# USING INSECTICIDE MIXES TO IMPROVE TARNISHED PLANT BUG CONTROL B.C. Thrash G.M. Lorenz III N.M. Taillon W.A. Plummer H.M. Chaney Jr. D. L. Clarkson M.E. Everett L.R. Orellana University of Arkansas Cooperative Extension Service Lonoke, AR

#### <u>Abstract</u>

In recent years tarnished plant bug, *Lygus lineolaris*, populations have been extremely high and increasingly difficult to control with currently labeled insecticides. Along with decreasing spray intervals, using tank-mixes and premixes of insecticides can enhance control of this pest. Trials conducted in the 2009 - 2013 growing seasons were compiled to assess the amount of control insecticide mixes provide compared to single products. The compiled data indicates that substantial control increases can be obtained when insecticides are mixed. Tank-mixes and premixes containing bifenthrin and novaluron proved to be two of the most effective combinations. Transform provided the best control of all single products tested.

### **Introduction**

Tarnished plant bug, *Lygus lineolaris*, is the most important pest of cotton in Arkansas and the mid-south. From 2003 to 2009 it caused more yield loss than any other pest averaging a loss of over 50,000 bales in Arkansas (Williams, 2009). Plant bug populations in the past several years have been extremely high and currently labeled insecticides are not providing the level of control needed to reduce plant bug numbers below economic threshold with one application (Lorenz, 2010). To make matters worse resistance to multiple insecticides has been found across the mid-south (Snodgrass, 1996; Snodgrass et al., 2009). Uses of insecticide premixes and tank-mixes have been shown as an effective way to increase control of tarnished plant bug (Thrash et al. 2012). A total of 42 trials from the 2009 - 2013 growing seasons were used to evaluate the control of insecticide mixes compared to single products.

# **Materials and Methods**

Trials were conducted during the 2009 - 2013 growing season in Lee County, AR at Lon Mann Cotton Branch Experiment Station and grower fields. Treatments were applied with a Mud Master fitted TXVS-6 hollow cone nozzles. Spray volume was 10 GPA at 40 psi. Plot sizes were 12.5 ft. (4 rows) by 50 ft. Insect numbers were determined by using a 2.5 ft. drop cloth and taking 2 samples per plot (10 row ft.). Data were processed using Agriculture Research Manager Version 8, AOV, and Duncan's New Multiple Range Test (P=0.10) to separate means. Data was compared between tests by converting each treatments season total plant bug numbers to their respective untreated checks season total to provide a percent control. The number of data sets for each insecticide ranged from 1 - 13.

### **Results and Discussion**

Insecticide mixes generally increased TPB control when compared to single products. All treatments showed an increase in efficacy when single products were mixed with bifenthrin (Fig. 1). An average increase in efficacy of 12.25% was observed when selected insecticides were combined with bifenthrin. All selected insecticides showed an increase in efficacy when novaluron (6 oz/a) was mixed with single products showed an average increase of 16.6% when compared to single products (Fig. 2). However, when novaluron (6 oz/a) was mixed with Transform (2.125 oz/a) control was increased only 7% over Transform alone (Fig. 3). When selected insecticides were mixed with Transform (1.5 oz/a) control was increased an average of only 4%, and in the case of Bidrin (8 oz/a) control was actually decreased. The small increase in control provided with Transform mixes is probably not enough to warrant the extra cost. Transform (2.5 oz/a) provided the greatest control in the High Pressure Plant Bug trial though

no insecticide or mix provided significantly better control than any other (Fig. 4). The trial FMC Plus 2013 indicates the lack of control some pyrethroids (Hero, Mustang Max) are providing and that mixing two insecticides together does not guarantee increased control (Fig. 5). Transform (1.5 oz/a, 2 oz/a) in this study provided better control than all other treatments. Carbine (2.3 oz/a, 2.8 oz/a) alone provided better control than when mixed with Mustang Max or Hero. This may be because Carbine is relatively "soft" on beneficial insects and mixing an ineffective pyrethroid could be killing beneficial insects, resulting in lowered plant bug control. Cost is a major factor in choosing which insecticides to use. Many of the insecticides mixes mentioned perform very well, but may not be a viable option because of price and others can provide similar control at lower costs (Table 1).

Tank-mixes that included novaluron regularly provided increased control. Transform provided excellent control when compared to all other single products. The results of these studies show insecticide mixes can be an effective and economical way to increase control of tarnished plant bug with existing products.

Fig. 1Tarnished plant bug control with mixes of bifenthrin



Mixes with 4.12 – 6.4 oz/a Bifenthrin\*





Fig. 3Tarnished plant bug control with mixes of Transform



**Transform Mixes** 





FMC Plus 2013

**2012 High Pressure Plant Bug Trial** 

Fig. 5 FMC Plus 2013





- Transform 2 oz/a

Table 1 Insecticide costs and control		
Insecticide	% Control	Cost
Novaluron 6 oz/a + Transform 2.125 oz/a	90%	\$22
Novaluron 6 oz/a + Centric 2.5 oz/a	84%	\$17.25
Novaluron 6 oz/a + Transform 1.5 oz/a	83%	\$18
Transform 2.125 oz/a	83%	\$16
Novaluron 6 oz/a + Acephate 0.75 lb ai/a	81%	\$9
Bifenthrin 6 oz + Transform 1.5 oz/a	81%	\$15
Acephate 1 lb/a	80%	\$4
Bifenthrin 4.12 oz + 2 oz Imidacloprid	80%	\$4
Novaluron 6 oz/a + Bidrin 6 oz/a	79%	
Novaluron 6 oz/a + Bifenthrin 6 oz/a	78%	\$9
Transform 1.5 oz/a	77%	\$12

Table 1 Insecticide costs and control

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