INTEGRATING RESEARCH AND PRACTICE: IMPLEMENTING ALTERNATIVES TO METHYL BROMIDE SOIL FUMIGATION IN CALIFORNIA AGRICULTURE

James A. Liebman, Bio-Integral Resource Center, Berkeley, CA 94707

We have been examining alternatives to the use of methyl bromide as a soil fumigant in California agriculture. Using the Pesticide Use Reporting data from the California Department of Pesticide Regulation. we identified the major crop uses of methyl bromide in the state. These include strawberries, grapes, nursery crops, almonds and stone fruits. For each of these crops, we conducted a comprehensive literature search on potential alternative pest management methods. We also identified growers who do not use methyl bromide, and studied their production systems to understand how they manage soil-borne pest problems.

Only 3.123 acres (41%) of the 7.651 acres planted to wine grapes in California in 1992 were fumigated with methyl bromide. Growers elect not to use methyl bromide for a number of reasons. including:

*Fumigation with methyl bromide is expensive.

•Large buffer zones are required where fields are bordered by housing or other buildings.

-Some wine grapes are planted on hillsides that are difficult to fumigate.

•The land may not have a history of soil-borne pests.

•Grower preference: some growers do not like to use methyl bromide.

*Some growers feel fumigation would not be effective on their soils.

•Other technologies are available to control soil-borne pests, including solarization, crop rotation, resistant rootstocks, and soil fumigation chemicals other than methyl bromide.

Forest tree nurseries present a similar picture. According to a US Forest Service survey, 2 1% of the forest tree nurseries in the Western use no methyl bromide. Many of the others use it on only some of their land. Some nurseries stopped using methyl bromide several years ago for reasons unrelated to the current concerns about stratospheric ozone depletion, including the high cost of the material, concerns about worker exposure, and variable efficacy. These nurseries now manage soil-borne pests by careful site preparation: the use of chemical soil fumigants other than methyl bromide, notably dazomet and metam-sodium; and herbicides and hand labor to control weeds. In addition. some nurseries, including most of those in Canada. produce seedlings in containers in greenhouses. These operations generally use no methyl bromide, and instead use steam to pasteurize soil, or use soilless mixes that do not harbor pathogens.

Our studies indicate that it Is possible to grow these crops in California without methyl bromide. It is important to note that for neither of the two crops discussed here is there a perceived difference in profitability or product quality between growers who use methyl bromlde and those who do not.

Our investigations also suggest that there is a critical need for on-farm research and technology transfer that integrates the practical concerns of production with basic

research on mechanisms. Areas in need of special attention include:

*Effects of various treatments (dazomet, metam-sodium, crop rotation. resistant rootstocks. etc.) on long-term yield of perennial crops.

*Economic analyses of the various treatment options, including crop rotations used to control soil-borne pests.

*Role of cover crops and organic matter amendments on pest control.

*Relationship between pathogen density and crop damage. This is especially important because pathogen density alone is often a poor predictor of disease incidence.