BRASSICA SPECIES: BIOCONTROL FOR ROOT-KNOT NEMATODES IN GA VEGETABLE PLASTICULTURE

W. S. Monfort*, Plant Pathology Department, University of Georgia; A. S. Csinos, J. Desaeger, K. Seebold, T. M. Webster, and J. C. Diaz-Perez.

Vegetable producers in Georgia lost an estimated $ 44.3 million from diseases in 2004. One of the economically important disease organisms producers are faced with on an annual basis is plant parasitic nematodes. In Georgia, many nematode species infect and cause damage to vegetables including *Meloidogyne* species, *Rotylenchulus reniformis*, *Pratylenchus thornei*, *Belonolaimus longicaudatus*, and *Paratrichodorus* species. Of the nematode species that feed on and cause damage to vegetables; *Meloidogyne* species, is considered to be the most problematic and widely distributed. With plasticulture vegetable production continuing to increase in both total area planted and economic value over the last decade in Georgia, producers are concerned with the potential impact the loss of methyl bromide will have on their input costs as it relates to controlling nematode pests. One potential biological alternative to methyl bromide for control of nematode pests is the use of Brassica amendments prior to planting. *Brassicas* contain glucosinolates in their cells that degrade to form isothiocynates (ITCs). Past research has demonstrated that these volatile isothiocynates have nematicidal activity on multiple plant parasitic nematode species including Meloidogyne *incognita*, *M. javanica*, *Heterodera schachtii* and *Pratylenchus neglectus*.

Multiple *Brassica* species commonly grown in Georgia were evaluated as a potential biofumigant alternative to methyl bromide for control of root-knot nematode in vegetables. *Brassica* species were grown as cover crops and incorporated as green manures prior to transplanting of vegetable crop. Nematicidal activity of the *Brassica* species was based on changes in nematode population and root damage caused by root-knot infection and feeding. Plant growth and crop yield was also evaluated to determine the response of the subsequent vegetable crop to the incorporated *Brassica*s.

Incorporation of select *Brassica* species reduced root-knot populations and root damage caused by root-knot infection comparable to non-*Brassica* cover crops with metam sodium in most years; however, the level and consistency of the nematicidal activity observed from the incorporated *Brassicas* varied between and within *Brassica* species. Variations in plant growth and yield were observed among and with *Brassica* and non-*Brassica* species. Generally, increased growth and yield corresponded with cover crop treatments that provided the highest level of reduction in root-knot nematode populations between cover crop incorporation and planting of the subsequent crop. Along with increased plant growth and yield in treatments where nematodes were reduced, a few cover crop treatments had a negative affect on the growth and yield potential of the vegetable crops. Therefore, a producer will need to choose a *Brassica* cover crop that can significantly reduce nematode populations without adversely affecting the growth/yield of the subsequent vegetable crop.