

CONTROL OF TARNISHED PLANT BUGS, *LYGUS LINEOLARIS*, IN COTTON**A.Y. Whitfield****G.M. Lorenz****N.M. Taillon****B.C. Thrash****N.R. Bateman****W.A. Plummer****C. Rice****T. Newkirk****C.A. Floyd****University of Arkansas Cooperative Extension Service****Lonoke, Arkansas****Abstract**

Tarnished Plant Bug (TPB), *Lygus lineolaris*, is the number one insect pest in Mid-South cotton production. Plant bug feeding causes square loss, deformed flowers, and damaged bolls ultimately resulting in reduced yield. TPB is a difficult pest to manage in cotton with growers averaging 4-6 insecticide applications a year. A regional Mid-South study was conducted over the past four years to evaluate the efficacy of currently labeled insecticides for control of this pest and ensure that current recommendations are still viable. These trials are also used to monitor for developing issues of insecticide resistance and to serve as a source of data for registration of new insecticides that may become available. Insecticides evaluated include: Transform (sulfoxaflor), Centric (thiamethoxam), Vydate (oxamyl), Orthene (acephate), Brigade (bifenthrin), Bidrin (dicrotophos), Admire Pro (imidacloprid), Carbine (flonicamid) and Diamond (novaluron). Treatments were initiated when a threshold of 3 TPB per 5 row feet were sampled in the test area, and when the majority of treatments exceeded threshold after the initial application. Results indicated that Diamond and Transform performed consistently better than many of the other insecticides. Many of the insecticides tested failed to provide any consistent level of control.

Introduction

Tarnished plant bug (TPB), *Lygus lineolaris*, will typically feed on cotton terminals, squares, blooms and bolls, causing a reduction of overall lint yield as well as lint quality. In Arkansas, cotton producers will typically make 4-6 insecticide applications to control tarnished plant bug and protect yield. Multiple insecticide applications can become very expensive for the producers. It is recommended that growers' budget approximately \$100 per acre to allow for proper control of TPB throughout the season. Mid-South cotton producers seek insecticides that deliver a high level of efficacy and residual longevity. Currently, researchers have established an action threshold of 3 TPB per 5 row feet. The objectives of this study were to evaluate the efficacy and residual control of available insecticides, watch for potential resistance issues, and provide the optimal chemical control strategies to keep Arkansas cotton producers profitable.

Methods

A study was conducted in 2020 at the Lon Mann Cotton Research Center located in Marianna, Arkansas. Plot size were 12.5 ft. (4 rows) by 50 ft. A total of ten treatments were used in this study, including an untreated check (UTC) (Table 1). Treatments were initiated when TPB densities reached the action threshold. Applications were made using a Bowman Mudmaster (Bowman Manufacturing Newport, AR) at a pressure of 40 psi, and a rate of 10 GPA. TPB densities were determined using a 2.5 foot drop cloth and taking two samples per plot for a total of 10 row feet. Plots were sampled at 4 and 7 days after the first application (4 DAA1, 7 DAA1) and 4, 7, and 11 days after the second application (4 DAA2, 7 DAA2, 11 DAA2). Data was processed using Agriculture Research Manager Version 10, AOV, and Duncan's New Multiple Range Test (P=0.10) to separate means.

Results

At 4 DAA1, all treatments reduced plant bug densities compared to the UTC. There was no significant difference between Transform, Centric, Brigade + Orthene, and Vydate which all reduced plant bug populations below threshold (Fig 1). At 7 DAA1, Centric was the only treatment to keep TPB densities below threshold, but was not significantly different from Transform, Brigade + Orthene, Bidrin or Diamond (Fig 2). At 4 DAA2 Brigade + Orthene, Orthene, and Transform, provided better control of TPB than Carbine or Couraze Max. All treatments reduced TPB densities compared to the UTC but Carbine and Couraze Max did not reduce population below threshold (Fig 3). At 7 DAA2, Vydate, Centric, Carbine, and Couraze Max began to lose residual, and TPB populations exceeded threshold. Plots receiving Diamond, Transform or Orthene reduced plant bug populations below threshold 7 DAA2 (Figure 4). At 11 DAA2, Transform, Diamond, Orthene and Brigade + Orthene provided greater control than Carbine, Couraze Max, and Vydate (Fig 5).

Table 1. Trade Names and Rates

Trade Name	Rate
Transform	1.5 oz/a
Centric	2.0 oz/a
Vydate	12.8 oz/a
Orthene	0.77 lb/a
Brigade + Orthene	6 oz/a + 0.77 lb/a
Bidrin	8 oz/a
Couraze Max	1.9 oz/a
Carbine	2.85 oz/a
Diamond	9 oz/a

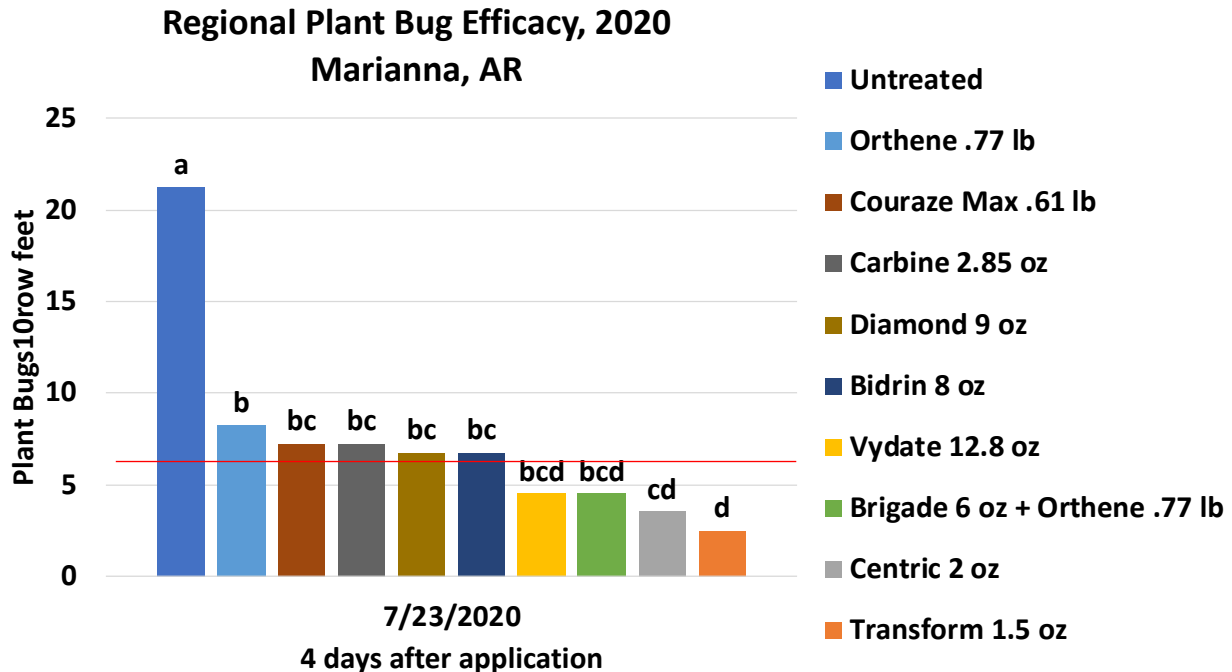


Figure 1. Plant Bug Population 4 days after the initial application.

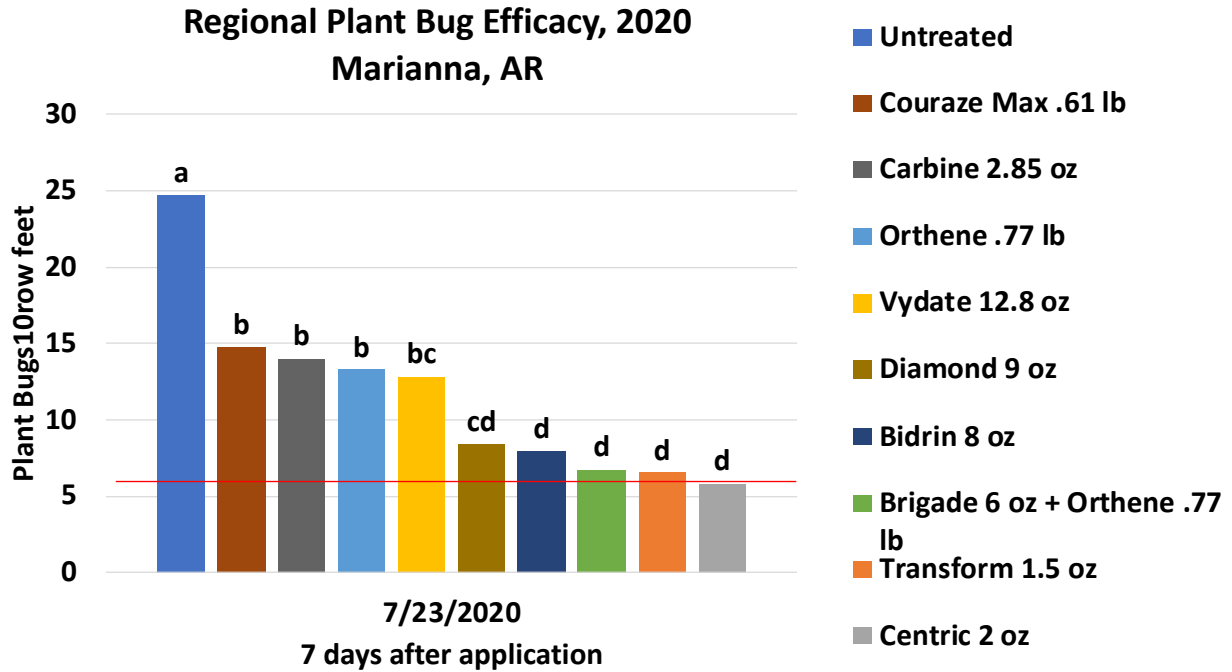


Figure 2. Plant Bug Population 7 days after the initial application.

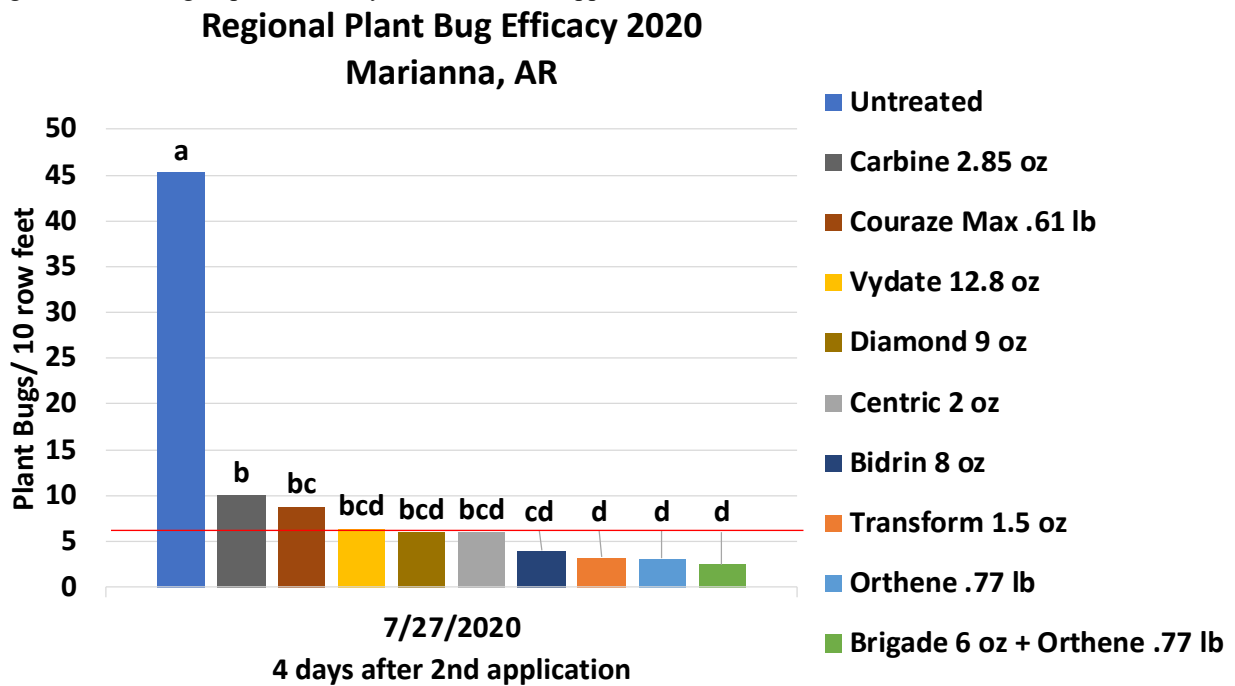


Figure 3. Plant Bug Population 4 days after second application.

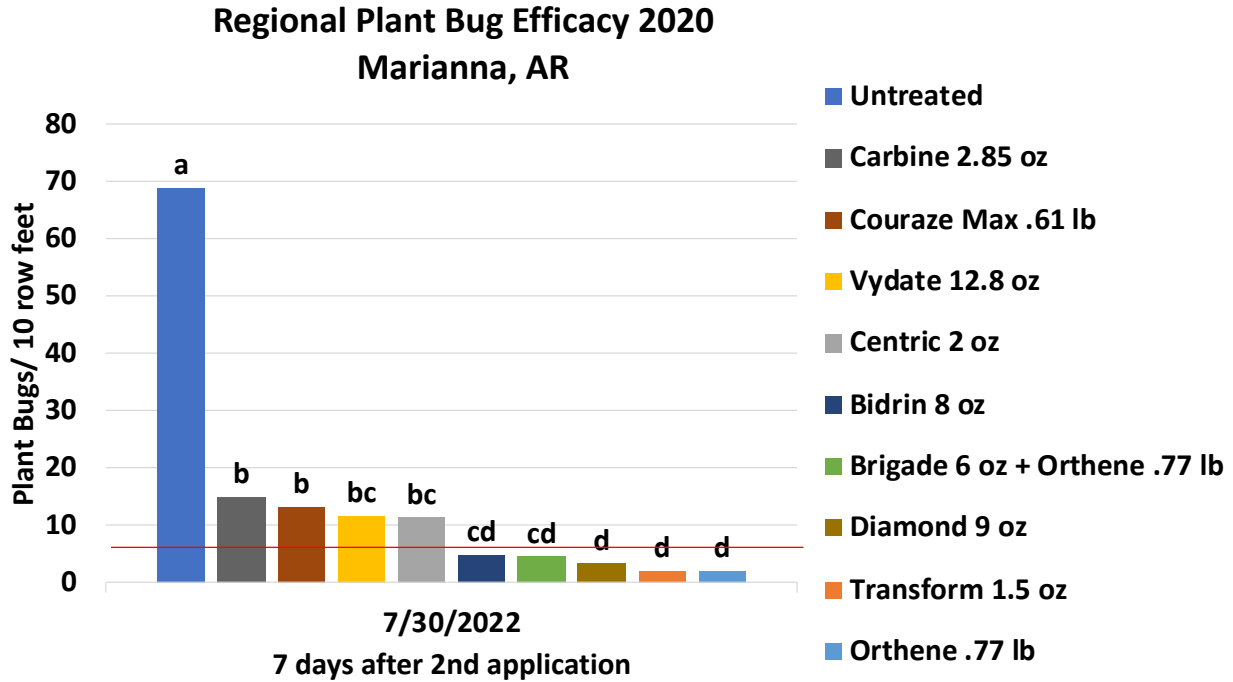


Figure 4. Plant Bug Populations 7 days after second application.

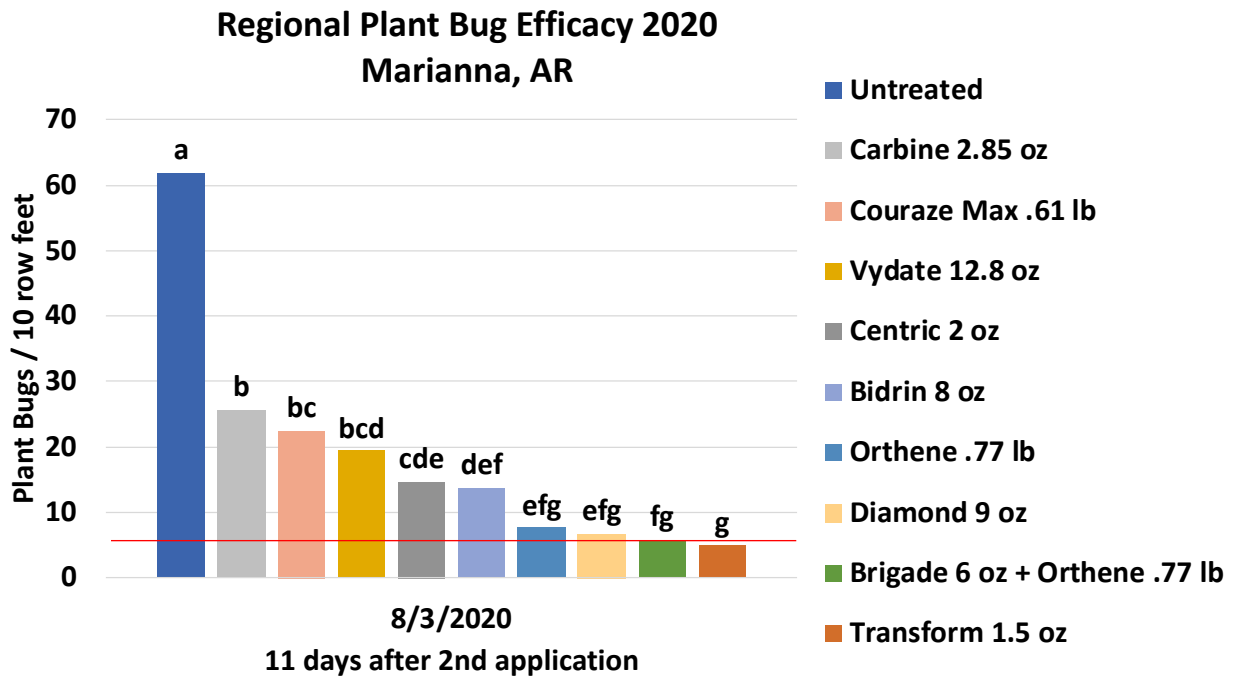


Figure 5. Plant Bug Population 11 days after second population.

Summary

This data suggests that Diamond, Transform, and Brigade + Orthene perform consistently better than other selected insecticide treatments. All treatments provided some control of TPB, but Diamond, Transform, and Brigade + Orthene were the only treatments to provide residual control. Of the products tested Transform and Brigade + Orthene provided

a consistent knock down of TPB. Diamond, although slow, provided good residual control of TPB. Carbine and Couraze Max provided consistently poor control of TPB. It is interesting to note that Orthene did not provide good control after the first application, but it improved substantially after the second. The addition of Brigade to Orthene, improved TPB control. Our results from this study indicate that Transform, Orthene, and Brigade + Orthene perform consistently better than other insecticides.

Acknowledgments

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