

Efficacy of Foliar-Applied Insecticides to Reduce Pod Damage Caused by Southern Corn Rootworm

R. Brandenburg*, B. Royals, D. Reisig, E. Foote, C. Ellison, B. Barrow, M. Strickland, P. Smith, and D.L. Jordan

North Carolina State University, Raleigh, NC 27695.

Introduction

Southern corn rootworm can damage peanut pods and reduce yield (Figure 1). Historically, chlorpyrifos was applied at pegging as a granular product to suppress this pest and protect yield. Tolerances for chlorpyrifos in peanut were revoked following the 2024 peanut crop. Currently, there are no chemical alternatives to chlorpyrifos that suppress this insect. The objective of this research was to determine if insecticides currently registered for peanut have activity against the adult of southern corn rootworm (spotted cucumber beetle).

Materials and Methods

Thirty trials were conducted in North Carolina during 2022 and 2023 to determine if three bi-weekly sprays of bifenthrin (Brigade at 6.0 oz/acre) versus indoxacarb (Steward at 11 oz/acre) in 15 trials or indoxacarb only in 15 trials decreased the percentage of pods with scarring when sprays were initiated during the last week of June. A non-treated control was included. These experiments were conducted in fields with moderate to high risk for damage caused by southern corn rootworm damage based on the current NC State Extension southern corn rootworm index.

Results for trials were grouped by treatment design or year. In 2022, pod scarring in trials with bifenthrin and indoxacarb was 9% or less in nine trials for the non-treated control regardless of location or tillage system (e.g. conventional tillage, strip tillage, and no tillage or presence of a cereal rye cover crop).

Results

When these insecticides were compared in 2023, pod scarring was also 9% or less in the non-treated control in four trials. However, in two trials, pod scarring was 3 to 24% and 5 to 15% in the non-treated control. In a group of five trials in farmer fields, pod scarring ranged 8 to 19%, 6 to 23%, 4 to 9%, 0 to 1%, and 0 to 3% in the non-treated control. In two industry sponsored trials, pod scarring in the non-treated control ranged from 12 to 25% (2022) and 0 to 3% (2023). In a final group of trials with eight combinations of year, location, and cover crop treatments, pod scarring was 7% or less in four trials and 0 to 34% in the other four trials.

Based on ranges of pod scarring in non-treated controls, only 9 of 30 trials likely had adequate pod scarring (10% or greater) to determine if insecticides affected southern corn rootworm damage. In 3 of these 9 trials, indoxacarb decreased pod scarring compared with non-treated peanut. Bifenthrin was not applied in these three trials.

Pod scarring was not affected by cover crop treatment or the interaction of insecticide treatment and cover crop.

Pod yield was determined in 28 of the 30 trials. In 2 of the 3 trials where indoxacarb decreased pod scarring, no difference in peanut yield was observed when insecticides were applied compared with non-treated peanut. One of the three trials was not harvested. In the remaining 27 trials, pod yield was similar for non-treated peanut and peanuts treated with insecticides.

Figure 1. Puncturing of pods caused by southern corn rootworm.



Implications of Research

These results indicate that in many fields pod scarring from southern corn rootworm is relatively low even though risk to southern corn rootworm was moderate to high based on the current NC State Extension risk index for this pest. In the few instances where a significant difference in pod scarring was observed, there was no differences in yield. Lack of a difference in yield when comparing treated and non-treated peanuts was the result of relatively low level of pod scarring. Previous research has shown that a minimum of 25% pod scarring is needed to result in adequate puncturing of pods by southern corn rootworm to reduce peanut yield.

These results support the current recommendation in North Carolina that three sequential applications of bifenthrin or indoxacarb are not justified to prevent pod damage caused by southern corn rootworm.

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