Quest for Methyl Bromide Alternatives Continues

America has made a commitment to the world—for the protection of our planet's environment—to give up nearly every outdoor, on-farm use of one of agriculture's most versatile and effective chemicals: methyl bromide. Primarily through its chief scientific branch—the Agricultural Research Service—USDA is making an all-out, nationwide effort to help growers farm successfully without this invaluable tool.

The research is, in fact, one of ARS' highest priorities. Scientists at 20 laboratories around the country are racing against the formidable deadlines of the methyl bromide phaseout. They must come up with new tactics to help growers combat the microbial, weed, and insect pests that methyl bromide so adeptly thwarts.

For decades, most of America's strawberry growers have fumigated their fields with methyl bromide to torpedo weed seeds and quash soil-dwelling pests that could otherwise weaken or kill strawberry plants. Some of the California studies that ARS has initiated to find new ways to farm the fruit are highlighted in this issue (see page 4).

When methyl bromide is used to produce berries, bell peppers, or any of about 100 other crops, some of it escapes from the soil into the atmosphere. It eventually reaches the stratosphere, where it causes a thinning of the ozone layer. This damage reduces the layer's effectiveness in protecting us from ultraviolet radiation.

To limit the flow of methyl bromide into the atmosphere, growers usually place plastic tarpaulins over their fields after fumigation. At Riverside, California, we are exploring a new option—"virtually impermeable films." In lab tests, emissions of several promising fumigants were reduced to a mere 5 to 15 percent with these films—as were emissions of methyl bromide. The films may be useful not only for capturing the alternative chemicals but also for minimizing methyl bromide emissions until the phaseout is complete.

In Florida, we're tackling the challenge of how to grow tomatoes without the protection methyl bromide affords. Growers there use about a third of all the methyl bromide sold in this country for fumigating soils. Scientists at our Fort Pierce laboratory have teamed with colleagues at the University of Florida to work out a new regimen that relies on a trio of alternative chemicals—Telone (1,3-dichloropropene), chloropicrin, and pebulate.

Tomatoes aren't harmed by pebulate, but other key crops are. That means this trio isn't the answer for growing bell peppers, eggplant, or strawberries, for instance. Our search continues for new, safe, and powerful ways to disinfest fields where these crops are planted.

Launching the new tactic for Florida's tomato fields didn't happen without a great deal of effort. At the outset of the research, pebulate wasn't approved by the U.S. Environmental Protection Agency (EPA) for use in fields where tomatoes would be hand-transplanted. Yet hand-transplanting is the method nearly all of tomato producers in Florida use to establish young nursery-grown plants.

Through the efforts of the USDA/EPA Methyl Bromide Alternatives Working Group and pebulate's manufacturer, Zeneca, Inc., the product is now conditionally registered for this much-needed use. The pebulate saga is a success the committee hopes to repeat with other compounds that may be appropriate alternatives to methyl bromide yet currently lack the requisite federal and state registrations.

Another chemical that has attracted the committee's interest is propargyl bromide, a fumigant that kills nematodes, weeds, and soil-dwelling fungi. To bolster ARS and university research on this compound, USDA recently allocated $800,000 specifically for propargyl bromide studies.

Will alternatives developed in the laboratory succeed in real-world conditions? To ensure that they do, ARS includes grower-managed demonstration plots as a key part of the methyl bromide alternatives research program. California's commercial and organic strawberry farmers have volunteered portions of their fields for this work, as have growers of grapes, peaches, and almonds—other crops that will be affected by the looming loss of methyl bromide. Similarly, Florida tomato and pepper producers have opened their farm gates to researchers.

Growers can learn about research results at field days regularly offered at these demonstration sites. What's more, we present the latest updates in *Methyl Bromide Alternatives*, a quarterly newsletter sent free-of-charge to growers, researchers, and others. The newsletter also appears on the World Wide Web at http://www.ars.usda.gov/is/np/mba/mebrhp.htm.

And scientists from the United States and abroad summarize their findings every year at the Annual International Research Conference on Methyl Bromide Alternatives and Emissions Reduction, which USDA cosponsors. Held in either Orlando, Florida, or San Diego, California, every year since 1994, this symposium has become the world's premier forum on the topic.

To find substitutes that match the efficacy and versatility of methyl bromide is, without doubt, a monumental challenge for scientists and growers alike. We continue to give it all we've got.

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