

MANAGEMENT OF EARLY SEASON THRIPS IN ULTRA NARROW ROW COTTON

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Abstract

Field studies were conducted to evaluate early season thrips management programs in ultra narrow row cotton. Temik was evaluated at 7.5 and 10 lb. per acre and various rates of Orthene treated seed were evaluated with and without supplemental foliar Orthene sprays. In these studies Temik treatments and Orthene treated seed supplemented with foliar sprays significantly reduced thrips populations. Additionally these studies demonstrated that if heavy thrips populations are not controlled, yields will be significantly reduced in ultra narrow row cotton.

Introduction

Ultra narrow row cotton (UNRC) production may be defined as cotton planted in row spacings of ten inches or less. Although this concept is not new, little is known about insect pest management programs in UNRC.

Thrips are annual pests of seedling cotton in Georgia and most growers utilize a preventive insecticide at planting to control early season thrips in wide-row cotton. Thrips feed by piercing the plant tissues and feeding on the escaping plant sap. This can cause leaf mutilation, terminal bud damage, and plant death (Hawkins et al. 1966). The potential importance of thrips control in UNRC is recognized and may be achieved using in-furrow insecticides. However, if comparable rates of in-furrow insecticides on a row foot basis are used in UNRC, the rate per acre may be three to five times greater as in conventional wide-row cotton. The objective of our studies was to evaluate selected management programs for control of early season thrips in UNRC. Programs evaluated included the use of in-furrow insecticides and Orthene treated seed with and without supplemental foliar sprays.

Methods

Early season thrips management programs in ultra narrow row cotton were evaluated at the University of Georgia Coastal Plain Experiment Station (CPES) in Tift County GA during 1998 and 1999 and the Sunbelt Agricultural Exposition (Expo) in Colquitt County GA during 1999. Experiments were arranged in a randomized complete block design with three or four replications. Plot sizes were 10 feet

wide by 50 feet long at the CPES sites and 5 feet wide by 50 feet at the Expo site. Plots were established using a Monosem air planter with 10 inch row spacings. Approximately 150,000 seeds were planted per acre. The CPES 1998 location was planted on May 1 with DP 33B cottonseed and foliar applications of Orthene 90S were applied with a CO2 backpack sprayer in 10 gallons of water on May 14 and 21 (8 and 15 days after emergence). DP 458 was planted on May 20 at the Expo site during 1999 and foliar Orthene 97WP treatments were applied in a similar manner as above on June 11 (16 days after emergence). The third location was planted with SG 125B/RR on June 7 at the CPES during 1999. Orthene 90S was applied as a seed treatment by thoroughly mixing seed and insecticide at various rates in a closed bucket during 1999, whereas, commercially available Orthene 80SP treated seed was used during 1998. Plots were maintained according to University of Georgia Cooperative Extension Service recommendations.

Thrips populations were sampled at specified intervals by randomly selecting ten plants and immersing them in 70% ethyl alcohol (adapted from Burris et al. 1990). Adult and larval thrips were counted using a dissecting microscope. Visual damage ratings were made by assigning plant injury indexes on a scale from one to five; 1=no damage, 2=slight damage, 3=moderate but acceptable damage, 4=heavy damage, and 5=severe damage. Mean plant heights were obtained by measuring ten consecutive plants in each plot and plant populations were determined by counting plants in ten row feet on four adjacent rows. Yields were determined by machine harvesting plots with an Allis Chalmers finger stripper and assuming a lint turnout of 28 percent. All data were analyzed using Analysis of Variance and means were separated using Least Significant Difference procedures (Gylling, 1996).

Results and Discussion

CPES 1998

Moderate to heavy thrips pressure was observed at the CPES location during 1998. An error occurred during establishment of this trial in that Temik was only applied to every other row in the Temik plots. This mistake was recognized prior to collection of data and was very apparent in the study for the remainder of the season. Due to this error, all data, except yield, were recorded from the treated rows in Temik plots. Larval thrips populations peaked on May 20 (Table 1). All treatments significantly reduced larval thrips compared with the untreated on this date. Damage ratings were made on May 28 and all treatments were significantly different; Temik less than Orthene treated seed sprayed twice with Orthene less than Orthene treated seed less than untreated. Severe stunting occurred in the untreated plots as plant height was significantly lower in the untreated compared with other plots. Plant height was significantly

greatest in the Temik treatment compared with other treatments. Although not significantly different, stand loss was observed in the untreated plot compared with insecticide treatments. Yields were significantly greater in insecticide plots compared with the untreated. Supplemental control of thrips with two foliar Orthene sprays significantly increased yield when Orthene treated seed was used. Although the Temik yield was high in this trial, conclusions should not be made due to problems with Temik application mentioned above.

Expo 1999

Light to moderate thrips pressure occurred at the Expo location during 1999 (Table 2). Larval thrips per plant on June 2 and 11 were significantly less in Orthene treated seed and Temik plots compared with untreated plots (includes foliar only treatment since was not sprayed until June 11). However, Temik treatments had significantly fewer larval thrips compared with other treatments on June 11. On June 18, Temik plots and treatments receiving foliar Orthene applications had significantly fewer larval thrips. A rate response for Orthene treated seed also occurred on June 18. Orthene treated seed at 24 and 36 ozs/cwt had significantly fewer thrips compared with the untreated and Orthene treated seed at 8 ozs/cwt treatment. Orthene treated seed at 8 ozs/cwt was not significantly different from the untreated. Visual damage ratings were made on June 16 and all insecticide treatments were significantly lower compared with the untreated except the foliar Orthene only treatment. Temik treatments were significantly lower than remaining treatments. Plant heights were significantly greater in the Orthene treated seed at 24 and 36 ozs/cwt and Temik treatments compared with the untreated plot. Yields were taken on October 19. Unexplained variation in plant growth was observed during mid-late season, possibly due to soil type variability, nematodes, and/or other factors. However, Temik treatments yielded highest and were the only treatments significantly different from the check.

CPES 1999

Light thrips pressure was observed at the CPES location during 1999 likely due to the late June 7 planting date. No significant differences were observed in larval thrips or yield but visual ratings of damage were significantly lowest in the Temik treatment (Table 3). However, damage ratings were lower than three in all treatments which is considered to be acceptable based on the rating scale used.

Summary

Thrips management must be practiced when producing UNRC. Failure to control thrips will result in plant stunting which delays canopy closure and may compound weed control efforts. Additionally, excessive thrips injury will negatively impact yields in UNRC as in conventional wide

row cotton. These preliminary studies suggest that reduced rates of Temik on a row foot basis may provide acceptable thrips control in UNRC. These studies also suggest that utilization of Orthene treated seed supplemented with foliar sprays on an as-needed basis may also provide acceptable control. Additional information is needed on thrips management systems which will ultimately maximize profits.

Acknowledgment

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References

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Table 1. Larval thrips per plant, thrips damage rating, plant height, and yield in UNRC planted in 10 inch rows. CPES, RDC Pivot, Tift County GA - 1998.

Planted May 1	Thrips per Plant (larvae)			
	13 May	20 May	28 May	3 June
Untreated	0.20	11.03	0.60	1.07
Orthene 80SP 8 ozs/cwt (OTS)	0.10	2.80	0.33	1.27
OTS fb Orthene 90S				
0.2 lb ai/a (8,15 DAE)	0.17	0.97	0.27	1.50
Temik 15G 7.5 lb/a*	0.00	0.73	0.47	1.83
LSD (p=0.05)	0.13	5.82	0.62	1.28

Table 1. (continued)

Planted May 1	Damage Rating	Height (inches)	Plants per acre	Lint (lbs/a)
	28 May	29 May	22 Oct	25 Sept
Untreated	4.5	2.35	77,537	732
Orthene 80SP				
8 ozs/cwt (OTS)	4.00	4.44	90,082	973
OTS fb Orthene 90S				
0.2 lb ai/a (8,15 DAE)	3.08	4.47	101,189	1,109
Temik 15G 7.5 lb/a*	2.66	5.14	97,574	1,141
LSD (p=0.05)	0.27	0.51	28,519	96

* Insecticide tube malfunction, every other row in Temik treatment was untreated. Thrips count, damage rating, and plant height data was taken from treated rows.

Table 2. Larval thrips per plant, thrips damage rating, plant height, and yield in UNRC planted in 10 inch rows. Sunbelt Expo, Colquitt County GA - 1999.

Planted May 20	Thrips per Plant (larvae)		
	2 June	11 June	18 June
Untreated	2.70	5.87	1.60
Orthene 90S 8 ozs/cwt	0.30	2.47	1.47
Orthene 90S 16 ozs/cwt	0.90	3.17	1.07
Orthene 90S 24 ozs/cwt	0.57	2.73	0.97
Orthene 90S 32 ozs/cwt	0.50	2.63	0.77
Orthene 90S 8 ozs/cwt + foliar*	0.47	3.63	0.23
Orthene 90S 16 ozs/cwt + foliar*	0.37	2.67	0.07
Orthene 90S 24 ozs/cwt + foliar*	0.40	2.47	0.13
Orthene 90S 32 ozs/cwt + foliar*	0.73	2.50	0.10
Orthene 97WP 0.25 lb ai/a (foliar)*	2.97	6.43	0.07
Temik 15G 7.5 lb/a	0.00	0.03	0.00
Temik 15G 10 lb/a	0.00	0.17	0.00
LSD (p=0.05)	1.27	1.89	0.49

* Foliar spray applied on June 11, Orthene 97WP, 0.25 lb ai/a.

Table 2. (continued)

Planted May 20	Damage Rating	Height (inches)
	16 June	18 June
Untreated	3.83	3.49
Orthene 90S 8 ozs/cwt	3.17	4.10
Orthene 90S 16 ozs/cwt	2.83	4.26
Orthene 90S 24 ozs/cwt	2.83	4.40
Orthene 90S 32 ozs/cwt	2.50	4.67
Orthene 90S 8 ozs/cwt + foliar*	3.00	4.20
Orthene 90S 16 ozs/cwt + foliar*	3.17	4.35
Orthene 90S 24 ozs/cwt + foliar*	2.33	4.50
Orthene 90S 32 ozs/cwt + foliar*	2.33	4.26
Orthene 97WP 0.25 lb ai/a (foliar)*	3.67	3.71
Temik 15G 7.5 lb/a	1.33	5.72
Temik 15G 10 lb/a	1.33	5.14
LSD (p=0.05)	0.64	0.87

* Foliar spray applied on June 11, Orthene 97WP, 0.25 lb ai/a.

Table 3. Larval thrips per plant, thrips damage rating, and yield in UNRC planted in 10 inch rows. CPES, Ponder Farm, Tift County GA - 1999.

Planted June 7	Thrips per Plant (larvae)		Damage Rating	Lint (lbs/a)
	22 June	29 June	7 July	5 Nov
Untreated	0.08	0.10	2.63	763
Orthene 90S 24 ozs/cwt	0.05	0.08	2.25	727
Temik 15G 7.5 lb/a	0.05	0.23	1.50	700
LSD (p=0.05)	0.13	0.44	0.59	68