EFFICACY OF SELECT INSECTICIDES FOR CONTROL OF TARNISHED PLANT BUG, *LYGUS LINEOLARIS*, ARKANSAS COTTON

A. Plummer
W. Plummer
G. Lorenz
B. Thrash
N. Taillon
K. McPherson
C. Floyd
C. Rice
A. Whitfield
University of Arkansas Cooperative Extension Service
Lonoke, Arkansas
N. Bateman
G. Felts
University of Arkansas Cooperative Extension Service
Stuttgart, Arkansas

Abstract

An experiment was conducted at the Lon Mann Cotton Branch Experiment Station in Lee County, Arkansas in 2019 to evaluate the efficacy of selected foliar insecticides and rates on tarnished plant bug (*Lygus lineolaris*) in cotton. Selected insecticides included Bidrin 0.25 lb ai/a, Bidrin 0.375 lb ai/a, Bidrin 0.5 lb ai/a, Discipline 0.1lb ai/a, Bidrin 0.25 lb ai/a + Discipline 0.1 lb ai/a, Bidrin 0.375 lb ai/a + Discipline 0.1 lb ai/a, Bidrin 0.5lb ai/a + Discipline 0.1 lb ai/a, Orthene 97 0.75 lb + Discipline 0.1 lb ai/a, and Transform 0.047 lb ai/a.

Introduction

Tarnished plant bug (TPB) is the number one insect pest for cotton producers in Arkansas. From 2016-2018 TPB cost growers up to $93.94/acre in cotton yield losses + control cost, and was responsible for up to 56% of the total cotton yield lost from insects (Cook, 2018). Plant bug feeding causes square loss, deformed flowers, and damaged bolls, ultimately resulting in reduced yield. Growers and consultants rely on foliar insecticide applications to control plant bugs. The purpose of this study was to compare several rates and combinations of Bidrin or acephate with bifenthrin for control of TPB. This data will aid growers and consultants with TPB insecticide selection.

Materials and Methods

Cotton was planted on May 7. Plot size was 12.5 ft (4 rows) by 40 ft, with a 2 row buffer between plots. Treatments were arranged in a randomized complete block design with 4 replications. Treatments consisted of: untreated control (UTC), Bidrin 0.25 lb ai/a, Bidrin 0.375 lb ai/a, Bidrin 0.5 lb ai/a, Discipline 0.1 lb ai/a, Bidrin 0.25 lb ai/a + Discipline 0.1 lb ai/a, Bidrin 0.375 lb ai/a + Discipline 0.1 lb ai/a, Bidrin 0.5 lb ai/a + Discipline 0.1 lb ai/a, Orthene 97 0.75 lb + Discipline 0.1 lb ai/a, and Transform 0.047 lb ai/a. Insecticides were applied with a Mud Master fitted with TX6 cone jet nozzles with 19.5 inch spacing. Spray volume was 10 gal/a at 40 psi. All treatments received insect applications on July 19 and July 25. Plant bug numbers were determined by taking two samples with a 2.5 ft drop cloth per plot for a total of 10 row ft. Percent square retention was measured by recording the presence or absence of the first position square on the third node from the top of the plant, from 25 randomly selected plants/plot. Boll damage was assessed by splitting 10 random thumb-sized bolls/plot and checking for discolored lint and/or warts on the inner boll wall. Samples for the first treatment were taken on July 22 and 25. The second treatment was sampled on July 29, August 1 and 8. Data was processed using Agriculture Research Manager 2019 (Gylling Data Management, Inc., Brookings, S.D.). Analysis of variance was conducted with Duncan's New Multiple Range Test (P=0.10) to separate means.

Results and Discussion

At 3 days after first application all treatments reduced TPB densities compared to the untreated check (UTC) (Fig 1). All other treatments reduced TPB numbers compared to Discipline (0.1lb ai/a), and Bidrin (0.25lb ai/a) + Discipline (0.1lb ai/a).

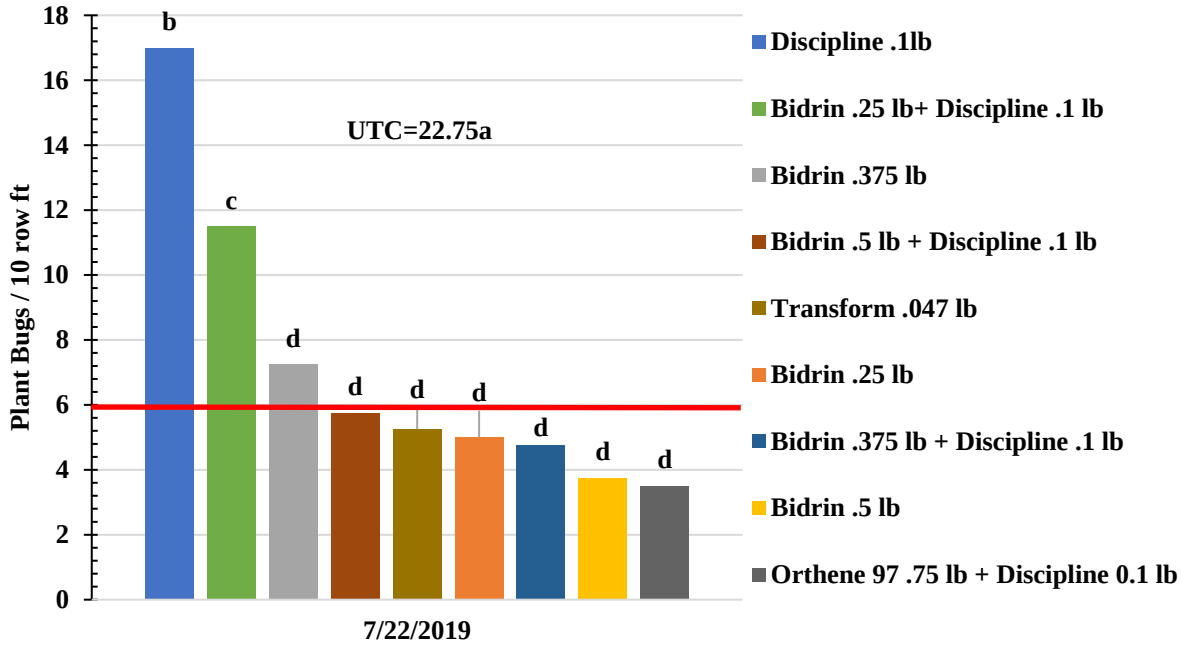

Figure 1. Assessment of plant bug densities 3 days after application of foliar insecticide.

Although there are no differences, trends showed the treatments with less plant bugs to have better square retention than the UTC (Fig 2).

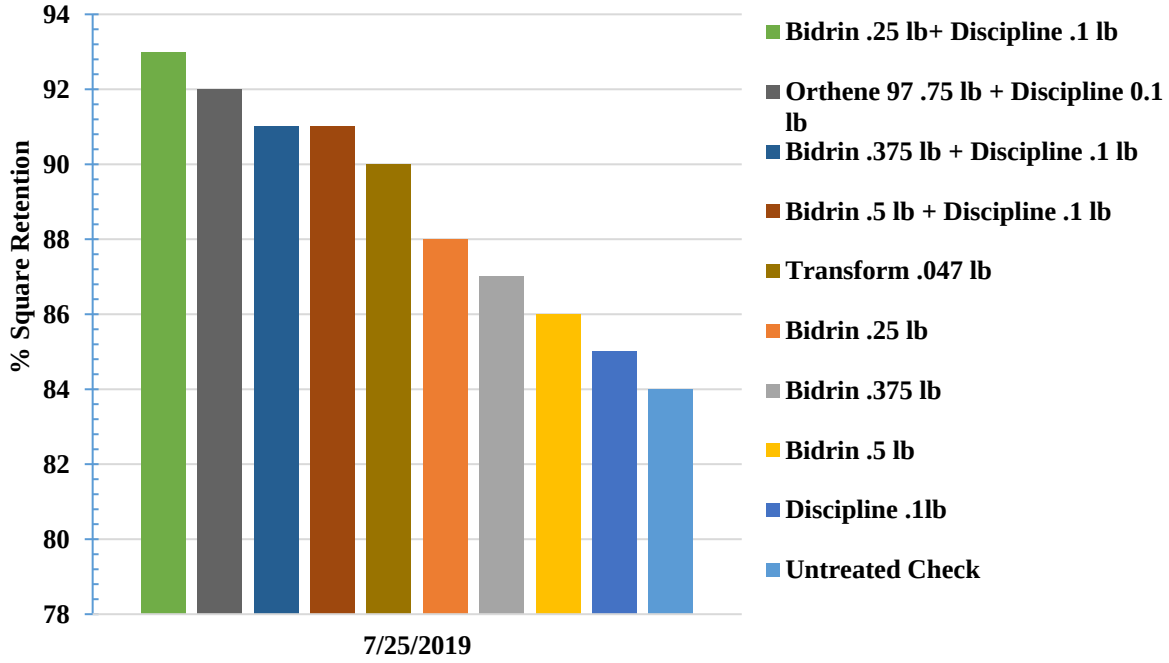

Figure 2. Percent square retention of selected insecticides 6 days after application.

Similarly, at 4 days after the second application, all treatments reduced plant bug numbers compared to the UTC and had fewer plant bugs than Discipline (0.1lb ai/a) (Fig. 3).

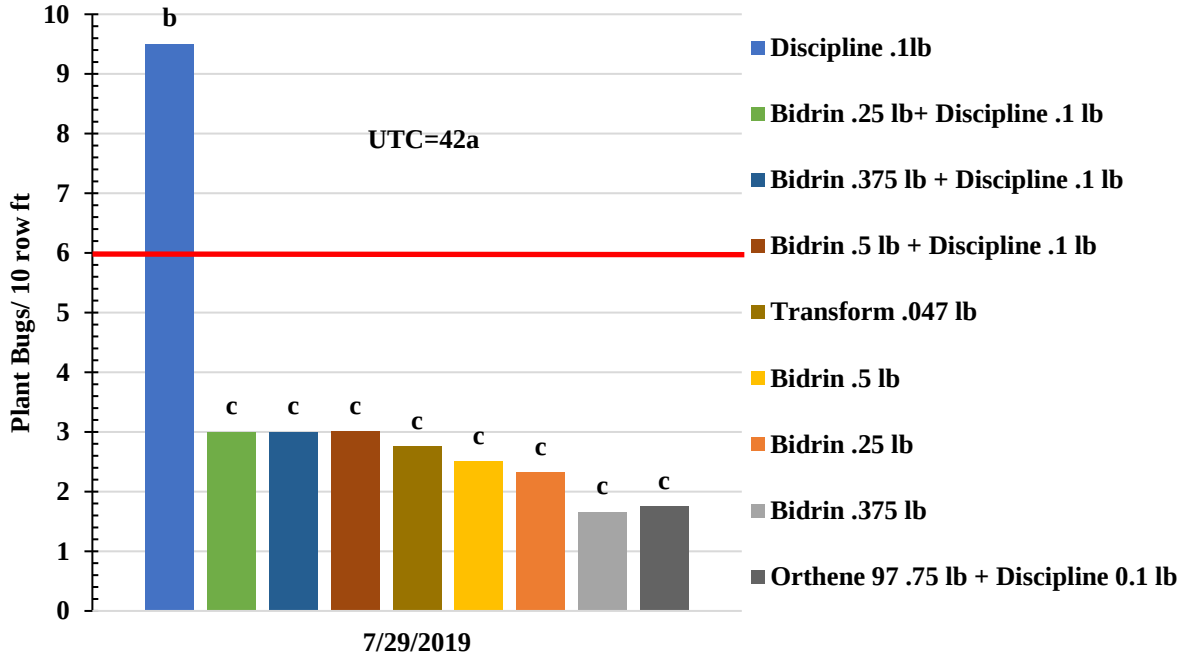

Figure 3. Assessment of plant bug densities 4 days after 2nd application of foliar insecticide.

At 7 days after second application, boll damage was assessed. All treatments had less boll damage than the UTC (Fig 4). Bidrin (0.375lb ai/a), Bidrin (0.25lbs ai/a), Orthene 97 (0.75lb ai/a) + Discipline (0.1lb ai/a), Bidrin (0.5lb ai/a) + Discipline (0.1lb ai/a), Bidrin (0.375lb ai/a) + Discipline (0.1lb ai/a) and Transform (0.047lb ai/a) all had less boll damage than Discipline (0.1lb ai/a).

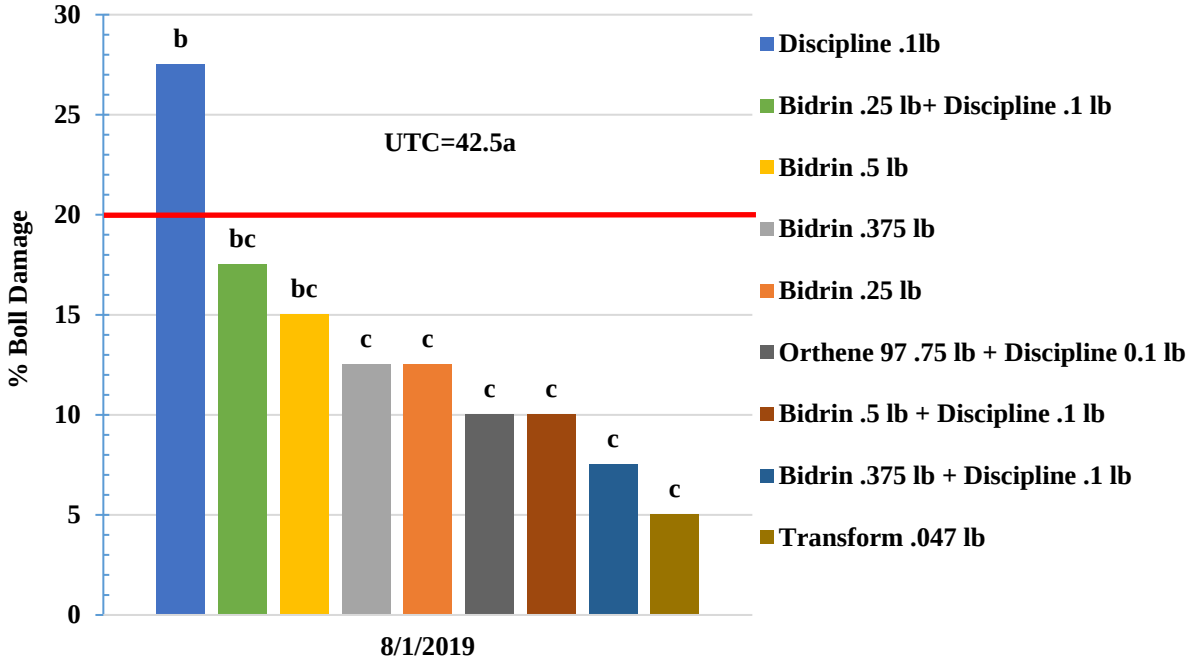

Figure 4. Percent boll damage of selected insecticides 7 days after 2nd application.

At 12 days after second application, boll damage was similar to 7 days after application (Fig 5).

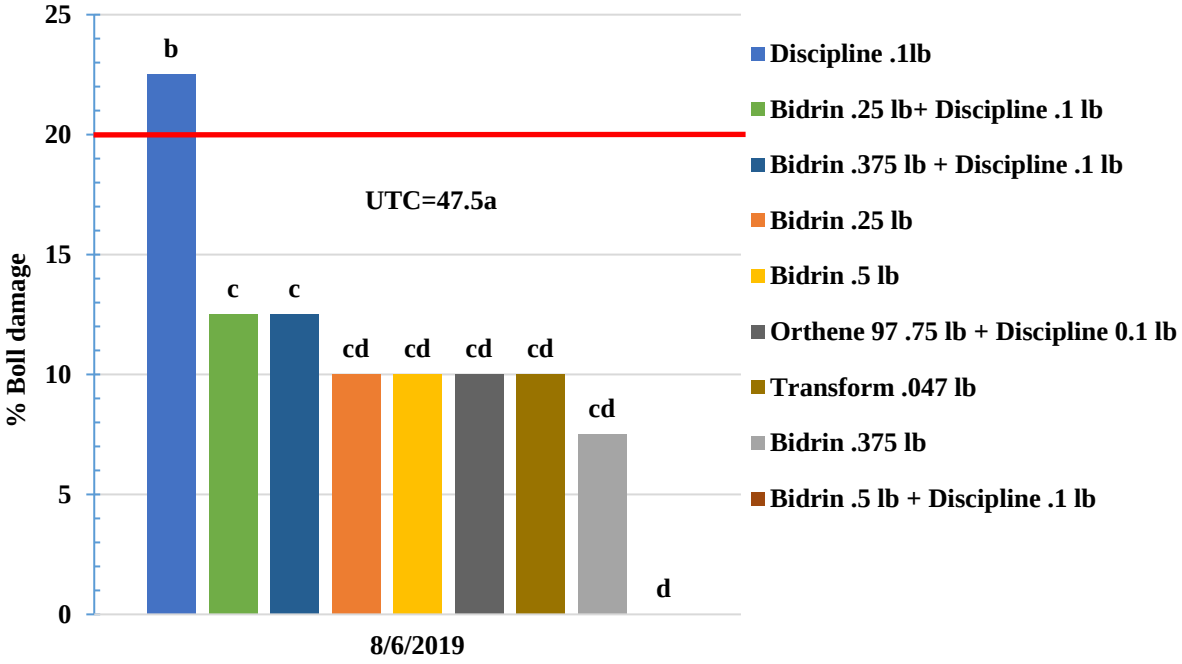

Figure 5. Percent boll damage of selected insecticides 12 days after 2nd application.

At 14 days after second application all treatments shown reduced TPB densities compared to the UTC (Fig 6). Orthene 97 (0.75lb ai/a) + Discipline (0.1lb ai/a), Bidrin (0.5lb ai/a) + Discipline (0.1lb ai/a), Bidrin (0.5lb ai/a), Bidrin (0.375lb ai/a) + Discipline (0.1lb ai/a), Transform (0.047lb ai/a) and Bidrin (0.375lb ai/a) had fewer plant bugs than Discipline (0.1lb ai/a) alone. Orthene 97 (0.75lb ai/a) + Discipline (0.1lb ai/a) had fewer plant bugs than Discipline (0.1lb ai/a), Bidrin (0.5lb 2ai/a) + Discipline (0.1lb ai/a), Bidrin (0.25lb ai/a) and Bidrin (0.375lb ai/a).

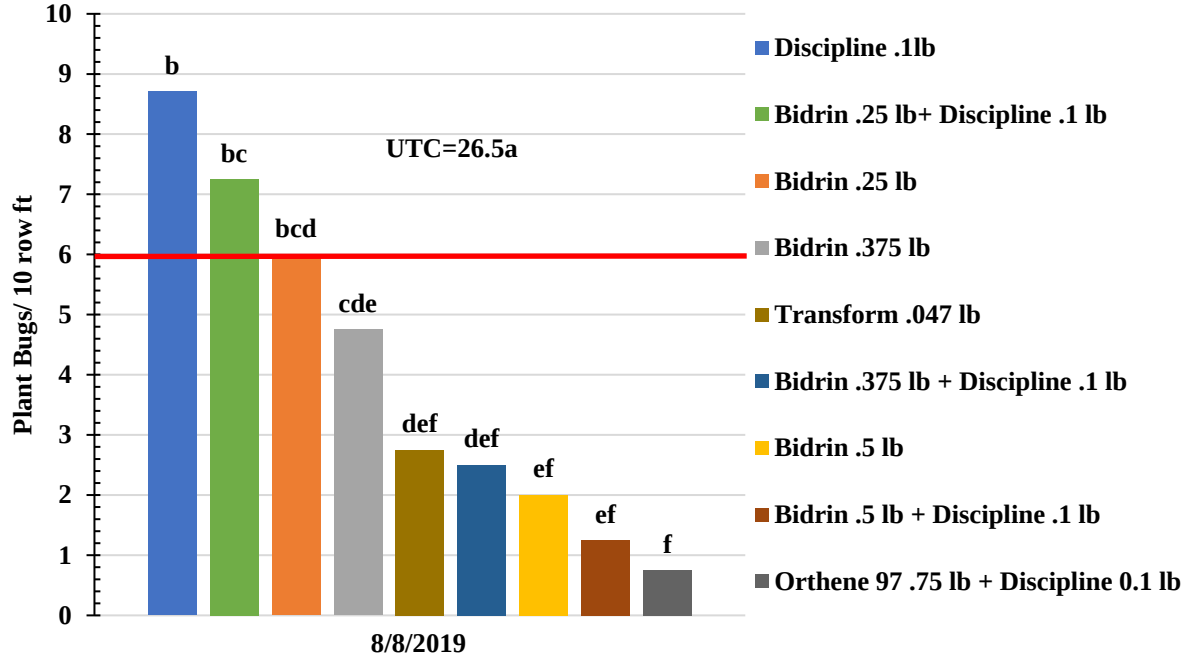

Figure 6. Assessment of plant bug densities 14 days after 2nd application of foliar insecticide.

Summary

Results indicated Discipline alone is not an adequate option to provide control of tarnished plant bugs. A trend was observed adding Discipline to Bidrin can increase control and decrease fruit damage.

Acknowledgements

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References

Cook, D.R., 2016-2018. Cotton Insect Losses 2016-2018. *In*: Proceedings Beltwide Cotton Conference 2016-2018.