Methyl Bromide Phase-Out Strategies

A Global Compilation of Laws and Regulations

United Nations Environment Programme
Division of Technology, Industry and Economics
OzonAction Programme

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A Message from UNEP's Executive Director

Klaus Töpfer
United Nations Under-Secretary-General and Executive Director of UNEP

Protecting the ozone layer is the main goal of the Montreal Protocol on Substances that Deplete the Ozone Layer. Vital to all forms of life, the ozone layer is a protective shield above the Earth that filters out harmful ultraviolet radiation from the Sun.

In the early 1990s, scientists discovered that methyl bromide, a chemical used primarily as a fumigant in agriculture, and for pest control in structures and stored commodities and for quarantine and pre-shipment treatments, was depleting the ozone layer. The bromine from methyl bromide is 60 times more destructive to ozone on an atom-per-atom basis than the chlorine from CFCs. The Parties to the Montreal Protocol responded to this threat by including methyl bromide as one of the controlled substances under the Protocol and agreeing to a global phase-out schedule.

Phasing out methyl bromide is essential to achieving the Protocol's goals. However, it does not mean that agriculture, which is important to the economies of many developing countries, will be adversely affected. UNEP's Methyl Bromide Technical Options Committee has identified effective alternatives for the vast majority of methyl bromide uses and many of these are already used successfully around the world.

Strong national policies are needed to meet the Protocol's phase-out requirements and to promote widespread adoption of alternatives. Experience gained from replacing other ozone-depleting substances has shown that strong policy measures bring about a faster phase out in a cost-effective way. Farmers and other methyl bromide users will also benefit from policy measures that support their efforts to transition to ozone-friendly alternatives.

UNEP, through its OzonAction Programme, is committed to assisting countries in putting such policies into place and has created *Methyl Bromide Phase-Out Strategies* as a resource for policymakers developing policy measures to replace methyl bromide. This document provides an overview of the range of policy options available to control methyl bromide, and outlines existing policy measures on methyl bromide from over 90 countries.

It is hoped that this document, along with UNEP's other policy development tools, will help developing countries take their first steps in moving away from methyl bromide and in meeting their commitments to the Montreal Protocol.

Section 1. Introduction

1-1. Purpose of the Compilation

This compilation is designed to be a resource for those countries developing action plans and implementing measures to promote the phase out of the ozone depleting pesticide methyl bromide. By focusing specifically on policy measures, this document addresses a need that is becoming increasingly urgent as deadlines for the international phase out of methyl bromide approach.

Use of methyl bromide continues to grow rapidly in some developing countries, despite fast approaching requirements for a 2002 freeze on consumption and 20% reduction in 2005 under the international Montreal Protocol agreement. Experience with the phase out of other ozone depleting substances (ODS), and experience to date with methyl bromide, demonstrates that timely phase-out efforts depend on a strong national policy framework combined with appropriate technical information and effective training. The policy component of this approach has proven to be a particularly cost-effective way to reduce and eliminate use of ODS. The purpose of this document is to help speed the adoption of policy measures in developing countries that promote the phase out of methyl bromide.

The compilation provides an overview of existing laws and regulations influencing use of methyl bromide in both developing and industrialized countries. It also highlights economic incentives and voluntary programmes supporting phase out, as well as policies acting as barriers or impediments to methyl bromide use reduction. In addition, the compilation highlights government-supported programmes that specifically promote alternatives to methyl bromide. More general pesticide use reduction programmes are noted as potential tools that could be tailored to support methyl bromide use reduction activities.

While the primary audience for the compilation is officials in National Ozone Units (NOUs) and other interested government agencies in developing countries, the information presented here may also be useful to industrialized countries which have not yet implemented phase-out programmes or are working to strengthen existing efforts. The information may also be valuable to policy researchers, methyl bromide user groups and non-governmental organizations (NGOs). Contact information for appropriate government officials is provided in each Country Report, with an aim to facilitate direct exchange of information among interested parties.

1-2. Data Collection Methods

The Pesticide Action Network North America (PANNA) conducted a survey of government officials for the United Nations Environment Programme (UNEP) to collect the information included in this compilation. Close to 450 questionnaires were distributed to government officials in more than 170 countries. Appropriate officials to be contacted were identified from several lists and databases, including (1) UNEP's lists of National Ozone Unit officials in developing countries and government representatives in industrialized countries and countries with economies in transition; (2) the current list of Designated National Authorities for implementing the Prior Informed Consent (PIC) scheme (government officials charged with monitoring imports of restricted pesticides);[1] and (3) the most recent list of delegates to the Montreal Protocol on Substances that Deplete the Ozone Layer. The regional breakdown of responses is as follows:

Africa	19 respondents of 47 countries surveyed
Asia and the Pacific Region	17 respondents of 29 countries surveyed
Latin America and the Caribbean	27 respondents of 33 countries surveyed
Middle East	4 respondents of 12 countries surveyed
Other Article 5(1) Countries	5 respondents of 12 countries surveyed
Non-Article 5(1) Countries	25 respondents of 39 countries surveyed

Responses from each of the 97 countries which submitted completed surveys are included in the overview and country reports in **Section 4** and **Section 5**.

The information collected in this compilation is provided by government officials and has not been independently verified by UNEP or PANNA. In some cases it may be incomplete if a particular Ministry responded without detailed knowledge of programmes administered by other agencies (e.g., Ministry of Agriculture without complete knowledge of policies targeting ozone depleting substances, or Ministry of Environment not fully aware of pesticide use reduction programmes) or if information was not available. Information was collected from a variety of sources in each country whenever possible. PANNA worked with partner organizations in each region to coordinate the distribution of surveys and follow-up contacts.[2]

Information was collected regarding perceived barriers to phasing out methyl bromide, legislation and regulations governing the import and use of the pesticide, economic incentives supporting the adoption of alternatives, voluntary and collaborative programmes among user groups, researchers and government officials aimed at reducing the use of methyl bromide, and outreach and training programmes promoting alternatives. Information was also collected on general pesticide use reduction or sustainable agriculture programmes. A full copy of the survey questionnaire is included in **Appendix A**.

1 Under the Prior Informed Consent (PIC) scheme, importing governments must be informed of shipments of banned or severely restricted pesticides. The scheme is operated jointly by the Food and Agriculture Organization's Plant Protection Division and UNEP's International Register of Potentially Toxic Chemicals. Designated National Authorities are appointed by the importing governments to receive information about pesticide shipments.

2 PANNA's partner organizations for this project were the Comite Nacional pro Defensa de la Fauna y Flora (CODEFF - FoE-Chile), PAN Africa (Senegal), PAN Colombia (RAPALMIRA), and PAN Philippines.

1-3. How to Use the Compilation

This document is intended to encourage more rapid adoption of policies supporting a methyl bromide phase out through exchange of information and experiences. The information presented can provide ideas for creative and effective approaches which, when adapted to local/national circumstances, may be appropriate in a range of countries. The compilation also identifies areas where additional information and policy support is most urgently needed. The document is organized in the following sections.

- **Section 2** provides an overview of methyl bromide use worldwide, international controls under the Montreal Protocol, international mechanisms supporting the adoption of alternatives, and the relevance of policy measures to national phase-out efforts.

- **Section 3** highlights the importance of policy measures, including examples of effective policy measures which have been adopted to promote the phase out of methyl bromide and policy barriers identified through the survey.

- **Section 4** presents a summary of the survey results, including descriptions of various policy approaches reported by responding governments and programmes promoting methyl bromide alternatives and pesticide use reduction. Some specific country examples are highlighted in this section.

- **Section 5** provides the full listing of country reports, including information on specific laws and regulations controlling methyl bromide use, agencies involved in implementation of these controls, methyl bromide alternatives projects, pesticide use reduction programmes, and policy barriers to phase out. Contacts for the various agencies are also included in the listings, which are organized by region. Each regional listing includes a table summarizing the findings for countries submitting information in the region.

- **Section 6** provides additional information on policy resources and support provided to government officials under the Montreal Protocol. Descriptions are included of relevant work of UN agencies involved in implementing Multilateral Fund projects, as well as of regional networks providing support to NOUs in developing countries. Key online resources are also listed.

- **Appendix A** provides the policy survey that was distributed to government representatives.

- **Appendix B** provides a list of UNEP's publications on methyl bromide and how to order them.

- **Appendix C** provides a country index to easily find policy information in a particular country.

1-4. Complementary Resources

UNEP has produced a series of publications to support the phase out of methyl bromide and the transition to alternatives. Documents include a *Methyl Bromide Information Kit* designed to provide basic information on use, alternatives and phase-out deadlines and support awareness-raising activities, a compilation of case studies of alternatives which have been successfully adopted and a *Sourcebook of Technologies for Protecting the Ozone Layer: Methyl Bromide* which provides information on commercially-available technologies, equipment,

chemicals and/or expertise to assist with the transition away from methyl bromide. UNEP has also recently produced an *Inventory of Technical and Institutional Resources for Promoting Methyl Bromide Alternatives*. These and other relevant publications are described briefly in **Appendix B** including ordering information.

Section 2. Phasing out Methyl Bromide

2-1. Methyl Bromide Use and Impacts

Methyl bromide is an ozone depleting pesticide that is used to fumigate soil before planting some crops, to treat some commodities and grains after harvest, to fumigate buildings and vehicles, and to disinfest some commodities before export to or upon import from another country ("quarantine and pre-shipment" uses). An estimated 71,500 metric tonnes of methyl bromide is used worldwide.[3]

Methyl bromide use in developing countries (called "Article 5(1)" countries under the Montreal Protocol) was an estimated 15,500-17,500 tonnes in 1996, or about 25 percent of global consumption. While the pattern of use varies from country to country, roughly 70 percent of the use among Article 5(1) countries is for soil fumigation. An estimated 10 percent of use is for grain storage, and about 20 percent for all types of quarantine and pre-shipment (QPS) uses.[4] Industrialized ("non-Article 5(1)") countries[5] account for an estimated 75% of global consumption of methyl bromide, with a similar breakdown of use. Major methyl bromide-using crops include cut flowers, tobacco, cucurbits, tomatoes and strawberries (see **Figure 1**). The pesticide is produced primarily in the United States, Israel, Japan and France, with some reported production in the Ukraine, China and Romania.

Methyl bromide is extremely toxic, acting as a broad-spectrum biocide that kills most living organisms exposed to it. Direct exposure causes a range of health effects in humans, including neurological symptoms such as headaches, nausea, muscle tremors and visual disturbance. Toxicology studies indicate that the pesticide can cause birth defects in animals[6], and severe exposure can lead to death.

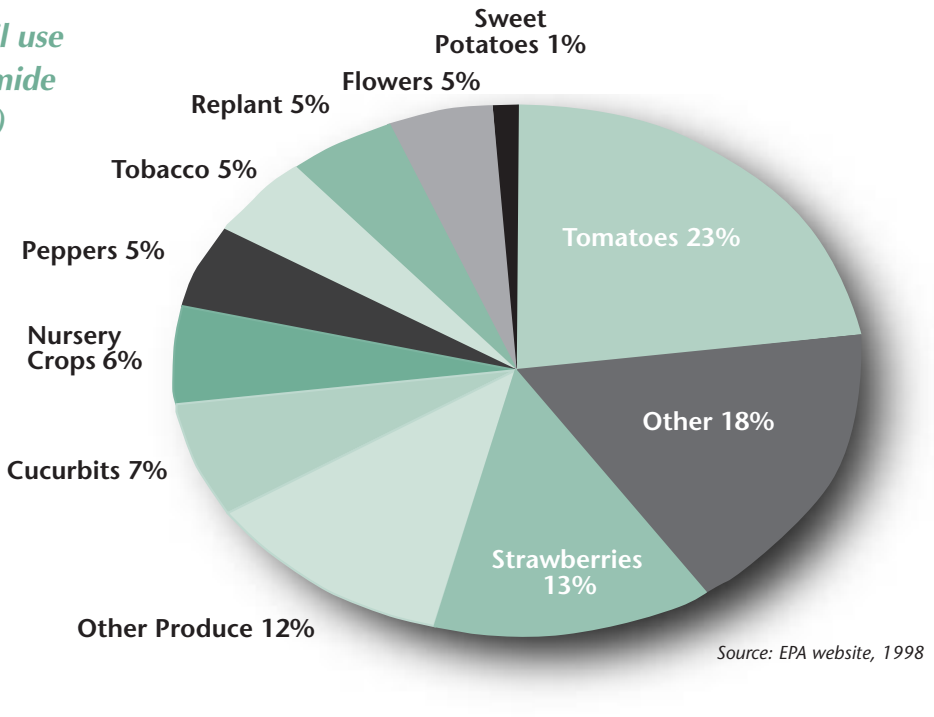
3 See *Methyl Bromide: Getting Ready for the Phase Out*, UNEP IE, 1998.

4 Quarantine and pre-shipment uses are currently exempt from controls under the Montreal Protocol. Quarantine use means fumigating commodities to avoid inadvertently transporting pests to places where those pests are not already present or where they are being officially controlled. Pre-shipment refers to treatments applied just prior to commodity export to meet pest-control regulations in either the importing or exporting country.

5 The following countries with economies in transition (CEITs) are classified as non-Article 5(1) countries: Armenia, Azerbaijan, Belarus, Bulgaria, Czech Republic, Estonia, Hungary, Kazakhstan, Latvia, Lithuania, Poland, Russia, Slovakia, Tajikistan, Turkmenistan, Ukraine and Uzbekistan. The remaining CEIT countries are Article 5(1) countries under the Montreal Protocol. CEITs classified as Article 5(1) countries are: Bosnia-Herzegovina, Croatia, Georgia, Macedonia, Moldova, Romania, Slovenia and Yugoslavia.

6 See studies compiled by the California Department of Pesticide Regulation for the Developmental and Reproductive Toxicant Identification Committee for the consideration of methyl bromide as a developmental toxicant under state legislation, March 7, 1994.

Figure 1. Worldwide soil use of methyl bromide by crop (1996)



Source: EPA website, 1998

Methyl bromide is also a potent ozone depleting substance (ODS). The bromine atom from methyl bromide acts quickly in the stratosphere ozone to break down 60 times as much ozone as a chlorine atom from CFC emissions. Ozone depletion contributes to human health problems caused by increased exposure to ultraviolet-B radiation (UV-B). UV-B is known to affect human health by causing eye cataracts, skin cancer, and suppression of the immune system.

2-2. Montreal Protocol Controls

In 1987, governments around the world agreed on the Montreal Protocol on Substances that Deplete the Ozone Layer to protect human health and the environment against depletion of the stratospheric ozone layer resulting from human activities. The Protocol establishes ODS phase-out schedules for both industrialized and developing countries.

In 1997, Parties to the Protocol agreed to the following deadlines for non-Article 5(1) countries: a 25% reduction in 1999 (based on 1991 consumption levels), a 50% reduction in 2001, a 70% reduction in 2003, and full phase out in 2005. Methyl bromide use in Article 5(1) countries will be frozen in 2002 (based on average 1995-1998 consumption), reduced by 20% in 2005, and phased out in 2015. "Critical uses" of methyl bromide, which are yet to be fully defined under the Protocol, will be exempt from these controls. Many countries, both industrialized and developing, have committed to phase out methyl bromide well in advance of the Montreal Protocol schedule (see **Table 2-1**).[7] QPS uses are currently exempt from controls under the Montreal Protocol.

7 A number of developing and industrialized countries signed declarations at Protocol meetings in 1992, 1993, 1995 and 1997 stating their determination to phase out methyl bromide as soon as possible to reduce the human and environmental impacts of ozone depletion.

Table 2-1: Countries Restricting or Phasing Out Methyl Bromide Before Montreal Protocol Deadlines

Countries	Phase-Out Goals	Restrictions/Notes
Angola*	—†	MB registration cancelled
Austria	Phase out by 2000	Eliminated storage facility uses by 1998
Bahrain	—	MB use prohibited
Barbados	Legislation in development to phase out all ODS (including MB) by 2000	
Belize	—	MB use prohibited; emergency quarantine/pre-shipment use allowed
Bhutan	—	MB registration cancelled
Bolivia	—	MB registration cancelled, sale prohibited
Canada	25% reduction in 1998 Phase out by 2001	
Colombia	—	Agricultural uses prohibited in 1996
Costa Rica	Legislation under consideration to phase out methyl bromide use before Protocol deadlines	
Croatia	Phase out by 2006	
Denmark	Phased out by 1998	Phase out includes quarantine and pre-shipment uses
El Salvador	Legislation in development to prohibit imports from 1999	Limited use of existing stocks will be permitted
European Union	Accelerated schedule under consideration: 60% reduction by 2001, 75% reduction by 2003, phase out by 2005	QPS exempt, critical use exemptions to be determined
Finland	Phase out by 1999	Phase out includes quarantine and pre-shipment uses
Fiji	Phase out by 2005	
Germany	Treatments for foodcrops and stored grains have been phased out	
Iceland	—	MB use prohibited since 1994
Indonesia	Phase out imports by 1998	
Italy	—	MB use prohibited in region of Lake Bracciano Fields may be fumigated only one year in two in all other regions Allowable application rates reduced
Mozambique	—	MB registration cancelled
The Netherlands	—	Soil uses not permitted since 1992
New Zealand	25% reduction in 1998, 35% reduction in 1999, 45% reduction in 2000, 60% reduction in 2002, 75% reduction in 2004, phase out by 2005	
Sweden	Phased out in 1998, except pre-shipment uses	Soil uses prohibited in 1993, structural and post-harvest uses were prohibited in 1998
Switzerland	—	Soil uses not permitted
Venezuela	Legislation in development to prohibit import and use of MB from January 1, 2000	

* Not a signatory to the Montreal Protocol.

† No specific phase-out goals adopted.

Sources: Country reports for this compilation, *Report of the Methyl Bromide Technical Options Committee, 1998 Assessment of Alternatives to Methyl Bromide*, UNEP, 1998 and *The Technical and Economic Feasibility of Replacing Methyl Bromide in Developing Countries*, (Melanie Miller, ed. Friends of the Earth 1996).

2-3. Promoting Alternatives to Methyl Bromide

Alternatives have been identified and their commercial use documented for the vast majority of methyl bromide's uses.[8] For soil fumigation, viable alternatives include cultural practices (e.g., crop rotation, cover crops, plant breeding and grafting), organic amendments, biological controls, physical control methods (e.g., steam treatments, solarization and biofumigation) and various alternative chemicals (e.g., chloropicrin, metam sodium, methylisocyanate). Documented alternatives for durable commodities include heat treatment, irradiation, sanitation and preventative practices, biological controls, controlled atmospheres and alternative fumigants.

Combinations of these approaches have been documented worldwide, from cultural practices combined with pesticides on broccoli, snow peas and strawberries in Guatemala, to solarization and soil amendments for strawberry production in the Philippines and Zimbabwe, to use of resistant tomato cultivars in Mexico and Morocco.[9]

Programmes are in place in many countries to provide information and training on alternative approaches to methyl bromide users. User education and training are particularly important for successful adoption of alternatives for soil fumigation uses, since knowledge-intensive approaches such as integrated pest management (IPM)[10] have proven to be one of the most effective alternatives to methyl bromide.

In 1990, the international community established a financial mechanism called the Multilateral Fund to support efforts in developing countries to phase out ODS under the Montreal Protocol. The Fund is financed by contributions from industrialized countries, and projects are implemented by four agencies: UNEP, the UN Development Programme (UNDP), the UN Industrial Development Organization (UNIDO), and the World Bank. Bilateral donor agencies can also implement Multilateral Fund projects. Methyl bromide alternatives projects became eligible for support from the Fund in 1995, when the 2002 methyl bromide freeze in developing countries was established.[11]

Seventy-eight projects supporting on-site trials of alternatives (demonstration projects) have been approved by the Fund, as well as several larger-scale investment projects promoting national information dissemination and training. According to UNEP's Technology and Economic Assessment Panel (TEAP), however, effective policy approaches to ODS phase out can be up to seven times more cost-effective than investment projects such as those supported under the Fund.[12]

8 For detailed descriptions of alternatives in use, see the *UNEP Technology and Economic Assessment Panel Report, 1997 Vol. 1*, *The Technical and Economic Feasibility of Replacing Methyl Bromide in Developing Countries* (Miller, 1996) and *Under African Skies: Methyl Bromide Use and Alternatives in Sub-Saharan Africa* (Schonfield, 1995).

9 See *UNEP Technology and Economic Assessment Panel Report, 1997 Vol. 1.*

10 Integrated pest management has a wide range of definitions. Many define IPM as a systems-based, knowledge-intensive approach in which farmers learn to observe and analyze ecological interactions and combine various biologically-based methods of pest management. Chemical pesticides are seldom if ever used, and only as a last resort.

11 Guidelines adopted by the Fund's Executive Committee in March, 1998 outline priority sectors for methyl bromide alternatives demonstration, investment and non-investment projects, and recommend approaches to project development. The guidelines also emphasize that investment projects should be undertaken in the context of a government commitment to a package of policy measures aimed at eliminating methyl bromide use.

12 See the following TEAP report: *Assessment of the Funding Requirements for the Replenishment of the Multilateral Fund for the Period 1997-1999*, UNEP, 1996, p.45, Table 7.3.

Section 3. The Importance of Policy Measures

Because methyl bromide is a broad-spectrum pesticide, users have come to rely heavily on this single chemical to combat a wide range of pests. Many of the most effective alternatives, while less chemical-intensive, require more complex management and/or a variety of inputs to achieve similar results and are not as widely used in commercial agriculture. In some sectors, methyl bromide is perceived by users as the most cost-effective and reliable pest control method available. The transition from methyl bromide to alternatives thus requires a combination of technical information about viability, effective training programmes, and government policies restricting use and providing incentives for adoption of alternatives.

The importance of the policy component of this package is highlighted in recent evidence that use of methyl bromide is increasing rapidly in some developing countries. To meet the upcoming Montreal Protocol deadlines of a 2002 freeze and a 20% reduction in 2005, political commitment and targeted policy measures, in addition to effective national training programmes, are urgently needed.[13]

3-1. Effective Policy Approaches

Ratification of the Copenhagen Amendment to the Montreal Protocol[14] is the first step national governments must take toward creating the needed national policy framework. This action confirms government commitment at a national level to the agreements made under the Protocol to phase out methyl bromide. In developing countries, governments must take this step to access financial support from the Multilateral Fund to implement alternatives programmes.

Once the Copenhagen Amendment has been ratified, the next effective steps by governments may include some combination of regulations, import taxes, labeling requirements, and training and information exchange programmes. In its 1998 report, TEAP[15] identified the

13 See the *1998 Report of the Technology and Economic Assessment Panel*, UNEP, 1998.

14 The Copenhagen Amendment, adopted by the Parties to the Montreal Protocol in 1992, brings methyl bromide under jurisdiction of the Protocol as an ODS.

15 See the *1998 Report of the Technology and Economic Assessment Panel*, UNEP, 1998, p.90-91.

following measures governments can adopt or implement. This list is based on years of experience with other ODS and experience to date with methyl bromide:

- Strong policy frameworks establishing a national phase-out schedule and mechanisms to implement and enforce it;
- Strengthening existing pesticide controls to ban or restrict specific methyl bromide uses and to place tighter conditions on its use;
- Controlling imports (permits, quotas, import fees);
- Establishing economic incentives to adopt alternatives (taxing imports or use, license fees, labeling requirements, targeted subsidies);
- Requiring labeling or encouraging voluntary labeling of products produced with or without methyl bromide, including government-sponsored eco-labeling systems;
- Developing and implementing farmer education and training programmes to promote alternatives, including use of existing extension systems and support for farmer-to-farmer exchanges;
- Providing government assistance to local companies to supply and market alternative products and services;
- Promoting programmes for industry leadership, and to encourage farmers and pest control companies to adopt alternatives (including support for and participation in demonstration and investment projects promoting alternatives); and
- Intensifying efforts to encourage exporters, supermarkets and purchasing companies to change policies, specifications or contracts on methyl bromide use.

Countries in which methyl bromide is produced will also need to explore production sector policies. Possible measures include restriction of production to comply with Protocol requirements, development of a quota system allowing each production facility an allowance to produce a specified amount, and economic transition strategies supporting job creation through development of alternative technologies.

Coordination involving various government agencies in a particular country (e.g., Ministries of Environment, Agriculture, Health, Industry and Trade, etc.) often increases the effectiveness of these various approaches. In many cases, policy implementation may be streamlined further through formation of voluntary working groups involving government officials from several agencies, researchers working directly on alternatives, user group representatives, and other interested NGOs (see specific examples in **Sections 4** and **5**).

3-2. Reported Barriers to Phase Out

As governments develop a policy framework and action plan for phasing out methyl bromide, it is critical to identify existing and potential barriers to these efforts. This exercise helps countries identify and address problems well before phase-out deadlines approach, and highlights problem areas where external support and guidance could be helpful.

Respondents to the survey identified three primary barriers to the phase out of methyl bromide:

- quarantine and pre-shipment (QPS) requirements of importing countries;
- potential economic loss and the resulting resistance from growers to phase out; and
- lack of coordination and/or political will among government agencies.

3-2-1. Quarantine and Pre-shipment Requirements of Importing Countries

QPS uses of methyl bromide are currently exempt under the Montreal Protocol. Quarantine use of methyl bromide is the fumigation of commodities being imported into a country where potential pests are not already present or are being officially controlled. Pre-shipment refers to treatments applied directly prior to exporting of commodities, to meet official pest-control regulations in either the importing or exporting country.

The UNEP Methyl Bromide Technical Options Committee[16] (MBTOC) is investigating the QPS issue, and will report to the Parties to the Montreal Protocol in 1999 regarding QPS-related uses under the Protocol. According to MBTOC, QPS uses currently constitute an estimated 22% of global methyl bromide use.

QPS requirements were the most frequently mentioned barrier to a phase out, cited by 23 survey respondents. The importing countries requiring pre-shipment fumigation with methyl bromide most often cited are Australia, the European Union and the United States. For some countries, such as Jamaica and the Netherlands, meeting these requirements constitutes the only major use of methyl bromide, which has been phased out in all other applications.

3-2-2. Economic Impacts and Political Issues

Resistance to eliminating the use of methyl bromide is often related to concerns about the cost-effectiveness of alternatives. This can be a significant barrier to development and implementation of effective policies. This has been a central concern among affected user groups in the United States, and was cited in survey responses from Chile, the European Union, Indonesia, Myanmar, Paraguay and Sri Lanka.

The issue of the cost effectiveness of methyl bromide alternatives was addressed extensively in a 1997 TEAP report.[17] TEAP's Economic Options Committee found that documented alternatives for almost all uses of methyl bromide are nearly as cost-effective as methyl bromide, and in some cases more so. One of the difficulties in analyzing the costs of alternatives is that combination treatments are often the most effective substitute for methyl bromide, and the costs of such treatments are difficult to quantify. The Economic Options Committee found that integrated approaches actually had the most cost-effective outcomes, particularly after several years of use when users have effectively adapted the combined approach to their circumstances.

Closely related to the economic issues are questions of political will and appropriate coordination of government agencies. Five responding countries cited these issues as important policy barriers, while others have made specific efforts to create multi-agency boards or commissions to coordinate phase-out efforts. For many countries responding to the survey, lack of effective coordination among government agencies was evident in the method of response itself. In very few cases was there evidence that survey responses were coordinated among the agencies responsible for the various methyl bromide controls, and only one country, Canada, submitted a survey completed jointly by more than one agency.

16 The Methyl Bromide Technical Options Committee (MBTOC) was established by UNEP under the Montreal Protocol in 1992 to identify existing and potential alternatives to methyl bromide. MBTOC reports to the Technology and Economic Assessment Panel (TEAP) which advises the Parties on scientific, technical and economic matters related to the control of ODS, and their alternatives. The Committee currently consists of 39 members from 23 countries representing a wide range of methyl bromide-related expertise, including scientists, users, NGOs and government representatives.

17 See *Technology and Economic Assessment Panel*, April 1997 Report (Volumes I & II), UNEP.

Section 4. Overview of Policy Survey Results

Respondents to the survey identified a range of existing policy measures that either directly encourage the phase out of methyl bromide or have potential to do so. Measures identified include laws specifically controlling methyl bromide as an ODS, pesticide control laws, import restrictions, permitting requirements and other regulatory controls. Financial and other incentives for adopting alternatives were also identified such as taxes and fees, voluntary programmes, support for methyl bromide alternatives research and training, and complementary pesticide use reduction programmes.

Analysis of the relative effectiveness of these various approaches is beyond the scope of this report, since information on specific results of the policy measures identified was not part of the survey. The information presented here, however, provides the groundwork for further understanding of the effectiveness of various policy tools and approaches. In addition, variations from country to country in terms of capacity to implement and enforce policy measures should be considered when reviewing the data collected.

The survey results show that several types of laws govern and influence the use of methyl bromide around the world. Thirty-four of the 97 countries responding to the survey have established specific legislation controlling ODS, in some cases establishing a schedule to phase out use of those substances, including methyl bromide. ODS legislation is found most often in non-Article 5(1) countries, with a significant number in Latin America as well.

The majority of respondent countries (73 of 97) have basic laws governing use, registration and sometimes import of all pesticides, including methyl bromide. In some countries there are separate laws controlling the QPS uses of pesticides and setting health and safety requirements for hazardous chemical/pesticide use. Pesticide regulations that apply to methyl bromide include registration and licensing, permit operations, use monitoring systems, and requirements for buffer zones and protective equipment. In many countries a National Registrar or other designated federal agency has authority to approve or revoke both individual use permits and overall registration of a pesticide, based on public health and environmental impacts. In most countries, jurisdiction over methyl bromide import and use is shared by at least two and up to eight separate agencies.

Countries responding from the Asian region reported more economic incentives and voluntary programmes than any other region (eight of 17 Asian countries reporting). Some non-Article 5(1) countries (11 of 25) also reported having economic incentives and/or voluntary programmes in place. Programmes specifically promoting alternatives to methyl bromide are reported by more than half of the respondents, with the majority of these programmes in Latin America (13) and Asia (12). Many of these programmes are supported through the Multilateral Fund, with a handful supported directly by the reporting government. Forty-three of the 97 respondents also reported more general programmes promoting pesticide use reduction, IPM or other forms of sustainable agriculture (see **Table 4-1**).

4-1. Laws Targeting Methyl Bromide as an Ozone Depleting Substance

Legislation specifically controlling ozone depleting substances is most common among non-Article 5(1) (industrialized) countries, according to the survey results. This is to be expected, given these countries' earlier phase-out schedule (see Section 2-2). Latin America, however, also has a significant number of countries reporting ODS legislation already in place or under development. Eight of the 27 Latin American countries responding to the survey reported existing or soon to be adopted ODS laws; in several instances, this legislation calls for an earlier methyl bromide phase out than required under the Montreal Protocol, e.g., Barbados, Colombia, Costa Rica, El Salvador and Venezuela.

Methyl bromide controls in ODS legislation vary from country to country. In some cases, laws simply require reporting to the National Ozone Unit (NOU) of all ODS use. In others, import quotas are used to control the volume of methyl bromide used in the country; still others prohibit use of methyl bromide after a certain date. Coordination between the agencies governing ODS phase out and national pesticide use systems was noted or required in only a few cases, e.g., Australia, Canada, Finland and Fiji.

Table 4-1: Regional Summary of Legislation, Controls and Incentives Affecting Methyl Bromide Use

(Number of Countries Reporting in Each Region)

Region (# of respondents)	ODS Legislation	Pesticide Legislation	Import and Licensing Controls	Economic Incentives/ Voluntary Programmes	Programmes for MB Alternatives	Programmes for Pesticide Reduction
Africa *(19)*	3	14	7	8	12	10
Asia & Pacific *(17)*	3	15	11	8	12	10
Latin Am. & Caribbean *(27)*	8	17	12	5	13	10
Middle East *(4)*	0	3	2	0	2	0
Other Article 5(1) Countries *(5)*	2	5	5	0	3	3
Non-Article 5(1) Countries *(25)*	18	19	20	11	11	9
Total *(97)*	**34**	**73**	**57**	**32**	**53**	**42**

4-2. Pesticide Control Laws

The majority of countries responding to the survey reported some form of national pesticide legislation and regulatory system that governs the use and/or import of all pesticides, including methyl bromide. Existing pesticide control systems may provide useful tools for further restricting methyl bromide use to meet commitments under the Montreal Protocol.[18] Methyl bromide is often in a "restricted use" category because of its acute toxicity, which often means that it is supposed to be tightly monitored and controlled. In some countries, use has been prohibited in response to concerns about toxicity and potential dangers to human health, e.g., Angola, Bahrain, Bhutan, Bolivia, Colombia, Iceland, and the Netherlands.

Pesticide laws are often administered by a Ministry of Agriculture and/or a National Registrar of Pesticides. In some cases, implementation of pesticide laws is carried out by a multi-agency body (e.g., Pesticide Control Board/Commission), such as is found in Antigua, Barbados, Belize, the Cook Islands, the Gambia, Kenya, Mexico, and Zimbabwe.

4-3. Restrictions on Imports

Controlling pesticide imports is one of the main methods of governing pesticide consumption for many countries, since pesticide production tends to be concentrated in a few countries. This is particularly true for methyl bromide. Very few companies produce methyl bromide, and they are located in China, France, Israel, Japan, Romania, Ukraine and the United States.[19] Import restrictions appear under both ODS legislation and pesticide laws, and take a variety of forms. Governments are required to report imports of methyl bromide under the Montreal Protocol, so all ODS legislation requires, at a minimum, an annual report on imports. Some countries require that importers specify the intended use of methyl bromide (soil, post-harvest, or QPS) and in some cases, documentation of QPS use is also required.

"Open import licensing" systems, established under pesticide control laws in many countries, require importers to register their imports with a national authority and may require that only properly trained, authorized companies/individuals be allowed licenses. Imports may also be restricted by volume, with a total quantitative cap and/or specific volumes per importing company allowed (see **Box 4.1**).

18 The level of enforcement of existing laws and capacity of the agencies involved to further tighten controls on methyl bromide must be considered when tapping existing pesticide control systems.

19 Methyl bromide producing companies include Albermarle (U.S.A.), Great Lakes Chemical (U.S.A.), Dead Sea Bromine (Israel), Elf Atochem (France), Teijin Chemicals (Japan), Sanko Chemicals (Japan), Lianyungang Seawater Chemical 1st Plant of Jiangsu Province and Changyi Chemical Plant of Shandong Province (China).

Box 4.1: Controlling How Much Methyl Bromide is Imported

Canada: Canada uses a "consumption allowance system" to meet its Montreal Protocol commitments. Under this system, Canada's maximum consumption as established by the Protocol is divided among Canadian companies. Each company receives allowances equal to the maximum quantity of methyl bromide it can import during a given year. Transfer of consumption allowances between companies is allowed; a transfer is only valid for one year. The tradable allowances system creates an incentive for companies to introduce alternatives as the unused portion of their allowances can be sold to other companies that have further needs for methyl bromide. This mechanism, coupled with a gradual reduction of maximum consumption, helps companies finance introduction of alternatives in sectors where they exist. It also increases the cost of methyl bromide use, thereby making alternatives more attractive economically.

Malta: An overall cap on methyl bromide imports (40 tonnes/year) has been established in Malta under the Pesticides Control of Importation, Sale and Use Act. Importers must have permit applications approved by the Department of Agriculture, and are required to follow health and safety guidelines during application.

New Zealand: Imports and QPS uses of methyl bromide must be reported under New Zealand's Ozone Layer Protection Regulations. These regulations also establish a base-year permitting system, which allows importers to import a decreasing amount each year from 1998 to 2005 when full phase out will be in effect. Reductions (from a 1991 baseline) are 25% in 1998, 35% in 1999, 45% in 2000, 60% in 2002, 75% in 2004, and 100% in 2005.

Philippines: The import volume of methyl bromide is restricted in the Philippines. Companies must justify any increase in imports, but are otherwise allowed to use similar volume as in previous years. Any company importing methyl bromide must report on how the imported volume was used before applying for another import license.

4-4. Permitting Requirements and Other Controls

In addition to import controls, many countries responding to the survey operate a use permitting system for pesticides or ODS. Pesticide permitting systems vary in their specificity; many require users to be trained and certified to handle hazardous/toxic substances, and some (e.g., Benin) specify quantities to be used for various treatments, allowable air concentrations and residues, etc. In many countries, use permits include specific product handling and labeling requirements. These regulations are often enforced by Ministries of Health, Labour or Social Services.

Some permitting requirements include a detailed application specifying intended use, and if approved, registration with a national authority and/or documentation of how the pesticide

was used at the end of the reporting period, e.g., Australia, Canada, Chile, Malaysia, Papua New Guinea, Spain, Thailand, Zimbabwe. In some cases, required permits include an import authorization from one agency and a use authorization from another, e.g., Costa Rica.

Use permits and reporting requirements may also be implemented at a state or provincial level, e.g., United States, Italy. Like permits in Benin, the more localized permits may outline very specific use requirements, including appropriate quantity to be applied, application procedures, protective "buffer zones" from adjacent structures (see **Box 4.2**) and other safety measures.

Box 4.2: Methyl Bromide Buffer Zones

California, U.S.A.: State law in California requires a distance ranging from 30-300 feet[20] (depending on the size of the plot and type of application) between a methyl bromide soil fumigation site and neighboring residences or schools. The size of the buffer zone is specified in permit applications approved by County Agricultural Commissioners.

The Netherlands: For fumigation of buildings, stocks or QPS, the Pesticide Law in the Netherlands requires that a distance of 100 meters between the fumigation site and houses or other occupied structures. Every fumigation must be reported to the Ministry of Social Affairs.

4-5. Incentives for Adopting Alternatives

In many countries, incentives for adopting alternatives are an important component of a methyl bromide phase-out strategy. Reported incentives include economic measures such as import duties, taxes or fees, government sponsored working groups, other voluntary programmes and support for alternatives research and training. Methyl bromide alternatives projects may also be supported by external sources such as the Multilateral Fund or bilateral donor agencies. In addition, many countries have existing agricultural training and outreach programmes which do not specifically target methyl bromide, but are designed to reduce the use of pesticides and/or promote sustainable alternatives.

4-5-1. Taxes and Fees

Taxes, duties and fees can encourage methyl bromide users to begin the transition to alternatives. This approach was used effectively for other ODS (such as CFCs) in the United States[21] and has been successfully adopted for methyl bromide in Australia.

In the Australian case, imports of methyl bromide are subject to an activity fee of US $60 per metric tonne payable to the Commonwealth at the end of each calendar quarter. This fee is in addition to the two-year license fee of US $7,000. In addition to the activity fees, Australian importers of methyl bromide have agreed to collect a voluntary levy on imports of this ozone depleting pesticide. The funds collected annually (approximately US $170,000) are deposited

20 Roughly 10-100 meters.

21 Methyl bromide was exempted from the tax requirement under the U.S. Clean Air Act.

in a private trust fund which is matched by Horticultural Development Corporation, and used to support research, development and testing of potential alternatives.

Examples of taxes and fees are also reported by officials in the Philippines and Senegal. In the Philippines, Presidential Decree 1144, which governs the registration and import of all pesticides in the Philippines, requires that importers of restricted pesticides (such as methyl bromide) must pay a slightly higher fee for import licenses. And in Senegal, Law No. 84-14, which controls use of farm chemicals, states that products considered alternatives to pesticides are exempt from import taxes, and similar exemptions are not available for toxic or otherwise polluting products such as methyl bromide.

4-5-2. Voluntary Programmes

Under ODS legislation many countries have convened working groups to coordinate phase-out efforts for all ODS, including methyl bromide. Working groups involve relevant and concerned agencies and research institutions, and in some cases (e.g., Australia, Canada, Chile, Costa Rica, South Africa and Sweden) also involve stakeholders from methyl bromide user groups, producers of alternative products and interested NGOs.

Voluntary programmes also include government and/or industry-sponsored training on alternatives to methyl bromide, such as training in alternative fumigant uses in Thailand and voluntary use reductions or adoption of alternatives in Mali and Mozambique. Public commitments by user groups to phase out methyl bromide are another example, such as a commitment by multinational companies in Vietnam to support the early phase out of methyl bromide and recommendations to the government from participants in a stakeholder meeting in Brazil for an accelerated phase-out schedule.

In the Brazil case, a workshop was held in 1996 on *Alternatives to Methyl Bromide in Agriculture*, with participants from various methyl bromide using sectors and the scientific community. In the "Florianópolis Letter on Methyl Bromide" (October 1996), workshop participants made the following specific recommendations to the government:

- Implement a freeze in the year 2000 based on 1993-95 consumption levels;
- Reduce methyl bromide use by 20% by 2001; and
- Prohibit all but quarantine, pre-shipment and essential uses by 2006.

The Canadian experience provides another example of an effective voluntary programme. Canada's Joint Industry-Government Working Group on Methyl Bromide Alternatives is composed of representatives from the federal government, private industry and environmental NGOs. The Working Group provides direction in the implementation of Canada's programme for the control of methyl bromide, including direction on the adoption of alternatives, research and development and the design of control strategies.

4-5-3. Support for Alternatives Research and Training

Several industrialized countries are providing significant support to research institutions for research and development of methyl bromide alternatives. In some cases, such as Australia and Canada, this research takes place in the context of a broad-based working group to ensure appropriate prioritization of research topics, involvement of stakeholders, widespread dissemination of results and appropriate and targeted training.

Many developing countries promote methyl bromide alternatives through existing agricultural extension and training programmes. These government-sponsored efforts target both soil fumigation and structural uses of methyl bromide, and often involve collaboration with industry/grower associations. Examples of structural fumigation training on methyl bromide alternatives are found in Benin, Fiji, Mozambique, Myanmar, Nepal and Thailand. Training and outreach efforts targeting soil uses have also been established in many countries, including Angola, Fiji, Ghana, Kenya, Malta and Sri Lanka.

In addition, some methyl bromide alternatives research and training is supported by outside agencies, either through the Multilateral Fund or bilateral donors. The majority of these efforts are in the early "demonstration trial" stage, although preliminary results are available for some projects (see **Box 4.3**).

Box 4.3: Methyl Bromide Alternatives Project Results

China: The China-Canada bilateral assistance Methyl Bromide Replacement Demonstration Program was conceived to help support China move towards the phase out of methyl bromide as a fumigant in storage applications, and to replace it with IPM systems which include the use of a Canadian-produced enhanced diatomaceous earth (EDE) product. EDE was identified as a particularly cost-effective alternative for China, which has a natural source of diatomaceous earth. The project, initiated in 1997, involved (1) field trials undertaken in collaboration with the Guangdong Institute of Cereal Science Research and the China National Research Center for Stored Grain in Chengdu, and (2) a workshop aimed at senior government officials and grain board authorities, as well as other government agencies responsible for grain storage and handling in China, technical field trial participants and Canadian project officials. The field trials found that the EDE product reduced the reproduction of three key pest species by 90-100% in the storage of both wheat and rice.

Cuba: An investment project is currently underway in Cuba to phase out the use of 80 metric tonnes of methyl bromide used in the production of transplants in traditional tobacco seedbeds. This is the only use of methyl bromide in the country. The project promotes a combination of biocides and soilless cultivation using a floating tray system. This technology has already been tested in Cuba with excellent results. Cuban officials have committed to phase out use of methyl bromide as a result of this project. Local enterprises, cooperatives and farmers' groups have have agreed to replace methyl bromide with the biocide/soilless float tray system technology. Two training programmes are underway to transfer the technology to more than 2,000 farmers and cooperative personnel. The project is being implemented by UNIDO, in close cooperation with MINVEC (Ministerio para la Inversion Extranjera y la Colaboración Económica de Cuba) and the OTOZ (Oficina Tecnica de Ozono) of the CITMA (Ministerio de Ciencia, Tecnología y Medio Ambiente).

4-5-4. Complementary Pesticide Use Reduction Programmes

Public awareness of the dangers of pesticides is growing. Some governments have responded to these concerns by establishing a range of projects promoting more environmentally sound alternatives which do not threaten human health. Many countries report having a national programme in place to promote IPM and/or reduced pesticide use. Several report programmes specifically researching and promoting organic production methods, e.g., Belgium, Brazil, Chile, Estonia,[22] Ghana, Kenya,[23] Paraguay and Thailand.

These programmes, while in many cases relatively limited in scope, can offer significant contributions to efforts to replace methyl bromide. Agricultural and training expertise from such programmes represent potential tools and resources to be integrated into specific efforts to promote methyl bromide alternatives. While the focus of complementary programmes may be on crops which do not use methyl bromide, many of the approaches (both technical approaches and training methods) may be transferable (see **Box 4.4**).

The programmes reported here do not necessarily reflect all of the activities in each country, since programmes supported by bilateral agencies and international and local NGOs may not be captured in the survey responses. In addition, in some cases the government agency responding to the survey may not be fully aware of complementary programmes implemented by other government agencies.

Box 4.4: Examples of Reported Pesticide Use Reduction/ IPM Approaches

Many survey respondents reported programmes promoting reduced use of pesticides and/or IPM approaches. Some of these programmes are national in scope while others are specific to a region or a crop. Several countries reported the establishment of Farmer Field Schools to promote IPM. This participatory, field-based approach to farmer education and training has been particularly effective throughout Asia and in many parts of Africa.

Below are some of the specific alternative pest management techniques reported in the survey. The programmes described by respondents often involve a combination of techniques, and some involve crops and pest management approaches directly applicable to the promotion of methyl bromide alternatives.

Agricultural diversification
Beneficial bacteria
Beneficial fungi
Biofumigation
Biological soil management
Botanical plant extracts (e.g., neem)
Composting
Integrated pest management
Intercropping
Micro-pesticides
Non-chemical pest control methods
Organic farming and marketing
Resistant varieties
Solarization
Trap cropping
Vapor heat post-harvest treatment systems

22 To be established in 2000.

23 The programme is operated by the Kenyan Institute for Organic Farming, an NGO.

Section 5. Country Reports by Region

Survey results are summarized for each country in this section, with countries grouped into five regions: Africa, Asia and the Pacific, Latin America and the Caribbean, the Middle East, Other Article 5(1) Countries and Non-Article 5(1) Countries. Countries are listed alphabetically within each region (see **Appendix C** to quickly find a specific country listing).

A summary table is provided for each region, indicating which countries reported the following:

- legislation specific to ozone depleting substances;
- pesticide legislation;
- import and licensing controls governing methyl bromide;
- economic incentives or voluntary programmes encouraging phase out;
- education or training programmes specifically promoting methyl bromide alternatives; and
- more general programmes promoting pesticide use reduction or sustainable agriculture.

Within each country listing, the consumption and production of methyl bromide is included when figures are available.[24] A description is then given of relevant legislation and regulations reported, along with agencies responsible for implementing these policies. Any reported economic incentives or voluntary programmes are described, along with programmes promoting methyl bromide alternatives, other pesticide reduction programmes, and policy barriers to a methyl bromide phase out that were cited by respondents.

Full contact information for relevant agencies is provided for each listing to encourage direct exchange of information and experiences.

24 Use and production figures included are from the following sources: (1) methyl bromide consumption officially reported to the Ozone Secretariat, as listed in the *Report of the Methyl Bromide Technical Options Committee, 1998 Assessment of Alternatives to Methyl Bromide* (UNEP, 1998) and (2) *Review of Official Sources of Data on Methyl Bromide Consumption*, Touchdown International, Prospect, Tasmania, 1998. In some cases, additional information provided in survey responses is included.

5-1. AFRICA

In 1996, Africa's use of methyl bromide was approximately 25% of use among Article 5(1) countries, and just over 6% of global consumption. Most use in the region is concentrated in a handful of countries, including Morocco, South Africa, Zimbabwe, Egypt and Kenya. In several of these countries, use has grown in recent years despite the upcoming freeze and future controls and phase out of methyl bromide use agreed to under the Montreal Protocol.

Only Chad, Congo and the Gambia reported legislation specific to ODS. Most responding countries have legislation and regulations controlling the import and use of pesticides, including methyl bromide, and eight of the 19 respondents reported some type of economic incentive or voluntary programme supporting the phase out of methyl bromide. Twelve countries have programmes in place specifically promoting alternatives to methyl bromide, and 10 reported broader programmes promoting IPM and other pesticide use reduction approaches.

Table 5-1: Africa Country Report Summary

Country	Reported Use (tonnes) 1995/1996	ODS Legislation	Pesticide Legislation	Import and Licensing Controls	Economic Incentives/ Voluntary Programmes	Programmes for MB Alternatives	Programmes for Pesticide Reduction
Angola†	N/A		X			X	
Benin	3.2 / N/A		X			X	X
Burkina Faso†	0 / 0		X				X
Chad†	0 / 0	X††	X††				
Central African Republic	0 / 0	X††	X	X	X	X	
Comoros	N/A / 0		X††				X
Congo	0 / 0		X		X††	X††	
Gambia	0 / 0	X††	X	X	X	X	X
Ghana†	N/A / 0					X	X
Kenya	225 / 394.5		X	X	X	X	X
Lesotho	0.5 / 0.3						
Mali†	0 / 0						
Morocco	1,298 / 1,085		X	X		X	
Mozambique†	8 / 4.5		X		X	X	X
Niger†	0 / 0						
Senegal	1.2 / 1.2		X		X	X	X
South Africa	1,007 / 1,265		X	X	X	X	
Tanzania	0 / 10.8		X	X			X
Zimbabwe	675 / 707			X	X	X	X

N/A *Not available.*
† Registration cancelled, imports prohibited, or no use reported
†† In development or under consideration.

Angola

Reported Use: Not available.

Legislation: Regulation of the Production, Importation, Domestic Sale and Use of Pesticides, August 28, 1965, governs the use of methyl bromide.

Regulations: Methyl bromide's registration has been cancelled; it had previously been allowed for restricted sale.

Implementing Agencies: National Ministry of Agriculture and Forests, Department of Plant Protection (MINADER).

Economic Incentives/ Voluntary Programmes: None listed.

MB Alternatives Training/Outreach: The Department of Plant Protection supports alternatives to methyl bromide through its programmes promoting integrated control of pests utilizing all components of the agroecosystem, cultural controls biological controls, and some pesticide use.

Policy Barriers: None listed

Other Training: None listed.

Contact: Sidonio Mateus, Engenheiro Agronomo
National Ministry of Agriculture and Forests
Organizaçâo, Departamento de Protecçâo de Plantas
Avenida Codt. Gika C. Postal No 527
Luanda, Angola
Tel: 244-323449

Benin

Reported Use: 22.8 tonnes reported in 1994, 3.2 tonnes reported in 1995.

Legislation: Decree No. 592/MDR/DC/CC/CP (1995) and Decree No. 188/MDR/DC/CC/CP (1993) govern the use of methyl bromide.

Regulations: Decree No. 592 establishes clear guidelines for use of methyl bromide as a structural/post-harvest fumigant, including maximum residue content, guidelines on products and packages, companies or legal entities which are allowed to stock methyl bromide, admissible concentrations in the air, and quantities to be used for treatment. Decree No. 188 establishes similar guidelines for methyl bromide use in the agricultural sector.

Implementing Agencies: Plant Protection Service, Ministry of Rural Development.

Economic Incentives/ Voluntary Programmes: None listed.

MB Alternatives Training/Outreach: Structural post-harvest fumigation technicians receive annual training. Agencies involved in training are the Plant Protection Service, Centre d'Action Regional pour le Developpement Rural (CARDER) and private distribution companies.

Policy Barriers: None listed.

Other Training: Use of neem oil for treatment of pests, aqueous extract of neem seeds for market gardening, use of flavoviride metarisium against grasshoppers in the south and north of the country and use of micro-pesticides against the green (manioc) acaridan.

Contact:
M. Abdoulaye Toko, Chief
Service Protection des Vegétaux
Ministére de l'Environnment, de l'Habitat et de l'Urbanisme
B.P. 58 Port-Novo, Benin
Tel: 229-214413
Fax: 229-214413
Email: isys@syfed.bj.refer.org.

Burkina Faso

Reported Use: No use reported for 1994-96.

Legislation: Law No. 005/97 ADP, Environmental Code (1997) governs the use of methyl bromide. The law's objectives are to improve and protect the environment.

Regulations: Health, safety and use requirements under Public Health Code and Environment Code, labeling requirements under the Environment Code.

Implementing Agencies: Ministries of Health, Environment and Water, Agriculture and Commerce.

Economic Incentives/ Voluntary Programmes: None listed.

MB Alternatives Training/Outreach: None listed.

Policy Barriers: Inadequacy of legislation, coordination and dialogue among agencies.

Other Training: Various programmes supporting pesticide use reduction under the Ministry of Agriculture, Ministry of Scientific Research, Secondary and Higher Education.

Contact:
Salo R. Bruno, Director of Pollution Prevention
Ministry of Environment and Water
B.P. 7044 Ouagadougou 03
Burkinå Faso
Tel: 226-31-1669
Fax: 226-31-6491

Central African Republic

Reported Use: No use reported in 1995 or 1996.

Legislation: National legislation promoting the phase out of methyl bromide is currently in development.

Regulations: Regulations are currently in place controlling imports through a permitting system. Fumigators must be licensed applicators.

Implementing Agencies: Ministry of Commerce and Industry, National Ozone Bureau; Ministry of Finance, National Ozone Bureau.

Economic Incentives/ Voluntary Programmes: Incentives to adopt alternatives to methyl bromide include reduction of taxes for the import of alternatives and financial aid to users that will be financially affected by the phase out.

MB Alternatives Training/Outreach: The National Ozone Bureau and the National Technical Group sponsor training and awareness-raising seminars, and have implemented a project to train customs agents at a regional level. Participants include economically affected users and NGOs.

Policy Barriers: None listed.

Other Training: None listed.

Contact:
Legislation and Measures of Authorization
National Ozone Bureau
B.P. 828 Bangui
Central African Republic
Tel: 236-61-1942
Fax: 236-61-4918

Chad

Reported Use: No use reported for 1994-96. Government officials report that methyl bromide has never been used in Chad.

Legislation: Two laws which are currently under consideration would govern the importation and use of methyl bromide: Law No. 14/PR/95 (1995) regarding crop protection, and Law No. 14/PR/98 (1998) regarding environmental protection.

Regulations: Import restrictions on methyl bromide as outlined in the two laws above.

Implementing Agencies: Ministry of Agriculture; Ministry of Environment and Water Resources.

Economic Incentives/ Voluntary Programmes: None listed.

MB Alternatives Training/Outreach: None listed.

Policy Barriers: None listed.

Other Training: None listed.

Contact: Ali Ngaram, Coordinator
National Ozone Bureau
Ministry of Environment and Water Resources
P.O. Box 4205 N'Djamena
Chad
Tel: 235-52-3128
Fax: 235-52-4470 or 3839

Comoros

Reported Use: No use reported. Comoros conducted a national survey of methyl bromide use in 1997-1998 (technical and legislative fields). Survey results were presented at UNEP's Regional Workshop on Methyl Bromide in French-Speaking Africa (Niamey, 15-18 April 1998). Results indicate that there has been no use or stocks of methyl bromide in the Comoros since national independence (1975). The reason for cessation of methyl bromide use is not clear.

Legislation: There is no specific legislation on pesticides or methyl bromide use. A project has been established to support substitutes for pesticides in agriculture (PAFIA). One of the project objectives is to create legislation promoting pesticide alternatives (to be introduced in early 1999).

Regulations: None listed.

Implementing Agencies: Ministry of Environment.

Economic Incentives/ Voluntary Programmes: None listed.

MB Alternatives Training/Outreach: None listed.

Policy Barriers: None listed.

Other Training: The PAFIA project was established in response to a government decision to disengage from pesticides management. PAFIA is an independent body promoting agricultural alternatives. Current training programmes focus on biological soil management and non-chemical pest control methods.

Contact:
Mr. Mohamed Yahaïya
Chef de Service de l'Aménagement du Territoire
Direction Général de l'Environnement
et Responsable National Action Ozone-Comores
B.P. 1024 Moroni Comores
Fax: 269-73-22-22

Congo

Reported Use: No use reported from 1994-1996.

Legislation: None listed.

Regulations: Pesticide registration laws apply to methyl bromide.

Implementing Agencies: Ministry of Industry and the Environment.

Economic Incentives/ Voluntary Programmes: The National Ozone Office is in the process of developing a voluntary programme to reduce methyl bromide use.

MB Alternatives Training/Outreach: A methyl bromide alternatives project is current being developed.

Policy Barriers: None listed.

Other Training: None listed.

Contact:

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Ministére de l'Industrie Minière et de l'Environnement
B.P. 958 Brazzaville
Congo
Tel: 242-81-5979
Fax: 242-81-0330

Gambia

Reported Use:

No use reported for 1994-96. Methyl bromide was historically used in greenhouses in flower production and as a soil fumigant. All the methyl bromide now found in the Gambia is stored as an obsolete product (by the Gambia Groundnut Council and Makumbaya Farms), ready to be disposed of through the FAO/Industry Disposal project. Disposal is scheduled for 1999.

Legislation:

The Hazardous Chemicals and Pesticides Control and Management Act (HCPCMA), April 1994. The primary objectives of the Act are to manage and control the importation, sale, use/application, distribution and disposal of hazardous chemicals and pesticides in the country. The Act does not specifically address methyl bromide, but a multisectoral Board established under the act severely restricted its use in 1995. Board members include the National Environment Agency (NEA), the Department of Agricultural Services, the Department of Health Services, the Department of Livestock Services, the National Agricultural Research Institute, the Attorney General's Chambers, the Customs and Excise Department and the Gambia Chamber of Commerce and Industries.

Regulations:

Regulations under the Act address registration, licensing, importation, distribution and other aspects of pesticide use. Since its classification as a severely restricted pesticides in 1995, only professionals wearing protective clothing may apply methyl bromide. All pesticides entering the country require labeling that conforms with the FAO code of conduct. All importers of pesticides are required to pay 0.5% of the CIF value of their pesticide consignment before offloading. This is preceded by issuance of a clearance by the Registrar of Pesticides and Chemicals of the National Environment Agency. No use reporting is required.

In addition, the Ozone Programme of the NEA is establishing regulations to address the phase out of ODS, including methyl bromide.

Implementing Agencies:

The Hazardous Chemicals and Pesticides Control and Management Board, c/o the Registrar of Pesticides and Chemicals; National Environment Agency.

Economic Incentives/ Voluntary Programmes: The Ozone Depleting Substances Working Group is responsible for reducing use of ODS, including methyl bromide. Both private and public sector organizations are represented on the Working Group, which collaborates to review relevant ODS documents, prepare proposals for regulatory and legislative measures for the phase out of ODS, and implement the government's framework strategy for the protection of the ozone layer.

MB Alternatives Training/Outreach: To a lesser extent, the private sector (the Gambia Groundnut Council, Radville Farms) train their personnel on the use of pesticides, including methyl bromide and phostoxin. Extension workers, farmers and workers (in the private sector) participate in such trainings.

Policy Barriers: None listed.

Other Training: The Agricultural Pest Management Unit (APMU) of the Department of Agricultural Services conducts farmer training on the safe use of pesticides and their alternatives, including the use of soil treatment alternatives. The APMU conducts village-based farmer training courses on pesticides and IPM methods.

Contact:

Mr. M.B.S. Canteh
Head of Agricultural Pest Management Unit (APMU)
Department of Agricultural Services
Yundum, The Gambia
Tel: 220-472758 or 472207

Fatoumata Jallow Ndoye
Registrar of Pesticides and Chemicals
National Environment Agency
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Ghana

Reported Use: No use reported in 1996. Ghana has not imported methyl bromide since 1989, when the cocoa sector stopped using the pesticide.

Legislation: None listed.

Regulations: None listed.

Implementing Agencies: None listed.

Economic Incentives/ Voluntary Programmes: None listed.

MB Alternatives Training/Outreach: Plant Protection and Regulatory Services Department outreach programmes tend to discourage the use of methyl bromide through promotion of suitable alternative products and approaches.

Policy Barriers: None listed.

Other Training: Several programmes exist, including Integrated Crop Protection/IPM programmes using Farmers' Field Schools and Participatory Technology Development approaches for control of pests in production of vegetables, cowpeas, plantains and rice. Organic farming and marketing programmes have also been established, including research of a variety of methods such as intercropping, trap cropping, and botanical plant extracts (e.g. neem).

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Kenya

Reported Use: 225 tonnes reported in 1995, 394.5 tonnes reported in 1996.

Legislation: The Pest Control Products Act, Chapter 346 of the Laws of Kenya (1982) regulates the import, export, manufacture, distribution and use of pest control products.

Regulations: An import license is required to import methyl bromide. Proof of intended use and technical capacity is required. An export license is also required, as are appropriate product labeling and adherence to health and safety standards. As for all ODS, methyl bromide imports and exports are reported to the Ozone Secretariat.

Implementing Agencies: Pest Control Products Board.

Economic Incentives/ Voluntary Programmes: Market forces linked to "Codes of Conduct on Flower Production and Trade" now operating in some industrialized countries tend to discourage the use of a controlled pesticides such as methyl bromide.

MB Alternatives Training/Outreach: Several activities have been carried out by the NOU alone or in conjunction with NGOs. Participating agencies/institutions include the NOU under the Ministry of Environmental Conservation;

Horticultural Crops Development Authority under the Ministry of Agriculture; Health and Environment Watch Africa (HEWA — a Kenyan NGO); and Consumer Information Network (CIN — a NGO). Relevant publications are distributed during the workshops to raise awareness of methyl bromide as a controlled chemical.

Policy Barriers: None listed.

Other Training: A local NGO known as the Kenya Institute of Organic Farming (KIOF) advocates organic farming rather than use of chemicals.

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The Secretary
Pest Control Product Board
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Nairobi, Kenya

Lesotho

Reported Use: 0.5 tonnes reported in 1995, 0.3 tonnes reported in 1996. Lesotho uses little methyl bromide because agricultural production is mainly on small subsistence farms.

No additional information provided.

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Bore Motsamai, Principal Secretary
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PO Box 10993
Maseru, Lesotho 1000

Mr. S.P. Rabogha, Senior Meteorologist
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Mali

Reported Use: No methyl bromide use. A cereal storage company which had tested the product discontinued use because of its toxicity.

No additional information provided.

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Morocco

Reported Use: 1,298 tonnes reported in 1995, 1,085 tonnes reported in 1996.

Legislation: Law No. 666-87 (1997) regulates the use of methyl bromide in agriculture for soil fumigation. Two additional laws (1952) require the Director of Labor and Social Issues to publicize the dangers of methyl bromide poisoning and recommend appropriate medical treatment for methyl bromide poisoning cases.

Regulations: As outlined in Law No. 666-87, importation of methyl bromide is authorized by the Plant Protection Service. Authorization is valid for one year, and granted only to companies meeting regulatory requirements. Soil fumigation is conducted only by companies with certified equipment, and quarantine treatments must be conducted in fumigation chambers controlled by the Plant Protection Service.

Implementing Agencies: Ministry of Agriculture and Land Reform, Plant Protection Service; Director of Labor and Social Issues.

Economic Incentives/ Voluntary Programmes: None listed.

MB Alternatives Training/Outreach: A demonstration project on alternatives for soil uses of methyl bromide (strawberries and tomatoes) involves UNIDO, the Plant Protection Service, the Institute of Agronomy and Veterinary Sciences, and professional associations. An additional project is underway with GTZ for production of citrus fruits and tomatoes, and a future project with GTZ is planned on alternatives to methyl bromide for cucumber and tomato production.

Policy Barriers: Some countries require pre-shipment methyl bromide treatment for export of goods to their countries (e.g., for spices and artifacts).

Other Training: None listed.

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Mozambique

Reported Use: Eight tonnes reported in in 1995, 4.5 tonnes reported in 1996.

Legislation: Pesticide Regulation (Diploma Ministerial 88/87) governs pesticide imports.

Regulations: Methyl bromide is not currently registered. All pesticide imports are governed by the Pesticide Regulation.

Implementing Agencies: Ministry of Agriculture, Department of Plant Protection; Ministry of Health.

Economic Incentives/ Voluntary Programmes: Fumigation companies switched voluntarily to phosphine for fumigation of stores/imported grain.

MB Alternatives Training/Outreach: Seminars and meetings have been conducted by plant quarantine services to increase awareness of methyl bromide issues and use of alternative fumigants. Participants have included fumigation companies, plant quarantine inspectors and warehouse owners.

Policy Barriers: Phytosanitary inspection and quarantine regulations previously required use of methyl bromide (Diploma Ministerial No. 134/92), specifically for maize grain imported into Mozambique. Phosphine is now accepted as an alternative quarantine treatment.

Other Training: Screening and selection of tobacco varieties resistant to nematodes and soil borne fungal pathogens; training of fumigation companies on phosphine fumigation.

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Niger

Reported Use: No use reported from 1991-1996.

No additional information provided.

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Senegal

Reported Use: 1.2 tonnes reported in 1995 and 1996.

Legislation: Law No. 84-14 (1984) controls the use of farm chemicals.

Regulations: None listed.

Implementing Agencies: Plant Protection Authority, Ministry of Agriculture.

Economic Incentives/ Voluntary Programmes: Alternative products are exempt from import taxes. Similar exemptions are not available for polluting products.

MB Alternatives Training/Outreach: Investment project to eliminate the use of methyl bromide in groundnut fumigation at Novasen Ltd., coordinated by UNIDO and the Ministry of Environment.

Policy Barriers: None listed.

Other Training: Programmes exist to promote biological controls, including use of bacteria and beneficial fungi. Rodale International (a NGO) is also experimenting with use of neem extracts.

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South Africa

Reported Use: 1,007 tonnes reported in 1995, 1,265 tonnes reported in 1996. Methyl bromide is primarily used for soil fumigation, with a small portion used for QPS and for the fumigation of structures and grain storage.

Legislation: The Registrar of Pesticides Act, No. 36 of 1947, applies to methyl bromide. The following national phase-out schedule has been established, in accordance with agreements under the Montreal Protocol[25]:

January 1, 2001 – consumption limited to 75% of 1991 usage
January 1, 2005 – consumption restricted to 50% of 1991 usage
January 1, 2010 – consumption restricted to zero (with critical agricultural uses and QPS uses exempted)

Regulations: Regulations developed under the Registrar of Pesticides Act specify that fumigation may only be carried out by registered technicians and that the soil to be fumigated must be covered with Virtually Impenetrable Film. Imports of methyl bromide are controlled under the Import and Export Regulations administered by the Department of Trade and Industries. Small two-pound containers have been banned.

Implementing Agencies: Department of Environmental Affairs and Tourism; Department of Agriculture; Department of Trade and Industries.

Economic Incentives/ Voluntary Programmes: If needed to meet the phase-out deadlines, the Department of Trade and Industries will establish an environmental levy on all imports of methyl bromide as a disincentive for using the pesticide. A Methyl Bromide Working Group representing the various affected parties has been established to assist the government in implementing the Protocol requirements.

MB Alternatives Training/Outreach: The Department of Agriculture and the Agricultural Research Council will establish a project evaluating replacement products for methyl bromide in South Africa. The government will also create a public awareness programme for industry, the agricultural sector and the public regarding methods to decrease methyl bromide use.

Policy Barriers: None listed.

Other Training: None listed.

25 South Africa's status under the Montreal Protocol was reclassified in 1997 from a non-Article 5(1) country to an Article 5(1) country, with the agreement that they follow the phase-out schedules agreed to prior to this reclassification. South Africa's phase-out schedule for methyl bromide is thus the schedule for non-Article 5(1) countries agreed to prior to the changes adopted at the Ninth Meeting of the Parties in September, 1997.

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Tanzania

Reported Use: No use reported in 1995, 10.8 tonnes reported in 1996.

Legislation: The Plant Protection (Fumigation) Rules (1968) govern the use of methyl bromide on exported produce, and the Tropical Pesticides Research Institute Act (1979) governs the import of methyl bromide.

Regulations: The Plant Protection Rules outline regulations for the inspection and preparation of produce to be exported, including rules for fumigation with methyl bromide.

Implementing Agencies: Ministry of Agriculture and Cooperatives, Plant Protection Division; Tropical Pesticides Research Institute.

Economic Incentives/ Voluntary Programmes: None listed.

MB Alternatives Training/Outreach: None listed.

Policy Barriers: None listed.

Other Training: The Tanzania-Germany IPM Programme and the National Programme for Food Security (FAO) promote IPM techniques.

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Fax: 255-57-8217

Zimbabwe

Reported Use: 675 tonnes reported in 1995, 707 tonnes reported in 1996.

Legislation: None listed.

Regulations: Methyl bromide is subject to licensing requirements on import and sale of pesticides, as well as health and safety requirements including use of protective gear. Potential pesticide users must describe intended use and request Ministry approval. Once approved, the user must sign a poisons register upon acquiring the pesticide. In addition, users/manufacturers must label methyl bromide products with a purple triangle and indicate the toxicity level.

Implementing Agencies: Ministry of Health and Child Welfare, Hazardous Substances Department; Plant Protection Research Institute.

Economic Incentives/ Voluntary Programmes: The National Ozone Committee is a multi-agency group established to raise public awareness about ozone depletion, draft ODS regulations, and approve action plans submitted by the national ozone office. Participating Ministries include the Ministry of Health and Child Welfare, Ministry of Industry and Commerce, Ministry of Home Affairs, Ministry of Legal and Parliamentary Affairs, Ministry of Posts and Telecommunications, Department of Meteorology, Department of Mining, Department of Customs, Ministry of Energy and Transport, Ministry of Lands and Agriculture, Ministry of Education, Sports and Culture, Ministry of Higher Education and the Scientific Liaison Office.

MB Alternatives Training/Outreach: Demonstration project on alternatives to methyl bromide in tobacco seedbeds; demonstration project on alternatives to methyl bromide in grain storage (to be submitted to the Multilateral Fund's Executive Committee in 1999). Half-year reports on projects must be submitted to the National Ozone Unit.

Policy Barriers: None listed.

Other Training: Various programmes conducted by the Hazardous Substances Board Phase-Out Programme (under the Ministry of Health and Child Welfare).

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5-2. Asia and the Pacific Region

The Asia and Pacific region consumed an estimated 4,177 tonnes of methyl bromide in 1996. This represents approximately 24% of use among Article 5(1) countries, and 6% of global use. The countries consuming the greatest volumes of methyl bromide in Asia are China, the Korean Republic, Thailand and Vietnam.

Three countries in Asia reported legislation specific to ODS: Fiji, Pakistan and Vietnam. Almost all reported pesticide legislation governing methyl bromide use, the majority with import and licensing controls. Eight of the 17 responding countries have some type of economic incentive or voluntary programme in place discouraging the use of methyl bromide, and 12 reported programmes specifically promoting methyl bromide alternatives. Ten countries reported other programmes encouraging the use of alternatives to pesticides, IPM and sustainable agriculture.

Table 5-2: Asia and the Pacific Region Country Report Summary

Country	Reported Use (tonnes) 1995/1996	ODS Legislation	Pesticide Legislation	Import and Licensing Controls	Economic Incentives/ Voluntary Programmes	Programmes for MB Alternatives	Programmes for Pesticide Reduction
Bhutan†	N/A						
China	810 / 1,600		X	X	X	X	
Cook Islands	N/A		X	X			X
Fiji	N/A	X	X	X	X	X	X
Indonesia	50 / 50		X	X	X	X	X
Korea, Republic of	1,245 / 1,211		X				
Malaysia	55.8 / 41.5		X		X	X	X
Myanmar	16 / 79.2		X			X	
Nepal†	N/A		X	X		X	X
Pakistan†	0 / 0	X				X	
Papua New Guinea	1.2 / 1		X	X			
Philippines	68.3 / 53.7		X	X	X	X	X
Samoa	N/A		X	X	X	X	X
Solomon Islands	N/A		X				X
Sri Lanka	6 / 13.8		X	X		X	
Thailand	567 / 642		X	X	X	X	X
Vietnam	310 / 300	X	X	X	X	X	X

N/A *Not available.*
† Registration cancelled, imports prohibited, or no use reported

Bhutan

Reported Use: Bhutan has halted all use and importation of methyl bromide, based on the recommendation of the National Plan Protection Centre, the focal body for pesticides under the Ministry of Agriculture.

No additional information provided.

Contact:

Khandu Wangchuck, Minister
Ministry of Trade and Industry
Royal Government of Bhutan
Tashichho Dzong, Thimphu
Bhutan

China

Reported Use: 810 tonnes reported in 1995, an estimated 1,600 tonnes reported in 1996, an estimated 2,260 tonnes reported in 1997. China reported 1,100 tonnes of methyl bromide production in 1996.

Legislation: None listed.

Regulations: Pesticide Management Regulation 216 (1997) requires import and production of pesticides to be registered with the State Ministry of Agriculture, and requires that all pesticides produced, imported or sold in China, including methyl bromide, obtain a pesticide registration certificate from the Ministry of Chemical Administration. In addition, Notification on Implementing License for Import and Export of Pesticides and Notification of Temporal Approval Procedure for Import of Pesticides (both issued in 1985) require import licensing. In 1997, the construction of new methyl bromide production facilities was prohibited.

Implementing Agencies: Relevant agricultural and chemistry departments of the government implement the pesticide management and import programmes.

Economic Incentives/ Voluntary Programmes: UNEP is coordinating the development of a strategic framework to control methyl bromide growth in China. China established a working group in July 1998 to address the methyl bromide issue and help develop a strategic framework for phasing out methyl bromide. Participants include the State Environmental Protection Administration, Ministry of Agriculture, State Administration of Petroleum and Chemistry Industries, the State Administration of Internal Trade, and research institutes affiliated with these agencies.

MB Alternatives Training/Outreach: Two projects have been conducted and are underway in China: (1) the China-Canada bilateral assistance Methyl Bromide Replacement Demonstration Program, which focuses on the phase out of methyl bromide as a fumigant in storage applications, and (2) a UNIDO coordinated project focusing on soil fumigation uses of methyl bromide in several crops. China is also working with UNEP and several bilateral assistance agencies to develop training programs as part of a strategic framework for the coordinated phase out of methyl bromide.

Policy Barriers: None listed.

Other Training: None listed.

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Cook Islands

Reported Use: The use of methyl bromide in the Cook Islands is primarily for plant quarantine treatment of exports and imports. A survey conducted in August 1998 found about 40 litres of the pesticide being stored by the Quarantine Division of the Ministry of Agriculture.

Legislation: Pesticide Act, 1987 requires all pesticides to be registered before use.

Regulations: The Pesticide Act establishes a Pesticide Board to assess and evaluate applications for pesticide registration, determine the conditions of use of any pesticides, cancel registration of any pesticide at its discretion and promote the efficient and safe use of pesticides. The Act also controls the importation of all pesticides.

Implementing Agencies: The Pesticide Board, made up of representatives from the Ministry of Agriculture, Ministry of Health, Environment Service and an importer of pesticides as nominated by the Ministers.

Economic Incentives/ Voluntary Programmes: None listed.

MB Alternatives Training/Outreach: None listed.

Policy Barriers: Plant Quarantine Regulation, 1992, requires the use of methyl bromide on some commodities.

Other Training: Various training efforts to promote alternatives to pesticides, including the "Taau Taku Tita" ("Our Rubbish") programme designed to promote composting of organic materials. There is resistance, however, to substituting slower-acting alternatives for pesticides.

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Fiji

Reported Use: Not available.

Legislation: Ozone Depleting Substances (ODS) Act (1998) regulates the import, export and sale of ODS. The Occupational Health and Safety (OHS) Act (1996) governs health and safety in the workplace. The Pesticides Act (1971) regulates the imports, sale and use of pesticides.

Regulations: The OHS Act controls methyl bromide application conditions including the stipulation that only trained personnel can handle methyl bromide and stocks must be stored properly. The Pesticide Act requires all pesticides imported into the country to be registered with the Registrar of Pesticides. Permits are also required for use under the Pesticide Act, and the Registrar of Pesticides will disallow importation and use of methyl bromide after 2005.

Implementing Agencies: Ministry of Local Government, Housing and Environment, Department of Environment; Ministry of Labour and Industrial Relations; Ministry of Agriculture, Forestry and Fisheries; Customs Department, Quarantine Section; Registrar of Pesticides.

Economic Incentives/ Voluntary Programmes: National Occupational Health and Safety Advisory Board; Consultative Committee on Ozone Depleting Substances.

MB Alternatives Training/Outreach: Several programmes support the adoption of alternatives, including the South Pacific Commission (SPC) Integrated Pest Management Scheme and the South Pacific Regional Environmental Programme (SPREP). Trials of "hot temperature forced air" treatment of export crops are supported by the Australian Government.

Policy Barriers: The ODS Act does not yet reflect the new Montreal Protocol schedule and the commitment of Registrar to ban imports and use after 2005; the government intends to update the legislation.

Other Training: The SPC and SPREP alternatives programmes address various aspects of sustainable agriculture and IPM.

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Ministry of Labour and Industrial Relations
Box 2216, Government Building
Suva, Fiji

Indonesia

Reported Use: 50 tonnes reported in both 1995 and 1996.

Legislation: The Decree of the Minister of Agriculture No. 322/kpts/TP.270/4/1994 on the Restriction and Permission of Methyl Bromide Use was established to reduce the use of methyl bromide in the country.

Regulations: Import restrictions for methyl bromide under Ministry of Trade and Industry Decree No. 410/MPP/Kep/9/1998, and permitting requirements under Ministry of Agriculture Decree No. 711/Kpts./TP,270/97. Safety and handling requirements are stipulated by the Minister of Agriculture, as are use reporting requirements for restricted pesticides.

Implementing Agencies: Pesticide Committee of the Ministry of Agriculture; Ministry of Trade and Industry; Ministry of Health; Ministry for Environment.

Economic Incentives/ Voluntary Programmes: Indonesia's Country Programme for ODS Phase Out is coordinated by the State Ministry for Environment.

MB Alternatives Training/Outreach: Training on ODS phase-out strategies is coordinated by the State Ministry for Environment, and a demonstration project is in

progress with support from the World Bank through the Multilateral Fund.

Policy Barriers: Demand for methyl bromide is still quite high, and it is recognized as the least expensive fumigant available. Appropriate alternatives are still not viewed as cost-effective.

Other Training: National workshops and seminars are held regularly on IPM implementation, and the government supports IPM training and field schools for officials and farmers.

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Korea, Republic of

Reported Use: 1,245 tonnes reported in 1995, 1,211 tonnes reported in 1996.

Legislation: The Agrochemicals Management Act (1995) governs the use of methyl bromide.

Regulations: None listed.

Implementing Agencies: Rural Development Administration.

Economic Incentives/ Voluntary Programmes: None listed.

MB Alternatives Training/Outreach: None listed.

Policy Barriers: The National Plant Quarantine Service requires fumigation of imported or exported grains, fruits and vegetables.

Other Training: None listed.

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Malaysia

Reported Use: 55.8 tonnes reported in 1995, 41.5 tonnes reported in 1996, 46 tonnes reported in 1997.

Legislation: Pesticide Act 149 (1974) and the Hydrogen Cyanide Act 260 (1953, revised 1981) control import and usage of methyl bromide.

Regulations: The Pesticide Act restricts import of methyl bromide by means of a licensing system, and its sale by registration and appropriate labeling. The amount of methyl bromide imported, however, is not controlled as it is under the present quota system for CFCs. The Hydrogen Cyanide Act requires methyl bromide to be handled by licensed fumigators and outlines health and safety requirements for structural uses.

Implementing Agencies: Ministry of Agriculture; Ministry of Health.

Economic Incentives/ Voluntary Programmes: A Working Group on Methyl Bromide has been established under the National Steering Committee for the Protection of the Ozone Layer.

MB Alternatives Training/Outreach: Regular meetings/training with users, including fumigation operators and importers, are held to promote awareness of alternatives and develop skill in handling pesticides. An ongoing "Extension Work Programme" conducted by the Department of Agriculture focuses on farmer education. Research on alternatives is being carried out by local institutions such as the Forestry Research Institute and the Malaysian Agricultural Research and Development Institute.

Policy Barriers: Australian Plant Quarantine Act requires fumigations of wood produce exported to their country. Other importing countries also require methyl bromide fumigation of export goods and commodities.

Other Training: Ongoing training includes the National Integrated Pest Management Programme and widespread implementation of IPM for some major crops in the country.

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Myanmar

Reported Use: 16 tonnes reported in 1995, 79.2 tonnes reported in 1996.

Legislation: The Union of Myanmar, The State Peace and Development Council, Pesticide Law, 1990, establishes government authority to analyse and test pesticides submitted for registration, to evaluate applications for registration and importation and to prohibit the use of any registered pesticide found to be harmful to human beings, animals, crops or the environment.

Regulations: No specific import controls on methyl bromide. Safety equipment is required, and free medical attention available to all operators. Use reporting forms are submitted to the Pesticide Control Department. Appropriate labeling of a dangerous gas product is required.

Implementing Agencies: The Myanmar Agricultural Service undertakes the official function of the registration board.

Economic Incentives/ Voluntary Programmes: None listed.

MB Alternatives Training/Outreach: Plans are in progress for demonstration programmes promoting phosphine as an alternative fumigant on board vessels, which has

been practiced by neighbouring countries such as Thailand, Singapore, Indonesia and Malaysia.

Policy Barriers: Resistance from exporters and vessel owners to a transition to phosphine, which has a much longer aeration time.

Other Training: None listed.

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Yangon, Myanmar
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Nepal

Reported Use: Not available. Stockpiles of methyl bromide (21 cylinders) are awaiting safe disposal.

Legislation: The Pesticide Act (1991) and the Pesticide Rule (1993) regulate the import, manufacture, sale, distribution and use of pesticides, including methyl bromide. These rules aim to prevent risk to human and animal health and the environment.

Regulations: Pesticide Inspectors are appointed by the government to meet the goals of the Pesticide Act and Pesticide Rule. The government publishes lists of registered pesticides; unregistered pesticides are not allowed to be imported, exported, produced, used or distributed. Methyl bromide is not currently registered.

Implementing Agencies: Pesticide Registration Office, Plant Protection Division, Department of Agriculture.

Economic Incentives/ Voluntary Programmes: None listed.

MB Alternatives Training/Outreach: The Department of Agriculture promotes the use of aluminum phosphide as an alternative to methyl bromide to fumigate stored products. The Department's Post Harvest Loss Control Section has conducted training sessions for safe and effective fumigation with aluminum phosphide.

Policy Barriers: None listed.

Other Training: IPM has been declared the national pest control strategy in the Agriculture Perspective Plan. There is wide acceptance of biological pesticides. Elimination of highly toxic pesticides has been established as a national priority. The Department of Agriculture is educating farmers and advocating IPM approaches through Farmer Field Schools.

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Pakistan

Reported Use: No use reported in 1995 or 1996.

Legislation: None listed.

Regulations: A licensing system to monitor and control imports of ODS, including methyl bromide, came into effect in July 1998. Government authorization is now required for methyl bromide imports.

Implementing Agencies: Ministry of Commerce; Ministry of Environment, Ozone Cell.

Economic Incentives/ Voluntary Programmes: None listed.

MB Alternatives Training/Outreach: A methyl bromide alternatives demonstration project is underway with UNIDO. A technical and economic feasibility study has just been completed, and UNIDO is now in the process of identifying prospective participants for the project.

Policy Barriers: Certification of fumigation with methyl bromide is required for exports to the United States and Europe (cotton, rice, tobacco).

Other Training: None listed.

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Papua New Guinea

Reported Use: 1.2 tonnes reported in 1995, 1.0 in 1996.

Legislation: Environment Contaminants Act, 1978 was established to prevent, abate, and control environmental contamination.

Regulations: Environment Contaminants (Pesticides) Regulation, 1988 requires companies or individuals wishing to import methyl bromide to obtain a permit from the Department of Environment and Conservation. Methyl bromide is a restricted use pesticide. Therefore, only companies or individuals certified in the application of methyl bromide will be granted an import permit. Use permits are also required under the 1988 regulation, and importing companies are required to report the following information to the Department every three months: purpose for the chemical's use, target pest(s) and amount used during the three month period. The 1988 regulation also requires appropriate product labeling, including storage and disposal instructions.

Implementing Agencies: Department of Environment and Conservation.

Economic Incentives/ Voluntary Programmes: None listed.

MB Alternatives Training/Outreach: None listed.

Policy Barriers: None listed.

Other Training: None listed.

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Philippines

Reported Use: 68.3 tonnes reported in 1995, 53.7 tonnes reported in 1996.

Legislation: Presidential Decree 1144, 1977 established the Fertilizer and Pesticide Authority (FPA) to govern the registration and import of all pesticides.

Regulations: Methyl bromide is on the national list of restricted pesticides and can only be used by certified fumigators. The import volume of methyl bromide is restricted; companies must justify any increase in imports, but are otherwise allowed to use a similar volume as in previous years. Any company importing methyl bromide must report on how the imported volume was used before applying for another import license. FPA will be reviewing methyl bromide to determine whether it poses an imminent threat to health and the environment; it may be further restricted on this basis.

Implementing Agencies: Fertilizer and Pesticide Authority.

Economic Incentives/ Voluntary Programmes: Importers of restricted pesticides must pay a higher fee for import licenses.

MB Alternatives Training/Outreach: A methyl bromide alternatives demonstration project with UNDP will focus on the banana sector, which is responsible for a large proportion of the country's methyl bromide use.

Policy Barriers: Australia's requirements for fumigation with methyl bromide before exporting to their country.

Other Training: A national IPM programme is coordinated by the National Crop Protection Center, the Ministry of Agriculture, university research programmes and other agencies.

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Samoa

Reported Use: Not available. Methyl bromide imports are allowed only for essential quarantine purposes.

Legislation: The Agriculture, Forests and Fisheries Amendment Act (1989) gives the Minister of Agriculture, Forests and Fisheries authority to regulate, control and supervise the manufacture, importation, storage and use of pesticides. The Pesticides Regulations (1990) govern restricted use pesticides such as methyl bromide.

Regulations: Methyl bromide is a restricted use pesticide; potential users must apply for and receive approval from the Pesticides Technical Committee before import or use. Importers and users must maintain a current register of all import and use.

Implementing Agencies: Registrar of Pesticides, Ministry of Agriculture, Forests and Fisheries; Pesticides Technical Committee.

Economic Incentives/ Voluntary Programmes: The Department of Lands and Environment coordinates a Task Team for the phase out of ODS, including methyl bromide.

MB Alternatives Training/Outreach: The Registrar of Pesticides coordinates several hot forced air treatment trials, with support from New Zealand. Information on the results of the trials are widely distributed.

Policy Barriers: Some domestic and international quarantine requirements specify methyl bromide fumigation.

Other Training: The Minister of Agriculture has commissioned a report to investigate steps needed to reduce pesticide use (particularly herbicides). A long term goal has been stated to "see Samoa being officially recognized in the world as the first country to ban all artificial chemicals from being used in agriculture."

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Solomon Islands

Reported Use: Not available.

Legislation: None listed.

Regulations: The Safety at Work (Pesticides) Regulation includes requirements for use reporting, health and safety, and labeling which apply to methyl bromide.

Implementing Agencies: Research Division of the Registrar of Pesticides, Ministry of Agriculture and Fisheries.

Economic Incentives/ Voluntary Programmes: None listed.

MB Alternatives Training/Outreach: None listed.

Policy Barriers: None listed.

Other Training: Organic agricultural training programmes and IPM programmes are ongoing.

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Sri Lanka

Reported Use: Six tonnes reported in 1995, 13.8 tonnes reported in 1996

Legislation: Control of Pesticides Act No. 33 (1980) controls the import and use of pesticides that are toxic to humans. The Import and Exports Act (1997) also controls the import of methyl bromide.

Regulations: The Control of Pesticides Act restricts the sale and use of methyl bromide to authorized persons approved by the Registrar of Pesticides. Importation of methyl bromide is controlled through

licensing by the Controller of Imports and Exports on the recommendation of the Registrar of Pesticides. The Montreal Protocol Unit of the Ministry of Environment tracks the use levels of methyl bromide.

Implementing Agencies: Registrar of Pesticides, Department of Agriculture; Controller of Imports and Exports; Montreal Protocol Unit, Ministry of Environment.

Economic Incentives/ Voluntary Programmes: None listed.

MB Alternatives Training/Outreach: Studies have been initiated by the Tea Research Institute to identify alternatives to methyl bromide for soil fumigation in tea nurseries.

Policy Barriers: Several countries require pre-shipment fumigation before importing into their countries. Given the economic importance of tea in the country, cost-effective alternatives must be identified to avoid economic losses.

Other Training: None listed.

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Thailand

Reported Use: 567 tonnes reported in 1995, 642 tonnes reported in 1996.

Legislation: Hazardous Substance Control Act B.E.2535 (1995) controls the import and use of pesticides. The Munitions of War Control Act B.E. 2530 (1987) controls methyl bromide importation.

Regulations: The Hazardous Substance Control Act requires permits, use reporting, and adherence to health and safety standards when applying methyl bromide. Import of methyl bromide is restricted through the Munitions Control Act B.E. 2530, 1987. This act also regulates

possession, and requires use reporting and permits for methyl bromide.

Implementing Agencies: Industry Department, Defence Industry and Energy Center, Office of the Permanent Secretary for Defence; Agricultural Regulation Control Division, Department of Agriculture, Ministry of Agriculture and Cooperatives.

Economic Incentives/ Voluntary Programmes: The Department of Agriculture promotes voluntary use of phosphine as an alternative to methyl bromide to fumigate long-term storage products and requests fumigators not to use methyl bromide.

MB Alternatives Training/Outreach: The Department of Agriculture and private companies have conducted training sessions for fumigation company workers on the safe and effective use of phosphine as an alternative to methyl bromide. Another project demonstrates alternatives to methyl bromide in commodity fumigation.

Policy Barriers: QPS fumigation is required by the National Plant Quarantine Authority (particularly for cut flower/orchids for export to European countries) and by the Australian Quarantine Inspection Service (AQIS).

Other Training: Several national programmes promote sustainable agriculture, organic farming, IPM and pesticide use reduction.

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Vietnam

Reported Use: 310 tonnes reported in 1995, 300 tonnes reported in 1996.

Legislation: Joint Ministries Circular Letter on Determination of Import Management and Control of Using Methyl Bromide, 1998 controls the import and use of methyl bromide with the objective of limiting use and promoting alternatives. Methyl bromide is also regulated under the Decree of Plant Protection and Quarantine, 1993 and the Ordinance on Management of Plant Protection Chemicals, 1998.

Regulations: Import controls as outlined in the Circular Letter.

Implementing Agencies: Hydrometeorological Service of Vietnam; Ministry of Agriculture and Rural Development.

Economic Incentives/ Voluntary Programmes: Multinational companies that use methyl bromide in Vietnam have voiced commitment to helping the country phase out this ozone depleting substance as soon as possible.

MB Alternatives Training/Outreach: A current project demonstrates alternatives to methyl bromide for fumigation of stacked bags of rice, in grain silos and for timber under tarps in warehouse at the Vietnam Fumigation Company. The project involves the Ministry of Agriculture and Rural Development's Department of Plant Protection (DPP) and the branch office of the DPP in the provinces.

Policy Barriers: None listed.

Other Training: Several multi-agency training programmes promote alternatives to pesticides, including IPM on rice and vegetables and demonstration programmes for low-cost (vapor heat treatment) disinfesting systems for fresh fruit.

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5-3. Latin America and the Caribbean

Several countries in Latin America have relatively high levels of methyl bromide use, and use levels in some of these countries are increasing. The largest consumers in the region are Brazil, Chile, Costa Rica, Guatemala and Mexico. All Latin American and Caribbean countries combined, make up an estimated 38% of consumption among Article 5(1) countries, and about 9% of global consumption.

Of the developing regions, Latin American countries reported the most legislation specifically controlling methyl bromide as an ODS. In four of the eight countries reporting such legislation, the law is currently being developed or is under consideration. In several cases, the ODS legislation specifies controls more stringent than those required under the Montreal Protocol. Eighteen of the 27 responding countries reported pesticide legislation that governs methyl bromide, and most of these involve import and licensing controls.

Only five countries reported any economic incentives or voluntary programmes encouraging the phase out of methyl bromide. Fifteen countries have programmes in place promoting methyl bromide alternatives (most of these are supported by the Multilateral Fund), and ten countries listed more general pesticide use reduction/IPM programmes.

Table 5-3: Latin America and the Caribbean Country Report Summary

Country	Reported Use (tonnes) 1995/1996	ODS Legislation	Pesticide Legislation	Import and Licensing Controls	Economic Incentives/ Voluntary Programmes	Programmes for MB Alternatives	Programmes for Pesticide Reduction
Antigua	N/A	X	X		X		
Argentina	443 / 530						
Barbados	0 / 0	X††		X			
Belize	N/A		X	X			X
Bolivia†	0 / 0		X				
Brazil	953.2 / 1,778.4		X		X	X	X
Chile	294.7 / 393.7		X			X	X
Colombia	343 / 391	X	X			X	
Costa Rica	550 / 600	X	X		X	X	
Cuba	125 / 125		X	X		X	X
Dominican Republic	115 / 169.8			X		X	
Ecuador	65.7 / 65.7		X			X	X

(chart continued on next page)

Table 5-3: Latin America and the Caribbean Country Report Summary (cont.)

	Reported Use (tonnes) 1995/1996	ODS Legislation	Pesticide Legislation	Import and Licensing Controls	Economic Incentives/ Voluntary Programmes	Programmes for MB Alternatives	Programmes for Pesticide Reduction
El Salvador	4.2 / 4.2	X††		X	X	X	
Guatemala	418 / 418	X	X††	X††		X	
Guyana	4.7 / 4.7		X††	X	X		
Honduras	N/A						
Jamaica†	0/0		X	X		X	
Mexico	3,995.4 / 2,084			X		X	
Nicaragua	0.3 / 2.8		X				X
Panama	0.2 / 0.2						
Paraguay	1.3 / 1.3						X
Peru	1.3 / 0.2	X††	X	X			
St.Vincent and the Grenadines†	N/A						
Suriname†	N/A		X	X			X
Trinidad and Tobago	19.7 / 19.7		X	X			X
Uruguay	25 / 10		X			X	X
Venezuela	17 / 17	X††				X	

N/A *Not available.*
† Registration cancelled, imports prohibited, or no use reported
†† In development or under consideration.

Antigua

Reported Use: Not available.

Legislation: Montreal Protocol Act, 1992 (No. 13 of 1992) implements measures outlined in the Montreal Protocol and the Pesticide Control Act (cap.325) 7/325 governs the use of pesticides.

Regulations: Permits are issued only to certified pest control experts by the Ministry of Trade under advice of the Pesticide Control Board (PCB). Proper labeling is ensured by PCB inspectors on-site.

Implementing Agencies: Ministry of Trade; Pesticide Control Board.

Economic Incentives/ Voluntary Programmes: Programmes currently being designed include licensing fees (Ministry of Trade) and research on alternatives (Ministry of Agriculture).

MB Alternatives Training/Outreach: None listed.

Policy Barriers: None listed.

Other Training: None listed.

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Argentina

Reported Use: 443 tonnes reported in 1995, 530 tonnes reported in 1996. Estimated imports were 736 tonnes in 1997, 950 tonnes in 1998.

Legislation: The Agrochemical Law governs the use of all pesticides, including methyl bromide.

Regulations: As outlined in Agrochemical Law.

Implementing Agencies: National Service for Quality and Protection of Foodcrops (SENASA).

Economic Incentives/ Voluntary Programmes: Voluntary programmes to reduce methyl bromide use exist in three sectors: fruit/horticultural production, tobacco, and quarantine treatments.

MB Alternatives Training/Outreach: The National Institute of Agricultural Technology (INTA) and UNIDO are implementing a methyl bromide alternatives demonstration project in the Gran La Plata region of Buenos Aires province. The project involves various methyl bromide-using crops, including tomato, pepper, cut flower and fruit. Technicians and researchers from INTA, the university and the Ministry of Agriculture participate in the project. Experiments and

demonstration plots include solarization and steam treatments, other fumigants, and soilless cultivation practices. Conferences, field days and media outreach are included in the project.

INTA and UNDP are also implementing a demonstration project in the tobacco sector. Beginning in 1999, the project will demonstrate the technical, social and economic feasibility of methyl bromide substitution methods for tobacco seedbeds, including non-soil (hydroponic) techniques, solarization and use of other chemical treatments. A variety of information tools, including technical manuals for farmers and extensionists, will be prepared and disseminated in each tobacco producing region. The project will also develop policy instruments, market measures and a national plan for phasing out methyl bromide in the tobacco sector.

Policy Barriers: Lack of a specific policy targeting methyl bromide elimination. QPS requirements for fruit exported to Japan, the United States and Europe.

Other Training: INTA has several programmes in place or in development promoting sustainable or organic production. The most important is the Integrated Fruit Production Programme in the Rio Negro province, which specifically targets pear and apple production. Other programmes include horticultural crops, citrus, and soy beans. Organic production is growing rapidly, in part due to adoption of national organic standards.

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Barbados

Reported Use: Very little methyl bromide is imported into Barbados, on a sporadic "as needed" basis for essential uses only (no imports reported in 1995/96). Used for nematode extermination on golf courses and pest control on airplanes.

Legislation: None listed, but a law is being developed to phase out all ODS (including methyl bromide) by the year 2000.

Regulations: The Pesticide Control Board decides on a case-by-case basis which pesticides and other chemicals will be imported.

Implementing Agencies: Pesticides Control Board, Ministry of Agriculture.

Economic Incentives/ Voluntary Programmes: None listed.

MB Alternatives Training/Outreach: None listed.

Policy Barriers: None listed.

Other Training: None listed.

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Belize

Reported Use: Methyl bromide use is currently prohibited in Belize.

Legislation: Pesticides Control Act (1985) and the Pesticides Order (1988) control pesticide import, use and categorization, e.g., general use, restricted, prohibited.

Regulations: Schedule IV of the Pesticide Control Act, 1985, restricts imports.

Implementing Agencies: Pesticides Control Board under the Ministry of Agriculture and Fisheries.

Economic Incentives/ Voluntary Programmes: None listed.

MB Alternatives Training/Outreach: None listed.

Policy Barriers: An application has been presented to the Pesticides Control Board by OIRSA (Organismo Internacional Regional de Sanidad Agropecuaria) for consideration of the use of methyl bromide for quarantine fumigation purposes. The Board has arrived at an interim decision: use of methyl bromide will be considered in case of an emergency situation with recommendation from the National Plant Protection Unit. Assistance in consideration of alternatives is welcome.

Other Training: The Pesticide Control Board Training Programme promotes IPM.

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Bolivia

Reported Use: Methyl bromide is not registered in Bolivia and its sale is prohibited.

Legislation: Article 60 of Supreme Directive No. 10283 (1972) prohibits sale of products classified as extremely toxic.

Regulations: Methyl bromide is also considered a "Dangerous Substance" under Environmental Law 1333; Title 1, Section 1, Article 2 regulates substances with intrinsic characteristics of toxicity (among other dangerous characteristics).

Implementing Agencies: Plant Protection Division, Ministry of Agriculture, Livestock and Rural Development.

Economic Incentives/ Voluntary Programmes: None listed.

MB Alternatives Training/Outreach: None listed.

Policy Barriers: None listed.

Other Training: None listed.

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Brazil

Reported Use: 953.2 tonnes reported in 1995, 1,778.4 tonnes reported in 1996, an estimated 1,500 tonnes reported in 1997.

Legislation: Law No. 7.802, July 1989 regulates the production, import, trade and use of pesticides.

Regulations: Registration required for all pesticides, and compliance with health and environmental guidelines for application.

Implementing Agencies: Ministry of Agriculture; Ministry of Health; Ministry of Environment; Brazilian Institute for Environment and Renewable Natural Resources (IBAMA).

Economic Incentives/ Voluntary Programmes: A workshop was held in 1996 on Alternatives to Methyl Bromide in Agriculture, with participants from the various methyl bromide using sectors and the scientific community. In the "Florianópolis Letter on Methyl Bromide" (October 1996), workshop participants in the meeting made the following recommendations to the government:

- implementing a freeze in the year 2000 based on 1993-95 consumption levels;
- reducing methyl bromide use by 20% by 2001; and
- prohibiting all but QPS and essential uses by 2006.

MB Alternatives Training/Outreach: A demonstration project was initiated in January 1998 for three alternatives to the use of methyl bromide in tobacco: non-soil cultivation, solarization and low-dose chemicals. The project is being conducted in four locations in the states of Rio Grande and Santa Catarina, and is implemented by UNIDO, EMBRAPA (Emprese Brasileira de Pesquisa Agropecuaria) and EPAGRI (Empresa de

Pesquisa Agropecaria e Extensao Rural de Santa Catarina). A pamphlet has been produced describing the problem of ozone depletion and the use of methyl bromide in agriculture.

Policy Barriers: Lack of political will/government mobilization.

Other Training: Various programmes, including research and promotion of organic agriculture.

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Chile

Reported Use: 294.7 tonnes reported in 1995, 393.7 tonnes reported in 1996.

Legislation: None listed.

Regulations: Methyl bromide users must register with the Agricultural Protection Department of the Agriculture and Livestock Service. Registration applicants must present documentation of the effectiveness of methyl bromide for their proposed use. Appropriate health and safety and labeling requirements must be observed.

Implementing Agencies: Agriculture and Livestock Service.

Economic Incentives/ Voluntary Programmes: None listed.

MB Alternatives Training/Outreach:

The National Environmental Commission (CONAMA) conducted a demonstration project in 1996 with Environment Canada for methyl bromide recycling in fumigation chambers used for grape exports. Other participants included the Fruit Exporters Association, the Agricultural Service, and the Foundation for Fruit Product Development.

CONAMA is also coordinating a project to demonstrate alternatives for soil fumigation uses of methyl bromide for tomatoes and peppers. The two-year project begins in March 1999, and participants include the Agricultural Research Institute (INIA), the National Institute for Agricultural Development (INDAP), the Association of Organic Producers and CONAMA.

Policy Barriers:

Two policy barriers identified are (1) the requirement by the United States that fruit exported from Chile be fumigated with methyl bromide for control of key quarantine pests; and (2) scarce local funds to support the development of methyl bromide alternatives (significant funds are currently being redirected to drought relief).

Other Training:

The National Agricultural Development Institute (INDAP), in collaboration with the association of organic producers, conducts a project in Chile's Region V to promote demonstrations of organic cultivation.

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Colombia

Reported Use:

343 tonnes reported in 1995, 391 tonnes reported in 1996. No importation of methyl bromide was reported in 1997, although low levels of use continue within the banana sector.

Legislation:

Resolution No. 2152 (1996) limits the importation, sale and use of methyl bromide to quarantine treatment for the control of exotic

pests on fresh vegetables in closed chambers, until a viable substitute is identified. Both methyl bromide's toxicity and its ozone depleting properties were considered in the adoption of this legislation.

Regulations: Methyl bromide use is not permitted for soil uses or structural fumigation.

Implementing Agencies: Ministry of Environment; Ministry of Agriculture and Rural Development; Ministry of Health.

Economic Incentives/ Voluntary Programmes: None listed.

MB Alternatives Training/Outreach: A regional workshop on methyl bromide was held in Colombia in 1995 with participants from several Latin American and Caribbean countries, as well was from Africa, Southeast Asia and the Pacific. A demonstration project has been developed to assist the banana sector in adopting alternatives to methyl bromide. The project is coordinated by the National Ozone Unit of the Ministry of Environment, the Ministry of Health and UNIDO.

Policy Barriers: Lack of information on viable alternatives for quarantine uses.

Other Training: NGO programmes promote alternatives to pesticides.

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Costa Rica

Reported Use: 550 tonnes reported in 1995, 600 tonnes reported in 1996.

Legislation: Law No. 7808, 1998 mandates compliance with the Montreal Protocol and its amendments. The Regulation of Registration and Control of Pesticides also governs methyl bromide use. Costa Rica is also considering legislation to prohibit methyl bromide use before the Montreal Protocol deadlines.

Regulations: Use restrictions include limitation of sale to professional applicators. Required permits include an import authorization from the Ministry of Agriculture and a use authorization from the National Ozone Commission.

Implementing Agencies: Governmental Ozone Commission, Ministry of Environment and Energy; Plant Protection Department, Ministry of Agriculture.

Economic Incentives/ Voluntary Programmes: A national dialogue has been established involving businesses, methyl bromide users, NGOs and the Ozone Commission.

MB Alternatives Training/Outreach: Two demonstration projects, one for melon production and one for cut flowers, are supported by the Fund and coordinated by UNDP. Participants include the Ozone Commission, universities, NGOs and agribusiness representatives.

Policy Barriers: None listed.

Other Training: None listed.

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Cuba

Reported Use: 125 tonnes reported in both 1995 and 1996. Government officials report that use has fallen from 450-600 tonnes/year to an estimated 80 tonnes/year, now concentrated almost entirely in tobacco seedbed use.

Legislation: Directive/Law No.153/1994, the Plant Protection Regulations and Resolution 10/87 for Permitting of Pesticides in the National Territory all control importation and use of agricultural pesticides, including methyl bromide.

Regulations: Approval and registration for use in the national pesticide registry is required before importation; permits are required for pesticide use.

Implementing Agencies: Ministry of Agriculture; Ministry of Public Health.

Economic Incentives/ Voluntary Programmes: None listed.

MB Alternatives Training/Outreach: An investment project[26] is currently being implemented to replace methyl bromide use in the tobacco sector. Participating agencies include UNIDO, the Technical Ozone Office and the Ministry of Agriculture.

Policy Barriers: Use is required for export of some agricultural products, including tobacco, and disinfestation of some grains.

Other Training: The Cuban Plant Protection Institute (ISV) is promoting alternatives and research in integrated pest and disease management, solarization and other practices with positive results.

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26 Most methyl bromide alternatives projects under the Multilateral Fund have been "demonstration projects," demonstrating the viability of alternatives on a relatively small scale. The Cuba project is one of the first large-scale investment projects to be approved to phase out use of methyl bromide in a specific sector.

Dominican Republic

Reported Use: 115 tonnes reported in 1995, 169.8 tonnes reported in 1996.

Legislation: None listed.

Regulations: A permit is required for methyl bromide import. This is not a restriction, but imports must be approved by the Secretariat for Agriculture.

Implementing Agencies: Secretariat for Agriculture.

Economic Incentives/ Voluntary Programmes: None listed.

MB Alternatives Training/Outreach: A methyl bromide alternatives demonstration project coordinated by UNIDO was initiated in February 1999, including soil pasteurization, biofumigation with solarization and low doses of pesticides.

Policy Barriers: None listed.

Other Training: None listed.

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Ecuador

Reported Use: 65.7 tonnes reported in both 1995 and 1996.

Legislation: The primary legislation governing methyl bromide use is the "Law governing the formulation, production, importation, sale and use of pesticides and similar agricultural products."

Regulations: As indicated under pesticide control law listed above, as well as controls under the "General regulation of pesticides and agricultural products" and the "Regulation establishing a standard registry of pesticides and veterinary products."

Implementing Agencies: Ministry of Agriculture; Ministry of Health; Ministry of Environment.

Economic Incentives/ Voluntary Programmes: None listed.

MB Alternatives Training/Outreach: A demonstration project is underway with the World Bank for alternatives to methyl bromide in the cut flower sector.

Policy Barriers: None listed.

Other Training: A National Training Programme focuses on the correct use of pesticides.

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El Salvador

Reported Use: 4.2 tonnes reported in both 1995 and 1996.

Legislation: Environmental Law (1998) and the Regulation Controlling Ozone Depleting Substances (to be approved in 1999) govern methyl bromide use and import.

Regulations: The 1999 regulation controlling ODS will prohibit importation of methyl bromide. Sufficient stocks of methyl bromide exist in El Salvador to support minimal use levels in the country.

Implementing Agencies: Ministry of Environment and Natural Resources; Ministry of Agriculture

Economic Incentives/ Voluntary Programmes: In-country stocks of methyl bromide are available at a much lower price than the market price, which means imports are not needed. Once these stocks are depleted, the much higher market price will be a disincentive to use.

MB Alternatives Training/Outreach: A demonstration project is being supported by UNIDO. Participants include the Salvadoran Foundation of Economic and Social Development (FUSADES), the Al Agro Division and the experimental farm (El Porvenir).

Policy Barriers: Ministry of Agriculture requires methyl bromide use for some crops, including coffee, non-traditional crops in the experimental stage and cereals.

Other Training: None listed.

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Guatemala

Reported Use: 418 tonnes reported in both 1995 and 1996.

Legislation: Decree N. 110-97, 1997, controls the importation and regulates the use of CFCs and other ODS.

Regulations: Under Decree No. 110-97, CONAMA is controlling importation permits to reduce methyl bromide importation gradually, based on import levels prior to 1997. Health and safety regulations are enforced by the Guatemalan Institute of Social Security (IGSS).

Implementing Agencies: National Environmental Commission (CONAMA); General Customs Department; Ministry of Agriculture.

Economic Incentives/ Voluntary Programmes: None listed.

MB Alternatives Training/Outreach: A demonstration project with UNIDO is evaluating alternatives to methyl bromide use for tomato, pepper, cut flowers, melon and broccoli. Participants are CONAMA and the Institute of Agricultural Science and Technology (ICTA).

Policy Barriers: None listed.

Other Training: None listed.

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CONAMA
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Guyana

Reported Use: 4.7 tonnes reported in both 1995 and 1996.

Legislation: Pesticides and Toxic Chemical Control Bill (1998 - currently under consideration) will establish a registration and licensing system for the import, distribution and use of pesticides and other toxic chemicals.

Regulations: Registration and licensing as required in implementation of the 1998 Bill above, in addition to an ODS licensing system (to be established before July 1, 2000) will control methyl bromide import and use.

Implementing Agencies: Pesticides and Toxic Chemicals Control Board under the Minister of Agriculture.

Economic Incentives/ Voluntary Programmes: Voluntary programmes are currently under development by the National Climate Committee.

MB Alternatives Training/Outreach: None listed.

Policy Barriers: Methyl bromide is required for storage of rice for exports.

Other Training: None listed.

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Honduras

Reported Use: Not available. Methyl bromide use in Honduras is primarily for horticultural production, melons and bananas.

Legislation: New legislation covering the Registration, Use and Control of Pesticides and Toxic Substances is currently under consideration. This legislation will establish the technical, legal and administrative capacity to control the registration, import, production, formulation, repackaging, transport, sale, use, management and export of pesticides. Also under consideration is legislation governing substances which deplete the ozone layer. Methyl bromide will be controlled under both of these laws.

Regulations: All pesticides must be registered before importation, production or use. Import licenses will be required under the new pesticide law. Health and safety regulations require reporting on pesticide toxicity, environmental impacts, and disposal. Appropriate product labeling is also required.

Implementing Agencies: Ministry of Agriculture's Plant Protection Department, in coordination with other agencies and the NOU.

Economic Incentives/ Voluntary Programmes: None listed.

MB Alternatives Training/Outreach: A Multilateral Fund project coordinated by UNIDO is demonstrating alternatives to methyl bromide, with the participation of experts from Colombia.

Policy Barriers: Lack of extension and demonstration projects highlighting methyl bromide alternatives.

Other Training: None listed.

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Jamaica

Reported Use: No use reported in 1995 or 1996.

Legislation: Pesticides Regulations (1996) and the Pesticide Act (1975) control pesticide use.

Regulations: The Pesticide Control Authority (PCA) has restricted the use of methyl bromide. Approval for import requests has been limited to essential requirements; each user is responsible to ensure that proper safety measures are followed.

Implementing Agencies: Pesticide Control Authority.

Economic Incentives/ Voluntary Programmes: None listed.

MB Alternatives Training/Outreach: A limited phase-out programme is being developed for methyl bromide as part of the Country Programme under the Montreal Protocol. A programme to phase out methyl bromide use in the tobacco sector is also being developed by the Food Storage and Prevention of Infestation Division of the Ministry of Industry and Commerce.

Policy Barriers: Methyl bromide use is required for tubers and other products exported to the United States.

Other Training: None listed.

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Mexico

Reported Use: 3,995.4 tonnes reported in 1995, 2,084 tonnes reported in 1996.

Legislation: None listed.

Regulations: Authorization for importation of methyl bromide is required from the Intersectoral Commission for the Control of the Processing and Use of Pesticides, Fertilizers and Toxic Substances (CICOPLAFEST). Guidelines for application of pesticides are also outlined by CICOPLAFEST under official rule # NOM-045-SSA1-1993.

In addition, a number of regulations exist requiring the use of methyl bromide, including requirements to fumigate domestic wheat and fruit before it can be transported within Mexico, and fumigation of imported grains (either in the exporting country or in Mexico). Relevant laws requiring methyl bromide use include NOM-075-FITO-1997, NOM-001-FITO-1995, NOM-028-FITO-1995, NOM-005-FITO-1995 and NOM-022-FITO-1995.

Implementing Agencies: CICOPLAFEST has representatives from the Ministry of Agriculture and Rural Development (SAGAR), Ministry of Environment, Natural Resources and Fisheries (SEMARNAP), Ministry of Commerce and Industry (SECOFI) and the Ministry of Health (SS).

Economic Incentives/ Voluntary Programmes: None listed.

MB Alternatives Training/Outreach: Two projects supported by the Multilateral Fund, one coordinated by UNIDO and one by UNDP.

Policy Barriers: None listed.

Other Training: None listed.

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Nicaragua

Reported Use: 0.3 tonnes reported in 1995, 2.8 tonnes reported in 1996.

Legislation: Basic Law for the Regulation and Control of Pesticides, Toxic Substances and Other Chemicals (1997) governs use of methyl bromide.

Regulations: As outlined under the Basic Law.

Implementing Agencies: Ministry of Environment and Natural Resources.

Economic Incentives/ Voluntary Programmes: None listed.

MB Alternatives Training/Outreach: None listed.

Policy Barriers: None listed.

Other Training: The National University of Nicaragua (León) carries out extension, training and demonstration programmes in IPM, sustainable agriculture and other approaches to reducing pesticide use.

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Panama

Reported Use: 0.2 tonnes reported in both 1995 and 1996.

Legislation: Law No. 7 of the 3rd of January, 1989, outlines measures to protect the Ozone Layer.

Regulations: A variety of regulations govern methyl bromide import, use and safety requirements, including:

- Executive Decree No. 225 of November 16 1998 implements Law No. 7 (1989).
- Resolutions No. 287 and 288 of the Ministry of Commerce and Industry (1998) establishes technical regulations for pesticides in methyl bromide's toxicological category.
- Regulation No. 29 (1996) establishes standards governing the labeling of pesticides, including methyl bromide.
- Executive Decree No. 54 (1998) authorizes the Ministry of Agricultural Development to establish fees for pesticide use.
- Resolution ALP No. 023 (1998) establishes standards and procedures for a national pesticide registry, and for the management and safe and effective use of agricultural chemicals.
- Executive Decree No. 386 (1997) authorizes the Ministry of Health to enforce pesticide controls.

Implementing Agencies: Ministry of Health; Ministry of Agricultural Development; Ministry of Commerce and Industry.

Economic Incentives/ Voluntary Programmes: None listed.

MB Alternatives Training/Outreach: None listed.

Policy Barriers: None listed.

Other Training: The Department of Agricultural Extension in the Ministry of Agricultural Development directs a programme aimed to promote rational pest control methods for crops that are exported, including use of plastics to protect crops from UV radiation and introduction of winter crops. Training and technical demonstrations are also provided to field technicians working with farmers on correct application and use of pesticides. A National Commission for the rational use of pesticides in agricultural production was also established under the Ministry of Agricultural Development to promote gradual reduction of pesticide use.

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Paraguay

Reported Use: 1.3 tonnes reported in 1995 and 1996.

Legislation: None listed.

Regulations: National regulations to control the production, registration, import and use of agrochemicals apply to methyl bromide.

Implementing Agencies: Department of Plant Protection, Ministry of Agriculture Regulations.

Economic Incentives/ Voluntary Programmes: None listed.

MB Alternatives Training/Outreach: None listed.

Policy Barriers: Methyl bromide is used primarily as a post-harvest fumigant for cotton in Paraguay. Since this is an economically important crop, the relatively high cost of alternatives has generated resistance to a methyl bromide phase out.

Other Training: Extension, training and demonstration projects promoting alternatives to pesticides are local rather than regional in scope. They include pilot projects and research on organic agriculture, direct seeding and agricultural diversification to reduce reliance on monocrops such as cotton.

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Peru

Reported Use: 1.3 tonnes reported in 1995, 0.2 tonnes reported in 1996. Actual use, however, may be much higher since methyl bromide imports may be listed in a general "insecticide" category. Methyl bromide use is increasing due to the privatization of the national agricultural extension systems, since soil fumigation (and the crops dependent on it) are being promoted by private companies.

Legislation: Public Health Law No. 26842 controls toxic and dangerous substances. Plans exist to revise sections controlling acutely toxic pesticides in 1999. In addition, Supreme Decree No. 119-97-EF to improve customs controls of pesticide imports, including methyl bromide, 1998. The Ministry of Industry, Trade and Tourism is developing rules to comply with the 2002 methyl bromide freeze.

Regulations: The Ministry of Agriculture is responsible for product registration, including methyl bromide. Health and safety requirements are found under the Regulation for Registration, Sale and Control of Agricultural Pesticides.

Implementing Agencies: Environmental Health Agency (DIGESA - responsible for household and industrial pesticide use); National Pesticide Commission (CONAP); Ministry of Agriculture (SENASA - responsible for agricultural pesticide use); Ministry of Industry, Trade, and Tourism (MITINCI) which houses the Technical Ozone Office.

Economic Incentives/ Voluntary Programmes: None listed.

MB Alternatives Training/Outreach: None listed.

Policy Barriers: The majority of methyl bromide imports avoid import registration since they are imported under a general "insecticide" category. The 1998 customs control law was directed in part at this problem.

Other Training: None listed.

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St. Vincent and the Grenadines

Reported Use: Not available. Methyl bromide use was confined to soil fumigation in the construction industry (not in agriculture) but that has now been replaced by a less expensive substitute.

No additional information provided.

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Suriname

Reported Use: Methyl bromide has not been imported or used in Suriname since 1995.

Legislation: The Pesticide Act (1972) and Pesticide Decree (1974) govern pesticide import and use.

Regulations: Controls pesticide import and use as outlined in the Pesticide Act.

Implementing Agencies: Ministry of Agriculture, Animal Husbandry and Fisheries, Pesticides Division, Agricultural Experiment Station.

Economic Incentives/ Voluntary Programmes: None listed.

MB Alternatives Training/Outreach: None listed.

Policy Barriers: None listed.

Other Training: Several training programmes have been organized for farmers on the safe and effective use of pesticides by the Agricultural Experiment Station (six programmes in 1997, three in 1998).

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Trinidad and Tobago

Reported Use: 19.7 tonnes reported in both 1995 and 1996.

Legislation: Pesticides and Toxic Chemicals Act.

Regulations: An open permit system exists for pesticide imports. Health and safety requirements are enforced by the Pesticides and Toxic Chemicals Board; all importers and retailers of pesticides must submit data to the Registrar of Pesticides and Toxic Chemicals.

Implementing Agencies: Pesticides and Toxic Chemicals Board.

Economic Incentives/ Voluntary Programmes: None listed.

MB Alternatives Training/Outreach: None listed.

Policy Barriers: None listed.

Other Training: Ministry of Agriculture has ongoing educational programmes.

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Uruguay

Reported Use: 25 tonnes reported in 1995, 10.1 tonnes reported in 1996, 27 tonnes reported in 1997, primarily for soil fumigation on such crops as tomatoes, cucumbers, and peppers.

Legislation: Decree 149/77 regulates the sale of pesticides.

Regulations: Methyl bromide is a category 1 pesticide and is regulated as such.

Implementing Agencies: Ministry of Agriculture and Fisheries.

Economic Incentives/ Voluntary Programmes: None listed.

MB Alternatives Training/Outreach: A current project with UNIDO is demonstrating methyl bromide alternatives in tomatoes and peppers.

Policy Barriers: None listed.

Other Training: A variety of programmes are ongoing, including integrated production of fruit and horticultural products with support from GTZ; an organic production programme including international workshops and technical training; a national technical assistance programme focusing on training technicians; and several validation trials for low-input approaches, including soil fumigation alternatives (solarization, biofumigation, etc.) in the cultivation of fruits, tomatoes, carrots and lettuce.

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Venezuela

Reported Use: 17 tonnes reported in both 1995 and 1996.

Legislation: Rules to Reduce Consumption of Substances that Deplete the Ozone Layer (a proposed law, currently under consideration), will prohibit the import and use of methyl bromide from 1 January 2000.

Regulations: None listed.

Implementing Agencies: Ministry of Environment and Renewable Natural Resources; Agricultural Services.

Economic Incentives/ Voluntary Programmes: None listed.

MB Alternatives Training/Outreach: A workshop promoting the elimination of methyl bromide is planned for mid-1999, with support from UNIDO and the participation of FONDOIN.

Policy Barriers: None listed.

Other Training: None listed.

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5-4. Middle East

Significant users of methyl bromide in the Middle East region are Iraq, Jordan, Lebanon, Turkey and Syria. Many countries reported no use of methyl bromide, and the region as a whole constitutes an estimated 12% of use in Article 5(1) countries and 3% of global consumption.

Very few countries in the region responded to the survey. Of the four countries responding, none reported specific ODS legislation, three reported pesticide legislation with corresponding licensing and/or import controls, and two cited specific programmes promoting methyl bromide alternatives.

Table 5-4: Middle East Country Report Summary

Country	Reported Use (tonnes) 1995/1996	ODS Legislation	Pesticide Legislation	Import and Licensing Controls	Economic Incentives/ Voluntary Programmes	Programmes for MB Alternatives	Programmes for Pesticide Reduction
Jordan	300 / 300		X	X		X	
Lebanon	252 / 299		X			X	
Qatar†	0 / 0						
Yemen	N/A		X	X			

N/A *Not available.*
† Registration cancelled, imports prohibited, or no use reported

Jordan

Reported Use: 300 tonnes reported in both 1995 and 1996.

Legislation: None listed.

Regulations: Pesticide Import Regulations control importation of methyl bromide.

Implementing Agencies: Ministry of Agriculture.

Economic Incentives/ Voluntary Programmes: None listed.

MB Alternatives Training/Outreach: A demonstration project supported by the Multilateral Fund is coordinated by UNIDO in conjunction with GTZ, the German development organization.

Policy Barriers: None listed.

Other Training: None listed.

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Lebanon

Reported Use: 252 tonnes reported in 1995, 259 tonnes reported in 1996.

Legislation: None listed.

Regulations: None listed.

Implementing Agencies: Ministry of Environment; Ministry of Agriculture.

Economic Incentives/ Voluntary Programmes: None listed.

MB Alternatives Training/Outreach: A demonstration project for methyl bromide alternatives in greenhouses began in February 1999. Participating institutions include UNDP, Ministry of Environment, Ministry of Agriculture, the Lebanese University and the American University of Beirut.

Policy Barriers: None listed.

Other Training: None listed.

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Qatar

Reported Use: Methyl bromide is not used in Qatar.

No additional information provided.

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Yemen

Reported Use: Not available.

Legislation: Environment Protection Law No. 26, 1995 governs the use of all pesticides. A Pesticide Handling Law, currently being considered, will control all import, sale, storage, use and disposal of pesticides.

Regulations: Regulations under the new Pesticide Law will establish import restrictions, permitting requirements, use reporting requirements, labeling and health and safety guidelines.

Implementing Agencies: Environment Protection Council; General Department of Plant Protection, Ministry of Agriculture.

Economic Incentives/ Voluntary Programmes: None listed.

MB Alternatives Training/Outreach: None listed.

Policy Barriers: None listed.

Other Training: None listed.

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5-5. Other Article 5(1) Countries

Several countries with economies in transition (CEIT) responded to the survey. This region, categorized as "other Article 5(1) countries," makes up a small proportion of methyl bromide use: an estimated 1% of Article 5(1) consumption and 0.2% of global use.

Two of the five countries responding have ODS legislation in place or under consideration. All countries reported pesticide legislation governing methyl bromide use through import and licensing controls. No countries have economic incentives or voluntary programmes in place, and three of the five reported programmes specifically promoting alternatives to methyl bromide. Three countries also reported programmes promoting pesticide use reduction or sustainable agriculture.

Table 5-5: Other Article 5(1) Country Report Summary

	Reported Use (tonnes) 1995/1996	ODS Legislation	Pesticide Legislation	Import and Licensing Controls	Economic Incentives/ Voluntary Programmes	Programmes for MB Alternatives	Programmes for Pesticide Reduction
Croatia	28 / 29	X†	X	X		X	
Macedonia	20 / 42		X	X		X	X
Malta	62 / 39		X	X		X	X
Romania	34 / 31		X	X			
Slovenia	1 / 0	X	X	X			X

† In development or under consideration.

Croatia

Reported Use: 28 tonnes reported in 1995, 29 tonnes reported in 1996, 28 tonnes reported in 1997 and 20 tonnes reported in 1998.

Legislation: The Plant Protection Law (1994) established a Plant Protection Commission to determine what pesticides can be used in Croatia. The By-Law on Substances that Deplete the Ozone Layer (Official Gazette No.7/99) defines requirements and methods for phasing out consumption of ODS, as well as handling of products that contain such substances or were produced with them. The By-Law specifies a complete phase out of methyl bromide by the year 2006. The accelerated phase-out schedule was adopted to prevent the spread of methyl bromide use to sectors beyond tobacco production, which is currently the only consuming sector. The By-Law also specifies:

- consumption quotas for all ODS, including methyl bromide;
- improved licensing system;

- ban on imports and production of products containing ODS; and
- improved data collection system.

Regulations: The Plant Protection Law and several other relevant laws (Law on Transport of Hazardous Substances; Law on Production, Marketing and Use of Poisons; Law on Poisons) control the import and permitting for methyl bromide, set health and safety standards for its use and require product labeling. The By-Law on Substances that Deplete the Ozone Layer will require reporting of methyl bromide (and other ODS) consumption during the phase-out period.

Implementing Agencies: Plant Protection Commission of the Ministry of Agriculture and Forestry; Institute for Plant Protection in Agriculture and Forestry; the State Directorate for the Protection of Nature and Environment.

Economic Incentives/ Voluntary Programmes: None listed.

MB Alternatives Training/Outreach: A demonstration project was established in 1998 to promote methyl bromide alternatives in tobacco production (solarization and bio-fumigation, use of low-dose chemicals and non-soil cultivation). With this project, the complete phase out of this substance will be possible by the year 2006. The project includes a technical and economic evaluation of technologies used and dissemination of the results among qualified specialists from Article 5(1) countries with similar climatic conditions. Participants include UNIDO, the State Directorate for the Protection of Nature and Environment, the Institute for Plant Protection in Agriculture and Forestry and the Tobacco Institute.

Policy Barriers: None listed.

Other Training: None listed.

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Macedonia

Reported Use: Data not reported in 1995, 20 tonnes reported in 1996.

Legislation: The Law for Plant Protection (1998) and the Law for Production of Toxins (1976) control the import and application of pesticides, including methyl bromide.

Regulations: Methyl bromide can be imported and sold following approval from the Ministry of Agriculture, Forestry and Water Economy for the use of specific quantities on specific crops.

Implementing Agencies: Agency for Development in Agriculture, Ministry of Agriculture, Forestry and Water Economy; Republic Inspectorate for Agriculture and Republic Inspectorate for Health.

Economic Incentives/ Voluntary Programmes: None listed.

MB Alternatives Training/Outreach: A demonstration project has been established by UNIDO for alternatives to methyl bromide in tobacco and horticultural production.

Policy Barriers: None listed.

Other Training: IPM projects and official trials for testing the efficiency of chemical replacements for methyl bromide (e.g. basamid) are being conducted by the Faculty of Agriculture, Skopje, the Institute for Tobacco, Prilep, and the Agricultural Institute, Skopje.

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Malta

Reported Use: 62 tonnes reported in 1995, 39 tonnes reported in 1996. Methyl bromide is used primarily for structural fumigation in Malta, including aircraft disinfestation.

Legislation: The Environment Protection Act (1991) establishes various environmental controls relevant to methyl bromide use. The Pesticides (Control of Importation, Sale and Use) Act (1966) controls the use of pesticides in Malta.

Regulations: Methyl bromide imports have been limited to 40 tonnes per year. Contractors importing and using methyl bromide must have permit applications approved by the Department of Agriculture, and are required to follow health and safety guidelines during application. Appropriate product labeling, in English and Maltese, is also required.

Implementing Agencies: Environment Protection Department; Pesticides Advisory Board, Ministry of Agriculture; Department of Health.

Economic Incentives/ Voluntary Programmes: None listed.

MB Alternatives Training/Outreach: Programmes have been established by the Department of Agriculture to encourage steam sterilization and solarization of soil as an alternative to methyl bromide. Results are publicized in a Department of Agriculture Newsletter.

Policy Barriers: None listed.

Other Training: National programmes promoting IPM methods have been established.

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Romania

Reported Use: 33.7 tonnes reported in 1995, 31 tonnes reported in 1996. Romania reported 36 tonnes of methyl bromide production in 1995, 18 tonnes reported in 1996.

Legislation: The Interministerial Order No.7 (1995) regulates the use of methyl bromide for agricultural product storage and vegetable production. Methyl bromide use is also governed by Law No. 137/1995 on Environmental Protection and Law No. 5/1982 on Pesticide Control.

Regulations: Import, trade and licensing of methyl bromide all follow the "Toxicity Group 2" requirements of the Plant Protection and Phytosanitary Quarantine Departments of the Ministry of Agriculture.

Implementing Agencies: Ministry of Agriculture; Ministry of Health; Ministry of Waters, Forests and Environmental Protection.

Economic Incentives/ Voluntary Programmes: None listed.

MB Alternatives Training/Outreach: None listed.

Policy Barriers: None listed.

Other Training: None listed.

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Slovenia

Reported Use: One tonne reported in 1995, no use reported in 1996.

Legislation: The Decision on the Prohibition of Trade and of the Use of Toxic Substances (1996-97) and the Decree on Handling Substances Depleting the Ozone Layer (1997) both control the import and use of methyl bromide.

Regulations: Under current regulations, methyl bromide may only be imported for laboratory research purposes and for essential uses (e.g., QPS requirements for export and post-harvest fumigation). Methyl bromide can only be handled by authorized enterprises or institutions, and appropriate labeling is required.

Implementing Agencies: Ministry of Health; Ministry of Environment and Physical Planning.

Economic Incentives/ Voluntary Programmes: None listed.

MB Alternatives Training/Outreach: None listed.

Policy Barriers: None listed.

Other Training: National IPM and pesticide use reduction programmes are ongoing.

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5-6. Non-Article 5(1) Countries

The combined use level of non-Article 5(1) countries constitutes roughly 75% of global consumption. More than half of the use in the region is in the United States, which consumes an estimated 40% of the global total. Other significant users are France, Israel, Italy, Japan and Spain.

Two-thirds of the non-Article 5(1) countries responding to the survey reported some form of legislation specifically controlling methyl bromide as an ODS. In several of these countries, this legislation puts controls and phase-out schedules in place that are more stringent than the Montreal Protocol controls (see **Table 2-1**). Nineteen of the 25 countries reported pesticide legislation that governs the use of methyl bromide, including controls on imports and licensing. Economic incentives and voluntary programmes are listed in eleven countries, and specific programmes promoting methyl bromide alternatives are reported by eleven countries as well. Nine countries reported programmes promoting pesticide use reduction or sustainable agriculture.

Table 5-6: Non-Article 5(1) Country Report Summary

Country	Reported Use (tonnes) 1995/1996	ODS Legislation	Pesticide Legislation	Import and Licensing Controls	Economic Incentives/ Voluntary Programmes	Programmes for MB Alternatives	Programmes for Pesticide Reduction
Australia	564 / 907	X	X	X	X	X	X
Belarus	37.5 / 92.5	X		X	X		
Belgium	N/A	X	X	X			X
Bulgaria	12 / 0		X	X			
Canada	152 / 246	X	X	X	X	X	X
Denmark†	9 / 8	X		X			
Estonia†	0 / 0	X	X	X			X
European Union	14,223 / 19,247	X		X		X	
Finland†	8 / -	X	X	X		X	X
France	3,294 / 4,458		X	X			
Germany	85 / 96		X	X	X		
Hungary	53 / 53	X		X			
Iceland†	0 / 0	X		X			X
Israel	5,833 / 5,833	X	X		X	X	
Italy	N/A	X	X		X	X	X
Japan	5,971 / 5,261	X	X			X	
Kazakhstan	N/A		X	X			
Netherlands	23 / 35		X		X		
New Zealand	185 / 160	X	X	X	X	X	X
Norway	9 / 10	X	X	X	X	X	
Slovakia	6 / 7		X	X			
Spain	N/A	X	X	X	X	X	
Sweden	10 / 27		X		X		X
Ukraine	650 / 650	X		X			
United States	20,806 / 21,534	X	X	X		X	

N/A *Not available.*

† Registration cancelled, imports prohibited or no use reported.

Australia

Reported Use: 564.3 tonnes reported in 1995, 907 tonnes reported in 1996.

Legislation: Ozone Protection Act 1989 (Commonwealth) was passed to implement Australia's obligations under the Vienna Convention and Montreal Protocol by instituting a system of controls on the manufacture, import and export of ODS. Methyl bromide controls were added to the law in 1995.

Regulations: Importers of methyl bromide are required to hold a "Controlled Substances License" restricting the quantity they can import. Licenses are granted for all or part of a two-year period. Reductions in these allowances will be implemented in line with the Montreal Protocol phase-out schedule. License holders are required to report to the Commonwealth at the end of each calendar year on the amount of methyl bromide imported into Australia in that period, specifying the tonnage imported for soil fumigation and QPS. Documentation must be included verifying that the methyl bromide imported for QPS purposes is in fact sold for that use. Methyl bromide must also be registered with the National Registration Authority, which reviews and assesses the suitability of all agricultural chemicals.

Implementing Agencies: Environment Australia, National Registration Authority.

Economic Incentives/ Voluntary Programmes: Imports of methyl bromide are subject to an activity fee of US $60 per metric tonne payable to the Commonwealth at the end of each calendar quarter. This fee is in addition to the two-year license fee of US $7,000. License and activity fees are placed into an Ozone Protection Reserve established by the Ozone Protection Act to reimburse the Commonwealth for costs associated with furthering the phase out of methyl bromide and providing information about those phase-out programmes.

In addition to the activity fees levied under the Ozone Protection Act, Australian importers of methyl bromide have agreed to collect a voluntary levy on imports of this ozone depleting pesticide. The funds collected annually (approximately US $170,000) are deposited in a private trust fund which is matched by the Rural Industries Research and Development Corporation, and used to support research, development and testing of potential alternatives.

The National Methyl Bromide Consultative Group assists in the development and implementation of practical strategies to phase out methyl bromide in a manner which minimizes potential adverse impacts on horticultural production in Australia. The Group assisted with the development of Australia's National Methyl Bromide Response Strategy (Part 1: Horticultural Uses) to

ensure users of methyl bromide could meet the accelerated phase-out schedule for methyl bromide.

The National Methyl Bromide Alternatives Research Coordination Committee was formed in mid-1995 to promote the rapid phase out of methyl bromide; identify, review and propose research, development and extension activities to promote alternatives; develop strategies for commissioning regional research, development and extension projects; ensure effective research coordination; communicate the results of research to user groups; and facilitate liaison with the National Registration Authority.

MB Alternatives Training/Outreach: Three programmes have been funded by Environment Australia to facilitate the development, trials and adoption of alternatives, including (i) a methyl bromide national communication strategy; (ii) development of effective fumigation methods to minimize use rates and facilitate new treatment registrations; and (iii) field trials to test methyl bromide alternatives in six climatic regions around Australia.

Policy Barriers: None listed.

Other Training: Nationwide government and non-governmental activities promoting pesticide use reduction and alternatives (too numerous to identify individually).

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Belarus

Reported Use: 37.5 tonnes reported in 1995, 92.5 tonnes reported in 1996.

Legislation: Under the Cabinet of Ministers Resolution No. 218 (1997) regarding general import controls, specific legislation was adopted regarding "Permission for ODS movement (imports, exports, transit) through the Customs Area of Belarus". Methyl bromide is also controlled under Cabinet of Ministers Resolution No. 1038 (1997), which establishes a licensing system for ODS production, storage and consumption. This resolution also establishes an import fee for all ODS, including methyl bromide.

Regulations: A license is required for storage and use of ODS, and permits are required for imports. Annual use reporting for methyl bromide is required.

Implementing Agencies: Ministry of Natural Resources and Environmental Protection; State Customs Committee of Belarus.

Economic Incentives/ Voluntary Programmes: ODS import fees are administered through the State Customs Committee.

MB Alternatives Training/Outreach: None listed.

Policy Barriers: National quarantine requirements, absence of available alternatives and financial means to promote them.

Other Training: None listed.

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Belgium

Reported Use: Not available.

Legislation: Decree of June 5 1975 regulates the conservation, trade and use of non-agricultural pesticides, including the non-agricultural uses of methyl bromide. The Decree of 28 February 1994 regulating the conservation, marketing and use of agricultural pesticides governs methyl bromide's soil fumigation uses.

Regulations: Import of methyl bromide is controlled under European Economic Commission rule No.3053/94 regulating the trade of ODS products. A two-year license authorizing use for non-agricultural purposes is required from the Minister of Public Health and the Environment; licenses for agricultural use are required from the Minister of Agriculture. Only specially authorized and technically competent users may receive licenses for methyl bromide use.

Implementing Agencies: Ministry of Public Health and Environment; Ministry of Agriculture.

Economic Incentives/ Voluntary Programmes: None listed.

MB Alternatives Training/Outreach: None listed.

Policy Barriers: Timber exports to Australia require methyl bromide pre-shipment fumigation.

Other Training: Existing programmes include (1) reduction of authorized uses for some pesticides causing problems for surface and groundwater (e.g., lindane, endosulfan, dichlorvos, atrazine, simazine, diuron); (2) IPM programme and certification of IPM system in pome fruit; (3) fees on sold quantities of selected pesticides; and (4) application of EU regulation 2078/92 concerning demonstration projects reducing the input of pesticides and promoting organic farming.

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Bulgaria

Reported Use: Twelve tonnes reported in 1995, 66 tonnes reported in 1997, and 65 tonnes reported in 1998.

Legislation: None listed.

Regulations: Import and use of pesticides is monitored and controlled. An ordinance issued by the Ministry of the Environment and Water requires that a methyl bromide use inventory be developed for the period 1991-1998, along with measures to meet the Montreal Protocol phase-out requirements.

Implementing Agencies: Ministry of Health (imports); Ministry of Agriculture and Forests (use).

Economic Incentives/ Voluntary Programmes: None listed.

MB Alternatives Training/Outreach: None listed.

Policy Barriers: None listed.

Other Training: None listed.

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Canada

Reported Use: 152.2 tonnes reported in 1995, 246.2 tonnes reported in 1996.

Legislation: The Canadian Environmental Protection Act (CEPA), 1988 was established to protect the environment and human health in Canada. The Ozone Depleting Substances Regulations (ODSR), 1989 is designed to implement Canada's commitments under the Montreal Protocol, including gradual reduction and phase out of ODS production and consumption. Methyl bromide use is governed by both of these laws; methyl bromide provisions were included in the ODSR in 1994. The Pest Control Products Act also controls methyl bromide use.

Regulations: The ODSR required a freeze on the production and consumption of methyl bromide at 1991 levels in 1995, and a 25 percent reduction from 1991 levels in 1998. The Pest Control Products Act requires that methyl bromide be registered before import and the ODSR requires a permit for the import and export of methyl bromide. The ODSR also requires that anyone who manufactures, imports or exports methyl bromide submit an annual use report to the Minister of Environment.

Implementing Agencies: Environment Canada; Pest Management Regulatory Agency/Health Canada.

Economic Incentives/ Voluntary Programmes: Canada uses a "consumption allowance system" to meet its Montreal Protocol commitments. Under this system, Canada's maximum consumption as established by the Protocol is divided among Canadian companies. Each company receives allowances equal to the maximum quantity of methyl bromide it can produce or import during a given year. Transfer of consumption allowances between companies is allowed; a transfer is only valid for one year. The tradable allowances system creates an incentive for companies to introduce alternatives as the unused portion of their allowances can be sold to other companies that have further needs for methyl bromide. This mechanism, coupled with a gradual reduction of the maximum consumption, helps companies finance the introduction of alternatives in sectors where they exist. It also increases the cost of methyl bromide use thereby making alternatives more attractive economically.

In terms of voluntary programmes, Canada has established a Joint Industry-Government Working Group on Methyl Bromide Alternatives, composed of representatives from the federal government, private industry and environmental NGOs. The Group provides direction on the implementation of Canada's programme for the control of methyl bromide, including direction on the adoption of alternatives, research and development. A Canada-U.S. Working Group on Methyl Bromide Alternatives has also been

established to share information between the two countries on methyl bromide alternatives, and plan collaborative research and other initiatives. Participants include representatives from U.S. and Canadian governments and industry.

MB Alternatives Training/Outreach:

The Industry-Government Working Group organized an international alternatives workshop in 1996 to demonstrate and promote alternatives. The Working Group also hosted an industry demonstration of alternatives during the 10th Meeting of the Parties to the Montreal Protocol in Montreal in 1997. In 1998, Environment Canada's Technology Transfer Office, in collaboration with the Environment Bureau of Agriculture and Agri-Food Canada, organized a tour of Canadian companies and research facilities in southern Ontario which specialize in methyl bromide alternative technologies and expertise for members of the Executive Committee of the Protocol's Multilateral Fund. The Pest Management Regulatory Agency (PMRA) chaired a Subcommittee on Alternatives for the Food Processing Sector under the Working Group. The Subcommittee prepared a document providing guidelines for an IPM approach in food processing facilities.

In addition, many Canadian companies have made presentations on alternatives at international and domestic conferences and meetings. Canada is also actively involved in promoting alternatives to methyl bromide outside the country, including bilateral projects with China and Kenya promoting IPM systems in grain storage facilities.

Policy Barriers:

None listed.

Other Training:

PMRA is using a partnership approach to support increased adoption of IPM. The PMRA facilitates development of voluntary national IPM strategies in cooperation with a range of partners including grower organizations, manufacturers, other federal government departments, provinces, research establishments and other non-governmental organizations. In each IPM partnership project an interactive and consultative process is used to develop and communicate a practical IPM programme for a specific crop or pest. Active involvement of growers/users is critical to project success.

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Denmark

Reported Use: Nine tonnes reported in 1995, eight tonnes reported in 1996, five tonnes reported in 1997. Denmark prohibited all use of methyl bromide, including QPS, by January 1998.

Legislation: Statutory Order No. 974 Prohibiting the Use of Certain Ozone Depleting Substances (1995) established phase-out schedules for all ODS, including methyl bromide.

Regulations: Under Order No. 974 all use of methyl bromide was prohibited in Denmark by 1st January 1998. Violations may be punished by fine, detention or imprisonment for up to one year.

Implementing Agencies: Danish Environmental Protection Agency.

Economic Incentives/ Voluntary Programmes: None listed.

MB Alternatives Training/Outreach: None listed.

Policy Barriers: None listed.

Other Training: None listed.

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Estonia

Reported Use: No use reported. Methyl bromide is not currently registered in Estonia; a small volume of existing stocks can be used. The Estonian Plant Production Inspectorate is not planning to reregister methyl bromide for use as a pesticide.

Legislation: The Act on Joining with Vienna Convention for the Protection of the Ozone Layer and with Montreal Protocol on Substances that Deplete the Ozone Layer (1996) establishes authorities to reduce the use of substances that deplete the ozone layer. Methyl bromide is also controlled under the Act on Protection of Air and the Plant Protection Act.

Regulations: The import and use of methyl bromide are controlled under the various Acts listed above.

Implementing Agencies: Ministry of Environment; Plant Production Inspectorate.

Economic Incentives/ Voluntary Programmes: None listed.

MB Alternatives Training/Outreach: None listed.

Policy Barriers: None listed.

Other Training: Plant protection programmes are aimed at reducing pesticide use and treatment frequency. Other general training projects involve some elements of pesticide use reduction. A project supporting organic farming will be initiated in 2000.

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European Union

Reported Use: 14,223 tonnes reported in 1995, 19,247 tonnes reported in 1996, 17,240 tonnes reported in 1997, and 12,930 tonnes reported in 1998 and 1999.

Legislation: Regulation 3093/94 was established to promote the protection of the ozone layer. This law included a freeze on methyl bromide production and consumption in 1995 at 1991 levels, and a 25% cut in 1998. A new proposed regulation includes phase out in 2005 with 60% cut in 2001 and 75% cut in 2003, as well as a freeze on quantities used for QPS.

Regulations: Annual quotas are required for import and placing on the Community market. Quotas are progressively reduced in line with the phase-out schedule; import licenses are required for each shipment imported.

Implementing Agencies: National Competent Authorization; European Commission DGXI.D.3.

Economic Incentives/ Voluntary Programmes: Not at European level.

MB Alternatives Training/Outreach: Workshops on methyl bromide alternatives organized for the European Union in 1997 (Spain), 1998 (Italy) and 1999 (Greece).

Policy Barriers: Some national or Community legislation requires use of methyl bromide for imported commodities (QPS). Resistance to phase out is strong among fumigation companies.

Other Training: Fumigators need licenses to purchase, supply and apply methyl bromide under Member State pesticide laws. Training is mandatory for fumigators. Under the new regulation, use of virtually impermeable plastics to minimize leakages is compulsory.

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Finland

Reported Use: Eight tonnes reported in 1995. As of January 1 1999, methyl bromide use is prohibited and products containing it may not be placed on the market.

Legislation: Council of State Decision on Substances that Deplete the Ozone Layer No. 262/98 (1998) sets phase-out dates for all substances that deplete the ozone layer. The Finnish Pesticides Act (327/69) governs the import, sale and use of all pesticides, including methyl bromide.

Regulations: The Pesticide Board must authorize the import, sale or use of any pesticide. In 1998, the Board decided, following the Council of State Decision No.262/98, to cancel approval of Metabrom, the only methyl bromide product registered in Finland.

Implementing Agencies: Ministry of Environment.

Economic Incentives/ Voluntary Programmes: None listed.

MB Alternatives Training/Outreach: Several projects have been or are being conducted by the CFC group under the Nordic Ministers framework. The current project promotes IPM in flour mills to replace methyl bromide. Publications resulting from these projects are produced and distributed among users.

Policy Barriers: None listed.

Other Training: A Pesticide Use Reduction Programme was established in 1992.

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France

Reported Use: 3,294 tonnes reported in 1995, 4,458 tonnes reported in 1996. France reported 3,437 tonnes of methyl bromide production in 1995, 4,567 tonnes reported in 1996.

Legislation: Methyl bromide use is governed by the Law on Conditions for the Release and Use of Methyl Bromide in Agriculture (1971, modified

1990). This law refers to several codes and decrees, including the Code Concerning the Repression of Fraud in the Commerce of Products Used for Pest Control (1903) and the Decree on regulations for the public administration and application of this law (1997); the Code of Public Health relating to the conditions of release and use of poisonous substances (R.5149, R.5165, R.5229), and the Modification Regarding the Organization of Control of Pest Control Products Used in Agriculture (1943).

Regulations:

Methyl bromide use for soil fumigation is authorized according to specific conditions, including:

- Virtually impermeable film must be used to cover treated areas; and
- Dosage cannot be more than 120 grams per square meter.

Methyl bromide can only be applied by applicators who have been trained and certified by the Department of Plant Protection. Three-day advance notice of applications to the Chief of the Phytosanitary Department is required. In addition, warning signs are required around application sites for 48 hours following treatment, and a buffer zone of five meters from residences or structures containing animals is required. Appropriate protective gear and maximum exposure levels are also specified in the regulations.

In addition, the European Union is developing a regulation on substances that deplete the ozone layer that will apply to France and all other member states.

Implementing Agencies: Ministry of Agriculture, Department of Plant Protection.

Economic Incentives/ Voluntary Programmes: None listed.

MB Alternatives Training/Outreach: None listed.

Policy Barriers: None listed.

Other Training: None listed.

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Germany

Reported Use: 85 tonnes reported in 1995, 96 tonnes reported in 1996 and 83 tonnes reported in 1997. These figures represent the amount of methyl bromide sold or placed on the German market, as reported by industry under the Plant Protection Act.

Legislation: Under the Plant Protection Act, all products used for plant protection, including methyl bromide, require government authorization before being placed on the market. The Ordinance Governing the Ban on the Use of Plant Protection Products sets out restrictions for using several substances, including methyl bromide. In addition, the European Union is developing a Regulation on Substances that Deplete the Ozone Layer that will apply to Germany and all other member states.

Regulations: Allowable post-harvest uses of methyl bromide include: fumigation of mills, storerooms, stores and other rooms of the food processing industry, and fumigation against stored product pests in vacuum chambers, in gasproof small silos, in transport containers and under gasproof tarpaulins. Allowable soil treatment uses include treatment outside water catchment areas in ornamentals, in vine nurseries and for producing seed potatoes in plant breeding gardens. In addition, methyl bromide may only be used by specially authorized and trained personnel, as outlined in the Ordinance for Protection Against Hazardous Substances.

Implementing Agencies: Federal Biological Research Centre for Agriculture and Forestry; Federal Institute for Consumer Protection and Veterinary Medicine; Federal Environmental Protection Agency.

Economic Incentives/ Voluntary Programmes: Economic incentives are not necessary because use is restricted to essential uses. The Federal Biological Research Centre for Agriculture and Forestry has established an ongoing dialogue with user groups and associations regarding the definition of essential uses of methyl bromide.

MB Alternatives Training/Outreach: None listed.

Policy Barriers: Wood packaging must be treated prior to export to New Zealand and Australia, and cut flowers (orchidaceae) originating in Thailand require treatment before import.

Other Training: None listed.

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Hungary

Reported Use: 53 tonnes reported in 1995 and 1996. Methyl bromide is mostly used for soil fumigation in greenhouse, foil tent and open ground horticulture.

Legislation: Decree 22/1993 (VII.20) KTM on Implementation of the International Treaty on Protection of the Stratospheric Ozone controls the use of all ODS, including methyl bromide.

Regulations: Use permits are required for soil fumigation with methyl bromide (not QPS). Import and national consumption levels are limited to 1991 levels as of 1995 (QPS excepted). The Decree specifies reductions required under the Montreal Protocol in 1999, 2001 and 2003, with full phase out in 2005.

Implementing Agencies: Ministry of Environment; Ministry of Economic Affairs; Regional Environmental Inspectorates.

Economic Incentives/ Voluntary Programmes: None listed.

MB Alternatives Training/Outreach: None listed.

Policy Barriers: None listed.

Other Training: None listed.

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Iceland

Reported Use: Methyl bromide use has been prohibited in Iceland since 1994.

Legislation: Regulation No. 656/1997 outlines measures to reduce and prevent the use of ODS. This regulation replaces Regulation No. 546/1994. Methyl bromide provisions were enacted in the 1994 version of the law.

Regulations: The import and use of methyl bromide has been banned since November 1994. The ban was extended to include recycled and reused substances in 1997.

Implementing Agencies: The Environmental and Food Agency of Iceland.

Economic Incentives/ Voluntary Programmes: None listed.

MB Alternatives Training/Outreach: None listed.

Policy Barriers: None listed.

Other Training: Soil disinfection in greenhouses is done primarily with hot water or steam. In warehouses and other storage facilities regular cleaning programmes keep the risk of problematic pests at a minimum.

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Israel

Reported Use: 5,833 tonnes reported in 1995 and 1996. Israel reported 24,213 tonnes of methyl bromide production in 1995, 23,678 tonnes reported in 1996.

Legislation: The Business Licensing Law, the Hazardous Substances Act and the Plant Protection and Inspection Law (1995) govern the use of methyl bromide and other pesticides, and enforce the Montreal Protocol rules on Israel's production of methyl bromide.

Regulations: Registration and reporting of methyl bromide use is required under the Ministry of Agriculture, which also enforces appropriate labeling requirements. The Ministry of Environment issues and enforces health and safety guidelines regarding methyl bromide use.

Implementing Agencies: Ministry of Environment; Ministry of Agriculture, Plant Protection and Inspection Services.

Economic Incentives/ Voluntary Programmes: The Flower Growers Board and the Vegetable Growers Board coordinate voluntary programmes to reduce the use of methyl bromide.

MB Alternatives Training/Outreach: The Ministry of Agriculture's extension service and the Volcani Research Center conduct outreach and training on methyl bromide alternatives, including demonstration plots and trials of solarization, agrotechniques and chemical alternatives.

Policy Barriers: Methyl bromide use is required for importation of some plant materials.

Other Training: None listed.

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Italy

Reported Use: Not available.

Legislation: Framework Regulation n. 549 (1993) on substances that deplete the ozone layer governs methyl bromide use, as does National Ordinance of 16 June, 1994 (issued by the Ministry of Health).

Regulations: The National Ordinance of 16 June, 1994 requires that fields must be fumigated only one year in two, treated soil must remain covered for at least seven days, and the maximum application rate must be 60 grams per square meter. Regional governments have additional controls, including application restrictions and buffer zones.

Implementing Agencies: Ministry of Environment; Ministry of Health.

Economic Incentives/ Voluntary Programmes: The Sicilian regional government has subsidized the purchase of agricultural equipment necessary for the adoption of methyl bromide alternatives, including plastic for solarization (25% reimbursement) and machinery to lay plastic for open field solarization (13% reimbursement). The government in the Liguria region has subsidized the purchase of fuel for steam treatment.

MB Alternatives Training/Outreach: The Ministry of Environment collaborates with several organizations to conduct research and inform farmers on the availability of methyl bromide alternatives. The Agronomy University in Turin, for example, has conducted experimental trials on chemical treatments, solarization and steam treatments, soilless cultivation and biological alternatives. Results are published in popular agricultural

trade magazines. In addition, the Chamber of Commerce of Savona in Albenga (Liguria) is conducting experimental trials on reduced dosage of methyl bromide using virtually impermeable films.

Policy Barriers: None listed.

Other Training: Regional programmes promote IPM, including a programme in the Emilia Romagna region with participation from 20% of the fruit growers in the region.

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Japan

Reported Use: 5,971 tonnes reported in 1995, 5,261 tonnes reported in 1996. Japan reported 5,270 tonnes of methyl bromide production in 1995, 5,015 tonnes reported in 1996.

Legislation: The Law Concerning Protection of the Ozone Layer through the Control of Specified Substances and Other Measures (1988) promotes international cooperation for protection of the ozone layer by taking measures to control the manufacture of specified substances, control the emission of such substances and take other steps to enforce the Vienna Convention and the Montreal Protocol. The Agricultural Chemicals Regulation Law also governs methyl bromide.

Regulations: Methyl bromide use must be registered under the Agricultural Chemicals Regulation Law, and use must be reported under the Law Concerning Protection of the Ozone Layer.

Implementing Agencies: Plant Protection Division, Agricultural Production Bureau, Ministry of Agriculture, Forestry and Fisheries; Ministry of International Trade and Industry; Environment Agency.

Economic Incentives/ Voluntary Programmes: None listed.

MB Alternatives Training/Outreach: A project is underway to establish field trials and promote alternatives to agricultural uses of methyl bromide, focusing on IPM approaches. The project also encourages the rapid registration of alternative pesticides for methyl bromide uses.

Policy Barriers: None listed.

Other Training: None listed.

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Kazakhstan

Reported Use: Not available.

Legislation: The List of Chemical and Biological Substances to Combat Plant Pests and Disease (1997) was established to manage the import, export and use of pesticides. Methyl bromide is also controlled under the National Register of Potential Toxic Substances.

Regulations: Control of import, export and use as outlined in the List and registration requirements under the National Register.

Implementing Agencies: Ministry of Agriculture; Ministry of Ecology and Natural Resources, Committee of Environmental Monitoring.

Economic Incentives/ Voluntary Programmes: None listed.

MB Alternatives Training/Outreach: None listed.

Policy Barriers: None listed.

Other Training: None listed.

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Ministry of Agriculture
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Republic of Kazahkstan
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The Netherlands

Reported Use: 23 tonnes reported in 1995, 35 tonnes reported in 1996.

Legislation: Netherlands Pesticide Law (1992) governs the use of methyl bromide.

Regulations: The Pesticide Law has prohibited use of methyl bromide as a soil fumigant since 1992. For fumigation of buildings, stocks or QPS, a distance of 100 meters is required between the fumigation site and houses or other occupied structures. Every fumigation must be reported to the Ministry of Social Affairs.

Implementing Agencies: Ministry of Environment; Ministry of Agriculture; Ministry of Health; Ministry of Social Affairs.

Economic Incentives/ Voluntary Programmes: Subsidies have been given for testing alternative techniques for fumigation of durables, perishables and buildings. A voluntary programme to restrict the use of methyl bromide to only critical uses (including QPS) is being developed.

MB Alternatives Training/Outreach: None listed.

Policy Barriers: Australian/New Zealand requirement of fumigation of containers with wooden pallets (this is now one of the major uses of methyl bromide in the Netherlands).

Other Training: None listed.

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New Zealand

Reported Use: 185.5 tonnes reported in 1995, 160 tonnes reported in 1996.

Legislation: The Ozone Layer Protection Regulations (1997) establish timetables for reduction in use of methyl bromide and other ODS. The Pesticides Act (1979), Fumigation Regulations (1967) and the Toxic Substances Act (1979) also apply to methyl bromide.

Regulations: The Pesticides Act requires that methyl bromide is registered before import or sale, and the Fumigation Regulations require the licensing of methyl bromide applicators. Imports and QPS uses must be reported under the Ozone Layer Protection Regulations. These regulations also establish a base-year permitting system which allows importers to import a decreasing amount each year from 1998-2005, when full phase out will be in effect. Reductions (from a 1991 baseline) are 25% in 1998, 35% in 1999, 45% in 2000, 60% in 2002, 75% in 2004, and 100% in 2005.

Implementing Agencies: Ministry for the Environment; Ministry of Health; Ministry of Agriculture; Ministry of Commerce.

Economic Incentives/ Voluntary Programmes: The government's Sustainable Management Fund and Industry Support Fund provide grants for research into alternative soil fumigants for strawberries. Growers' groups have established working groups on methyl bromide soil fumigation alternatives.

MB Alternatives Training/Outreach: Government research and training for methyl bromide recycling in fumigation chambers and alternatives to methyl bromide for strawberries. The projects involve industry/growers' groups and the Horticultural and Food Research Institute of New Zealand.

Policy Barriers: Some countries specify that exported commodities must be fumigated with methyl bromide.

Other Training: Several national programmes, including "Kiwi Green" pest management programme for kiwifruit, integrated fruit production programme for pomefruit, and "GrowSafe" training/licensing programme for farmers and growers.

Contact:

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Norway

Reported Use: Nine tonnes reported in 1995, 9.7 tonnes reported in 1996.

Legislation: The Regulation on Production, Import, Export and Uses of Methyl Bromide (1997) ensures that international obligations under the Montreal Protocol are met, as well as European Union regulations. The Regulation on Fumigation with Methyl Bromide (1975) also governs its use.

Regulations: Import requires approval from the Norwegian Pollution Control Authority, and permits are given for a single year and a specified amount. Annual reports on import and use are required.

Implementing Agencies: Norwegian Pollution Control Authority; Norwegian Board of Agriculture; Norwegian Board of Health.

Economic Incentives/ Voluntary Programmes: The government supported a trial of heat-treatment as an alternative to methyl bromide in 1995.

MB Alternatives Training/Outreach: Norway is cooperating with the Nordic Council of Ministers through the Nordic Programme to develop and implement outreach and training on alternatives.

Policy Barriers: None listed.

Other Training: None listed.

Contact:
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Slovakia

Reported Use: Six tonnes reported in 1995, 7 tonnes reported in 1996.

Legislation: Law No. 76/98 Collection of Acts on Protection of the Earth Ozone Layer and Law No. 455/91 Collection of Acts on Trading Entrepreneurial (trading law) both govern methyl bromide use.

Regulations: Permits are required for methyl bromide use under Law No. 76/98, Enclosure No. 1 and 2, Collection of Acts. Health and safety requirements and appropriate product labeling must be met under the Act of Phytosanitary Care No. 285/96 of Acts and the Decree

on Poisons and other Substances Harmful to Health, No. 206/1988, Collection of Acts.

Implementing Agencies: Agricultural Central Control and Testing Institute.

Economic Incentives/ Voluntary Programmes: None listed.

MB Alternatives Training/Outreach: None listed.

Policy Barriers: None listed.

Other Training: None listed.

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Spain

Reported Use: Not available.

Legislation: The following national legislation governs methyl bromide as an ODS:

- Counsel Decision (1993) regarding the Montreal Protocol on Substances that Deplete the Ozone Layer;
- Counsel Regulation (1994) relative to substances that deplete the ozone layer; and
- Ratification of decisions taken at the Ninth Meeting of the Parties to the Montreal Protocol (1998).

In addition, methyl bromide is controlled as a pesticide under the Technical and Sanitation Regulations of Pesticides and Decree 2163/1994 which enacts, at the national level, the Directive of the Counsel of the European Union No. 91/414/CEE.

Regulations: Imports of methyl bromide are registered with the Official Registry of Phytosanitary Products and documented in the official record of "trade of dangerous pesticides." Importing companies are subject to inspection and are required to document the distribution of their imports to their clients/end-users. Methyl bromide is subject to health and safety regulations that apply to all dangerous pesticides.

Implementing Agencies: Ministry of Environment; Ministry of Sanitation and Consumers (control of imports of chemical products); Ministry of Agriculture (authorization of pesticide products); Ministry of Foreign Affairs (implementation of the Montreal Protocol).

Economic Incentives/ Voluntary Programmes: Government funds have been allocated for a Programme of Investigation of Methyl Bromide Alternatives, involving researchers, fumigation companies, farmers' associations and other interested parties.

MB Alternatives Training/Outreach: Several programmes are supported through government agencies and universities, including:

- Environmentally sustainable and economically viable alternatives to methyl bromide (INIA);
- Substitution of methyl bromide fumigation and disease management in strawberry crops by IPM strategies (University of Salamanca);
- Alternatives to methyl bromide use in greenhouses (Community of Madrid);
- Integration of mycorrhiza in alternative cultivation systems to control soil pathogens; and
- Workshops on effective use of virtually impermeable films in the application of methyl bromide.

Particular efforts are made to publicize results of these studies in technical and agricultural trade journals.

Policy Barriers: The primary barrier is lack of awareness and training among users of the use and viability of alternatives, and their efficacy when compared with methyl bromide.

Other Training: None listed.

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Sweden

Reported Use: Ten tonnes reported in 1995, 27 tonnes reported in 1996.

Legislation: The Ordinance on Pesticides (1985) and Approval on Methyl Bromide (1997) govern the regulation of methyl bromide.

Regulations: Soil fumigation uses of methyl bromide were prohibited in 1993. In 1998, structural and post-harvest fumigation was also prohibited. Methyl bromide use is now restricted to pre-shipment uses to control wood-boring insects in wooden packing materials, and only in instances when the receiving country (e.g., Australia) requires such fumigation.

Implementing Agencies: National Chemicals Inspectorate; Swedish Environmental Protection Agency.

Economic Incentives/ Voluntary Programmes: A working group on the methyl bromide phase out involved the Swedish Environmental Protection Agency, companies using methyl bromide and the association of mills.

MB Alternatives Training/Outreach: None listed.

Policy Barriers: QPS requirements are excluded in the EU and Montreal Protocol phase-out programme for methyl bromide.

Other Training: Several pesticide use reduction programmes are in place.

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Ukraine

Reported Use: 650 tonnes reported in both 1995 and 1996. Survey respondents report that use is for QPS purposes only. The Ukraine reported 1,402 tonnes of methyl bromide production in 1995 and 1996.

Legislation: Decree of the Cabinet of Ministers of Ukraine No. 373 on Licensing Import and Export of ODS and Products Containing Them (1998).

Regulations: Under the Decree, a license for methyl bromide import may be issued upon approval by the Ministry of Environmental Protection and Nuclear Safety if all conditions of the Montreal Protocol have

been met. Health, safety, reporting and labeling requirements are the same as those for other dangerous substances.

Implementing Agencies: Ministry for Environmental Protection and Nuclear Safety; Ministry of Agriculture.

Economic Incentives/ Voluntary Programmes: None listed.

MB Alternatives Training/Outreach: None listed.

Policy Barriers: None listed.

Other Training: None listed.

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United States

Reported Use: 20,806 tonnes reported in 1995, 21,534 tonnes reported in 1996. The United States reported 23,941 tonnes of production in 1995, 26,866 tonnes reported in 1996.

Legislation: The 1990 Amendments to the Clean Air Act require that an ODS with an ozone depletion potential of .2 or higher be phased out within seven years of being listed as an ODS. Under the authority of this legislation, the U.S. Environmental Protection Agency set forth regulations in 1993 (December 10, 1993 - 58 FR 65018) to prohibit the production and import of methyl bromide after January 1, 2001. Congressional changes to the Clean Air Act in 1998 delayed this phase out to 2005, with interim reductions as specified in the Montreal Protocol. The Federal Insecticide Fungicide and Rodenticide Act (FIFRA) also governs methyl bromide use.

Regulations: Production and importation of methyl bromide will be curtailed in the U.S. to meet the deadlines outlined in the Clean Air Act as amended by Congress in 1998. FIFRA classifies methyl bromide as a restricted use pesticide and a class I toxic material, and requires correct labeling, appropriate training, protective clothing, face and body protection, and breathing protection. A number of other restrictions apply, including what crops it can be used on and how it can be used. No national use reporting is required, but some

states (e.g., California) require use reporting and may apply additional use restrictions.

Implementing Agencies: The U.S. Environmental Protection Agency (U.S. EPA); U.S. Department of Agriculture (USDA).

Economic Incentives/ Voluntary Programmes: None listed.

MB Alternatives Training/Outreach: The U.S. EPA has published several documents on examples of alternatives to methyl bromide. In addition, the U.S. EPA created and maintains an Internet site devoted to all aspects of the methyl bromide phase out and replacement. The USDA publishes a quarterly newsletter highlighting developments in methyl bromide alternatives which is distributed to researchers, methyl bromide users and other interested parties. USDA also supports an alternatives research programme.

Policy Barriers: None listed.

Other Training: None listed.

Contact:

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www.ars.usda.gov/is/mb/mebrweb.htm

Section 6. Policy Resources under the Montreal Protocol

6-1. The Multilateral Fund's Implementing Agencies

The Multilateral Fund's four Implementing Agencies are responsible for working with Article 5(1) country governments to develop and implement projects and policies to phase out all ODS controlled under the Protocol, including methyl bromide. The agencies are also responsible for coordinating their work to ensure complementary projects and policy initiatives. The responsibilities and approaches of each Implementing Agency are described briefly below, along with appropriate contact information.

6-1-1. United Nations Development Programme (UNDP)

UNDP assists developing country governments in investment project planning and preparation, development of country programmes (national plans for phasing out various ODS), institutional strengthening and training and demonstration projects.

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Website: www.undp.org/seed/eap/montreal

6-1-2. United Nations Environment Programme (UNEP)

Through its OzonAction Programme (see **Section 6-2**), UNEP collects data, provides an information clearinghouse, assists low-volume consuming countries in the preparation of Country Programmes, Institutional Strengthening and Refrigerant Management Plans and offers training and networking assistance.

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Division of Technology, Industry and Economics (UNEP TIE)
United Nations Environment Programme
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39-43 Quai André Citroen
75739 Paris Cedex 15, France
Tel: 33-1-4437-1459
Fax: 33-1-4437-1474
Email: ozonaction@unep.fr
Website: www.unepie.org/ozonaction.html

6-1-3. United Nations Industrial Development Organization (UNIDO)

UNIDO runs small- to medium-scale investment projects, assists in the development of Country Programmes and offers technical assistance and training for individual facilities.

Contact: Mr. Angelo D'Ambrosio, Managing Director
Industrial Sectors and Environment Division
United Nations Industrial Development Organization
Environment and Energy Branch
Industrial Sectors and Environment Division
Vienna International Centre, P.O. Box 400
A-1400 Vienna, Austria
Tel: 43-1-21131-3782
Fax: 43-1-21131-6804
Email: ssi-ahmed@unido.org
Website: www.unido.org

6-1-4. The World Bank

The World Bank assists developing country governments in the development and implementation of large-scale investment projects and preparation of Country Programmes.

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Environment Department
The World Bank
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6-1-5. Multilateral Fund Secretariat

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6-1-6. UNEP Ozone Secretariat

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6-2. About the UNEP-TIE OzonAction Programme

Nations around the world are concerned about the emissions of man-made CFCs, halons, carbon tetrachloride, methyl chloroform, methyl bromide and other ozone-depleting substances (ODS) that have damaged the stratospheric ozone layer — a shield around the Earth which protects life from dangerous ultraviolet radiation from the Sun. Over 167 countries have committed themselves under the Montreal Protocol to phase out the use and production of these substances. Recognizing the special needs of developing countries, the Parties to the Protocol also established a Multilateral Fund and appointed implementing agencies to provide technical and financial assistance to enable the developing countries to meet their commitments under the treaty. UNEP is one of the Fund implementing agencies; the others are UNDP, UNIDO and the World Bank.

Since 1991, the UNEP TIE OzonAction Programme in Paris has been strengthening the capacity of governments (especially National Ozone Units) and industry in developing countries to make informed decisions on technology and policy options that will result in cost-effective ODS phase-out activities with minimal external intervention. The Programme accomplishes this by delivering a range of need-based services, including:

Information Exchange
To enable decision makers to take informed decisions on policies and investments. Information and management tools already provided for developing countries include the OzonAction Information Clearinghouse (OAIC) diskette and World Wide Web site, a quarterly newsletter, sector-specific technical publications for identifying and selecting alternative technologies, and policy guidelines.

Training and Networking
To provide platforms for exchanging experiences, developing skills, and tapping the expertise of peers and other experts in the global ozone protection community. Training and network workshops build skills for implementing and managing phase-out activities, and are conducted at the regional level (support is also extended to national activities). The Programme currently operates eight regional and sub-regional Networks of ODS Officers comprising 95

countries, which have resulted in member countries taking early steps to implement the Montreal Protocol.

Country Programmes, Institutional Strengthening and Refrigerant Management Plans
To support the development of national ODS phase-out strategies and programmes, especially for low-volume ODS-consuming countries. The Programme currently assists 79 countries in the development of their Country Programmes and implements Institutional-Strengthening projects for 67 countries.

For more information about these services please contact:

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Website: http://www.unepie.org/ozonaction.html

Box 6.1: UNEP's Mentor Programme

UNEP's OzonAction Programme has established a Mentor programme to provide expert-to-expert policy-setting assistance for government officials. Mentors are available to answer questions, discuss issues, assist with insights and share practical experiences with effective policy-setting. Direct, practical advice, not just theoretical information, is needed for NOUs and policy drafters to understand the key lessons learned by their counterparts in industrialized countries. Under this programme, a mentor makes him/herself available on a regular basis to answer questions posed by developing country counterparts, provide advice and insights, and share experiences with effective policy-setting. The Mentor Programme operates on a voluntary, unpaid basis.

The following countries are currently part of UNEP's Policy Mentor Network: Canada, Belgium, Germany, Israel, New Zealand, and the United States. Efforts are being made to expand this pool of expertise. **To volunteer or nominate someone to participate in the programme, or for further information, contact Rajendra M. Shende, Chief, Energy and OzonAction Unit.**

6-2-1. Regional NOU Networks

Networking provides a platform for Ozone Officers from developing countries to exchange experiences, develop their skills, and tap the expertise of their peers in both developing and developed countries. Conducted at the regional level, the Networking activities coordinated by UNEP build participants' skills for implementing and managing national ODS phase-out activities.

The OzonAction Programme currently operates seven Networks comprising more than 109 developing and eight industrialized countries. Networking activities include annual workshops and regular communication between UNEP representatives and Ozone Officers to provide information and assistance in resolving any difficulties encountered.

The Networks are administered on a day-to-day basis by Regional Network Coordinators based in UNEP Regional Offices. The entire Networking activity is managed by the Network Manager based at UNEP TIE in Paris, France. Contacts for all of the regional coordinators are available on the OzonAction website (see **Section 6-1-2**).

6-3. About the UNEP Division of Technology, Industry and Economics

The mission of the UNEP Division of Technology, Industry and Economics (formerly known as UNEP Division of Industry and Environment) is to help decision-makers in government, local authorities, and industry develop and adopt policies and practices that:

- are cleaner and safer;
- make efficient use of natural resources;
- ensure adequate management of chemicals;
- incorporate environmental costs; and
- reduce pollution and risks for humans and the environment.

The UNEP Division of Technology, Industry and Economics (UNEP TIE) located in Paris, is composed of one centre and four units:

- *The International Environmental Technology Centre* (Osaka), which promotes the adoption and use of environmentally sound technologies with a focus on the environmental management of cities and freshwater basins, in developing countries and countries in transition.
- *Production and Consumption* (Paris), which fosters the development of cleaner and safer production and consumption patterns that lead to increased efficiency in the use of natural resources and reductions in pollution.
- *Chemicals* (Geneva), which promotes sustainable development by catalysing global actions and building national capacities for the sound management of chemicals and the improvement of chemical safety world-wide, with a priority on Persistent Organic Pollutants (POPs) and Prior Informed Consent (PIC, jointly with FAO).
- *Energy and OzonAction* (Paris), which supports the phase-out of ozone depleting substances in developing countries and countries with economies in transition, and promotes good management practices and use of energy, with a focus on atmospheric impacts. The UNEP/RISÿ Collaborating Centre on Energy and Environment supports the work of the Unit.

- *Economics and Trade* (Geneva), which promotes the use and application of assessment and incentive tools for environmental policy and helps improve the understanding of linkages between trade and environment and the role of financial institutions in promoting sustainable development.

UNEP TIE activities focus on raising awareness, improving the transfer of information, building capacity, fostering technology cooperation, partnerships and transfer, improving understanding of environmental impacts of trade issues, promoting integration of environmental considerations into economic policies, and catalysing global chemical safety.

For more information contact:

UNEP Division of Technology, Industry and Economics
39-43 Quai André Citröen
75739 Paris Cedex 15, France
Tel: 33 1 44 37 14 50
Fax: 33 1 44 37 14 74
E-mail: unepie@unep.fr
Website: http://www.unepie.org

6-4. Online Resources

The following methyl bromide-related websites may provide useful information and ideas to those working to phase out methyl bromide and promote its alternatives. This is not a comprehensive list, but many of these websites provide extensive links to additional related sites. A more extensive listing of agricultural websites may be found in UNEP's *Inventory of Technical and Institutional Resources for Promoting Methyl Bromide Alternatives.*

- **Environment Canada**
  (www.ec.gc.ca/ozone/mbrfact.htm)
  Outlines Canada's compliance guidelines for methyl bromide users and strategies for reaching 2001 phase out.

- **Methyl Bromide Technical Options Committee**
  (www.teap.org/html.methyl_bromide.html)
  Recent MBTOC reports and information on MBTOC members.

- **Southern European Alternatives Workshop**
  (www.ccma.csic.es/agroecol/mebr/mebr1.htm)
  Proceedings from a 1997 workshop on methyl bromide alternatives in Southern European countries.

- **Society for Research and Intiatives for Sustainable Technologies and Institutions (SRISTI)**
  (csf.colorado.edu/sristi/index.html)
  SRISTI is an Indian-based NGO conducting applied research aimed at generating practical approaches for sustainable developement. The SRISTI website documents programme initiatives and other results, including sustainable agriculture and organic certification projects. Links to related sites are also provided.

- **USDA Research Home Page**
  (www.ars.usda.gov/is/mb/mebrweb.htm)
  Overview of USDA research on alternatives to methyl bromide, with specific research results and links to university sites.

- **USDA Newsletter Homepage**
  (www.ars.usda.gov/is/np/mba/mebrph.htm)
  Online copies of recent issues of the *Methyl Bromide Alternatives* quarterly newsletter.

- **U.S. Environmental Protection Agency Methyl Bromide Home Page**
  (www.epa.gov/spdpublc/mbr/mbrqa.html)
  Provides an overview of U.S. policy on the methyl bromide phase out, discussion of alternatives, "myths and facts" about the phase out, and numerous links to other methyl bromide related online resources, including civil society websites in the United States.

Appendix A. Policy Survey

The following survey (in English, Spanish and French) was distributed via fax or email to 442 government representatives in 172 countries.

United Nations Environment Programme Survey of National Methyl Bromide Legislation, Regulations and Phase-Out Incentives

Methyl bromide is scheduled for phase out under the international Montreal Protocol treaty because it is a powerful ozone depleting chemical. It is also an acutely toxic pesticide, and many countries are limiting its use and promoting alternatives to protect public health and safety. By documenting the policy efforts to reduce the use of methyl bromide in various countries, and sharing those experiences through a widely disseminated report, UNEP hopes to facilitate a smoother and more rapid transition to alternatives worldwide.

The survey below is designed to collect information about legislation and regulations which directly support the phase out of methyl bromide, as well as general pesticide and sustainable agriculture policies which influence methyl bromide use and the promotion of alternatives. If no programmes of a particular type exist in your country, please indicate "none" on the survey form. Feel free to attach additional sheets if more space is needed.

Please return the completed survey form to the Pesticide Action Network North America (PANNA) at the contact listed below (preferably via fax) **by December 31st if possible, and by January 8th, 1999 at the latest**. You are welcome to send your survey and any supporting documents in the language most convenient for you, as UNEP will be providing translation services for PANNA.

1. Please list any **national legislation** discouraging the use of the pesticide methyl bromide (attach copy of legislation if available).

Title of legislation: _____

_____

Date legislation enacted: _____

Primary goals and objectives of legislation: _____

_____

Agencies responsible for implementation (include contact information): _____

2. Please list **national regulations** controlling the import or use of methyl bromide.

Import restrictions:

Permitting requirements: _____

Health and safety requirements: _____

Use reporting requirements:_____

Labeling requirements: _____

Agencies enforcing regulations (include contact information for any additional agencies not listed above):

3. Please list any **economic incentives** specifically promoting the use of alternatives to methyl bromide (tax, levy, matching grant/subsidy programs).

_____

_____

_____

_____

4. Please list any **voluntary programmes**, agreements or working groups designed to reduce the use of methyl bromide.

_____

_____

_____

5. Please list **outreach, training or demonstration programmes** promoting alternatives to methyl bromide, and agencies/institutions participating in these programs.

Outreach, training or demonstration programs: _____

_____

_____

Participating agencies/institutions: _____

_____

_____

Related publications/outreach materials: _____

_____

_____

6. Please list any national (or international) **regulations that require the use of methyl bromide** (e.g., fumigation of nursery stock, post-harvest fumigation standards, bank loan requirements, pre-shipment/quarantine requirements for export).

Regulations requiring use of methyl bromide: _____

_____

_____

Agencies/institutions enforcing regulations: _____

_____

_____

Crops/user groups affected: _____

_____

_____

7. Please list any **additional policy barriers** to a phase out of methyl bromide.

_____

_____

_____

_____

8. Please list any **other pesticide regulations** that apply to methyl bromide.

Additional pesticide controls: _____

_____

_____

Agencies enforcing regulations: _____

_____

_____

9. Do **state or regional governments** also have authority to regulate pesticide use? If yes:

State/regional regulations specific to methyl bromide: _____

_____

_____

Contact information for state or regional authorities: _____

_____

_____

10. Please list outreach, training or demonstration ***programmes promoting alternatives to pesticides*** (e.g., sustainable or organic agricultural research or training programs, integrated pest management national goals or programs, pesticide use reduction programmes, etc.).

_____

_____

_____

_____

UPDATED CONTACT INFORMATION:

Name and title: _____

_____

Organization: _____

Address: _____

_____

Country: _____

Phone: _____

Fax: _____

Email: _____

RETURN COMPLETED SURVEY FORM TO:
Kristin Schafer, Program Manager
FAX: 1-415-981-1991

Mailing address:
Pesticide Action Network North America
49 Powell Street, Suite 500
San Francisco, CA 94102, USA

Phone: 1-415-981-1771
Email: kristins@panna.org

Thank you for completing and returning the survey!

Appendix B. Complementary Resources

The following documents may be ordered from UNEP's OzonAction Programme. To order, contact the UNEP OzonAction Programme:

UNEP TIE OzonAction Programme
Tour Mirabeau
39-43 Quai André Citroen
75739 Paris Cedex 15, France
Tel: 33-1-4437-1450
Fax: 33-1-4437-1474
Email: ozonaction@unep.fr
Website: www.unepie.org/ozonaction.html

B-1. Methyl Bromide Information Kit

The purpose of the information kit is to create and enhance awareness among national policy makers and other stakeholders of methyl bromide use, alternatives and phase-out deadlines, and encourage the shift to alternatives and development of policies to support a rapid transition from methyl bromide. The kit includes (1) a brochure describing the methyl bromide issue and importance and benefits of ratifying the Copenhagen Amendment (*Methyl Bromide: Getting Ready for the Phase Out,* available in English, French and Spanish, ISBN #92-807-1716-2, 1998); (2) a public service announcement that can be aired on television and in movie theatres (1998); and (3) a poster depicting aspects of the methyl bromide issue (1998).

B-2. Case Studies on Alternatives to Methyl Bromide: Technologies with Low Environmental Impact

The case study compilation provides methyl bromide users with information that will assist them in selecting commercially available, low impact (i.e. environmentally friendly) alternatives, including information on performance, yields and farmer satisfaction. The document focuses on crops/uses where such alternatives have already been successfully implemented. Each case study provides cost-benefit information, costs of conversion and supplier information for alternative inputs identified. (ISBN # 92-807-1764-2, 1999).

B-3. Protecting the Ozone Layer, Volume 6: Methyl Bromide

This publication summarizes current uses of methyl bromide, availability of substitutes and technological and economic implications of eliminating methyl bromide for all sectors. It is based on original reports of the UNEP Methyl Bromide Technical Options Committee (ISBN # 92-807-1718-9, 1998).

B-4. Inventory of Technical and Institutional Resources for Promoting Methyl Bromide Alternatives

This document is a directory of organizational resources for promoting methyl bromide alternatives. It identifies a wide range of potential project partners for government officials who are designing projects promoting alternatives to methyl bromide, including agricultural NGO networks, intergovernmental and bilateral agricultural programmes, international agricultural research networks, and international NGO agricultural programmes. It also lists organizations and individual consultants with expertise in agricultural project design, as well as programmes and institutions offering agricultural policy resources. Contact information and a brief description, including available publications and online resources, are included for each listing (ISBN #92-807-1739-1, 1999).

B-5. Towards Methyl Bromide Phase Out: A Handbook for National Ozone Units

This user-friendly handbook presents options and ideas to facilitate the transition to methyl bromide alternatives. It is designed to assist Article 5(1) countries in developing action plans to phase out methyl bromide and promote adoption of alternatives. The handbook provides examples of activities and programmes implemented by governments to replace methyl bromide and highlights options and actions through diagrams, decision trees, illustrations and checklists (ISBN # 92-807-1734-0, 1999).

B-6. Sourcebook on Technologies for Protecting the Ozone Layer: Methyl Bromide

This document is part of a series of sourcebooks of technologies to protect the ozone layer. This publication presents existing technical options to replace methyl bromide based on findings of the UNEP Methyl Bromide Technical Options Committee. The Sourcebook provides guidance on how to select an appropriate option, and provide sources of commercially-available technologies, equipment, chemicals and/or expertise to assist with the elimination of methyl bromide from farming systems. The primary audiences for this publication are methyl bromide users, companies that purchase products that are grown or treated with methyl bromide, and agricultural advisors (available in 1999).

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