EFFECTS OF COVER CROPS WITH POTENTIAL FOR USE IN ANAEROBIC SOIL DISINFESTATION (ASD) ON REPRODUCTION OF *MELOIDOGYNE* SPP.

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Several cover crops were assessed for their susceptibility to invasion and galling by three species of root-knot nematode, *Meloidogyne arenaria*, *M. incognita*, and *M. javanica*. Crops were selected based on their potential for use as the organic amendment component in anaerobic soil disinfestation (ASD) applications. Development of ASD techniques for reducing soilborne pest populations during summer months in Florida has provided insight into some of the effects of these cover crops on root-knot nematode populations (Butler et al., 2012a, 2012b).

Root-knot nematode juvenile (J2) numbers in soil and roots, egg production, and galling were evaluated for all crops in greenhouse trials. Cover crops included in the study were arugula (*Eruca sativa*, cv. Nemat), cowpea (*Vigna unguiculata*, cv. Iron & Clay), jack bean (*Canavalia ensiformis*, cv. Comum), two commercial mixtures of Indian mustard and white mustard (*Brassica juncea* & *Sinapsis alba*, cvs. Caliente 61 and Caliente 99), pearl millet (*Pennisetum glaucum*, cv. Tifleaf III hybrid), sorghum-sudangrass hybrid (*Sorghum bicolor* × *S. bicolor var. sudanense*, cv. Sugar Grazer II), and three cultivars of sunflower (*Helianthus annuus*, cvs. 545A, Nusun 660CL, and Nusun 5672). The susceptible control for all three species of root-knot nematodes tested was tomato (*Solanum lycopersicum*, cv. Rutgers), which was included in all studies. Separate experiments were performed for each nematode species tested, and all experiments were repeated.

The majority of cover crops were less susceptible than tomato to *M. arenaria*, with the exception of jack bean and sunflower. Sunflower cv. Nusun 5672 had fewer *M. arenaria* J2 isolated from roots than the other two sunflower cultivars tested, less galling than tomato, and fewer root-knot nematode eggs isolated from roots than tomato and sunflower cv. 545A. Arugula, pearl millet, and sorghum-sudangrass did not produce visible galls in response to *M. arenaria* and also had fairly low egg production per gram of root. Cowpea also had low numbers of *M. arenaria* J2 isolated from roots but had fairly high gall index values. This may indicate that, although some galls are produced, the nematodes are not completing their life cycle on this host. Several of the cover crops tested did not support high populations of *M. incognita* in roots, or exhibit significant galling, even though fairly high numbers of *M. incognita* J2 were isolated from the soil. Arugula, cowpea, and mustard cv. Caliente 99 did not support *M. incognita* in either roots or soil. *Meloidogyne javanica* produced severe galling symptoms on tomato and moderate galling on all sunflower cultivars. However, all sunflower cultivars

produced more eggs of *M. javanica* than tomato. Sunflower, jack bean and both mustard mixtures exhibited significant galling in response to *M. javanica.*

Arugula, cowpea, and sorghum-sudangrass consistently had low numbers of all three species of *Meloidogyne* associated with roots, and are good selections for use in ASD as organic amendments, with the most potential for reducing populations of root-knot nematodes. The remainder of crops tested had significant levels of galling, J2, and nematode eggs associated with roots, which varied among the *Meloidogyne* species tested. These trials were undertaken in order to answer some basic questions that impact root-knot nematode control strategies for Florida crop production, including implementation of ASD.

Butler, D., Kokalis-Burelle, N., Muramoto, J., Shennan, C., McCollum, T. G., and Rosskopf, E. N. 2012a. Impact of anaerobic soil disinfestation combined with soil solarization on plant-parasitic nematodes and introduced inoculum of soilborne plant pathogens in raised-bed vegetable production. Crop Protection 39(1):33-40.

Butler, D. M., Rosskopf, E. N., Kokalis-Burelle, N., Albano, J. P., Muramoto, J., and Shennan, C. 2012b. Exploring warm-season cover crops as carbon sources for anaerobic soil disinfestation (ASD). Plant and Soil 355:149-165.