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National Peanut Board/Southeast Peanut
Research Initiative Quarterly Progress Report
For Work Done Under Research Agreement #023824-01

FINAL REPORT

INSTITUTION: University of Georgia

PROJECT TITLE: More Efficient Collection of Soil Insect Data and Survey of Insects Affecting Peanut Production and Quality in the Southeast

RESEARCH AGREEMENT NO. 26-31-RE677-230

PROJECT LEADER: Dr. Steve L. Brown

EXPIRATION DATE: 12/31/03

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NPB CONTACT: Mr. Stephen O'Brien

REPORT OF PROGRESS:

Several species of insects which live in the soil can adversely impact peanut yield and quality. Unlike foliar insect pests which can be readily counted using standard scouting techniques, soil insect populations are difficult to assess. Relatively little is known about the biology of soil insects and therefore reliable treatment recommendations and treatment thresholds are lacking. The lack of reliable soil insect data is complicated by time and cost required to conduct soil insect research. Soil insect population data often requires collection of large, heavy soil samples, transportation of those samples to a processing location, followed by tedious and labor intensive hand screening.

This project was intended to design, develop and test a mobile soil insect sampling machine that would simplify data collection and produce useful data for peanut growers. All of the \$20,000 funded for this project was used to build a prototype sampling machine (figure 1). The machine was designed by Dr. Steve Brown at the University of Georgia with input from Dr. Ron Weeks at Auburn University and Dr. Jay Chapin at Clemson University. The machine was built by the Instrument Shop on the campus of the University of Georgia. The machine was delivered mid way through the 2002 growing season but limited data was collected during that year.

Wireworm populations were measured at the Attapulgus Research and Education Center in Attapulgus, Georgia and at the Wiregrass Research and Education Center in Headland, Alabama. Specimens were collected from both locations and identified to species. Different species were predominant at each location and at Attapulgus, different species were found to be predominant on different sample dates. These results illustrated the dynamic nature of wireworm species composition.

The machine was used by Dr. Weeks at Headland to evaluate soil insect populations in peanuts strip tilled into different winter cover crops. Results confirmed earlier observations that burrower bugs could become a serious problem for strip tilled peanuts when no tillage was used the previous fall. The machine performed well but suggestions were made for improvements and modifications.

Dr. Chapin also tested the machine in test plots at the Edisto Research Station in South Carolina and made suggestions for modifications.

During the winter months following the 2002 season, a efficiency test was conducted to determine recovery rates for various test objects placed in soil samples. Different numbers of small, plastic fishing grubs, one cm sections of

plastic weed eater line and 3mm diameter plastic beads where buried in 0.6 cubic foot samples of Tifton sandy loam soil. Recovery rates were 78-82% allowing a 2-3 minute search time for objects on the screens after sieving. Due to the large amounts of rocks and organic matter (cotton residue) in the soil, many of the test objects became lodged and were not readily found. Given unlimited search time, 100% of the objects were found. The machine's efficiency in extracting insects from soil samples will vary with soil type and with the search time allowed, however, it clearly simplifies soil insect research and allows data collection that would otherwise not be feasible.

The prototype machine is being shared by entomologists in three states. A subsequent NPB project has allowed us to build a second machine and put both machines to work on specific projects. Those results will be presented in the final report on that project.

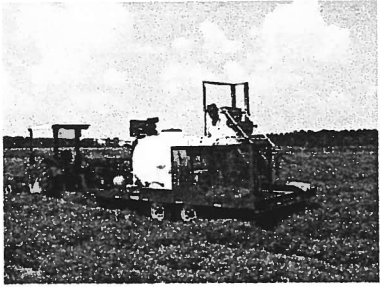


Figure 1. Prototype soil insect sampling machine designed and built under this project.