INTEGRATION OF METHYL BROMIDE ALTERNATIVES INTO A COMMERCIAL TOMATO PRODUCTION SYSTEM.

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A viable alternative to preplant fumigation with methyl bromide was developed using a cropping systems approach. Fall production of fresh market tomato in Northern Florida, a $25 million industry consisting of approximately 1,000 ha, was used as the model system. Information on production practices, climate, the biology and ecology of key soilborne pests and grower concerns unique to this cropping system were used to identify pest management tactics for evaluation. Production practices consist of a raised bed, plastic mulch production system in which beds for fall crops are fumigated and prepared between May 15 and July 1. Soil types are sandy loams and sandy clay loams with generally higher water holding capacities and organic matter contents than soils in other regions of the state. The months of June, July and August are hot and humid with ambient temperatures around 35 C and frequent rain showers. Important soilborne pests are yellow and purple nutsedge, plant parasitic nematodes, bacterial wilt, Fusarium wilt, and *Sclerotium rolfsii*. Principal concerns of growers were control of soilborne pests and regulatory constraints imposed on the use of chemical pesticides.

Soil solarization was selected for evaluation as the principal component of the soilborne pest management program based on efficacy data, ease of integration into current production practices, cost effectiveness, and reduction of regulatory constraints. Various combinations of reduced rates of chemical fumigants, organic amendments and plastic films were evaluated including the use of gas impermeable films. Results obtained from experimental plots were used to select combinations of alternatives for testing in large 1- 2.5- ha plots in commercial production fields.

In 1994, no significant differences in yield were detected between plots receiving soil solarization and plots receiving applications of a 67:33 formulation of methyl bromide:chloropicrin. Soil solarization significantly reduced populations of yellow and purple nutsedge. Populations of reniform and sting nematode also were significantly reduced by soil solarization. Reductions in Fusarium wilt, bacterial wilt and *Sclerotium rolfsii* were variable but in several cases were similar to reductions achieved by methyl bromide. Further reductions in populations of several soilborne pests were achieved when

soil solarization was combined with reduced rates of methyl bromide:chloropicrin, Telone C-17 or cabbage residue applied under a gas impermeable plastic film.

Additional large scale grower evaluations are planned for fall 1996. One key technical problem which will be addressed is the process of painting the plastic white prior to transplanting tomatoes. Additional studies using recent advances in plastic technology to enhance solar heating under soils are planned.