INITIATION OF A USDA, ARS METHYL BROMIDE ALTERNATIVES AREA-WIDE PEST MANAGEMENT PROJECT

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Methyl bromide (MB) has been used extensively as a soil fumigant to control nematodes, fungi, insects and weeds on more than 100 crops worldwide. It is considered essential for production of many high-value annual and perennial food, nursery, and ornamental crops in the United States. Without the fumigant and effective alternative production strategies, U.S. losses have been estimated to reach $450 million (Carpenter et al. 2000, National Center for Food and Agricultural Policy, Washington, D.C.). In 1997, the majority (89%) of MB use was concentrated in California (45%), Florida (38%), Georgia (4%), North Carolina (5%) and South Carolina (4%).

MB was classified as an Ozone Depleting substance under the under the Montreal Protocol on Substances that Deplete the Ozone Layer and the United States Clean Air Act. Its use as a soil fumigant has been phased out except for Critical Use Exemptions (CUEs) approved by Parties of the Montreal Protocol after annual review. Under the Protocol, CUEs are limited to crops for which no “technically or economically feasible” alternative is known. The most recent US CUE requests, for 2008 soil fumigation, totaled more than 8.7 million kg MB (including 1.8 million from California and other western states; 6.8 million from Florida and other south Atlantic states; and 0.1 million kg from Michigan).

Over the past 10 years an extensive research effort by land grant universities, private research enterprises and the USDA, Agricultural Research Service (ARS) has identified potential technically feasible MB alternatives for some crops. However, widespread industry adoption of these alternatives has not occurred for several reasons, including but not limited to: variability in the effectiveness of the alternatives coupled with incomplete knowledge regarding the sources of variation and the means to manage it; the need to combine many of the alternatives with supplementary herbicides or other inputs for acceptable efficacy; failure to demonstrate the benefits from integrating the MB alternatives into a more comprehensive pest management approach, inadequate regionally coordinated efforts to transfer the alternatives technology expeditiously; and, especially in California, regulatory restrictions that limit uses of the alternatives.

In 1995, USDA, ARS implemented an Area-wide (AW) Pest Management initiative with the goal of demonstrating the positive impacts and advantages to farmers and ranchers of adopting alternative pest management practices designed to reduce and maintain pest populations at an acceptable low density with over a multi-state or multiregional area. Expected outcomes from the projects include increased grower profits, reduced worker risks from chemical pesticides, an enhanced environment, and effectiveness of strategies that integrate biointensive, environmentally sound and economical technologies over large geographical areas affected by targeted pests.. To date, nine projects have been put in place and funded by the agency.

In March, 2006 USDA, ARS decided to establish a 5-year AW Pest Management Project on alternatives to MB. The work will focus on pre-plant alternatives to MB for soil fumigation and occur in the most severely impacted agricultural production systems in South Atlantic and Pacific regions of the U.S., including those devoted to production of food and ornamental crops and plants for planting. The project will demonstrate and optimize alternatives to MB; characterize biological, chemical, and physical sources of variability that affect performance of the alternatives; provide commercial-scale economic assessments of the alternatives; and demonstrate the benefits and feasibility of incorporating the alternatives into integrated pest management (IPM) programs.

Area-wide project funds will be used to support: establishment and completion of field trials with MB alternatives; collection and analysis of data from the trials; research needed to facilitate transition to MB alternatives; and educational outreach designed to demonstrate and transfer the technology and pest management concepts to affected industries and institutions. In cooperation with growers and institutions representing the affected industries, scientists and educators participating in AW project will test and optimize MB alternatives in commercial-scale field trials and transfer resulting concepts, assessments, and technology needed for adoption of MB alternatives. The field trial sites will be chosen to represent the range of biological and edaphic variation potentially impacting efficacy of industry-appropriate MB alternatives. Key variables affecting efficacy of the alternatives will be identified and assessed to support optimal management strategies for the targeted pests. Treatments will be chosen according to regional needs and economically evaluated, with ample attention given to regulatory restrictions, worker safety, and strategies for minimizing fumigant emissions to the surrounding environment. Integration of crop rotation, host resistance and biological control with MB alternatives will be emphasized where effective.

A key goal of the project is to sustain the economic competitiveness the affected industries while facilitating their transition to MB alternatives. The areawide project will strive to implement economical, integrated, environmentally sound production practices.