

ALTERNATIVE FUMIGANTS FOR CONTROL OF SOIL PESTS: STRAWBERRY AS A MODEL SYSTEM

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The methyl bromide phase-out will impact the production of numerous vegetatively propagated ornamental, trees, vines and other herbaceous perennials. Methyl bromide has been the foundation for disease, nematode and weed control in plant propagation nurseries for over 40 years. We have conducted a series of studies to develop alternative fumigant systems designed to provide disease, nematode and weed control in strawberry as well as other crops. A team of plant pathologists, a soil chemist, a weed scientist and an economist who are evaluating the impacts of soil borne pests, fumigant distribution in the soil and dissipation in the environment as well as economic factors on plant production from the nursery to the production field are conducting this research. The primary research objective is to evaluate the efficacy of alternative fumigants for controlling soil borne pathogens and weeds in the field. Strawberry is being used as a model system. Alternative fumigants such as chloropicrin, 1,3-D plus chloropicrin mixture, dazomet and iodomethane have been evaluated in strawberry nurseries. Nursery plants that were produced through two cycles of nursery production using alternative fumigants are being assessed in fruiting fields at two locations on the California coast. At the fruiting field sites, monitoring of weeding costs is being conducted to document economic inputs in the production system. Demonstration of alternative fumigants such as chloropicrin, 1,3-D plus chloropicrin mixture, iodomethane, and propargyl bromide are being conducted at two fruiting field sites to provide growers with an idea of the relative performance of alternative fumigants. Thus far the results suggest that iodomethane plus chloropicrin in 50:50 mixture is a viable alternative fumigant for strawberry nurseries, since plant health is comparable to plants produced with methyl bromide plus chloropicrin 57:43. Weeding costs with 1,3-D plus chloropicrin mixture in both fruiting and nursery fields is comparable to methyl bromide. Chloropicrin, 1,3-D plus chloropicrin mixture, iodomethane, and propargyl bromide are all potential alternative fumigants for strawberry fruit producers, but all have some limitations. For example, chloropicrin will require a sequential application of metam sodium to provide effective weed control. Township caps currently limit the use of 1,3-D plus chloropicrin in California.