

TARNISHED PLANT BUG CONTROL IN THE MISSISSIPPI DELTA

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Abstract

Effective tarnished plant bug, *Lygus lineolaris* (Palisot de Beauvois), control was accomplished with foliar applied insecticides. Orthene® 90S at 0.5 lb ai/A and 1.0 lb ai/A consistently gave the greatest reduction in nymphs and adults. Several pyrethroids, including Baythroid® 2EC, Karate® 1EC and 1CS, and Fury® 1.5EC gave good plant bug control, but some cases of variable effectiveness may be the result of pyrethroid resistance in the population. Bidrin® 8 (0.25 lb ai/A), Provado® 1.6F (0.047 lb ai/A), and Monitor® 4EC (0.31 lb ai/A) provided effective control. Regent® 2.5EC (0.038 lb ai/A) significantly reduced plant bug infestation and is a promising new product. Furadan® 4F at 0.25 lb ai/A provided a moderate level of tarnished plant bug control, which would be a beneficial side effect when used against another primary target pest such as cotton aphid.

Introduction and Methods

All treatments were applied to 8 row plots (26.6 ft wide by 40 ft long) arranged in randomized complete blocks replicated 4 times. Deltapine 20 cotton was planted on May 9, 1997 in 40 in. rows with planting and all other production practices conducted by a cotton producer cooperator. Insecticide applications were made with a Melroe Spracoupe® model 230 operated at 48 psi which delivered 6 gpa spray volume through ConeJet® TX-8 tips at 5.5 mph. Applications were made on August 18, 1997 when above treatment threshold levels of tarnished plant bugs were observed in some plots.

Tarnished plant bug counts were made in each plot for adults and nymphs utilizing a 3 ft drop cloth (Snodgrass, 1993). Four 3-ft samples were observed per plot. Visual observations were also taken in each plot from 25 terminals and squares on the upper 2 nodes of the cotton plant. Counts were made prior to treatment on August 18 to determine pretreatment infestations, and on 2 posttreatment dates, August 21 and 25. Drop cloth sample data are presented as mean number per 12 row ft and visual observation data are presented as mean number per 100 terminals. Analysis of variance was conducted on the data and least significant difference applied to determine differences in treatment.

Results and Discussion

Tarnished plant bug adult and nymph infestation counts are summarized in Tables 1-3. The data presented are means for nymphs, adults, and nymphs plus adults for both observation methods. Most of the following interpretation of results is related to visual observations of nymphs plus adults in terminals on August 21.

Of the two posttreatment observation dates, August 21 and 25, the average infestation numbers from the terminal area on August 21 showed the greatest treatment effects compared to the untreated controls. Orthene 90S at 0.5 lb ai/A and 1.0 lb ai/A consistently provided the greatest reduction in nymphs and adults. Adult control with Orthene 90S at 0.5 lb ai/A was not different from Orthene 90S applied at 1.0 lb ai/A on August 21. However, there was an increase in adult average plant bug numbers observed on August 25 in plots treated with the lower rate of Orthene 90S compared to those plots treated with 1.0 lb ai/A of Orthene 90S.

Provado 1.6F applied at 0.047 lb ai/A provided effective control of adults and nymphs. Provado at 0.025 lb ai/A (essentially one-half rate) in mixtures with Monitor, Guthion, or Baythroid was about equally effective or slightly less effective than the full rate of Provado alone. Bidrin 8 at 0.25 lb ai/A, Monitor 4EC at 0.3 lb ai/A, and Regent 2.5EC at 0.038 lb ai/A significantly reduced plant bug infestation levels compared to the untreated control plots 3 days after application.

The pyrethroids, Baythroid 2EC at 0.03 lb ai/A, Karate 1EC and 1CS at 0.025 lb ai/A, and Fury 1.5EC at 0.035 lb ai/A showed excellent control of plant bug nymphs and adults in most cases. The few cases of mean numbers of plant bugs among the pyrethroid treatments not different from the untreated check may be a reflection of resistance development in tarnished plant bugs to certain pyrethroids (Snodgrass and Elzen, 1995).

Furadan 4F at 0.25 lb ai/A significantly reduced tarnished plant bug infestation compared to the untreated check. However, the level of reduction was not comparable to other more effective treatments.

Conclusions

Relatively high rates of Orthene 90S (0.5 and 1.0 lb ai/A) provided the greatest and most consistent reduction in tarnished plant bug infestations. Currently registered products, Bidrin 8 (0.25 lb ai/A), Provado 1.6F (0.047 lb ai/A), and Monitor 4EC (0.31 lb ai/A) gave effective tarnished plant bug control. Fipronil (Regent 2.5EC), a promising new product, at 0.038 lb ai/A provided effective tarnished plant bug control. Several pyrethroids, including Baythroid 2EC, Karate 1EC and 1CS, and Fury 1.5EC, were effective in reducing numbers of plant bug adults and

nymphs. However, some variable results may be the result of pyrethroid resistance in the tarnished plant bug population tested. Products such as Furadan 4F that provide moderate tarnished plant bug suppression probably give greatest value for tarnished plant bug control when used against another primary target pest such as cotton aphid.

References

Snodgrass, G. L. 1993. Estimating absolute density of nymphs of *Lygus lineolaris* in cotton using drop cloth and sweep-net sampling methods. *J. Econ. Entomol.* 86(4):1116-1123.

Snodgrass, G. L. and G. W. Elzen. 1995. Insecticide resistance in a tarnished plant bug population in cotton in the Mississippi Delta. *Southwest. Entomol.* 20(3):317-323.

Table 1. Mean tarnished plant bug nymphs in drop cloth and terminal observation counts pretreatment and two posttreatment observation dates. Sharkey County, MS. 1997.

Treatment (rate ¹)	Drop Cloth (12')			Visual (100 Terminals)		
	8/18	8/21	8/25	8/18	8/21	8/25
Orthene 90S (0.5)	0.5	0.3	0.3	3.0	1.0	2.0
Orthene 90S (1.0)	0.8	0.3	0.0	4.0	1.0	0.0
Bidrin 8 (0.25)	2.0	1.0	0.3	2.0	3.0	4.0
Provado 1.6F (0.047)	0.3	0.0	0.0	2.0	3.0	3.0
Provado 1.6F (0.025)	1.0	0.8	0.5	2.0	5.0	2.0
+ Monitor 4EC (0.25)						
Monitor 4EC (0.31)	1.0	0.8	0.3	2.0	3.0	1.0
Guthion 2L (0.125)	0.5	0.8	1.5	4.0	2.0	1.0
+ Provado 1.6F (0.025)						
Baythroid 2EC (0.03)	0.5	0.0	0.3	0.0	2.0	2.0
+ Provado 1.6F (0.025)						
Baythroid 2EC (0.03)	1.8	0.8	0.5	2.0	1.0	1.0
Regent 2.5EC (0.038)	0.3	0.8	0.5	3.0	0.0	2.0
Karate 1EC (0.025)	1.3	0.5	0.5	9.0	6.0	2.0
Karate 1CS (0.025)	1.0	0.3	0.3	10.0	2.0	0.0
Fury 1.5EC (0.035)	1.3	0.5	0.3	6.0	4.0	2.0
Furadan 4F (0.25)	1.3	0.5	0.0	2.0	6.0	1.0
Untreated Check	0.8	0.5	0.8	5.0	10.0	2.0
LSD (P= 0.05)	1.4	1.1	1.1	5.7	5.0	3.8

¹Rate = lb ai/A

Application date: 8/18

Table 2. Mean tarnished plant bug adults in drop cloth and terminal observation counts pretreatment and two posttreatment observation dates. Sharkey County, MS. 1997.

Treatment (rate ¹)	Drop Cloth (12')			Visual (100 terminals)		
	8/18	8/21	8/25	8/18	8/21	8/25
Orthene 90S (0.5)	2.0	0.3	0.0	3.0	0.0	4.0
Orthene 90S (1.0)	0.8	0.5	0.0	4.0	0.0	0.0
Bidrin 8 (0.25)	0.8	0.0	0.0	4.0	2.0	1.0
Provado 1.6F (0.047)	0.5	0.5	0.5	1.0	0.0	1.0
Provado 1.6F (0.025)	0.8	0.8	0.3	2.0	2.0	1.0
+ Monitor 4EC (0.25)						
Monitor 4EC (0.31)	1.0	0.3	0.3	2.0	0.0	1.0
Guthion 2L (0.125)	2.8	0.3	0.3	7.0	5.0	1.0
+ Provado 1.6F (0.025)						
Baythroid 2EC (0.03)	0.8	0.3	0.8	4.0	2.0	2.0
+ Provado 1.6F (0.025)						
Baythroid 2EC (0.03)	0.8	1.0	0.5	1.0	3.0	1.0
Regent 2.5EC (0.038)	1.0	0.5	0.0	2.0	2.0	2.0
Karate 1EC (0.025)	1.5	0.3	0.5	16.0	0.0	0.0
Karate 1CS (0.025)	1.3	0.0	0.3	4.0	1.0	0.0
Fury 1.5EC (0.035)	2.5	0.5	1.3	5.0	4.0	2.0
Furadan 4F (0.25)	0.8	0.3	0.3	2.0	4.0	2.0
Untreated Check	1.3	0.3	1.5	5.0	8.0	2.0
LSD (P= 0.05)	1.5	0.8	1.0	7.9	5.3	3.8

¹Rate = lb ai/A

Application date: 8/18

Table 3. Mean total tarnished bugs (nymphs and adults) in drop cloth and terminal observation counts pretreatment and two posttreatment observation dates. Sharkey County, MS. 1997.

Treatment (rate ¹)	Drop Cloth (12')			Visual (100 terminals)		
	8/18	8/21	8/25	8/18	8/21	8/25
Orthene 90S (0.5)	2.5	0.5	0.3	6.0	1.0	6.0
Orthene 90S (1.0)	1.5	0.8	0.0	8.0	1.0	0.0
Bidrin 8 (0.25)	2.8	1.0	0.3	6.0	5.0	5.0
Provado 1.6F (0.047)	0.8	0.5	0.5	3.0	3.0	4.0
Provado 1.6F (0.025)	1.8	1.5	0.8	4.0	7.0	3.0
+ Monitor 4EC (0.25)						
Monitor 4EC (0.31)	2.0	1.0	0.5	4.0	3.0	2.0
Guthion 2L (0.125)	3.3	1.0	1.8	11.0	7.0	2.0
+ Provado 1.6F (0.025)						
Baythroid 2EC (0.03)	1.3	0.3	1.0	4.0	4.0	4.0
+ Provado 1.6F (0.025)						
Baythroid 2EC (0.03)	2.5	1.8	1.0	3.0	4.0	2.0
Regent 2.5EC (0.038)	1.3	1.3	0.5	5.0	2.0	4.0
Karate 1EC (0.025)	2.8	0.8	1.0	25.0	6.0	2.0
Karate 1CS (0.025)	2.3	0.3	0.5	14.0	3.0	0.0
Fury 1.5EC (0.035)	3.8	1.0	1.5	11.0	8.0	4.0
Furadan 4F (0.25)	2.0	0.8	0.3	4.0	10.0	3.0
Untreated Check	2.0	0.8	2.3	10.0	18.0	4.0
LSD (P= 0.05)	2.0	1.5	1.5	12.2	8.0	5.0

¹Rate = lb ai/A

Application date: 8/18