RESISTANCE AS A TOOL TO MANAGE ROOT-KNOT DISEASE ON TOMATO IN FLORIDA

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Root-knot nematodes (RKN) (*Meloidogyne* spp.) are one of the major constraints for tomato production in Florida. Because of use of methyl bromide by Florida tomato growers for more than 45 years there has been little or no interest in using root-knot nematode resistant tomato cultivars. This is in contrast to what has occurred in California and other tomato production regions were the majority of field-grown processing tomatoes have root-knot resistance. With the phase out of methyl bromide, the question remains, whether using root-knot resistant tomato cultivars are a good option for Florida growers.

Nematode host resistance in tomato is governed by the *Mi* gene, which is the only available source of resistance against RKN in tomato. *Mi* offers good protection against the most common root-knot nematode species (*Meloidogyne incognita, M. javanica* and *M. arenaria*). There are several reasons why *Mi* cv's are rarely planted in Florida, including the limited variety of desirable cultivars, the possibility of yield drag, the heat sensitivity of the *Mi*-gene that offers the nematode resistance, the emergence of resistance-breaking nematode isolates, and the need to control other soilborne pathogens than root-knot nematodes. Also, even in RKN resistant tomato cultivars, RKN juveniles still puncture the root and make the plant more vulnerable to different soilborne pathogens.

To better understand some of these potential problems, we set-up a series of trials studying the performance of *Mi* tomato cv's under Florida conditions by integrating tomato host resistance with current nematode management tactics, such as fumigants and/or nematicides.

Two field trials were set-up at the University of Florida's Gulf Coast Research and Education Center (GCREC) (fall 2017 and spring 2018). Three tomato cultivars with *Mi* gene (Sanibel, Skyway, Tasti Lee (new isoline with *Mi*) and one cv. without *Mi* (Florida 47) were planted in plastic-mulched raised beds. All cv's were planted either 1) with a fumigant (chloropicrin), 2) with a fumigant + nematicide (chloropicrin + fluensulfone or fluazaindolizine), 3) with only a nematicide (fluazaindolizine), or 4] with no fumigant or nematicide.

Root-knot damage was significantly affected by tomato cultivar and fumigant/nematicide treatment. All *Mi* cultivars significantly reduced root-knot damage as compared to the susceptible cv FL 47. Fumigation with chloropicrin, and/or drip application of non-fumigant nematicides, provided

some additional nematode control, mostly so for the susceptible cv FL 47. The RKN-resistant cv. Sanibel generally had the highest tomato yields, especially when combined with chloropicrin and nematicide.

Root-knot resistant tomato cv's (Sanibel, Skyway and a new isoline of Tasti-Lee) significantly reduced root-knot damage in both our trials (fall and spring), and showed that they could be an effective additional tool for root-knot management in tomato. However, if nematode-resistant tomato cultivars are to become more widely adopted in Florida's tomato production, this will require that more commercially acceptable cv's (that have not only *Mi* resistance, but also virus and disease resistance) become available to growers.