

FINAL REPORT
National Peanut Board

Project Title: Research to Clarify the Role of Insecticides in Reduction of Tomato Spotted Wilt Virus in Peanut

Project No.: 447405

Project Leader: Ames Herbert, Virginia Tech

Please note that three field tests were conducted, as proposed, and data collected for each test included two stand counts, three thrips injury ratings, three tomato spotted wilt virus (TSWV) ratings, and plot yields. The three tests are designated in this report as PT05TSWV1 (Tables 1 & 2), PT05TSWV2 (Tables 3 & 4), and PT05TSWV3 (Tables 5 & 6) (attached).

Plant stand: There were no apparent effects on plant stand with any of the treatments, in any of the three field tests. There were no statistical differences in plant stand among any of the treatments applied for control of thrips and TSWV (Tables 2, 4, & 6).

Thrips plant injury ratings: All treatments had significantly lower thrips injury than the untreated controls on all sample dates in all three TSWV tests. In PT05TSWV1 (Table 1), there was a trend for less injury when Temik was followed with at least two Orthene broadcasts. There were mixed results with Thimet followed by Orthene broadcasts for the three sample dates; however, having at least one broadcast treatment helped to control late (June 21) thrips injury. In PT05TSWV2 (Table 3), the addition of Orthene broadcasts to in-furrow treatments tended to significantly reduce thrips injury. The experimental product KC791230 applied in-furrow followed by an Orthene broadcast provided the best thrips control. In PT05TSWV3 (Table 5), the Temik and Thimet combinations (1.05/0.70 and 0.525/1.0 lb ai/A) resulted in lower thrips injury than either product alone.

TSWV incidence: Disease incidence peaked on Aug 31, with a range of 18.75 to 22.25 hits per plot in the untreated controls of the three tests (Tables 2, 4, & 6). All insecticide treatments resulted in significantly less virus compared with the untreated controls. In PT05TSWV1, the least virus was detected in Thimet 20G treated plots followed by two or four oversprays with Orthene 97 at 0.36 lb ai/acre. In PT05TSWV2, the least virus was detected in the Thimet 20G treatment oversprayed one time with Orthene 97 at 0.36 lb ai/acre. In PT05TSWV3, there was no difference in virus incidence among treatments. The best 'value' was the treatment with reduced rates of Temik 15G (0.525 lb ai/acre) and Thimet 20G (0.7 lb ai/acre).

Peanut yield: In all tests, all treatments resulted in significantly greater yields compared with the untreated controls (Tables 2, 4, & 6), and within tests there were no significant differences among any of the treatments. In PT05TSWV1, the difference between treatments and the untreated control ranged from 782 to 895 lb/acre, with a mean of 848 lb/acre. In PT05TSWV2,

the difference between treatments and the untreated control ranged from 367 to 731 lb/acre, with a mean of 507 lb/acre. In PT05TSWV3, the difference between treatments and the untreated control ranged from 556 to 872 lb/acre, with a mean of 738 lb/acre. In PT05TSWV1, addition of Orthene oversprays increased yield in Temik treated plots by a range of 44 to 150 lb/acre. Addition of Orthene oversprays increased yields in Thimet treated plots by a range of 179 to 316 lb/acre. Yields averaged 5258 lb/acre for all treatments receiving Temik, and 5271 lb/acre for those treated with Thimet. In PT05TSWV2, the Orthene overspray increased the Temik treatment by 102 lb/acre, and the Thimet treatment by 185 lb/acre.

These results will be summarized for presentation at winter meetings. In addition, plans are in place to combine several years' data from Virginia Tech with similar data collected at North Carolina State University and Clemson University for publication in Peanut Science and the Virginia-Carolina Peanut News.

Thank you for your support of our peanut entomology program. Do not hesitate to contact us if we can provide further information, or can serve you in any related matter.

Table 1. Thrips injury rating, PT05TSWV1. Tidewater AREC, Suffolk, VA, 2005.

#	Material	Rate and application method ²	Thrips injury rating ¹		
			Jun 7	Jun 14	Jun 21
1	Temik 15G	1.05 lb ai/A (IF)	1.06 b ³	1.13 b	1.25 b
2	Temik 15G Orthene 97	1.05 lb ai/A (IF) 0.36 lb ai/A (BC at late GC)	1.00 bc	0.94 b-d	0.75 c
3	Temik 15G Orthene 97	1.05 lb ai/A (IF) 0.36 lb ai/A (BC at late GC + 2 wk)	0.63 d	0.69 de	0.50 d
4	Temik 15G Orthene 97	1.05 lb ai/A (IF) 0.36 lb ai/A (BC at late GC + 2 & 4 wk)	0.81 b-d	0.81 c-e	0.50 d
5	Temik 15G Orthene 97	1.05 lb ai/A (IF) 0.36 lb ai/A (BC at late GC + 2, 4, & 6 wk)	0.69 cd	0.69 de	0.56 cd
6	Thimet 20G	1.0 lb ai/A (IF)	1.06 b	1.06 bc	1.31 b
7	Thimet 20G Orthene 97	1.0 lb ai/A (IF) 0.36 lb ai/A (BC at late GC)	0.75 b-d	0.75 de	0.75 c
8	Thimet 20G Orthene 97	1.0 lb ai/A (IF) 0.36 lb ai/A (BC at late GC + 2 wk)	0.81 b-d	0.94 b-d	0.63 cd
9	Thimet 20G Orthene 97	1.0 lb ai/A (IF) 0.36 lb ai/A (BC at late GC + 2 & 4 wk)	0.88 b-d	0.75 de	0.63 cd
10	Thimet 20G Orthene 97	1.0 lb ai/A (IF) 0.36 lb ai/A (BC at late GC + 2, 4, & 6 wk)	0.75 b-d	0.63 e	0.56 cd
11	Untreated	---	2.50 a	4.94 a	5.81 a
	LSD		0.34 P<0.01	0.26 P<0.01	0.23 P<0.01

¹ Thrips injury rated on a 0-10 scale, 0 = no thrips and 10 = dead plants. Peanut was planted on May 10.

² In-furrow treatments were applied on May 10; broadcast at late ground cracking treatments were applied on May 26; broadcast at late ground cracking + 2 week treatments were applied on Jun 9; broadcast at late ground cracking + 4 week treatments were applied on Jun 23; broadcast at late ground cracking + 6 week treatments were applied on Jul 7.

³ Means within a column followed by the same letter(s) are not significantly different (LSD).

Table 2. Stand counts, TSWV hits, and yield, PT05TSWV1. Tidewater AREC, Suffolk, VA, 2005.

#	Material	Rate and application method ²	Stand count per 80 row ft			TSWV hits ¹			Yield lb/acre ³
			May 25	Jun 7	Jun 14	Jul 22	Aug 31		
1	Temik 15G	1.05 lb ai/A (IF)	194.0 a ⁴	287.5 a	2.00 bc	9.50 a-c	7.75 bc	5163 a	
2	Temik 15G Orthene 97	1.05 lb ai/A (IF) 0.36 lb ai/A (BC at late GC)	183.3 a	277.3 a	3.00 a-c	11.25 ab	7.00 bc	5207 a	
3	Temik 15G Orthene 97	1.05 lb ai/A (IF) 0.36 lb ai/A (BC at late GC + 2 wk)	190.0 a	278.8 a	2.25 bc	12.25 ab	5.25 bc	5313 a	
4	Temik 15G Orthene 97	1.05 lb ai/A (IF) 0.36 lb ai/A (BC at late GC + 2 & 4 wk)	180.5 a	281.0 a	3.75 ab	8.75 a-c	7.00 bc	5297 a	
5	Temik 15G Orthene 97	1.05 lb ai/A (IF) 0.36 lb ai/A (BC at late GC + 2, 4, & 6 wk)	188.0 a	273.0 ab	2.75 a-c	9.75 a-c	6.00 bc	5311 a	
6	Thimet 20G	1.0 lb ai/A (IF)	181.8 a	271.5 ab	1.25 c	10.00 a-c	8.50 b	5083 a	
7	Thimet 20G Orthene 97	1.0 lb ai/A (IF) 0.36 lb ai/A (BC at late GC)	193.3 a	279.5 a	1.50 bc	10.25 a-c	5.25 bc	5262 a	
8	Thimet 20G Orthene 97	1.0 lb ai/A (IF) 0.36 lb ai/A (BC at late GC + 2 wk)	188.3 a	252.3 b	1.75 bc	9.50 a-c	4.50 c	5333 a	
9	Thimet 20G Orthene 97	1.0 lb ai/A (IF) 0.36 lb ai/A (BC at late GC + 2 & 4 wk)	193.8 a	278.3 a	1.75 bc	7.75 bc	7.50 bc	5278 a	
10	Thimet 20G Orthene 97	1.0 lb ai/A (IF) 0.36 lb ai/A (BC at late GC + 2, 4, & 6 wk)	187.3 a	276.3 a	1.00 c	5.75 c	4.00 c	5399 a	
11	Untreated	---	188.8 a	275.8 a	4.75 a	13.00 a	18.75 a	4527 b	
	LSD		15.7 P=0.68	21.9 P=0.25	2.37 P=0.08	4.70 P=0.18	3.84 P<0.01	334.7 P<0.01	

¹ Number of plants expressing symptoms of tomato spotted wilt virus per 80 row feet. Peanut was planted on May 10.

² In-furrow treatments were applied on May 10; broadcast at late ground cracking treatments were applied on May 26; broadcast at late ground cracking + 2 week treatments were applied on Jun 9; broadcast at late ground cracking + 4 week treatments were applied on Jun 23; broadcast at late ground cracking + 6 week treatments were applied on Jul 7.

³ Yield based on weight of peanut with moisture content of 7%. Dig date = Oct 15 and harvest date = Oct 20.

⁴ Means within a column followed by the same letter(s) are not significantly different (LSD).

Table 3. Thrips injury rating, PT05TSWV2. Tidewater AREC, Suffolk, VA, 2005.

#	Material	Rate and application method ²	Thrips injury rating ¹		
			Jun 7	Jun 14	Jun 21
1	Temik 15G	1.05 lb ai/A (IF)	1.00 b ³	1.00 c	1.25 b
2	Temik 15G Orthene 97	1.05 lb ai/A (IF) 0.36 lb ai/A (BC at late GC)	0.69 c	0.81 cd	0.50 d
3	Thimet 20G	1.0 lb ai/A (IF)	1.00 b	1.50 b	1.13 b
4	Thimet 20G Orthene 97	1.0 lb ai/A (IF) 0.36 lb ai/A (BC at late GC)	0.50 d	0.75 cd	0.75 c
5	KC791230	1.05 lb ai/A (IF)	0.69 c	0.75 cd	0.75 c
6	KC791230 Orthene 97	1.05 lb ai/A (IF) 0.36 lb ai/A (BC at late GC)	0.50 d	0.50 d	0.50 d
7	Untreated	---	2.50 a	5.25 a	5.38 a
	LSD		0.10 P<0.01	0.37 P<0.01	0.16 P<0.01

¹ Thrips injury rated on a 0-10 scale, 0 = no thrips and 10 = dead plants. Peanut was planted on May 10.

² In-furrow treatments were applied on May 10; broadcast at late ground cracking treatments were applied on May 26.

³ Means within a column followed by the same letter(s) are not significantly different (LSD).

Table 4. Stand counts, TSWV hits, and yield, PT05TSWV2. Tidewater AREC, Suffolk, VA, 2005.

#	Material	Rate and application method ²	Stand count per 80 row ft			TSWV hits ¹			Yield lb/acre ³
			May 24	Jun 7	Jun 14	Jul 22	Aug 31		
1	Temik 15G	1.05 lb ai/A (IF)	179.5 a ⁴	251.3 a	3.00 b	10.75 a	7.50 bc	5059 b	
2	Temik 15G Orthene 97	1.05 lb ai/A (IF) 0.36 lb ai/A (BC at late GC)	188.8 a	268.8 a	2.75 b	11.50 a	6.50 bc	5161 ab	
3	Thimet 20G	1.0 lb ai/A (IF)	192.3 a	260.8 a	1.75 b	10.25 a	7.00 bc	5238 ab	
4	Thimet 20G Orthene 97	1.0 lb ai/A (IF) 0.36 lb ai/A (BC at late GC)	194.0 a	260.0 a	2.25 b	7.25 a	4.00 c	5423 a	
5	KC791230	1.05 lb ai/A (IF)	180.5 a	258.0 a	2.25 b	10.75 a	9.00 bc	5176 ab	
6	KC791230 Orthene 97	1.05 lb ai/A (IF) 0.36 lb ai/A (BC at late GC)	187.8 a	269.3 a	1.75 b	11.00 a	9.50 b	5135 ab	
7	Untreated	---	186.0 a	266.0 a	7.25 a	12.75 a	22.25 a	4692 c	
	LSD		15.3 P=0.39	24.8 P=0.73	2.17 P<0.01	5.51 P=0.57	5.05 P<0.01	311.8 P<0.01	

¹ Number of plants expressing symptoms of tomato spotted wilt virus per 80 row feet. Peanut was planted on May 10.

² In-furrow treatments were applied on May 10; broadcast at late ground cracking treatments were applied on May 26.

³ Yield based on weight of peanut with moisture content of 7%. Dig date = Oct 15 and harvest date = Oct 20.

⁴ Means within a column followed by the same letter(s) are not significantly different (LSD).

Table 5. Thrips injury rating, PT05T5WV3. Tidewater AREC, Suffolk, VA, 2005.

#	Material	Rate and application method ²	Thrips injury rating ¹		
			Jun 7	Jun 14	Jun 21
1	Temik 15G	1.05 lb ai/A (IF)	1.00 b ³	1.25 c	1.00 b
2	Thimet 20G	1.0 lb ai/A (IF)	1.06 b	1.44 b	1.00 b
3	Temik 15G Thimet 20G	1.05 lb ai/A (IF) 0.70 lb ai/A (IF)	0.88 c	0.75 e	0.50 c
4	Temik 15G Thimet 20G	0.525 lb ai/A (IF) 1.0 lb ai/A (IF)	0.75 d	0.75 e	0.50 c
5	Temik 15G Thimet 20G	0.525 lb ai/A (IF) 0.70 lb ai/A (IF)	1.00 b	1.00 d	0.50 c
6	Untreated	---	2.50 a	5.06 a	5.00 a
	LSD		0.12 P<0.01	0.11 P<0.01	0.00 P<0.01

¹ Thrips injury rated on a 0-10 scale, 0 = no thrips and 10 = dead plants. Peanut was planted on May 10.

² In-furrow treatments were applied on May 10.

³ Means within a column followed by the same letter(s) are not significantly different (LSD).

Table 6. Stand counts, TSWV hits, and yield, PT05TSWV3. Tidewater AREC, Suffolk, Virginia, 2005.

#	Material	Rate and application method ²	Stand count per 80 row ft		TSWV hits ¹				Yield lb/acre ³
			May 24	Jun 7	Jun 14	Jul 22	Aug 31		
1	Temik 15G	1.05 lb ai/A (IF)	178.8 a ⁴	245.8 a	2.50 b	12.75 b	7.50 b	5162 a	
2	Thimet 20G	1.0 lb ai/A (IF)	175.8 a	251.0 a	1.25 bc	8.00 c	6.75 b	5263 a	
3	Temik 15G Thimet 20G	1.05 lb ai/A (IF) 0.70 lb ai/A (IF)	180.3 a	251.5 a	0.75 c	8.25 c	6.75 b	5275 a	
4	Temik 15G Thimet 20G	0.525 lb ai/A (IF) 1.0 lb ai/A (IF)	177.5 a	237.3 a	0.75 c	11.25 bc	4.50 b	5251 a	
5	Temik 15G Thimet 20G	0.525 lb ai/A (IF) 0.70 lb ai/A (IF)	185.0 a	261.0 a	1.25 bc	8.00 c	5.75 b	5191 a	
6	Untreated	---	182.3 a	250.8 a	4.50 a	16.75 a	20.00 a	4380 b	
	LSD		14.7 P=0.79	27.0 P=0.59	1.39 P<0.01	3.96 P<0.01	4.13 P<0.01	391.8 P<0.01	

¹ Number of plants expressing symptoms of tomato spotted wilt virus per 80 row feet. Peanut was planted on May 10.

² In-furrow treatments were applied on May 10.

³ Yield based on weight of peanut with moisture content of 7%. Dig date = Oct 15 and harvest date = Oct 20.

⁴ Means within a column followed by the same letter(s) are not significantly different (LSD).