u>half</u> rate with Coax 1%)	35.0 ab	0.9
19.	Temik (half rate) + QRD452 (half rate)	36.4 ab	1.6
20.	Untreated check	39.6 a	2.0
	LSD	20.4	NS

PEANUT TEST AT HEADLAND

Planting date: 8 June 2009

Foliar spray dates (weekly): 9 July, 16 July, 24 July

TSWV rating was done 24 September 2009.

Sampling procedure: Whole plant sampling was not possible at WREC due to late planting and the delayed occurrence of thrips in 2009 production season. Alternatively, 20 peanut flowers from each plot (i.e., 10 flowers each from two treated rows) were collected in transparent Ziploc bag and shaken vigorously 20 times to dislodge and collect thrips. Organic debris was removed from bag before counting thrips in field. Only cumulative thrips numbers (nymphs+ adults) are reported herein. Virus hits were visually counted after thoroughly checking symptoms two times in the season; only the final TSWV count is reported in Table 2.

Results from the preliminary trial at Headland in 2009 (Table 2):

- There were highly significant differences ($F = 4.14$; $df = 19$; $P = <0.0001$) among treatment means for thrips counts at $P = 0.05$.
- There were no statistical differences ($F = 0.63$; $df = 19$; $P = 0.8643$) among treatment means for spotted wilt at $P = 0.05$.
- Peanut seed germination was uniform in the plots. No phytotoxicity due to insecticide applications was noticeable in the trial.
- Untreated check plots had the highest thrips numbers (47 per plot) but very low TSWV levels were observed in those plots (two per 60 foot row).
- Under delayed planting and late thrips onset, all three alternative insecticides tested performed well when integrated with Thimet (at reduced rates of all products).

Table 2. Efficacy of bio-based insecticides in combination with synthetic insecticides for thrips management in peanut, WREC, Headland, 2009. Treatments are arranged in the order of increasing thrips numbers. Five treatments with lowest spotted wilt levels appear in bold.

		Average thrips numbers per plot (foliar sampling at 7 DAT)	TSWV hits (average per 60 foot of row)
	<i>IPM regime</i>	<i>July 16</i>	<i>September 24</i>
1.	Temik (half rate) + Radiant (<u>half</u> rate)	16.5 f	0.4
2.	Thimet (half rate) + BotaniGard (<u>half</u> rate with Coax 1%)	16.5 f	0.4
3.	Thimet (half rate) + QRD452 (<u>half</u> rate)	17.0 f	0.5
4.	Radiant (<u>full</u> rate) foliar sprays only	17.8 ef	1.0
5.	Thimet (half rate) + Radiant (half rate)	20.0 def	0.6
6.	Temik (half rate) followed by Karate (full rate)	23.5 def	0.3
7.	Temik (half rate) + QRD452 (half rate)	25.0 cdef	0.3
8.	QRD452 (<u>full</u> rate) foliar sprays only	25.5 cdef	0.5
9.	Karate Z (full rate) alternated with QRD452 (<u>full</u> rate)	26.3 cdef	0.9
10.	Thimet (half rate) + QRD452 (<u>full</u> rate)	27.5 bcdef	0.3
11.	Thimet (half rate) + BotaniGard (<u>full</u> rate with Coax 1%)	27.8 bcdef	0.5
12.	Temik (half rate) only at planting	27.8 bcdef	0.6
13.	Karate Z (full rate) foliar sprays only	30.0 bcde	0.5
14.	Karate Z (full rate) alternated with Radiant (full rate)	30.5 bcde	1.1
15.	Thimet (half rate) only at planting	31.0 cde	0.4
16.	Thimet (half rate) + Radiant (<u>full</u> rate)	37.5 abc	0.4
17.	Karate Z (full rate) alternated with BotaniGard (<u>full</u> rate with Coax 1%)	39.2 ab	0.4
18.	Temik (half rate) + BotaniGard (<u>half</u> rate with Coax 1%)	39.8 ab	0.6
19.	BotaniGard (<u>full</u> rate with Coax 1%) foliar sprays only	44.8 a	0.9
20.	Untreated check	47.3 a	0.8
	<i>LSD</i>	<i>12.8</i>	<i>NS</i>

Overall, what have we learnt from this preliminary study?

- That Temik and Thimet can be applied at reduced rates albeit efficacy of product is lost in three weeks.
- That Radiant, Requiem and BotaniGard can provide thrips control in peanuts as a component of IPM; however, research will continue in future on efficacy and persistence of these and other alternative insecticides. **Radiant, Requiem and BotaniGard have not been registered for use on peanuts in Alabama.**
- Due to the broad-spectrum action of modern biological insecticides, effect of these new products on other foliar insect pests of peanuts (e.g., caterpillars) needs to be evaluated in order to improve their cost effectiveness and benefit to farmers.

For queries, please call Dr. A at (251)331-8416 or email bugdoctor@auburn.edu. If you love cell phone, the call the toll free Alabama IPM hotline 1-800-446-0375. For the Internet savvy, click https://sites.aces.edu/group/commhort/vegetable/Vegetable/alabama_IPM_trap_network.aspx. Good luck.