TECHNOLOGY TRANSFER STRATEGY FOR BIOLOGICALLY-INTENSIVE IPM ALTERNATIVES TO METHYL BROMIDE IN WINEGRAPES

Sheila Daar*[1], William Olkowski[1], Gisela Wittenborn[1], and Cliff Ohmart [2]

This presentation is a component of a panel discussion on strategies for transferring technology on alternatives to methyl bromide (MB) to growers of crops currently dependent on the fumigant.

Achieving grower adoption of new technology is a significant challenge in most situations. This task is made even more complex when dealing with MB alternatives for a number of reasons. These include MB's impact on a wide spectrum of pests; a limited (but rapidly evolving) research base on environmentally sound, cost-effective alternatives; political resistance to seeking alternatives in some key sectors; and lack of a coordinated technology transfer strategy and resources at the state or national level.

These barriers to adoption of alternatives are being compounded by uncertainties about the mandatory phase-out date for methyl bromideùcurrently 2001 for the U.S., but likely to become 2005 to harmonize with the Montreal Protocol, an international treaty on ozone protection. Whatever the eventual phase-out date, of immediate significance to growers are the mandatory stepwise reductions in MB production, based on 1991 production levels, required by the treaty. All manufacturers of MB must comply with these requirements. The schedule is as follows: 25% reduction by 1999; 50% by 2001; 70% by 2003; 100% by 2005. How and to whom the significantly diminishing supplies of MB will be distributed is left to the discretion of the manufacturers of MB.

A biologically intensive integrated pest management system (Bio-IPM), with multiple components, has the highest potential for replacing MB without unacceptable economic, health, or environmental impacts in the long-term. While the scientific research base on this approach to MB alternatives is at an early stage, significant advances in organic and IPM production systems and novel pest management products now serve as resources for adaptation to MB-dependent crops.

Given the time pressures on MB phase-out, and the still emerging state of the art in Bio-IPM alternatives, a hybrid strategy that combines technology transfer bolstered by on-farm applied research is required. This two-pronged strategy enables growers to take advantage of well-researched alternatives as well as new products or methods that appear promising but do not yet have an independent research base.

Since October, 1996, IPM specialists with the Bio-Integral Resource Center have been utilizing this hybrid strategy in conjunction with the 675-member Lodi-Woodbridge Winegrape Commission in northern California. The goal of this project is to identify, test on-farm, and stimulate grower adoption of Bio-IPM alternatives to MB for winegrape

cropping systems. The

primary soilborne target pests on cooperating farms are a complex of nematodes, the most important of which are the root-knot nematode *Meloidogyne incognita,* and the dagger nematode *Xiphinema index* (which vectors fan leaf virus). Key components of the Bio-IPM system being developed and tested are a nematode monitoring system, and both pre- and post-plant treatments with several microbial products, composts, other soil amendments, and number of cultural methods.

Important components of successful technology transfer projects geared to the challenges of MB alternatives include the following:

1. Work closely with growers to plan the project from the beginning
2. Seek key members of the grower community to help identify and recruit progressive growers ("early-adopters") who influence others
3. Form a collaborative management team (grower, pest control advisor or crop consultant, extension agent or other technology transfer specialist) and an advisory committee (commodity and processor representatives, researchers, relevant public agencies, and other stakeholders who can help remove obstacles and bring resources to the project)
4. Understand each cooperating grower's entire cropping system and fit the alternative program into that system
5. Identify any alternatives already being used by growers and/or that aredescribed in the scientific literature
6. Identify any potential financial incentives to reduce grower risk during transition to alternative methods (e.g., IPM demonstration grants, subsidized crop insurance, processor guaranteed crop purchase, etc.)
7. Present cooperating growers and their crop or pest management consultants, with a list of potential alternatives and the state of research-based validation or lack thereof
8. Develop and distribute written educational materials and a newsletter
9. Conduct grower workshops on how the alternatives work and how they enhance the grower's system.
10. Make connections with product suppliers and obtain donated alternative materials for on- farm tests
11. Have the grower chose from a menu of alternatives to test on his/her farm
12. Establish on-farm comparative trials for alternatives
13. Monitor and fine-tune the alternatives as needed
14. Build a relationship with researchers who can conduct multi-year replicated, randomized trials of alternatives shown promising in initial on-farm tests
15. Host on-farm field days to discuss progress of the alternatives
16. Document results and disseminate them industry-wide
17. Hold media events to publicize the program
18. Have fun! Grower-hosted BBQs for neighboring growers and friends provides an effective forum for discussing the progress on MB alternatives and increasing

participation in the program

19. Plan for as rapid a phase-in of alternatives to the entire cropping system as is feasible for growers.

This approach to bio-intensive IPM technology transfer has proven successful in a number of non-MB crops, and is now being adapted to perennial winegrape production systems.

[1] Bio-Integral Resource Center, Berkeley, CA 94707
[2] Lodi-Woodbridge Winegrape Commission, Lodi, CA 95242