

RESEARCH REPORT TO NATIONAL PEANUT BOARD

December 2004

Project: Soil Insect Management for Improved Quality and Profitability.

Principal Investigator: Jay W. Chapin, Extension Peanut Specialist / Research Entomologist

Institution: Clemson University

Objectives: Improve peanut profitability by developing pest management programs for reduced tillage production systems.

Results:

1. We quantified the direct peanut yield and grade reductions caused by burrower bugs in reduced tillage systems.
2. We showed for the first time that burrower bugs have been a significant and previously unrecognized source of aflatoxin contamination on drought stressed peanuts.
3. We showed that incidental levels (< 20 % of kernels) of burrower bug feeding did not have a detrimental effect on peanut flavor.

Significance:

This work is relevant to southeastern peanut producers because aflatoxin is a major quality issue. Our previous studies showed that the combination of reduced tillage and drought stress increased the probability of burrower bug feeding on kernels. We now know that this feeding was also responsible for nearly all of the aflatoxin contamination (>98 %) that occurred in a grower's field. Furthermore some of this contamination was occurring on SMK peanuts with no signs of injury or discoloration that could be targeted by automated removal systems. Therefore the ways we previously found to reduce burrower bug feeding (irrigation, elimination of volunteer peanut, winter tillage for cover crop establishment, or chemical treatment) become more relevant to reduced tillage growers.

By showing that incidental levels of BB kernel feeding do not affect peanut flavor, our work demonstrates that low levels of BB feeding are not a quality concern in the absence of aflatoxin. It was previously believed that even minor feeding imparted a bitter flavor to peanut.

We reported our results at APRES meetings and also published them in scientific journals:

Chapin, J. W., J. W. Dorner, and J. S. Thomas. 2004. Association of a burrower bug, *Pangaeus bilineatus* (Say) (Heteroptera: Cydnidae) with aflatoxin contamination of peanut kernels. *J. Entomol. Sci.* 38: 71-83.

Chapin, J. W., and J. S. Thomas. 2003. Burrower bugs (Heteroptera: Cydnidae) in peanut:

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seasonal species abundance, tillage effects, grade reduction effects, insecticide efficacy, and management. J. Econ. Entomol. 96: 1142-1152.

Chapin, J. W., T. H. Sanders, L. O. Dean, K. W. Hendrix, and J. S. Thomas. 2005.

Effect of feeding by a burrower bug, *Pangaeus bilineatus* (Say) (Heteroptera: Cydnidae), on peanut flavor and oil quality. J. Entomol. Science (in review).