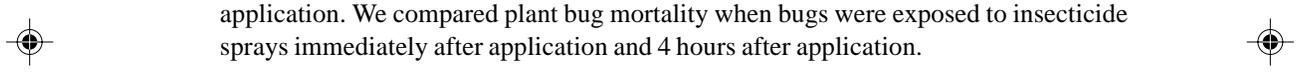




MORTALITY OF TARNISHED PLANT BUG ADULTS FOLLOWING DIFFERENTIAL EXPOSURE TO CENTRIC, STEWARD AND LEVERAGE IN FIELD CAGES

Tina Gray Teague, N.P. Tugwell, and Eric J. Villavaso¹

RESEARCH PROBLEM



Evaluating new insecticides for control of tarnished plant bug (TPB) [*Lygus lineolaris* (Palisot de Beauvois)] remains a research priority (Teague et al., 2000; Teague and Tugwell, 1996). In this study, our objective was to examine how activity of several insecticides used against tarnished plant bug declined in the first few hours after a field application. We compared plant bug mortality when bugs were exposed to insecticide sprays immediately after application and 4 hours after application.

RESEARCH DESCRIPTION

The insecticides Steward 1.25 SC (indoxacarb), Centric 40 WG (thiamethoxam), and Leverage 2.7 EC (imidacloprid + cyfluthrin) were evaluated. The experiment was conducted in a commercial cotton field on Wildy Farms located near Leachville in northeast Arkansas with cultivar PSC 355 planted on 30 April 2001. Plots were 4 rows wide and 40 ft long with 10 ft alleys, and they were arranged in a randomized complete block design with 3 replications. Insecticides were applied 24 July using a 4-row electrostatic, high-clearance sprayer calibrated to deliver 13.4 gpa at 28 psi with Turbo Teejet nozzles (TT1002-VP) set on 19-inch spacing to provide 2 nozzles per row. In the center 2 rows of each plot, 6 organdy sleeve cages, 6 inches diameter by 18 inches long, were secured to randomly selected individual plants. The lower end of each cage was tied around the plant ca. 1 ft from the terminal. The cages were rolled down to the tie and covered with aluminum foil leaving plant terminals exposed. Application began at 8:00 AM immediately following the insecticide application, while the foliage was still wet, the foil was removed, the cage pulled up, and 5 TPB adults (<5 days old) were placed into each of 3 cages. Cages were secured with twist ties. Application of insecticides

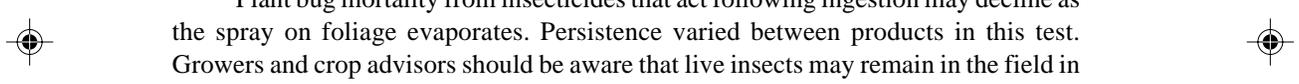
¹ Professor, Arkansas State University, Jonesboro; professor, Department of Entomology, Fayetteville; and research scientist, ARS-USDA, Mississippi State, MS.

ticide and release of bugs were completed in 27 minutes. Four hours later TPB adults were released in the remaining 3 cages in each plot. At 72 hrs following application, plants where bugs had been released 0 hours after spray (HAS) were cut below the cage and taken to the laboratory where TPB mortality was determined. The procedure was repeated for the remaining cages 4 hours later. Mortality data were analyzed with AOV, and means separated with LSD. TPB were obtained from a laboratory colony reared on artificial diet at the USDA-ARS laboratory in Mississippi State, MS.

RESULTS

Significant differences among treatments were observed in both exposure times in cages (Table 1). The new insecticide Centric resulted in highest mortality at 0 and 4 hours after spray. Mortality of >20% was observed in the untreated control in 4-HAS treatments. This higher-than-expected mortality was probably due to high noon-time temperatures during the release period.

PRACTICAL APPLICATION



Plant bug mortality from insecticides that act following ingestion may decline as the spray on foliage evaporates. Persistence varied between products in this test. Growers and crop advisors should be aware that live insects may remain in the field in the first few days following application of insecticides with anti-feedent properties such as Provado (imidacloprid), Centric, or Steward; however, crop injury may not be occurring. To assess insecticide efficacy, crop monitoring of new injury is required. If no new injury is observed, the insecticides have performed their crop protection function.

ACKNOWLEDGMENTS

We thank David and Justin Wildy and their staff at Wildy Farms for their assistance in the study. We also acknowledge Mr. Dale Wells for his support, and Mr. Joe Stewart and Ms. Gay McCain, USDA, ARS, Mississippi State, MS, for providing the tarnished plant bug nymphs. Special thanks to Mr. Alan Hopkins of Bayer for the use of his high-clearance sprayer.

REFERENCES

- Teague, T.G., and N.P. Tugwell. 1996. Chemical control of tarnished plant bug: Results from field cage studies and laboratory bioassays. *In*: D.A. Richter and J. Armour (eds.). Proc. Beltwide Cotton Conf., National Cotton Council, Memphis TN, pp. 850-854.

Teague, T.G., N.P. Tugwell, S. Muthiah, and J.M. Hornbeck. 2000. New insecticides for control of tarnished plant bug – results from field and cage studies and laboratory bioassays. *In*: D.A. Richter and J. Armour (eds.). Proc. Beltwide Cotton Conf., National Cotton Council, Memphis TN, pp. 1214-1217.

Table 1. Mean percentage mortality of tarnished plant bug adults observed 72 hrs after release in sleeve cages in cotton. Bugs were released at 0 hrs after spray or 4 hrs after spray (HAS).

Treatment/formulation	Rate	Mortality after 72 hrs	
		Released 0 HAS	Released 4 HAS
Untreated control		4.3 c ^z	22.2 d
Steward 1.25 SC	0.1040	73.7 b	62.2 bc
Centric 40 WG	0.0346	90.1 a	84.4 a
Centric 40 WG	0.0625	95.7 a	82.2 ab
Leverage 2.7 EC	0.0634	85.0 ab	56.1 c
<i>P</i> > <i>F</i> (AOV)		0.001	0.001
<i>LSD</i> (0.05)		12.0	20.52

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