

Dose Morality Vial Test with Tarnished Plant Bugs and Adult Bollworms

Jana’ Slay

USDA-ARS, Southern Insect Research Management Unit

By conducting research on insect pests, we ensure the continuation of civilization. The research we conduct in the Southern Insect Research Management Unit allows us to use chemical and biological controls to manage insect pests. Some scientists specifically focus on improving the tarnished plant bug population and determining the effect of bollworm ecology on pyrethroid insecticides. With the studies conducted scientists can see how effective Bt corn and cotton plants are as well as see if they are worth the cost.

In the article *Acephate Resistance in Populations of the Tarnished Plant Bug (Heteroptera: Miridae) From the Mississippi Delta* it is stated, “that the tarnished plant bug populations highly resistant to pyrethroid insecticides were still susceptible to organophosphates, especially acephate. This is no longer true for tarnished plant bugs in the delta.”

The Dose morality Vial Test with plant bugs can establish baseline measurements of susceptibility for an insecticide. Various insecticide are used. A common insecticide used was Diamond. Because of these tests ran today, years later it can be referred back to so population resistance can be determined.

Assorted chemicals are tested to judge effectiveness on killing the plant bugs. Plant bugs are caught from various regions throughout Mississippi. We “rear” the bugs to make colonies so multiple tests can be conducted. We start the test by soaking the vials in the different chemicals. We also use different dosages of the chemicals. After allowing the vials to air dry, we then place the plant bugs in the vials. After a set amount of time (roughly 3-24 hours) the plant bug is then removed from the vial and individually placed into plastic cups with food suitable for survival. The test is then rated by observing the bugs for death as well as switching out the food for those who managed to survive. After rating the test a certain amount of times, data are then collected, reviewed, and stored.

Adult bollworms also have a Dose Morality Vial Test. Pyrethroids are used to test the bollworms. Moths are placed in vials covered with insecticides. They are placed in vials for a set amount of time (roughly 3-24 hours.) If the survivors are able to fly afterwards they are reported as resistant. The deceased bollworms are listed as susceptible. This test can also be used to monitor resistance over period s of time.



Photo from cottoninsectcorner.org



Photo from The University of Florida

References: Snodgrass, G.L., Gore, J., Abel, C.A., Jackson, R.E. 2008. Resistance to Acephate in Tarnished Plant Bug (Heteroptera: Miridae) Populations in the Mississippi River Delta. Journal of Economic Entomology.102:699-707

Acknowledgments: Thank you Dr. Luttrell and Michelle Mullen for all your help and encouragement through these years.