EVALUATION OF TALL FESCUE FOR RESISTANCE TO ROOT-KNOT NEMATODE IN PEACH

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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. In South Carolina peach orchards, *M. incognita* and *M. javanica* were found in 95% and 5% of orchards sampled, respectively. *Meloidogyne* spp. can cause stunted growth, loss of vigor, and early defoliation of one to two-year-old peach trees when recommended management practices are not followed. The current preplant nematicide recommendation for managing *Meloidogyne* sp includes fumigation with methyl bromide or 1, 3-D. In the southeastern United States, preplant fumigation in combination with a nematode resistant rootstock is recommended for increased tree longevity and maximum protection against root-knot nematodes. However, in recent years growers have been faced with economic hardships which have made it difficult to afford the costs associated with preplant fumigation. Growers have also encountered difficulty in not having enough time to get the land fumigated at the recommended time of year due to a conflict with managing other crops. It is also worth noting that at a recent growers meeting in 2006, a prominent Georgia peach grower inquired about the availability of using a preplant groundcover in place of preplant fumigation to control root-knot nematode. Finding an alternative groundcover rotation to preplant chemical control of root-knot nematode is warranted.

In Georgia, rotation with Coastal Bermuda grass is recommended for control of *Meloidogyne* spp., which also can be harvested for hay. Another potential groundcover rotation crop for nematode management is tall fescue grass. One disadvantage of using tall fescue is that some of the commercially available varieties are endophyte fungus-infected, which can result in “fescue toxicosis” in grazing animals. Fescue toxicosis condition results from the intake of ergot alkaloids derived from the endophyte association. One alternative to planting an endophyte-infected grass (E+) is an endophyte-friendly tall fescue grass. An endophyte-friendly tall fescue provides all the beneficial effects for the plant without producing the dangerous toxins. The host susceptibility of tall fescue to peach nematode pests [i.e., ring (*C. xenoplax*), root-knot (*Meloidogyne* spp.) and root-lesion (*Pratylenchus vulnus*) nematodes] in the Southeast is unknown. The objective of this study was to determine the host susceptibility of E+ and E- tall fescue to the Southern root-knot nematode, *Meloidogyne incognita* (GA-peach isolate).

Tall fescue lines evaluated included, 1) Jesup EI (E+, wild-type endophyte present), 2) Jesup EF (E-, no endophyte present), 3) Max-Q (E+, but non-ergot producing endophyte), and 4) GA-5 (E+). Additionally, Lovell peach (i.e., root-knot nematode susceptible) was included as the reference control. The study was terminated 123 days after inoculation with 3,000 eggs per pot. Criteria used in evaluating tall fescue resistance/susceptibility to root-knot nematode include, i) number of egg masses per plant, ii) number of eggs per plant, iii) number of eggs per gram of root, iv) number of eggs per egg mass, and v) number of galls per plant. The study was repeated once. Soil remaining after each tall fescue evaluation experiment was then placed back into 15-cm-diameter plastic pots. One Rutgers tomato seedling was planted in each pot for a bioassay of levels of *M. incognita* J2's not detectable by elutriation and centrifugal-flotation. Tomato root systems were harvested and the number of root galls and egg masses were counted 90 days later.

In both fescue evaluation tests, Lovell peach supported greater ($P \leq 0.05$) reproduction of *M. incognita* (i.e., 8,787 and 25,449 eggs per gram dry root, respectively) than on Jesup EI (i.e., 0 & 0 eggs per gram dry root, respectively), Jesup EF (0, 15), Max-Q (0, 0), and GA-5 (0, 0) tall fescue plants. In both soil bioassay tests, Lovell peach supported greater ($P \leq 0.05$) reproduction of *M. incognita* (i.e., 266,430 and 29,464 eggs per gram dry root, respectively) than the tall fescue treatments. In bioassay test 1, root galls and egg masses were detected on only one of 10 tomato root systems each of GA-5 and Max-Q. In bioassay test 2, no root galls or egg masses were detected on any of the tall fescue treatments, which indicate that the two infected plants in test 1 were possibly the result of contamination during handling. Results indicate that all tall fescue lines tested were either poor or nonhosts for *M. incognita* and that the presence of the endophyte does not appear to effect nematode reproduction.

These data provide useful insights into the potential usefulness of a tall fescue crop rotation system as a nonchemical management strategy to reduce the population density of *M. incognita* prior to planting peach. We have yet to determine how tall fescue soil treatments compare with preplant soil fumigation on a root-knot nematode infested site.