

Tashanika Knight
Dr. Zhu Student Worker
Final Report

My name is Tashanika Knight and I am a student worker for Dr. Yu Cheng Zhu.

Dr. Zhu is a research entomologist who started working at USDA in 1995, which means he has been her for about sixteen years now. He obtained his bachelor's degree at Nanjing Agricultural University, in China, in Plant Protection. Following his bachelor's degree he received his master's at the University of Missouri, in Missouri, in Entomology, and received his Ph.D. from Kansas State University, in Kansas, in Entomology as well. Over the course of time that Dr. Zhu has been working here he has been very productive and active in his research. Dr. Zhu is most proud of the fact that he has been able to be very productive in the publications of his research papers. He has a total of 97 total publications and 73 peered review articles, some of which have appeared in very prestigious, scientific journals. His ability to be so hands-on with all his research and the collection of the data, and publish high quality articles in journal rankings and has led him to receive numerous recognitions, superior and outstanding performance cash awards, and a competitive fellowship award. His future goal is to hopefully get promoted to a GS-15 and produce even more outstanding articles and research.

The scientific journal article that I read, that Dr. Zhu produced, is entitled "Comparative Study on Glutathione S-transferase activity, cDNA, and Gene Expression between Malathion Susceptible and Resistant Strains of the Tarnished Plant Bug, *Lygus lineolaris*." This article is basically about how the susceptible and resistant strain was determined in tarnished plant bugs from certain areas, around Mississippi and Arkansas, that had weeds near and not near or in cotton fields. This research experiment lasts from the month of May all the way through the month of October. Each month a fresh batch of tarnished plant bugs are collected to test and its results are used to compare to the

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previous month's or years results to depict any changes. The resistant strain seemed to be more abundant on weeds that were in or near a cotton field whereas that susceptible strain was more visible on weeds that were not near or in cotton fields. Upon collection, these tarnish plant bugs were taken back to the lab and tested in bioassays using various amounts of insecticide concentrations ranging from 25 $\mu\text{g}/\text{vial}$ to 400 $\mu\text{g}/\text{vial}$. One of the insecticides used, among many others, was an organophosphate insecticide called malathion. One of the prime factors of this research experiment seems to be trying to determine how much of an impact S-transferase, GST, has on the resistant strains. According to the article, the lowest GST activity was gathered in May, which was the earliest month the samples were collected, and the largest amount of GST activity was found in October, the last month the samples were collected. This means that there was an increase of about 1.76 in activity over the entire experiment season.

Since I've been working here I've learned so many new things as far as Figuring out the protein concentration in tarnished plant bugs, how to reproduce a tarnish plant bug and fall army worm colony, how to actually go out in a field and collect over 300 plant bugs from each cite, how to interpret the results of the experiments on the plant bugs, and how to decipher and compare the survivors from one concentration to another. The Southern Insect Management Research Unit is important because we are "Improving the safety and efficiency of pest control for cotton, maize, soybean, sweet potato, and other row crops." What we do is find ways to develop environment friendly and safe, cost efficient, continuous pest control methods for U.S. southern row crops. I love my job and I'm so grateful that I have the opportunity to take part in such valuable and interesting research.

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References

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