IMPACT OF THE MONTREAL PROTOCOL REGULATIONS ON PREPLANT SOIL USE AND TRENDS IN ADOPTION OF ALTERNATIVES

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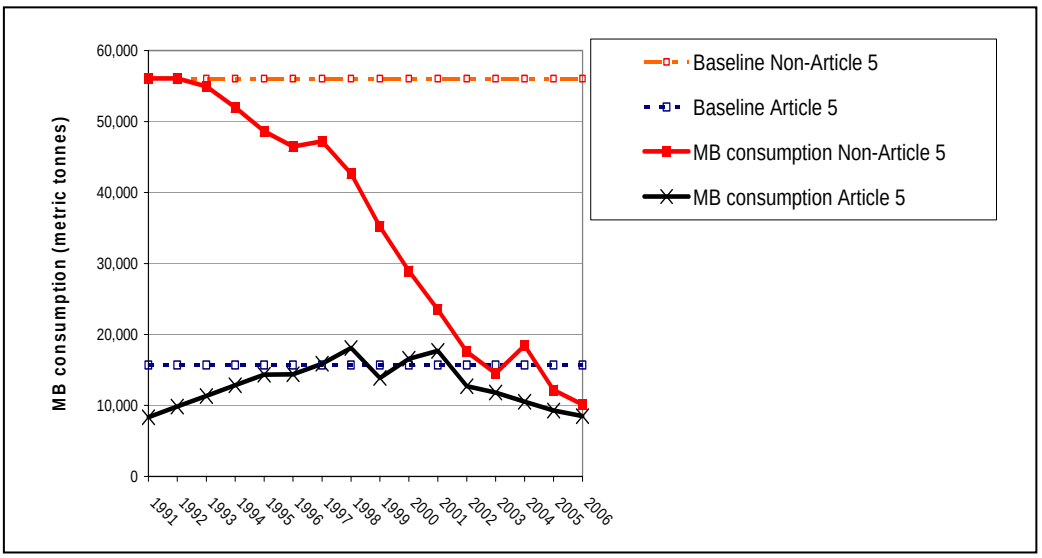
Impact of Regulation of MB for Preplant Soil Use Under the Montreal Protocol

In 1995, approximately 72,000t of methyl bromide –MB - (excluding feedstock) was used globally with around 50,000 t used for preplant soil fumigation (mainly fungi, nematodes and weeds), 3,500t for non-QPS commodity treatments (mainly pests), 10,500 t used in developing countries and 8,000-14,000 t for QPS uses which remain exempt from the phaseout under the Montreal Protocol.

As of 1 January 2007, over 45,000 t of MB has been reduced under the Montreal Protocol regulations (Table 1), however approximately 25,000 t are still used in three main areas: critical uses in developed countries, permitted use in developing countries and use for Quarantine and Preshipment (QPS). This latter use has increased from around 8,000 t during the 1990s to 14,000 t in 2005 due to increasing phytosanitary demands and new regulations such as ISPM 15 (requiring fumigation of wood packaging). Approximately 95% of the reduction in MB to date has been due to reductions for preplant soil use.

In 2007, over 9,000 t of MB was exempted from phase out under the 'critical use' category for preplant soil uses, however this will fall to around 6,000 t in 2008 (Table 1). Eight countries who applied in 2005 no longer apply for preplant soil use of MB under the critical use exemption process of the Montreal Protocol (Table 1), however all countries have dramatically reduced consumption.

Figure 1. Reductions in MB consumption for uses controlled under the Montreal Protocol in the Developed (Non A5) and Developing (A5) countries since 1991.



Party	Baseline Usage (including non QPS Commodity treatments)	Nominations for Preplant Soil Use in 2008 or 2009
Australia	704	30
Belgium*	312	0
Canada	200	7
France*	4,195	0
Greece*	970	0
Israel	3,580	950 (2008)
Italy*	6,974	0
Japan	6,107	503
Malta*	40	0
New Zealand	135	0
Poland*	200	
Portugal*	65	0
Spain*	4,236	215 (2008)
UK*	629	0
USA	25,529	4,473
TOTALS		

QPS – Quarantine and Preshipment; * - Countries of the European Community

Table 1. Summary of Reductions in Use of MB and Nominations for Critical Use in 2008 or 2009.

Preplant Uses	CUN 2008	CUN 2009
Cucurbits	Israel, Japan, USA	Israel, Japan, USA
Forest Nurseries	USA	USA
Ginger	Japan	Japan
Nurseries (fruit, nut, flower)	USA	USA
Orchard replant	USA	USA
Ornamentals	Israel, USA	Israel, USA
Peppers and eggplant	Japan, USA	Japan, USA
Tomatoes	Israel, USA	Israel, USA
Potato, Sweet potatoes	Israel, USA	Israel, USA
Strawberry fruit	Israel, USA	Israel, USA
Strawberry runners	Israel, Spain, Poland, Australia, Canada, USA	Australia, Canada, Israel, USA
Weed (Broomrape)	Israel	Israel

Table 2. Key sectors and countries applying for critical use exemptions to continue preplant soil use of MB in either 2008 or 2009.

Critical Use Exemptions for preplant use in 2007 and trends in adoption of alternatives.

In 2007, TEAP's Methyl Bromide Technical Options Committee (MBTOC) reviewed 43 applications for critical use for preplant soil use of MB (Table 2) down from 70 in the previous round in 2006. Of this use, MBTOC considers about 1200 tonnes of MB are needed for areas which have major difficulties adopting alternatives. These uses have high health or certification requirements and thus require more stringent testing of alternatives to ensure that the same levels of disease control are achieved as compared to MB. In general these situations are for nursery industries where planting material is produced for the larger production industries (eg. strawberry runners, ornamental, fruit and forest nurseries).

Internationally, chemical alternatives used alone or as mixtures have mostly replaced MB, particularly the use of formulations of 1,3-Dichloropropene and chloropicrn (Pic), Pic alone and to a lesser extent, metham and dazomet. Non chemical controls such as substrates, hydroponic systems and grafting have also replaced a significant proportion of MB in different sectors. Research studies have shown that several new chemical alternatives (eg. methyl iodide and dimethyl disulphide (DMDS)) have given excellent results relative to MB, especially when used in combination with chloropicrin. Registration applications are pending for these products in several countries. This paper will include a discussion of the relative performance of over 100 chemical and non chemical alternatives in relation to methyl bromide.

The continuation of research into more sustainable options to MB is seen as essential, as pressure is mounting internationally to further restrict use of all fumigants worldwide (EC Regs 91/414 and 2037, the USA Cluster Analysis and Volatile Organic Compound reviews). Industries need to be prepared for the affect this will have on their crop protection and pathogen and pest eradication strategies.

The Benefits of MB Regulation

Over 30% of the bromines in the stratosphere are man made; these are 60 times more destructive of ozone than chlorines. Regulation of MB under the Montreal Protocol has contributed to a 45% fall in bromine in the troposphere (Fig 2) and 30% of the present fall in effective stratospheric chlorine load in the stratosphere. Owing to the short half-life of MB in the stratosphere (0.7 years), MB is one of the few regulated ODS gases that have a rapid affect on ozone recovery.

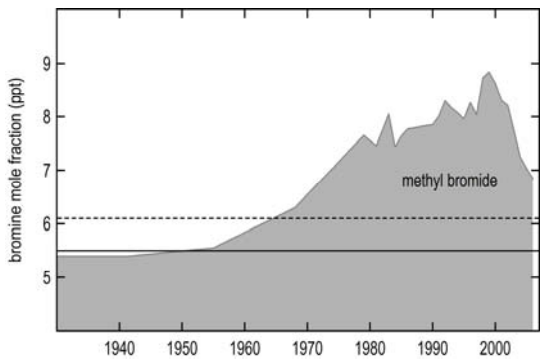


Figure 2. The impact of the MB restrictions on reduction in bromine concentrations in the troposphere since 1945. (The solid line indicates the bromide from natural sources (i.e. the historic baseline). The dashed line indicates the approximate level that bromide concentration would presently fall if all non QPS MB was phased out). (Figure supplied by Paul Fraser, CSIRO, Australia)