Title: Rootworm Population Dynamics and Management

Principal Investigator:
Dr. Mark R. Abney, Associate Professor and Extension Specialist
mrabney@uga.edu, Department of Entomology, University of Georgia, Tifton Campus, 2360 Rainwater Rd, Tifton, GA 31794

The rootworm complex—comprising the southern corn rootworm and the banded cucumber beetle—has become a serious economic problem in irrigated peanut production in Georgia in recent years. Chlorpyrifos was the only registered insecticide with proven efficacy against these species in peanut; however, tolerances for peanut were revoked in June 2025. In response, the University of Georgia (UGA) Peanut Entomology program has worked for several years to identify alternatives to chlorpyrifos. This research effort began with examining the distribution and relative abundance of the two species. Results from this work indicate that the banded cucumber beetle is responsible for most rootworm injury in Georgia peanut. Compared with the southern corn rootworm, the banded cucumber beetle has been poorly studied. A better understanding of the population structure of the rootworm complex will inform management decisions and guide future research on this pest group.

This project was part of ongoing rootworm research focused on determining how rootworm abundance and infestation timing affect the incidence of injury, total yield, and pod quality. The objectives of this study were to evaluate the effects of infestation timing and pest density on pod injury, yield, and quality at harvest, and to assess feeding injury on peanut pods by size and maturity.

Larval stages of rootworms feed on peanut roots and developing pods and can cause serious economic losses when populations are high. The southern corn rootworm (*Diabrotica undecimpunctata*) has long been recognized as a pest of peanut in Georgia, whereas relatively little is known about the biology and pest status of the banded cucumber beetle (*Diabrotica balteata*). Rootworm injury has increased in recent years alongside an apparent increase in the relative abundance of the banded cucumber beetle. Larvae of both species occur exclusively in the soil and require relatively high soil moisture for survival. As a result, fields with heavy soil textures and irrigation are at greatest risk for infestation and injury; however, irrigated fields with lighter textured soils can also be affected.

A systematic evaluation of rootworm populations in Georgia peanut fields conducted over three years (2020–2023) provided baseline data on species distribution, composition, and injury levels. These data form the foundation for future research efforts, including determining the need for additional studies on the biology of the banded cucumber beetle. Although the reasons for the increased incidence of rootworm injury in Georgia peanut fields remain unclear, it is evident that the banded cucumber beetle has become the most abundant species in many areas. Recent work suggests that corn serves as an important source of banded cucumber beetle adults that infest peanut fields and lay eggs in early summer. Despite high rootworm populations and injury levels in 2021 and 2022, few peanuts were graded as Segregation 2, and yields were generally high.

Nevertheless, research trials have demonstrated that rootworm injury can result in significant yield losses, with reductions of up to 1,000 lb/acre documented.

A series of small-plot experiments were conducted at the Southwest Research and Education Center (SWREC) in Plains, GA, and at the UGA Tifton Campus in Tifton, GA. To evaluate the impact of rootworm infestation on yield and quality, an experimental insecticide (isocycloseram) was used to manipulate rootworm populations. Pods were collected at weekly intervals throughout the growing season to characterize crop phenology and quantify pod injury. The size and developmental stage of each damaged pod were recorded. This work was designed to address questions regarding the fate of injured pods and the compensatory ability of peanut plants, and it should provide a clearer assessment of the pest status of the rootworm complex in Georgia peanut.

Results from this study showed that high levels of rootworm injury can significantly reduce peanut yield and quality. Equally important, pod injury levels below 20% did not significantly reduce yield at harvest. Peanut fields at high risk for rootworm injury—such as those with a history of infestation—will likely be treated preventatively with insecticides to reduce the risk of economic loss. In contrast, fields with no history of rootworm injury should be scouted and treated based on observed pest abundance and the incidence of pod injury. Fields in which feeding injury affects less than 20% of pods are unlikely to benefit from insecticide application. Determining when and how to scout for rootworm injury will remain a focus of ongoing research within the UGA Peanut Entomology program.

Damage assessments from 2025 experiments are still ongoing. Once completed, all data will be analyzed and prepared for publication.