

**PERFORMANCE OF TRANSFORM AGAINST SELECTED COTTON INSECTS IN LABORATORY
AND FIELD STUDIES**

Bryan Olivi

Don Cook

Jeff Gore

Mississippi State University, Delta Research and Extension Center

Stoneville, MS

Angus Catchot

Mississippi State University, Entomology & Plant Pathology

Mississippi State, MS

Gordon Snodgrass

USDA-ARS, Southern Insect Management Research Unit

Stoneville, MS

The tarnished plant bug, *Lygus lineolaris* (Palisot de Beauvois), has become a major pest of cotton, *Gossypium hirsutum* (L.), within the Mid-Southern United States over the last several years. Tarnished plant bug has become the target of more insecticide applications than any other insect pest of cotton in the Mid-South with some growers making up to 15 foliar insecticide applications for plant bug control. A limited number of insecticides are available for tarnished plant bug management including products from the organophosphate, carbamate, neonicotinoid, pyridine carboxamide, benzylphenol urea, pyrethroid, and sulfoxamine classes of chemistry. However, the level of activity against tarnished plant bug varies among products. In addition, tarnished plant bug is becoming resistant to several of the products currently available for control. Populations of tarnished plant bug exhibiting varying levels of tolerance/resistance to some organophosphates, pyrethroids, cyclodienes, and carbamates have been reported in the Mid-South. Sulfoxaflor (Transform™ WDG) is a new insecticide for plant bug management that has been shown to perform equal to or better than currently available products. Sulfoxaflor is considered to be in a different class than other insecticides and will be an additional tool to help manage tarnished plant bug infestations. Laboratory assays to determine the baseline response of tarnished plant bug to sulfoxaflor were initiated during 2010. Also, monitoring the response of plant bug populations from 20 to 25 locations in Arkansas, Louisiana, and Mississippi to the neonicotinoids, imidacloprid and thiamethoxam, was conducted during 2007 to 2012 using similar procedures. Feeding assays using formulated product mixed at different concentrations in 10% honey-water solution were conducted using adults captured from non-cultivated host plants. For imidacloprid and thiamethoxam monitoring, a tarnished plant bug population collected from a non agricultural area in Arkansas was used as a reference. The mean LC₅₀ values for imidacloprid ranged from 4.24 to 5.22 µg/ml during 2007 to 2011. Mean resistance ratios ranged from 2.49 to 3.07. The mean LC₅₀ values for thiamethoxam ranged from 2.02 to 4.42 µg/ml during 2007 to 2012. Mean resistance ratios ranged from 0.67 to 1.47. For sulfoxaflor, 27 collections from Arkansas, Louisiana, Mississippi, and Tennessee were tested during 2010 to 2013. The LC₅₀ values ranged from 0.2 to 6.65 µg/ml. Of these collections, only two had LC₅₀'s greater than 3 µg/ml and 70% of the collections had LC₅₀ values less than 2 µg/ml.