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Introduction of methyl bromide alternatives in strawberry, pepper and eggplant in Turkey*

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INTRODUCTION

Agriculture maintains its importance economically and socially in Turkey 14,6% of Gross Domestic Production come from agriculture and, about 45% of the population is involved in agriculture. Vegetables and strawberry account for a considerable proportion of the agricultural production. Most of the vegetable production is consumed domestically, while strawberry is exported. Vegetables and strawberries are among important crops in Turkey. Vegetable cultivation under protected conditions in Turkey reached 44 000 ha in 1999. Strawberries cover 8600 ha in 1999. Methyl Bromide (MeBr) is used for soil fumigation, especially for strawberry and vegetables grown under protected conditions. MeBr consumption has increased from 643 Mt in 1990 up to 1319 Mt in 1998. However, Turkey plans to phase out MeBr by 2008.

The main problems restricting protected cultivation of vegetables in the East Mediterranean Region are soil borne pathogens (such as *Fusarium* spp., *Verticillium* spp., *Phytophthora* spp.) root-knot nematodes (*Meloidogyne incognita*, *M. javanica* and *M. arenaria*), weeds and insects. The major problem restricting strawberry production in the East Mediterranean Region arises from soil borne fungi such as *Rhizoctonia solani*. In addition, some weed, nematode and insect species create problems in the protected cultivation areas.

MeBr is registered in Turkey for quarantine measures, commodities and soil fumigation. Although the Turkish Government attempted to reduce MeBr usage in 1994, this was not well accepted by the farmers, due to its quick and deep soil penetration, biocidal effects on soil-borne fungi, nematodes, some bacteria and weeds.

MeBr is extensively used in the East Mediterranean Region against soil-borne pest complexes in protected vegetable cultivation. Potential alternative techniques to replace MeBr have been identified but use of alternatives by farmers in Turkey is not common because those techniques have not been introduced and farmers do not know how to use them. In the case of strawberry production under protected conditions in the region, MeBr is extensively used, and the farmers think of no other alternatives. Although there are no precise statistical data on MeBr usage, it is estimated that MeBr consumption is about 150 Mt in pepper, eggplant, and strawberry production in the East Mediterranean Region.

In Aydın province, in 1998, 306 hectares were cultivated and over 10,207 Mt of strawberries were obtained with a little MeBr consumption. It is expected that the use of MeBr will increase in the next few years as the strawberry growing continues to expand in Aydın.

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Turkey plans to phase out MeBr by 2008 although the Canada Convention requires MeBr phase out by 2015 for fumigation usage in the world.

OBJECTIVES

1. To demonstrate the technical and economic feasibility of alternative pest control methods for MeBr in the East Mediterranean Region where protected cultivation (strawberry, pepper and eggplant) is extensively carried out, and Aydin Province where strawberry is produced.
2. To develop and implement a training and extension program, to transfer the best and most cost-effective technological approaches to 50 % of MeBr users (ca 4% of farmers) in these sectors.
3. To develop policy measures and an information program to ensure that 150 Mt of MeBr is permanently phased out in these specific sectors.

PROJECT DESCRIPTION

This project has three main parts:

Part 1: Demonstrations in 2000-2001 to evaluate the techniques and identify the most suitable, cost-effective alternatives. Demonstrations of selected alternatives will be carried out in 2001-2002 as part of the development of the training program (below);

Part 2: Development and implementation of a program for training, technical advice, technical information dissemination and technology transfer.

Part 3: Concurrent with Parts 1 and 2, the development of policy measures and an awareness raising program, to ensure that MB phased-out by this project will be permanently eliminated.

IMPLEMENTATION

A baseline survey was completed to obtain information on farmer profiles and the usage of MeBr.

Eleven demonstrations covering in an area of 1,4 ha were conducted in strawberry, pepper and eggplant growing areas of the East Mediterranean Region, and 6 demonstrations with 0,5 ha for strawberry in the Aydin Province.

Combination of solarization with dazomet (400 kg/ha), metham sodium (1000 L/ha), chicken manure (1 kg/m²) were applied at demonstrations. *Trichoderma* spp. will be applied firstly at seeds beds, then periodically once in a month. In strawberry, basamid and chicken manure were applied and then ridges were prepared before tarp was covered for 6-week-solarization.

- Soil samples for physical, pathogens, nematode and weed seed analysis were taken and analysis have already been started.
- The first observations show that, emergence of weeds are drastically reduced compared to those of control and MeBr applied parcels.
- Nematode population were reduced in parcels where solarization combined with alternative methods.