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CONTROL OPTIONS FOR THRIPS IN SOUTHEAST ARKANSAS - 2004

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Abstract

Seed treatments, in-furrow insecticides and foliar-applied insecticides were tested to determine effectiveness in controlling thrips populations. Wet conditions following planting, along with moderate to heavy thrips pressure, provided pronounced damage to cotton plants. Seed treatments such as thiamethoxam (Cruiser) and imidacloprid (Gaucho) provided control equal to or exceeding that of aldicarb (Temik). Yields in plots treated with Cruiser were highest. Above normal rainfall delayed foliar treatments and resulted in increased damage when compared with seed treatments and in-furrow insecticides. Foliar treatments, seed treatments, and in-furrow insecticides, such as the experimental compound KC791230 provided adequate control of thrips populations.

Introduction

Early-season insect control is one of the first decisions that a grower must face each year. One of the pests that growers are concerned with are thrips as they continue to be an early-season pest in Southeast Arkansas cotton. Heavy infestation of thrips can cause damage to terminal growth in cotton plants, resulting in plant death in extreme cases or terminal abortion (Micinski et al. 1990). Aborted terminals can lead to branching and excessive growth, resulting in reduced yields and delayed maturity if the damage is severe (Micinski et al. 1990). Thrips begin to move into cotton from senescing wild hosts and wheat and can reach populations high enough to cause economic damage to cotton if left untreated (Herbert 1995, Roberts and Rechel 1996). Seed treatments, along with in-furrow treatments, continue to be valuable options for early-season control of thrips (Johnson et al. 2003, Greene et al. 2003, and Greene et al. 2004).

Materials and Methods

Stoneville 4646 B2/R was planted on 23 April (Test 1) and 28 April (Test II) 2004 at the Southeast Branch Experiment Station near Rohwer, AR. Plots measured 8 rows by 40 feet, spaced 38 inches apart, with four replications of each treatment arranged in a RCBD. Standard fertilization and herbicide practices were followed according to current University of Arkansas Extension recommendations (Chapman 2000). In Test I, thrips were collected on 10, 17, 20, 24, and 28 May and on 1 and 3 June by randomly pulling 10 plants from rows 2 and 7 of each plot and washing them in 1-quart jars of 70% isopropyl alcohol. In Test II, thrips were collected on 17, 20, and 28 May and on 1, 3, and 9 June using identical procedures as in Test I. Foliar treatments were applied on 25 May and 7 June. Nymphs and adults were counted following filtration procedures in the laboratory. The filtration process consisted of pouring the collection jar into a funnel containing a 70-mm piece of filter paper that was attached to a flask. The flask was attached to a pump with plastic tubing that was used to pull the alcohol into the flask. The filter paper containing the thrips was removed to be counted under microscopes. Plant injury ratings were conducted on both trials by observing the visible foliar damage caused by thrips. This damage was rated by assigning a number to each plot with the numeral 10 equal to highest damage, and the numeral 0 equal to lowest damage. Data were processed using Agriculture Research Manager (ARM) (Gylling Data Management, Inc., Brookings, SD), and means were separated using Least Significant Difference (LSD) procedures following significant F tests using Analysis of Variance (ANOVA).

Results and Discussion

Test I

All treatments provided significant control of thrips up to 28 days after planting (28 DAP) (Table 1) duplicating results seen in other trials (Lentz et al. 2003, Greene et al. 2003, Greene et al. 2004). At 32 DAP, numbers of thrips in all insecticide treatments did not significantly differ from the untreated control. Only Temik at 3.5 lb and Cruiser seed treatment (ST) provided significantly higher yields than the untreated control, with Cruiser yielding the most numerically, with similar results observed in previous trials (Greene et al. 2003, Greene et al. 2004). Temik at 4.0 and 5.0 lb and Cruiser ST yielded numerically more than the untreated control (Table 1). Visual plant injury ratings were taken on 9 July. In terms of visual injury, all treatments sustained less damage than the untreated control (Table 1).

Test II

Only Temik at 5 lb and Cruiser ST provided significant control of thrips populations on 17 May (19DAP) when compared with the untreated control (Table 2). On 20 May (22DAP), all treatments except Dimethoate and Monitor provided significant control of thrips populations when compared with the untreated control. All treatments, except KC791230 at 5 lb, Temik at 3.5 lb, and Gaucho ST on 28 May (30DAP) and KC791230 at 5 lb and Temik at 3.5 lb on 1 June (34DAP) and 9 June (42DAP), provided significant control of thrips populations when compared with the untreated control. Visual plant injury ratings demonstrated that all treatments sustained less damage than the untreated control (Table 2).

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Disclaimer

The mention of trade names in this report is for informational purposes only and does not imply an endorsement by the University of Arkansas Cooperative Extension Service.

References

Chapman, S. L. 2000. Soil Test Recommendations Guide. University of Arkansas Division of Agriculture publication: 39.

Greene, J., C. Capps, G. Lorenz, P. Smith, D. Johnson, and G Studebaker. 2004. Control options for thrips in Southeast Arkansas-2003. Proceedings of the Beltwide Cotton Conference. National Cotton Council, Memphis, TN.

Greene, J., C. Capps, and J. Reed. 2003. Control options for thrips in Southeast Arkansas. Proceedings of the Beltwide Cotton Conference. National Cotton Council, Memphis, TN.

Herbert, D.A. 1995. Insect pest management in Virginia peanuts, soybeans, and cotton. pp. 97-110. Virginia Tech. Tidewater Agricultural Research and Extension Center Info Ser. No. 372.

Johnson, D.R., G. Lorenz, G. Studebaker, and D. Walsh. 2003. Thrips management in Arkansas cotton. Proceedings of the Beltwide Cotton Conference. National Cotton Council, Memphis, TN.

Lentz, G.L., N. Van Tol, and D. Pekarchick. 2003. Performance of early-season insecticides under adverse conditions in West Tennessee. Proceedings of the Beltwide Cotton Conference. National Cotton Council, Memphis, TN.

Micinski, S.D., P.D. Colyer, K. T. Nguyen, and K. L. Koonce. 1990. Effects of planting date and early-season pest control on yield in cotton. J. Prod. Agric. 3:597-602.

Roberts, B.A. and E.A. Rechel. 1996. Effects of early season thrips feeding on root development, leaf area, and yield. pp. 939-941. *In*: P. Dugger and D.A. Richter (eds.) Proceedings of the Beltwide Cotton Conference. National Cotton Council, Memphis, TN.

Table 1. Average number of adult and immature thrips per 10 plants (Test I).

Treatment/ Rate	10 May 18 DAP	17 May 25 DAP	20 May 28 DAP	24 May 32 DAP	28 May 36 DAP	03 June 42 DAP	Injury[1] 42DAP	Yield @ 35 % T.O.
UTC	43.8 a	94.0 a	196.3 a	221.5 a	108.5 a	42.3 a	7.3 a	1146 c
Temik 3.5 lb	4.3 c	12.8 b	37.0 b	145.0 a	119.0 a	55.3 a	1.5 b	1334 ab
Temik 4.0 lb	3.8 c	11.5 b	31.8 b	191.0 a	147.0 a	84.5 a	1.0 b	1206 bc
Temik 5.0 lb	4.0 c	15.0 b	36.3 b	156.8 a	158.0 a	42.0 a	1.0 b	1308 abc
Cruiser ST	1.5 c	11.5 b	39.8 b	139.0 a	126.0 a	51.5 a	1.0 b	1394 a
Gaucho ST	14.0 b	29.8 b	44.8 b	179.0 a	128.3 a	47.5 a	0.5 b	1317 abc

Means followed by same letter do not significantly differ ($P>0.05$, LSD). [1]Visual plant damage (10 = most damage, 0 = least damage).

Table 2. Average number of adult and immature thrips per 10 plants (Trial II).

Treatment/ Rate	17 May 19 DAP	20 May 22 DAP	28 May 30 DAP	01 June 34 DAP	03 June 36 DAP	09 June 42 DAP	Injury[1] 42DAP
UTC	32.5 a-d	149.0 ab	133.3 a	29.8 a	22.8 b	69.0 a	8.0 a
Dimethoate 4 @ 0.25 lb ai/a	38.0 ab	105.8 bc	18.0 d	15.0 b	19.3 b	3.5 de	5.3 b
Bidrin 8 @ 0.25 lb ai/a	34.5 abc	95.5 cd	10.8 d	11.5 b	13.0 b	1.8 e	4.3 bc
Orthene 97 @ 0.25 lb ai/a	46.8 a	97.3 cd	7.8 d	5.8 b	10.3 b	3.3 de	4.5 bc
Monitor 4 @ 0.25 lb ai/a	45.0 a	168.3 a	20.8 cd	7.8 b	19.0 b	7.0 de	4.0 c
KC791230 @ 3.5 lb/acre	21.0 b-e	14.5 e	21.3 cd	6.8 b	13.8 b	12.0 cde	0.5 ef
KC791230 @ 4.0 lb/acre	15.0 de	15.5 e	20.8 cd	4.5 b	15.5 b	18.0 b-e	0.3 f
KC791230 @ 5.0 lb/acre	14.3 de	53.8 de	79.5 abc	16.8 ab	20.5 b	45.0 ab	0.5 ef
Temik 15G @ 3.5 lb/acre	17.3 cde	37.3 e	97.5 ab	18.0 ab	57.0 b	41.5 abc	2.0 d
Temik 15G @ 5.0 lb/acre	9.3 e	24.0 e	65.3 bcd	14.5 b	48.3 a	26.3 b-e	2.0 d
Cruiser ST	13.3 e	19.8 e	39.0 bcd	7.0 b	19.8 b	24.8 b-e	1.5 de
Gaucho ST	24.0 b-e	30.5 e	83.8 ab	7.3 b	18.8 b	32.5 cd	1.0 def

Means followed by same letter do not significantly differ ($P>0.05$, LSD). [1]Visual plant damage (10 = most damage, 0 = least damage).