

### **My summer Experience**

The Southern Insect Management Research Unit (SIMRU) is a research unit of the Mid-South Area (MSA), Agricultural Research Service (ARS), United States Department of Agriculture (USDA). SIMRU'S mission is intimately tied to that of USDA which is to provide leadership on food, agriculture, natural resources, and related issues based on sound public policy, and the best available and efficient management. I have learned so much during the past five years of my summer employment at SIMRU. Dr. Randal "Randy" Luttrell is the research leader of SIMRU. He is involved in not only his research, but every scientist's research in SIMRU. The three on-going programs that are in this unit are 1) Insecticide Resistance Management and New Control Strategies for Pests of Corn, Cotton, Sorghum, Soybean, and Sweet Potato (headed by Dr. Ryan Jackson), 2) Effect of Resistance on Insect Pest Management in Transgenic Cotton (headed by Dr. Omathhage Perera, and 3) Control of Tarnished plant Bugs by Biocontrol and Other Methods (headed by Dr. Gordon Snodgrass).

During the summer of 2011, I have learned the process of insect resistance research and what all goes into it. First of all, I needed to know the pattern of how and when the insects traveled from different crop sites. Next, we have a controlled site and a test site to test the insects' resistance to the insecticide that is sprayed on the crops. The plots at Livingston Farms are part of the insects' natural habitat so the insects come and go freely. The controlled site is where the cages are set up. We release specific amounts of tarnish plant bugs (TPB) and zea or vir moths in each of the cages. At the beginning of the summer, it seemed that there were a lot of insects on the crops due to the damage left behind. Now, the data that was collected showed that there was less damage but not by a lot. In an article written by Dr. Snodgrass, he talked about how tarnish plant bugs' reproductive diapause was studied during the winters of 1999, 2000, and 2001. Tarnish plant bugs have become a major pest problem and an alternative control method is badly needed. It is believed, based on our own study of tarnish plant bugs, that a *Beauveria bassiana* (fungus) may be the key to controlling the tarnish plant bug population. The reason behind this is that during the winter, TPBs are in a reproductive diapause state, so the hypothesis is that they can contract the fungus. Nymphs on the other hand can molt their exoskeleton and therefore escape fungal infestation. This study gives us an opportunity to use *Beauveria bassiana* as a biological control agent.

The other research project that we started on this summer is the moth data collection that was collected from Fayetteville, Foreman, Tillar, and Wildy. We sampled 100 moths from each location in the months of June and September. This was done so that a comparison from the beginning of the summer to the end of the summer could be done during testing. The three main things we test for in the moths are: the head & thorax, the abdomen, and the wings. The head & thorax are for DNA analysis. This allows us to look at the polymorphic genetic markers to be used in population genetic analysis. The abdomen is used as back up for DNA analysis. Lastly, the wings are used for stable carbon isotope analysis. In doing so, we will use the carbon isotope

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ratio to determine which plants the moth has eaten such as cotton, corn, and soybean. This project is in relation to Dr. Jackson's and Dr. O.P.'s research.

I am very glad that I was able to come back to work here at USDA-ARS SIMRU for a 5<sup>th</sup> year. Everyday has a new lesson to be learned. I will take everything that I have learned here and apply them in my future. This experience has helped me understand how to better myself as a scientist and as a team player. Even though it was not always smooth sailing, there were ways to assess the problem and move on. I want to thank my supervisors and fellow co-workers for a very interesting summer employment.