EVALUATION OF GUARDIAN™ PEACH ROOTSTOCK TO THE PEACH AND PECAN ROOT-KNOT NEMATODES

A. P. Nyczepir*[1], T. G. Beckman[1], and G. L. Reighard[2]

[1]USDA-ARS, Southeastern Fruit & Tree Nut Research Laboratory, 21 Dunbar Rd., Byron, GA 31008 and [2]Clemson University, Box 340319, Clemson, SC 29634

Root-knot nematodes (*Meloidogyne* spp.) are an important pest of peach in the U.S. and in other regions of the world. All four major *Meloidogyne* spp. have been reported to cause damage to stone fruits, but the Southern (*M. incognita*) and Javanese (*M. javanica)* root-knot nematodes are the predominant species on peach and plum. Root-knot nematodes generally cause stunted growth, loss of vigor, and early defoliation of one to two-year-old peach trees when recommended management practices are not followed.

Planting certified nematode-free rootstock, when it is available, is important as a management tactic to reduce problems with orchard establishment by the stakeholder. Preplant chemical treatment currently provides the most effective control of root-knot nematode because it allows trees to get off to a healthy start by preventing the nematode from causing major root damage. The 2004-05 preplant nematicide recommendation for managing *Meloidogyne* spp. in the Southeast includes the use of methyl bromide or 1,3-D. However, with the loss of methyl bromide, alternatives to conventional nematicide application are needed.

In the Southeast, Guardian™ peach rootstock is recommended over Lovell (root-knot nematode susceptible) because trees have a higher survival rate on peach-tree-short-life (PTSL) sites. Furthermore, it has been reported that Guardian™ rootstock is resistant to *M. incognita* (GA-peach isolate) and *M. javanica* (NC-tobacco isolate) in greenhouse experiments (MBAO Meeting, 1996).

However, in another greenhouse experiment using two other root-knot nematode populations [i.e., *M. javanica* (CA-peach isolate; known to parasitize S-37 peach rootstock) and *M. floridensis* (known to reproduce on Nemaguard peach rootstock)] Guardian™ was susceptible to both of these nematode isolates. These two nematode populations were of particular interest because both S-37 and Nemaguard are in the pedigree of Guardian™. Results from these two greenhouse studies indicate that the parasitic nature of the root-knot nematode isolate must be known when evaluating *Prunus* rootstocks for resistance. Additionally, the short duration of these earlier experiments made it difficult to

assess the effect these particular nematode isolates had on growth of Guardian™ rootstock over time.

The pecan root-knot nematode, *M. partityla*, was first detected in Georgia in 2002, and has been associated with pecan trees exhibiting above-ground symptoms that included dead branches in the upper canopy, severely stunted growth, and (or) mouse-ear leaf symptoms. In a 2003-04 survey of the major pecan growing regions of Georgia, it was determined that *M. partityla* was found in a greater number of samples and appears to be the dominant root-knot nematode species in pecan. In the past, it was not uncommon for peach growers to interplant pecan trees within a peach orchard, so that when the productivity of the peach orchard declined the grower would then push out the peach trees and continue using that site for pecan production. The question that has arisen is the host susceptibility of peach to *M. partityla*.

The objective of this research was to evaluate the effect of the newly described peach root-knot nematode, *M. floridensis* (FL-peach isolate) on growth of the advanced Guardian™ line SC 3-17-7 in field microplots and its susceptibility to the pecan root-knot nematode, *M. partityla* (GA-pecan isolate), under greenhouse conditions.

Criteria used in evaluating Guardian™ growth and resistance/susceptibility to these root-knot nematode isolates include, i) numbers of egg masses per plant, ii) eggs per plant, iii) eggs per gram of root, iv) root galls per plant, and (or) v) trunk diameter.

Our results indicate that *M. floridensis* did not suppress tree growth of SC 3-17-7, Nemaguard, or Flordaguard rootstocks as compared to the uninoculated control in field microplots 23 months after inoculation. *Meloidogyne floridensis* reproduced on all three rootstocks, with greatest number of eggs per gram dry root being produced on Guardian™ and Nemaguard. In the greenhouse experiment, *M. partityla* did not reproduce nor produce root galls in 4 months after inoculation on any of the peach rootstocks tested (i.e., SC 3-17-7, Lovell, and Nemaguard) as compared to the known susceptible ‘Curtis’ pecan control.

These data provide useful insights into the potential recommendation of Guardian™ rootstock in peach orchards infested with certain root-knot nematode species.