TECHNOLOGY TRANSFER OF METHYL BROMIDE ALTERNATIVES IN CALIFORNIA STRAWBERRY PRODUCTION

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Technology transfer could be defined as the transfer of knowledge from one body to another such that the receiving body can use the knowledge to produce a product commercially. Steps within the process of technology transfer include technology discovery/innovation, development/evaluation, demonstration/confirmation, communication/marketing of technology, and adoption. To enable the use of methyl bromide alternatives in California strawberry production, overcoming or adapting to cultural, economic, political, regulatory and training issues will be required. The following outlines the current state and the means used to effect the technology transfer of methyl bromide alternatives for preplant soil preparation in California strawberry production within the framework of the above technology transfer steps with emphasis on the demonstration and communication of technology.

Technology Discovery/Innovation

Private firms, University of California and USDA personnel involved in investigating preplant soil fumigants, biocontrol agents, crop rotation practices and soil amendments at a basic level in the lab or in small plots at test stations.

Development/Evaluation

Private firms (agrichemical companies, pesticide application firms, contract research firms, large strawberry operations with research personnel, etc.), University of California, and USDA personnel involved in investigating preplant soil fumigants and application methods, biocontrol agents, crop rotation practices and soil amendments on small plots at test stations and in a limited number of small on-farm field trials.

Demonstration/Confirmation

Using the most promising methyl bromide alternatives, an on-farm methyl bromide alternative trial was established in the 1993-1994 growing season by the University of California (Dr. John Duniway) in Watsonville, California. This trial was repeated during the 1994-1995 growing season.

Due to the costs and logistics associated with conducting demonstration/confirmation trials in strawberry state-wide, the California Strawberry Commission (CSC), the USDA-ARS, which provided funding for the trials, Tri-Cal and interested farmers established five on-farm methyl bromide alternative demonstration trials. Trials were conducted in four of the five strawberry production regions starting in the 1996-1997 growing season. These trials consisted of large plots (≥0.5 acres) of the most promising methyl bromide alternatives. During the 1997-1998 growing season nine on-farm demonstration trials were established with at least one trial in each production region. For the 1998-1999 growing season eight trials will be established. The intent of on-farm trials is to

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demonstrate the performance of the best available methyl bromide alternatives to the farmer and discover problems associated with the alternatives when used on a larger scale over the range of actual strawberry farming conditions (various soils, microclimates, pest and disease pressures, and farming abilities).

Communication/Marketing of Technology

The communication or marketing of information on alternatives to methyl bromide is done through numerous channels. The CSC regularly publishes findings of CSC grant recipient's findings in the 'Pink Sheet', the industry's newsletter which is used to either communicate new information\results or to confirm previously presented information\results, from projects funded by the CSC or other bodies. The CSC also conducts farmer workshops and field days in each of the production districts. The CSC also encourages and facilitates direct contact between the strawberry farmer and CSC funded scientists conducting strawberry research. Research from CSC funded projects is regularly presented at meetings of professional societies and is published in professional journals by CSC grant recipients. As with the CSC, the USDA also publishes findings from methyl bromide alternative research, encompassing a wide array of crops and alternatives, in a quarterly newsletter.

Adoption

There are a number of methyl bromide alternatives, but no methyl bromide replacements. To date, no methyl bromide alternative has been adopted on a large scale in strawberry production in California. The rate of adoption of each alternative post-methyl bromide will depend on the following characteristics of the alternative:

- Relative advantage – the degree one alternative is superior to others
- Compatibility – the degree the alternative fits or works within the current cropping system
- Complexity – the degree to which the alternative is relatively difficult to understand or use
- Divisibility – the degree to which the alternative can be tried on a limited basis
- Communicability – the degree to which the results of the alternatives use are observable or describable to others

The last two characteristics of methyl bromide alternative adoption are being addressed through on-farm trials with alternatives and the dissemination of trial results. The first three characteristics of each alternative need to be understood on a field by field basis by the farmer before a decision on which methyl bromide alternative could be adopted for any given field.