

SOUTHERN INSECT MANAGEMENT  
RESEARCH UNIT  
**USDA-ARS**  
**Mid South Area**

**Mission**

- *The mission of the Southern Insect Management Research Unit (SIMRU) is to generate new knowledge of arthropod pest biology, ecology and management and integrate this knowledge into contemporary farming systems that will promote economical and environmentally stable pest management practices for the southern U.S.*
- *The vision of SIMRU is to be a recognized center of innovation for negating agricultural pest problem through deployed scientific knowledge of pest biology, ecology and management options.*

**CRIS PROJECT**

**Insecticide Resistance Management and New Control Strategies for Pests of Corn, Cotton, Sorghum, Soybean, and Sweetpotato**

**PROJECT INVESTIGATORS**

- Clint Allen
- Randall Luttrell (Project Leader)
- OP Perera
- Gordon Snodgrass
- Yu Cheng Zhu

**CRIS PROJECT**

**Control of Tarnished Plant Bugs by Biocontrol and Other Methods**

**PROJECT INVESTIGATORS**

- Randall Luttrell
- Maribel Portilla
- Gordon Snodgrass (Project Leader)

## CRIS PROJECT

Effect of Resistance on Insect Pest Management in Transgenic Cotton

### PROJECT INVESTIGATORS

- Clint Allen
- Randall Luttrell
- **OP Perera (Project Leader)**
- Maribel Portilla

## SEMINAR ANNOUNCEMENT

"The Boll-feeding Sucking Bug Challenge: Evaluating Pest Risk Locally Regionally"



Dr. Mike Brewer  
Assistant Professor-Field Crop Entomology  
Texas A&M AgriLife Research  
Corpus Christi, TX

- Dr. Brewer earned his Ph.D in Entomology from the University of California at Riverside, California. He received Master's degrees in Applied Statistics and Entomology from Louisiana State University in Baton Rouge, Louisiana. He has a B. S. in Entomology from the University of California at Davis, California and an A. A. Degree from San Joaquin Delta College in Stockton, California. The focal point of his research is study of natural enemies, pest and plant interactions in diverse agricultural landscapes.

NBCL Conference Room  
March 29, 2013 at 10:00 a.m.

Hosted by: SIMRU

## NEW PUBLICATION CONGRATULATION Dr. Clint Allen

INSECTICIDE RESISTANCE AND RESISTANCE MANAGEMENT  
**Risk Assessment for *Helicoverpa zea* (Lepidoptera: Noctuidae)  
Resistance on Dual-Gene Versus Single-Gene Corn**

KRISTINE T. EDWARDS,<sup>1,2</sup> MICHAEL A. CAPRIO,<sup>1</sup> K. CLINT ALLEN,<sup>2</sup> and FRED R. MUSSER<sup>1</sup>

*J. Econ. Entomol.* 106(1): 292-302 (2013); DOI: <http://dx.doi.org/10.1093/EE/106.1>  
**ABSTRACT** Recent Environmental Protection Agency (EPA) decisions regarding resistance management in Bt-cropping systems have prompted concern in some experts that dual-gene Bt-corn (Cry1A.105 and Cry2Ab2 toxins) may result in more rapid selection for resistance in *Helicoverpa zea* (Boddie) than single-gene Bacillus thuringiensis (Bt)-corn (Cry1Ab toxin). The concern is that Bt-toxin longevity could be significantly reduced with recent adoption of a natural refuge for dual-gene Bt-corn (Cry1Ae and Cry2Ab2 toxins) and concurrent reduction in dual-gene corn refuge from 50 to 20%. A population genetics framework that simulates complex landscapes was applied to risk assessment. Expert opinions on effectiveness of several transgenic corn and cotton varieties were captured and used to assign probabilities to different scenarios in the assessment. At least 100 replicate simulations with randomly drawn parameters were completed for each of four risk assessments. Resistance evolved within 30 yr in 22.0% of simulations with single-gene corn and cotton with no volunteer corn. When volunteer corn was added to this assessment, risk of resistance evolving within 30 yr declined to 13.8%. When dual-gene Bt-corn planted with a natural refuge and single-gene corn planted with a 50% structured refuge was simulated, simultaneous resistance to both toxins never occurred within 30 yr, but in 38.2% of simulations, resistance evolved to toxins present in single-gene Bt-corn (Cry1Ab). When both corn and cotton were simulated as dual-gene products, cotton with a natural refuge and corn with a 20% refuge, 7% of simulations evolved resistance to both toxins simultaneously within 30 yr, while 10.6% of simulations evolved resistance to Cry1Ab-c toxin.  
**KEY WORDS** population genetic, insect, stochastic processes

## CONGRATULATION



Congratulation to Dr. Portilla and her daughter Manuela Portilla

Manuela placed first and was Best of Fair at the Regional and State Science Fair 2013, and received the following awards:

- Intel International Science and Engineering Fair 2013 Finalist
- Rich sustainable Development award
- Student awards for Geosciences Excellence (Association for Women Geoscientists)
- National Oceanic and Atmospheric Administration 2013 Taking the Pulse of the Planet Award

She will be going to Phoenix AZ for the International Science Fair 2013.

## SPECIAL THANKS

- Special thanks to Tabatha Nelson, Essanya Winder, June Jones, Sakinah Parker, and Yolanda Harvey for representing SIMRU during the Black History program on February 27, 2013.

## MARCH BIRTHDAYS CELEBRATION

Les, June, and Larry

