

MANAGEMENT OF THE TARNISHED PLANT BUG, *Lygus lineolaris*, WITH TRADITIONAL AND NEW INSECTICIDES

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RESEARCH PROBLEM

Selected insecticides were evaluated in 1999 for efficacy against the tarnished plant bug in three studies. Traditional insecticides used for plant bug control such as Orthene (acephate), Bidrin (dicrotophos), and Vydate provided good control in late-season studies. Newer insecticides such as Steward (indoxacarb), Regent (fipronil), and Actara (thiamethoxam) provided control of plant bugs equal to traditional insecticides.

BACKGROUND INFORMATION

The tarnished plant bug, *Lygus lineolaris*, is the predominant plant bug species in Arkansas and is considered an economical pest of cotton. In recent years, it has developed insecticide resistance to all traditional classes of insecticides, including organophosphates, pyrethroids, and cyclodienes (to varying degrees) in Arkansas and Mississippi (Hollingsworth *et al.*, 1997; Snodgrass, 1996). The objective of these studies was to evaluate the efficacy of traditional and new insecticides for the control of the tarnished plant bug in cotton.

RESEARCH DESCRIPTION

Three small-plot studies were conducted in 1999. Two of the studies were conducted in grower fields planted with DPL NuCotn 33B, in Jefferson County; another study was conducted in Lonoke County in a field planted with Paymaster 1220 BG RR. A randomized complete-block design with four replications was used on all studies. In both Jefferson County studies, a JD Hi-cycle sprayer was used to apply the insecticides in an 8.5-gal/acre solution volume. A tractor-mounted sprayer was used in the Lonoke County study delivering 10 gal/acre. Treatment dates were 3 August at Jefferson County and 13 August for Lonoke County. Plant bug counts were taken 3 d after treatment with shake sheets. Twelve row feet were counted in the Jefferson County studies, while 18 row feet were counted at Lonoke County. Data were subjected to analysis of variance and mean separation.

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RESULTS

In the first study (Table 1) no significant differences were observed between treatments for the number of adult plant bugs. However, differences did occur among treatments for immature plant bugs. Bidrin (dicrotophos) 0.5 lb/acre, Leverage (cyfluthrin and imidicloprid) 3.75 oz/acre, and Steward (indoxacarb) 0.065 lb/acre had significantly fewer immature plant bugs than both of the controls. In the second Jefferson County study (Table 2), no differences were observed between treatments for adults. However, nymphal counts indicated that all treatments, with the exception of Regent (fipronil) at the 0.038 lb/acre rate, were significantly lower than the control. Total plant bug counts indicated a similar trend. In the Lonoke County study, all treatments were significantly lower than the control, and all treatments with the exception of Tracer (spinosad) had lower nymphal counts than Pirate (chlorfenapyr) (Table 3). Adult counts indicated that Tracer, Karate (cyhalothrin), and Pirate treatments were not significantly different than the untreated control. Total plant bug counts indicated all treatments were significantly lower than the check. Steward at the 0.09 lb/acre rate appeared to provide adequate control of plant bugs in all three studies. Regent performed to standards in the first two studies at the 0.05 lb/acre rate, although the 0.038 lb/acre rate in the second study was not statistically different from the check. The new formulation of Orthene (97% ai) in the second study reduced plant bug numbers equally or better than most of the other treatments. Leverage, Provado, and Actara were also equal to or better than standard treatments.

PRACTICAL APPLICATION

With the development of Bollgard cotton and completion of the Boll Weevil Eradication Program in Arkansas, growers can expect reduced insecticide inputs, which will probably elevate the pest status of the tarnished plant bug. New insecticides will play a large role in controlling plant bugs as older classes of insecticides are phased out of production.

LITERATURE CITED

- Hollingsworth, R.G., D.C. Steinkraus, and N.P. Tugwell. 1997. Responses of Arkansas populations of tarnished plant bugs (Heteroptera: Miridae) to insecticides, and tolerance differences between nymphs and adults. *J. Econ. Entomol.* 90(1):21-26.
- Snodgrass, G.L. 1996. Insecticide resistance in field populations of the tarnished plant bug (Heteroptera: Miridae) in cotton in the Mississippi Delta. *J. Econ. Entomol.* 89(4):783-790.

Table 1. Control of plant bugs in cotton with selected insecticides. Jefferson Co., AR. 1999.

Treatment	Rate	Plant Bugs	
		Immature	Adult
	rate/acre	----- mean per 12 row ft -----	
Regent	0.038 lb	6.5 ab ^z	1.0 a
Regent	0.05 lb	4.0 ab	0.0 a
Bidrin	0.5 lb	1.3 b	0.3 a
Provado	0.047 lb	7.0 ab	1.0 a
Leverage	3.75 oz	1.8 b	0.3 a
Actara	0.062 lb	7.3 ab	1.8 a
Steward ^y	0.065 lb	2.3 b	0.3 a
Steward ^y	0.09 lb	3.5 ab	1.0 a
Untreated 1		16.0 a	1.3 a
Steward ^y	0.11 lb	5.5 ab	0.3 a
Denim	0.01 lb	8.0 ab	0.5 a
Untreated 2		16.3 a	1.3 a

^z Means followed by the same letter are not significantly different (P= 0.05).

^y All Steward treatments had surfactant Dyne-Amic added at 0.5% v/v.

Table 2. Control of plant bugs in cotton with selected insecticides. Jefferson Co., AR. 1999.

Treatment	Rate	Plant Bugs		
		Immature	Adult	Total
	lb ai/acre	----- mean per 12 row ft -----		
Regent	0.038	15.00 a ^z	1.25 a	16.25 ab
Regent	0.05	3.75 b	1.75 a	5.50 bc
Provado	0.047	5.25 b	1.25 a	6.50 bc
Steward ^y	0.09	2.50 b	0.75 a	3.25 c
Steward ^y	0.11	6.75 b	0.75 a	7.50 bc
Vydate	0.33	4.00 b	0.00 a	4.00 c
Orthene 97	0.25	4.75 b	0.75 a	5.50 bc
Orthene 97	0.50	4.25 b	0.25 a	4.50 c
Untreated		16.75 a	2.25 a	19.00 a

^z Means followed by the same letter are not significantly different (P = 0.05).

^y All Steward treatments had surfactant Dyne-Amic added at 0.5% v/v.

Table 3. Control of plant bugs in cotton with selected insecticides. Lonoke Co., AR. 1999.

Treatment	Rate lb ai/acre	Plant Bugs		
		Immature	Adult	Total
		----- mean per 18 row ft -----		
Steward ^y	0.09	5.60 c	0.0 b	5.60 c
Steward ^y	0.09	5.60 c	0.0 b	5.60 c
Steward	0.11	5.60 c	4.2 b	9.70 c
Vydate	0.25	5.60 c	7.0 b	12.50 c
Tracer	0.08	12.50 bc	22.3 a	34.80 b
Karate	0.028	2.80 c	16.7 ab	19.50 bc
Orthene	0.50	1.40 c	2.8 b	4.20 c
Pirate	0.35	19.50 b	20.9 a	40.30 c
Untreated		33.30 a	36.2 a	69.50 a

^z Means followed by the same letter are not significantly different (P=0.05).

^y All Steward treatments had surfactant Dyne-Amic added at 0.5% v/v.