PROGRESS IN PHASING OUT METHYL BROMIDE FOR TOMATO PRODUCTION IN DEVELOPING AND DEVELOPED COUNTRIES

Mohamed Besri
Institut Agronomique et Vétérinaire Hassan II, B.P. 6202 Rabat - Instituts, Morocco
m.besri@iav.ac.ma

Introduction

Methyl Bromide (MB) is a powerful ozone depleting substance. The meeting of the parties (MOP) to the Montreal Protocol called for its phase out in 1992. In 1997, a global phase out schedule of this chemical was established by the MOP according to which Article 5 countries (developing countries) are required to freeze consumption and production of MB by 2002, reduce its use by 20% in 2005 and complete total phase out by 2015. In comparison, non Article 5 countries (developed countries) must phase out MB by 2005 (Batchelor 2002). What is the current situation in developing and developed countries? Are there technically available and feasible alternatives for tomato in these countries? If so, what are the main constraints for their adoption at a commercial level?

Methyl bromide use for tomato production in developed and developing countries

Developing countries

In Article 5 countries, 66 % of MB is used for soil fumigation of which 23 % is for Tomato. In order to phase out methyl bromide in developing countries, the Multilateral Fund (MLF) is providing these countries with financial and technical support. Many demonstration and investment projects have been implemented to limit the use of MB on tomato in Latin America (Argentina, Chile, Dominican Republic, Guatemala, Mexico, Uruguay), Africa (Botswana, Egypt , Morocco), Middle East (Jordan, Lebanon ,Syria, Turkey) and Asia (China). The MLF projects were implemented by UNIDO, UNDP, World Bank and by bilateral agencies (Germany, Italy, France...). The main activities of the demonstration projects include trials to evaluate and adapt alternatives to the local conditions, workshops with stakeholders and dissemination of information to raise awareness about MB issues. Because of the excellent results obtained by the demonstration projects, a quick and enthusiastic response came from many developing countries promising an earlier phase out of MB. Therefore, it is expected that in many developing countries, a total phase out of MB (except essential use) could be within reach before or during 2006, well in advance of the agreed protocol for developing countries. Advancement of the phase out date is mainly due to three major reasons: a) The availability and proven efficacy of the alternatives in developing countries b) Developing countries want to catch up with developed countries in terms of new technologies, c) Developing countries want to ensure continuity of exports to developed countries who may not accept products treated with BM after the deadline of 2005. In Lebanon, 97 % of the Methyl bromide used for vegetables have been phased out by using soil solarisation, biofumigation, grafting and minimal use of 1,3 D. In Turkey; MB will be phased out in 2008 by adopting non chemical (solarisation, biofumigation, biological control, soil less culture and chemical (1,3D, metam sodium, dazomet) alternatives .

Developed countries

In some developed countries e.g. Spain, Holland, Germany, Portugal, USA, MB is still used a large scale for tomato production. In others e.g. Denmark, Spain, Holland, Germany, this fumigant is not any more used to control tomato soil borne pathogens. Spain has the same production system, climate, pest pressure and environment as Portugal, Southern France, Italy or Greece which are still considering that MB is important for the success of tomato production. The characteristics of tomato production in Holland are similar to those in Belgium .This last country is still using MB while the first one has phased out this product many years ago. In Spain and in Holland many alternatives have replaced this fumigant with great efficiency.

Alternatives to methyl bromide for the control of tomato soil borne pathogens in developing and developed countries

Developing countries

The leading alternatives to MB for the control of tomato soil borne pathogens in developing countries include non chemical alternatives (resistant cultivars, grafting, biofumigation, solarization, steam, soil less culture, biocontrol) and chemical alternatives (Chloropicrin, 1,3 D, Dazomet, Metam Sodium) and a combination of these treatments. The successes of the alternatives depend on their use within an IPM program that includes sanitation, pathogen free seeds and seedlings and other production methods .In general, the results obtained at experimental and commercial levels using these alternatives are as good as those obtained with MB for soil disinfestation .

Developed countries

A substantial number of chemical and non-chemical alternatives presently used commercially in developing countries, have proved to be as effective as MB for controlling tomato soil borne pathogens in many developed countries such as Belgium, Spain, Italy, Greece, France. However, in spite of their efficiency, some developed countries have requested in 2003 and 2004 Critical Use exemptions (CUEs) for tomato (Table 1).

Critical use exemption and constraints to the methyl bromide alternatives adoption in developed countries

Under Article 2H of the Montreal protocol, the production and consumption of MB is to be phased out in non Article 5 countries by 1 January 2005. However, decision IX/6 established criteria allowing CUEs. Use of MB should qualify as "critical" only if the nominating party determines that a) the specific use is critical because the lack of availability of MB for that use would result in a significant market disruption and b) there are no technically and economically feasible alternatives or substitutes available to the user that are acceptable from the stand point of environment and health are suitable to the crops and circumstances of the nomination. The nominations presented by some European and non European countries cited several categories of reasons for CUNs:

- Absence of identified alternatives: e.g. resistant cultivars and root stocks to a broad spectrum of pathogens and races

- Lack of approval by regulatory authorities: e.g. Chloropicrin is not registered in France but registered in other European countries, chloropicrin+1,3 D is registered in Spain but not in Italy, availability of granula formulation (Dazomet), Incertitude for the future, most of the chemical alternatives are under revision according to the European regulation 91/414/CEE
- Insufficient time to develop infrastructures: e.g. commercial nurseries, specialized companies for chemical application (e.g. Chloropicrin)
- Lack of training in the use of alternative and adaptation of the process to local conditions: solarisation, grafting, biofumigation, drip irrigation
- Available alternatives not suitable for local conditions: e.g. Solarisation, breakdown of resistance by high temperature
- Longer time between fumigation and planting (plant back periods) with the use of some alternatives, causing disruption to cropping programs: e.g. Metam Sodium, Chloropicrin
- Available and suitable alternatives not economically viable: e.g. propagative materials, steaming, soil less cultivation, electric energy availability at farm level,

However, all the nominations have only considered the adoption of single alternatives to solve tomato soil borne pathogens problems. MBTOC reported that alternatives should be considered as components of an IPM program, combining strategies and tactics to prevent or manage pest problems

In 2003 and 2004, respectively only 5 and 3 countries have requested critical use exemptions for tomato production (Table 1). This reduction of 60% of the countries requesting critical use exemptions in one year, demonstrates the availability at a commercial level of efficient alternatives to Methyl Bromide for tomato production

Table 1
Critical use nominations for vegetables

Crop	2003		2004	
	Tonnage nominated	Number of nominations (*)	Tonnage nominated	Number of nominations(*)
Tomato	4,312	5	4,012	3

Conclusion

Many alternatives (non chemical and chemical) to Methyl Bromide are available and have proven, when associated with an Integrated Pest Management Program, to be as efficient as Methyl Bromide for the control of soil borne pathogens of tomato in different geographic regions. Article 5 countries will be able to phase out this fumigant before 2015. In 2003 and 2004 respectively, only 5 and 3 non article 5 countries have requested critical use exemptions for tomato production. This reduction in one year, of 60% of countries requesting critical use exemptions, illustrates the availability at a commercial level of efficient alternatives to Methyl Bromide for tomato production