EFFECTS OF GRAFTED HEIRLOOM TOMATOES ON PARASITIC NEMATODE POPULATIONS IN AN ORGANIC PRODUCTION SYSTEM

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Grafting vegetable crops has shown potential to contribute to root-knot nematode management alone and in combination with chemical treatments (Kokalis-Burelle et al., 2009; Kokalis-Burelle and Rosskopf, 2011). In organic production, there are extremely limited options currently available to growers for control of phytoparasitic nematodes. Grafting desirable tomato scions onto nematode-resistant or tolerant rootstock could fill an important pest management niche for the organic tomato market in the southern U.S.

A field trial was conducted in cooperation with a certified organic grower in Ft. Pierce, FL to evaluate tomato (*Solanum esculentum*) rootstocks grafted to heirloom variety scions for effects on parasitic nematodes. Heirloom variety tomato scions evaluated were 'Purple Calabash' (Tomato Growers Supply Company, Ft. Myers, FL), 'Black Prince', and 'Moskvich' (Johnny's Selected Seeds, Winslow, ME). Rootstocks evaluated were 'Matt's Wild Cherry' (Johnny's Selected Seeds, Winslow, ME) and 'Tygress' (Seminis, St. Louis, MO). In addition, all heirloom varieties were assessed on their own roots as ungrafted controls. Plants were produced in a commercial setting in protected, raised beds, according to USDA organic production standards typically utilized by the grower for tomato. Natural populations of root-knot (*Meloidogyne*) and spiral (*Helicotylenchus*) nematodes were extracted from roots and root disease was assessed at the end of the season.

Grafting of 'Purple Calabash' scions onto 'Tygress' rootstock reduced the number of root-knot nematode juveniles isolated from roots compared to 'Purple Calabash' grafted onto 'Matts Wild Cherry' rootstock. Although numbers of root-knot nematode juveniles isolated from roots of 'Black Prince' and 'Moskvich' were higher in the ungrafted controls for both varieties than for plants of both varieties grafted onto 'Matt's Wild Cherry' and 'Tygress' rootstocks, data were not statistically significant at $P < 0.05$. Galling by root-knot nematodes was high on all ungrafted varieties. 'Purple Calabash' galling on 'Matt's Wild Cherry' rootstock was equivalent to galling on the ungrafted 'Purple Calabash' but was significantly reduced on 'Tygress' rootstock. Trends for both root-knot nematode numbers isolated from roots and root galling for heirloom varieties grafted onto 'Tygress' rootstock indicate that 'Tygress' reduced invasion by root-knot nematodes and this effect appeared to be enhanced by grafting. Numbers of spiral nematodes isolated from roots were similar in the ungrafted controls compared to the same variety of plants grafted onto 'Matt's Wild Cherry' and 'Tygress'

rootstocks, with one exception. ‘Black Prince’ grafted onto ‘Matt’s Wild Cherry’ rootstock had higher numbers of spiral nematodes/g root than the ungrafted ‘Black Prince’. Also, ‘Black Prince’ on ‘Matt’s Wild Cherry’ had higher numbers of spiral nematodes in roots than both ‘Purple Calabash’ on ‘Matt’s Wild Cherry’ and ‘Matt’s Wild Cherry’ ungrafted. This may indicate that grafting with some scion varieties may enhance susceptibility to some species of parasitic nematodes. There is a great deal of additional research required to identify nematode resistant rootstocks compatible with tomato for use in organic production. It appears that grafting can both positively and negatively affect nematode susceptibility.

Kokalis-Burelle, N., M.G. Bausher, and E.N. Rosskopf. 2009. Greenhouse evaluation of *Capsicum* rootstocks for management of *Meloidogyne incognita* on grafted bell pepper. Nematropica 39:121-132.

Kokalis-Burelle, N. and E.N. Rosskopf. 2011. Microplot evaluation of rootstocks for control of *Meloidogyne incognita* on grafted tomato, muskmelon, and watermelon. Journal of Nematology 43:166-171.