

THE IMPACT OF DOMESTIC AND INTERNATIONAL REGULATORY CONTROLS ON THE COMPETITIVENESS OF AMERICAN AGRICULTURE

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ABSTRACT

Artificially produced methyl bromide (MB), a versatile, highly effective, fast-acting fumigant, is employed by man in a number of important ways to kill organisms destructive to plants. A wide spectrum of commodities is treated with MB. The compound is unique in providing a wide range of pest control techniques that may be applied to a broad spectrum of both food and non-food commodities, can be used for fumigation of both large and small quantities of materials, and, when applied properly, leaves no residues of toxicological significance. This compound has recently come under scientific scrutiny and been identified as a potentially potent ozone-depleting chemical. As a result, countries operating under the Montreal Protocol, an international treaty for regulating ozone-depleting substances, will be restricting, and, in many cases, eliminating its use altogether. For example, the United States Environmental Protection Agency has proposed a total phase-out by 1 January 2001. Its limited use and/or potential phase-out will have severe economic implications unless alternatives which are equally efficacious, economical and available are developed.

There may be many important uses for which, due to the complexity of researching a wide array of alternatives, the number of steps involved in making efficacious alternatives ready for use and the limited amount of time involved, effective alternatives will not be available by the time the phase-out takes effect. This eventuality would impose significant competitive disadvantages on American agricultural production and trade. The provisions of the United States Clean Air Act are more stringent than those of the Montreal Protocol which govern the regulatory controls in other countries of the world. This disparity has been the subject of considerable debate, in both the United States agricultural community and the United States Congress, regarding the economic and competitive position of American agriculture.

INTRODUCTION

Since 1991, methyl bromide (MB) has come under scientific scrutiny, and it has been identified as a potentially potent ozone-depleting substance (ODS). As a result, countries operating under the Montreal Protocol (MP) will be restricting or eliminating its use

altogether. For example, the United States Environmental Protection Agency (USEPA) has published a final ruling that will terminate total production and consumption of MB in the US by 1 January 2001 (US Federal Register, 1993). Developed countries operating under the MP will be eliminating MB production and consumption in the year 2010 (UNEP, 1995). Imposing limitations and/or a total phase-out on the use of MB will have severe economic effects if viable alternative treatments are not available.

In addition to its worldwide use, MB is one of the few fumigants left for insect disinfestation. It is the only remaining fumigant for commodity treatment for quarantine. Commodity treatments account for approximately 10% of the total use of MB in agriculture (Methyl Bromide Science Workshop Proc., 1992). There are no alternative treatments available which would provide the same physical and chemical characteristics as MB and be as useful in broad-scale commodity treatments, including quarantine treatments, which require fast action (fumigation times of 2–24 h depending on commodity) and ease and flexibility of application, as well as gaseous efficaciousness at a broad range of temperatures.

THE MONTREAL PROTOCOL

In 1985 the Vienna Convention, under the auspices of the United Nations Environment Program (UNEP), laid down the framework for addressing substances which deplete the ozone. In response to the growing evidence that chlorine and bromine could destroy stratospheric ozone on a global basis, the international community in 1986 negotiated the MP (UNEP, 1986). The MP limits the production and consumption of specific sets of ODS's. Significant scientific advances have continued; reports indicate that the rate of ozone depletion is more rapid than previously believed and that "anthropogenic sources of MB are significant contributions to stratospheric ozone depletion." (UNEP, 1992a; WMO, 1994).

At the fourth meeting of the Parties to the Montreal Protocol, in Copenhagen, Denmark, 23–25 November 1992, additional adjustments to the Protocol were made, including an amendment regulating use of MB in developed countries. The amendment proposed to add MB to the list of controlled substances with an assigned ozone depleting potential (ODP) of 0.7, to freeze production and consumption in 1995 at the 1991 levels, to exempt quarantine and preshipment uses from the 1991 freeze in production and consumption, to conduct a two-year in-depth study of MB uses and alternatives and to re-evaluate the science and the in-depth study in 1995 (UNEP, 1992b).

At the seventh meeting of the parties, in Vienna, Austria, 5–8 December 1995, actions were taken to strengthen the overall controls for MB. These actions included a change in the listed ODP from 0.7 to 0.6, a developed-country phase-out on 1 January 2010 for production and consumption, which will be preceded by two interim reductions (25% on 1 January 2001, and an additional 25% on 1 January 2005), and a developing-country freeze, commencing 1 January 2002, on production and consumption at the average of the 1995–1998 production levels. These actions did not affect

the 1992 Copenhagen exemptions for quarantine and preshipment applications (UNEP, 1995).

US CLEAN AIR ACT

Section 602(e) of the USCAA states: "Where the ozone-depletion potential of a substance is specified in the Montreal Protocol, the ozone-depletion potential specified for that substance under this section shall be consistent with the Montreal Protocol" (USCAA, 1990). Therefore, the action taken under the Montreal Protocol provided the legal basis for USEPA to publish, in the US Federal Register of December, 1993, rules for use of MB (US Federal Register, 1993). These actions included listing MB with an ODP of 0.7, freezing production and consumption on 1 January 1994 at the 1991 levels, classifying MB as a Class I ozone depleting chemical, terminating production and consumption on 1 January 2001 and not requiring MB-treated products to be labeled.

Comparison of actions for MB under the USCAA and the MP

Regulatory provisions for MB under the USCAA are more stringent than are those contained in the MP. The US pushed very hard at the seventh meeting of the parties for actions consistent with the USCAA to be taken; this would have provided a level playing field for all parties. However, most countries, particularly developing countries, were not prepared to go that far. Their decision was based primarily on the importance of MB to their economies and to the lack of available alternatives. After considerable debate, developed countries agreed to a phase-out of MB on 1 January 2010, with two 25% interim reductions, in 2001 and 2005, for a total of 50%.

In spite of the additional actions taken by the Protocol to strengthen MB controls, a large regulatory gap remains between the Protocol and the USCAA. The Protocol exempts quarantine and preshipment uses; the USCAA authorizes no exemptions. Other, more obvious, difference are the distinction between Class I and Class II ozone-depleting substances and the mandatory phase-out dates required under the USCAA. Class I and Class II ODS's are based on the numerical number of their respective ODP's, and the threshold number which separates the two classes is 0.2. Thus, chemicals with ODP's greater than 0.2 are Class I; those with less than 0.2, Class II. Class I ODS's must be phased out 7 years subsequent to the listing date; Class II ODS's by the year 2030. The Montreal Protocol does not list ODS's by classes and lacks mandatory phase-out dates, which are determined via consensus vote by the Parties.

Impact on US agriculture

Because of the important uses of MB and its role in agricultural production and trade, the phase-out of MB in 2001 under Title VI of the USCAA is of vital significance. This US law is more restrictive than the provisions for MB that govern the rest of the world under the MP. In particular, the MP allows longer phase-out schedules and includes provisions for exemptions for essential uses. The differences between the

domestic and international regulations has caused profound concern among agricultural producers and processors and those engaged in international trade. US farmers are concerned that, if adequate alternatives are not available, when the US phase-out takes effect, they will be put at a significant competitive disadvantage in international agriculture and trade.

MB is particularly important for quarantine treatments because it is effective against a large variety of both indigenous and non-indigenous pests and can be easily and economically applied to both small and large shipments as well as to storage. US regulations require that a wide array of imported food and non-food commodities be fumigated with MB as a condition of entry. In addition, a number of commodities exported by the US must be fumigated with MB in order to comply with quarantine requirements of recipient countries. A quarantine use of MB critical for US agriculture is its role as the only practical emergency treatment for commodities moved out of areas quarantined for outbreaks of such exotic pest insects as the Mediterranean fruit fly.

The primary uses for MB are as a soil fumigant and in intensive production of such high value crops as strawberries, tomatoes, cucumbers, peppers, melons and eggplants. The 1993/94 production value of these six commodities, using MB for pre-plant treatment, was US\$2.4 billion (USDA, 1993–4). In addition to these six commodities, a 1993 USDA assessment report listed an additional 15 for which MB was also important in production (USDA, 1994).

Stored agricultural food products include a wide variety of dry foodstuffs (principally cereals, grains, oilseeds and legumes), grain products, dried fruits and nuts, such other durable products as timber and timber-containing products and various artifacts. These products, often stored for long periods of time, are treated with MB for control of a number of domestic pests. Insect and mite pests can breed on these materials during storage. Pests may also be present at the time of harvest, and they persist in storage or during transportation. Control of pests infesting stored commodities is essential in keeping commodity losses to a minimum, maintaining quality, preventing damage and preventing the spread of pests between countries. In 1993/94 the estimated value of dried fruits and nuts alone was in excess of US\$4 billion.

Structural fumigation of food production and storage facilities (mills, food processing plants and distribution warehouses), non-food facilities (dwellings and museums) and transport vehicles (trucks, ships, aircraft and rail cars) rely heavily MB for control of a large number of pests. It is used either on an entire structure or on a significant portion of a structure. Fumigation is utilized whenever the infestation is either so widespread that localized treatments may result in re-infestation or within the walls (or in other inaccessible areas).

Agricultural exports consistently make a large positive contribution to the US balance of trade. The USDA Economic Research Service's statistics for the fiscal year 1993/94 showed the value of US exports of apples, cherries, peaches/nectarines and strawberries to the world market was US\$650 million. The figure for cotton was US\$2.3 billion; for oak logs, US\$130 million; and for walnuts (in shell),

US\$86 million. The market values for export of these commodities to countries requiring MB treatment totaled US\$282.8 million (US\$101, US\$106, US\$24 and US\$1.8 million, respectively) (USDA, 1993–4).

The current extent and importance of MB use and the potential impact that the 2001 phase-out poses for American agriculture necessitate a major effort to ensure that American farmers can continue to raise and market their crops. USDA has directed its resources and expertise, with the support of Congress and in cooperation with growers, to conducting an ambitious research program for identifying and developing alternatives for control of the pests currently controlled by MB.

SUMMARY

USDA has placed a high priority on dealing with agricultural concerns while contributing to the protection of the global environment. There are three areas where USDA is working to develop solutions that meet both of those needs in dealing with the MB issue (Elworth, 1995, 1996). These are discussed below.

Research

The Agricultural Research Service (ARS) of the USDA has for many years devoted significant research resources to investigating approaches that can potentially replace MB. Since the USEPA announced the phase-out for MB, the ARS has increased its efforts to find alternatives through research on a variety of approaches. These include new cultural practices, improved host-plant resistance to pests and diseases and biological control systems using beneficial microorganisms, as well as less harmful fumigants. For postharvest treatment, the alternatives being investigated include the creation of pest-free agricultural zones, physical methods such as hot or cold treatment or storage in modified atmospheres, alternative fumigants, MB trapping and recycling technologies, biological control and systems approach.

Spending for ARS research on MB alternatives increased from US\$7.4 million in fiscal year 1993 to the US\$13.9 million included in the current appropriation for fiscal year 1996. This spending supports 42 scientist-years involving 46 projects. This research is augmented by research from both grower groups and the EPA.

The USDA recognizes that there are a number of real-world factors that affect our ability to find alternatives. We recognize that alternatives will have to be found for a wide variety of crop applications spread over a diverse set of geographic conditions and that no single practice will substitute for all those uses in all those conditions. We also know that a genuine alternative for farmers must be efficacious, cost effective, logistically possible and available for efficient incorporation into standard agricultural practices. In addition, the approval process for a new use or new product requires time for the registrants to conduct and submit the necessary studies that the EPA must review by the latest standards. Finally, securing the approval of importing countries for the quarantine practices has typically taken years of negotiation.

The Montreal Protocol

The USDA has actively participated in the development of positions to be taken by the United States Government in international deliberations by the parties to the Montreal Protocol. The USDA has worked within the delegation to help level the playing field in the international arena for US producers, by pressing at the Vienna meeting for a global phase-out which would require all countries to meet the same standards. Although the parties did not ultimately support that position, important progress was made. Developed countries agreed to a phase-out schedule, and a freeze on developing-country use was adopted. Although these measures fell short of the US position, they represent a universal commitment to international controls and are the first steps toward a world-wide phase-out.

Administrative solution

Despite the progress made internationally, there remains a disparity between the US-CAA controls on MB in the US and the controls affecting the rest of the world under the MP. As a result, the USDA is very concerned that, if adequate alternatives are not available, when the US phase-out takes effect in 2001 US farmers will be put at a significant competitive disadvantage in international agriculture and trade. The Clinton administration has indicated its willingness to work with Congress and other stakeholders in crafting a reasonable solution which would be limited to resolving the concerns about the competitiveness of US agriculture and trade by means of assuring the continued availability of MB where, because of the lack of acceptable alternatives, it is needed.

If we are to come to a successful and responsible solution, some important principles must be incorporated into any legislation. First of all, such legislation must protect American agriculture and trade from being put at a competitive disadvantage. Secondly, it must provide sound protection of the global environment. Thirdly, it must retain the incentives for research on alternatives. Fourthly, it must not result in a cumbersome or unworkable administrative process. Finally, it must not undercut international agreements.

REFERENCES

- Elworth, L. (1995) US Department of Agriculture Testimony before the Subcommittee on Health and Environment, Committee on Commerce, United States House of Representatives, 1 August 1995.
- Elworth, L. (1996) US Department of Agriculture Testimony before the Subcommittee on Health and Environment, Committee on Commerce, United States House of Representatives, 25 January 1996.
- Methyl Bromide Science Workshop Proc. (1992) Washington, D.C. (June 1992).
- UNEP (1986) *Handbook for the Montreal Protocol on Substances that Deplete the Ozone Layer*, Eds. 1-3.
- UNEP (1992a) *Methyl Bromide: Its Atmospheric Science, Technology and Economics*. Montreal Protocol Assessment Supplement, June 1992. UNEP, Nairobi. 41 pp.

- UNEP (1992b) *Report of the Fourth Meeting of the Parties to the Montreal Protocol on Substances that Deplete the Ozone Layer*, UNEP/OzL. Pro. 4/15, 23–25 November 1992. Copenhagen. 75 pp.
- UNEP (1995) *Report of the Seventh Meeting of the Parties to the Montreal Protocol on Substances that Deplete the Ozone Layer*, UNEP/OzL. Pro. 7/12, 27 December 1995.
- US Federal Register (1993) 40 CFR Part 82, 10 December 1993.
- USCAA (1990) United States Clean Air Act, Public Law 159, Title VI-Stratospheric Ozone Protection. Washington, DC.
- USDA (1993–4). United States Department of Agriculture, Economic Research Service, Statistical Data.
- USDA (1994) *Economic Effects of Banning Methyl Bromide for Soil Fumigation*, United States Department of Agriculture, Economic Research Service, Report No. 677, March 1994.
- WMO (1994) *Scientific Assessment of Ozone Depletion. 1994 Executive Summary. Global Ozone Research and Monitoring Project*, Report No. 37. World Meteorological Organization, Geneva, Switzerland. 36 pp.