

Rootworm Population Dynamics and Management

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Rootworms (southern corn rootworm and banded cucumber beetle) have emerged as increasingly serious pests in irrigated peanuts in Georgia in recent years. Chlorpyrifos is currently the only registered insecticide with proven efficacy against these species in peanut, and it is under intense regulatory scrutiny. The UGA Peanut Entomology program has been working for several years to identify alternatives to chlorpyrifos. The purpose of this project was to examine the distribution and relative abundance of the two species to determine if increased populations of banded cucumber beetle could be responsible for the observed increases in rootworm injury. Relative to southern corn rootworm, banded cucumber beetle has been poorly studied. Understanding the population structure of the rootworm complex will inform decisions regarding management and future research and on this pest group. The objective of this work was to determine the distribution and relative proportion of southern corn rootworm, *Diabrotica undecimpunctata*, and banded cucumber beetle, *Diabrotica balteata*, within overall rootworm populations in Georgia peanut fields.

The larval stages of rootworms feed on roots and developing pods of peanut and can cause serious economic loss when populations are high. The southern corn rootworm (SCRW), *Diabrotica undecimpunctata*, has long been known to infest peanut in Georgia, but little is known about the biology and pest status of banded cucumber beetle (BCB), *Diabrotica balteata*. Rootworm injury has increased in recent years along with an apparent increase in the relative abundance of BCB. Larvae of both species occur only in the soil and can survive only under conditions of relatively high moisture. Fields with heavy soil textures and irrigation are at greatest risk to infestations and injury. Nevertheless, irrigated fields with lighter textured soils were infested with rootworms in 2019 and 2020. A systematic evaluation of the rootworm population in Georgia peanut fields will provide baseline data regarding species distribution, composition, and injury. These data collected in 2020 provide direction for future research efforts including the need for additional research to understand the biology of BCB. The reason for increased incidence of rootworm injury in Georgia peanut fields is unknown; this work was the first step to investigate whether changes in rootworm species composition and abundance could be responsible for this phenomenon.

A monitoring program for rootworm adults was established in 11 commercial peanut fields in Georgia in 2020. Fields with a history of rootworm infestation were selected based on conversations with county Extension faculty and growers. The initiation of sampling was delayed until late July as a result of restrictions associated with COVID-19. Rootworm traps were placed in each field, and fields were monitored for rootworm activity with sweep nets every two weeks until late September. Fields were sampled in Early, Terrell, Randolph, and Sumter Counties. Rootworm adults were collected and transported to the Peanut Entomology lab where they were sorted and identified to species. In late September, pods were collected from three plants at 10 locations in each field and rated for rootworm injury.

Banded cucumber beetle adults were collected more frequently in sweep nets than southern corn rootworm adults at all 11 locations regardless of sample period (Figs 1 and 2). Sample period from late July to late September did not affect the number of adult banded cucumber beetles collected in sweep nets, though SCB numbers declined during the final sample period (fig 2). More BCB than SCB adults were collected on sticky traps regardless of attractant lure, and more BCB adults were captured in September than July or August (fig 3).

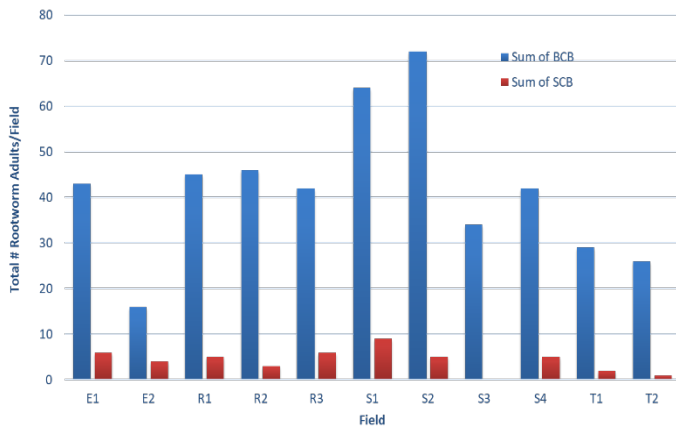


Fig. 1 Abundance of two rootworm species adults in sweep nets by field in 2020

Georgia. Compared to the southern corn rootworm, little is known about the biology or pest status of banded cucumber beetle in peanut. Reports of rootworm injury in peanut have increased in recent years. It is likely that adequate rainfall during this time contributed to conditions that favor rootworm development, but the increased abundance of banded cucumber beetle may also play a role and should be investigated. Future studies are planned that will provide additional population data, evaluate the role of corn as a source for rootworm infestations in peanut, and examine the interaction between rootworm infestation timing, peanut maturity, and economic losses.

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Banded cucumber beetle is not native to the southeastern US, but the data reported here suggest that it has become the dominant rootworm species in peanut in

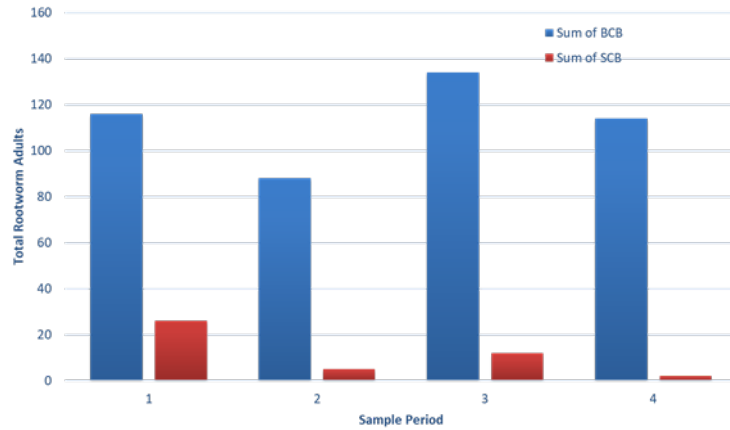


Fig. 2 Abundance of two rootworm species adults in sweep nets by sample period in 2020

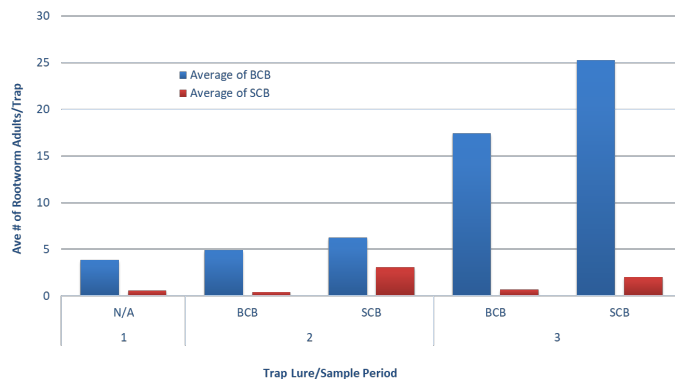


Fig. 3 Abundance of two rootworm species adults on yellow sticky traps by attractant lure and sample period in 2020