

USDA-ARS
Mid South Area
SOUTHERN INSECT MANAGEMENT
RESEARCH UNIT

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
- **Ryan Jackson (Project Leader)**
- Randall Luttrell
- 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
- Ryan Jackson
- Randall Luttrell
- OP Perera (Project Leader)

NEW PUBLICATION CONGRATULATIONS Dr. Carlos Blanco

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Agricultural Sciences

Evaluating host plant resistance in cotton (*Gossypium hirsutum* L.) with varying gland densities to tobacco budworm (*Heliothis virescens* F.) and bollworm (*Helicoverpa zea* Boddie) in the field and laboratory

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ABSTRACT

Cotton (*Gossypium hirsutum* L.) produces a number of toxic terpenoid alkaloids (TA) compounds contained in epidermal glands that help protect the plant from pests and diseases. In the seed, one of these toxic compounds, gossypol, limits the use of the seed to ruminants such as dairy cows. There are breeding techniques and strategies available to decrease gossypol in the seed, but the breeding process also tends to include methods to evaluate the plant's ability to resist insect pests. These approaches were used to assess resistance of cotton to herbivory from bollworm (*Helicoverpa zea* Boddie) and tobacco budworm (*Heliothis virescens* F.) including field counts, controlled field infections, assays and laboratory feeding tests of young third instar larvae. Results indicated that both field and laboratory evaluation could provide an assessment of the cotton host's resistance. Measurements of terpenoid alkaloids (TA) in the seed and the leaves, confirmed that the levels and types of TA in the seed were not always good indicators of seed TA and that other TA, such as homogentisinolone and helioalan contribute to host plant resistance.

1. INTRODUCTION

Cotton (*Gossypium hirsutum* L.) produces not only an economically important natural fiber, but also oil and high quality protein from the seed [1]. For every kilogram of fiber produced, 1.6 kg of seed is available as a source of extra income for the grower. However, gossypol, a toxic terpenoid alkaloid (TA), decreases the value of cotton seeds and limits their use in feeding ruminants for example such as dairy cows, goats or water buffalo [1]. Gossypol seed color (seed coat) is composed primarily of compounds are contained in trigonous glands normally found throughout the plant [1] and protect the plant from pests and pathogens [2,3]. While gossypol in the predominant TA in seeds and roots, other TA predominant in "green" tissues such as stems, leaves and bolls [4]. The two most common are homogentisinolone (HGO) and a group of related TAs often referred to as helioalan [4].

Bolter and [5,6] showed that glanding in cotton was controlled by two major genes, *G1* and *G2*. A fully glanded plant is *G1G1G2G2* and a completely glandless plant is *g1g1g2g2*. The number of dominant alleles present determines the density of the glands. While both genes are active on the vegetative and reproductive parts of the cotton plant, *G2* is most strongly expressed in the seed and *G1* in the nonreproductive above parts. Biochemical mechanisms control TA production and in the

NEW EMPLOYEE Barbara Putman

- The USDA -ARS Southern Insect Management Research Unit is pleased to welcome Barbara Putman.
- She is currently an undergraduate student working on two B.S. degrees, one in Biology and the other in Environmental Science.
- She will graduate this May from Delta State University.
- Her plans are to pursue a career in Entomology.
- Barbara will be attending the 2012 Southeastern-Southwestern Meeting sponsored by the Entomological Society of America in Little Rock, AR on March 4-7, 2012, presenting a poster presentation with two other Delta State University Biology students.
- You may contact Barbara by phone at 686-5244. In addition, she will be working out of building I room 417.



OUTREACH Chris Johnson

- Chris Johnson was a guest speaker at the Career & Technical Education Month Program.
- This program was sponsored by the Joe Barnes Career & Technical Center a part of the West Bolivar School District, Rosedale, MS.



Congratulations Sandy West On Ten Years of Service



Congratulations Owen Houston On Ten Years of Service



MARCH National Women's History Month

- **Women's History Month** is an annual declared month worldwide that highlights contributions of women to events in history and contemporary society. March has been set aside as this month in the United Kingdom and in the United States. In India, this month is celebrated in October and corresponds with the celebration of Persons Day, which is October 18.



Black History Program Special Acknowledgement

- We would like to thank the following SIMRU employees for their contributions to the Mid-South Area Black History Program held on February 28, 2012:
- Yolanda Harvey (Photographer)
- Sakinah Parker (Food Server & DDT photographer assistant)
- Essanya Winder (Music Ensemble)

MARCH BIRTHDAYS CELEBRATION

Les, Dustin, and Larry

