INTRODUCTION:

While cover crops are often thought of in terms of their benefits for minimizing erosion and improving soil structure, composition and porosity, certain cover crops can either suppress or increase insect, nematode, weed and pathogen populations that may be pests to the primary tomato or pepper crop. Knowing this information can help growers make the best choice for their situation.

SELECTING A COVER CROP:

- Greatest benefits are from cover crops which grow fast and produce the maximum amount of biomass for shading out undesirable weeds and for adding green biomass back to the soil.
- Cover crops can help reduce the population of weeds which may be hosts for diseases such as *Phytophthora capsici, Alternaria solani* and others.
- Destruction of weeds prior to planting a cover crop is important because inoculum in weeds can survive for months on undecomposed plant material.
- Weeds can also be hosts for viruses such as *Tomato yellow Leaf curl virus* (TYLCV), *Tomato spotted wilt virus* (TSWV) and *Tobacco mosaic virus* (ToMV).
- Black nightshade can be a secondary host for pepper weevil, but can be reduced in numbers by a cover crop which will out-compete weed growth.
- Cover crops should be chosen which have adverse effects on pathogen populations either through competition, parasitism, predation or antagonism. Cover crops can also disrupt the life cycle of many destructive pests.
- Incorporation of Brassica cover crop residue has been shown to aid in soil-borne pest control by production of glucosinolates which further break down into isothiocyanates which have biofumigant properties.
- While sorghum-sudan grass hybrids make effective 'smother' crops, they also secrete allelopathic compounds (toxins) that suppress some weeds.
- Cover crops should be selected which are non-hosts for plant pathogens and nematodes, but which are adapted to the climate and production season.
- Some cover crops can either harbor beneficial insects or outcompete weeds that harbor pests; however, timing must be considered in terms of how long that crop will be in the field depending on season and climatic adaptation.
- Some cover crops can suppress weeds which can be an alternate host for nematodes. Certain sorghum-sudangrass cultivars suppress root-knot nematode populations, but can actually host sting nematodes. 'Iron-clay' pea **(Figure 16)** and Sunn hemp **(Figure 17)** are also nematode-suppressive.

Figure 16. 'Iron-Clay' pea cover crop. Photograph by: Carlene Chase.

Prepared by: Phyllis Gilreath and Carlene Chase

Table 1. Common weeds of Florida vegetables and their ability to support root-knot nematode galling and egg mass development. (Reproductive index scale consists of 0=no egg masses; 1=light or <10 per gram of root; 2=moderate or 10-50 per gram of root; 3=heavy or 50-100 per gram of root; and 4=very heavy or >100 per gram of root). Table by: Joe Nowling.

Weed Species	Reproductive Index
Pigweed	Heavy – Very heavy
Purslane	Very Heavy
Nightshade	Light – Very Heavy
Eclipta	None – Light
Ragweed	Moderate - Heavy
Sweet Clover	None – Light
Hemp Sesbania	Very Heavy
Sand Vetch	Very Heavy
Goosegrass	Very Heavy
Crabgrass	Light – Very Heavy
Carolina Geranium	None – Light
Cutleaf Evening Primrose	Moderate
Cudweed	None – Moderate
Yellow Nutsedge	Light

Figure 17. Sunn hemp has been shown to reduce root-knot nematode populations and enhance natural enemies. Seed may be expensive and difficult to obtain. Photograph by: Carlene Chase.

Table 2. Effect of cover crops on subsequent common weed populations.*

Cover Crop	Nutsedge	Pigweed	Crabgrass
Sorghum-sudan	Increase	Decrease	No effect to decrease
Cowpea	Decrease	Decrease	No effect to decrease
Millet	Increase	No effect	No effect to increase

** Gilreath, J. P., Personal communication*

CONTACT INFORMATION:

Dr. Carlene A. Chase, UF/IFAS, Horticultural Sciences
P.O. Box 110690
Gainesville, FL 32611
cachase@ufl.edu
352-392-1928 ext. 206

Dr. Robert McSorley, UF/IFASEntomology and Nematology
P.O. Box 110620
Gainesville, FL 32611
mcsorlely@ufl.edu
352-392-1901 ext. 137

Dr. Joe Noling, UF/IFAS CREC-Lake Alfred
700 Experiment Station Rd.
Lake Alfred, FL 33850
jnoling@ufl.edu
863-956-1151 ext. 1262

REFERENCES:

Noling, J.W. and J.P. Gilreath. 2002. Proceedings, International Research Conference on Methyl Bromide Alternatives and Emissions Reductions. http://mbao.org/2002proc/006NolingJ%20MBAO2002-1.pdf

Li, Yuncong, H. Bryan, R. Rao, N. Heckert and T. Olczyk. 2000. Summer cover crops for tomato production in South Florida. UF/IFAS. http://swfrec.ifas.ufl.edu/LIV/groups/cultural/cover/covercr1.htm

Sustainable Agriculture Network. 1998. Managing Cover Crops Profitably. 2nd edition. SAN Handbook Series Book 3.

IPM Integrated Pest Management Florida
UF UNIVERSITY of FLORIDA IFAS Extension

Prepared by: Dr. Phyllis Gilreath