

**MONTREAL PROTOCOL
ON SUBSTANCES THAT DEplete
THE OZONE LAYER**



UNEP

**REPORT OF THE
TECHNOLOGY AND ECONOMIC ASSESSMENT PANEL**

AUGUST 2007

**EVALUATIONS OF 2007 CRITICAL USE NOMINATIONS FOR METHYL
BROMIDE AND RELATED MATTERS**

FINAL REPORT

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On Substances that Deplete the Ozone Layer**

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Glossary of Acronyms

1,3-D	1,3-dichloropropene
A5	Article 5 Party
CEIT	Countries with Economies in Transition
CUE	Critical Use Exemption
CUN	Critical Use Nomination
EC	European Commission
EPA	Environmental Protection Agency
IPM	Integrated Pest Management
IPPC	International Plant Protection Convention
ISPM	International Standard Phytosanitary Measure
LPBF	Low Permeability Barrier Film
MB	Methyl bromide
MBTOC	Methyl Bromide Technical Options Committee
MBTOC QSC and	Methyl Bromide Technical Options Committee Quarantine, Structures and Commodities Subcommittee
MBTOC S	Methyl Bromide Technical Options Soils Subcommittee
MOP	Meeting of the Parties
MRL	Maximum Residue Level
MS	Metham sodium
NPMA	National Pest Management Association
OEWG	Open Ended Working Group
Pic	Chloropicrin
PMRA	Pest Management Regulatory Agency (of Canada)
QPS	Quarantine and Pre-shipment
SF	Sulfuryl fluoride
TEAP	Technology and Economics Assessment Panel
VIF	Virtually Impermeable Film

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1. Scope of this Report

This 2007 final report provides final evaluations of MBTOC/TEAP on CUNs submitted for methyl bromide use by Parties in 2007, in accordance with Decision IX/6 (refer Annex 1 of this report). CUNs were submitted to the Ozone Secretariat by the Parties in January 2007 and have been assessed following the timetable set out in the Annex 1 referred to by Decision XVI/4 (Annex II). The condensed timetable for preparation of this report was necessary in order to meet the revised schedule this year for the 20th anniversary meeting of the Montreal Protocol.

During the past year, MBTOC has provided an interim CUN Report, Progress Report (TEAP, 2007) and an Assessment Report (MBTOC, 2007) which report on MB production and consumption figures, case studies on alternatives, an update of new information on the performance of alternatives and an estimate of the trends in global emissions of methyl bromide.

This progress report provides the Parties with recommendations of Critical Use Nominations submitted by Parties in 2007 for use of methyl bromide in either 2008 or 2009. The report also provides tables and figures of trend lines in critical use exemptions and the criteria by which CUNs are assessed. A revision of the standard presumptions for some preplant uses of MB is included for consideration at the 19th MOP. This information is submitted in order to meet the requirements to review management strategies submitted by Parties pursuant to Decision Ex.I/4(9d) and to report on the amount of methyl bromide nominated for critical use by the Parties as per Decision XVII/9(10).

In late 2006, TEAP Co-Chairs announced a reorganization of MBTOC, separating it formally into two independent sub-committees, recognizing the differing expertise required for the two main groupings of CUNs, those relating to postharvest and structural uses and those involved with soil fumigation. MBTOC Quarantine, Structures and Commodities (MBTOC QSC) has responsibility for issues concerning methyl bromide uses and alternatives for quarantine, pre-shipment, structural and commodities. Additionally, MBTOC QSC has absorbed the membership of the former Quarantine Task Force. MBTOC Soils has responsibility for the pre-plant uses and alternatives of methyl bromide. Evaluations of CUNs for the two categories are reported separately below.

2. Critical Use Nominations for Methyl Bromide

2.1 Mandate

Under Article 2H of the Montreal Protocol the production and consumption (defined as production plus imports minus exports) of methyl bromide is to be phased out in Parties not operating under Article 5(1) of the Protocol, by 1 January 2005. However, the Parties agreed to a provision enabling exemptions for those uses of methyl bromide that qualify as critical. Parties established criteria, under Decision IX/6 of the Protocol, which all such uses need to meet in order to be granted an exemption. MBTOC provides guidance to the Parties' decisions on critical use exemptions in accordance with Decisions IX/6 and Annex I of Decision XVI/4. Refer to Annexes I and II of this report for copies of these Decisions.

2.2 Fulfilment of Decision IX/6

Decision XVI/2 directed MBTOC to indicate whether all CUNs fully met the requirements of Decision IX/6. When the requirements of Decision IX/6 were met, MBTOC recommended the full amount of the nomination. Where some of the conditions were not fully met, MBTOC recommended a decreased amount, or was unable to assess, depending on its technical and economic evaluation. MBTOC reduced a nomination when a technical alternative was considered effective or, in a few cases, when the Party failed to show that it was not effective. In this round of CUNs, as in previous rounds, MBTOC considered all information provided by the Parties, including to answers to questions requested by MBTOC, up to the date of the final assessment. .

In the past two years, with accumulation of experience, MBTOC has become firmer in judging merits of CUNs in the light of the requirements of Decision IX/6. Applicants and Parties are expected to conduct research and/or evaluate the research conducted by others in the circumstances of their nomination, to document that effort and submit the documents to MBTOC. Documents should take the form of reports of field trials and commercial scale up trials, directly pertinent to the circumstances of that particular nomination. MBTOC has encountered difficulty in assessment when yield losses presented in some nominations differ markedly from those reported in a large number of studies in similar circumstances and are not substantiated by references. In post-harvest where research based economics data is less often available, we are asking Parties to substantiate costs estimates.

Now that alternatives have been identified for most applications, regulations on the use of these alternatives and comparative information on the economic feasibility/infeasibility of their use compared to MB are critical to the outcomes of present and future CUNs. Without this information, further CUNs may not be assessable. In some cases, MBTOC has proposed potential research and regulatory issues to Parties that could assist the phase out of MB. In paragraph 20 of Annex 1 referred to in Decision XVI/4, Parties, inter alia, specifically requested that, in cases where a nomination relies on the economic criteria of Decision IX/6, MBTOC's report should explicitly state the central basis for the Party's economic argument

relating to CUNs. Tables 4 and 8 provide this information for each CUN that relied on economic criteria.

2.3 Consideration of Stocks

One criterion for granting a critical use under Decision IX/6 is that methyl bromide for the use “is not available in sufficient quantity and quality from existing stocks of banked or recycled methyl bromide” (para. 1 (b) (ii)). Parties nominating critical use exemptions are requested under decision Ex.I/4(9f) to submit an accounting framework to the information on stocks. Since the consideration of stocks is an active area of negotiation for the Parties, and given that the information received from the Parties is incomplete, MBTOC has not made an adjustment to a nomination to account for stocks held and has relied on Parties to make this adjustment.

In accordance with Decision XVIII/13(7), a summary of the data on stocks reported by the Parties in 2007 for 2006 has been summarized in Table 2 below. Parties may wish to consider this information in the light of Decision IX/6 1(b)(ii). Tables 1 and 2 show the stock data that have been reported by the Parties in 2006 and 2007.

Table 1. Quantities of MB ‘on hand’ at the beginning and end of 2005, as reported by Parties in 2006 under Decision XVI/6.

Party	Critical use exemptions authorized by MOP for 2005	Quantity of MB as reported by Parties (metric tonnes)				
		Amount on hand at start of 2005	Quantity acquired for CUEs in 2005 (production +imports)	Amount available for use in 2005	Quantity used for CUEs in 2005	Amount on hand at the end of 2005
Australia	146.600	0	114.912	114.912	114.912	0
Canada	61.792	0	48.858	48.858	45.146	3.712
EC	4,392.812	216.198	2,435.319	2,651.517	2,530.099	121.023
Israel	1,089.306	16.358	1,072.350	1,088.708	1,088.708	0
Japan	748.000	0	546.861	546.861	546.861	0
New Zealand	50.000	6.900	40.500	47.400	44.580	2.810
USA(a)	9,552.879		7,613.000	not reported	7,170.000	443.000

(a) Additional information on stocks was reported on US EPA website, September 2006: Methyl bromide inventory held by US companies: 2004 = 12,994 tonnes; 2005 = 9,974 tonnes.

Table 2. Quantities of MB 'on hand' at the beginning and end of 2006, as reported by Parties in 2007 under Decision XVI/6.

Party	Critical use exemptions authorized by MOP for 2006	Quantity of MB as reported by Parties (metric tonnes)				
		Amount on hand at start of 2006	Quantity acquired for CUEs in 2006 (production + imports)	Amount available for use in 2006	Quantity used for CUEs in 2006	Amount at the end of 2006
Australia	75.100	0	55.308		55.308	0
Canada	53.897	3.7	41.967	54.667	Not yet available	Not yet available
EC	3,527.030	114.953	1,472.781	1,587.734	[1,519.184](a)	[68.550](a)
Israel	880.295	-	-	-	-	-
Japan	741.400	70.735	488.810	559.545	540.207	19.338
USA	8,081.753	9,974.000(b) 443.000(c)	6,924.000	16,898.000(d) 443.000 (c)	7,168.000(e)	8,210.000(f) 443.000 (c)

(a) Preliminary data subject to update.

(b) Amount of pre-2005 stock on hand.

(c) Amount of stocks at the end of 2005 from production/imports specifically made for CUEs (acquired in 2005).

(d) The sum of 9,974 of pre-2005 stocks + 6,924 tonnes produced/imported in 2006 for CUEs.

(e) The sum of 6,384 tonnes of production/imports for CUEs plus 784 tonnes used from stocks.

(f) The sum of 539 tonnes of stocks produced/imported in 2006 specifically for CUEs, plus 7,671 tonnes stocks acquired pre-2005.

2.4 Disclosure of Interest

All MBTOC members have prepared disclosure of interest forms relating specifically to their level of national, regional or enterprise involvement for the 2007 CUN process, according to a standardised format developed by TEAP. This was required to ensure that those with a high level of involvement and interest in developing a particular nomination did not bias the process of evaluation through participation in the detailed review. The Disclosure of Interest declarations are found in Annex V. As in previous rounds, some members withdrew from a particular CUN assessment or only provided technical advice on request for those nominations where a potential conflict of interest was declared.

3. Evaluations of CUNs – 2007 Round for 2008 and 2009 Exemptions

Each MBTOC sub-committee held two meetings in 2007 to assess the CUNs. The first meeting of each sub-committee was held concurrently in Alassio, Italy March 19 – 23 to prepare the interim recommendations. Following further clarification from the Parties of issues arising from the initial assessment of the CUNs, each subcommittee required a second meeting to finalise assessments. MBTOC QSC met in College Park, Maryland, June 30 – July 3 and MBTOC Soils in San Jose Costa Rica from July 10-13. These meetings were held earlier than usual in order to meet the report schedule required for the 19 MOP in Canada in September of 2007.

In total, 5 Parties (7 countries - Australia, Canada, Israel, Japan, Poland, Spain and USA), who had previously received CUEs for specific MB uses, submitted 58 nominations in this round, compared to 60 submitted in the previous round in 2006. Nominations were no longer submitted from New Zealand or the EC for the following countries - France, Greece, Ireland, Italy, The Netherlands and United Kingdom. CUNs in this report relate to CUEs sought for 2008 and 2009. Nominations from Spain, Poland were for 2008, Australia, Canada, Japan and USA for 2009 and Israel for both 2008 and 2009. No nominations in this particular round were submitted for longer periods.

For post-harvest uses of MB, Parties submitted 15 CUNs for the use of MB in structures and commodities in 2007. Of the 2007 nominations, 7 were for 2008 for a total of 11.535 tonnes. Of nominations for 2008, MBTOC QSC recommended 9.179 tonnes. This figure does not include a recommendation for Australia rice 2008. The Australia rice evaluation for 2008, and the Meeting report of the 27 OWEG, para 128, explain the declaration of the Government of Australia on this matter. MBTOC did not recommend one CUN.

Of the 2007 post-harvest nominations 8 were for 2009 for a total of 478.719 tonnes. TEAP report of April 2007 report noted this figure as 529.721 tonnes. However, since that report, the USA has withdrawn the cocoa segment of the NPMA CUN (51.002 tonnes). Of the nominations for 2009, MBTOC QSC recommended a total of 451.178 tonnes.

For soil uses, Parties submitted 43 CUNs in total, 15 nominations for 2008 and 28 nominations for 2009. These totalled 1123.146 and 5575.242 metric tonnes respectively. Nominations from Spain and Poland were for 2008, Australia, Canada, Japan and the US for 2009 and Israel for both 2008 and 2009. No nominations in this particular round were submitted for longer periods. A use previously nominated by USA (sweet potato production, including production of nursery stock) was presented for the first time by Israel. The nomination was explained as arising from unprecedented expansion in the sector and is envisaged for 2 years only, whilst a feasible alternative becomes registered.

The US delegation made arrangements to meet with MBTOC Soils during the Alassio and San Jose meetings for discussions with regard to their CUNs, in accordance with paragraph 8 of Annex 1 referred to in Decision XVI/4.

For the 2007 round, MBTOC Soils has recommended a total of 5291.867 tonnes, being 1102.706 tonnes for 2008 and 4189.161 tonnes for 2009. An amount of 91.69 tonnes was not recommended for 2008, and 536.286 tonnes not recommended for 2009. An amount of 848.795 tonnes for 2009 of the Israeli CUNs remained unable to assess pending further information (Table 5).

3.1 Critical Use Nominations Review

A soil subcommittee in MBTOC considered the nominations relating to the use of MB for soil fumigation, while MBTOC QSC considered the nominations relating to the use of MB for fumigation of commodities, structures and objects. This report and decisions of the committee were by consensus, recognizing that different perspectives exist within the committee on certain aspects.

In general, the most recent CUE approved by the Parties for a particular application was used as a benchmark for consideration of continuing nominations. In some instances, this benchmark differed from that used by the nominating Party.

In considering the CUNs submitted in 2007, both MBTOC sub-committees applied the standards contained in Annex I of 16MOP, and, where relevant the standard presumptions given at the start of each sub committee report (Sections 4 and 5). In particular, MBTOC sought to provide consistent treatment of CUNs within and between Parties while at the same time taking local circumstances into consideration for specific crops and situations, and to provide transparency in its processes and conclusions.

3.1.1 Consideration of Alternatives

As in previous years, MBTOC used the guidance given in the Annex I referred to in Decision XVI/4 where ‘alternatives’ were defined as any practice or treatment that can be used in place of methyl bromide. ‘Existing alternatives’ are those alternatives in present or past use in some regions; and ‘potential alternatives’ are those alternatives in the process of investigation or development.

MBTOC also used information on the suitability of alternatives for a nomination by considering the commercial adoption of alternatives in regions nominated for CUNs. Also, adoption in regions with similar climatic zone and cropping practices was used as an indication of the feasibility (technical and economic) of an alternative in a similar region. For example for preplant soil uses of MB, 1,3-dichloropropene/chloropicrin (1,3-D/Pic), metham sodium alone or in combination with Pic, dazomet, substrates and the use of resistant varieties and grafted plants (for solanaceous crops, melons and other cucurbits) have been adopted to replace MB for a range of crops in industries applying for CUNs and in many regions where MB was once used.

MBTOC evaluation of CUNs relating to production of strawberries, tomatoes and some other crops was assisted by information provided by a large number of published studies on MB alternatives and by a meta-analysis (TEAP 2006). The published studies provided additional transparency to MBTOC evaluations, as requested by the Parties in Decision XV/4.

Rate of change in commercial adoption, partly as a result of rapidly changing regulation, challenges MBTOC's ability to make diligent recommendations in the use of alternatives for post-harvest applications, especially when recommendations are considered for one or two years in the future. In post-harvest applications, where research is minimal, but commercial adoption trials are more common, MBTOC needs Parties and the affected industries to release the results of commercial trials, using group reporting methods when data is judged to be proprietary.

For commodity and structural applications, it was assumed that technically and economically feasible alternatives would provide disinfestation to a level that met the objectives of a MB treatment, e.g. meeting infestation standards in finished product from a mill, while ensuring the costs were economically feasible in the context of that nomination, to the extent that could be determined.

Technically feasible alternatives do not necessarily provide superior pest control results than are achieved in practice by MB; economically feasible alternatives do not necessarily cost the same as MB.

MBTOC has to be knowledgeable about regulatory advances, but in post-harvest applications domestic, import and export regulations all play a role that complicates adoption of alternatives. Several post-harvest CUNs indicate that if importing Parties were to set maximum residue levels for fluoride in foods, then the use of alternatives, for both food and structural applications by exporting countries, would improve. This year, as MBTOC was making its final recommendations, some Parties published maximum residue levels for fluoride in several foods, or only in imported foods as in the case of Canada. Given the newness of these announcements, the impact of these publications on actual MB use for 2007 and 2008 was difficult to predict.

3.2 Rate of Adoption of Alternatives

MBTOC recognizes that time is needed to effect phase-in of alternatives and accepts this as a reasonable technical argument for lack of availability to the user *sensu* Decision IX/6.

Some CUNs in the 2007 round argued that time was required to allow the relevant industry to transition to available effective alternatives. Most CUNs showed a reduction in nominated quantity requested from that of the preceding year, reflecting progressive adoption of alternatives; while others had the same or similar quantities of MB nominated to the preceding CUNs. Some CUNs showed comparatively slow rates of adoption, and also indicated that the Party expected that only part of the sector might be able to transition. As a result, MBTOC informs Parties that without change, some CUNs may be submitted for the next 5-8 years.

In some cases, alternatives at varying stages of readiness for adoption, were identified by the Party in the CUN and, in others, they were identified by MBTOC. MBTOC reviewed the technical information on alternatives and the commercial adoption of alternatives by Parties previously using MB in similar sectors to those where CUNs had been sought, i.e. the ability and rate of phase out MB (see Figures 1 and 2) in order to make an assessment. In some cases, MBTOC made adjustments for adoption

rates of alternatives based on the specific circumstances of the nomination. In most instances the adoption rates varied from no adoption up to 25% adoption.

For many CUNs in the soils sector, several industries which have been heavily dependent on MB, e.g. strawberries, tomatoes and other vegetable crops (e.g. Italy, Spain, Belgium, Portugal and other countries of the EC, Australia, New Zealand) have completely adopted alternative technologies (especially those requiring similar application technologies) within a 3 to 4 year period. MBTOC took account of this during assessments.

There is limited guidance from the Parties and data available on what is a reasonable rate of transition to existing and available alternatives, though para. 35 of Annex I referred to in Decision XVI/4 states that “in situations where MBTOC recommends a nomination on grounds that it is necessary to have a period for adoption of alternatives, the basis for calculating the time period” is required to be “fully in the TEAP report. It is also necessary to take fully into account the information provided by the nominating Party, the supplier, the distributor or the manufacturer. For this reason it is important that the Party provide this information as required in para. 35 of Annex 1 on relevant factors for such a calculation including; the number of enterprises that need to transition, e.g., the number of fumigation and pest control companies, estimated training time assuming full effort, opportunities for importing alternative equipment and expertise if not available locally, and costs involved.”

As most Parties did not provide all the information required under Annex 1 of Decision XIV/4, MBTOC used information on effectiveness of alternatives compared to MB from trials and commercial transition rates for other Parties to assist determination of suitable adoption rates in order to provide specific recommendations in this report.

3.3 Sustainable Alternatives

In a large proportion of CUNs, the most currently appropriate alternatives are chemical fumigant alternatives, which themselves, like MB, have issues related to their long term suitability for use. In both the EC and US, MB and most other fumigants are involved in rigorous reviews that could affect future regulations over their use for preplant soil fumigation. MBTOC has been informed that the US government has received a petition to stay (i.e. remove regulatory approval) the pesticide tolerances for SF. Sulfuryl fluoride is a recently approved, important, methyl bromide alternative for several post-harvest applications. A stay or other action that removes the pesticide tolerance for SF would increase significantly pressure to revert to MB in structural and commodity fumigation. For preplant soil uses of MB, the regulatory restrictions on 1,3-dichloropropene and chloropicrin are preventing further adoption of these products and putting pressure on industries to retain MB.

MBTOC urges Parties to consider the long term sustainability of treatments adopted as alternatives to MB, to continue to adopt environmentally sustainable and safe chemical and non-chemical alternatives for the short to medium term and to develop sustainable IPM or non-chemical approaches for the longer term. Decision IX/6 1(a)(ii) refers to alternatives that are ‘acceptable from the standpoint of environment

and health'. MBTOC has consistently interpreted this to mean alternatives that are registered or allowed by the relevant regulatory authorities in individual CUN regions.

3.4 Frequency of Allowed MB Use

In the CUN round for 2007, reductions in MB for both preplant soil and post harvest uses could be achieved in some nominations, where effective alternatives were identified, by reducing the frequency of MB fumigations. In some countries, present regulations already restrict the frequency of use of MB (e.g. to every second year) on similar crops and circumstances to those nominated by other Parties. MBTOC suggests that in these, and other instances, MB may only be required every 2, 3 or 4 years and suggests that Parties further consider reductions where appropriate. Alternation of pest control measures may also help provide or extend user confidence and experience in alternatives. New pest control measures may also be good agricultural practice, reducing risk of development of resistance and providing control of a wider spectrum of pests.

3.5 Use of Disposable Canisters of MB

One Party still used small disposable canisters (i.e. 500 to 750g canisters) for application of MB for preplant soil use under plastic films. This practice is not considered as effective for pathogen control as use of MB/Pic mixtures and also leads to high emissions of methyl bromide. Use of small canisters has been eliminated in most non-Article 5 countries as it is considered a dangerous practice. According to the Party, canisters are used because they provide small-scale farmers with an easy application method and the ability to apply targeted amounts of MB to small areas where injection machinery may be difficult to use.

3.6 Trends in Methyl Bromide Use for CUEs since 2005

Since 2005, there has been a progressive trend by all Parties to reduce their consumption and CUN nominations for preplant soil use, although this has occurred at very different rates. In this round, the phase out of MB for several major uses has slowed. Figs 1 and 2 show the trends in the reduction in amounts approved/nominated by Parties for 'Critical Use' from 2005 to 2009 for some key uses in 2008 and 2009. The trends in phase out of MB by country are shown in Table 3.

Figure 1. Amounts of MB exempted for CUE uses in preplant soil industries from 2005 to 2009. Solid lines indicate trend in CUE methyl bromide. Dashed lines indicate quantity of methyl bromide nominated by the party in either 2008 or 2009.

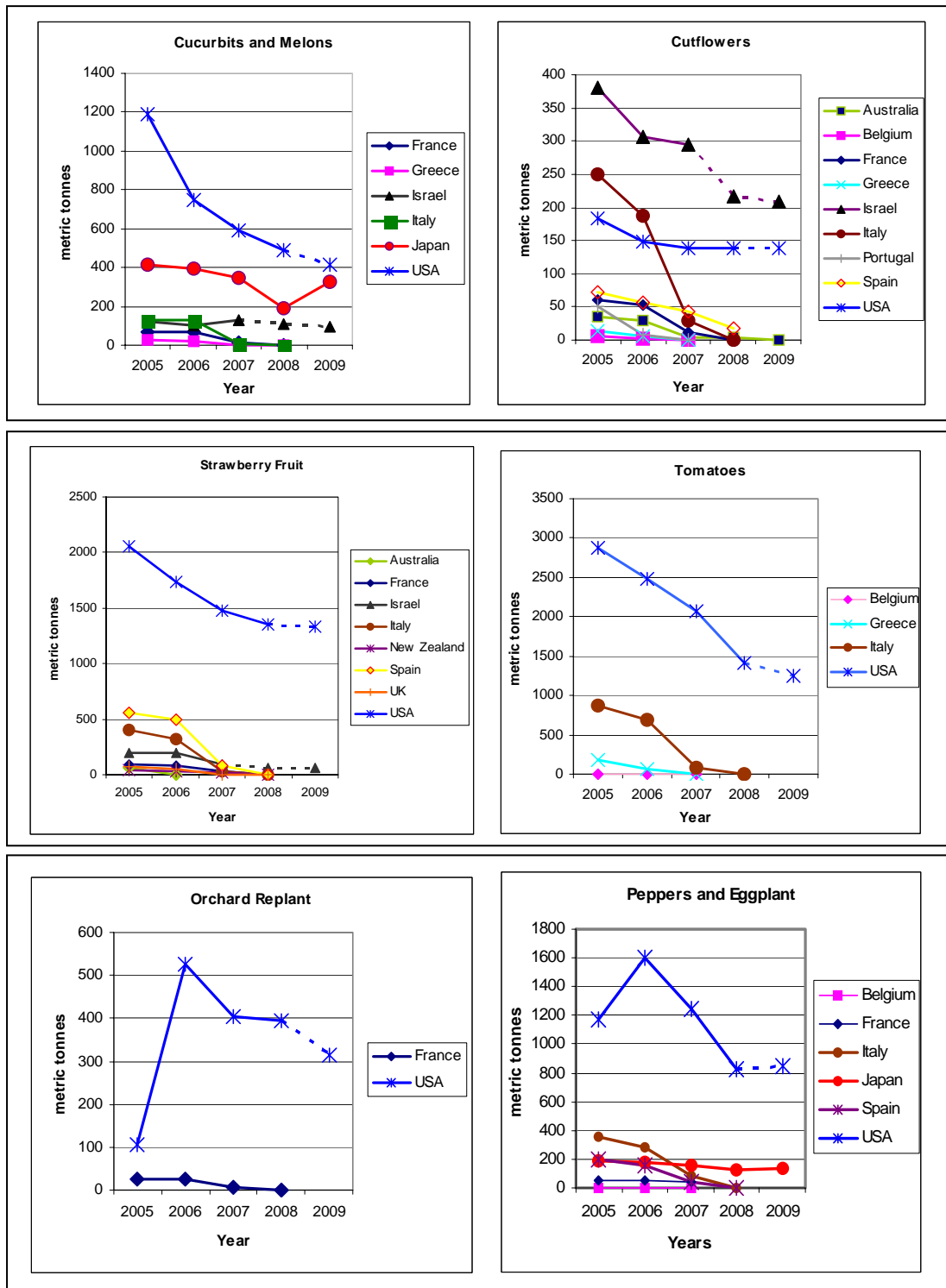


Figure 2. Amounts of MB exempted for CUE uses in mills and food processing facilities from 2005 to 2009. Solid lines indicate trend in CUE methyl bromide. Dashed lines indicate quantity of methyl bromide nominated by the Party in either 2007 or 2008.

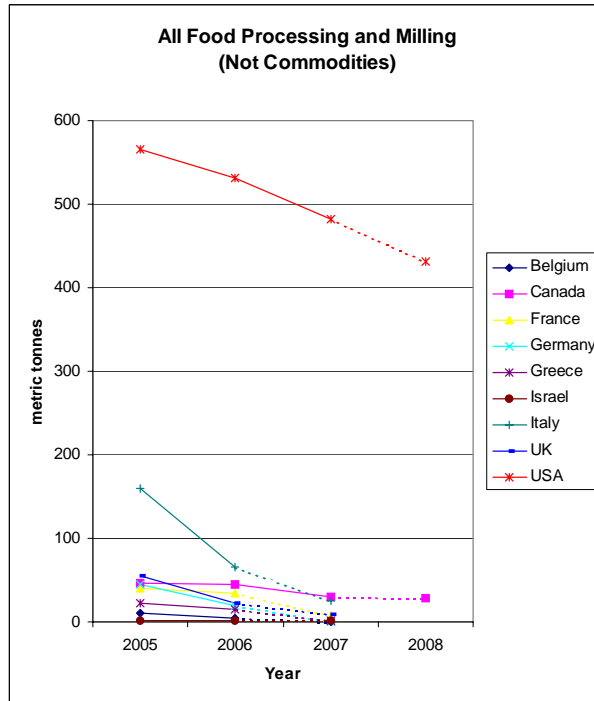


Table 3. Summary of Critical Use Nomination (2005 – 2009 in part) and Exemption (2005 – 2008 in part) Amounts of MB Granted by Parties under the CUN/CUE Process. (Note: A breakdown of CUN and CUE amounts by sector is given in Annex VI)

PARTY	QUANTITIES NOMINATED					QUANTITIES APPROVED			
	Total Nomination For 2005	Total Nomination For 2006	Total nominations for 2007	Nomination for 2008	Nomination for 2009	2005 (1ExMOP and 16MOP)	2006 (16MOP+ 2ExMOP+ 17MOP)	2007 (17MOP + 18MOP)	2008 (18MOP)
Australia	206.950	81.250	52.145	52.900	38.990	146.600	75.100	48.517	48.45
Canada	61.992	53.897	46.745	42.241	34.375	61.792	53.897	52.874	36.112
European Community ¹	5754.361	4213.47	1239.873	245.00	*	4392.812	3536.755	689.142	*
Israel	1117.156	1081.506	1236.517	952.845	851.395	1089.306	880.295	966.715	*
Japan	748.000	738.700	651.700	589.600	508.90	748.000	741.400	636.172	443.775
New Zealand	53.085	53.085	32.573	0	0	50.000	42.000	18.234	0
Switzerland	8.700	7.000	0	0	0	8.700	7.000	0	0
USA	10753.997	9386.229	7417.999	6415.153	4942.227	9552.879	8081.753	6749.060	5355.456
TOTALS	18704.24	15615.135	10677.55	8297.739	6375.955	16050.089	13418.200	9160.714	5883.793

* Not yet available.: ¹ Members of the European Community having CUNs/CUEs include:

2005 – Belgium, France, Germany, Greece, Italy, Netherlands, Poland, Portugal, Spain, and the United Kingdom.

2006 – Belgium, France, Germany, Greece, Ireland, Italy, Latvia, Malta, Netherlands, Poland, Portugal, Spain, and the United Kingdom.

2007 – France, Greece, Ireland, Italy, Netherlands, Poland, Spain, and the United Kingdom

2008 – Poland, Spain

4. MBTOC QSC: Evaluations of 2007 Critical Use Nominations for Methyl Bromide: July 2007

4.1 Introduction

MBTOC Quarantine, Structures and Commodities met in June 2007 in College Park, Maryland, USA to re-review CUNs as requested by Australia and Canada. The CUNs re-reviewed were: Australia rice 2009; Canada pasta manufacturing 2008 and Canada rodenticides and molluscicides 2008. The Parties supplied additional information about the nominations following the publication of the TEAP May 2007 Progress Report, and during bilateral meetings with MBTOC during the Open Ended Working Group meeting in Nairobi, Kenya.

The USA informed MBTOC that research, commercial trials and an economic assessment of the use of sulfuryl fluoride for cocoa beans, resulted in regulatory change that will allow this sector to fully transition away from methyl bromide by 2009. Consequently, the USA has withdrawn the cocoa bean sector of the nomination by the National Pest Management Association.

With the assistance of the USA, MBTOC conducted a field trip to visit processors of Southern dry cure ham (the subject of a critical use nomination), and meet with North Carolina State University Extension and other research scientists who are part of a multi-state research team trying to solve the pest control problem with this commodity.

4.2 ISPM Draft Methyl Bromide Strategy

MBTOC noted the availability of a draft standard for comment by Parties to the IPPC. The standard provides guidance to National Plant Protection Organizations (NPPOs) and Regional Plant Protection Organizations (RPPOs) in the development of a strategy to reduce or replace the use of methyl bromide as a phytosanitary measure, in order to reduce emissions of methyl bromide.

4.3 Quarantine Issues

MBTOC draws the Parties' attention to the potential for economic impact, particularly in Article 5 countries, which may develop when imports of commodities and associated packaging materials are rejected following treatment against quarantine pests with methyl bromide. Methyl bromide quarantine use may be increasing, in part in response to concerns about the consequences of importing quarantine pests. Parties may wish to charge TEAP with further investigation of these matters.

4.4 Regulatory Update

In Australia, the review of the registration application for sulfuryl fluoride for structural, quarantine and commodity use is ongoing.

In Canada, the website of the Pest Management Regulatory Agency (PMRA) has published an interim re-evaluation for aluminium phosphide, and requested more information from registrants. 1,3-D is still under re-evaluation; more information has been requested from registrants. Health Canada has approved import MRLs for sulfur dioxide on imported foods. PMRA is also reviewing new sulfur dioxide submissions, and submissions for the use of CO₂, heat and phosphine as a combination process. PMRA has determined that there are no regulatory barriers to the use of irradiation on rodenticides and molluscicides; however, ethylene oxide is not registered for this use.

The TEAP 2007 May Progress Report (MBTOC chapter) reviews registration issues in the EU.

In Japan, registration review of methyl iodide for both post-harvest and pre-plant uses is continuing and reviewers on the Food Safety Committee have requested additional information from manufacturers.

The USA has confirmed that the legal challenge to the use of sulfur dioxide is ongoing and that there may be future implications for use of SF as an alternative treatment. There is a new USA registrant of SF, which has resulted in two suppliers of the alternative for post-harvest uses. The re-registration review of methyl bromide and several other fumigants used for post-harvest and pre-plant is in public comment period. Decisions on buffer zones based on risk mitigation measures have not yet been made.

4.5 Standard Presumptions Used in Assessment of Nominated Quantities.

These have not changed since presentation to the Parties at 17 MOP.

4.6 Details of Evaluations

Parties submitted 15 CUNs for the use of MB in structures and commodities in 2007.

Of the 2007 nominations, 7 were for 2008 for a total of 11.535 tonnes. Of nominations for 2008, MBTOC QSC recommended 9.179 tonnes. This figure does not include a recommendation for Australia rice for 2008. The text associated with Australia rice for 2008 (Table 4), and the Meeting report of the 27 OWEG, para 128, explain the declaration of Australia on this matter. MBTOC did not recommend one CUN.

Of the 2007 nominations 8 were for 2009 for a total of 478.719 tonnes. TEAP April 2007 progress Report noted this figure as 529.721 tonnes. However, since that report, the USA has withdrawn the cocoa segment of the NPMA CUN (51.002 tonnes). Of the nominations for 2009, MBTOC QSC recommended a total of 451.178 tonnes.

Table 4 below provides the MBTOC QSC final recommendations for the CUNs submitted in 2007.

Table 4. Final evaluations for QSC CUNs submitted in 2007 for 2008 or 2009

Country	Industry	Quantity approved for 2005 (ExMOP1 and MOP16)	Quantity approved for 2006 (MOP16+ ExMOP2+ MOP17)	Quantity approved for 2007 (MOP17+ MOP18)	Quantity approved for 2008 (MOP18)	Quantity nominated for 2008 (additional or new)	MBTOC recommendation for 2008 (additional or new)	Quantity nominated for 2009 (new)	MBTOC recommendation for 2009 (new)
Australia	Rice	6.150	6.150	9.205	7.400	1.800		9.200	7.82
<p>MBTOC comments: On 2008 CUN: MBTOC's interim report recommended an additional 0.84 tonnes to the 7.4 tonnes of MB already granted by the Parties for rice treatment in 2008. The recommendation was based on the Party's documents indicating it would have a paddy harvest of 261.300 tonnes, milled to 209,000 tonnes and fumigated at 20g/m3 giving a total MB usage of 8.24 tonnes. (Parties had already approved 7.4 tonnes for 2008 at MOP 18.) However, at the 27th Meeting of the OEWG, Australia indicated that the "amount of rice to be treated was 261,300 tonnes and that the full amount of the 1.8 tonnes approved by the Parties at the 18th MOP would be required. MBTOC confirmed it had received this clarification." (27th OEWG Meeting report, para 128)</p> <p>On 2009 CUN: MBTOC recommends a reduced CUE of 7.82 tonnes for this nomination in 2009. This represents a 15% reduction to the amount of MB nominated by the Party, to encourage the beginning of adoption of alternatives, as required by Decision IX/6. The Party has indicated it would begin to adopt alternatives after three years of consecutive high harvests, but harvests have been low. MBTOC, however, finds it reasonable to expect some adoption of alternatives, even in difficult economic times. The applicant has invested in recapture equipment on its largest treatment site with quoted savings of about 45% of MB emissions. There are several technically effective and available alternatives in use worldwide for packaged rice. MBTOC's previous CUN evaluations and reports have discussed these alternatives at length. The Party has indicated a preference for phosphine as an alternative, but indicates quite high costs of transition. CUN documents and discussions with the Party have indicated that the pest of concern is <i>Sitophilus spp.</i>, particularly <i>S. oryzae</i>. This species does not show high levels of resistance to phosphine although it is a species of high natural tolerance. However, the Party has based its economic analysis on an unnecessarily long treatment time of three weeks, which would only apply at temperatures below 15 °C. The unnecessarily long treatment time increases the number of silos to be built, and strongly contributes to the very high economic impact cited by the Party. Research papers submitted by the Party and from other sources, including the quarantine procedure for phosphine published by the European Plant Protection Organisation (EPPO Bulletin 23, 212-214 (1993), shows effective phosphine treatment of <i>Sitophilus spp.</i> can be achieved within 12 days at temperatures above 20°C and 4 days above 30°C, under well-sealed conditions at a dose of about 700ppm.</p> <p>MBTOC comments on economics: The CUN states: drought has made it impossible to undertake investment in phosphine facilities. Estimated costs for up to 100 silos would be Aus \$40 million. CUN states it would involve three years of transition, potentially complete in 2012. However, CUN does not provide annual cost of this capital expenditure. Even if borrowing or raising external capital is not feasible, the calculations of the annual cost have to be based on the amortised capital cost over the economic life of the investment. CUN Tables 3, 4, and 5 compare costs of phosphine and MB treatment on an annual basis. MBTOC analysis concludes that phosphine would costs \$19.02 per ton for each of the first 10 years. For a 1-kilo retail package this amounts to \$0.019, or about 2 cents. With any elasticity of demand and with any branding value, some of this could be is passed on to consumers. Further, per capita domestic use (broadly defined and may include use for beer, pet food, seed and residual) is about 9 kg per person. This suggests an annual cost to consumers if higher fumigation costs were passed fully of about 20 cents per year per person. Some distributional issues remain as certain ethnic groups have much higher than average per capita consumption.</p>									

Country	Industry	Quantity approved for 2005 (ExMOP1 and MOP16)	Quantity approved for 2006 (MOP16+ ExMOP2+ MOP17)	Quantity approved for 2007 (MOP17+ MOP18)	Quantity approved for 2008 (MOP18)	Quantity nominated for 2008 (additional or new)	MBTOC recommendation for 2008 (additional or new)	Quantity nominated for 2009 (new)	MBTOC recommendation for 2009 (new)
Canada	Mills	47 (included mills and pasta)	34.774	30.167 (included mills only)	28.650			26.913	26.913
	<p>MBTOC comments: MBTOC recommends 26.913 tonnes for flour mill fumigation in 2009 with the understanding that Canadian flour millers continue their rigorous research program and complete reports in 2007. Industry-government commercial scale trials of heat treatment, sulfuryl fluoride and heat, phosphine and carbon dioxide combination, are ongoing. Sulfuryl fluoride is only allowed under conditional registration and can only be used in empty flour mills. No maximum residue levels for fluoride resulting from SF fumigations have been established in Canada. Furthermore, it is unknown if any use limits will be placed on the use of sulfuryl fluoride by Provincial governments. The nomination for 2009 represents a decrease of about 5% relative to 2008 levels. MBTOC would expect a considerable decrease in any further nomination if the trials currently being conducted show economic feasibility and technical efficacy in Canadian climate conditions. MBTOC notes that a growing body of research and practical experience indicates that best results in SF fumigations are obtained when facility temperatures of approximately 30°C are achieved. MBTOC awaits the results of Canadian testing to determine if this result is also observed in Canada.</p>								
	<p>MBTOC comments on economics: CUN states: It appears that heat remains very costly and has not provided comparable efficacy. Lack of trials makes adoption of alternatives unlikely. Technical feasibility issues and lack of registration still exist. This nomination does not rely on economic arguments.</p>								
Canada	Pasta	(see Canada mills)	10.457	6.757		6.067	6.067		
	<p>MBTOC comments: MBTOC recommends 6.067 tonnes for Canada pasta in 2008, with the understanding that commercial trials of alternatives scheduled for this season will be conducted. MBTOC will not be able to recommend any further exemption for this sector without reports of commercial trials of alternative treatments in pasta facilities, detailing effects on pest control and facilities in the Canadian circumstances. The Party may consider a reduced allocation for this sector if trials are successful.</p>								
	<p>MBTOC comments on economics: CUN states: that heat treatment remains a very costly alternative. In general, the pest control service provider estimates the cost to carry out the heat treatment at twice the cost of doing a methyl bromide treatment. The cost of a heat treatment increased to three or four times the cost of methyl bromide when the costs of monitoring to ensure comparable results to a methyl bromide fumigation are included.</p>								

Country	Industry	Quantity approved for 2005 (ExMOP1 and MOP16)	Quantity approved for 2006 (MOP16+ ExMOP2+ MOP17)	Quantity approved for 2007 (MOP17+ MOP18)	Quantity approved for 2008 (MOP18)	Quantity nominated for 2008 (additional or new)	MBTOC recommendation for 2008 (additional or new)	Quantity nominated for 2009 (new)	MBTOC recommendation for 2009 (new)
Canada	Commodities	0.000	0.000	0.000	0.000	0.068	NR		
<p>MBTOC comments: MBTOC does not recommend a CUE for this specific nomination in 2008. The critical need for methyl bromide has not been demonstrated. There are no data indicating that mould would develop in bait for rodents or molluscs if manufacturing methods were improved and standard good manufacturing practices were used. The applicant states that product may become mouldy while held in the open at room temperatures, awaiting final processing and packaging without any effort made to cool or aerate the product. If the product was dried during processing to less than 75% equilibrium relative humidity the <i>Aspergillus</i> spp, said to be of concern, should not proliferate. Similarly, if the product was stored using standard grain handling techniques of air circulation, aeration, and/or air conditioning in the storage room, mould would also not grow. The applicant has indicated a MB use of approximately 2.7 kg (6 lbs) MB per truckload; the Party indicated 17 – 20 pallets per truck. However, the Party indicates an annual production of 1150 pallets (approx 430 – 540 kg per pallet), and has nominated 68 kg MB. The MB dosage rate (6.8 kg/100m³) is unlikely to control mould growth. Furthermore, most fumigation occurs in winter in an unheated vault, which would further reduce effectiveness, or result in an unnecessarily high requirement for methyl bromide. Irradiation is a technically effective and available alternative, although treatment costs plus shipping were estimated at considerably higher cost than MB treatment. Costs supplied by the Party showed wide variation in shipping and treatment costs, suggesting that lower costs could be obtained by ensuring the irradiation dosage rate has been properly selected for the purpose intended and that economies of scale might lower shipping costs. MBTOC is not aware of any other Party using MB for this purpose.</p>									
<p>MBTOC comments on economics: The cost of post-manufacture sterilization of the rodenticides and molluscicides by irradiation was estimated to cost approximately \$280 CDN to \$380 CDN per pallet of product (shipping included). Trucking costs were suggested to be between \$150 and \$170 (returned) per pallet of material and the cost of goods to be treated was \$120 to \$200 (depending on the strength (interpret as 'dose') required) per pallet of material and the company also included \$10 per pallet for their extra handling. The current cost for the post-manufacture sterilization of the product with methyl bromide is \$8.18 CDN per pallet.</p>									
Israel	Dates	3.444	2.755	2.200		1.800	1.8		
<p>MBTOC comments: MBTOC recommends 1.8 tonnes for dates in 2008. Israel's research programme combined with technology transfer to rural packing houses has allowed the successful adoption of heat treatment by packers of Medjool dates, the main variety. The Party has continued its 20% decrease for the third year. However, heat treatment has not been successful, thus far, for other date varieties. Work continues on this prospective treatment. Controlled atmosphere treatment may provide a technically effective alternative. A heat and carbon dioxide combination treatment has been found to be technically effective for one variety. The 'cocoon' method of vacuum in flexible container has worked for some varieties but requires packing houses to invest and adapt to a non-fumigation technology. At least one date variety is harmed by this method, but the applicant is encouraged to make the investments and shift in thinking to this and other alternatives where technically feasible and where product quality is not harmed. Phosphine is not feasible from the viewpoint of product quality. Sulfuryl fluoride and ethyl formate, although they have proven successful in the treatment of other dried fruit, are not registered.</p>									
<p>MBTOC comments on economics: CUN states: Alternative 3 (Cold) is not technically suitable, alternative 1 (Heat) is being carried out in part for Medjool only while alternative 2 (CO₂), 4 (vacuum) and 5 (Heat + CO₂) require further studies to reveal whether they are economically feasible or not. Otherwise CUN provides no economic data.</p>									

Country	Industry	Quantity approved for 2005 (ExMOP1 and MOP16)	Quantity approved for 2006 (MOP16+ ExMOP2+ MOP17)	Quantity approved for 2007 (MOP17+ MOP18)	Quantity approved for 2008 (MOP18)	Quantity nominated for 2008 (additional or new)	MBTOC recommendation for 2008 (additional or new)	Quantity nominated for 2009 (new)	MBTOC recommendation for 2009 (new)
Israel	Flour mills	2.140	1.490	1.040		0.800	0.312		
	<p>MBTOC comments: MBTOC recommends 0.312 tonnes for Israel flour mills in 2008, a 61% reduction in the nominated amount of 0.8 tonnes. Adoption of a rigorous IPM program combined with heat treatment seems a likely avenue for success in the circumstances of this nomination. The MB recommended will allow the applicant to complete transition to alternatives. The applicant indicates spot treatment with MB is used in the case of infestation, but in this circumstance spot treatment by heat seems quite possible, especially given the generally high ambient temperature. Although the applicant indicates an intended future reliance on sulfuryl fluoride, it seems unlikely to resolve their infestation problems in the short or middle term since there has not even been an application for registration submitted yet. The applicant indicates it uses 35 g m⁻³ of MB based on the poor penetration of MB through flour residues. Flour residues should be cleaned out before fumigation as a standard sanitation practice and a normal part of IPM. The MBTOC standard dosage rate is 20g m⁻³. This dosage rate is sufficient for full site treatments and would be more than sufficient for spot treatment. The amount of MB recommended was based on the following considerations. Five mills were reported to need to fumigate mills and equipment totalling 15,600m³. When MBTOC standard dosage rate of 20g m⁻³ is used, the result is 0.312 tonnes of MB needed.</p>								
	<p>MBTOC comments on economics: CUN states: that heat treatment is not economically feasible. Suitable equipment might overcome that problem. Otherwise CUN provides no economic analysis.</p>								
Japan	Chestnuts	7.100	6.800	6.500	6.300			5.800	5.800
	<p>MBTOC comments: MBTOC recommends 5.8 tonnes for Japan chestnuts in 2009. The Party has decreased the request for MB use in this sector by 8% by requiring growers and packing houses to amalgamate fumigation loads. The Party is encouraged to continue these improvements and to reduce dosage by increasing fumigation time. The Party has a rigorous research program that, in preliminary results, has identified some effective alternatives. Unfortunately many of the alternatives tested are either ineffective disinfestants or harms this fresh product. More encouraging research results indicate efficacy for methyl iodide which is not yet registered in Japan.</p>								
	<p>MBTOC comments on economics: CUN provides no economic analysis</p>								

Country	Industry	Quantity approved for 2005 (ExMOP1 and MOP16)	Quantity approved for 2006 (MOP16+ ExMOP2+ MOP17)	Quantity approved for 2007 (MOP17+ MOP18)	Quantity approved for 2008 (MOP18)	Quantity nominated for 2008 (additional or new)	MBTOC recommendation for 2008 (additional or new)	Quantity nominated for 2009 (new)	MBTOC recommendation for 2009 (new)									
Poland	Coffee & Cocoa Beans	See Medicinal Herbs	2.160	1.420		0.500	0.500											
										<p>MBTOC comments: MBTOC recommends 0.5 tonnes for this use in 2008, a reduction of 64.3% for this sector over last year's nomination. In recent years the Party has significantly reduced its requirement for MB by the reuse of recaptured MB. Additionally, the Party is adopting phosphine as an alternative. Registration of fast generated forms of phosphine is anticipated this year and will increase the rate of transition. If there are delays or ineffectiveness discovered in this planned treatment, another avenue is the use of heat and low oxygen as a combination controlled atmosphere treatment. This treatment, already in use in several ports, would control the mite infestation in an approximate treatment time of 5 days.</p>								
										<p>MBTOC comments on economics: CUN states: that phosphine (which is not registered, inter alia because of the expected small market) is 30% more expensive, largely as a result of additional costs associated with fumigation time of 12 days; high cost of speed boxes and phosphine generators. These additional costs make the fumigation treatments with phosphine more expensive by 50 Euro per tonne. CUN states that irradiation is expensive because of the high cost of transportation to the facility.</p>								
Poland	Medicinal herbs and mushrooms	4.100	3.560	1.800		0.500	0.500											
										<p>MBTOC comments: MBTOC recommends 0.5 tonnes for this use in 2008, a reduction of 81.5% for this sector over last year's nomination. In recent years the Party significantly reduced MB use in this sector by moving commodities to alternatives as technologies and treatments became available. The CUN this year represents the last remaining uses which are moving to use of carbon dioxide/high pressure.</p>								
										<p>MBTOC comments on economics: CUN states: that phosphine (which is not registered, inter alia because of the expected small market) is more expensive, largely as a result of additional costs associated with fumigation time of 12 days; high cost of speed boxes and phosphine generators. These additional costs make the fumigation treatments with phosphine more expensive. CUN states that irradiation is expensive because of the high cost of transportation to the facility.</p>								

Country	Industry	Quantity approved for 2005 (ExMOP1 and MOP16)	Quantity approved for 2006 (MOP16+ ExMOP2+ MOP17)	Quantity approved for 2007 (MOP17+ MOP18)	Quantity approved for 2008 (MOP18)	Quantity nominated for 2008 (additional or new)	MBTOC recommendation for 2008 (additional or new)	Quantity nominated for 2009 (new)	MBTOC recommendation for 2009 (new)
United States	Commodities	89.166	87.719	78.983	58.921 inc. 0.021 for research			58.912	45.623 inc. 0.020 for research
	<p>MBTOC comments: MBTOC recommends 45.623 tonnes for US commodities in 2009. This amount includes 20 kilograms for research. The Party had requested 58.921 tonnes for 2009, which included 21 kilograms for research purposes, but which included no transition to alternatives over the amount granted by the Parties for 2008. MBTOC's recommendation represents a 20% decrease in the nomination for walnuts, dried fruit and dates to allow for transition to alternatives. In the case of dried beans, we did not recommend a 20% reduction this year but reduced the dosage rate from 44g m⁻³ to 20g m⁻³. Therefore, on a sectoral basis the tonnes recommended are: walnuts (28.088); dried fruit (13.928); beans (1.980); dates (1.607). There are several alternatives available for use by this sector. Phosphine is in widespread use, but its slower action sometimes makes it logistically impractical for meeting holiday market windows. Phosphine is registered for treatment of beans in California, but is not registered if the beans are stated to be infested with cowpea weevils. Trials using phosphine and sulfuryl fluoride have been conducted with dates. Sulfuryl fluoride is technically effective and available; MRLs have recently been established in Germany, one of the largest importers of US walnuts. Some importing countries, however, have not yet established MRLs for fluoride residues, which limits its use in some cases. Controlled atmosphere treatment would also be effective and the technology is available on a lease basis.</p>								
	<p>MBTOC comments on economics: CUN provides economic data on alternatives for walnuts and dried fruit other than dates. CUN states: that phosphine fumigant costs are higher because it takes longer to accomplish so sellers don't reach December holiday export market window; its use leading to increased labour costs, and it corrodes equipment. CUN states walnuts and dried fruit all experience substantial additional downtime and subsequent lost revenues if phosphine is used. Net revenues for alternatives are negative. CUN states that profit margin decreases from 13.3% to -7.5% for Walnuts and from 5% to -16.8% for dried fruits. An economic analysis was not done for dates and dried beans.</p>								
United States	Cocoa beans - NPMA subset	61.519	55.367	64.082	53.188			51.002	CUN Withdrawn by USA
	<p>MBTOC comments: The United States has informed MBTOC that research, commercial trials and an economic analysis conducted by cocoa bean fumigators and a supplier of sulfuryl fluoride, followed by regulatory change, will allow this applicant to fully transition to alternatives by 2009. As a consequence, the USA has withdrawn the cocoa bean segment of the critical use nomination by the National Pest Management Association.</p>								
	<p>MBTOC comments on economics:</p>								

Country	Industry	Quantity approved for 2005 (ExMOP1 and MOP16)	Quantity approved for 2006 (MOP16+ ExMOP2+ MOP17)	Quantity approved for 2007 (MOP17+ MOP18)	Quantity approved for 2008 (MOP18)	Quantity nominated for 2008 (additional or new)	MBTOC recommendation for 2008 (additional or new)	Quantity nominated for 2009 (new)	MBTOC recommendation for 2009 (new)
United States	NPMA food processing structures (cocoa beans removed)	83.344	69.118	82.771	69.208			66.777 cocoa beans removed	54.606
	<p>MBTOC comments: MBTOC recommends 54.606 tonnes for processed food facilities in 2009. Cocoa beans had been disaggregated from this CUN but the nomination for this sector was later withdrawn by USA, as reported elsewhere. The Party has requested 66.777 tonnes for these sectors, cocoa removed. The Party indicates it can achieve a five-year transition at 17% per year of 84% of its facilities in this sector. The constant reduction in absolute tonnes annually of 84% of the total of this CUN is 13.871 tonnes (cocoa and cheese not included). 2009 will be the second year of this transition plan. MBTOC has not included a reduction for cheese stores because no alternatives have been registered, but the Party has reduced its MB nomination in this sector through various improvements. The total tonnage recommended is composed of the following sectoral amounts: processed foods (49.103); herbs and spice facilities (3.238); cheese (2.265). The Party is requested to ensure the recommendation for herb and spice facilities is used only for the facilities and not the commodity, especially not if intended for QPS. There are alternatives for herb and spice commodity in widespread commercial use in the US, and QPS uses cannot be included in critical uses.</p>								
	<p>MBTOC comments on economics: CUN states: For commodities listed in the NPMA CUN, an economic analysis was not conducted because this sector did not have an alternative registered. The comment about alternative registration is incorrect.. For food-processing facilities listed in the NPMA CUN, economic feasibility of such alternatives was not assessed due to the lack of revenue information which is necessary to quantify the economic impacts to food-processing facilities.</p>								
United States	Mills and processors	483.000	461.758	401.889	348.237			291.418	291.418
	<p>MBTOC comments: MBTOC recommends 291.418 tonnes for US mills and structures in 2009. Overall this is a 16.3% decrease for the entire sector. This decrease is distributed over each sector as follows: rice mills 26.7%, bakeries 41.8%, pet food 17.7% and flour millers 11.9%. The Parties granted 348.231 tonnes of MB for this use in 2008. The overall decrease in MB use is also similar to transition estimates by suppliers of alternative products and technologies. The total tonnages of MB recommended can be broken down into sectors as follows: rice mills (48.804); bakeries (8.308); pet food (21.955); and flour mills (212.352). US bakeries are making the fastest transition to alternatives and seem to have resolved earlier facility design problems that resulted in difficulties transitioning to heat. Gastightness should continue to be improved and numerous techniques are available to do so. MB should not be used in facilities that are of poor or very poor gastightness. These situations are especially prevalent in rice and flour mills. Transition to adoption of heat treatments should be encouraged, especially where gastightness is poor.</p>								
	<p>MBTOC comments on economics: The CUN states: that heat will cost 1.5 times and sulfuryl fluoride costs 1.3 times the cost of MB treatment. Heat treatment is reported to result in lost operating days and thus lower throughput and gross revenues. Where sulfuryl fluoride is technically feasible it results in loss of net revenue of 57% (rice millers), but only 4% (bakeries) and 2% (pet food manufacturers and North American Millers Association). Profit margins were added to the economic assessment.</p>								

Country	Industry	Quantity approved for 2005 (ExMOP1 and MOP16)	Quantity approved for 2006 (MOP16+ ExMOP2+ MOP17)	Quantity approved for 2007 (MOP17+ MOP18)	Quantity approved for 2008 (MOP18)	Quantity nominated for 2008 (additional or new)	MBTOC recommendation for 2008 (additional or new)	Quantity nominated for 2009 (new)	MBTOC recommendation for 2009 (new)
United States	Cured pork	67.907	40.854	18.998	19.669			19.699	18.998
	<p>MBTOC comments: MBTOC recommends 18.998 tonnes for 2009. This amount was also granted by the Parties for this use in 2007, but represents a decrease from the amount granted by the Parties in 2008 of 19.669 tonnes and renominated for 2009. There are no registered alternatives for the treatment of insects and mites on pork hanging in curing houses. Reliable historical use volumes for the largest group of producers in this sector are still not available due to the large number of small units. Therefore there is no justification for increase in use in this sector. A multi-state research project has begun and has released preliminary results. The research will identify potential for improvements in IPM, facility gastightness, processing methods and efficacy of alternatives which may result in decrease in MB use and eventual transition to alternatives. The Party is encouraged to investigate efficacy of non-chemical alternatives for this commodity, which would then allow for faster transition away from MB in this sector. Controlled atmosphere at increased temperature may be effective. An additional avenue for investigation might be dips in hot oil as is done in European countries for similar pork products. (Schillings W. 2006. Methyl Bromide use to combat mite infestation in dry cured ham during production. In: Annual International Research Conference on Methyl Bromide Alternatives and Emissions Reductions, November 3 – 6, 2006 Orlando, Florida, USA.).</p>								
	<p>MBTOC comments on economics: No economic data given. The CUN states this is a minor use and there is little economic incentive to develop alternatives</p>								

* This figure does not include a recommendation for Australia rice 2008. The Australia rice evaluation for 2008, and the Meeting report of the 27th OWEG, para 128, explain the declaration of the Government of Australia on this matter.

** TEAP/MBTOC April 2007 report noted this figure as 529.721, however since that report, Government of the United States has withdrawn the cocoa segment of the NPMA CUN (51.002 tonnes).

5. MBTOC Soils: Evaluations of 2007 Critical Use Nominations for Methyl Bromide: July 2007

5.1 Summary of Outcomes

Of the 43 CUNs submitted for soil uses, recommendations were made on all 2008 and 2009 recommendations, except for 10 nominations from Israel for 2009 which remained unable to assess. MBTOC considered that changes to registration of a key alternative 1,3-D, a review of buffer zone regulations on alternatives and new economic information on substrate use were required before these nominations could be fully assessed.

After the two rounds of the 2007 assessment, MBTOC Soils has recommended a total of 5294.204 tonnes, being 1102.706 tonnes for 2008 and 4191.498 tonnes for 2009. An amount of 91.69 tonnes was not recommended for 2008, and 536.286 tonnes not recommended for 2009. An amount of 858.96 tonnes for 2009 of the Israeli CUNs remained unable to assess pending further information (Table 5).

Table 5. Summary of MBTOC Soils recommendations for 2008 and 2009 by country for CUNs received in 2007 for preplant soil use of methyl bromide (tonnes)

Country	CUE Granted at MOP 18	Additional 2008 CUN Request	2009 CUN Request	MBTOC-S Recommendation	
				2008	2009
Australia	35.75		29.790		29.790
Canada	14.124		7.462		7.462
EC (Poland, Spain)	689.142	244.151		244.146	-
Israel	933.315	950.245	813.045	858.96	Unable{a}
Japan	443.775		502.600		299.580
USA	4806.723		4472.563		3854.666
Total	6922.829	1194.396	5825.460	1102.706	4191.498

(a) Unable to assess 848.795 tonnes for 2009 of the Israeli CUNs pending further information.

5.2 Issues Related to CUN Assessment for Preplant Soil Use

Technical alternatives exist for almost all uses requesting CUNs, but uptake of alternatives varies between countries, crops and the pest pressure. In general, CUNs for preplant soil use of MB resulted mainly from the following issues: regulatory restrictions on one or two specific alternatives, adoption times to implement alternatives, and economic infeasibility of some key technical alternatives, such as the use of methods which avoid the need for MB such as the use of grafted plants.

Two key issues which affect the need for CUNs in the 2007 round were i) regulations on key alternatives, particularly 1,3-D/Pic and, chloropicrin used alone or in mixtures at rates greater than 200 kg/ha (20 g/m²), ii) lack of controls for nutsedge, and iii) lack of studies in specific sectors i.e. orchard replant, and nursery industries.

Unusually large buffer zone restrictions on fumigant alternatives, particularly limit their adoption, especially in Israel. MBTOC urges Parties to consider review of these regulations in view of the ability of barrier films to reduce dose rates of MB and alternatives and associated emissions. As in the previous round, Parties have found alternatives for propagation materials such as strawberry runners and nurseries more difficult to adopt, however the lack of research studies provided with CUNs has also led to difficulties in assessment as these CUNs do not fully satisfy the requirements of Decision IX/6. The impact of current reviews of VOC emissions in California may also have a major impact on MB use and the use of alternatives in California in future nominations. Registration of key alternatives such as 1,3-D/Pic and fludioxonil in Israel and the recent permits for methyl iodide use in Australia and USA are expected to impact on the number of future nominations, and the basis of several CUNs is expected to become economic rather than technical.

MBTOC also notes that a large proportion of MB has been nominated for uses where regulations or legislation prevent reductions of MB dose e.g. the mandatory use of MB at a specified dose for certified propagation material or bans are imposed on the use of barrier films which can reduce MB dose. Also regulations on alternatives are preventing their uptake for a substantial proportion of the remaining CUNs for preplant soil use. MBTOC urges the Parties to align their local policies and regulations with internationally accepted methodologies and MB alternatives that lie within the Montreal Protocol's goals.

In this round, MBTOC has sometimes suggested quantities of MB for 2008 or 2009 different from those nominated. Grounds used for these changes are given in detail after the relevant CUNs in Table 8. The adjustments follow the standard presumptions given in Tables 6 and 7 below, unless indicated otherwise.

A number of recommendations by MBTOC Soils on CUNs in the 2006 round were not accepted by the 18th MOP, and this led to the full or partial restoration of the original CUN amount requested. As MBTOC in most cases uses the technical information from the previous years CUE as the basis for its calculations of future nominations, it was difficult in this round for MBTOC to make accurate assessment of the US nominations this year as the Party did not provide the technical calculations for adjustments made at the 18th MOP.

5.3 Standard Presumptions Used in Assessment of Nominated Quantities.

The tables below (Tables 6 and 7) provide the standard presumptions applied by MBTOC Soils for this round of CUNs. These standard presumptions were first proposed in the MBTOC report of October 2005 and were presented to the Parties at 17th MOP. The rates and practices adopted by MBTOC as standard presumptions are based on maximum rates considered acceptable by published literature and actual commercial practice. A copy of the actual dosage rate of MB in MB/Pic formulations

is shown in Table 7 below. A revision to these presumptions is proposed for consideration at the 19th MOP (Section 9) to more accurately reflect effective maximum feasible doses with methyl bromide/chloropicrin combinations.

As in the evaluations in previous years, MBTOC considered reductions to quantities of MB in particular nominations to a standard rate per treated area where technical evidence supported its use (See Annex III and IV). MBTOC considered the maximum MB application rate for 98% MB to be either 250 or 350 kg/ha (25 to 35 g/m²), in conjunction with low barrier permeability films (e.g., VIF or equivalent), combined with extended exposure periods. Several Parties indicated that 250 kg/ha (25g/m²) of 98:2 were effectively used in standard commercial application. In cases where use of high chloropicrin-containing mixtures (approximately MB: Pic 67:33 or 50:50 or lower) is considered feasible, maximum dosage rates of 175 kg MB/ha (17.5 g/m²) where nutgrass is the key pest and 150 kg/ha (15 g/m²) for pathogens were used as the maximum standard presumptions unless there was a regulatory or technical reason indicated otherwise by the Party.

As a special case, MBTOC accepted a maximum rate of 200 kg/ ha (20 g/m²) for certified strawberry runner production in the absence of data that showed certification standards could be met in the circumstances of particular nominations. However, several Parties indicated that rates of 200 kg/ha (20g/m²) or less (Annex III) of MB: Pic 50:50 were effective with barrier films for production of ‘certified’ nursery material.

The indicative rates used by MBTOC were maximum guideline rates, for the purpose of calculation only. MBTOC recognises that the actual rate appropriate for a specific use may vary with local circumstances, soil conditions and the target pest situation. Some nominations were based on rates lower than these indicative rates.

Lower effective dose rates of MB in MB/Pic formulations of 125 kg MB/ha (12.5 g/m²) for pathogens and 150 kg MB/ha (15.0 g/m²) are proposed for specific crops (eg. strawberry fruit and vegetables) and 200 kg MB/ha (20.0 g/m²) for nursery crops unless otherwise specified by the Party.

Table 6. Standard presumptions used in assessment of CUNs for the 2007 round – soil treatments.

	Comment	CUN adjustment	Exceptions
1. Dosage rates	Maximum guideline rates for MB:Pic 98:2 25 to 35 g/m ² with barrier films (VIF or equivalent); for MB:Pic 67:33 - 15g or 17.5g MB/m ² for pathogens and nutsedge respectively, under barrier films. All rates on a 'per treated hectare' basis.	Amount adjusted to maximum guideline rates. Maximum rates set dependent on formulation and soil type and film availability.	Higher rates accepted if specified under national legislation or where the Party had justified otherwise.
2. Barrier films	All treatments to be carried out under low permeability barrier film (e.g. VIF)	Nomination reduced proportionately to conform to barrier film use.	Where barrier film prohibited or restricted by legislative or regulatory reasons
3. MB/Pic Formulation: Pathogen control	Unless otherwise specified, MB/Pic 50:50 (or similar) was considered to be the standard effective formulation for pathogen control, as a transitional strategy to replace MB/Pic 98:2.	Nominated amount adjusted for use with MB/Pic 50:50 (or similar).	Where MB/Pic 50:50 is not registered, or chloropicrin (Pic) is not registered
4. MB/Pic Formulation: Weeds/nutgrass control	Unless otherwise specified, MB/Pic 67:33 (or similar) was used as the standard effective formulation for control of resistant (tolerant) weeds, as a transitional strategy to replace MB/Pic 98:2.	Nominated amount adjusted for use with MB/Pic 67:33 (or similar).	Where chloropicrin or chloropicrin-containing mixtures are not registered
5. Strip vs. Broadacre	Fumigation with MB and mixtures to be carried out under strip	Where rates were shown in broadacre hectares, the CUN was adjusted to the MB rate relative to strip treatment (i.e. treated area). If not specified, the area under strip treatment was considered to represent 67% of the total area.	Where strip treatment was not feasible e.g. some protected cultivation or open field production of high health propagative material

Table 7. Actual dosage rates applied during preplant fumigation when different rates and formulations of methyl bromide/chloropicrin mixtures are applied with and without barrier films. Rates of application reflect standard commercial applications rates.

Commercial application rates of formulation	MB/Pic formulation (dose of MB in g/m²)			
	98:2	67:33	50:50	30:70
A. With Standard Polyethylene Films				
400	39.2	26.8	20.0	12.0
350	34.3	23.5	17.5	10.5
300	29.4	20.1	15.0	9.0
B. With Low Permeability Barrier Films (LPBF)				
250	24.5	16.8	12.5	7.5
200	19.6	13.4	10.0*	6.0
175	17.2	11.8	8.8	5.3

* Note: Trials from 1996 to 2007 (Annex III) show that a dosage of 10g/m² (e.g. MB/Pic 50:50 at 200kg/ha with LP Barrier Films) is technically feasible for many situations and equivalent to the standard dosage of >20g/m² using standard films

5.4 Use/Emission Reduction Technologies - Low Permeability Barrier Films and Dosage Reduction

Decision IX/6 states in part that critical uses should be permitted only if ‘all technically and economically feasible steps have been taken to minimise the critical use and any associated emission of methyl bromide’. Decision Ex.II/1 also mentions emission minimization techniques, requesting Parties “...to ensure, wherever methyl bromide is authorized for critical-use exemptions, the use of emission minimization techniques such as virtually impermeable films, barrier film technologies, deep shank injection and/or other techniques that promote environmental protection, whenever technically and economically feasible.”

As in past rounds, MBTOC assessed CUNs where possible for reductions in MB application rates and deployment of MB emission reduction technologies, such as use of LPBF, including VIF, or other appropriate sealing and emission control techniques including deep injection of MB, use of formulations with a lower proportion of MB and/ or reduced frequency of application (Annex III).

The use of low permeability barrier films (VIF or equivalent) is compulsory in the 25 member countries of the European Union (EC Regulation 2037/2000). In other regions LPBF films are considered technically feasible and large adoption has occurred, e.g. Israel and SE USA. In Florida the reported use of barrier films in vegetable crops has expanded from 3000 acres 2005/06 to 30,000 acres in 06/07 (Allen, pers. comm.). The exception to the use of barrier films is the State of California in the US where a regulation currently prevents use of VIF with MB (California Code of Regulations Title 3 Section 6450(e) but not the alternatives. This regulation has been set over concerns of possible worker exposure to MB when the film is removed or when seedlings are planted due to altered flux rates of MB.

5.5 Adjustments for Standard Dosage Rates Using MB/Pic Formulations

One key transitional strategy to reduce MB dosage has been the adoption of MB: Pic formulations with lower concentrations of methyl bromide (e.g. MB:Pic 50:50 or less). These formulations are considered to be equally as effective in controlling soilborne pathogens as formulations containing higher quantities of methyl bromide (e.g. 98:2, 67:33) (e. g. Porter *et al.*, 1997; Melgarejo *et al.*, 2000; Lopez-Aranda *et al.*, 2003; Santos *et al.*, 2007). Formulations containing high proportions of chloropicrin in mixtures with methyl bromide have been adopted widely by non-Article 5 countries to meet Montreal Protocol restrictions where such formulations are registered or otherwise permitted. Their use can be achieved with similar application machinery which allows co-injection of methyl bromide and chloropicrin or by use of premixed formulations. Consistent performance has been demonstrated with both barrier (Annex III and IV) and non barrier films. Parties are urged to consider lower dosage rates, i.e. as low as 75 kg/ha of 30:70 or 100 kg/ha of 50:50 MB/Pic in conjunction with barrier films as these have shown similar effectiveness to rates of 335 to 800 kg/ha of MB 98% using standard polyethylene (Annex IV).

Table 8. Final evaluations of CUNs for preplant soil use submitted in 2007 for 2008 or 2009

Country	Industry	Quantity approved for 2005 (1ExMOP and 16MOP)	Quantity approved for 2006 (16MOP+ 2ExMOP+ 17MOP)	Quantity approved for 2007 (MOP17+MOP18)	Quantity approved for 2008 (MOP18)	Quantity nominated for 2008 (additional or new)	MBTOC recommendation for 2008 (additional or new)	Quantity nominated for 2009 (new)	MBTOC recommendation for 2009 (new)
Australia	Strawberry runners	35.750	37.500	35.750	35.750	None	none	29.790	29.790
<p>MBTOC recommends 29.79 tonnes for this use in 2009. The key pests affecting strawberry runner production are fungi (<i>Phytophthora</i>, <i>Pythium</i>, <i>Rhizoctonia</i>, <i>Verticillium</i>) and weeds (<i>S. arvensis</i>, <i>Agrostis tenuis</i>, <i>Raphanus</i> spp, <i>Poa annua</i>, <i>Cyperus</i> spp). The CUN states that MB/Pic 50:50 at a dose of 50 g/m² is required to meet certification standards. The Party's request exceeds MBTOC's standard presumption of 20 g/m² but this rate is not currently registered. The Party is currently examining the efficacy of a rate of 125 kg/ha (12.5 g/m²) of MB using LDPE films. The Party states that the most promising alternative, 1,3-D/Pic, is reported to have been phytotoxic due to the heavy and wet soil in cold climate growing conditions. The CUN provided recent data from specific local trials which indicated phytotoxicity in runners that resulted in a doubling of the time required before planting compared to MB, problems with weed control and inconsistent results [up to a 30% decrease in runner yields]. Other alternatives tested included MS, dazomet, PIC, steam, hot water and solarization. The Party reported that plug plants are possibly a technically feasible alternative, but that the costs associated with this technology are too high and they result in 10% lower yields than bare-rooted runners. Barrier film (VIF) initially reduced emissions 10-fold when compared with standard LDPE films, but off gassing issues when lifting tarps after 4 days posed a potential risk to workers and bystanders. The Party notes that two currently unregistered alternatives appear promising – methyl iodide and cyanogen, and that methyl iodide has been granted a commercial scale up permit for 2007 to 2009. MBTOC encourages the Party to (1) expedite the use of the MB/Pic 50:50 formulation at 25 g/m² with barrier films and (2) to expedite the registration of the two alternatives as quickly as possible.</p> <p>MBTOC comments on economics: The nomination was not based on economic arguments. Economic statements provided in CUN: The CUN is based on assertion of lack of technically feasible alternatives in circumstances in Australia.</p>									

Country	Industry	Quantity approved for 2005 (1ExMOP and 16MOP)	Quantity approved for 2006 (16MOP+ 2ExMOP+ 17MOP)	Quantity approved for 2007 (MOP17+MOP18)	Quantity approved for 2008 (MOP18)	Quantity nominated for 2008 (additional or new)	MBTOC recommendation for 2008 (additional or new)	Quantity nominated for 2009 (new)	MBTOC recommendation for 2009 (new)
Canada	Strawberry runners (PEI)	6.840	6.840	7.995	7.462			7.462	7.462
<p>MBTOC recommends 7.462 tonnes for this use in 2009. The key pests affecting strawberry runner production are weeds and nematodes. The nomination states that MB/Pic 67:33 at a dose of 500 kg/ha (50 g/m²) is required to meet the certification standards for strawberry runners. MBTOC's standard presumption is 200 kg/ha (20 g/m²) with low permeability barrier films (LPBF) for propagative materials. The Party's request exceeds MBTOC's standard presumption; however, rates that conform to MBTOC's standard presumption are not currently registered and therefore cannot be used commercially to treat soils. The Party has indicated that in order to register the MBTOC recommended rate of 200 kg/ha (20 g/m²) with LPBF, the Pest Management Regulatory Agency would require the cooperation of the registrant and testing to demonstrate that the rate would be effective. The Party has attempted to replace MB with 1,3-D, but 1,3-D was banned in January 2003 due to groundwater contamination. Chloropicrin has recently been provisionally registered in Canada, but has yet to receive a permit from Prince Edward Island. The sector applying for the nomination has not yet trialled this alternative. Nor has the sector trialled low permeability barrier films (LPBF). MBTOC encourages the Party (1) to finalize the permits necessary for use of chloropicrin and dazomet, (2) implement the use of LPBF which are currently used worldwide and (3) in the absence of an effective alternative becoming available, conduct the necessary trials to support a lower application rate of MB to conform with MBTOC's standard presumption.</p> <p>MBTOC comments on economics: The nomination was not based on economic arguments. Economic statements provided in CUN: The nomination provides no economic data. CUN is based on technical feasibility reasons.</p>									
Israel	Broomrape	None	none	250.000		250.000	250.000	250.000	U
<p>2008 CUN: MBTOC recommends 250 tonnes for this use in 2008 and is unable to assess the nomination for 2009. MBTOC acknowledges that the CUE amount granted by the Party was not used or produced for this use in 2007 because of exceptional circumstances and that this amount recommended for 2008 is still required. The use is for broomrape eradication and land rehabilitation of 1000 ha in the Upper Galilee and the Golan Heights. A large area, 5700 ha is severely infested with this parasitic plant making it impossible to produce tomatoes in these regions. The recommended CUE is based on a dose of 250 kg/ha (25 g/m²) of MB:Pic 98:2 using LPBF. MB will be used only once in each region and the treatment is expected to bring the pathogen population below the disease threshold allowing for adoption of other alternatives. The Party has identified some alternatives for controlling low infestations of <i>Orobanche</i> (e.g. sulfosulfuron, solarization) but they are considered not adequate for controlling severe infestations of <i>O. aegyptiaca</i>. Additionally, the Party expects some alternatives (1,3-D/Pic, sequential application of 1,3-D and metham sodium) to be registered and/or available in 2007 or 2008 and these could impact on future nominations. MBTOC acknowledges that a registration for chloropicrin is being considered in Israel and that this would possibly allow for lower dosages of MB to be used for <i>Orobanche</i> in the absence of other effective alternatives.</p> <p>2009 CUN: The nomination for 2009 remains unable to assess as key information about the efficacy of alternatives, especially updated information on alternative fumigants and herbicides may alter the suitability of alternatives for this use.</p>									

Country	Industry	Quantity approved for 2005 (1ExMOP and 16MOP)	Quantity approved for 2006 (16MOP+ 2ExMOP+ 17MOP)	Quantity approved for 2007 (MOP17+MOP18)	Quantity approved for 2008 (MOP18)	Quantity nominated for 2008 (additional or new)	MBTOC recommendation for 2008 (additional or new)	Quantity nominated for 2009 (new)	MBTOC recommendation for 2009 (new)
	<p>MBTOC comments on economics: The nomination was not based on economic arguments. Economic statements provided in CUN: The CUN states that broomrape infestation is aggravated by the phase out of MB, as registered alternatives do not prevent area-wide infestation with the parasitic weed. The same is true for agro technical means, long-term fallow cropping and biological control, which in practice and in economic terms do not cope with the long-term vitality of broomrape seeds and their gradual germination mechanism. CUN also states that prospects for the registration of Imazapic are low and the manufacturer is having doubts about the cost-effectiveness of its registration, might refrain from its further development. Further, soil solarization, usually applied on intensive vegetable crops, is too expensive for extensive outdoor crops.</p>								
Israel	Cucumber – protected	None	none	25.000		18.750	18.750	6.250	U
	<p>2008 CUN: MBTOC recommends 18.750 tonnes for this use in 2008. Cucumbers are grown in open ended polyhouses in 3 cropping cycles per annum in the proximity of the residential houses of cooperative family and private family farms. A large proportion, 70%, of the critical use is concentrated in one village (Achituv), where the growers specialized for years in the cultivation of indoor cucumbers for the domestic market. For two out of the three cropping cycles, solutions were found despite the monoculture production pattern, which reflects the specialization of the growers but narrow rotations enhances the pressure from soil-borne pathogens. Additional reasons for this nomination are the appearance of a new race of a fungus, <i>F. oxysporum f. sp. radialis cucumerinum</i>, and buffer zone limitations on the use of the MS+1,3-D mixtures. The pathogen is highly virulent and the infestation level particularly high in the affected location and it could devastate entire greenhouses in a short period of time. MBTOC requested whether this was a contingency use for this pathogen, but no response has been received by the Party. MBTOC encourages the Party to consider the technical and economical feasibility of non-chemical alternatives (steam, substrates, heat, crop rotation) already in use in many parts of the world for this crop. The nominated amount is based on a dosage of 250 kg/ha (25 g/m²) of 98:2 MB/Pic in conjunction with use/ emission reduction technologies. MBTOC further encourages the Party to revise buffer zone regulations in light of the current generalized use of VIF films. The Party is requested to conduct a thorough review of the technically feasible use and economic cost of low cost substrate systems for future nominations.</p> <p>2009 CUN: The nomination for 2009 remains unable to assess as key information about the cost of cheaper substrate systems and buffer zone impacts may alter the suitability of alternatives for this use.</p> <p>MBTOC comments on economics: The nomination was not based on economic arguments. Economic statements provided in CUN: The CUN states that the costs of grafted seedlings are a limiting factor because the technology in cucumbers is in its infancy in Israel. Furthermore, the CUN states that dazomet is not economically feasible due to its high prices and its low efficacy in the winter in Israel when prevailing soil temperatures are too low for its use.</p>								

Country	Industry	Quantity approved for 2005 (1ExMOP and 16MOP)	Quantity approved for 2006 (16MOP+ 2ExMOP+ 17MOP)	Quantity approved for 2007 (MOP17+MOP18)	Quantity approved for 2008 (MOP18)	Quantity nominated for 2008 (additional or new)	MBTOC recommendation for 2008 (additional or new)	Quantity nominated for 2009 (new)	MBTOC recommendation for 2009 (new)
Israel	Cut flowers - bulbs - protected	303.000	240.000	220.185		163.400	114.450	155.200	U
<p>2008 CUN: MBTOC recommends 114.45 tonnes for this use in 2008. The nomination is for a variety of cut flowers produced under cover, which are mainly affected by weeds (<i>Cyperus</i> in particular) and nematodes (root-knot but also ectoparasites such as <i>Longidorus</i>) and fungi. MBTOC does not recommend the use of 1.8 tonnes for fumigating substrates used in rose production as alternatives such as steam are efficient for this use. MBTOC has adjusted the amount requested for carnations grown in Ghaza to conform to the standard presumptions of 350 kg/ha (35 g/m²) of MB/Pic 98:2. <i>Fusarium oxysporum f.sp. dianthi</i> is the key pest affecting carnations in the Ghaza region. Lack of registration of key alternatives and chloropicrin mixtures continues to be the major factor restricting adoption of alternatives, which have been identified as technically feasible. MBTOC considers that adoption of substrate production is possible for liliium, calla lilies, gerberas and carnations outside the Ghaza area. A 25% transition rate has been applied for adoption of this alternative in the 104 ha grown with these crops. Steam is a technically feasible alternative for other flower types but the Party states that it is economically unfeasible (economic information provided is however insufficient). 1,3-D and metham sodium are also available and a further 25% reduction was applied for phase-in of these alternatives in those flowers not suited for substrate production. MBTOC encourages the Party to seek registration of alternatives that have been identified as promising through research such as 1,3-D/Pic and to explore different steam application methods and equipment which have proven to be economically feasible in other countries. MBTOC requests the Party to submit a new nomination for 2009 as the envisaged registration of key alternatives could impact this nomination.</p> <p>2009 CUN: The nomination for 2009 remains unable to assess as key information about the cost of cheaper substrate systems and buffer zone impacts may alter the suitability of alternatives for this use.</p> <p>MBTOC comments on economics: The nomination was not based on economic arguments. Economic statements provided in CUN: The CUN provides partial budgets for MB and the next best alternatives. The net revenue for the next best alternatives is negative in all cases. CUN also states that soil steaming and solarisation is not cost effective. Some net revenue analysis was reported in 2006 round of CUNs.</p>									
Israel	Cut flowers - open field	77.000	67.000	74.540		53.345	44.750	53.345	U
<p>2008 CUN: MBTOC recommends a reduced amount of 44.75 tonnes for this nomination in 2008. The dose of MB proposed by the Party (250 kg/ha or 25 g/m² of 98:2 formulation) conforms to MBTOC's standard presumptions. The nomination is for open field production of cut flowers which are mainly affected by weeds (<i>Cyperus</i> in particular) and nematodes (root-knot but also ectoparasites such as <i>Longidorus</i>) and fungi. Lack of registration of key alternatives on flowers such as 1,3-D+Pic, dazomet and metham sodium, continue to be the major constraints affecting substitution of MB at this time. MB formulations with higher chloropicrin content are also not registered. However MBTOC estimates that, solarisation, plate steaming, substrates and the few chemical alternatives registered allow for 25% reduction in the amount nominated. This reduction is not applied to the 18.95 t requested for nurseries of geophytes where high health plant material needs to be produced, although no certification issues are involved. MBTOC encourages the Party to seek registration of alternatives identified as suitable through research. MBTOC requests the Party to submit a new nomination for 2009 as possible registration of alternatives could impact this nomination.</p> <p>2009 CUN: The nomination for 2009 remains unable to assess as key information about the cost of cheaper substrate systems and buffer zone impacts may alter the suitability of alternatives for this use.</p>									

Country	Industry	Quantity approved for 2005 (1ExMOP and 16MOP)	Quantity approved for 2006 (16MOP+ 2ExMOP+ 17MOP)	Quantity approved for 2007 (MOP17+MOP18)	Quantity approved for 2008 (MOP18)	Quantity nominated for 2008 (additional or new)	MBTOC recommendation for 2008 (additional or new)	Quantity nominated for 2009 (new)	MBTOC recommendation for 2009 (new)
	MBTOC comments on economics: The nomination was not based on economic arguments. Economic statements provided in CUN: The CUN states that steaming and solarization are not cost effective while the economic assessment refers the reader to the indoor flowers CUN. However the information provided in the CUN 2006 for indoor flowers is insufficient.								
Israel	Melon - protected and field	125.650	99.400	105.000		87.500	87.500	87.500	U
	<p>2008 CUN: MBTOC recommends 87.5 tonnes for this use for 2008 and is unable to assess the nomination for 2009. <i>Monosporascus cannonballus</i> is the key pathogen in the Arava Valley. <i>Fusarium oxysporum</i> f.sp. <i>melonis</i> and root-knot nematodes, mainly <i>M. javanica</i>, also cause problems. The requested amount at a rate of 250 kg/ha (25 g/m²) of 98:2 MB under barrier films (LDPF) complies with MBTOC's standard presumptions. MBTOC notes that alternatives are already used for 100% of the fall melons grown in the Arava valley and including metham sodium, dazomet, solarization, Formaldehyde + metham and 1,3-D/Pic (only in the southern Arava). The CUN is solely for the winter crop as the alternatives do not control the key pathogens and the plant back time is too short. The nominated amount has been reduced by 12% by the Party, with respect to the 2007 amount approved. MBTOC considers alternatives, such as substrates, grafting and the use of formalin + metham to be effective alternatives and notes recent studies which may assist transition to alternatives (Pivonia <i>et al</i> 2002, 2004). MBTOC notes that Pic and MB/Pic mixtures are effectively used for <i>Monosporascus</i> in other countries under similar conditions (eg. Stanghellini <i>et al</i>. 2003; Martyn, 2002). The Party is requested to conduct a thorough review of the technically feasible use and economic cost of low cost substrate systems for future nominations. Information received by MBTOC after the recommendation indicates that a fungicide, with the active ingredient fludioxonil, is used and effective for suppression of vine decline in cantaloupes (the soil-borne fungus <i>Monosporascus cannonballus</i>) and already registered in several countries (US, Canada, Australia, Japan, EU). In 2007 it is being tested for the first year of the two necessary for registration in Israel. Fludioxonil is a broad-spectrum fungicide, and is classified by the US EPA as a "reduced risk pesticide" due to its good toxicological profile. MBTOC expects that in a short term this product would be commercially available for Israeli growers for control of <i>M. cannonballus</i>. The Party is requested to submit information regarding progress in future nominations.</p> <p>2009 CUN: The nomination for 2009 remains unable to assess as key information about the cost of cheaper substrate systems and buffer zone impacts may alter the suitability of alternatives for this use.</p>								
	MBTOC comments on economics: The nomination was not based on economic arguments. Economic statements provided in CUN: The CUN provides partial budgets for the next best alternatives. The net revenue for the next best alternatives is negative.								

Country	Industry	Quantity approved for 2005 (1ExMOP and 16MOP)	Quantity approved for 2006 (16MOP+ 2ExMOP+ 17MOP)	Quantity approved for 2007 (MOP17+MOP18)	Quantity approved for 2008 (MOP18)	Quantity nominated for 2008 (additional or new)	MBTOC recommendation for 2008 (additional or new)	Quantity nominated for 2009 (new)	MBTOC recommendation for 2009 (new)
Israel	Potato	239.000	165.000	137.500		93.750	93.750	75.000	U
<p>2008 CUN: MBTOC recommends 93.75 tonnes of MB for this use in 2008. Potatoes are produced in a small cultivable area of the Sharon and Gaza regions where intensive cropping of groundnuts and potato occur in the same year and infestation with fungal and bacterial pathogens, nematodes, parasitic and perennial weeds take place, some of them common to the two predominant crops: <i>Rhizoctonia solani</i>, <i>Verticillium dahliae</i>, root knot nematodes, mainly <i>Meloidogyne javanica</i>, common scab (<i>Streptomyces scabies</i>), deep scab- (<i>Streptomyces</i> spp.), powdery scab (<i>Spongospora subterranea</i>), <i>Orobanch</i> spp. and nutsedge. Volunteer potato plants in the succeeding crop may carry PVY type viruses. The Party has made a 31.8% reduction with respect to the amount approved by the MOP for 2007. The dosage rate of 250 kg/ha (25 g/m²) of MB 98:2 conforms to MBTOC's standard presumptions. The nomination however is for both seed potatoes subjected to high health standards and regular crop production which is normally achieved without MB worldwide in locations where all the pest complexes exist. The applicant identified that 550 of 15,000 ha are located in highly populated areas where winter production occurs, pathogens are high, and regulatory constraints are in place for feasible alternatives such as 1,3 D + Pic (61:35) which as a result of buffer zones prohibit their use. The party indicates that effective control alternatives are in development for the pest complexes and that they are transitioning to these. The CUN indicates that new technologies are allowing increased use of alternatives such as metham sodium and formaldehyde. MBTOC notes that there are effective alternatives but that their use is affected by buffer zones, which are larger than in other countries (for 1,3-D stated as 250m compared to 31m in USA for example). MBTOC urges the Party to consider review of these buffers in the light of use with barrier films. The continuing reduction of requested amounts of methyl bromide is an indication that this strategy is successful.</p> <p>2009 CUN: The nomination for 2009 remains unable to assess as key information about the cost of cheaper substrate systems and buffer zone impacts may alter the suitability of alternatives for this use.</p> <p>MBTOC comments on economics: The nomination was not based on economic arguments. Economic statements provided in CUN: The CUN provides no economic analysis</p>									
Israel	Strawberry fruit – protected (Sharon and Ghaza)	196.000	196.000	93.000	none	64.125 + 71.250 for Ghaza	57 + 48.96 for Ghaza	57.000 + 67.500 for Ghaza	U
<p>2008 CUN: MBTOC recommends a reduced CUE of 57 tonnes for Sharon and 48.96 tonnes for Ghaza, totalling 105.96 tonnes for 2008. MBTOC has adjusted the nomination to the Sharon nomination for 20% adoption of 1,3-D/Pic and the Ghaza nomination to conform to rates used with barrier films but has not adjusted this part of the nomination for adoption of alternatives in 2008. The Party states that buffer zones restrict the use of alternatives, especially that of a key alternative, 1,3-D/Pic. MBTOC, however, considers low cost substrates to be a potential alternative and urges the Party to consider the feasibility of open field substrate systems for future nominations. Detailed economic information on the suitability of such systems is required. MBTOC urges the Party to consider registration of other alternatives to MB as well as other formulations of MB/Pic (e.g. 67:33 and 50:50) to assist further reductions in the use of MB. To date, the Party has not provided information, as required under Decision IX/6,1(b)(iii), to demonstrate that an appropriate effort is being made to evaluate and commercialise alternatives, and that research programmes are in place to develop and deploy alternatives. The CUN points out that relatively little work has been</p>									

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		<p>done on alternatives since about 2004, and 1,3-D/Pic is the only alternative fumigant that has been registered to date. The national management strategy does not present relevant plans to develop and deploy alternatives in strawberry fruit. MBTOC requests the Party to provide information about plans for transitioning to alternatives, including plans for alternative chemicals, low-cost substrates, combinations of resistant cultivars, registered nematicides and fungicides, cultural practices or other relevant techniques. The key pests affecting strawberry fruit in Israel are fungi (<i>Rhizoctonia solani</i>, <i>Colletotrichum acutatum</i>, <i>Macrophomina phaseolina</i>, <i>Verticillium dahliae</i>, <i>Fusarium</i> spp.), nematodes (<i>Meloidogyne hapla</i>), and weeds (<i>Cyperus rotundus</i>, purple nutsedge). The CUN states that 1,3-D/Pic is effective and used on part of the crop but further adoption is limited to 20% of the Sharon area and 0% in Ghaza due to buffer zones. However, the estimated impact of buffer zones has not been substantiated by any quantitative data to date for Sharon, despite being requested. MBTOC considers that soilless systems are a possible, technically-feasible alternative (López-Medina <i>et al.</i>, 2004; Lieten, 2004; Savvas and Passam, 2002; Mutitu <i>et al.</i>, 2006). Substrates have been used on a small area in this CUN, but the Party states that further uptake is limited by cost. MBTOC is requesting information on the economics of low-cost substrate systems and current MB prices. MBTOC encourages the applicant to consider evaluation and adoption of low-cost substrate systems which are used in similar circumstances in other regions, including warm climates (Mutitu <i>et al.</i> 2006; Vos and Bridge, 2006; MBTOC, 2007; Sonneveld, 2004; Lieten, 2004). Substrates have been adopted at the rate of up to 80 ha/year for protected strawberry in Mediterranean climates in several EC countries (EC 2006). MBTOC has not adjusted this nomination for 2008 for adoption of substrates due to economic uncertainty associated with low cost substrates but urges the Part to consider the feasibility of open field substrate systems for future nominations. MBTOC has reduced the MB dose on the Ghaza nomination to conform to standard presumptions for 100% adoption of VIF and the Sharon nomination for 20% adoption of 1,3-D/Pic. MBTOC recommends that the Party register other alternatives to MB as well as other formulations of MB/PIC (e.g. 67:33 and 50:50).</p> <p>2009 CUN: The nomination for 2009 remains unable to assess as key information about the cost of cheaper substrate systems and buffer zone impacts may alter the suitability of alternatives for this use.</p> <p>MBTOC comments on economics: The nomination was not based on economic arguments. Economic statements provided in CUN: CUN shows that the net revenue using MB is lower than for the alternatives. Dazomet and 1,3 D/pic provided net revenues that were 70% and 53% higher than MB at 2005 prices. CUN states that the registered chemical alternatives carry environmental costs [although this also applies to MB]. CUN also states that soilless cultures are a possibility, but not before 2010 due to the high costs of the capital-intensive versions considered in the CUN</p>							

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Israel	Strawberry runners (Sharon and Ghaza)	None	none	0.000		36.625	31.900	35.75	U
<p>CUN 2008: MBTOC recommends a reduced CUE of 31.9 tonnes for 2008 (11.9 t for Ghaza Strip and 20 t for Sharon, Israel). The key pests affecting strawberry runner production are fungi (<i>Rhizotonia solani</i>, <i>Verticillium dahliae</i>, <i>Fusarium</i>, <i>Phytophthora</i>, <i>Sclerotinia sclerotiorum</i>, <i>Macrophomina phaseolina</i>), root knot nematodes and purple nutsedge. The Party stated that MB 98:2 at a rate of 500 kg/ha (50 g/m²) with PE and 250 kg/ha (25 g/m²) with barrier films are necessary to meet certification standards. The requested amount for the Ghaza region has been adjusted to MBTOC's standard presumption of 35 g/m² for 98:2 MB. The Party stated that 1,3-D + PIC mixture has been the leading alternative; however, adoption of this alternative is limited by the required 250 m buffer which significantly limits its use in the Sharon strawberry nursery growing area which is heavily populated. Hot gas application method is used in the Ghaza Strip growing area because the plots are small, adjacent to houses and there are no injection tools or qualified applicators in the area. 10% of the treated area in the Ghaza strip will be tested with barrier films with a reduced application rate. MBTOC encourages faster adoption of LPBF in the Ghaza Strip. 100% of the treated area in Sharon uses barrier films (VIF).</p> <p>2009 CUN: The nomination for 2009 remains unable to assess as key information about the cost of cheaper substrate systems and buffer zone impacts may alter the suitability of alternatives for this use.</p> <p>MBTOC comments on economics: The nomination was not based on economic arguments. Economic statements provided in CUN: This CUN is based in regulatory restrictions and lack of technically feasible alternatives.</p>									
Israel	Sweet Potatoes	None	none	None		111.5	111.5	61.25	U
<p>2008 CUN: MBTOC recommends 111.5 tonnes of MB for 2008. This is a new nomination comprising both seed potato requiring high health and regular crop production. The key pests affecting sweet potatoes are root-knot nematodes, sweet potato scab (<i>Streptomyces ipomoea</i>) and <i>Pythium</i> spp. The applicant identified that MB is the only registered chemical for use for sweet potato production in Israel. The rates to be used in the CUN are consistent with MBTOC's standard presumptions under VIF. The party indicates that the only effective control alternative to MB is 1,3-D/Pic (Telopic) but this product is not currently registered for sweet potato. It is expected to receive registration by 2008. The applicant indicates that a 50% transition to this alternative by 2009 is possible and MBTOC recognizes that this is an effective rate of uptake of an alternative. MBTOC notes there are numerous nematode resistant varieties of sweet potato available and these are widely used in countries where nematodes are the primary pest problem (Bello A., pers. comm.). MBTOC suggests that the applicability of these varieties in Israel be investigated.</p> <p>2009 CUN: The nomination for 2009 remains unable to assess as key information about the cost of cheaper substrate systems and buffer zone impacts may alter the suitability of alternatives for this use.</p> <p>MBTOC comments on economics: The nomination was not based on economic arguments. Economic statements provided in CUN: Trial data shows that there may be economically feasible alternatives but these need to be verified.</p>									

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Japan	Cucumber	88.300	88.800	72.400	51.450	none	none	61.400	34.30
<p>MBTOC recommends a reduced amount of 34.30 tonnes for 2009. The recommended quantity represents a 33% reduction from the CUE amount for 2008 approved at the 18th MOP. MBTOC has considered this nomination, which is based on the need to control particular viruses of cucumber, since 2005. Globally, such viruses are not considered as soilborne pathogens but can survive in crop debris for several years. The problem mainly arises from continuous monoculture. An integrated program including cultural practices e.g. sanitation, rotation with a non-host, removal and destruction of crop debris, cleaning and sanitation of the greenhouse and the surrounded area, and pathogen free seeds has proven very effective in similar situations around the world. The Party has indicated that rotation to non-susceptible hosts such as tomatoes and strawberries is an effective way to reduce virus incidence (Matsuo and Suga, 1993). As a transition strategy, MBTOC urges the Party to increase adoption of LPBF which allow for reducing MB doses by up to 50%. Since the last nomination the 1,3-D/Pic mixture has become registered, however, farmers fear possible phytotoxicity. MBTOC thus urges the Party to conduct trials on the correct use of this mixture in some cucumber production. MBTOC recognises the unique farming system used for cucumber in Japan which has been in place for many years. However, in many countries cucumber production has already shifted to substrates in greenhouse conditions and has become the most widely used technique for eliminating a wide array of soilborne plant pathogens. Inexpensive and simple systems (buckets, bags, etc.) are available for this kind of production and are widely used in around the world. (Leoni & Ledda, 2004; Budai, 2002; Savvas and Passam 2002; Akkaya & Ozkan, 2004; Engindeniz, 2004). The Party is encouraged to consider substrate production, which implemented correctly can produce higher yields than MB (MBTOC, 2002, 2006; Batchelor 2000, 2002; Savvas and Passam 2002). Studies conducted in Japan support soilless culture as a feasible option (Fukuda and Anami 2002, Sakuma and Suzuki 1995). MBTOC notes however that even when growing in substrates there is a critical need for a high degree of sanitation and for the use of pathogen free transplants. Large numbers of growers can be trained to use substrates systems in a short period of time as experienced in many MLF projects (UNEP/TEAP, 2004). The CUN states that the Aichi Agricultural Research Centre (2005) identified the effectiveness of KGMMV control by methyl iodide in pot tests. MBTOC encourages the Party to continue to pursue the registration of methyl iodide for soil uses (methyl iodide was registered for imported timber in Japan in 2004, under JMAFF registration No. 21407).</p> <p>MBTOC comments on economics: The nomination was not based on economic arguments. Economic statements provided in CUN: The economic evidence provided shows a reduction in net revenue of more than 90% in capital-intensive soilless systems. As a result capital-intensive soilless culture systems are not economically feasible.</p>									

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Japan	Ginger (field)	119.400	119.400	109.701	84.075			102.200	63.056
<p>MBTOC recommends 63.056 tonnes for this use in 2009. The recommended amount has been reduced 25% from the CUE approved amount for 2008 at the 18th MOP in 2008 as alternatives are considered available. The nomination is for control of <i>Pythium</i> spp. (<i>Pythium ultimum</i> var. <i>ultimum</i>, <i>Pythium zingiberium</i>) in ginger fields using MB (98:2) applied from small cans. This nomination has been submitted several times with no change in production and cultural practices to minimize disease. MBTOC conducted a field visit to Japanese open field ginger production sites in August 2006 and recognized the difficulties that growers have in adopting some alternatives, however dazomet is considered an effective alternative which is economically feasible. Difficulties in applying dazomet occur during wet and cold weather, which sometimes cause phytotoxicity, unacceptable plant back times and reduced crop yields. Chloropicrin is registered in Japan but the Party states that the plant back time for chloropicrin is 40 days which could disrupt crop scheduling and result in delays in planting and lower yields compared to MB treatment. MBTOC urges the Party to encourage adoption of LPBF films and MB formulations with a higher proportion of pic, which would allow for reduced rates of MB. Further, metham sodium and dazomet can be used more efficiently if drip irrigation is adopted. The Party indicates that metalaxyl combined with dazomet is highly effective for managing <i>Pythium</i> diseases but does not refer to cultural practices such as soil drainage, sowing date, organic amendments (Smith et al 1988) or fungicides specific to Oomycetes, such as phosphonates. MBTOC kindly requests that updated information relating to trials with alternatives and a detailed prospect for relevant fumigant\pesticide registration during 2007-2009 are submitted with any future nominations.</p> <p>MBTOC comments on economics: The nomination was not based on economic arguments. Economic statements provided in CUN: The CUN states that the net revenue for the next best alternative (dazomet) is negative, because of a 58% decline in yield. As a result dazomet is not economically feasible.</p>									
Japan	Ginger (protected)	22.900	22.900	14.471	11.100			12.900	8.325
<p>MBTOC recommends 9.675 tonnes for this use in 2009. The recommended amount has been reduced 25% from the CUE approved amount for 2008 at the 18th MOP as alternatives are considered available. The nomination is for control of <i>Pythium</i> spp. (<i>Pythium ultimum</i> var. <i>ultimum</i>, <i>Pythium zingiberium</i>) in ginger fields using MB (98:2) applied from small cans. This nomination has been submitted several times with no change in production and cultural practices to minimize disease. MBTOC conducted a field visit to Japanese open field ginger production sites in August 2006 and recognized the difficulties that growers have in adopting some alternatives, however dazomet is considered an effective alternative which is economically feasible. Under protected production conditions, difficulties arising with dazomet during wet, cold conditions can be overcome as moisture and temperature can be controlled in protected environments. This would make plant back times more reasonable. MBTOC therefore considers that protected ginger can implement the use of dazomet much more quickly. Chloropicrin is registered in Japan but the Party states that the plant back time for chloropicrin is 40 days which could disrupt crop scheduling and result in delays in planting and lower yields compared to MB treatment. MBTOC urges the Party to encourage adoption of LPBF films and MB formulations with a higher proportion of Pic that allow for reduced rates of MB. The CUN states that metalaxyl does not control <i>Pythium</i> efficiently as resistant strains to this fungicide have been reported. The Party indicates that metalaxyl combined with dazomet is highly effective for managing <i>Pythium</i> diseases but does not refer to cultural practices such as soil drainage, sowing date, organic amendments (Smith et al 1988) or fungicides specific to Oomycetes, such as phosphonates. MBTOC kindly requests that updated information relating to trials with alternatives and a detailed prospect for relevant fumigant\pesticide registration during 2007-2009 are submitted with future nominations.</p>									

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	MBTOC comments on economics 2007: The nomination was not based on economic arguments. Economic statements provided in CUN: The CUN states that the net revenue for the next best alternative (Hot water treatment) is positive but 75% less than the net revenue for MB. As a result hot water treatment is not economically feasible.								
Japan	Melon	194.100	203.900	182.200	136.650			168.000	91.1
	<p>MBTOC recommends a reduced amount of 91.1 tonnes for 2009. The recommended quantity represents a 33% reduction from the CUE approved amount for 2008 at the 18th MOP as alternatives are considered available. MBTOC has considered this nomination, which is based on the need to control a particular virus of melon, since 2005. Globally, such viruses are not considered as soilborne pathogens but can survive in crop debris for several years. The problem mainly arises from continuous monoculture. An integrated program including cultural practices e.g. sanitation, rotation with a non-host, removal and destruction of crop debris, cleaning and sanitation of the greenhouse and the surrounded area, and pathogen free seeds has proven very effective in similar situations around the world. The Party has indicated that rotation to non-susceptible hosts such as tomatoes and strawberries is an effective way to reduce virus incidence (Matsuo and Suga, 1993). MBTOC urges the Party to increase adoption of LPBF which allow for reducing MB doses by up to 50%. Since the last nomination the 1,3-D/Pic mixture has become registered, however, farmers fear possible phytotoxicity. MBTOC thus urges the Party to conduct demonstration trials on the correct use of this mixture in melon production. MBTOC recognises the unique farming system used for melon in Japan which has been in place for many years. However, in many countries some melon production has already shifted to substrates in greenhouse conditions and has become the most widely used technique for eliminating a wide array of soilborne plant pathogens. Inexpensive and simple systems (buckets, bags, etc.) are available for this kind of production and are widely used in around the world. (Leoni and Ledda, 2004; Budai, 2002; Savvas and Passam 2002; Akkaya & Ozkan, 2004; Engindeniz, 2004). Substrate production, when implemented correctly can produce higher yields than MB (MBTOC, 2002, 2006; Batchelor 2000, 2002; Savvas and Passam 2002). Studies conducted in Japan support soilless culture as a feasible option (Fukuda and Anami 2002, Sakuma and Suzuki 1995). MBTOC notes however that even when growing in substrates there is a critical need for a high degree of sanitation and for the use of pathogen free transplants. Large numbers of growers can be trained to use substrates systems in a short period of time as experienced in many MLF projects (UNEP/TEAP, 2004).</p> <p>MBTOC comments on economics: The nomination was not based on economic arguments. Economic statements provided in CUN: The economic evidence provided states that resistant varieties (used alone) result in a 70% decrease in net revenue. The yield of the soilless culture is higher, however the unit price of the product is lower because of problems of appearance and uniformity of the fruit. As a result the gross income for this system of soilless culture is lower. In addition costs of capital-intensive soilless culture are higher hence net income is lower. As a result resistant varieties and capital-intensive soilless culture are not economically feasible.</p>								

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Japan	Pepper (green & hot)	187.200	190.700	156.700	121.723			134.400 (including 0.010 t for research)	81.149 Includes 0.010 for research
<p>MBTOC recommends a reduced amount of 81.149 tonnes for 2009. The recommended quantity represents a 33% reduction from the CUE approved amount for 2008 at the 18th MOP as alternatives are considered available. MBTOC has considered this nomination, which is based on the need to control particular viruses of peppers, since 2005. Globally, such viruses are not considered as soilborne pathogens but can survive in crop debris for several years. The problem mainly arises from continuous monoculture. An integrated program including cultural practices e.g. sanitation, rotation with a non-host, removal and destruction of crop debris, cleaning and sanitation of the greenhouse and the surrounded area, and pathogen free seeds has proven very effective in similar situations around the world. The Party has indicated that rotation to non-susceptible hosts such as tomatoes and strawberries is an effective way to reduce virus incidence (Matsuo and Suga, 1993). MBTOC urges the Party to increase adoption of LPBF which allow for reducing MB doses by up to 50%. Since the last nomination the 1,3-D/Pic mixture has become registered, however, farmers fear possible phytotoxicity. MBTOC thus urges the Party to conduct demonstration trials on the correct use of this mixture in pepper production. MBTOC recognises the unique farming system used for peppers in Japan which has been in place for many years. However, in many countries some pepper production has already shifted to substrates in greenhouse conditions and has become the most widely used technique for eliminating a wide array of soilborne plant pathogens. Inexpensive and simple systems (buckets, bags, etc.) are available for this kind of production and are widely used in around the world. (Leoni and Ledda, 2004; Budai, 2002; Savvas and Passam 2002; Akkaya & Ozkan, 2004; Engindeniz, 2004). Substrate production, when implemented correctly can produce higher yields than MB (MBTOC, 2002, 2006; Batchelor 2000, 2002; Savvas and Passam 2002). Studies conducted in Japan support soilless culture as a feasible option (Fukuda and Anami 2002, Sakuma and Suzuki 1995). MBTOC notes however that even when growing in substrates there is a critical need for a high degree of sanitation and for the use of pathogen free transplants. Large numbers of growers can be trained to use substrates systems in a short period of time as experienced in many MLF projects (UNEP/TEAP, 2004)</p> <p>MBTOC comments on economics: The nomination was not based on economic arguments. Economic statements provided in CUN: The economic evidence provided shows that the higher cost of soilless culture is largely due to the higher cost of seeds, fertilizers, depreciation and miscellaneous, and is only partly offset by lower costs of pesticides and insurance in capital-intensive systems. Given these data, the net revenue for capital-intensive soilless culture is negative and hence is not economically feasible.</p>									

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Japan	Watermelon	129.000	98.900	94.200	32.475			23.700	21.65
<p>MBTOC recommends a reduced amount of 21.65 tonnes for 2009. The nomination has been reduced over the CUE amount accepted by Parties at the 18 MOP. MBTOC acknowledges that the Party has made a substantial reduction since the previous nomination and this reflects a marked transition to alternatives. The nomination is based on the need to control particular viruses of watermelon, since 2005. Globally, such viruses are not considered as soilborne pathogens but can survive in crop debris for several years. The problem mainly arises from continuous monoculture. An integrated program including cultural practices e.g. sanitation, rotation with a non-host, removal and destruction of crop debris, cleaning and sanitation of the greenhouse and the surrounded area, and pathogen free seeds has proven very effective in similar situations around the world. The Party has indicated that rotation to non-susceptible hosts such as tomatoes and strawberries is an effective way to reduce virus incidence (Matsuo and Suga, 1993). MBTOC urges the Party to increase adoption of LPBF which allow for reducing MB doses by up to 50%. Since the last nomination the 1,3-D/pic mixture has become registered, however, farmers fear possible phytotoxicity. MBTOC thus urges the Party to conduct trials on the correct use of this mixture in watermelon production. MBTOC recognises the unique farming system used for cucumber in Japan which has been in place for many years. However, in many countries watermelon production has already shifted to substrates in greenhouse conditions and has become the most widely used technique for eliminating a wide array of soilborne plant pathogens. Inexpensive and simple systems (buckets, bags, etc.) are available for this kind of production and are widely used in around the world. (Leoni & Ledda, 2004; Budai, 2002; Savvas and Passam 2002; Akkaya & Ozkan, 2004; Engindeniz, 2004). Substrate production, when implemented correctly can produce higher yields than MB (MBTOC, 2002, 2006; Batchelor 2000, 2002; Savvas and Passam 2002). Studies conducted in Japan support soilless culture as a feasible option (Fukuda and Anami 2002). Sakuma and Suzuki 1995). MBTOC notes however that even when growing in substrates there is a critical need for a high degree of sanitation and for the use of pathogen free transplants. Large numbers of growers can be trained to use substrates systems in a short period of time as experienced in many MLF projects (UNEP/TEAP, 2004)</p> <p>MBTOC comments on economics: The nomination was not based on economic arguments. The economic evidence provided shows a reduction in net revenue of more than 50%. As a result soilless culture is not economically feasible.</p>									

Country	Industry	Quantity approved for 2005 (1ExMOP and 16MOP)	Quantity approved for 2006 (16MOP+ 2ExMOP+ 17MOP)	Quantity approved for 2007 (MOP17+MOP18)	Quantity approved for 2008 (MOP18)	Quantity nominated for 2008 (additional or new)	MBTOC recommendation for 2008 (additional or new)	Quantity nominated for 2009 (new)	MBTOC recommendation for 2009 (new)
Poland	Strawberry runners	40.000	40.000	24.500		12.000	11.995		
<p>MBTOC recommends a reduced amount of 11.995 tonnes for this nomination in 2008. The key pests affecting strawberry runner production are fungi (<i>Verticillium dahliae</i>, <i>Phytophthora cactorum</i>, <i>P. fragariae</i>, <i>Fusarium oxysporum</i>), and nematodes (<i>Globodera rostochiensis</i>). The nomination states that a dosage of 98:2 MB of 400 kg/ha with barrier films are needed to meet the certification standards for strawberry runners. The Party's CUN for 2008 is less than 50% of what MBTOC recommended for 2007 (24.5 t). The requested amount has been adjusted to account for the Party's inclusion of the entire amount of the formulation in their nomination instead of the MB portion only (392 kg/ha (39.2 g/m²)). The Party's request exceeds MBTOC's standard presumption of 20 g/m² MB for propagation materials, however formulations enabling the use of these rates are currently not registered. The Party tested a reduced rate [MB/Pic 300 kg/ha (30 g/m²) under VIF], but results indicated that plant vigour, productivity and weed control were too low in the low soil temperatures prevailing during autumn fumigation. Potentially effective alternatives such as 1,3-D & Pic and Pic alone are not currently registered. While dazomet and metham sodium are registered, their slow decomposition and long plant back time in the early spring has precluded expanded use due to production timing using currently available application equipment. Poland has recently acquired (July 2006) improved application equipment such as rotary spader machines which enhance efficiency of metham sodium and dazomet (Runia and Molendijk, 2006; Runia <i>et al.</i> 2007). MBTOC encourages the Party to expedite the adoption of this new application equipment and encourage the registration of Pic and other fumigants if needed.</p> <p>MBTOC comments on economics 2007: The nomination was not based on economic arguments. Economic statements provided in CUN: The Economic Analysis (page 17-18) shows 11 percent yield loss with dazomet and 80 percent loss with metham sodium when applied by traditional methods. The revenue analysis shows net revenue decrease of 54% in year 1, then 10% loss in year 2, and an increase of 7 % over MB in year 3. The increases in net revenue are due to adverse weather conditions in the first year, and is expected that Dazomet will be economically feasible in 3 years.</p>									

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Spain	Cut flowers (Andalucia and Catalonia)	53 + 20	42 + 15	43.490		17.000	17.000			
		<p>MBTOC recommends 17 tonnes for this use in 2008 (12t for Andalusia and 5t for Catalonia). This request represents a 60% reduction over the amount approved for 2007. The key pests are weeds, particularly <i>Cyperus</i> spp., nematodes such as <i>Meloidogyne</i> spp. and in the case of carnations which make up an important proportion of the nomination, <i>Fusarium oxysporum</i> f.sp. <i>dianthi</i>. The Party states that in spite of longer plantback times being necessary when using 1,3-D/Pic and other difficulties encountered when using alternatives (e.g. higher costs and technical requirements when using substrates), full phaseout of MB will be achieved by the end of 2008.</p>								
		<p>MBTOC comments on economics: The nomination was not based on economic arguments. Economic statements provided in CUN: CUN states that 1,3-D, presents economic disadvantages because of the longer waiting period, longer application period and changes required in drip irrigation systems to prevent corrosion, while 1,3-D + Chloropicrin leads to a loss of yield and steam has economic disadvantages. CUN argues that capital-intensive substrates are not economically feasible because of the cost. CUN states that substrates require high investment and increases the costs of the crop. Adoption needs a gradual process of farm modernization, and is expensive. CUN cites data that show that an investment of 270,455 € is necessary on an area of 5,000 m², and the enterprise is unprofitable for the first five years. CUN also states that the transformation cost for the industry in Catalonia is estimated at more than 108 million € if they adopted capital-intensive soilless systems.</p>								
Spain	Strawberry runners	230.000	230.000	230.000		215.000	215.000			
		<p>MBTOC recommends 215 tonnes for this use in 2008. The key pests affecting strawberry runner production are fungi (<i>Phytophthora</i>, <i>Rhizoctonia</i>, <i>Verticillium</i>) and weeds (<i>Chenopodium</i>, <i>Portulacca oleracea</i>, <i>Senecio</i>, <i>Solanum</i>, <i>Cynodon dactylon</i>). The Party states that MB (MB: Pic 50:50 at a dose of 300 kg/ha (30 g/m²)) is required to meet the EU Nursery Plant Certification and Control Regulations. The cold climate growing conditions of high elevation nurseries in Spain substantially limit the feasibility of alternatives (1,3-D/PIC, dazomet, MS, DMDS) to control target pests in order to meet certification standards. The Party claims that there is no technically feasible alternative available at this time. The Party's strategy to minimize MB use is to implement a stepwise reduction program. MBTOC encourages the Party to expedite the next steps in their application rate reduction program using lower MB/Pic application rates and lower MB ratio in the formulation in conjunction with LPBF and continue to pursue the registration of additional alternatives.</p>								
		<p>MBTOC comments on economics: The nomination was not based on economic arguments. Economic statements provided in CUN: The CUN provides data on the costs and net revenue of alternatives to MB, but not that of MB itself. CUN states that yields of alternatives are 14% to 16.7% lower.</p>								

Country	Industry	Quantity approved for 2005 (1ExMOP and 16MOP)	Quantity approved for 2006 (16MOP+ 2ExMOP+ 17MOP)	Quantity approved for 2007 (MOP17+MOP18)	Quantity approved for 2008 (MOP18)	Quantity nominated for 2008 (additional or new)	MBTOC recommendation for 2008 (additional or new)	Quantity nominated for 2009 (new)	MBTOC recommendation for 2009 (new)
Spain	Strawberry and Pepper	None	none	0.080	0.080	0.151	0.151		
	<p>MBTOC recommends 0.151 tonnes for research purposes in 2008. The CUN states that MB is needed as the reference treatment in the MB Alternatives National Project. In particular, studies on the environmental effects of some fumigants applied to soils are being conducted in Spain. Spain has not submitted requests for MB for pepper and strawberry fruit production in 2008. The 29.6 kg are specifically requested for strawberry research trials, 70.56 kg for pepper research trials and 50 kg will be used in studying the environmental effects of chemical soil fumigants in soil (strawberry cultivation). These trials are part of a new triennial project to optimise use and adoption of alternatives to MB in strawberries and pepper that was approved by the party last year for the period 2006-2008.</p>								
	<p>MBTOC comments on economics: The nomination was not based on economic arguments. Economic statements provided in CUN: The CUN provides no economic information, as it does not apply to the particular nature of the nomination.</p>								
United States	Cucurbits	1187.800	747.839	592.891	486.757			411.765 Includes 0.941 t for research)	407.091 t (Includes 0.941 t for research)
	<p>MBTOC recommends a reduced amount of 407.091 tonnes for this use in 2009. This comprises 22.5 tonnes for Michigan, a reduced amount of 4.55 tonnes for Maryland and Delaware, 239.8 tonnes for the South East cucurbits, 28.6 tonnes for Georgia squash, 21.9 tonnes for Georgia cucumbers and 88.8 tonnes for Georgia melons and 0.941 t for research. MBTOC does not recommend 4.55 tonnes of MB for watermelons in Maryland and Delaware as technical alternatives exist (e.g. grafting and resistant varieties). This request is 75 tonnes less than the amount nominated for 2008 and indicates the Party's effort to phase out MB for this industry. The nominated amounts conform to the standard presumptions for dosage rate of MB/Pic formulations of 17.5 g/m² for nutsedge and 15 g/m² for pathogens with adoption of LPBF and formulation changes of MB/Pic to achieve the reductions. The Party was requested to disaggregate this nomination by major types of cucurbits comprised (i.e. melons, watermelons), submitting specific information for each. MBTOC notes the effort of the Party in gathering detailed information and understands that "not every state/cucurbit type variety could be disaggregated, because there is limited information available to the USA. However, for MBTOC it is really difficult to understand and assess the specific circumstances that prevent the use of MB alternatives when separate data is not provided. Some of the cucurbits which are included in the nomination, e.g. <i>Cucurbita maxima</i>, have recognized alternatives that are used in other countries and even in the US. The Party is urged to further adopt grafting for commercial use in melon and watermelon. If future CUNs are submitted, MBTOC urges the Party to disaggregate the various cucurbits with reference to their key pest and limitation to the adoption of MB alternatives.</p> <p>In Michigan, the key pests are <i>Phytophthora capsici</i> and <i>Fusarium</i>. MBTOC recognizes the Party's statement that 1,3-D + Pic may be an effective alternative but growers will miss the optimal market window due to longer plant back times. According to the Party, this treatment cannot be applied in autumn because of the bad climatic conditions. In addition, a fall application of fumigant alternatives is not feasible because, over the fall and winter months deer and other animals damage the plastic and irrigation tape. In SE and Georgia, the key pest is nutsedge. Karst topography limits affects the use of alternatives, which include 1,3-D, which are the best alternatives for these pests. The Party states that metham sodium or metham potassium are also promising alternatives but still do not provide consistent control under the circumstances of the nomination and require further trialing. In addition, the Party states that trials are underway to investigate lower MB/Pic formulations such as 50:50 as there are no regulatory restrictions to the use of these formulations. Since the key pest in the SE and Georgia is nutsedge, in future nominations the Party is requested to provide up to date from recent trials of fumigants and herbicides trialed for nutsedge control for each specific crop included in the nomination to indicate that an effort is being made to uptake and commercialise alternatives as required in Decision IX/6.</p>								

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	<p>MBTOC comments on economics: Part of the nomination for Michigan, Maryland and Delaware were based on economic arguments. Economic statements provided in CUN: The CUN states next best alternative in all regions is 1,3-D with chloropicrin with expected yield losses of 6 percent in Michigan, Maryland and Delaware and 29 percent in Southeastern States and Georgia. CUN states 1,3-D with chloropicrin is considered technically feasible in Michigan. However, CUN noted that for Michigan in addition to the yield loss, delayed planting and harvest with the alternatives results in lower average price received from missed market windows and negative net revenue. In remaining regions yield losses significantly reduce net revenues. In Maryland and Delaware, 1,3-D with chloropicrin is considered technically feasible but use is constrained by water table concerns, land low soil temperatures leading to reduced yields and missed market windows. CUN notes other regions may also experience lower prices because of missed market windows.</p>								
United States	Eggplant (field)	76.712	81.162	85.363	66.018			62.789 (Includes 0.433 t for research)	48.691 (Includes 0.433 t for research)
	<p>MBTOC recommends 48.691 tonnes for this use in Georgia, Florida and Michigan in 2009 which includes 0.433 tonnes for research. The Party has stated that it based its nomination on MBTOCs standard maximum dosage rates of MB/Pic formulations of 175 kg/ha (17.5 g/m²) for nutsedge and 150 kg/ha (15 g/m²) for pathogens with adoption of LPBF and also made an adjustment for strip fumigation based on 0.58 of the area treated. The Party states that registration of a key alternative (eg. methyl iodide) is pending. In Michigan, the key pests are <i>Phytophthora capsici</i> and <i>fusarium</i>. According to the Party, <i>P.capsici</i> has been found in the irrigation water in Michigan and occurred after soil treatment with Telone C35 and metham sodium, however MBTOC considers reinfestation can occur with any fumigants, including methyl bromide. MBTOC recognizes the Party's statement that 1,3-D/chloropicrin may be an effective alternative, but growers will miss the optimal market window due to longer plant back times with this alternative. According to the Party, this treatment cannot be applied in autumn because of climatic conditions. In addition, a fall application of methyl bromide is not feasible because over the fall and winter months deer and other animals damage the plastic and irrigation tape. MBTOC considers that there are alternatives in other countries that should be considered for use in this region including grafted plants, resistant varieties and modifications to the application of 1,3-D/Pic with and without metham sodium may reduce plant back times. In Florida, the key pests are yellow and purple nutsedge, <i>Phytophthora</i>, nematodes, <i>Pythium</i> and <i>Sclerotinia</i>. In Georgia the key pests are yellow and purple nutsedge, <i>Phytophthora</i>, nematodes, southern blight and <i>Pythium</i> and <i>sclerotinia</i>. Karst topography limits the use of alternatives which include 1,3-dichloropropene, which are the best alternatives for these pests on 40% of the growing acreage in Florida and 8% of the acreage in Georgia. The Party claims that research on alternatives for peppers could be adopted for eggplant. The Party proposed a 7% transition in 2009 for Florida and Georgia and no transition for Michigan, and stated it will take more than 7 years to transition the full amount. MBTOC, however, considers that alternatives are available for both karst and non-karst areas in Florida and Georgia (1,3-D/Pic, Pic alone, metham with or without herbicides (napropamide, trifluralin) (Noling <i>et al</i> 2006; Chellemi <i>et al</i>. 2006; Simonne <i>et al</i>. 2006) for areas of moderate pest pressure at least. MBTOC has adjusted the nomination for these regions by 25%, which is in line with the 26% transition suggested by the Party in 2006. MBTOC requests that the Party provide further information to substantiate the lack of feasibility of some key alternatives used for eggplants in other countries, such as grafted plants and the key chemical alternatives. MBTOC notes that uptake of alternatives for this crop in regions with similar pests has occurred within 4 years or less in many countries e.g. Spain, Italy, Australia. (Leoni and Leda, 2004; Spotti, 2004; Tostovrsnik <i>et al</i> 2005; Minuto <i>et al</i>, 2003; Thanassouloupoulos, 2006). MBTOC also notes that Ristaino and Johnson (1999), Babadost and Islam (2002), Johnston <i>et al</i> (2002), Driver and Lows (2003), Hausbeck and Lamour (2004) and others have reported many efficient management strategies to control <i>Phytophthora</i> on pepper in Michigan including 3-4 years crop rotation with non susceptible hosts (carrots, beans, onions, asparagus, soybeans, alfalfa, cultural control (water management, plant density, soil amendments, protective mulch and raised beds) and use of registered fungicides in Michigan (Mefonoxan, Dimethomorph (Acrobat), Zoxamide + Mancozeb,</p>								

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	<p>Copper hydroxide+Acrobat). Seed treatment with Mephenoxan or metalaxyl control Phytophthora during seed germination. In tomato trials conducted in Florida on a key pest, nutsedge, 1,3-D/pic 65:35 with and without VIF and MNa/Pic provided similar yields as MB/Pic 67:33 in 3 trials over the spring and fall of 2003 and spring of 2004 (Santos, <i>et al</i>, 2005) even with moderate to severe nutsedge infestations. Recent studies continue to confirm the benefits of LPBF, (e.g. VIF and metalized films) as a means to reduce emissions and dose rate of MB (Ou et al 2006). MBTOC considers that further reductions in MB amount is also possible with changes to formulations of 50:50 MB/Pic or less (e.g. to 30:70) used in combination with barrier films.</p> <p>MBTOC comments on economics: Part of the nomination for Michigan was based on economic arguments. Economic statements provided in CUN: The CUN states next best alternative in all regions is 1,3-D with chloropicrin with expected yield losses of 6 percent in Michigan and 29 percent in Georgia and Florida. CUN states 1,3-D with chloropicrin is considered technically feasible in Michigan. However, CUN noted that for Michigan in addition to the yield loss, delayed planting and harvest with the alternatives results lower average price received from missed market windows and negative net revenue. In Florida and Georgia yield losses significantly reduce net revenues. CUN notes Florida and Georgia producers may also experience lower prices because of missed market windows</p>								
United States	Forest nursery	192.515	157.694	122.032	131.208			125.758	122.06
	<p>MBTOC recommends a reduced amount of 122.06 tonnes for this nomination in 2009. The nominated amount has been adjusted to conform to the adjusted rate of 26 g/m² for nutsedge control and 20g/m² for pathogen to conform to the standard presumption for dosage rate of MB/Pic formulation under HDPE. MBTOC notes that key pests are nutsedge, nematodes and fungi and that propagative material requires a very high level of pathogen control in order to avoid their widespread distribution from the nursery to the production fields. Nutsedge however, has no effect on certification but the Party states that it does affect yield by 3-5%. MBTOC requests that further nominations clearly show the trend in yield loss caused by nutsedge, nematodes or fungal pathogens over the number of seasons following fumigation with MB and alternatives and a breakdown of the economic comparisons to methyl bromide treatment. For the Northeast Forest and Conservation Nursery, only 40% is for nutsedge control and 60% of the nomination was adjusted to conform to standards for certified material of 20 g/m². For Michigan Seedlings only 50% is for nutsedge control, so 50% of the nomination was adjusted to 20 g/m². This nomination is for certified forest seedlings and for 2% of the total forest nursery cropping area. The CUN is based on economic infeasibility of use of substrates and the lack of effective alternatives for control of nutsedge and a range of fungal pathogens and nematodes in this remaining 2 %. It covers certified seedling production in 6 forest nursery regions. The key alternatives are 1,3-D/Pic, 1,3-D/Pic/metham sodium and metham sodium +Pic. The Party acknowledged that Pic and metham when used in conjunction with LPBF, may provide an effective technical alternative and avoid crop injury. MBTOC recognizes that the Party stated in the 'Summary of Significant Changes' that technical problems still exist when gluing LPBF for broadcast applications. MBTOC also considers glyphosate can be used as a pre-treatment to reduce pressure from nutsedge. However, this herbicide has been shown to cause phytotoxicity under nursery conditions. MBTOC considers that alternatives are available and that time for transition may be required. MBTOC acknowledges the initiation of large- scale demonstration trials for this sector by the Party. Limited substrate production of these crops is economical for small niche markets. Frequency of fumigation is once in two to four years, depending on crop. Rotation and cover crops are not fumigated. Research is on-going to reduce rates from 98:2 MB/Pic commonly used where nutsedge populations are severe to using reduced rates of 67:33 MB/Pic. This transition has already been made in 70 % of the forest nurseries in the South where nutsedge populations are not severe. LBPF films have been adopted on a broadacre basis in Europe for many years and technology should be available to the USA. LPBF will be adopted when the effective gluing technologies are locally, commercially available.</p>								

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	<p>MBTOC comments on economics: The nomination was not based on economic arguments. Economic statements provided in CUN: Partial budgets are provided for major alternatives in six regions: 1,3-D/Pic, dazomet, and metham sodium with Pic. The CUN reports yield losses of 3 to 5 percent with higher operating costs. Reported net revenue declines with these alternatives ranged from 8% to 53%. The CUN cites an analysis of the costs of containerized production that demonstrates large scale containerized production is not economically feasible.</p>								
United States	Nurseries stock (fruit, nut, flower)	45.800	64.528	28.275	28.275			25.326 (Includes 1.506 t for research)	25.326 (Includes 1.506 t for research)
	<p>MBTOC recommends a total of 25.326 tonnes for this use in 2009. This comprises 8.615 tonnes for raspberries, 1.579 tonnes for roses, 13.626 tonnes for fruit and nut trees, and 1.506 tonnes for research. The Party changed the nominated amount for raspberry from 28.571 to 8.615 tonnes and also advised that the amount nominated for raspberry nurseries in 2009 is to be used on 47ha for 4 nurseries in Washington only and not partly in California as previously advised. This nomination is for propagation materials that need to be certified as free of pests and diseases, even if certification is voluntary in this state. MBTOC accepted the rates of 24.4 g/m² for rose nursery, 31.9 g/m² for fruit and nut tree nursery and 20 g/m² for raspberry nursery. MBTOC recognises that propagative material requires a very high level of soilborne pest and pathogen control in order to avoid their wide spread distribution and notes the difficulty in protecting raspberry roots to a 1.5 m depth. MBTOC acknowledges that MB/Pic formulations 67:33 and 50:50 were used in other countries and urges the Party to consider these alternatives as a transition strategy.</p>								
	<p>MBTOC comments on economics: The nomination was not based on economic arguments. Economic statements provided in the CUN: CUN states an economic analysis was not done because the alternatives are not technically feasible, particularly for certification needs and so no economic analysis were done. CUN also reports large scale use of substrates is not economically feasible.</p>								

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United States	Orchard replant	706.176	527.600	405.400	393.720			314.007 (Includes 1.658 t for research)	292.756 (Includes 1.658 t for research)
<p>MBTOC recommends a reduced amount of 292.756 tonnes for this use in 2009. This includes 205.265 tonnes for stone fruit, a reduced amount of 9.992 tonnes for raisins, 35.147 tonnes for walnuts, 18.256 tonnes for almond, a reduced amount of 22.438 tonnes for grapes, and 1.658 tonnes for research. The CUN is for orchard/vineyard replant disorder of unknown aetiology; heavy soils or soils which cannot be treated to a sufficient depth to effectively use the reduced rates of 1,3-D now allowed in California. Regulatory constraints (maximum labelled rate) prevent the use of 1,3-D at the rates needed for effective kill of old roots and the associated pathogens in deeper soil layers for heavier (fine-textured) soils. Three alternatives, 1,3-D alone and 1,3-D combined with chloropicrin or metham sodium, are available technical alternatives according to the CUN for treatment in light soils. Although a two year fallow was found to be effective under Mediterranean conditions by Bello, <i>et al</i>, 2004, Schneider, <i>et al</i>, 2004 found that a four year fallow did not sufficiently eliminate the causative nematodes. MBTOC notes the large disparity between the application rates of MB used for California Stone fruit (204 kg/ha or 20.4 g/m²), Raisin grapes (310 kg/ha or 31 g/m²), Wine grapes (350 kg/ha or 35 g/m²), Walnut (140 kg/ha or 14 g/m²) and Almonds (123 kg/ha or 12.3 g/m²). The Party has indicated that this is due to averaging the application over the acreage treated by strip/broad acre fumigation and 'by the hole' spot treatments. The Party confirms that MB/Pic 67:33 formulation is used for California Stone fruit, Raisin grapes and Wine grapes but MB/Pic 98:2 for Almond and Walnut. Commercial adoption of 67:33 formulation and others containing lower amounts of MB (eg 50:50) were used predominantly for orchard replant treatment in other countries before switching to alternatives. The recommended reduced amount is based on the use of MB/Pic 67:33 formulation for California Table, Raisin and Wine grapes at 204kg/ha (20.4 g/m²). MB active ingredient which is considered effective by the Party for Almond, Walnut and Stone fruit. This represents a reduction of 21.251 tonnes or 6.76% of the nominated amount. MBTOC recognizes that regulatory restraints prevent the use of LPBF barrier films with methyl bromide in California but urges the Party to continue evaluating their use to improve the performance of alternatives.</p> <p>MBTOC comments on economics: The nomination was not based on economic arguments. Economic statements provided in CUN: An economic analysis was not done for this sector because most of the losses cannot be quantified. Factors that contribute to losses include delayed planting, fallow, additional use of herbicides, tree loss, replant costs to replace tree losses, loss of trees replanted, yield loss of fruit or nuts, delayed achievement of full yield potential, earlier loss of productivity of whole orchard. McKenry 1999 suggests that in some cases tree losses are likely to be greater than 20 % if replant disorders are not controlled.</p>									

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United States	Ornamentals	154.000	148.483	137.835	138.538			137.776 (Includes 4.06 t for research)	107.136 (Includes 4.06 t for research)
<p>MBTOC recommends a reduced amount of 107.136 tonnes for this use in 2009. This includes 64.404 tonnes for California, 2.539 tonnes for Michigan, a reduced amount of 36.133 tonnes for Florida, and 4.060 tonnes for research. The nomination is for a large number of species, mostly grown in the field. In Florida, the main species using MB are gladioli, lilies and snapdragon. Additional species using MB in California include calla lily, delphinium, dianthus, eustoma, freesia, helianthus, hypericum, iris, larkspur, liatris, matthiola, and ranunculus. In Michigan, flower crops needing methyl bromide are herbaceous perennials grown from seed or root divisions. MB is needed to control diseases (e.g., <i>Fusarium</i> spp., <i>Pythium</i> spp., <i>Phytophthora</i> spp., and <i>Rhizoctonia</i> spp.), plant parasitic nematodes (e.g., root knot, root lesion, stunt and dagger), weeds (e.g. <i>Cyperus</i> spp. and others), and previous crop propagules. MBTOC adjusted the California portion of the nomination to standard dosage rates from 211 kg/ha (21.1 g/m²) to 200kg/ha (20 g/m²) with standard polyethylene films. Previous nominations justified high rates of 35g/m² MB (350 kg/ha) in Florida on the basis of the nominated area being largely composed of muck soils. However, the Party has clarified that this assumption was not correct and that nutsedge pressure is not high in flower production areas in this state. The nomination has thus been adjusted to a standard dosage rate of 200 kg/ha (20 g/m²). MBTOC considers that technical alternatives are available for several flower species: for example, lilies, dianthus and calla lilies are grown successfully in substrates in many countries around the world. Also, soils grown with comparatively shallow rooted, short cycle flowers like snapdragons, larkspur and delphinium can be successfully treated with solarization, sometimes combined with reduced dose chemicals (metham sodium) with excellent results. Research conducted by the Party confirms this (McSorley <i>et al.</i>, a,b). Although the Party has provided a management strategy it does not include specific actions to transition to alternatives.</p>									
<p>MBTOC comments on economics: The nomination was not based on economic arguments. Economic statements provided in CUN: The economic analysis show decreases in yield in California of 20% to 25% result in negative net revenues. In Florida net revenues decrease 65% to 81% because of yield losses with alternatives. In Michigan herbaceous perennials, yield losses of 25% lead to net revenue declines of 37%.</p>									
United States	Peppers (field)	1094.782	1243.542	1106.753	756.339			783.821 (Includes 2.844 t for research)	548.984 (Includes 2.844 t for research)
<p>MBTOC recommends 548.984 t for this use in SE, Georgia, Florida and Michigan in 2009 but does not recommend use in California in 2009. The amount recommended includes 2.844 t for research. MBTOC has reduced the amounts in SE, Georgia, Florida by 25% from the amount approved for 2008 to allow for adoption of alternatives and further rate reduction by adoption of formulations of MB/Pic with lower ratios of MB in conjunction with barrier films. According to the available information, MBTOC has determined that the amounts for each region are 47.754 t for the SE, 84.072 t for Georgia, 404.137 t for Florida, 10.177 t for Michigan. The Party has stated that it based its nomination on MBTOCs standard maximum dosage rates of MB/Pic formulations of 175 kg/ha (17.5 g/m²) for nutsedge and 150 kg/ha (15 g/m²) for pathogens with adoption of LPBF and also made an adjustment for strip fumigation based on 0.58 of the area treated. An adjustment was also made for dosage rate for Michigan suitable for pathogens of 150 kg/ha (15 g/m²). MBTOC noted that the area of land using MB has increased by approx 10% compared to 2008. In California, methyl bromide is requested for the control of crown and root rots caused by <i>Phytophthora capsici</i>;</p>									

Country	Industry	Quantity approved for 2005 (1ExMOP and 16MOP)	Quantity approved for 2006 (16MOP+ 2ExMOP+ 17MOP)	Quantity approved for 2007 (MOP17+MOP18)	Quantity approved for 2008 (MOP18)	Quantity nominated for 2008 (additional or new)	MBTOC recommendation for 2008 (additional or new)	Quantity nominated for 2009 (new)	MBTOC recommendation for 2009 (new)
		<p><i>Rhizoctonia</i>, <i>Verticillium</i>, and <i>Pythium</i>, root knot (<i>Meloidogyne</i> spp). According to the Party, metham sodium is used on nearly as many acres as MB and has been considered a viable alternative for hillsides and in areas affected by township caps, however is possibly becoming less effective because of enhanced degradation, but this is not supported by studies within the region. The Party also did not provide evidence to support infeasibility of alternatives especially metham sodium and chloropicrin and Telone. Telone/Pic is also considered an effective alternative.</p> <p>The key pest of peppers in Michigan is <i>Phytophthora capsici</i> and in the Southeastern United States, including Florida and Georgia, nutsedge and <i>P. capsici</i>. In Michigan, <i>P. capsici</i> has been found in the irrigation water in Michigan and occurred after soil treatment with Telone C35 and metham sodium. However MBTOC considers reinfestation can occur with any fumigants, including methyl bromide. 1,3-D/chloropicrin may be an effective alternative but the Party states growers will miss the optimal market window. According to the Party, this treatment cannot be applied in autumn because of climatic conditions. In Florida and Georgia karst topography limits the use of alternatives which include 1,3-dichloropropene, which are considered the best alternatives for these pests on 40% of the growing acreage in Florida and 8% of the acreage in Georgia. The Party in the past has stated that metham sodium or metham potassium is promising alternatives but no further data has been provided on their performance. MBTOC, however, considers that alternatives are available for both karst and non-karst areas in SE, Florida and Georgia (Noling <i>et al</i> 2006; Rosskopf <i>et al</i>, 2005; Gilreath and Santos 2004a; Gilreath <i>et al</i> 2003a, 2005a; Gilreath 1999, Santos <i>et al</i> 2006; Chellemi <i>et al</i> 2004; Chellemi 2006) and can be adopted on areas of moderate pest pressure at least, and has adjusted the nomination for these regions by 25%, which is in line with the 26 % transition suggested by the Party in 2006. The Party indicated that 42% transition to alternatives was possible in these regions over a seven year period. MBTOC considered a 25% reduction possible in this year by further rate reductions of MB using formulations of MB/Pic with lower ratios of MB in conjunction with barrier films, and adoption of alternatives. It has based this reduction on the amount approved at the 18 MOP. (This amount reflected a further 18% transition over the Parties suggested 7% transition for 2009). The Party showed references which supported use of alternatives in combination with LDPF (Culpepper, 2006). Other studies on possible effective alternatives are available (Ristaino and Johnson (1999), Babadost and Islam (2002), Johnston <i>et al</i> (2002), Driver and Lows (2003). A combination of 1,3-D or metham sodium with chloropicrin + herbicides (Trifluralin, napropamide, halosulfuron, s-metalochlor) is considered as the best alternative strategy in Florida. No future indication for the use of this combination was given by the Party. Hausbeck and Lamour (2004) and others have reported many efficient management strategies to control <i>Phytophthora</i> on pepper, including crop rotation with non susceptible hosts (carrots, beans, onions, asparagus, soybeans, alfalfa , cultural control (water management, plant density, soil amendments, protective mulch, raised beds etc....) and use of registered fungicides (Mefonoxan, Dimethomorph (Acrobat), Zoxamide + Mancozeb, Copper hydroxide+Acrobat). Seed treatment with Mephenoxan or metalaxyl control <i>Phytophthora</i> during seed germination. MBTOC notes that uptake of alternatives for this crop in regions with similar pests has occurred within 4 years or less in many countries e.g. Spain, Italy, Australia. (Leoni and Leda, 2004; Spotti, 2004; Tostovrsnik <i>et al</i> 2005;Minuto <i>et al</i>, 2003). In 2007 the Party indicated that 42% transition to alternatives was possible in these regions over a seven year period. The Party showed references which supported use of alternatives in combination with LDPF (Culpepper, 2006). Other studies on possible effective alternatives are available (Ristaino and Johnson (1999), Babadost and Islam (2002), Johnston <i>et al</i> (2002), Driver and Lows (2003). A combination of 1,3-D or metham sodium with chloropicrin + herbicides (Clomazone, s-metalochlor) is considered as the best alternative strategy in Florida. No future indication for the use of this combination was given by the Party. Hausbeck and Lamour (2004) and others have reported many efficient management strategies to control <i>Phytophthora</i> on pepper, including crop rotation with non susceptible hosts (carrots, beans, onions, asparagus, soybeans, alfalfa , cultural control (water management, plant density, soil amendments, protective mulch, raised beds) and use of registered fungicides (Mefonoxan, Dimethomorph (Acrobat), Zoxamide + Mancozebe, Copper hydroxide+Acrobat). Seed treatment with Mephenoxan or metalaxyl control <i>Phytophthora</i> during seed germination.. MBTOC notes that uptake of alternatives for this crop in regions with similar pests has occurred within 4 years or less in many countries e.g. Spain, Italy, Australia. (Leoni and Leda, 2004; Spotti, 2004; Tostovrsnik <i>et al</i>, 2005;Minuto <i>et al</i>, 2003). MBTOC considers that further reductions in MB amount is possible with changes to formulations of 50:50 MB/Pic or less (e.g. to 30:70) used in combination with barrier films.</p>							

Country	Industry	Quantity approved for 2005 (1ExMOP and 16MOP)	Quantity approved for 2006 (16MOP+ 2ExMOP+ 17MOP)	Quantity approved for 2007 (MOP17+MOP18)	Quantity approved for 2008 (MOP18)	Quantity nominated for 2008 (additional or new)	MBTOC recommendation for 2008 (additional or new)	Quantity nominated for 2009 (new)	MBTOC recommendation for 2009 (new)
	MBTOC comments on economics: Part of the nomination for Michigan was based on economic arguments. Economic statements provided in CUN: The CUN states next best alternative in all regions is 1,3-D with chloropicrin with expected yield losses of 6 percent in Michigan and California and 29 percent in other regions. CUN states 1,3-D with chloropicrin is considered technically feasible Michigan. In Michigan delayed planting and harvest with the alternatives results in lower average price (7.5%) received from missed market windows, and negative net revenue. In remaining regions yield losses significantly reduce net revenues.								
United States	Strawberry (field)	2052.846	1730.778	1476.019	1349.575			1336.754 (Includes 2.377 t for research)	1,269.321 (Includes 2.377 t for research)
	<p>MBTOC recommends a reduced CUE of 1,269.321 tonnes for this use in 2009. This comprises 1,064.556 tonnes for California, 70.088 tonnes for Eastern USA, 132.300 tonnes for Florida and 2.377 tonnes for research. For California the Party nominated 1,064.556 tonnes for 2009 (5452 ha at 195 kg/ha (19.5 g/m²)). The nomination is based on the grounds that township caps and county restrictions limit further adoption of 1,3-D and Pic. Additional information provided by the Party confirmed the regulatory restrictions of the township caps (1,3-D) and county commissioners restrictions on the use of Pic. The nominated area for MB in California is for 5,452 hectares. Based on the generalised data available, MBTOC estimated that the area needing MB due to restrictions on alternative fumigants could range from approximately 6,532 hectares assuming a 1x cap in all townships, to approximately 3,981 hectares assuming a 2x cap, based on CSC anticipated crop growth of 4% per year. Further clarification of the restrictions on the use of alternatives is required in future nominations. LPBF cannot be used with MB in California, but these films can be used with alternatives and can reduce the dosage rates required for effective pathogen and weed control. MBTOC encourages the Party to continue research on the use of LPBF and other techniques that result in improved efficacy at lower application rates and/or reduced emissions that would result in more use of alternatives under township cap and county commissioner constraints. For Eastern states the Party nominated 93.488 tonnes (534 ha @ 175 kg/ha (17.5 g/m²)). The nomination is based on moderate to severe pest pressure (<i>Meloidogyne</i> spp., <i>Pythium</i>, <i>Rhizoctonia</i>, <i>Phytophthora cactorum</i>, <i>Cyperus esculentus</i>, <i>C. rotundus</i>, <i>Lolium</i> spp.) affecting 33% of the crop area, and small farm buffer zones on 40% of the area which affects use of 1,3-D formulations. MBTOC considers that alternatives are available for part of the CUN area (on both buffer and non buffer areas) by use of combinations of 1,3-D, Pic, metham with herbicides and/or (Ferguson <i>et al.</i> 2001; Sydorovych <i>et al.</i> 2004; Driver <i>et al.</i> 2005; López-Aranda <i>et al.</i> 2005; Norton <i>et al.</i> 2002; Gilreath <i>et al.</i> 2003c; studies cited in TEAP 2006). MBTOC accordingly reduced the nomination by 23.372 tonnes (about 25%) to allow for transition to alternatives and MB dose adjustment to 150 kg/ha (15 g/m²) for the areas of low nutsedge pressure affected by buffer zones (allowing 175 kg/ha (17.5 g/m²)) for the high pest pressure areas). However MBTOC notes that the Eastern states planned to implement MB/Pic mixtures with lower dosage rate formulations of MB/Pic in combination with LPBF in the previous nomination (US CUN 06). For Florida the Party nominated 176.333 tonnes (1008 ha @ 175 kg/ha (17.5 g/m²)). The nomination is based on the grounds that currently available alternatives are not able to control moderate-severe nutsedge (33% of area), 1,3-D is restricted in karst/seepage areas (56%), and economic issues. MBTOC considers that alternatives are available for part of the CUN area on both karst and non karst areas by use of combinations of 1,3-D, pic, metham with herbicides and/or LPBF as studies provide evidence for yields that are statistically similar to MB (Gilreath <i>et al.</i> 2003bc; Norton <i>et al.</i> 2002; Ajwa <i>et al.</i> 2003, 2004, 2005; López-Aranda <i>et al.</i> 2005; studies in TEAP 2006). Accordingly the nomination was reduced by 44.083 tonnes to allow for transition to alternatives and dose adjustments to 150 kg/ha on areas of low nutsedge pressure on karst (allowing 175 kg/ha (17.5 g/m²) for high pest pressure areas).</p>								

Country	Industry	Quantity approved for 2005 (1ExMOP and 16MOP)	Quantity approved for 2006 (16MOP+ 2ExMOP+ 17MOP)	Quantity approved for 2007 (MOP17+MOP18)	Quantity approved for 2008 (MOP18)	Quantity nominated for 2008 (additional or new)	MBTOC recommendation for 2008 (additional or new)	Quantity nominated for 2009 (new)	MBTOC recommendation for 2009 (new)
	<p>MBTOC comments on economics: The nomination was not based on economic arguments. Economic statements provided in CUN: CUN reports costs for three next best alternatives for California, Florida, and Eastern United States. 1,3-D with chloropicrin is reported to reduce yield by 10 to 14 percent. Resulting lower production leads to large losses of net revenue. Planting and harvesting delays with alternatives are reported to lead to lower average prices received in all regions, but are only shown in the revenue analysis for California.</p>								
United States	Strawberry runners	54.988	56.291	4.483	8.838			8.837 (Includes 0.454 t for research)	7.944 (Includes 0.454 t for research)
	<p>MBTOC recommends a reduced amount of 7.944 tonnes for this use in 2009. This comprises 4.69 tonnes for CA, 2.8 tonnes for SE and 0.454 tonnes for research. The key pests affecting strawberry runners are weeds (purple and yellow nutsedge), fungi (<i>Rhizoctonia</i> and <i>Pythium</i> in SE, <i>Phytophthora</i>, <i>Verticillium</i>), nematodes (root-knot, sting in CA). The CUN states that MB at a dosage of 26.3 g/m² in CA and 35.0 g/m² in SE is required to meet the certification standards for strawberry runners. The Party's request exceeds MBTOC's standard presumption of 200 kg/ha (20 g/m²) of MB which is considered effective for production of 'high health' strawberry runners using LPBF and other emission control technologies (TEAP October 2005); however, California's certification requirements specify minimum amounts of MB that must be applied. Furthermore, California regulations prohibit the use of LPBF with MB. The reduction is for the SE to conform to MBTOC presumptions. The Party indicates that key alternatives include 1,3-D + PIC followed by dazomet, PIC followed by dazomet and MI + PIC but that these have not been sufficiently tested on a commercial scale. Furthermore, MI is not currently registered. MBTOC encourages the Party to expedite the commercial scale testing of these alternatives as well as the registration of MI.</p>								
	<p>MBTOC comments on economics: The nomination was not based on economic arguments. Economic statements provided in CUN: CUN identifies 1,3-D with chloropicrin as the next best alternative with a 10-percent yield loss in California and the south eastern States. Operating costs with 1,3-D plus chloropicrin are marginally higher in the Southeast and marginally lower in California. In both regions the alternative is predicted to result in a 46 percent decrease in net revenues.</p>								
United States	Sweet potato slips	None	80.830	0.000	18.144			18.144 (Includes 2.377 t for research)	18.144 (Includes 2.377 t for research)
	<p>MBTOC recommends 18.144 MB for this use in 2009. The key pests affecting production of sweet potato slips are nematodes (<i>Meloidogyne incognita</i>), fungi (<i>Streptomyces ipomea</i>, <i>Monilochaetes infuscans</i>, <i>Fusarium oxysporum</i>, <i>Ceratocystis fimbriata</i>), weeds (<i>Chenopodium</i> spp., <i>Digitaria</i> spp.) and insects (Scarabid beetles, <i>Limonius</i> spp). The Party identifies that Telone effectively controls the key pests of sweet potatoes in California. However, Telone cannot be used in Dec-Jan as township caps are exceeded by November which is the fumigation window for slips. The party requests MB for use only in slips where high quality seed is produced. The rates stated in the CUN are consistent with MBTOC's standard presumptions. However, MBTOC notes that desirable nematode resistant cultivars are widely available elsewhere in the world and may be useful in managing nematode pests. The nomination does state that resistant varieties were to be tested in California from 2001 to 2003 but no results are provided.</p>								

Country	Industry	Quantity approved for 2005 (1ExMOP and 16MOP)	Quantity approved for 2006 (16MOP+ 2ExMOP+ 17MOP)	Quantity approved for 2007 (MOP17+MOP18)	Quantity approved for 2008 (MOP18)	Quantity nominated for 2008 (additional or new)	MBTOC recommendation for 2008 (additional or new)	Quantity nominated for 2009 (new)	MBTOC recommendation for 2009 (new)
	MBTOC comments on economics: The nomination was not based on economic arguments. Economic statements provided in CUN: No economic data on alternatives given. Factors that contribute to losses include delayed planting due to use of alternatives; fallow; additional use of herbicides; losses due to weeds, insects and diseases resulting in smaller, less attractive produce (quality loss).								
United States	Tomatoes (field)	2876.046	2476.364	2065.246	1406.484			1245.249 (Includes 5.501 t for research)	1003.876 (Includes 5.501 t for research)
<p>MBTOC recommends 1003.876 t for this use in SE, Georgia, Florida and Michigan in 2009. The amount recommended includes 5.501 tonnes for research. A new nominated amount has been requested for Maryland a region which the Party has stated previously used MB from stocks. A reduction was made in the SE, Georgia, Florida by 25% from the amount approved for 2008 to allow for adoption of alternatives and to account for further rate reduction by adoption of formulations of MB/Pic with lower ratios of MB in conjunction with barrier films. According to the available information, MBTOC has determined that the amounts for each region are 230.919 t for the SE, 55.747 t for Georgia, 685.789 t for Florida, 24.90 t for Michigan and 1.02 t for Maryland. The Party has stated that it based its nomination on MBTOC's standard maximum dosage rates of MB/Pic formulations of 175 kg/ha for nutsedge and 150 kg/ha for pathogens with adoption of LPBF and also made an adjustment for strip fumigation based on 0.58 of the area treated. An adjustment was also made for dosage rate for Michigan suitable for pathogens of 150 kg/ha (15 g/m².) No information was provided on the key pests in Maryland and an assumption was made that pests were similar to the other regions in the SE. MBTOC has assumed this region was not included in the "region SE and middle Atlantic, US". If this assumption is not correct the party is requested to provide the appropriate information.</p> <p>The key pest of tomatoes in the south eastern United States, including Florida and Georgia are nutsedge, nematodes and <i>P. capsici</i>. In Florida and Georgia karst topography limits the use of alternatives which include 1,3-dichloropropene, which are considered the best alternatives for these pests on 54% of the growing acreage in Florida, 11% in Georgia and 6% of the acreage in Georgia. The Party in the past has stated that metham sodium or metham potassium is promising alternatives but no further data has been provided on their performance. MBTOC, however, considers that alternatives are available for both karst and non-karst areas in SE, Florida and Georgia (Noling <i>et al.</i> 2006; Santos <i>et al.</i> 2006; Noling and Gilreath 2004; Gilreath and Santos 2004bc; Gilreath <i>et al.</i> 2002, 2003, 2004, 2005bc, 2006; Roskopf <i>et al.</i>, 2005; Chellemi and Browne, 2006; McMillan and Bryan 1998, 1999, 2002; Rich and Olson 2003) which can be adopted on areas of moderate pest pressure at least. MBTOC has adjusted the nomination for these regions by 25%, which is in line with the 26 % transition suggested by the Party in 2006. The Party indicated that 42% transition to alternatives was possible in these regions over a seven year period. MBTOC considered a 25% reduction possible in this year by further rate reductions of MB using formulations of MB/Pic with lower ratios of MB in conjunction with barrier films, and adoption of alternatives. It has based this reduction on the amount approved at the 18 MOP. (This amount reflected a further 18% transition over the Parties suggested 7% transition for 2009). The Party showed references which supported use of alternatives in combination with LDPF (Culpepper, 2006). Other studies on possible effective alternatives are available (Ristaino and Johnson (1999), Babadost and Islam (2002), Johnston <i>et al.</i> (2002), Driver and Lows (2003). A combination of 1,3-D or metham sodium with chloropicrin + herbicides (Trifluralin, Devrinol, napropamide, halosulfuron, s-metalochlor) is considered as the best alternative strategy in Florida. No future indication for the use of this combination was given by the Party. Husbeck and Lamour (2004) and others have reported many efficient management strategies to control <i>Phytophthora</i> on vegetables, including crop rotation with non susceptible hosts (carrots, beans, onions, asparagus, soybeans, alfalfa , cultural control (water management, plant density, soil amendments, protective mulch, raised beds etc....) and use of registered fungicides (Mefonoxan, Dimethomorph (Acrobat), Zoxamide + Mancozeb, Copper hydroxide+Acrobat). Seed treatment with Mephenoxan or metalaxyl control</p>									

Country	Industry	Quantity approved for 2005 (1ExMOP and 16MOP)	Quantity approved for 2006 (16MOP+ 2ExMOP+ 17MOP)	Quantity approved for 2007 (MOP17+MOP18)	Quantity approved for 2008 (MOP18)	Quantity nominated for 2008 (additional or new)	MBTOC recommendation for 2008 (additional or new)	Quantity nominated for 2009 (new)	MBTOC recommendation for 2009 (new)
		<p>Phytophthora during seed germination. MBTOC notes that uptake of alternatives for this crop in regions with similar pests has occurred within 4 years or less in many countries e.g. Spain, Italy, Australia. (Leoni and Ledda, 2004; Spotti, 2004; Tostovrsnik et al 2005; Minuto et al, 2003; Vos and Bridge 2006; EC 2006). MBTOC considers that further reductions in MB amount is possible with changes to formulations of 50:50 MB/Pic or less (e.g. to 30:70) used in combination with barrier films. The Party states that registration of a key alternative (eg. methyl iodide) is pending.</p>							
		<p>MBTOC comments on economics: Part of the nomination for Michigan was based on economic arguments. Economic statements provided in CUN: The CUN reports yield losses for 1,3-D with chloropicrin as the next best alternative ranging from 1.75% to 6%. Net revenue declines reported for all regions. Changes in pest control costs are less than 4 percent of total variable costs so have little impact on economic measures. Missed market window in Michigan cited as main reason.</p>							

6. MBTOC Work plan for 2008

6.1 Introduction

The Parties, at their Sixteenth Meeting, decided to adopt the elements related to procedures and terms of reference of the Methyl Bromide Technical Options Committee (MBTOC) related to the evaluation of nominations for critical uses of methyl bromide as set out in Annex I to the report of the Sixteenth Meeting of the Parties (16MOP) (decision XVI/4).

Paragraph 15 of Annex I to the report of 16MOP states that annual work plan should be drawn up by MBTOC (supported by the Ozone Secretariat) in consultation with TEAP and that MBTOC should submit it to the Meeting of the Parties each year.

In accordance with paragraph 15 of Annex I to the report of 16MOP, MBTOC has prepared its 2008 work plan in consultation with TEAP and with support of the Ozone Secretariat. The timelines for the work plan are contained below for consideration by the Parties at their Nineteenth Meeting.

Paragraph 15 of Annex I to the report of 16MOP also specifies that a summary report of MBTOC activities over the previous year (paragraph 15(h)) should also be indicated in the MBTOC plan. In accordance with this requirement, this summary report is provided.

6.2 MBTOC Workplan for 2008 - Details

Paragraph 1 of Annex I to the report of 16 MOP provides the schedule for the MBTOC assessment of critical-use exemptions. In accordance with the schedule, MBTOC envisages its activities in 2008 as set out in Table 9 below. The elements of the work plan as specified under paragraph 15 of Annex I to the report of 16MOP have been incorporated. The schedule of the work to be carried out by MBTOC on the MBTOC composition is also included. The list of current membership of MBTOC is contained in Annex I.

The work plan also includes an indicative budget for the activities in 2008 which are related to evaluation of CUNs. Parties had indicated in the 2006 approved budget that 2006 is the last year for providing supplemental funding to MBTOC and for 2007, no supplemental funding was provided for MBTOC. MBTOC would like to bring to the attention of the Parties that such financial assistance is needed to ensure the effective operation of MBTOC in continuing to carry out the evaluation of CUNs. In particular, provision of some funding for non-Article 5 MBTOC members and co-chairs is strongly recommended. Some non- Article 5 members do not have funding to attend meetings; some members are funded by their Parties, although funding is not always consistently in place. Some non- Article 5 members presently use personal funds or funds from research programs to attend MBTOC meetings. As mentioned in the previous workplan of MBTOC as well as in the Progress Reports of TEAP, the financial burden on individual members and/or their research institutions has become increasingly unsustainable.

Although decreasing work load for the second meeting of the year as a result of reduced numbers of CUNs and experience with the remaining ones, may lead to reevaluating the necessity for two 'face-to-face' meetings a year, additional workload and costs include: (i) the requirement for MBTOC reports to more clearly and completely reference the reasons for decision making, thus additional costs of obtaining reference documents; (ii) field trips to understand the circumstances of particular nominations; (iii) time necessary to prepare reports that summarize particularly complex issues.

As a result of lack of funding only local site visits were conducted in those places where MBTOC meetings took place.. Further, it was necessary to conduct a number of important tasks off line, including the finalisation of the MBTOC 2006 Assessment Report and the revision of Handbook for Critical Use Nominations. This represented extra effort and difficulties and often required MBTOC members to work extensively outside regular office hours.

Table 9. MBTOC work plan and indicative budget for 2008

Tasks and actions	Indicative supplemental budget needs where applicable	Indicative completion date	Dates of meetings
<i>Assessment of the CUNs</i>			
1. Parties submit their nominations for critical-use exemptions to the Secretariat	-	24 January 2008	
2. The nominations are forwarded to MBTOC co-chairs for distribution to the subgroups of appointed members	-	7 February 2008	
3. Initial summarization of the nominations	-		
4. Nominations in full are assessed by the subgroups of appointed members. The initial findings of the subgroups, and any requests for additional information are forwarded to the MBTOC co-chairs for clearance	-	28 February 2008	
5. MBTOC co-chairs forward the cleared advice on initial findings and may request additional information on to the nominating Party concerned and consult with the Party on the possible presumption therein	-	7 March 2008	
6. Nominating Party develops and submits its response to the MBTOC co-chairs	-	25 March 2008	
7. MBTOC Meeting No.1 to assess nominations, including any additional information provided by the nominating Party prior to the MBTOC meeting under action 5 and any additional information provided by nominating Party through pre-arranged teleconference, or through meetings with national experts, in accordance with paragraph 3.4 of the terms of reference of TEAP	Funds for a specialist in nutsedge control to attend MBTOC S meeting to assist analysis of CUNs ¹ : \$7250 Funds for travel of one non A5 Co chair and two non A5 members: US\$ 14,250 ³ : Meeting costs US\$4,000 (\$2000 for each sub-committee)**		Tentative MBTOC-S April 7-11, Rehovot, Israel MBTOC- QSC Tentative: The Philippines
8. Field missions by MBTOC members to some key sites where methyl bromide is used as per nominations.	Funds for travel to field sites to observe and discuss important issues	In conjunction with MBTOC mtg No.1	

Tasks and actions	Indicative supplemental budget needs where applicable	Indicative completion date	Dates of meetings
	related to CUNs: US\$ 6,000 ⁴		
9. TEAP Meeting: To assess the MBTOC report on critical-use nominations and submits the finalised interim report on recommendations and findings to the Secretariat.	Funds for travel of 1 non-A5 co-chair: US\$ 4750 ²		April 14 – 18, Morocco
10. The Secretariat posts the finalised report on its web site and circulates it to the Parties	-	Mid May	
11. OEWG Bilateral Discussions: Nominating Party has the opportunity to consult with MBTOC on a bilateral basis in conjunction with the Open-ended Working Group meetings	Funds for travel of 1 non-A5 co-chair: US\$ 4750 ²	Early July	
12. The nominating Party submits further clarification for the critical-use nomination in the “unable to assess” category or if requested to do so by the Open-ended Working Group, and provides additional information should it wish to appeal against a critical-use nomination recommendation by MBTOC/TEAP	-	Mid August 2008	
13. MBTOC Meeting No 2: <ul style="list-style-type: none"> • reassess only those critical-use nominations in the “unable to assess” category, those where additional information has been submitted by the nominating Party and any critical-use nominations for which additional information has been requested by the Open-ended Working Group • finalise the report, including notice of any proposed new standard presumptions to be applied by MBTOC • conduct any bilateral consultations requested by Parties • draft work plan and budget for MBTOC for 2007 	Funds for travel of one non-A5 co-chair and 2 non-A5 members: US\$14,250 ^{2,3} : Meeting costs: \$US 4000 (\$2000 for each sub-committee) **.		Early September, 2008
14. MBTOC draft final report considered by TEAP, finalised and made available to Parties through the Secretariat	-	September 2008	
15. Twentieth Meeting of the Parties	Funds for travel of 1 non-A5 co-chair: US\$ 4750 ²	Early October 2008	Nov/Dec 2008
Total budget sought:	US\$56,000		
<p>* Cost calculated on basis of one round trip airfare in discount economy plus taxes and 1 week accommodation. ** Meeting costs covered separately by the Ozone Secretariat and not considered in total.</p> <p><i>Composition of MBTOC</i></p>			
16. At the MBTOC meeting on the assessment of nominations, MBTOC will also update the list of members and their expertise and decide on missing expertise. The list and missing expertise to be submitted to the Secretariat.		In conjunction with MBTOC meeting No.1 and 2	
17. The Secretariat will update on its website the list of members and their expertise as well as the information on ‘experts required for TEAP and its TOCs’.		In conjunction with MBTOC meetings No.1 and 2 as necessary	

Explanation of the budget: Funds are requested to support:

1. Funds are requested to support a resource specialist on nutsedge control, to the first meeting in 2008. Purple and yellow nutsedge are a key target pest for over 50% of the remaining CUNs and further information is critical to ensure MBTOC provides accurate assessment of Critical Use

Nominations for preplant soil use. The budget of \$7250 is requested for a discount economy airfare and expenses to cover costs for one person for 4 days (including days of travel).

2. Five trips (@\$4750/trip) for a non A5 Co-chair or Task Force Chair to attend MBTOC meetings x2, TEAP meetings, the OEWG and the MOP.
3. Two trips in the year (@ \$4750/trip) are requested to support the attendance of one non A5 member of each sub committee to ensure relevant expertise is present at meetings to be able to assess nominations effectively. The request is only for members who rely on their own personal funds to attend MBTOC meetings. These members are long standing members of MBTOC, have specialist expertise and are critical to the assessment of the CUNs. Over the past 2 years, between 10 and 15% of MBTOC-S members have been unable to attend the MBTOC meetings due to lack of funding.
4. Two field trips (@3,000/trip) are being planned in 2008 to review the situation with alternatives and methyl bromide use for industries that are applying for CUNs. These visits are an essential part of gaining information to accurately assess CUN nominations.

7. Summary Report of the Activities Carried out by MBTOC in 2007

- Initial summarization of the CUNs (initial sorting and recording carried out by the Secretariat).
- Preparation of questions for Parties. Assessment of responses received.
- Finalisation of the MBTOC 2006 Assessment Report which was published in March 2007
- First meeting of MBTOC on the assessment of the CUNs – Alassio, 19-23 March 2007. Interim recommendations and report prepared for the Parties. MBTOC QSC welcomed new members from Argentina, Belize, The Netherlands, New Zealand, and The Philippines. Some were members of the former QPS taskforce which was incorporated into this subcommittee. Departure of one MBTOC-S member from Brazil. Bilateral meetings were held with USA.
- Site visits: MBTOC-S conducted a field trip to observe alternatives adopted by basil and flower growers including substrate production, steam and alternative fumigants. MBTOC-QSC conducted a site visit to a speciality flour mill in Southern France at the request of the milling company.
- TEAP meeting – Rome, 26-30 March 2007.
- Issuance of the interim report for consideration by the 27 OEWG as part of 2007 TEAP Progress Report of April 2007.
- 27 OEWG (Nairobi, 4 – 7 June 2007). Bilateral meetings with Australia, Canada, and USA.
- Preparation of second round of questions to the Parties.

In accordance with TEAP reorganisation of MBTOC, the two subcommittees met separately for the second round of deliberations:

- Second meeting of MBTOC-Soils, San Jose, Costa Rica, 10-13 July 2007. A bilateral discussion was held with the USA. A site visit was conducted to observe alternatives adopted by flower growers participating in the UNDP project to phase-out MB. Resignation of one MBTOC-S member from Japan.
- Revision of the Handbook on Critical Use Nominations for Methyl Bromide
- Revision of the standard presumptions used by MBTOC-S when evaluating CUNs
- Second Meeting of MBTOC-QSC, Washington DC, USA, June 30 - July 3 2007 Bilateral meeting with USA.
- Site visit: MBTOC QSC conducted a field trip to processors of Southern cure ham and to North Carolina State University the coordination site for a multi-state research project on this MB use.
- Preparation of the final report on the CUNs for consideration by the Parties at their 19th Meeting.

8. Management and Personnel Issues

Annex V lists MBTOC members, country, work affiliation and expertise. MBTOC members represent an impressive scope and depth of experience and ability; MBTOC has members from 25 countries. MBTOC needs to have its members funded to attend meetings, and able to commit to contributing to the work of MBTOC outside of the meetings. Most members have been appointed by Parties, yet it is a constant struggle for many members to obtain sufficient funding to attend all MBTOC meetings, and even more so to be funded to spend the time necessary to accomplish the heavy workload.

Most importantly, improvements in funding by Parties for MBTOC members who are citizens of the Party, and secondly, the response of the Parties to MBTOC's indicative budget will, more than anything, clarify MBTOC's membership needs. Without funding to attend meetings, many current non-Article 5 MBTOC members will be unable to attend. In the past year, 23% of members in the soil committee have had funding problems and missed at least one meeting. If there is to be no change in the funding situation, MBTOC may lose specialist expertise and this would threaten both the outcome of CUN decisions and the ability to provide complete progress reports.

MBTOC continues to search for well-qualified members, particularly from Article 5 countries and countries with economies in transition (CEIT), with expertise in:

- Weeds, specifically *Cyperus* spp (nutsedge)
- Replant problems

As stated above, nutsedge is a target pest for over 50% of the remaining CUNs and MBTOC presently requires specialist expertise to address effective controls for specific regions, such as the south eastern USA and Israel.

Additionally, if Parties expand MBTOC's workload in the area of quarantine uses of methyl bromide, additional members with quarantine regulation expertise may be required.

9. Proposed Changes to Standard Presumptions for Preplant Soil Use of MB

Standard presumptions used in the current round of CUN are shown in Section 5.3. These have included a maximum dosage rate of 15 g/m² (150 kg MB/ha) for pathogen control and 17.5 g/m² (175 kg MB/ha) where nutgrass must be controlled, both under LPBF films (e.g. VIF or equivalent). Unless otherwise specified, 50:50 MB/Pic or nearest equivalent formulation is considered effective for pathogen control and 67:33 for nutsedge control and should be used to lower MB dose. For strawberry runner crops and other nursery crops, MBTOC also considered a maximum of 20.0 g/m² (200 kg MB/ha) applicable to meet certification standards for pathogens in the absence of data from the Party which stated that a different rate was necessary.

It is proposed that commencing with the CUN of 2008, that maximum dosage rates be revised to 12.5 kg/ha for pathogens and 15.0 kg/ha for specific preplant soil uses where trials and commercial adoption has proven that lower rates are effective.

Supporting data for the methyl bromide component and dosage is given in Appendix V.

Table 10. Proposed changes to maximum dosage rates for preplant soil use of MB.

Film Type	Maximum MB Dosage Rate (g/m ²) in MB/Pic mixtures considered effective for:			
	Strawberries and Vegetables	Nurseries*	Orchard Replant	Ornamentals
Barrier films - Pathogens	12.5	15	15	15
Barrier films - Nutsedge	15.0	17.5	17.5	17.5
No Barrier films - Pathogens	20	20	20	20
No Barrier films - Nut sedge	26	26	26	26

* Maximum rate unless certification specifies otherwise

10. References

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ANNEX I: Decision IX/6

1. *To apply the following criteria and procedure in assessing a critical methyl bromide use for the purposes of control measures in Article 2 of the Protocol:*
 - (a) *That a use of methyl bromide should qualify as “critical” only if the nominating Party determines that:*
 - (i) *The specific use is critical because the lack of availability of methyl bromide for that use would result in a significant market disruption; and*
 - (ii) *There are no technically and economically feasible alternatives or substitutes available to the user that are acceptable from the standpoint of environment and health and are suitable to the crops and circumstances of the nomination;*
 - (b) *That production and consumption, if any, of methyl bromide for critical uses should be permitted only if:*
 - (i) *All technically and economically feasible steps have been taken to minimise the critical use and any associated emission of methyl bromide;*
 - (ii) *Methyl bromide is not available in sufficient quantity and quality from existing stocks of banked or recycled methyl bromide, also bearing in mind the developing countries’ need for methyl bromide;*
 - (iii) *It is demonstrated that an appropriate effort is being made to evaluate, commercialise and secure national regulatory approval of alternatives and substitutes, taking into consideration the circumstances of the particular nomination and the special needs of Article 5 Parties, including lack of financial and expert resources, institutional capacity, and information. Non-Article 5 Parties must demonstrate that research programmes are in place to develop and deploy alternatives and substitutes. Article 5 Parties must demonstrate that feasible alternatives shall be adopted as soon as they are confirmed as suitable to the Party’s specific conditions and/or that they have applied to the Multilateral Fund or other sources for assistance in identifying, evaluating, adapting and demonstrating such options;*
2. *To request the Technology and Economic Assessment Panel to review nominations and make recommendations based on the criteria established in paragraphs 1 (a) (ii) and 1 (b) of the present decision;*
3. *That the present decision will apply to Parties operating under Article 5 and Parties not so operating only after the phase-out date applicable to those Parties.*

ANNEX II: ANNEX I Referred to by Decision XVI/4

All reviews of CUNs made in 2007 are to be in accordance with the ‘Annex I’ referred to in Decision XVI/4. This annex also sets out the procedure and timetable for the annual review of critical use nominations. In addition to the criteria for the evaluation provided in Decision IX/6, the Parties have given further guidance for the review of CUNs in Annex 1 of 16 MOP meeting report. Inter alia, this requires that TEAP and MBTOC provide a clear description of why any part of a nomination is not recommended, including references to the relevant studies used as the basis for such a decision. Para. 32 emphasises that exemptions must fully comply with Decision IX/6 and other relevant decisions, and are intended to be limited to the levels needed for critical use exemptions. These are considered as temporary derogations from the phaseout of methyl bromide in that they are to apply only until there are technically and economically feasible alternatives that otherwise meet the criteria in Decision IX/6. The assessment by MBTOC should take a precise and transparent approach to the application of the criteria, having regard, especially, to paragraphs 4 and 20 of Annex I.

Paragraphs 4 and 20 read:

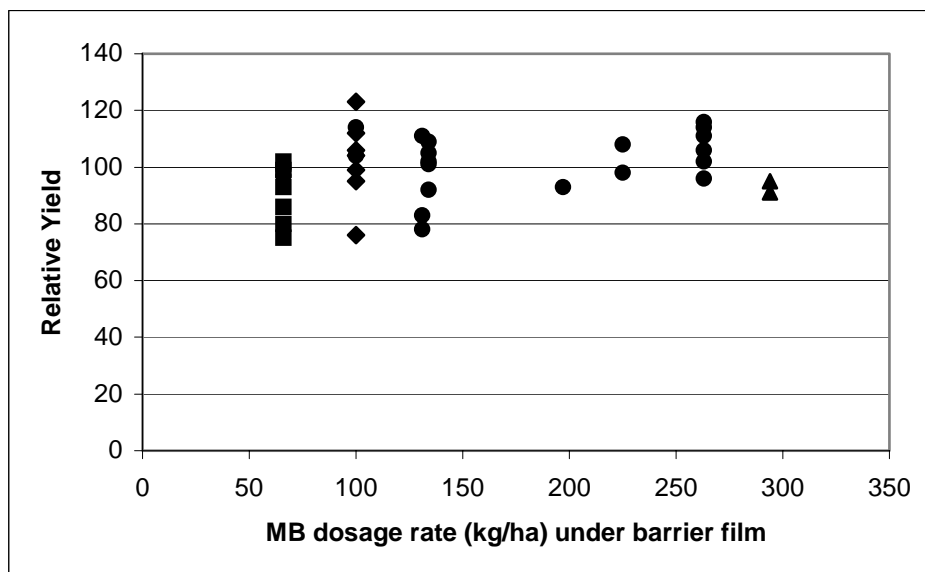
4. Although the burden of proof remains with the Party to justify a request for a critical-use exemption, MBTOC will provide in its report a clear explanation of its operation with respect to the process of making determinations for its recommendations, and clearly state the approach, assumptions and reasoning used in the evaluation of the critical-use nominations. When cuts or denials are proposed, the description should include citations and also indicate where alternatives are technically and economically feasible in circumstances similar to those in the nomination, as described in decision Ex.1/5, paragraph 8.

20. In line with paragraph 4 above, in any case in which a Party makes a nomination which relies on the economic criteria of decision IX/6, MBTOC should, in its report, explicitly state the central basis for the Party’s economic argument and explicitly explain how it addressed that factor, and, in cases in which MBTOC recommends a cut; MBTOC should also provide an explanation of its economic feasibility.

Spain	Moguer/Cartaya	Strawb. Runner	VIF - Not Spec		50:50	392											99		Inoculum not specified	Lopez-Aranda et al 2001b				
Spain	Cabeza, Nav.	Strawb. Runner	VIF - Not Spec	74	67:33	400							105, 92						1998 Two sites	Melgarejo et al 2000				
	Arevalo, Nav.			84	50:50	400													104, 104		1999 results, nurseries			
	Vinaderos, Nav.			49	50:50	400															95, 123	2000 results, nurseries		
Spain	Huelva	Strawb. Fruit	VIF - Not Spec	82	67:33	400														1997-1998 Inoc.unspecified	Lopez-Aranda et al 2000			
				72	67:33	400																1998-1999 Inoc. Unspecified		
				68	67:33	400																	1999-2000 Inoc. Unspecified	
Spain	Moncada	Strawb. Fruit	VIF - Not Spec	60	98:2	600														1998 No major pathogens but	Cebolla et al 1999			
				54	98:2	600																	Fusarium buried 10cm&30cm.	
France NZ USA	Douville	Strawb. Fruit	VIF - Not Spec	65	Not Spec	800			99											Inoculum not specified	Fritsch 1998 Horner 1999 Gilreath et al 2005			
				Havelock North	Strawb. Fruit	VIF - Not Spec	83	67:33	500															Phytophthora present
	USA	Florida	Pepper				VIF Plastopil	69	67:33	392														Nutgrass
								VIF Plastopil	69	67:33	392													
	VIF Vikase	69	67:33	392																				
VIF Vikase	69	67:33	392																					
USA	Florida	Strawb Fruit, Cantaloupe	Barrier - Pliant, Metallised		98:2 67:33		Trials on 18 Commercial Farms between 2000-2004; no increase in disease or weeds when rates reduced up to 50% under VIF wrt. polyethylene											Nutgrass and pathogens present	Noling and Gilreath 2004					
USA	California	Strawb. Fruit	VIF - Not Spec	72	67:33	336															Inoculum not specified	Ajwa et al 2004		
				80	67:33	392																		96
USA	Florida	Tomato	VIF - Not Spec	31	67:33	392															Nutgrass and rootknot nematodes	Hamill et al 2004		
USA	California	Strawb. Fruit	VIF - Not Spec	75	67:33	392																Ajwa et al 2003		
				83	67:33	392																		106
				65	67:33	392																		
USA	Florida	Tomato	VIF - Not Spec		67:33	392	"No significant reduction in yield"												Noling et al 2001					
USA	California	Strawb. Fruit	VIF - Not Spec	45	67:33	364																Duniway et al 1998		
USA	Florida		VIF - not spec			392/ 196																Ouet al., 2007		
Unweighted averages (relative % yield)				66			94	99	93	93		102		103	108	104	91							

ANNEX IV: Relative Yield of Crops Grown Under Barrier Films With Different MB/Pic Formulations Compared to the Standard Polyethylene from Trials Between 1998 and 2004.

Figure 3. Relative yield of crops (strawberries, tomatoes, peppers, cantaloupes) grown under barrier films with different MB/Pic formulations compared to the standard commercial treatment using standard polyethylene from trials between 1998 and 2004.



(▲MB/Pic 98:2; ● MB/Pic 67:33; ◆ MB/Pic 50:50; ■ MB/Pic 33:67). Data from ANNEX III.

ANNEX V: Disclosure of Interest

MBTOC QSC SUBCOMMITTEE					
Co-Chairs					
1. Michelle Marcotte	F	Consultant	Consultant, particularly food processing, regulations, structural and commodity treatments and irradiation	A	Canada Non-A5
Members					
2. Jonathan Banks (Co-Chair Quarantine Task Force)	M	Consultant	Consultant, postharvest, particularly non-chemical and gas technologies (fumigants, CA) and QPS uses of MB. Entomologist (PhD)	A	Australia Non-A5
3. Chris Bell	M	Consultant, formerly Central Science Laboratory (Government research)	Postharvest technologies, particularly fumigants, phosphine; sulfuryl fluoride, controlled atmospheres and heat' (PhD)	A	UK Non-A5
4. Fred Bergwerff	M	Eco2, Netherlands	Fumigator, specialist in non-MB systems, including heat.	D	Netherlands Non-A5
5. Kathy Dalip	F	CABI	Quarantine entomologist (Ph D)	D	Jamaica A5
6. Ricardo Deang	M	Consultant	Regulatory and registration. Entomologist (PhD)	A	Philippines A5
7. Patrick Ducom	M	Ministère de l'Agriculture (Government research)	Postharvest and structural alternatives	A	France Non-A5
8. Ken Glassey	M	MAFF, New Zealand	Forester, government advisor on MB alternatives in forest products	D	New Zealand Non-A5
9. Alfredo Gonzalez	M	Fumigator	Phosphine, QPS and non-QPS treatments. Structures, commodities.	D	Philippines A5
10. Darka Hamel	F	Institute for Plant Protection in Agriculture and Forestry (Government)	Postharvest and structural treatments, regulations	D	Croatia CEIT
11. Takashi Misumi	M	MAFF (Government research)	QPS expert	D	Japan Non-A5
12. David Okioga	M	Ministry of Environment and Natural Resources (Government regulatory)	Postharvest and QPS MB alternatives (PhD)	A	Kenya A5
13. Christoph Reichmuth	M	BBAGermany (Government research)	Researcher, MB alternatives in postharvest/structures (PhD)	B	Germany A5
14. Jordi Riudavets	M	IRTA-Department of Plant Protection. (Government Research)	IPM for stored products and horticultural crops (PhD)	D	Spain Non-A5
15. John Sansone	M	SCC Products (Fumigator)	Fumigator, particular expertise in structures	A	US Non-A5
16. Robert Taylor	M	Consultant	Postharvest technology, specifically A5 uses	A	UK Non-A5
17. Ken Vick	M	United States Department of Agriculture (Government research)	Research in MB alternatives, incl. QPS. Entomologist (PhD)	A	US Non-A5
18. Chris Watson	M	IGROX Ltd (Fumigator)	Practical use of MB and alternatives including the use of phosphine, Sulfuryl Fluoride, CO2 and Heat Treatments for commodities (inc timber) and structures	A	UK Non-A5
19. Eduardo Willink	M	Ministry of Agriculture	Quarantine entomologist (Ph D)	D	Argentina A5
Totals	M = 16 F = 3		A = 8 B = 3 C = 0 D = 8		CEIT & A5=7 Non-A5=12

A - >10 years; B - 5-10; C - 2-5; D - <2 year

Co-chair

Ms Michelle Marcotte

Marcotte Consulting Inc.

(Marcotte Consulting Inc is a Canadian corporation; its President, Michelle Marcotte, is located at:

10104 East Franklin Ave.

Maryland USA 20769

Ms Michelle Marcotte was a member of the 1992 Methyl Bromide Assessment and subsequently a member of the Methyl Bromide Technical Options Committee between 1992 and 2005; she was confirmed as Co-Chair in 2005. Until 1993 she worked for MDS Nordion, a supplier of radiation processing equipment which is an alternative to the use of methyl bromide in some commodity and quarantine situations. Since then, Ms Marcotte, through Marcotte Consulting, has provided consulting services to governments and agri-food companies in eight countries on agri-environmental issues, food technology, regulatory affairs and radiation processing. Marcotte Consulting has an interest in the topics of the Montreal Protocol because of its long time market development work in food irradiation, an alternative to some methyl bromide uses, and because of its interest in food processing, food safety and trade. In the field of methyl bromide alternatives, Ms Marcotte has published case studies for pest control in food processing, for stored commodities, for alternatives for quarantine and for greenhouse use. She is a member of the Canada Industry-Government Methyl Bromide Working Group and the Canada-US Methyl Bromide Working Group; both organizations work to achieve phase out of methyl bromide in the agri-food sector. Marcotte has consulted to companies, industry associations, the International Atomic Energy Agency and US AID on irradiation as a methyl bromide alternative in food processing, quarantine and trade. She has also prepared consulting reports summarizing research in methyl bromide alternatives and case studies on food processing for US Environmental Protection Agency. Ms Marcotte has no proprietary interest in alternatives or substitutes to ODSs, does not own stock in companies producing ODS or alternatives or substitutes to ODSs. Ms Marcotte's spouse works for United States Department of Agriculture managing research in methyl bromide alternatives and is a member of MBTOC. He does not have proprietary interest in alternatives or substitutes to ODS and does not own stock in companies producing ODS or alternatives or substitutes to ODSs. Marcotte receives a consulting contract from Government of Canada, Environment Canada, a Party to the Montreal Protocol that is committed to the phase out of methyl bromide. Ms Marcotte pays for travel to TEAP, MBTOC and Montreal Protocol meetings out of consultancy funds provided by the Canadian government, Environment Canada, to support her work on MBTOC.

Members

Dr Jonathan Banks, Co-Chair Quarantine Task Force

10 Beltana Road

Pialligo

Canberra ACT

AUSTRALIA

Dr. Jonathan Banks, Chair of TEAP's QPS Task Force, is a private consultant. He was a member of the 1992 Methyl Bromide Assessment and from 1993 to 1998 and 2001 to 2005 co-chaired the Methyl Bromide TOC. He worked as a Research Scientist with the Australian Commonwealth Scientific and Industrial Research Organization (CSIRO) from 1972 to 1999 on grain storage technologies, including use of improved use of fumigants. He is coinventor of carbonyl sulfide, an alternative fumigant to methyl bromide in some applications. Patent rights have been assigned to his employer, CSIRO. Dr Banks has no proprietary interest in alternatives or substitutes to ODSs, does not own stock in companies producing ODS or alternatives or substitutes to ODSs. He has stock in

Brambles Ltd, a company that *inter alia* leases wooden pallets for freight. The pallets may or may not be treated with methyl bromide or alternatives. His spouse is co-owner of their commercial organic apple orchard. She has no financial interests relating to ozone-depleting substances. He has served on some national committees concerned with ODS and their control, and within the last 4 years has received contracts from UNEP, and other institutions and public companies related to methyl bromide alternatives and grain storage technology--including training in fumigation (methyl bromide and alternatives) and fumigation technology and recapture systems for methyl bromide. In 2005 and 2006 he received some support from UNEP for TEAP and MBTOC activities. Other funding for his MBTOC activities has been through grants or contracts from the Department of Environment and Heritage, Australia or from personal contributions.

Dr Chris Bell

Consultant, Formerly Central Science Library
Sand Hutton
York YO41 ILZ
UNITED KINGDOM

Dr. Christopher Hugh Bell, is a Fellow at the Central Science Laboratory (CSL), Department of Environment, Food and Rural Affairs, at York, UK, where he led research into fumigation technology, including studies on methyl bromide and potential alternatives which were sponsored by UK government agencies and private companies, until his retirement in 2004. He is also a Regional Editor for the Journal of Stored Products Research for Europe and Africa, an Elsevier journal publishing original research addressing problems encountered in the storage of durable commodities. Dr. Bell has no proprietary interest in alternatives or substitutes to ODSs, does not own stock in companies producing ODS or alternatives or substitutes to ODSs, and does not represent organizations seeking to phase out ODSs. He works occasionally as a consultant to governments and companies on matters related to methyl bromide use or replacement, or the Montreal Protocol. Travel and subsistence to attend MBTOC meetings has been paid by the UK Department of Environment, Food and Rural Affairs (DEFRA), or by UNEP.

Fred Bergwerff

CEO
EcO2 BV
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Mr Fred Bergwerff is the General Manager for ECO2 B.V., a company that provides disinfection services through controlled atmospheres technology and equipment, and related consulting services. He is employed in a full time capacity with responsibilities for joint-venture partnerships, technical assistance, training and promotion of good practices in the structural, commodity, quarantine and port disinfection industries, particularly specialising in QPS and ISPM-15 treatments. ECO2 does not have a commercial relationship with any fumigant or pesticide manufacturers/registrants. ECO2 has been involved in research trials on MB alternatives and has assisted companies to adopt MB alternatives for structures, stored commodities and pre-shipment and quarantine treatments. ECO2 has an interest in the topics of the Montreal Protocol because of its expertise in disinfection and pest control, particularly non-chemical treatments. Other than controlled atmospheres and the company ECO2 BV, Mr Bergwerff and his business partners in ECO2 have no proprietary interest in ODS or other alternatives to ODS, and do not own stock in companies that manufacture ODS or other alternatives to ODS. He carries out consulting work for organizations and companies that are seeking to phaseout ODS. Mr Bergwerff's wife owns shares in ECO2, has no proprietary interest in ODS or other alternatives to ODS, and does not own stock in companies manufacturing ODS or other

alternatives to ODS. Travel to MBTOC meetings is paid by ECO2, which receives no contribution for this travel from any other company or organisation.

Dr Kathy M. Dalip

Article 5 member

Entomologist
CARDI Belize
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Cayo District
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Belize

Dr. Kathy M Dalip is an Entomologist at the Caribbean Agriculture Research and Development Institute (CARDI), which has headquarters in Trinidad and offices in twelve member countries. Kathy works full-time at the CARDI Belize Unit, Central Farm, Western Highway, Cayo District, Belize, Central America. Between 2000 and 2005, Kathy was stationed at the CARDI Jamaica Unit where she was a member of the Jamaica Methyl Bromide Working Group. Her work at CARDI is focused in the areas of integrated pest management (IPM) and organic agriculture. Hence, her emphasis is on finding non-chemical pest control options to improve production and economic feasibility for farmers. Kathy has no proprietary interest alternatives or substitutes to ODSs, does not own stock in companies producing ODS or alternatives or substitutes to ODSs and has not done consulting for organizations seeking to phaseout ODSs. Travel to MBTOC meetings is paid by for by the Ozone Secretariat of UNEP.

Dr Ricardo T Deang

Article 5 member

4 Istanbul Street
Merville Park
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THE PHILIPPINES

Dr Ricardo Deang is a retired Deputy Administrator for Pesticides of the Fertilizer and Pesticide Authority (FPA) – a government regulatory office for fertilizers and pesticides – since April 1996. He was responsible for registration, restriction, and banning of pesticides when imminent hazards are posed; and certification of pesticide applicators and fumigators. FPA has an interest in the topics of the Montreal Protocol because the Philippines is a signatory to the Montreal Protocol and the office restricts/monitors methyl bromide importation and use. Prior to this position Mr. Deang worked as a research entomologist on biological control. Currently Mr Deang is Chairman of the Board of a consultancy firm, Management and Executive Network, Inc. He has no proprietary interest on alternatives or substitute to ODSs, does not own stock in companies producing ODSs or alternatives or substitutes to ODSs and does not engage in consulting for organizations seeking to phase out ODSs. His wife and their children have no proprietary interest on alternatives or substitutes to ODSs, do not own stock in companies producing ODSs or alternatives or substitutes to ODSs and do not engage in consulting for organizations seeking to phase out ODSs. They have no interest in the topics of the Montreal Protocol. Travel to MBTOC meetings is paid by UNEP.

Dr. Patrick Ducom

Ministère de l'Agriculture
LNDS - QUALIS
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Jacques François Patrick Ducom, Agronomy Engineer, is a long standing MBTOC member and head of the Laboratoire National Denrées Stockées (LNDS), Plant Protection Service, Ministry of Agriculture, France. Dr Ducom is a full time researcher in fumigation LNDS. He works occasionally as a consultant for Implementing Agencies of the Multilateral Fund on matters related to the Montreal Protocol. Dr Ducom has no proprietary interest on alternatives or substitute to ODSs, does not own stock in companies producing ODSs or alternatives or substitutes to ODSs and does not engage in consulting for organizations seeking to phase out ODSs. Travel to MBTOC meetings is paid from the LNDS budget

Mr Kenneth Glassey

Senior Advisor Operational Standards Biosecurity New Zealand
Ministry of Agriculture and Forestry
Pastoral House, 24 the Terrace
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Wellington, NEW ZEALAND

Mr Kenneth Logan Glassey is a Senior Biosecurity Adviser at the Ministry of Agriculture and Forestry (MAF). Ken Glassey is a full time adviser on Phytosanitary Treatments and Treatment Operators at the Ministry of Agriculture and Forestry Head Office, Wellington, New Zealand. MAF has an interest in the topics of the Montreal Protocol because quarantine and pre-shipment treatments uses a significant amount of methyl bromide (218 tonnes in 2004). Current responsibilities cover researching, developing and reviewing New Zealand's import standards including operational standards such as treatments for imported commodities. This also involves monitoring quality and adequacy, initiating remedial action as necessary, and the provision of advice on the practical application and implications of such standards. Mr Glassey has been involved in QPS inspection and treatments for 20 years with particular expertise with forest produce, and worked in forest management for 11 years prior to that. Mr Glassey has no proprietary interest in alternatives or substitutes to ODSs, does not own stock in companies producing ODS or alternatives or substitutes to ODSs and does not consult for organizations seeking to phaseout ODSs. He does not work as a consultant to implementing agencies on matters related to the Montreal Protocol. Mr Glassey's partner living in same home does not work for or consults for any organization which has an interest in the topics of the Montreal Protocol. She has no proprietary interest alternatives or substitutes to ODSs, does not own stock in companies producing ODS or alternatives or substitutes to ODSs and does not consult for organizations seeking to phaseout ODSs. Travel to TEAP/TOC/TSB meetings is paid by MAF.

Mr Alfredo T. Gonzalez

President
Pestcon Pest Management and General Services
33 Evening News, West Triangle
Quezon City
THE PHILIPPINES

Article 5 Member

Mr Gonzalez is president of Pestcon Pest Management and General Services, a company with an interest in the Montreal Protocol because it uses methyl bromide in the for Quarantine and pre-shipment treatments as well as ISPM 15 treatments for wood packaging materials. Mr Gonzalez, has no proprietary interest in alternatives or substitutes to ODSs, and does not own stock in companies

producing ODS or alternatives or substitutes to ODSs. Presently he is the general consultant for the implementation of the Methyl Bromide Phase-out program in the Philippines for the Government of his country, under the Department of Natural Resources- Philippine Ozone Desk (DENR-POD) in cooperation with the Fertilizer and Pesticide Authority (FPA), which is directly related to the Montreal Protocol. Neither Mr Gonzalez's wife or their children have any proprietary interest in alternatives or substitutes in ODSs. Expenses related to Mr Gonzalez's attendance to MBTOC meetings are paid by UNEP.

Dr Darka Hamel

Article 5 member

Institute for Plant Protection in Agriculture and Forestry of Republic Croatia
Rim 98, 10000 Zagreb
CROATIA

Dr. Darka Hamel is an entomologist responsible the protection of stored products. Dr Hamel is a full time executive manager at the Institute for Plant Protection in Agriculture and Forestry of the Republic Croatia (PPI). The PPI has an interest in the topics of the Montreal Protocol because companies using methyl bromide for treatment in accordance with ISPM 15 are authorized to do so in accordance with the PPI recommendation. Dr. Hamel has no proprietary interest alternatives or substitutes to ODSs, does not own stock in companies producing ODS or alternatives or substitutes to ODSs and does not consulting for organizations seeking to phaseout ODSs. Dr. Hamel works occasionally as a consultant to the Croatian Ministry of Agriculture, Forestry and Water Management or the Ministry for Environmental Protection and Physical Planning regarding legislation on matters related to the Montreal Protocol. Travel to MBTOC meetings is paid by UNEP.

Mr Takashi Misumi

Ministry of Agriculture, Forestry and Fisheries MAFF, Japan
1-16-10 Shin-yamashita, maka-ku
Yokohama, 231-0801
JAPAN

Mr. Takashi Misumi, member of MBTOC since 2005 is a senior researcher at the Yokohama Plant Protection Station (YPPS). Mr. Misumi is a full time Researcher at the Quarantine Disinfestation Technology Section, Research Division of YPPS. He has no proprietary interest in alternatives or substitutes to ODSs, does not own stock in companies producing ODS or alternatives or substitutes to ODSs and does not consult for organizations seeking to phaseout ODSs. Neither his spouse nor their children work for organizations with has an interest in the topics of the Montreal Protocol. Expenses related to the attendance of MBTOC meetings are paid by International department of MAFF.

Dr David M Okioga

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Nairobi
KENYA

Dr. David Okioga is a founding member of MBTOC, joining in 1992. He was MBTOC co-chair between 1997 and 2002. Dr Okioga was the Director, National Plant Quarantine Services of Kenya for sixteen years. He also served as the Coordinator in Agricultural Botany under the Kenya Agricultural Research Institute, Secretary to the Ministry of Agriculture on Plant Breeder's Rights, Member of the National Agricultural Research Centre, National Horticultural Research Centre, National Potato Research Centre, and the National Committee for the National Genebank. Dr. Okioga has undertaken a number of contracts from the African Unity (then Organization of the African Unity), FAO and UNEP. Some of these consultancies were related to crop protection, where methyl

bromide was considered as the chemical of choice for soil fumigation, whereas others were on strengthening the Montreal Protocol policies on ODS phase out in the African region (including methyl bromide). In 1995, Dr. Okioga was appointed Coordinator, of the National Ozone Unit (NOU) of Kenya by the Ministry of Environment and Natural Resources, Kenya, in consultation with UNDP, a post that he still holds at present. Dr. Okioga's main responsibility is strengthening the government of Kenya in meeting the requirements of the Montreal Protocol and in phasing out of ODS in the country. Dr. Okioga has no proprietary interests in alternatives for ODS and does not consult for companies seeking to phase out ODS. Travel and expenses related to his attendance to MBTOC meetings are paid by UNEP.

Dr. Jordi Ruidavets

IRTACrop Protection
Carretera a Cabrils Km. 2
E-08348 Cabrils (Barcelona)
SPAIN

Dr. Jordi Riudavets is a Researcher at the Institute for Agrifood Research and Technology (IRTA) of Spain. He is a full time entomologist at the Crop Protection Division, with experience in the development and transfer of integrated pest management (IPM) programs for stored products and horticultural crops. The IRTA has an interest in the topics of the Montreal Protocol because is a state-owned company of the Catalan Government, and its activities are concerned with scientific research and technology transfer in the areas of agriculture, aquaculture and the agrifood industry. Dr. Riudavets has no proprietary interest alternatives or substitutes to ODSs, does not own stock in companies producing ODS or alternatives or substitutes to ODSs and does not consult for organizations seeking to phaseout ODSs. He occasionally works as a consultant to the Spanish Government, food companies, pest control companies and private companies with interest in matters related to the Montreal Protocol. Travel to MBTOC meetings is paid by the Spanish Ministry of the Environment.

Prof. Dr. Christoph Reichmuth

Federal Biological Research Centre for Agriculture and Forestry
Institute for Stored product Protection
Koenigin-Luise-St.19
D-14195 Berlin
GERMANY

Prof. Dr. Christoph Reichmuth is chemist and responsible for stored product protection. Dr Reichmuth is a full time director of the Institute for Stored Product Protection of the Federal Biological Research Centre for Agriculture and Forestry in Berlin, Germany, of the German Ministry for Nutrition, Agriculture and Consumer Protection, Germany.

The Federal Ministry for Nutrition, Agriculture and Consumer Protection together with the Federal Ministry for the Environment, Nature Conservation and Nuclear Safety has a pronounced interest to replace methyl bromide as quickly as possible, due to the strongly expressed political interest and public opinion in Germany. Dr Reichmuth has no proprietary interest, patent for production of phosphine from magnesium phosphide in a generator with the company Degesch Detia, Germany, patent for the treatment of stored products and organic materials (wood) with inert atmospheres with the company Buse, Germany, patent for pheromone traps for Lepidopteran pests with the Max-Planck-Society, Germany, at present there are no royalties paid from the patents to Dr Reichmuth. He gave and gives advice to private companies in Germany to obtain critical use exemptions for methyl bromide in helping to understand the English forms of UNEP/TEAP, he works occasionally as a consultant to UNIDO, supporting projects or parties to replace methyl bromide. Travel to MBTOC meetings or related meetings concerning the phaseout of methyl bromide are paid by the German

Ministry for Nutrition, Agriculture and Consumer Protection or by the German Ministry for the Environment, Nature Conservation and Nuclear Safety.

Mr John Sansone

SCC Products
2641 W. Woodland
Anaheim, CA 92801
UNITED STATES

Mr John Sansone is the President and General Manager for SCC Products. He is employed in a full time capacity with responsibilities for sales, training, stewardship and as a consultant for end users in the residential, commodity, quarantine and port fumigation industries. SCC Products has a commercial relationship with several fumigant/pesticide manufacturers/registrants, some of which offer products which are considered alternatives to MB. SCC Products has been involved in research trials in the food processing and stored commodities sectors. The firm was instrumental in the transition to alternatives for the residential fumigation marketplace and currently is transitioning alternatives into the commodity fumigation market. It is also involved in the implementation of recapture equipment for commodity fumigation companies in California. SCC Products has an interest in the topics of the Montreal Protocol because of its relationship and expertise in many fumigation areas. Mr Sansone has no proprietary interest in alternatives or substitutes to ODSs, does not own stock in companies producing ODS or alternatives or substitutes to ODSs and does not consult for organizations seeking to phaseout ODSs. He does not work as a consultant to the UN, UNEP, MLF, Implementing Agencies, Governments, companies, etc. on matters related to the Montreal Protocol. Mr Sansone has no relatives or business partners that work for or consult for any organization with an interest in the topics of the Montreal Protocol nor does he have relatives or business partner having a proprietary interests in alternatives or substitutes to ODSs, or who own stock in companies producing ODS or alternatives or substitutes to ODSs or consult for organizations seeking to phaseout ODSs. Travel to MBTOC meetings is paid by SCC Products, which receives no contribution for this travel from anyone.

Mr. Robert Taylor

Consultant
27 Lancet Lane
Loose, Maidstone, Kent ME15 9SA
UNITED KINGDOM

Mr Robert Taylor retired from the Natural Resources Institute (NRI) of the United Kingdom in 2001. The NRI was a government establishment involved in biological/agricultural research, development and training, primarily in relation to developing countries. In recent years the NRI has become part of the University of Greenwich. Crop protection in both the pre- and post-harvest stages has always been a major feature of NRI's research and development programmes. Pest management, including the use of fumigants, has always features strongly in such programmes. Mr Taylor has no proprietary interest in alternatives or substitutes to methyl bromide and does not own stock in companies consulting for organizations seeking to phase out the chemical. He works occasionally as a consultant to UN agencies including UNIDO and UNEP on matters relating to the Montreal Protocol. Mr Taylor has no relatives or business partners who work or consult for organizations which have an interest in the topics of the Montreal Protocol, nor does he have relatives or business partners having proprietary interests in alternatives or substitutes to methyl bromide, or who own stock in companies producing alternatives or substitutes to methyl bromide, or who consult for companies seeking to phase out methyl bromide. Travel and subsistence for MBTOC meetings is paid for by the UK government and most recently by the Department for the Environment Farming and Rural Affairs and UNEP.

Dr Ken Vick

Department of Agriculture
Agricultural Research Service/ National Program Staff
5601 Sunnyside Ave
Beltsville MD 20705 – 5139
UNITED STATES

Dr Kenneth W. Vick is a Senior National Program Leader for methyl bromide alternatives research at the Agricultural Research Service (ARS), United States Department of Agriculture (USDA). As National Program Leader he helps lead the almost \$20 million ARS research program to develop alternatives to the use of methyl bromide for soil and post-harvest applications. ARS has an interest in the topics of the Montreal Protocol because it was assigned lead responsibility for developing alternatives as the primary research arm of the USDA and because it was deemed to be of high priority by the United States Government. Dr Vick has no proprietary interest in alternatives or substitutes to ODSs, does not own stock in companies producing ODS or alternatives or substitutes to ODSs and does not consult for any organization. His spouse, a MBTOC co-chair, consults for governments, NGOs and companies that have an interest in the phase out of methyl bromide because they are Parties to the Protocol or because they are investigating or developing food irradiation a methyl bromide alternative for some commodities and in some quarantine situation. She has no proprietary interest in alternatives or substitutes to ODSs, does not own stock in companies producing ODS or alternatives or substitutes to ODSs and does consult for organizations seeking to phase out ODSs. Dr Vick's travel to MBTOC and Montreal Protocol meetings is paid by the USDA Agriculture Research Service.

Mr Chris Watson

IGROX Ltd
White Hall, Worlingworth
Woolbridge, Suffolk, IP13 7HW
UNITED KINGDOM

Mr. Christopher Russell Watson is a MBTOC member since 1992. He works for Igrox Ltd in the UK as Chairman a part-time position since he is presently semi-retired. Mr Watson has been involved in the fumigation industry using both methyl bromide and other fumigants for 40 years. Together with his wife he formed Igrox Ltd in 1976, which is now one of the largest fumigation and pest control servicing companies in the UK. For the past 20 years he has been involved in working closely with government agencies in the UK to develop safe and efficient fumigation practices and procedures. Igrox Ltd has an interest in the topics of the Montreal Protocol because it supplies services and products that are alternatives to methyl bromide, as well as continuing to provide services using methyl bromide in situations where it is still necessary. Mr Watson owns stock in Igrox Ltd, and occasionally carries out consultancy work for agencies seeking to phase out ODS's which have included the UK government agencies as well as private companies. His spouse doesn't not own stocks in Igrox Ltd and has no proprietary interests in alternatives or substitutes for ODS's and does not consult for companies seeking to phase out ODS's. Travel to MBTOC meetings was subsidised by Igrox Ltd and the British Pest Control Association until 2005. Presently, Mr Watson covers travel expenses from his own personal funds with some assistance from the UK Government(DEFRA)

Mr Eduardo Willink

Estación Experimental Agroindustrial Obispo Colombrés
William Cross 3150, Las Talitas,
4101 Tucumán
ARGENTINA

Article 5 member

Mr Eduardo Willink is Director of Special Disciplines and Head of the Agricultural Zoology Department of the Estación Experimental Agroindustrial Obispo Colombrés Tucumán, Argentina. He is a full time researcher in entomology who leads a team of researchers working on quarantine treatments, systems approach and pest host status, and is a member of the Technical Panel on Phytosanitary Treatments within IPPC, FAO. The organization has an interest in the topics of the Montreal Protocol because its mission is to resolve regional agro industrial problems with the least impact on the environment. Mr Willink has no proprietary interest in alternatives or substitutes to ODSs, does not own stock in companies producing ODS or alternatives or substitutes to ODSs and does not consulting for organizations seeking to phaseout ODSs. Neither his spouse or dependant children work for or consult for organizations with an interest in the topics of the Montreal Protocol, nor do they have any proprietary interest in alternatives or substitutes to ODSs, own stock in companies producing ODS or their alternatives or substitutes or consult for organizations seeking to phaseout ODSs. Travel to TOC is paid by UNEP.

MBTOC – SOILS SUBCOMMITTEE						
Names	Gender	Affiliation	Expertise	Length of service	Country	Article 5 status
Co-Chairs						
1. Mohamed Besri	M	Institut Agronomique et Vétérinaire Hassan II (Academia)	Professor, researcher, particularly MB alts for vegetables. Pathologist (PhD)	B	Morocco	A5
2. Marta Pizano	F	Consultant	Consultant, MB alts, particularly cut flower production and IPM. Pathologist (MSc)	B	Colombia	A5
3. Ian Porter	M	Consultant	Researcher, specialist in soil disinfestation, chemical and non chemical alternatives, solarisation, biocontrol and IPM. Pathologist (PhD)	B	Australia	Non-A5
Members						
4. Marten Barel	M	Consultant	Consultant, , specialist on soil fumigation, Substrates, Hydroponics, Steaming, Bio-fumigation and Solarization	D	Netherlands	Non-A5
5. Antonio Bello	M	Centro de Ciencias Medioambientales (Government research)	Professor, non-chemical alternatives. Pathologist. (PhD, Prof.)	A	Spain	Non-A5
6. Aocheng Cao	M	Chinese Academy of Agricultural Sciences (Government research)	Researcher, soil alternatives, particularly in China (A5) context. Pathologist. (PhD)	C	China	A5
7. Peter Caulkins	M	Associate Director, Special Review & Re-registration Division US EPA	Registration of alternatives, regulatory issues (PhD)	D	US	Non A-5
8. Ariane Elmas	F	Totken Lebanon – consulting	Economics and trade	D	Lebanon	A5
9. Fabio Chaverri	M	IRET-Universidad Nacional (Academia)	Researcher, soil alternatives, including solarisation. Microbiologist.	C	Costa Rica	A5
10. Abraham Gamliel	M	Agricultural Research Organization, The Volcani Center, (Government Research)	Alternatives for soils, horticulture. Pathologist (PhD)	D	Israel	Non-A5
11. Saad Hafez	M	University of Idaho (Academia)	Soils alternatives, nematologist (PhD, Prof.)	C	US	Non-A5

12. George Lazarovits	M	Agriculture & Agri-food Canada (Government research)	Researcher, non chemical control of soilborne pathogens (PhD)	C	Canada	Non-A5
13. Nahum Marbán Mendoza	M	Universidad Autonoma de Chapingo (Academia)	Researcher, soils alternatives, particularly nematode problems (PhD, Prof.)	C	Mexico	A5
14. Melanie Miller	F	Consultant	Consultant in MB alternatives use and policy (PhD)	A	Belgium	Non-A5
15. Andrea Minuto	M	Agroinnova Universita Torino (Academia)	Researcher, MB and alternatives in soils. Pathologist (PhD)	D	Italy	Non-A5
16. Kazufumi Nishi	M	Nat Institute of Vegetables and Tea Science (Government research)	Nonchemical alts, particularly heat systems for soils (PhD)	D	Japan	Non-A5
17. James D. Schaub	M	United States Department of Agriculture (Government regulatory)	Agricultural economist (PhD)	C	US	Non-A5
18. Sally Schneider	F	United States Department of Agriculture (Government research)	Researcher in soils alts, particularly replant problems and propagative nursery material . Nematologist. PhD)	C	US	Non-A5
19. JL Staphorst	M	Plant Protection Research Institute (Parastatal research)	Soil Microbiologist (DSc)	B	South Africa	A5
20. Akio Tateya	M	Syngenta Japan K.K.	Application of MB and alts, particularly in Japan	A	Japan	Non-A5
21. Alejandro Baleiro	M	Instituto Nacional de Tecnología Agropecuaria (Government research)	Introduction/use of soils alts, including tobacco. Agronomist (MSc).	C	Argentina	A5
22. Nick Vink	M	University of Stellenbosch (Academia)	Agricultural economics (PhD, Prof.)	C	South Africa	A5
23. Jim Wells	M	Environmental Solutions Group, LLC (Consultant)	Registration and regulatory - MB and alternatives, soil uses	A	US	Non-A5
TOTALS	19 M 4 F			4A 4B 9C 6D		14 non-A5 9 A5

A - >10 years; B – 5-10; C – 2-5; D - <2 year

Co-chairs

Professor Mohamed Besri

Department of Plant Pathology

Institut Agronomique et Vétérinaire Hassan II

Rabat

MOROCCO

Article 5 co-chair

Prof. Mohamed Besri, is a full time Professor of Plant Pathology and Integrated Disease Management at the Hassan II Institute of Agronomy and Veterinary Medicine, Rabat, Morocco (HII IAVM). The HII IAVM has an interest in the topics of the Montreal Protocol because it houses specialists in Soil-borne Plant Pathogens and MLF projects (strawberries, bananas, cut flowers). It advises the Ministry of Agriculture on all aspects of alternatives to Methyl Bromide. Dr Besri has no proprietary interest in alternatives or substitutes to ODSs, does not own stock in companies producing ODS or alternatives or substitutes to ODSs . Dr Besri works occasionally as a consultant to UNEP on matters related to the Montreal Protocol. Neither Dr Besri's spouse, business partner or dependant children living at same home work for or consults for any organization which has an interest in the topics of the Montreal Protocol, nor do any of them have any proprietary interest in alternatives or substitutes to ODSs, nor do any of them own stock in companies producing ODS or alternatives or substitutes to ODSs or consult for organizations seeking to phaseout ODSs. Costs associated to travel,

communication, and others related to participation in the TEAP, MBTOC, and relevant Montreal Protocol meetings, are paid by UNEP's Ozone Secretariat.

Ms Marta Pizano

Consultant

Bogotá

COLOMBIA

Article 5 co-chair

Ms Marta Pizano is a consultant on methyl bromide alternatives, particularly for cut flower production, and has actively promoted methyl bromide alternatives among growers in many countries. She is a regular consultant for the Montreal Protocol Multilateral Fund (MLF) and its implementing agencies. In this capacity, she has contributed to the methyl bromide phase-out programs in nearly twenty Article 5 countries around the world, assisting growers with the adoption of sustainable alternatives and the implementation of IPM programs. She is a frequent speaker at national and international methyl bromide conferences and has authored numerous articles and publications on alternatives to this fumigant. She has been a member of MBTOC since 1998 and a co-chair since 2005. Neither Ms Pizano nor her husband or their children own stock or have proprietary interest in companies producing ODS or their alternatives or substitutes. Costs associated to travel, communication, and others related to participation in the TEAP, MBTOC, and relevant Montreal Protocol meetings, are paid by UNEP's Ozone Secretariat.

Dr Ian Porter

Principle Researcher, Plant Pathology

Department of Primary Industries, Victoria

AUSTRALIA

Dr Ian Porter is the Principle Researcher in Plant Pathology with the Victorian Department of Primary Industries (DPI). DPI has an interest in developing sustainable control measures for plant pathogens and biosecurity. He is a member of a number of National Committees regulating ODS, has led the Australian research program on methyl bromide alternatives for soils and has 27 years experience in researching sustainable methods for soil disinfection of plant pathogens with over 200 research publications. He has been a member of MBTOC since 1997, Soils sub committee chair since 2001 and MBTOC Co-chair since 2005. Neither, Dr Ian Porter, wife or children have any proprietary interest in alternatives or substitutes to ODSs, nor own stock in companies producing ODS or alternatives or substitutes to ODSs. Dr Porter is presently assisting National research agencies in Australia develop national priorities for IPM and soil health. He has acted occasionally as a key consultant for UNEP and UNIDO in developing programmes to assist China, Mexico and CEIT countries to replace methyl bromide. The Victorian DPI has in the past made in-kind contributions to attend MBTOC and UNEP meetings, but provides no present support. The Australian Federal Government Research Funds and funds obtained through the Ozone Secretariat have provided funds to support travel and expenses for MBTOC activities.

Members of Record

Mr Marten Barel

Consultant

THE NETHERLANDS

Marten Barel, a member of MBTOC since 2002, is a consultant. He has no proprietary interest in alternatives or substitutes to ODSs, and does not own stock in companies producing ODS or alternatives or substitutes to ODSs. Since 1999 he has worked as a consultant and trainer in MLF methyl bromide projects for GTZ, UNDP and UNIDO. For more than 30 years he has provided growers, fumigators and companies with specialist technical advice and training in methods of

controlling soilborne pests and soil pasteurisation/ disinfection techniques in nurseries and horticultural crop production. For 40 years (until 1999) he owned a fumigation / soil disinfection company that used methyl bromide until it was phased-out in the early 1980s, and then developed alternatives to methyl bromide e.g. negative pressure steaming techniques. His social partner and children do not work for organisations which have an interest in the topics of the Montreal Protocol, and have no proprietary interest in alternatives or substitutes to ODSs, and do not own stock in companies producing ODS or alternatives or substitutes to ODSs. Travel to MBTOC meetings is currently funded by the Ministry of VROM in the Netherlands.

Prof. Antonio Bello

Centro de Ciencias Medioambientales/ CSIC
Madrid
SPAIN

Dr Antonio Bello Pérez is a full time Research Professor at the Consejo Superior de Investigaciones Científicas, Madrid, Spain. The institute has an interest in the topics of the Montreal Protocol because of the environmental impact of methyl bromide. Dr Bello Pérez has no proprietary interest alternatives or substitutes to ODSs, does not own stock in companies producing ODS or alternatives or substitutes to ODSs and does not consult for organizations seeking to phaseout ODSs. He works occasionally as a consultant for UNEP, Implementing Agencies and Governments, on matters related to the Montreal Protocol. Travel to MBTOC meetings is paid by his institution, which in turn receives contributions for this travel from national projects.

Prof. Cao Aocheng

Institute of Plant Protection
Chinese Academy of Agricultural Sciences
Beijing
CHINA

Article 5 Member

Dr. Aocheng Cao is a Research Professor at the Institute of Plant Protection, Chinese Academy of Agricultural Sciences focusing on research in pesticide sciences. The Chinese Academy of Agricultural Sciences, a non-profit organization, is interested in the topics of the Montreal Protocol because soil pathogens and nematodes are important pests in China and alternatives to methyl bromide are urgently needed. Dr Cao has no proprietary interest in alternatives or substitutes to ODSs, does not own stock in companies producing ODS or their alternatives or substitutes and does not consult for organizations seeking to phase-out ODSs. His spouse also works for the Chinese Academy of Agricultural Sciences, which has an interest in the topics of the Montreal Protocol as it conducts research on pest control, but has no proprietary interest in alternatives or substitutes to ODSs, nor does she own stock in companies producing ODS or their alternatives or substitutes or perform consultancy for organizations seeking to phase out ODSs. Expenses related to Dr Cao's attendance to MBTOC meetings are paid by UNEP.

Dr. Peter Caulkins

Associate Director, Special Review & Reregistration Division EPA
Washington D. C.
UNITED STATES

Dr Peter Caulkins is the Associate Director in the Special Review and Reregistration Division in the Office of Pesticide Programs in the U.S.EPA. The U.S. EPA has sole authority for the regulation of all pesticide use in the U.S. and therefore has a strong interest in the Montreal Protocol's phase-out of methyl bromide. Neither Dr Caulkins nor his wife or their son have any proprietary interests in ODSs or their alternatives, own no stock in either ODS companies or companies providing alternatives and do not do any consulting for organizations seeking to phase-out ODSs. Travel to MBTOC meetings is paid for by EPA.

Prof. Fabio Chaverri

Instituto Regional de Estudios en Sustancias Tóxicas
Universidad Nacional
Heredia
COSTA RICA

Article 5 member

Mr Fabio Chaverri is a professor at the Universidad Nacional de Costa Rica where he works as a full time researcher on pesticide alternatives at the IRET (Central American Research Centre on Toxic Substances). The IRET has an interest in the topics of the Montreal Protocol since its main objective is to implement alternatives for toxic substances with a strong environmental or human health impact, such as ODSs. Mr Chaverri has no proprietary interest on alternatives or substitutes to ODSs, does not own stock in companies producing ODS or their alternatives or substitutes and does not consult for organizations seeking to phaseout ODSs. He occasionally works as a consultant for UNDP and UNEP, governments and companies on matters related to the Montreal Protocol. His spouse does not work for or consult for any organization with has an interest in the topics of the Montreal Protocol and has no proprietary interest on alternatives or substitutes to ODSs, nor does she own stock in companies producing ODS or their alternatives or substitutes or consult for organizations seeking to phaseout ODSs. Mr Chaverri's travel expenses to cover attendance to MBTOC meetings is paid by UNEP.

Ms Ariane Elmas

Tokten Lebanon
LEBANON

Article 5 member

Ms Ariane Elmas was formerly the project manager of a "Trade and Environment" project funded by UNEP, managed by UNDP and implemented by the Ministry of Environment in Lebanon. This project published a report on the effects of trade liberalization in Lebanon with special focus on products where methyl bromide is used and includes an annual profitability analysis and a cost benefit analysis comparing the Methyl Bromide alternatives used for each crop. Ms Elmas, is an economist and is currently the Project Manager at the UNDP in Lebanon. The UNDP has an interest in the topics of the Montreal Protocol because it is one of its implementing agencies and as such manages the MB phase out project implemented in Lebanon under the coordination of the Ministry of the Environment. Neither Ms Elmas, nor her spouse or their dependant children have any proprietary interest in alternatives or substitutes to ODSs, own stock in companies producing ODS or their alternatives or substitutes or consult for organizations seeking to phaseout ODSs. Expenses related to Ms Elmas' attendance to MBTOC meetings is paid by UNEP.

Dr. Abraham Gamliel

Agricultural Research Organization,
The Volcani Center,
Bet Dagan
ISRAEL

Dr Abraham Gamliel is a full time senior researcher on methods and technologies for pest control and pesticide application at the Ministry of Agriculture, Agricultural Research Organization, Volcani Center, Bet Dagan, Israel. He is also an adjunct professor at the Hebrew University of Jerusalem, Faculty of Agriculture, Rehovot, Israel. ARO Volcani Center has an interest in the topics of the Montreal Protocol because it is the research and development institute for solving the farmer's problem and for developing environmentally safe crop production. Dr Gamliel has no proprietary interest alternatives or substitutes to ODSs, does not own stock in companies producing ODS or

alternatives or substitutes to ODSs, and does not consult for organizations seeking to phaseout ODSs. He works occasionally as a consultant for the Government, on matters related to the Montreal Protocol. Neither his spouse nor their children work for or consult for organizations having an interest in the topics of the Montreal Protocol nor do they have a proprietary interest in alternatives or substitutes to ODS, own stock in companies producing ODS or their alternatives or substitutes. Dr Gamliel's travel expenses to attend MBTOC meetings are paid by the Ministry of Agriculture of Israel.

Prof Saad Hafez

Plant, Soil and Entomological Sciences
Univ. of Idaho
UNITED STATES OF AMERICA

Dr. Saad L. Hafez is a full Professor of Nematology at the University of Idaho, working at the Parma Research and Extension Center. The University of Idaho has an interest in the topics of the Montreal Protocol as it conducts research on methyl bromide alternatives for nematode control. Dr Hafez has no proprietary interest in alternatives or substitutes to ODSs, does not own stock in companies producing ODS or their alternatives or substitutes and does not consult for organizations seeking to phaseout ODSs. Dr. Hafez occasionally works as a consultant for UNDP, UNEP, and UNIDO, Governments, companies and others on projects relating to Methyl Bromide alternatives. Dr. Hafez's spouse children do not work for or consult for any organization with an interest in the topics of the Montreal Protocol. His spouse and their dependant children have no proprietary interest in alternatives or substitutes to ODSs, do not own stock in companies producing ODS or alternatives or substitutes to ODSs and do not consult for organizations seeking to phaseout ODSs. Costs of travel to enable Dr Hafez to attend MBTOC meetings are paid by the University of Idaho.

Dr George Lazarovits

Agriculture & Agri-food Canada,
London, Ontario
CANADA

Dr George Lazarovits is a research scientist at the Southern Crop Protection and Food Research Center of Agriculture and Agrifood Canada (AAFC). He is employed as a fulltime research scientist to investigate aspects of plant pathology involved with management of soilborne plant pathogens. AAFC has an interest in the topics of the Montreal Protocol because Canada has a vested interest in eliminating ozone- depleting substances such as methyl bromide, which are still being used by Canadian growers and Industries. AAFC, in collaboration with Environment Canada, is charged with overseeing the phase-out of ozone depleting products. Dr Lazarovits has no proprietary interest in alternatives or substitutes to ODSs, does not own stock in companies producing ODS or those manufacturing alternatives or substitutes to ODSs and does not act as consultant for organizations seeking to phase-out ODSs, other than non profit government agencies charged with enforcing the regulations of the Montreal Protocol. He is involved in advising as a consultant to Environment Canada (EC) on matters related to the Montreal Protocol, including evaluation of critical use nominations submitted to them by Canadian growers or Industries seeking exemptions for use of MB under CUE. Such nominations, if approved by EC, are eventually adjudicated by members of MBTOC. Dr Lazarovits' spouse has no involvement whatsoever with any issues or has any interest in the topics of the Montreal Protocol or any proprietary interest in alternatives or substitutes to ODSs. She does not own stock in companies producing ODS or alternatives or substitutes to ODSs and does not consult for organizations seeking to phase-out ODSs. They have no dependent children living with them and their children have no involvement in any businesses dealing with issues that are in any way related to the Montreal Protocol. Travel to MBTOC meetings is paid for by AACF, and occasionally Environment Canada, from A Base budgets.

Dr Nahum Marbán-Mendoza
Universidad Autónoma de Chapingo
MEXICO

Article 5 member

Dr Nahum Marbán-Mendoza is a full-time professor of Integrated Pest Management and Plant Nematology at the Universidad Autónoma de Chapingo in the graduate programme of crop protection. He has over 25 years experience in the research and development of non-chemical alternatives to control plant parasitic nematodes associated with different crops in Central America and Mexico. Dr Marbán-Mendoza was MBTOC co-chair from 2002 to 2005. He has also assisted implementing agencies of the Montreal Protocol (UNEP, UNIDO) with methyl bromide phase-out programs in Mexico and Guatemala; occasionally he receives funds for wages and travel. Neither Dr Marbán nor his spouse or their daughter have ever had proprietary interest or owned stocks in a company producing ODS or their alternatives or substitutes, nor have they ever consulted for organizations seeking to phase out ODSs. Costs related to Dr Marbán's participation in MBTOC activities are paid by UNEP.

Dr Melanie K Miller
Consultant
La Hulpe
BELGIUM

Dr Melanie Miller, a member of MBTOC since 1993, is a consultant on methyl bromide and alternative technologies. She has no proprietary interest in alternatives or substitutes to ODSs, and does not own stock in companies producing ODS or alternatives. She has authored a large number of papers and publications about methyl bromide alternatives for UNEP and other government bodies. She is a reviewer of project proposals for MLF and GEF methyl bromide projects, and has provided technical assistance to many methyl bromide projects in Article 5 countries. She was a sector expert in the World Bank's Ozone Operations Review Group (OORG) from 1999, member/adviser of the TEAP Economic Options Committee (EOC) Task Force on Methyl Bromide in 1996-1998, and analysed data for the TEAP Task Force reports on MLF replenishment in 2002 and 2005. Her spouse is an international expert on technical and legal aspects of the Montreal Protocol and currently works as a consultant. Her spouse has no proprietary interest in alternatives or substitutes to ODSs, and does not own stock in companies producing ODS or alternatives. The cost of travel to MBTOC meetings is paid from her own personal funds and sometimes by UNEP, at least in part.

Dr. Andrea Minuto
Ass. Prof. University of Torino
ITALY

Dr Andrea Minuto is a full time assistant professor at the University of Torino (c/o Agroinnova) in Italy. Agroinnova has an interest in the topics of the Montreal Protocol because of the research conducted on soilborne pest and disease management. Dr Minuto has no proprietary interest in alternatives or substitutes to ODSs, and does not own stock in companies producing ODS or their alternatives or substitutes. He does consulting (as Agroinnova) for organizations seeking to phase out ODSs and also works occasionally as a consultant for Implementing Agencies and Governments on matters related to the Montreal Protocol. His spouse does not work or consul for organizations which have an interest in the topics of the Montreal Protocol or organizations seeking phase-out of ODS, nor does she have any proprietary interest in alternatives or substitutes to ODSs, or own stock in companies producing ODS or their alternatives or substitutes. Travel to MBTOC meetings is paid by Agroinnova, which receives contributions from the Italian Ministry of Environment, Territory and Sea.

Dr Kazufumi Nishi

National Agriculture and Food Research Organization (NARO)
JAPAN

Dr Kazufumi Nishi is a Chief Researcher at the National Institute of Vegetable and Tea Science of Japan (NIVTS). He conducts research on plant disease control techniques, particularly physical control methods. Dr. Nishi has no proprietary interest in alternatives or substitutes to ODSs, does not own stock in companies producing ODS or alternatives or substitutes to ODSs and does not consult for organizations seeking to phaseout ODSs. Travel to MBTOC meetings is paid by the International Department at MAFF.

Dr. James D. Schaub

Office of the Chief Economist
U.S. Department of Agriculture
Washington
UNITED STATES

Dr. James D. Schaub is an economist and Director of the Office of Risk Assessment and Cost-benefit Analysis, Office of the Chief Economist, United States Department of Agriculture (USDA). Dr. Schaub is employed full time within the Office of the Chief Economist, USDA in Washington D.C. The USDA has an interest in the topics of the Montreal Protocol because of its interest in environmentally sound agricultural production systems and the protection stored commodities. Further, USDA is responsible for protection of animal and plant health from quarantine pests. Dr. Schaub has no proprietary interests in alternatives or substitute ODSs, does not own stock in companies producing ODS or alternatives or substitutes to ODSs and does not consult for organizations seeking to phase out ODSs. He does not work as a consultant to any organization on matters related to the Montreal Protocol. Neither his spouse nor dependant children living at same home work for or consult for any organization which has an interest in the topics of the Montreal Protocol, nor do any of them have any proprietary interest in alternatives or substitutes to ODSs, nor do any of them own stock in companies producing ODS or alternatives or substitutes to ODSs or consult for organizations seeking to phaseout ODSs. Travel to MBTOC meetings is paid by Office of the Chief Economist, USDA.

Dr. Sally Schneider

National Program Leader – Horticulture, Pathogens & Germplasm
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Dr Sally Schneider is a National Program Leader at the United States Department of Agriculture. Dr. Schneider is a full time National Program Leader for Horticulture, Pathogens, and Germplasm at the Agricultural Research Service, Beltsville, Maryland, U.S.A. The Agricultural Research Service has an interest in the topics of the Montreal Protocol because they are the in-house research agency for the U.S. Department of Agriculture. Dr. Schneider has no proprietary interest in alternatives or substitutes to ODSs, does not own stock in companies producing ODS or alternatives or substitutes to ODSs and does not consult for organizations seeking to phaseout ODSs. Dr. Schneider does not work, occasionally or otherwise, as a consultant to UN, UNEP, MLF, Implementing Agencies, Governments, companies, etc. on matters related to the Montreal Protocol. Dr. Schneider does not have a spouse, business partner, social partner, or dependant children living in same home. Travel to MBTOC meetings is paid by United States Department of Agriculture.

Dr. JL (Stappies) Staphorst

Senior Scientist

Plant Protection Research Institute (PPRI)

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Dr JL (Stappies) Staphorst is a soil microbiologist at the Plant Protection Research Institute of the Agricultural Research Council of South Africa. Dr Staphorst is a full time senior researcher, advisor and mentor in the Plant Pathology and Microbiology Division of the Institute in Pretoria, South Africa. The Plant Protection Research Institute has an interest in the topics of the Montreal Protocol because it houses the specialist Soil-borne Plant Diseases Unit and forms part of the Public Support Services Division that advises the Department of Agriculture on all aspects of plant diseases, pests and pesticides. Dr Staphorst has no proprietary interest in alternatives or substitutes to ODSs, does not own stock in companies producing ODS or alternatives or substitutes to ODSs and does no consulting for organizations seeking to phaseout ODSs. Dr Staphorst works occasionally as a consultant to UNEP on matters related to the Montreal Protocol. His spouse has no proprietary interest in alternatives or substitutes to ODSs, does not own stock in companies producing ODS or alternatives or substitutes to ODSs and does no consulting for organizations seeking to phaseout ODSs. Travel to MBTOC meetings is paid by UNEP with logistical support from the Plant Protection Research Institute.

Mr. Akio Tateya

Technical Adviser

Syngenta Japan K.K.

Tokyo

JAPAN

Mr. Akio Tateya is a Technical Adviser at Syngenta Japan K.K. a pesticide producing company, which does not produce substitutes to methyl bromide. He also a technical adviser for the Japan Fumigation Technology Association, a non-profit body that is financially supported by the Japanese Government and companies producing methyl bromide and its substitutes. He conducts work for Syngenta Japan K.K. on a contract basis for a consultancy fee; he acts as a nominal member and adviser of the Japan Fumigation Technology Association, for which he is not paid. He is also a member of the Japanese delegation attending the Meeting of the Parties and Open-ended Working Groups, acting as technical adviser on matters related to the Protocol. He has been occasionally asked to attend panels or meetings at the Ministry of Agriculture, Forestry and Fisheries. He has no proprietary or any other kind of interest in alternatives or substitutes to ODS, nor does he own any stocks in companies producing either ODS or their alternatives or substitutes and does not work for any organization seeking to phase-out ODS. His spouse and children do not work for organizations with an interest in the Montreal Protocol. Travel expenses to enable attendance to MBTOC meetings and other meetings related to the Montreal Protocol are paid by the Japan Fumigation Technology Association. He receives no funding from the Japanese Government.

Alejandro Valeiro

National Project Coordinator

National Institute for Agriculture and Technology

Tucumán

ARGENTINA

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Mr Alejandro Valeiro is the National Coordinator of the PROZONO Project (MLF/UNDP project ARG/02/G61) at the National Institute for Agricultural Technology (INTA) of Argentina, based at the Famaillá INTA's Experimental Station in Tucumán Province, Argentina. The INTA has an interest in

the topics of the Montreal Protocol because it is the national counterpart for implementing MLF methyl bromide phase-out projects, which are coordinated by the National Ozone Unit. Mr Valeiro has no proprietary interest on alternatives or substitutes to ODSs, does not own stock in companies producing ODS or their alternatives or substitutes and does not perform permanent consulting for organizations seeking to phaseout ODSs. He works occasionally as a consultant to the MLF, Implementing Agencies, on matters related to the Montreal Protocol. Mr Valeiro's spouse consults for UNDP, which has an interest in the topics of the Montreal Protocol because it implements MLF projects in Argentina. Neither Mr Valeiro, nor his spouse or dependant children have proprietary interest in ODS or their alternatives or substitutes, and do not own stock in companies producing ODS alternatives or substitutes to ODSs. Travel to MBTOC meetings is paid by UNEP.

Prof Nick Vink

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University of Stellenbosch
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Dr Nick Vink is Chair of the Department of Agricultural Economics at the University of Stellenbosch, South Africa. He is a full time Professor at the University of Stellenbosch. The University has no interest in the topics of the Montreal Protocol. Dr Vink has no proprietary interest in alternatives or substitutes to ODSs, does not own stock in companies producing ODS or alternatives or substitutes to ODSs and does not consult for organizations seeking to phaseout ODSs. He does not work as a consultant to any organisation on matters related to the Montreal Protocol. Neither his spouse or dependant children work for or consult for any organization which has an interest in the topics of the Montreal Protocol, nor do they have any proprietary interest in alternatives or substitutes to ODSs, or own stock in companies producing ODS or their alternatives or substitutes. Travel to MBTOC meetings is paid by UNEP.

Mr James Wells

President
Environmental Solutions Group, LLC
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James Wells is the President of Environmental Solutions Group, LLC (ESG), a regulatory consulting firm in Sacramento, California. He was invited to join MBTOC in 1993 primarily because of his experience in pesticide regulatory programs, especially with methyl bromide and methyl bromide alternatives. He worked for the State of California pesticide regulatory program for 27 years and was the Director of the California Department of Pesticide Regulation from 1991 to 1999. Dr. Wells has no proprietary interest in alternatives or substitutes to ODSs and does not own stock in companies producing ODS or alternatives or substitutes to ODSs. He does not consult for organizations seeking to phaseout ODSs. However, ESG consults with several agricultural organizations seeking Critical Use Exemptions for the use of methyl bromide. These organizations are; the California Strawberry Commission (CSC), the California Strawberry Nursery Association (CSNA), the Garden Rose Council (GRC) and the California Association of Garden and Nursery Centers (CANGC). Together with his staff he prepares and submits CUEs for the CSNA, GRC and CANGC to the USEPA. His spouse works for the California Department of Justice, which has no interest in the topics of the Montreal Protocol. She has no proprietary interest in alternatives or substitutes to ODSs, does not own stock in companies producing ODS or alternatives or substitutes to ODSs and does not consult with organizations seeking to phaseout ODSs. Travel to MBTOC meetings is paid by ESG.

ANNEX VI: List of nominated and exempted amounts of MB granted by Parties under the CUE process.

Table 12. List of nominated (2005 – 2009 in part) and exempted (2005 – 2008 in part) amounts of methyl bromide granted by Parties under the CUE process for each crop or commodity.

Part A: Preplant Soil Applications

Party	Industry	Total CUN MB Quantities					Total CUE MB Quantities			
		2005	2006	2007	2008	2009	2005	2006	2007	2008
Australia	Cut Flowers – field	40.000	22.350				18.375	22.350		
Australia	Cut flowers – protected	20.000					10.425			
Australia	Cut flowers, bulbs – protected Vic	7.000	7.000	6.170	6.150		7.000	7.000	3.598	3.500
Australia	Strawberry Fruit	90.000					67.000			
Australia	Strawberry runners	35.750	37.500	35.750	35.750	29.790	35.750	37.500	35.750	35.750
Belgium	Asparagus	0.630	0.225				0.630	0.225		
Belgium	Chicory	0.600	0.180				0.180	0.180		
Belgium	Chrysanthemums	1.800	0.720				1.120			
Belgium	Cucumber	0.610	0.545				0.610	0.545		
Belgium	Cut flowers – other	6.110	1.956				4.000	1.956		
Belgium	Cut flowers – roses	1.640								
Belgium	Endive (sep from lettuce)		1.650					1.650		
Belgium	Leek & onion seeds	1.220	0.155				0.660			
Belgium	Lettuce(& endive)	42.250	22.425				25.190			
Belgium	Nursery	Not Predictable	0.384				0.900	0.384		
Belgium	Orchard pome & berry	1.350	0.621				1.350	0.621		
Belgium	Ornamental plants	5.660					0.000			
Belgium	Pepper & egg plant	5.270	1.350				3.000	1.350		
Belgium	Strawberry runners	3.400	0.900				3.400	0.900		
Belgium	Tomato (protected)	17.170	4.500				5.700	4.500		
Belgium	Tree nursery	0.230	0.155				0.230	0.155		
Canada	Strawberry runners (PEI)	14.792	6.840	7.995	7.462	7.462	(a)14.792	6.840	7.995	7.462
Canada	Strawberry runners (Quebec)		1.826	1.826			(a)	1.826	1.826	
Canada	Strawberry runners (Ontario)			6.129					6.129	
France	Carrots	10.000	8.000	5.000			8.000	8.000	1.400	
France	Cucumber	85 revised to 60	60.000	15.000			60.000	60.000	12.500	
France	Cut-flowers	75.000	60.250	12.000			60.000	52.000	9.600	
France	Forest tree nursery	10.000	10.000	1.500			10.000	10.000	1.500	

Party	Industry	Total CUN MB Quantities					Total CUE MB Quantities			
		2005	2006	2007	2008	2009	2005	2006	2007	2008
France	Melon	10.000	10.000				7.500	6.000		
France	Nursery: orchard, raspberry	5.000	5.000	2.000			5.000	5.000	2.000	
France	Orchard replant	25.000	25.000	7.500			25.000	25.000	7.000	
France	Pepper	Incl in.tomato cun	27.500	6.000				27.500	6.000	
France	Strawberry fruit	90.000	86.000	34.000			90.000	86.000		
France	Strawberry runners	40.000	4.000	35.000			40.000	40.000	28.000	
France	Tomato (and eggplant for 2005 only)	150(all solanaceous)	60.500	33.250			125.000	48.400		
France	Eggplant		27.500	33.250				48.400		
Greece	Cucurbits	30.000	19.200				30.000	19.200		
Greece	Cut flowers	14.000	6.000				14.000	6.000		
Greece	Tomatoes	180.000	73.600				156.000	73.600		
Israel	Broomrape			250.000	250.000	250.000			250.000	
Israel	Cucumber - protected new 2007			25.000	18.750	6.250			25.000	
Israel	Cut flowers – open field	77.000	67.000	80.755	53.345	53.345	77.000	67.000	74.540	
Israel	Cut flowers – protected	303.000	303.000	321.330	163.400	155.200	303.000	240.000	220.185	
Israel	Fruit tree nurseries	50.000	45.000	10.000			50.000	45.000	7.500	
Israel	Melon – protected & field	148.000	142.000	140.000	87.500	87.500	125.650	99.400	105.000	
Israel	Potato	239.000	231.000	137.500	93.750	93.750	239.000	165.000	137.500	
Israel	Seed production	56.000	50.000				56.000	28.000		
Israel	Strawberries – fruit	196.000	196.000	176.200	64.125	57.000	196.000	196.000	93.000	
Israel	Strawberry runners	35.000	35.000		20	20	35.000	35.000	28.000	
Israel	Strawberry runners and fruit Ghaza				87.875	83.250				
Israel	Tomatoes			90.000					22.750	
Israel	Sweet potato				111.500	61.250				
Italy	Cut flowers (protected)	250.000	250.000	30.000			250.000	187.000	30.000	
Italy	Eggplant (protected)	280.000	200.000	15.000			194.000	156.000		
Italy	Melon (protected)	180.000	135.000	10.000			131.000	131.000	10.000	
Italy	Pepper (protected)	220.000	160.000	67.000			160.000	130.000	67.000	
Italy	Strawberry Fruit (Protected)	510.000	400.000	35.000			407.000	320.000		
Italy	Strawberry Runners	100.000	120.000	35.000			120.000	120.000	35.000	
Italy	Tomato (protected)	1300.000	1030.000	418.000			871.000	697.000	80.000	
Japan	Cucumber	88.300	88.800	72.400	68.600	61.400	88.300	88.800	72.4	51.450
Japan	Ginger – field	119.400	119.400	112.200	112.100	102.200	119.400	119.400	109.701	84.075
Japan	Ginger – protected	22.900	22.900	14.800	14.800	12.900	22.900	22.900	14.471	11.100
Japan	Melon	194.100	203.900	182.200	182.200	168.000	194.100	203.900	182.2	136.650
Japan	Peppers (green and hot)	189.900	200.700	169.400	162.300	134.400	187.200	200.700	156.700	121.725
Japan	Watermelon	126.300	96.200	94.200	43.300	23.700	129.000	98.900	94.2	32.475

Party	Industry	Total CUN MB Quantities					Total CUE MB Quantities			
		2005	2006	2007	2008	2009	2005	2006	2007	2008
Malta	Cucumber		0.096					0.127		
Malta	Eggplant		0.128					0.170		
Malta	Strawberry		0.160					0.212		
Malta	Tomatoes		0.475					0.594		
New Zealand	Nursery material	1.085	1.085					0.000		
New Zealand	Strawberry fruit	42.000	42.000	24.780			42.000	34.000	12.000	
New Zealand	Strawberry runners	10.000	10.000	5.720			8.000	8.000	6.234	
Poland	Strawberry Runners	40.000	40.000	25.000	12.000		40.000	40.000	24.500	
Portugal	Cut flowers	130.000	8.750				50.000	8.750		
Spain	Cut Flowers – Cadiz	53.000	53.000	35.000			53.000	42.000		
Spain	Cut Flowers – Catalonia	20.000	18.600	12.840	17.000 (+Andalucia)		20.000	15.000	43.490 (+Andalucia)	
Spain	Pepper	200.000	155.000	45.000			200.000	155.000	45.000	
Spain	Strawberry Fruit	556.000	499.290	80.000			556.000	499.290	0.0796	
Spain	Strawberry Runners	230.000	230.000	230.000	215.000		230.000	230.000	230.000	
Spain	Peppers and Strawberries				0.151					
UK	Cut flowers		7.560					6.050		
UK	Ornamental tree nursery	12.000	6.000				6.000	6.000		
UK	Strawberry (& raspberry in 2005)	80.000	63.600				68.000	54.500		
UK	Raspberry nursery		4.400					4.400		
USA	Chrys. Cuttings/roses	29.412					29.412	0.000		
USA	Cucurbits – field	1187.800	747.839	598.927	588.949	411.765	1187.800	747.839	592.891	486.757
USA	Eggplant – field	76.761	101.245	96.480	79.546	62.789	76.721	82.167	85.363	66.018
USA	Forest nursery seedlings	192.515	157.694	152.629	133.140	125.758	192.515	157.694	122.032	131.208
USA	Ginger	9.200					9.200	0.000		
USA	Orchard replant	706.176	827.994	405.415	405.666	314.007	706.176	527.600	405.400	393.720
USA	Ornamentals	210.949	162.817	149.965	138.538	137.776	154.000	148.483	137.835	138.538
USA	Nursery stock - fruit trees, raspberries, roses	45.789	64.528	12.684	51.102	27.663	45.800	64.528	28.275	51.102
USA	Peppers – field	1094.782	1498.530	1151.751	919.006	783.821	1094.782	1243.542	1106.753	756.339
USA	Strawberry fruit – field	2468.873	1918.400	1733.901	1604.669	1336.754	2052.846	1730.828	1476.019	1349.575
USA	Strawberry runners	54.988	56.291	4.483	8.838	8.837	54.988	56.291	4.483	8.838
USA	Tomato – field	2876.046	2844.985	2334.047	1840.100	1245.249	2876.046	2476.365	2065.246	1406.484
USA	Turfgrass	352.194	131.600	78.040	52.189	0	206.827	131.600	78.04	0
USA	Sweet potato	224.528			18.144	18.144				18.144

Table 12 (cont'). *List of nominated (2005 – 2008 in part) and exempted (2005 – 2008 in part) amounts of methyl bromide granted by Parties under the CUE process for each crop or commodity*

Part B: Post-harvest Structural and Commodity Applications

Party	Industry	Total CUN MB Quantities					Total CUE MB Quantities			
		2005	2006	2007	2008	2009	2005	2006	2007	2008
Australia	Almonds	1.900	2.100				1.900	2.100		
Australia	Rice consumer packs	12.300	12.300	10.225	9.200 +1.8	9.200	6.150	6.150	9.205	7.400
Belgium	Artefacts and structures	0.600	0.307				0.590	0.307		
Belgium	Antique structure & furniture	0.750	0.199				0.319	0.199		
Belgium	Churches, monuments and ships' quarters	0.150	0.059				0.150	0.059		
Belgium	Electronic equipment	0.100	0.035				0.100	0.035		
Belgium	Empty silo	0.050	0.043				0.050	0.043		
Belgium	Flour mill see mills below	0.125	0.072				See mills below	0.072		
Belgium	Flour mills	10.000	4.170				9.515	4.170		
Belgium	Mills	0.200	0.200				0.200	0.200		
Belgium	Food processing facilities	0.300	0.300				0.300	0.300		
Belgium	Food Processing premises	0.030	0.030				0.030	0.030		
Belgium	Food storage (dry) structure	0.120	0.120				0.120	0.000		
Belgium	Old buildings	7.000	0.306				1.150	0.306		
Belgium	Old buildings and objects	0.450	0.282				0.000	0.282		
Belgium	Woodworking premises	0.300	0.101				0.300	0.101		
Canada	Flour mills	47.200	34.774	30.167	28.650	26.913	(a)47	34.774	30.167	28.650
Canada	Pasta manufacturing facilities	(a)	10.457	6.757	6.067		(a)	10.457	6.757	
Canada	Commodities					0.068				
France	Seeds sold by PLAN-SPG company	0.135	0.135	0.100			0.135	0.135	0.096	
France	Mills	55.000	40.000	8.000			40.000	35.000	8.000	
France	Rice consumer packs	2.000	2.000				2.000	2.000		
France	Chestnuts	2.000	2.000	1.800			2.000	2.000	1.800	
Germany	Artefacts	0.250	0.100				0.250	0.100		
Germany	Mills and Processors	45.000	19.350				45.000	19.350		
Greece	Dried fruit	4.280	3.081	0.900			4.280	3.081	0.45	
Greece	Mills and Processors	23.000	16.000	1.340			23.000	15.445	1.340	
Greece	Rice and legumes		2.355					2.355		
Ireland	Mills		0.888	0.611				0.888		
Israel	Artefacts	0.650	0.650	0.600			0.650	0.650		
Israel	Dates (post harvest)	3.444	3.444	2.200	1.800		3.444	2.755	2.200	

Party	Industry	Total CUN MB Quantities					Total CUE MB Quantities			
		2005	2006	2007	2008	2009	2005	2006	2007	2008
Israel	Flour mills (machinery & storage)	2.140	1.490	1.490	0.800		2.140	1.490	1.040	
Israel	Furniture- imported	1.422	1.422	2.042			1.422	0.000		
Italy	Artefacts	5.500	5.500	5.000			5.225	0.000	5.000	
Italy	Mills and Processors	160.000	130.000	25.000			160.000	65.000	25.000	
Japan	Chestnuts	7.100	6.500	6.500	6.300	5.800	7.100	6.800	6.500	6.300
Latvia	Grains		2.502					2.502		
Netherlands	Strawberry runners post harvest		0.120	0.120				0		
Poland	Medicinal herbs & dried mushrooms as dry commodities	4.000	3.560	1.800	0.500		4.100	3.560	1.800	1.800
Poland	Coffee, cocoa beans	(a)	2.160	2.000	0.500			2.160	1.420	1.420
Spain	Rice		50.000					42.065		
Switzerland	Mills & Processors	8.700	7.000				8.700	7.000		
UK	Aircraft			0.165					0.165	
UK	Mills and Processors	47.130	10.195	4.509			47.130	10.195	4.509	
UK	Cereal processing plants		8.131	3.480			(a)	8.131	3.480	
UK	Cheese stores	1.640	1.248	1.248			1.640	1.248	1.248	
UK	Dried commodities (rice, fruits and nuts) Whitworths	2.400	1.256				2.400	1.256		
UK	Herbs and spices	0.035	0.037	0.030			0.035	0.037		
UK	Mills and Processors (biscuits)	2.525	1.787	0.479			2.525	1.787		
UK	Spices structural equip.	1.728					1.728	0.000	0.479	
UK	Spices stored	0.030					0.030	0.000		
UK	Structures buildings (herbs and spices)	3.000	1.872	0.908			3.000	1.872	0.908	
UK	Structures, processors and storage (Whitworths)	1.100	0.880	0.257			1.100	0.880	0.257	
UK	Tobacco equipment	0.523					0.050			
UK	Woven baskets	0.770					0.770			
USA	Dried fruit and nuts (walnuts, pistachios, dried fruit and dates and dried beans)	89.166	87.719	91.299	67.699	58.912	89.166	87.719	78.983	58.921
USA	Dry commodities/ structures (cocoa beans)	61.519	61.519	64.028	52.256	51.002	61.519	55.367	64.082	53.188
USA	Dry commodities/ structures (processed foods, herbs and spices, dried milk and cheese processing facilities) NPMA	83.344	83.344	85.801	72.693	66.777	83.344	69.118	82.771	69.208
USA	Smokehouse hams (Dry cure pork products) (building and product)	136.304	135.742	40.854	19.669	19.699	67.907	81.708	18.998	19.699
USA	Mills and Processors	536.328	505.982	401.889	362.952	291.418	483.000	461.758	401.889	348.237