STANDARDIZED INSECTICIDE TRIAL FOR CONTROL OF TARNISHED PLANT BUGS ACROSS THE MID-SOUTH, 2018

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Abstract

A study was conducted in 2018 at seven locations across the Mid-South. The objective of this research was to perform a standardized efficacy trial for common insecticides on the control of tarnished plant bug, *Lygus lineolaris* (Palisot de Beauvois). Insect populations in the field were sampled following foliar applications of insecticides made to flowering cotton. All insecticides significantly reduced tarnished plant bug populations 6 – 8 days after application (DAA) and 10 – 11 DAA. At the 6 – 8 DAA rating, Transform, Diamond, Orthene 97, and Bidrin controlled plant bug infestations better than all other insecticides. At 10 – 11 DAA, Transform reduced plant bug numbers similarly to Diamond and Orthene 97, but more than all other insecticides. Three locations made a second application and ratings were taken 4 and 7 days afterward. Following this second application, all insecticides significantly reduced plant bug populations compared with the non-treated check 4 DAB. Transform, Orthene 97, and Diamond (followed by Bidrin) tended to provide the best control across all ratings. Brigade, Carbine, Vydate, Centric and Admire Pro provided statistically similar but less control of plant bug populations. Across the four locations where yield data were collected, Transform, Orthene 97, and Diamond yielded significantly better than all other treatments.

Introduction

Tarnished plant bugs are consistently the most destructive pest of cotton in the Mid-South. Multiple insecticide applications are needed in virtually all cotton fields in this region due to the damaging nature of this pest, its high mobility as an adult, and the relatively short period of effective residual activity for most insecticides. This represents a substantial input cost to growers. Tarnished plant bug has an established history of developing resistance to

insecticides, and ongoing evaluations are needed to verify the continued effectiveness of labeled materials. Therefore, a regional study was performed in 2018 to evaluate the efficacy of common insecticides used to control tarnished plant bug in cotton.

Methods and Materials

Tests were done in 2018 at seven locations in the Mid-South including Arkansas (2), Louisiana (1), Mississippi (3), and Tennessee (1) to evaluate the efficacy of selected insecticides for control of tarnished plant bug in cotton (Table 1). Bt cotton varieties suitable for each location were planted with a row spacing of 38 or 40 inches and managed according to local university recommendations. Individual plots were either 4 or 8 rows wide, depending on location, and a minimum of 35 feet in length. Treatments, including a non-treated check, were replicated in a randomized complete block design.

Foliar applications were made to flowering cotton at recommended label rates. Plots were sampled with a standard 2.5 x 2.5 ft black shake sheet. Two shake sheet samples were taken on the center two rows (10 row feet) of all plots. Ratings after the initial insecticide application were done three times (2 – 5 DAA and 6 – 8 DAA; [7 locations each] and 10 – 11 DAA [3 locations]). Three locations (AR-Lorenz, AR-Studebaker, TN-Stewart) made a second application, and plots were sampled 4 days afterward. Two of these locations sampled again 7 DAB. Seed cotton yield data were collected at four locations (AR-Lorenz, AR-Studebaker, MS-USDA, TN-Stewart) by harvesting the center two rows with a spindle picker. Data were analyzed in SAS using Proc GLIMMIX (Version 9.4, SAS Institute, Cary, NC). Replicate, location, and replicate nested within location were considered random effects in the model, and means were separated using a protected LSmeans ($\pm = 0.05$).

Results and Discussion

Tarnished plant bug infestation levels varied by location (Table 2). Across all trials, all insecticides significantly reduced tarnished plant bug populations at 6 – 8 DAA and 10 – 11 DAA (Fig. 1). Additionally, Transform, Diamond, Orthene 97 and Bidrin controlled plant bug infestations better than all other insecticides at 6 – 8 DAA. At 10 – 11 DAA, Transform reduced plant bug numbers similarly to Diamond and Orthene 97 and more than all other insecticides (Fig. 1). Three locations made a second application and ratings were taken 4 and 7 days afterward. Following this sequential application, all insecticides significantly reduced plant bug populations compared with the non-treated check 4 DAB (Fig. 2). Transform, Orthene 97, and Diamond (followed by Bidrin) tended to provide the best control across all ratings. Brigade, Carbine, Vydate, Centric and Admire Pro provided statistically similar but less control of plant bugs. Four locations harvested seed cotton. All treatments significantly increased seed cotton yield compared with plots not treated for plant bugs (Fig. 3). Across the four locations where yield data were collected, Transform, Orthene 97, and Diamond yielded significantly better than all other treatments. Overall, results were comparable to a similar test performed in 2017 (Steckel et al. 2018).

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References

Steckel, S., M. Williams, S. Stewart, A. Catchot, J. Gore, D. Cook, D. Kerns, S. Brown, G. Lorenz, G. Studebaker, and N. Seiter. 2018. Standardized insecticide trial for control of tarnished plant bugs across the mid-south. pp. 232-235 *In* Proceeding Beltwide Cotton Conf., National Cotton Council of America, San Antonio, TX.

Table 1. List of insecticides and rates evaluated for the control of tarnished plant bugs in 2018.

Insecticide	Formulation	Active Ingredient	Rate (oz product /acre)	Manufacturer
Transform	50 WG	Sulfoxaflor	1.5	Dow AgroSciences
Centric	40 WG	Thiamethoxam	2.0	Syngenta
Vydate	3.77 C-LV	Oxamyl	12.8	DuPont
Orthene	97 SP	Acephate	12.3	Amvac
Brigade	2 EC	Bifenthrin	6.4	FMC
Bidrin	8 EC	Dicrotophos	8.0	Amvac
Admire Pro	4.6 SC	Imidacloprid	1.7	Bayer CropScience
Carbine	50 WG	Flonicamid	2.85	FMC
Diamond	0.83 EC	Novaluron	9.0	Chemtura

Table 2. Mean number of tarnished plant bugs per 10 row feet at each location in plots not treated with insecticide.

Location	After First App (6-8 DAA)	After First App. (10-11 DAA)	After Second App. (4 DAB)	After Second App. (7 DAB)
AR-Lorenz	30.38	-	26.25	55.25
AR-Studebaker	29.75	-	33.25	-
MS-USDA	21.50	25.00	-	-
MS-Catchot	12.50	13.50	-	-
MS-Gore	37.50	-	-	-
LA-Brown	9.25	-	-	-
TN-Stewart	29.50	62.75	55.75	57.25

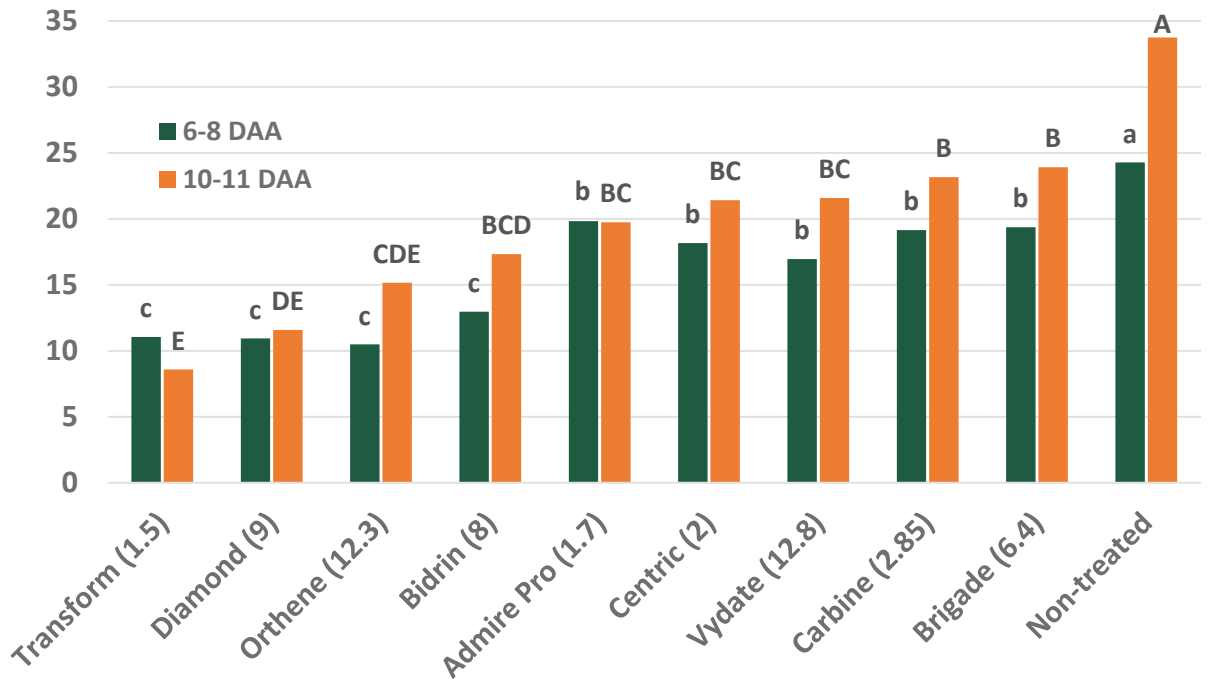

Figure 1. Total plant bugs per 10 row feet in flowering cotton at two evaluation timings across multiple locations in the Mid-South, 2018. Insecticide rates (oz product/acre) are shown in parentheses on the x-axis. Data are shown for 6 – 8 days after application (7 locations) and 10 – 11 days after application (3 locations).

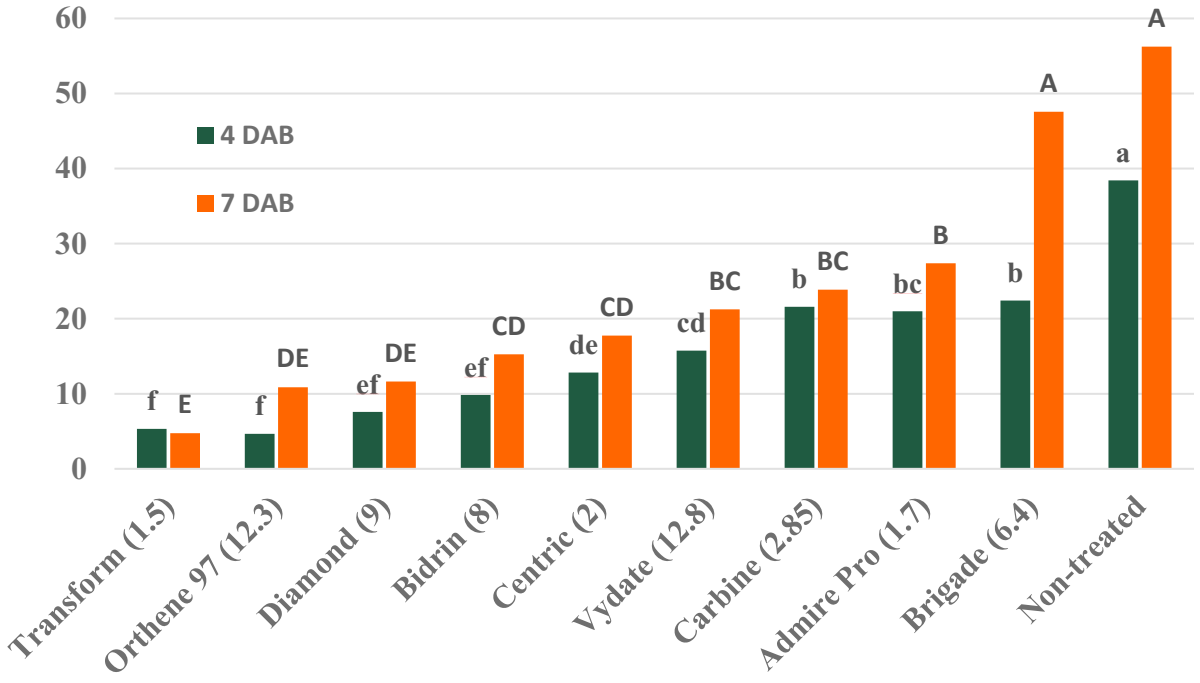

Figure. 2. Total plant bugs per 10 row feet in flowering cotton following a second foliar application for three locations at 4 DAB and for two locations at 7 DAB. Insecticide rates (oz product/acre) are shown in parentheses on the x-axis.

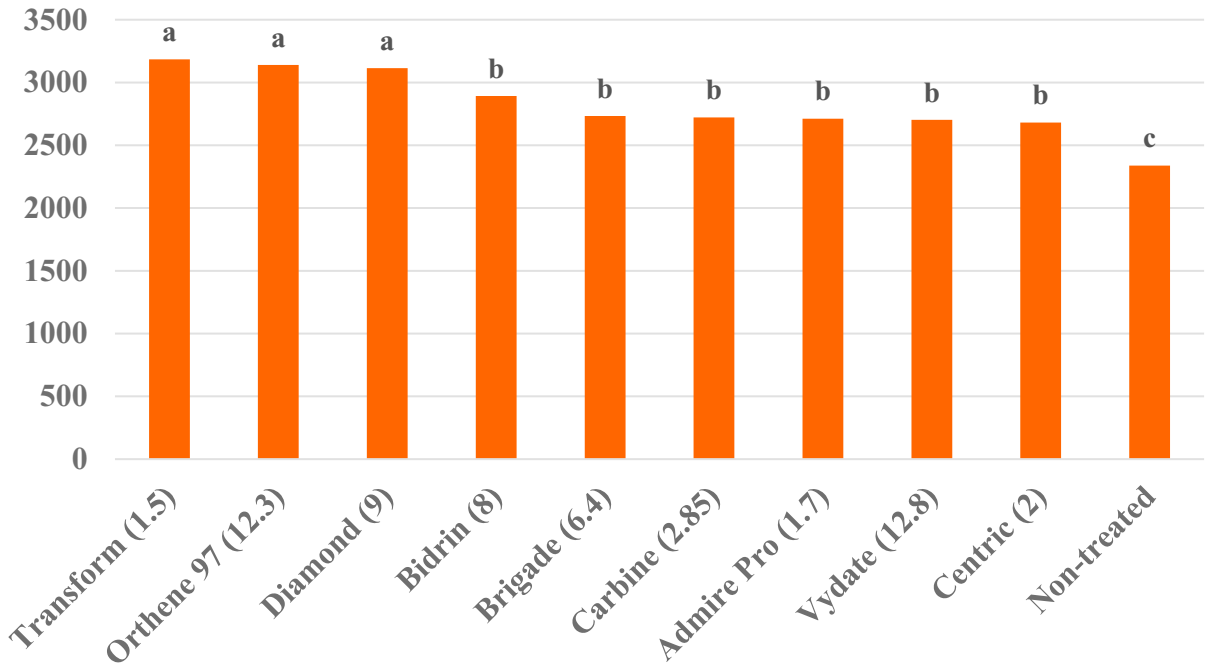

Figure 3. Seed cotton yield (lbs/acre) at four locations (AR-Lorenz, AR-Studebaker, MS-USDA, and TN-Stewart). Insecticide rates (oz product/acre) are shown in parentheses on the x-axis.