

Alternatives eyed for methyl bromide

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U.S. Department of Agriculture (USDA) scientists trying to help Florida growers find a replacement for methyl bromide are studying an alternative soil treatment that uses molasses as one of its ingredients.

Researchers with USDA's Agricultural Research Service (ARS) are examining whether a [cropping system](#) that uses molasses to stimulate [microbial activity](#) could be used to replace the popular fumigant. They also are studying recently developed fumigants. The work, presented at the recent Annual International Research Conference on [Methyl Bromide Alternatives and Emissions Reductions](#), supports the USDA priority of promoting international food security. ARS is USDA's principal intramural scientific research agency.

Farmers have been using methyl bromide since the 1930s to control a broad spectrum of nematodes, pests and pathogens. But because methyl bromide depletes the earth's stratospheric ozone layer, growers worldwide are being required to find a replacement. That's a tall order in Florida, where the sandy soils limit organic alternatives and the mild winters serve as a safe harbor for many nematodes, weeds and pathogens.

ARS scientists Erin Roskopf and Nancy Kokalis-Burelle and former ARS research associate David Butler raised bell peppers and eggplant at the agency's U.S. Horticultural Research Laboratory in Fort Pierce, Fla., to test a combination of composted broiler litter, molasses and anaerobic [soil](#) disinfestation (ASD). In ASD, topsoil is saturated with water and covered with a plastic tarp. Then, a carbon source—in this case molasses—

is added to stimulate microbial activity.

The sun-drenched tarp "cooks" the weed seeds in the soil, and the carbon and water increase microbial activity, creating conditions conducive to pest control. As part of the project, ARS scientists Greg McCollum and Joseph Albano, who are also with the Fort Pierce lab, evaluated [fruit quality](#) and soil and plant nutrients.

The researchers heated the soil via solarization and treated plots with different levels of the organic materials and different amounts of water. The molasses used was a waste product of the sugar cane processing industry. They planted peppers in the fall and eggplant in the spring, sampled the soil for nematodes, counted nematodes on crop roots, assessed weed populations and soil properties and measured crop yields.

The scientists found nematode populations were reduced when treated with molasses and poultry litter, that molasses and poultry litter controlled grass weeds just as well as methyl bromide, and that the solarized treatments heated the soil to levels that were at or just below levels that are lethal for many soil pathogens.

The researchers also are comparing two recently developed fumigants, dimethyl disulfide (DMDS) and methyl iodide, with methyl bromide at two sites, one where they raised delphiniums and the other with caladiums. Preliminary results show the alternatives are just as effective as methyl bromide at suppressing grass weeds and controlling nematodes, but their overall effectiveness depended on the type of cultivar produced.

More information: Read more about this research in the March 2011 issue of Agricultural Research magazine.

[www.ars.usda.gov/is/AR/archive ... r11/pathways0311.htm](http://www.ars.usda.gov/is/AR/archive...r11/pathways0311.htm)

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