ALTERNATIVE SOIL DISINFESTATION TREATMENTS FOR WEED CONTROL

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The vegetable industry in Florida during the 1997-98 season was worth more than $1.6 billion, amounting to 326,000 A. The bell pepper crop totaled more than $272 million and the tomato crop was worth $473 million (Florida Agricultural Statistics, 1999). In 1998, ninety-five percent of all tomato acreage was treated with methyl bromide resulting in the application of more than 2,700 metric tons, which represents a decrease in methyl bromide use when compared to 1996. One thousand-four hundred metric tons of methyl bromide were used in pepper in 1998, also a reduction from previous years (National Agriculture Statistical Service, 1999). Losses in fresh market tomatoes in Florida due to weed pressure, with methyl bromide available, have been estimated at more than $291 million (Bridges, D.C., 1992). In the absence of methyl bromide, increased losses due to weed pressure are a major concern to growers. The limited registration of efficacious herbicides for use in tomato and pepper will necessitate the use of an integrated approach to weed management. Soil disinfestation methods will serve as an important component in an integrated system.

Large-scale soil disinfestation field trials were conducted with grower cooperators or on research farms in 7 locations from 1997 through 1999. Soil disinfestation treatments are listed in Table 1. Total weed population counts were made either at the mid-season mark or several times throughout the season, depending upon location. While weed counts were generally lower in methyl bromide treated plots; some weeds were not effectively controlled by this biocide. These included nutsedges (*Cyperus esculentus* and *C. rotundus*), purslane (*Portulaca oleracea*), hemp sesbania (*Sesbania exaltata*), goosegrass (*Eleusine indica*), and several pigweeds (*Amaranthus* spp.). Weed dominance was highly variable from site-to-site, but numbers of goosegrass, crabgrass (*Digitaria* spp.), and nutsedge were consistently higher in the alternative soil disinfestation treatments than in methyl bromide. Sites in which soil solarization combined with compost had been used for several years had weed counts that were comparable to methyl bromide treated plots in the same location. No soil disinfestation treatment provided weed eradication, although some combination applications were comparable to methyl bromide.

Florida Agricultural Statistics. 1999. Vegetable Summary. Florida Agricultural Statistical Service, Orlando, FL.

National Agricultural Statistical Service. 1999. Vegetables-1998 Summary, VG1-2, 99C, US Department of Agriculture, Washington, DC.

Bridges, D.C. 1992. Crop losses due to weeds in the United States. Weed Science Society of America, Champaign, Illinois.

Table 1. Soil disinfestation treatments.

Treatment	Crop
methyl bromide	pepper, tomato
solarization	pepper, tomato
solarization (multiple years)	pepper
solarization/biosolid compost	pepper
solarization/biosolid compost (multiple years)	pepper
solarization/deep disk	pepper
Telone II	pepper
Telone C-35	pepper
Telone C-35/Devrinol	pepper
Telone II/Devrinol	pepper
Telone II/Vapam	pepper
Telone C-35/Vapam	pepper
Vapam	pepper
Telone/Vapam/Devrinol	pepper