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You Don't Have To Go Home But You Carrot Stay Here: Root-Knot Nematode Biological Control in Carrots

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ABSTRACT

Root-knot nematodes cause tens of billions of dollars in damages annually in agricultural production. The enormous economic losses brought about by nematodes, combined with the downsides to current methods for handling them, have led to an increased focus in understanding natural plant defense mechanisms and finding alternative methods to lessen the damage done by root-knot nematodes. Endophyte biocontrol agents such as *Trichoderma harzianum* have shown promise in reducing nematode damage. Recent studies have demonstrated that soil management practices and plant genotype can influence endophyte community structure, but it is unclear whether such differences influence susceptibility to nematode damage. This study seeks to better understand these dynamics by quantifying how differences in endophyte community structure influence nematode (*Meloidgyne incognita*) infection and plant performance in three carrot varieties that are susceptible, moderately resistant, or highly resistant to nematodes. The treatments are 1) unamended control, 2) *Trichoderma harzianum*, 3) endophytes from an organically farmed field, and 4) endophytes from a conventionally farmed field. Preliminary results indicate that carrot genotype significantly impacts carrot biomass, and carrots grown in the presence of endophytes from organically farmed soils have greater biomass than carrots grown in the other treatments. Analysis of endophyte community structure and nematode infection are ongoing.

KEYWORDS

root-knot nematodes, *Meloidgyne incognita*, carrots, *Trichoderma harzianum*, biocontrol agent