

Project Impacts/Benefits

Our research holds the potential to minimize the entry of aflatoxins into the food chain, which would increase profit margins for producers and provide the agricultural community with effective research strategies for fight against the aflatoxin contamination and insect attack. This will ultimately improve stakeholder's economy, production effectiveness, and protect the consumer by improving the food safety at national level.

Project Deliverables

Graduate Student Degree: Curtis Atkinson, MS Biochemistry (MS Defended August, Degree Conferred. December 2013)

Atkinson, C.M. (2013) Differentiation of Fungal Phytopathogens by Ft-IR and MALDI-TOF MS. Published Thesis. Mississippi State University.

Publications: Erika Womack, ***Ashli Brown** and Darrell Sparks (2013) A Recent Review of Non-Biological Remediation of Aflatoxin-Contaminated Crops. *Journal of the Science of Food and Agriculture* DOI:10.1002.

Pechanova, O.; *Pechan, T.; Rodriguez, J.M; Williams, W.P.; ***Brown, A.E.** (2013) A Two-Dimensional Proteome Map of the Aflatoxigenic Fungus *Aspergillus flavus*. *Proteomics*. 13(9):1513-1518.

Curtis Atkinson, Olga Pechanova, Darrell Sparks, ***Ashli Brown** and Jose Rodriguez (2013) Differentiation of Aflatoxigenic and Non-Aflatoxigenic Strains of Fungi by FI-IR. *Applied Spectroscopy*. In Press.

*Geiger, A.J.; *Ward, S.H.; Kaletsch, K.N.; **Johnson, A.B.**; Sparks, D.L. (2013) Translation of Aflatoxin Into the Milk of Lactating Dairy Cows Fed an Anti-Caking Agent. *Journal of Dairy Science*. Submitted July 2013.

Johnston, C.I.; Womack, E.; ***Brown, A.**; *Sparks, D.L. (2013) Recent Developments in the Biological Control of *Aspergillus flavus* and aflatoxin. *Journal of the Science of Food and Agriculture*. Expected Submission November 2013.

Presentations: **Invited

****Ashli Brown**, Xueyan Shan, Darrin F. Roberts, Paul Williams, Marilyn Warburton, Gary Windham, Robert Kemerait, Boazhu Guo, Zhi-Yuan Chen, S. Brooks Blanche, Dawn S. Luthe, Alisa Huffaker, Eric Schmelz (2013) Identification of Gene-Based Markers for Resistance to Aflatoxin Accumulation in Corn by Examination of the Plant/Pathogen/Environment Interactions. Commodity Classic, Kissimmee, FL. (February 26-March 2).

Ashli Brown, Curtis Atkinson, Darrell Sparks (2013) Identification of Agricultural Phytopathogens by Mobile FTIR. ASTS-Environmental and Food Safety Series Webinar Sponsored by Agilent Technologies and ACS. (March 5).

Alka Tiwari, W. Paul Williams, J. Erik Mylroie, Gary L. Windham, **Ashli Brown**, Xueyan Shan (2013) Computational Analysis of 2D Protein Gel Images for Identification of Differentially Expressed Proteins Associated with Resistance to Aflatoxin Accumulation in Maize. MCBIOS Annual Meeting, Columbia, MO. (April 5-7).

Curtis Atkinson, Darrell Sparks, **Ashli Brown**, Jose Rodriguez (2013) Toxicogenicity Detection by FT-IR. 245th ACS National Meeting, New Orleans, LA. (April 7-11).

W. Isaac Jumper, Whitney C. Smith, W. Paul Williams, Darrell L. Sparks, **Ashli E. Brown** (2013) Reaction of Fall Army Worms to Jasmonate Based Volatiles. 245th ACS National Meeting, New Orleans, LA. (April 7-11).

Erika Womack, Darrell Sparks, Stephanie Hill, **Ashli Brown** (2013) Evaluation of Adsorbents for the Removal of Aflatoxin M1 from Contaminated Milk Using QuEChERS as an Extraction Method. 245th ACS National Meeting, New Orleans, LA. (April 7-11).

Cedric Reid, Erik Mylroie, W. Paul Williams, **Ashli Brown**, and Darrell Sparks (2013) Single Corn Kernel Aflatoxin Detection. 245th ACS National Meeting, New Orleans, LA. (April 7-11).

Emily Davis, Curtis Atkinson, **Ashli Brown**, and Darrell Sparks (2013) Developing NALDI-TOF MS for Aflatoxin Screening of Corn. AOAC Southern Section Annual Meeting, Atlanta, GA. (April 22-23).

Curtis Atkinson, **Ashli Brown**, Darrell Sparks, and Gale Hagood (2013) Prep-Free Differentiation of Agriculturally Important Fungi by FT-IR Spectroscopy. AOAC Southern Section Annual Meeting, Atlanta, GA. (April 22-23, 2013).

****Ashli Brown**, Curtis Atkinson, Frederic Prulliere, Darrell Sparks (2013) Agricultural Phytopathogens Identified via Portable FT-IT. Gordon Research Conference on Mycotoxins and Phycotoxins. (June 16-21).

Project Deliverables (Continued)

Leveraging: Funding Received in Bold, Funding Pending*

The 2013 MCPB funding helped secure AMCOE, Texas Corn Promotion Board, and USDA funding, as well as a partnership with Agilent Technologies “Monitoring Mycotoxins in MS” for instrumentation as part of Food Segment Division. We have applied for funding from USAID under the Feed the Future Initiative for mycotoxin management strategies in developing countries. Additionally, we have submitted applications for funding to Peanut and Mycotoxin Innovation Lab and the Special Research Initiative.

January 2013: Mississippi Soybean Promotion Board. RAPID IDENTIFICATION OF SOYBEAN FUNGI BY SPECTROSCOPIC TECHNIQUES. (Year 3) (\$63,405 for 1yr) PI

June 2013: Peanut and Mycotoxin Innovation Lab. RAPID DETECTION OF ASPERGILLUS FLAVUS IN PEANUTS (\$740,000.00 for 4yrs) CoPI

November 2013: AMCOE. ADVANCING GENOME RE-SEQUENCING TO MARKER DISCOVERY TOWARD ASPERGILLUS FLAVUS RESISTANCE AND AFLATOXIN REDUCTION IN MAIZE (\$90,000) CoPI

December 2013: MAFES Strategic Research Initiative. RAPID DETECTION OF PHYTOPATHOGENIC FUNGI IN AGRICULTURAL AND BIOFUEL CROPS (\$43,200) CoPI

Graphics

