Project Title: Burrower bug occurrence as affected by environment and its role on aflatoxin contamination of runner peanut.

PI: K.L. Bowen, Auburn University, AL

Layman's Summary

Aflatoxins are highly carcinogenic compounds that can naturally contaminate peanuts. The source of this contamination are fungi that inhabit soil in which peanuts develop. Managing aflatoxin contamination is difficult, since the soil harbors insects and nematodes that cause damage to peanut pods. One of these insects is the burrower bug. Little is known or has been published on this insect in the southeast U.S. Therefore, our study sought to gain more information about the burrower bug and to determine if burrower bug damage was directly linked to aflatoxin contamination of peanut.

Over the four years in which this study was done, we found relatively few burrower bugs and very low levels of aflatoxin contamination. A second study site was installed in 2013, and a greater number of burrower bugs were found there. The higher incidence of these bugs at the second site may be due to the lack of rotation at that site. More work is needed on the burrower bug, its ecology and possible role in aflatoxin contamination. However, weather plays a critical role in this toxin-insect-peanut system and studies do frequently fail.

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Final Report (through June 2015)

In 2014, this study was done at two study sites: the Wiregrass Research Center (WG) in southeast Alabama and E.V. Smith's Plant Breeding Unit (PBU) in east central Alabama. At both sites, pitfall traps were installed to capture burrower bugs. In addition, rain-out shelters were placed over some plots to establish drought in those plots. A greater number of burrower bugs were collected in 2014 than in previous years of this study. Considerably more burrower bugs were trapped at PBU than WG, which might be attributed to lack of rotation or the tillage system at the PBU site. At WG, 15 out of 31 trapped burrower bugs were found in plots which had been cropped with winter wheat. No burrower bugs were trapped under rain-out shelters at WG. At PBU, 87 of the 110 trapped burrower bugs were trapped under rain-out shelters.

Slightly higher concentrations of aflatoxins were found in peanuts from WG in this study than in previous years. Concentrations averaged 12 ppb in 2014 compared to < 2 ppb in 2013 and 2012. However, the majority of samples (95%) had < 5 ppb. Analyses indicate that burrower bug damaged seed do not have higher levels of aflatoxin than non-damaged seed; however, such differences would be non-discernible with these low levels of aflatoxin concentrations.