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INSECTICIDE PERFORMANCE EVALUATIONS FOR CONTROL OF TARNISHED PLANT BUG, *LYGUS LINEOLARIS* – 2003

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Abstract

Evaluations of new and existing insecticides for control of tarnished plant bug (TPB), *Lygus lineolaris*, in early-season and mid-to-late-season trials were conducted in 2003. In early-season trials, newer chemistries such as novaluron (Diamond) and thiamethoxam (Centric), and newly-formulated compounds such as imidacloprid (Trimax), provided adequate control of TPB, as did existing compounds such as acephate (Orthene), dicrotophos (Bidrin), and oxamyl (Vydate). In mid-to-late-season trials, new compounds provided enhanced control of TPB when tank mixed with pyrethroids and organophosphates. Experimental compounds, new chemistries such as acetamiprid (Intruder) and Centric, and existing chemistries such as Vydate provided adequate control of TPB. A pyrethroid alone performed poorly in early-season trials reaffirming that pyrethroids should not be used early season for control of TPB.

Introduction

Tarnished plant bug, *Lygus lineolaris,* has traditionally been an early-season pest in Southeast Arkansas but has become a mid-to-late season pest in recent years with the addition of Bt cotton, completion of the Boll Weevil Eradication Program, and use of lepidopteran specific insecticides. The expanded prominence of this pest necessitates continued applied research in the form of insecticide efficacy trials concerning its control. Our tests addressed the effectiveness of several new compounds compared with that provided by existing compounds.

Materials and Methods

Stoneville 4892 B/R was planted on 28 April and 28 May 2003 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 randomized complete block design. For the two early-season trials, mustard was seeded in late March on two rows between each eight row plot to attract plant bugs. Standard fertilization and herbicide practices were followed according to current University of Arkansas Extension recommendations (Chapman 2000). Insect counts were conducted by sampling 6 meters of row per plot with a small white pan while the cotton was young (less tan 18 in. tall) and later with a shake sheet (1 m^2) by counting adults and nymphs dislodged into the pan or onto the cloth. Tests I and IV were conducted as early-season plant bug trials, with treatments applied soon after pinhead square. Tests II and III were mid-to-late-season trials and applications were made post bloom. 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

Most compounds, except Mustang Max, provided significant early-season control of tarnished plant bugs (TPB), *Lygus lineolaris*, when compared with the untreated control across most sample dates (Table 1). This indicated that TPB maintains a tolerance to pyrethroid insecticides. Similar results were found in other trials (Greene and Capps 2003) and (Layton et al 2003). Yields in plots treated with Centric, Bidrin, Leverage, Trimax, Curacron, and Vydate were statistically higher than those in the untreated control, with Centric applications resulting in the highest yields.

Test II

In an additional early-season trial, all insecticides provided significant control across most sample dates with all treatments significantly yielding more than the untreated control (Table 2). Applications of Centric resulted in yields that were numerically higher than those of all other treatments.

Test III

In the first mid-to-late-season trial, all treatments provided significant control two days after the first application (2DAT1) when compared with the untreated control (Table 3). Malathion (0.5 lb ai/a) did not significantly differ from the untreated control on 4DAT1, and Trimax (0.031 lb ai/a) + Baythroid (0.025 lb ai/a), Malathion (0.5 lb ai/a), and Lorsban (0.5lb ai/a) did not significantly differ from the untreated control on 2DAT3. All treatments significantly reduced plant bug numbers on 3DAT2. All treatments except Malathion (0.5 lb a/a) yielded significantly more than the untreated check, with Diamond (0.0389 lb a/a) + Karate (0.025 lb a/a), Centric (0.03125 lb a/a) + Karate (0.025 lb a/a), and CS-AU-44-JO yielding the most numerically.

Test IV

In the second mid-to-late-season trial, all treatments provided significant control 2DAT1 when compared with the untreated control (Table 4). All treatments provided significant control of TPB at 3DAT2. Intruder (0.038 lb ai/a) + Crop oil and Intruder (0.05 lb ai/a) + Crop oil did not differ significantly from the untreated check.

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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

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Table 1. Average number of adult and immature plant bugs per 15-ft sample (Test I).

Treatment (lb ai/a)	TPB 2DAT1	TPB 7DAT1	TPB 2DAT2	TPB 4DAT2	TPB 7DAT2	TPB 2DAT3	TPB 4DAT3	TPB 8DAT3	Lint Yield (35%)
UTC	27.8 a-e	20.8abc	11.8abc	10.5a	8.5ab	5.5a	2.3abc	2.8 ab	930.5 g
Diamond 0.058	33.0abc	4.3d	5.0def	20.d	1.0ef	1.8cd	1.3bc	1.0 bcd	977.5 efg
Diamond 0.078	37.5a	14.0cd	6.8c-f	3.3cd	0.8f	1.5cd	1.3bc	0.8 cd	1072.7 c-g
Mustang Max 0.018	30.5 a-d	15.8bc	14.3a	9.5ab	9.3a	2.8bc	4.0a	1.5 bcd	986.9 d-g
Mustang Max 0.025	35.3ab	25.5ab	13.0ab	8.5ab	6.5abc	4.8ab	2.8ab	3.5 a	940.3 fg
Centric 0.0375	15.5cde	13.5cd	4.0def	3.0d	4.5cd	1.3cd	0.3c	0.0 d	1271.3 a
Bidrin 0.33	22.3 a-e	20.0abc	1.8f	1.8d	0.5f	0.5d	1.0bc	0.3 cd	1083.2 b-f
Orthene 97 0.33	32.3abc	17.0abc	3.5ef	2.0d	1.8def	0.0d	0.3c	0.5 cd	1060.7 c-g
Leverage 0.07	12.8 a-e	17.5abc	8.0 b-e	3.5cd	4.8cd	1.5cd	1.8bc	2.0 abc	1224.6 ab
Double Threat	14.3de	26.3a	4.0def	9.0ab	4.3cde	1.8cd	1.3bc	1.3 bcd	1023.8 d-g
Trimax 0.047	18.8 b-e	12.0cd	6.8 c-f	4.0cd	5.5bc	1.5cd	0.8bc	2.0 abc	1200.6 abc
Curacron 0.5	26.3 a-e	18.3abc	9.3 a-d	6.5bc	3.5 c-f	2.8bc	0.3c	1.8 a-d	1110.3 b-e
Vydate 0.33	19.3 b-e	20.0abc	1.8f	2.5d	2.0def	0.8cd	0.3c	0.5 cd	1128.4 a-d

Means followed by same letter do not significantly differ (P=0.05, LSD).

Table 2. Average number of adult and immature plant bugs per 15-ft sample (Test II).

Treatment (lb ai/a)	TPB 2DAT1	TPB 7DAT1	TPB 2DAT2	TPB 4DAT2	TPB 7DAT2	TPB 2DAT3	TPB 4DAT3	TPB 8DAT3	Yield 35%
UTC	40.5 a	17.3 a	11.3 a	5.8 a	3.5 a	6.5 a	3.3 a	1.5 a	988.4 c
Trimax 0.03125	13.3 bc	14.5 ab	5.8 b	4.0 ab	1.8 ab	1.5 b	0.8 b	0.5 ab	1265.3 b
Trimax 0.0469	24.8 b	4.3 c	4.8 b	2.5 b	2.5 ab	1.3 b	1.3 b	0.8 ab	1132.1 b
Bidrin 0.25	9.5 c	8.0 bc	3.8 b	3.0 ab	1.3 b	0.5 b	0.5 b	0.3 b	1218.6 b
Centric 0.03125	6.3 c	9.0 abc	3.3 b	2.3 b	1.0 b	1.0 b	0.5 b	0.8 ab	1418.7 a

Means followed by same letter do not significantly differ (*P*=0.05, LSD).

Table 3. Average number of adult and immature plant bugs per 15-ft sample (Test III).

Treatments (lb ai/a)	TPB 2DAT1	TPB 4DAT1	TPB 3DAT2	TPB 2DAT3	Yield 35%
UTC	42.5 a	38.0 a	63.0 a	30.0 ab	437.8 e
Diamond 0.0389 Karate 0.025	22.0 bc	19.5 bc	9.3 d	9.3 c	1005.0 a
Trimax 0.031 Bidrin 0.25	23.8 bc	22.8 bc	11.8 cd	14.3 c	889.1 ab
Trimax 0.031 Baythroid 0.025	19.3 bc	27.3 ab	30.8 b	38.0 a	890.6 ab
Centric 0.03125 Karate 0.025	20.8 bc	18.3 bc	16.5 bcd	13.3 c	958.3 a
Malathion 0.5	23.5 bc	28.0 ab	27.5 b	29.8 ab	472.4 de
Dimethoate 0.5	21.5 bc	20.8 bc	20.5 bcd	19.5 bc	809.4 bc
Vydate 0.25	18.0 bc	21.3 bc	21.0 bcd	14.5 c	746.2 c
CS-AU-44-JO	10.3 c	15.3 bc	11.8 cd	11.0 c	965.9 a
Lorsban 0.5	24.8 b	21.8 bc	25.5 bc	32.0 ab	607.8 d

Means followed by same letter do not significantly differ (*P*=0.05, LSD).

Table 4. Average number of adult and immature plant bugs per 15-ft sample (Test IV).

Treatments lb ai/a	TPB 2DAT1	TPB 4DAT1	TPB 3DAT2	TPB 2DAT3	Lint Yield (35%)
UTC	27.8 a	32.8 a	40.8 a	27.5 a	546.1 c
Intruder 0.05	27.8 a	16.0 bc	25.8 b	12.3 bc	776.3 ab
Intruder 0.038 + Crop oil	26.8 a	21.3 b	23.0 b	13.5 b	698.1 abc
Intruder 0.05 + Crop oil	18.8 ab	20.5 b	19.3 b	10.3 bcd	680.0 bc
Vydate 0.25	19.3 ab	15.8 bc	20.8 b	10.0 bcd	804.9 ab
Intruder 0.025 + Vydate 0.25	26.8 a	13.3 bc	25.0 b	7.3 de	744.7 ab
Intruder 0.025 + Vydate 0.25 + coc	22.0 ab	13.8 bc	16.8 b	8.8 cde	816.9 ab
Centric 0.05	23.0 ab	13.5 bc	17.5 b	10.5 cde	800.4 ab
Centric 0.05 + Crop oil	17.8 ab	9.5 c	15.8 b	11.3 bcd	825.9 ab
1785 0.088	15.8 b	13.0 bc	20.0 b	4.5 e	857.5 a

Means followed by same letter do not significantly differ (*P*=0.05, LSD).