

Rootworm Population Dynamics and Management

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Rootworms (southern corn rootworm (SCRW) and banded cucumber beetle (BCB)) have emerged as increasingly serious pests in irrigated peanuts in Georgia in recent years. Chlorpyrifos was the only registered insecticide with proven efficacy against these species in peanut, and tolerances for all food uses were revoked in February 2022. The cancellation of chlorpyrifos left peanut producers vulnerable to serious economic loss from rootworm infestation. The research described here is part of an ongoing effort to understand the biology including population dynamics of the rootworm complex and to develop effective tactics for managing the pests. Results of our work show that the non-native BCB is currently much more abundant in Georgia peanut fields than SCRW, and BCB is almost certainly responsible for the majority of rootworm injury to peanut in the state. Relative to southern corn rootworm, banded cucumber beetle has been poorly studied. Our recent work suggests that corn may be an important source of BCB adults that infest and lay eggs in peanut in early summer. In spite of high rootworm populations and injury in commercial fields in 2021 and 2022, very few peanuts were graded Seg2, and yields were generally high. Understanding how and when rootworms cause economic injury is critical to developing management recommendations. In addition to insecticide efficacy testing and on-farm evaluation of environmental factors and production practices that affect rootworm risk, our current research has the following objectives: 1. Evaluate the effect of time of infestation and pest density on incidence of injury, pod yield, and seed quality at harvest; 2. Determine the effect of plant date on rootworm infestation and injury; 3. Evaluate the effect of rootworm injury to pods on the incidence of mold (including *Aspergillus flavus*) on harvested peanut.

Rootworm research in 2023 was conducted at the UGA SWREC in Plains, GA. An experimental insecticide with a novel mode of action and excellent efficacy against rootworm was used to establish a “low injury” treatment while a “high injury” treatment was established by omitting all soil insecticides. Treatments were replicated four times in a randomized complete block design. Pod number, weight, and incidence of pod injury by pod size were recorded weekly throughout the season to determine when infestations occur and which developmental stages of pods are most susceptible to injury. A 4” diameter by 5” soil sample was collected from each plot each week and assessed for rootworm larvae. Rootworm pressure was low in 2023, and no differences were seen between the treatments for any of the parameters tested. Under heavy pest pressure in 2022, significant differences were observed for all dependent variables including yield. The effect of plant date on the incidence of rootworm feeding injury and pod yield was evaluated in a replicated small plot trial with three planting dates. Runner-type peanut cultivar GA-06G was seeded into 2 row X 30 ft plots on 11 and 31 May and 28 June. The incidence of injury at harvest did not differ significantly by treatment, though it did increase numerically with later planting dates. Yield varied significantly by plant date, but the effect was not likely due to rootworm feeding. A pod sample from every plot in all rootworm trials was sent to the Georgia Federal and State Inspection Service for grading; no mold was observed in any of the samples. Rootworm pressure in our research plots in 2023 was uncharacteristically low. All of the trials were located on the north side of the research center where there was no corn. Proximity of corn has been shown to be a significant risk factor associated with rootworm infestation in peanut.