

GRAFTING FOR CONTROL OF *MELOIDOGYNE INCOGNITA* ON BELL PEPPER, TOMATO, AND MELONS

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Greenhouse, microplot, and field trials were conducted over a three-year period to evaluate rootstocks for root-knot nematode (*Meloidogyne incognita*) resistance. Rootstocks were evaluated for bell pepper (*Capsicum annuum*), tomato (*Solanum esculentum*), cantaloupe (*Cucumis melo*), and watermelon (*Citrullus lanatus*) scions. Nine pepper rootstocks were grafted to the commercial bell pepper variety 'Aristotle' as a scion and evaluated in greenhouse experiments. Nematode infestation was assessed based on galling, as well as extraction and quantification of juveniles (J2) from roots and soil. 'Charleston Hot', 'Carolina Wonder', 'Charleston Belle', 'Mississippi Nemaheart' and 'Carolina Cayenne' rootstocks were consistently resistant to galling by *M. incognita*, while Aristotle ungrafted, Aristotle self-grafted, 'PA-136', and 'Caribbean Red Habanero' were consistently susceptible to galling. Cultivars 'Yolo Wonder' and 'Keystone Resistant Giant' varied in their response. Caribbean Red Habanero had the highest number of *M. incognita* isolated from both roots and soil (Kokalis-Burelle *et al.*, 2009).

Four seasons of microplot experiments were conducted to evaluate *M. incognita* resistance in rootstocks for tomato, muskmelon, and watermelon. Three tomato rootstocks; 'TX301', 'Multifort', and 'Aloha', were tested in addition to the ungrafted scion, 'FL-47'. Two muskmelon rootstocks, *Cucumis metuliferus* and 'Tetsukabuto' (*Cucurbita maxima* x *Cucurbita moschata*), were evaluated with the ungrafted scion 'Athena'. Two watermelon rootstocks, 'Emphasis' and 'StrongTosa' were grafted to the scion 'TriX Palomar'. Microplots were infested with *M. incognita* eggs in September each year. Tomatoes were planted in September followed by melons in March. In both years of the study, *M. incognita* J2 in soil were similar among all tomato rootstocks, but J2 in roots were higher in the ungrafted FL-47 than in all grafted rootstocks. In muskmelon only *C. metuliferus* rootstock reduced galling in nematode infested soil. Tetsukabuto did not reduce numbers of *M. incognita* J2 in either soil or roots either year. There were no differences in nematode numbers, galling, or plant growth among watermelon rootstocks tested (Kokalis-Burelle and Roskopf, 2010).

Field trials were conducted over two years in an area infested with *M. incognita*, soilborne pathogens, and weeds. Split plot experiments with four replications were used to evaluate rootstocks in fumigated and herbicide-only treated soil. Four soil treatments were applied under Canslit metalized film; methyl bromide (200 lbs/A, 67:33 mebr:chloropicrin), Midas (100 lbs/A, 50:50 iodomethane:chloropicrin), Paladin (50 gal/a, 79:21 DMDS:chloropicrin), and an herbicide-only control. Subplot treatments in tomato were three rootstocks;

TX301, Multifort, and Aloha, and the ungrafted scion, FL-47 on its own rootstock. Plots were 100-foot long and were split into 25-foot subplots for each tomato rootstock, planted in September and harvested in December. A double-crop of muskmelon was planted into existing beds in the March, harvested in June. Two muskmelon rootstocks, *C. metulifer* and Tetsukabuto, were evaluated with the ungrafted scion Athena on its own rootstock. Melon plants of each rootstock were planted into subplots previously occupied by each of the four tomato rootstocks. Both crops were managed using standard commercial practices for Florida tomato and muskmelon production. Although *M. incognita* populations in soil were highest in herbicide-only plots and in ungrafted tomato rootstocks, fumigant treatments did not differ statistically. All fumigants produced similar tomato plant growth, which was greater than the herbicide-only control, as were numbers of *M. incognita* isolated from roots. Multifort rootstock produced the largest and healthiest roots, however, *M. incognita* isolated from roots did not differ among the rootstocks tested. Gallings was highest in plots with herbicide-only soil and ungrafted roots. A high level of variability resulted in *M. incognita* J2 in soil not differing significantly among soil treatments. *M. incognita* J2 in soil also did not differ among melon rootstocks but numbers isolated from melon roots were higher in Tetsukabuto than *C. metuliferus*. Tetsukabuto rootstock produced larger root systems than the ungrafted Athena plants. *C. metuliferus* rootstock reduced galling when planted following all tomato rootstocks. Root condition ratings were generally better with *C. metuliferus* compared with either the ungrafted melon or Tetsukabuto following all tomato rootstocks. All fumigants tested provided protection for all melon rootstocks against galling by root-knot nematodes when compared to the herbicide-only control. Gallings on *C. metuliferus* rootstocks was less in all fumigant treatments compared with the ungrafted Athena and Tetsukabuto. Grafting commercial variety scions onto nematode resistant rootstocks has good potential for nematode management in combination with alternative soil fumigants or as a component in more sustainable crop production systems.

Kokalis-Burelle, N., M.G. Bausher, and E.N. Roskopf. 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. Roskopf. 2010. Microplot evaluation of rootstocks for control of *Meloidogyne incognita* on grafted tomato, muskmelon, and watermelon. *Journal of Nematology* 42:In Press.