The Impact of the Methyl Bromide Ban on the U.S. Vegetable Industry

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Introduction

The 1997 assessment of methyl bromide alternatives completed by the Methyl Bromide Task Force of UNEP (1997) reviewed the economic viability of substitutes from data provided in studies completed prior to February, 1997. The Task Force considered both chemical and non-chemical alternatives to methyl bromide and evaluated the impact they were reported to have on yield and cost for crops that had been studied. The Task Force concluded that technical data and other information required for more comprehensive and rigorous assessments of the relative economic performance of the alternatives were not generally available. Sector analyses have been used to evaluate the economic viability of alternatives. UNEP highlighted the work by Spreen et al. (1995) which estimated the impact of the methyl bromide ban on the winter fresh fruit and vegetable industry. That model was used to demonstrate the progress that had been made in identifying alternatives to methyl bromide. They concluded that further data needed to be completed to allow broader estimates of these impacts.

The Empirical Model

In order to evaluate the impact of the methyl bromide ban in the USA, the Spreen et al. model was expanded to account for most of the methyl bromide used in soil fumigation in the US. The industry is characterized by a large number of growers from different regions producing a range of crops and competing with each other for market share at different times of the year. Production and marketing were modeled on an annual basis with regions supplying markets at different points in time based on their location and growing season. The results of the model allow an evaluation of the impact a ban on the use of methyl bromide will have on U.S. producers of fresh vegetables that currently use methyl bromide for soil fumigation purposes.

The particular fruit and vegetable crops included in the model were tomatoes, bell peppers, cucumbers, squash, eggplant, strawberries and watermelons. Crops were included in the model when it was determined that methyl bromide was critical for production or when the crop was part of a double-cropping system involving another crop that utilized methyl bromide. Florida was included in the model as the dominant domestic producer of the crops using methyl bromide with significant foreign competition from Mexico. Although methyl bromide is not used for production in Texas,

the state was included as a domestic producer of bell peppers for the winter market. California was included as a major supplier of fresh strawberries in the winter market and as a critical user of methyl bromide. Other southern states (Alabama, Tennessee, South Carolina) and Virginia and Maryland were included in the model as they have a small market window for tomatoes during the year. Commodities were assumed to be shipped to one of four demand regions in the United States in the northeast, southeast, midwest and west regions of the country.

The model was solved to obtain a baseline approximating the production and marketing patterns for 1993-1994. After solving for the base solution, crop yields and crop budgets were changed to reflect the cost of growing these crops without methyl bromide and using the next best alternative. These results were then compared to the baseline solution to determine the economic impact of the ban.

Results

The model developed in this project estimates the impacts on competitiveness from a methyl bromide ban and the expected changes in acreage, production and value to U.S. producers of these crops. The model also provides estimates of allowable impacts on productivity that are required to minimize impacts on U.S. producers, i.e., allow these producers to maintain market shares within 10 percent of current market shares. As such, the results provide targets that can be used by scientists in evaluating alternatives for determining the economic viability of those alternatives.

References

Spreen, T.H., J.J. VanSickle, A.E. Moseley, M.S. Deepak and L. Mathers. 1995. Use of Methyl Bromide and the Economic Impact of its Proposed Ban on the Florida Fresh Fruit and Vegetable Industry. Univ. FL Bull. 898.

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