

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



UNEP

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

SEPTEMBER 2009

**EVALUATIONS OF 2009 CRITICAL USE NOMINATIONS FOR METHYL
BROMIDE AND RELATED MATTERS**

FINAL REPORT

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Common Acronyms

1,3-D	1,3-dichloropropene
A5	Article 5 Party
CUE	Critical Use Exemption
CUN	Critical Use Nomination
DOI	Disclosure of Interest
EC	European Community
EMOP	Extraordinary Meeting of the Parties
EPA	Environmental Protection Agency
EPPO	European Plant Protection Organisation
IM	Iodomethane
IPM	Integrated Pest Management
IPPC	International Plant Protection Convention
ISPM	International Standard Phytosanitary Measure
LPBF	Low Permeability Barrier Film (including VIF films)
MB	Methyl Bromide
MBTOC	Methyl Bromide Technical Options Committee
MBTOC QSC	Methyl Bromide Technical Options Committee Quarantine, Structures and Commodities Subcommittee
MBTOC S	Methyl Bromide Technical Options Soils Subcommittee
MDI	Metered Dose Inhalers
MITC	Methyl isothiocyanate
MOP	Meeting of the Parties
MS	Metham sodium
OEWG	Open Ended Working Group
Pic	Chloropicrin
QPS	Quarantine and Pre-shipment
SF	Sulfuryl fluoride
TEAP	Technology and Economics Assessment Panel
USA	United States of America
VIF	Virtually Impermeable Film
VOC	Volatile Organic Compounds

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1. Scope of the Report

This 2009 final report provides evaluations by MBTOC of CUNs submitted for methyl bromide (MB) in 2010 and 2011 by Parties in accordance with Decision IX/6 (Annex I). CUNs were submitted to the Ozone Secretariat by the Parties, in accordance with the timetable set out in the Annex I referred to by Decision XVI/4 (Annex II of this report).

This final report also provides information from Parties on stocks (Decision Ex.1/4 (9f)), an update on registration issues affecting availability of alternatives for preplant and post harvest uses (Decision Ex. 1/4 (9i) and (9j)), partial information on actual MB consumption for critical uses (Decision XVII/9), apparent adoption rates of alternatives, as evidenced by trend lines on reduction of MB CUNs (Decisions XIX/9, XX/5), and consideration of national, sub national and local regulations and law on the use of MB alternatives (Decision XX/5). It is noted that trend lines on adoption do not necessarily indicate true adoption rates for alternatives, because the use of stocks of MB may be available to the same sector or areas of production may have fallen within the sector due to a range of circumstances.

Standard presumptions used in the 2009 round were the same as those used in the 2008 round. MBTOC Soils (MBTOC S) conducted a review of commercial use rates in countries for preplant soils use in March 2009. This review confirmed that most actual MB rates presently used commercially in sectors conformed with the present standard presumptions, unless CUNs identified regulations which required different rates. MBTOC S has updated references to substantiate its standard presumptions for MB dosage rates (Annex III). These standard presumptions are subject to continual review, however any changes as required in Annex 1, MOP16 are to be notified to the Parties at the MOP preceding the year of assessment .

MBTOC Soils (MBTOC S) has initial responsibility for the pre-plant uses and alternatives of methyl bromide. MBTOC Quarantine, Structures and Commodities (MBTOC QSC) has initial responsibility for issues concerning methyl bromide uses and alternatives for quarantine, pre-shipment, structural and commodity treatments. Evaluations of CUNs for the two categories are reported separately below. Outcomes from deliberations by the two MBTOC subcommittees were discussed and vetted via electronic communication and each member asked to provide consensus on the final recommendation. Recommendations made by MBTOC S were circulated to MBTOC QSC and vice versa, as part of the process of reaching consensus within the whole committee.

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 MB 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 MB 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. TEAP and its MBTOC provide 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 depending on its technical and economic evaluation. The full text for Decision IX/6 can be found in Annex I at the end of this document. 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 answers to questions requested by MBTOC, up to the date of the assessment.

MBTOC has again encountered difficulty in the assessment of some nominations for MB use on soils 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 recent references. This is important for economic assessments where several comparisons with alternatives are based on data from studies conducted many years ago, (some on different crops e.g. tomato for eggplant CUNs) and these may not account for data with the new alternatives and new application methods for established alternatives.

Now that technically effective 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, as MBTOC will be unable to analyse the impact of national, subnational and local regulations and law as required in Decision XX/5. In some cases, MBTOC has proposed existing commercially and economically feasible alternatives and 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 Parties economic argument relating to CUNs.

2.3. Consideration of Stocks - Decision Ex.1/4 (9f)

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 with the information on stocks. Since the consideration of stocks is an active area of negotiation for the Parties, 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 from 2006 to 2009 for the preceding year and summarized in Table 2.1 to 2.4 below. Parties may wish to consider this information in the light of Decision IX/6 1(b)(ii).

Efficient functioning of commerce requires a certain level of “pipeline” stocks and additional stocks to respond to emergencies. Additionally, stocks may be held on behalf of other Parties. It is unclear whether reported stocks below fully cover the stocks held for exempt uses for QPS and feedstocks. The correct or optimal level of stocks for virtually every input to production is not zero.

Table 2.1. Quantities of MB (metric tonnes) ‘on hand’ at the beginning and end of 2005, as reported by Parties in 2007 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	146.6	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	1 072.35	1 088.708	1 088.708	0
Japan	748	0	594.995	594.995	546.861	48.134
New Zealand	50	6.9	40.5	47.4	44.58	2.81
USA(a)	9 552.879		7 613	not reported	7 170	443

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

Table 2.2 Quantities of MB ‘on hand’ at the beginning and end of 2006, as reported by Parties in 2007/2008 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	75.1	0	55.308		55.308	0
Canada	53.897	3.713	41.969	45.682	44.114	1.568
EC	3 536.755	114.953	1 462.747	1 577.700	1 558.557	19.114
Israel	880.29	0	840.6	840.6	840.6	0
Japan	741.4	70.735	488.81	559.545	540.207	19.338
USA	8 081.753	9 974(a) 443(b)	6 924	16 898	6 425	8 170(c)

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

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

(c) The sum of 499 tonnes of stocks produced/imported in 2006 specifically for CUEs, plus 7,671 tonnes stocks acquired pre-2005.

Table 2.3 Quantities of MB ‘on hand’ at the beginning and end of 2007, as reported by Parties in 2008 under Decision XVI/6.

Party	Critical use exemptions authorized by MOP for 2007	Quantity of MB as reported by Parties (metric tonnes)				
		Amount on hand at start of 2007	Quantity Acquired for CUEs in 2007 (production + imports)	Amount available for use in 2007	Quantity used for CUEs in 2007	Amount on hand at the end of 2007
Australia	48.553	0	45.832	45.832	45.832	0
Canada	52.874	0.897	38.073	38.970	38.622	0.348
EC	689.142	31.635	484.842	516.477	508.031	8.446
Israel	966.465	0	940.675	940.675	750.225	190.45
Japan	636.172	23.417	479.290	502.707	485.113	17.594
USA	6 749	7 671(a)	4 314	11 985	4 269	6 503(b)

(a) Amount of pre-2005 stocks

(b) The sum of 45 tonnes of stocks produced/imported in 2007 specifically for CUEs, plus 6,458 tonnes stocks acquired pre-2005.

Table 2.4 Quantities of MB ‘on hand’ at the beginning and end of 2008, as reported by Parties in 2009 under Decision XVI/6.

Party	Critical use exemptions authorized by MOP for 2008	Quantity of MB as reported by Parties (metric tonnes)				
		Amount on hand at start of 2008	Quantity Acquired for CUEs in 2008 (production + imports)	Amount available for use in 2008	Quantity used for CUEs in 2008	Amount on hand at the end of 2008
Australia	48.450	0	41.037	41.037	41.037	0
Canada	42.19	0.348	32.937	33.285	31.281	1.997
EC	245.146	6.409	206.146	212.555	212.463	0.092
Israel ^d	2.112	0	1.700	1.700	1.700	0
Japan	443.775	24.467	392.994	417.461	409.937	7.524
USA	5 336	1 730 6458(a)	3 036	9464	4 083	5381(b) 269(c)

(a) Amount of pre-2005 stocks

(b) Includes the pre-2005 stocks

(c) Amount of unused allocation for CUEs which will be reduced from following years production

(d) Only post harvest uses were provided in the accounting framework

2.3.1. Stocks

TEAP notes that the amount of MB stocks held by the US is now substantially greater than the total critical use allocation in a given year. In 2006, the US predicted that pre 2005 stocks for preplant soil uses would be exhausted by 2009, yet a major proportion of the pre 2005 stocks are still available. TEAP notes that the US has made allowances for some of the use of these stocks as critical allowances for CUNs and that Parties will be addressing the handling of stocks in response to Decision I X/6 par 1 (b)(ii).

2.4. Reporting of MB Consumption for Critical Use - Decision XVII/9

Decision XVII/9(10) of the 17th MOP requests TEAP and its MBTOC to “report for 2005 and annually thereafter, for each agreed critical use category, the amount of methyl bromide nominated by a Party, the amount of the agreed critical use and either:

- (a) The amount licensed, permitted or authorised; or
- (b) The amount used”

Since the start of the CUN reviews in 2003, MBTOC has provided the amounts of MB nominated and agreed for each critical use (Annexes VI and VII). Not all Parties supply data under Table 2 of the accounting framework, set out on p. 65 of the Handbook on Critical Use Nominations (version 6 of December 2007). Data reported here for (a) and (b) above is thus incomplete.

Tables and figures in this report (Table 3-4, Figures 3-1 and 3-2) show the nominated MB amounts and the apparent rate of reduction in MB or adoption of alternatives achieved by Parties. It should be noted that for those countries that have pre-2005 stocks of MB that are being drawn down, the reductions in CUEs from year to year cannot be taken directly as evidence of alternative adoption since pre-2005 stocks may have been sold into the same sectors. Table 14-5 in particular shows the amounts nominated and approved for ‘Critical Use’ in 2009 and 2010.

2.5 Trends in Methyl Bromide Use for CUEs since 2005

As part of the requirements of Decision XVII/9 trends in phase out by Parties are shown below. Since 2005, there has been a progressive trend by all Parties to reduce their nominations for consumption for preplant soil uses and post harvest uses, although this has occurred at different rates. Figs 3.1 and 3.2 show the trends in the reduction in amounts approved/nominated by Parties for ‘Critical Use’ from 2005 to 2011 for some key uses. The complete trends in phase out of MB by country, as indicated by change in CUE, are shown in Annexes V and VI.

Figure 2.1. Amounts of MB exempted for CUE uses in preplant soil industries from 2005 to 2011. Solid lines indicate the trend in CUE methyl bromide. Dashed lines indicate quantity of methyl bromide nominated by the Parties in either 2010 or 2011.

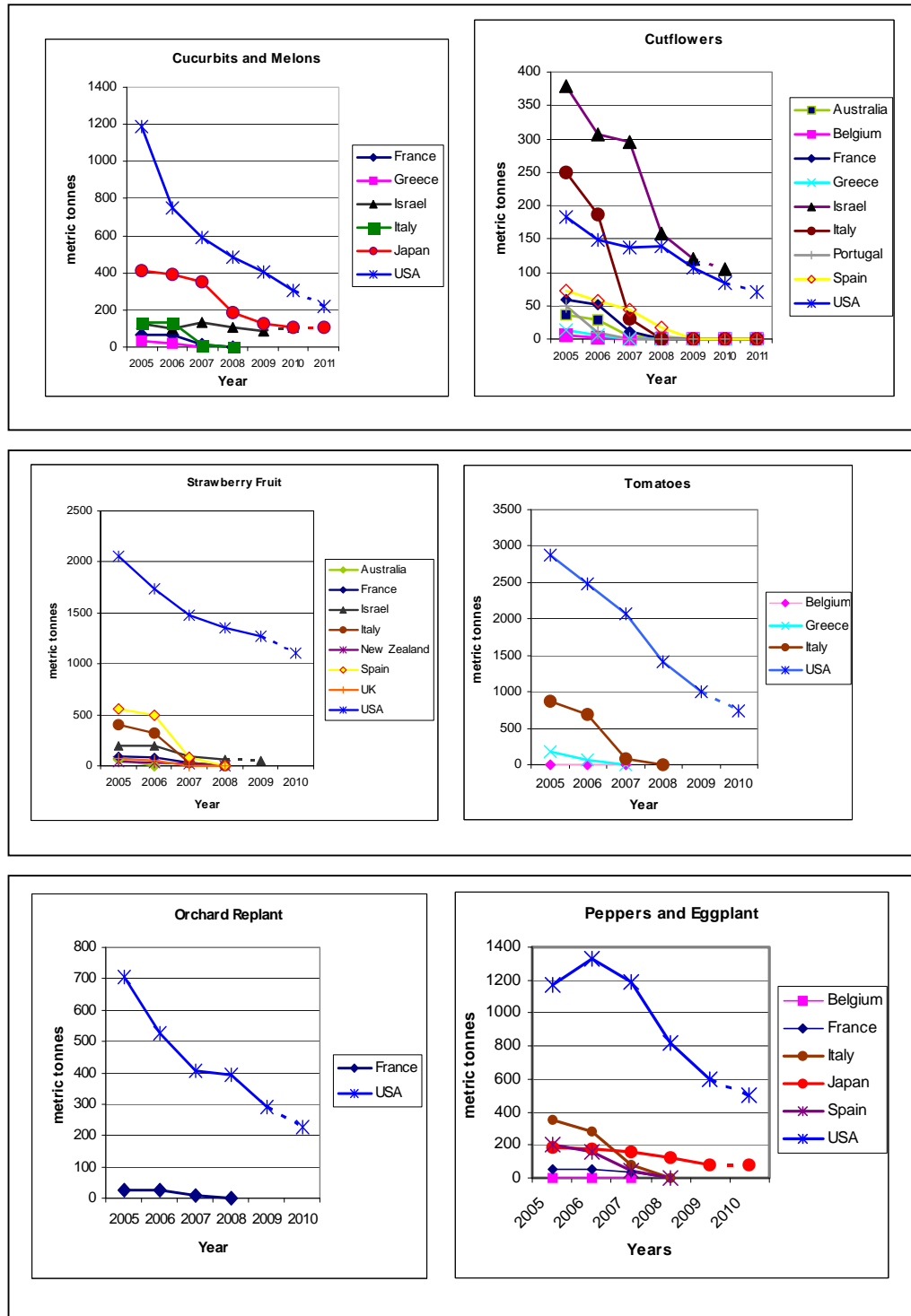


Figure 2.2. Amounts of MB exempted for CUE uses in mills and food processing facilities from 2005 to 2011. Solid lines indicate trend in CUE methyl bromide. Dashed lines indicate quantity of methyl bromide nominated by the Party in either 2010 or 2011.

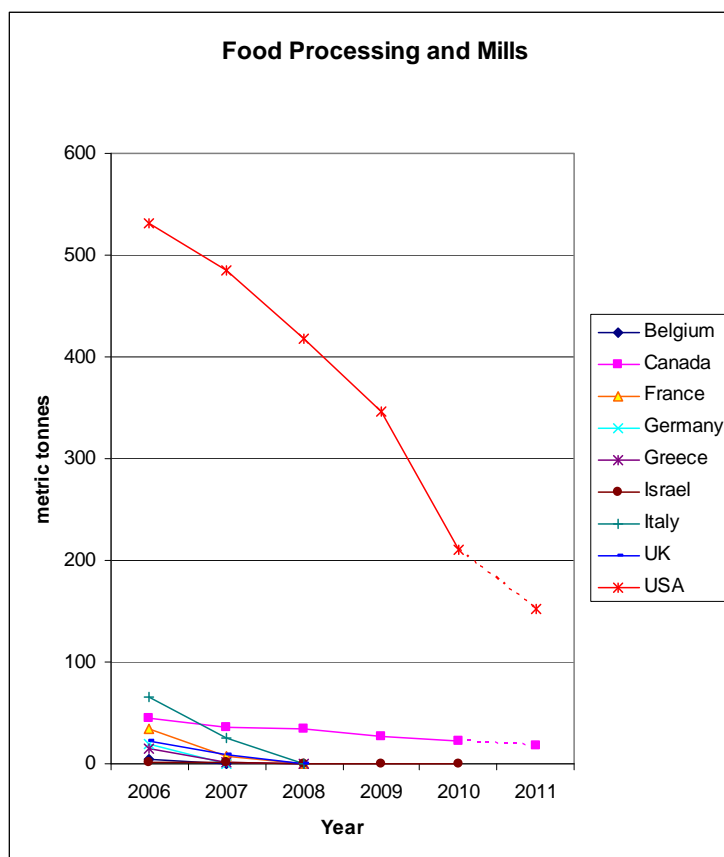


Table 2.5. Summary of Critical Use Nomination and Exempted Amounts of MB (2005- 2011) Granted by Parties and final Recommendations for CUEs for 2010 and 2011. (Note: A breakdown of CUN and CUE amounts by sector is given in Annex IV)

PARTY	QUANTITIES NOMINATED							QUANTITIES APPROVED						Quantities Recommended in this Round	
	2005	2006	2007	2008	2009	2010	2011	2005 (1ExMOP and 16MOP)	2006 (16MOP+ 2ExMOP+ 17MOP)	2007 (17MOP + 18MOP)	2008 (18MOP + 19MOP)	2009 (19MOP)	2010 (20MOP)	2010*	2011*
Australia	206.950	81.250	52.145	52.900	38.990	37.610	35.450	146.600	75.100	48.517	48.450	37.610	36.440	0	28.710
Canada	61.992	53.897	46.745	42.241	39.115	35.080	19.368	61.792	53.897	52.874	36.112	39.020	30.340	3.529	19.368
European Community ¹	5754.361	4213.47	1239.873	245.00	0	0	0	4392.812	3536.755	689.142	245.146	0	0	0	0
Israel	1117.156	1081.506	1236.517	952.845	699.448	383.700	*	1089.306	880.295	966.715	860.580	610.854	*	290.914	*
Japan	748.000	741.400	651.700	589.600	508.900	288.500	249.420	748.000	741.400	636.172	443.775	305.380	267.000		239.746
New Zealand	53.085	53.085	32.573	0	0	0	0	50.000	42.000	18.234	0	0	0	0	0
Switzerland	8.700	7.000	0	0	0	0	0	8.700	7.000	0	0	0	0	0	0
USA	10753.997	9386.229	7417.999	6415.153	4958.034	3299.490	2388.128	9552.879	8081.753	6749.060	5355.976	4261.974	3232.856	2.018	2055.200
TOTALS	18704.241	15617.837	10677.552	8297.739	6244.487	4044.380	2692.366	16050.089	13418.200	9160.714	6990.039	5,254.838	3566.636	296.461	2341.533

* Not yet available.

¹ Members of the European Community which had CUNs/CUEs included:

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

2.6. Evaluations of CUNs – 2009 round for 2010 and 2011 exemptions

In considering the CUNs submitted in 2009, as previously, both MBTOC subcommittees applied the standards contained in Annex I of the final report of 16 MOP, and, where relevant, the standard presumptions given below. In particular MBTOC sought to provide consistent treatment of CUNs within and between Parties while at the same time taking local circumstances into consideration. The CUN assessment in 2009 was also conducted as required by the time schedule for considerations of CUNs given in Annex I referred to in Decision XVI/4. This Annex contains a work schedule for MBTOC, which envisions up to two meetings per year to make CUN evaluations. The schedule further allows MBTOC to seek further information from Parties and for Parties to provide further information in response to MBTOCs interim recommendations made during the first meeting.

CUNs assessed in this report relate to CUEs sought for 2010 and 2011. No nominations in this particular round were initially submitted for longer periods, however the US Party revised one nomination for preplant soil use after the 29 OEWG and sought an MB exemption for 2010, 2011 and 2012 as part of an action plan developed by the Party for phase out of MB by 2013 for that specific CUN.

In total, two Parties (Israel and Canada) submitted nominations for 2010 and four Parties (Australia, Canada, Japan, and the USA) submitted nominations for 2011. Israel submitted a nomination for preplant soil use of MB for broomrape eradication in polyhouses, which had not been applied for in the previous rounds, but has been applied for in open fields. The total number of nominations submitted has been reduced from 42 nominations submitted by five Parties in the 2008 round to 36 for the present round. During the 29 OEWG, Japan confirmed its intention to phase out all preplant soil uses of MB by 2013.

Owing to the limited number of CUNs requiring reassessment, both subcommittees of MBTOC conducted their reevaluation of CUNs by email communication from July to September, using new information provided by Parties at the 29th OEWG and later. The review of information and the consensus decisions were made in subcommittees. Outcomes from deliberations by the two MBTOC subcommittees were discussed and vetted further via electronic communication. Recommendations made by MBTOC S were circulated to MBTOC QSC and vice versa, as part of the process of reaching consensus within the whole committee. Unless otherwise indicated, the most recent CUE approved by the Parties for a particular CUN was used as baseline for consideration of continuing nominations.

In general, CUNs resulted mainly from the following issues: regulatory restrictions on alternatives, scale-up of alternatives, technical efficacy of alternatives, economic issues and, to a much smaller degree, the technical unavailability of alternatives. For the most part, technical alternatives exist. Additionally, MBTOC notes that some Parties continue to struggle with the ability to adapt previously identified alternatives to their circumstances, within their definition of economic feasibility.

2.7. Disclosure of Interest

As in the past, all MBTOC members have prepared disclosure of interest forms relating specifically to their level of national, regional or enterprise involvement for the 2009 CUN process, according to a standardised format developed by TEAP. The Disclosure of Interest declarations are found in Annex VII at the end of this report. 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. MBTOC Soils: Final Evaluations of 2009 Critical Use Nominations for Methyl Bromide

3.1 Summary of outcomes

In the 2009 round, 27 CUNs were submitted for soil uses, 9 for 2010 and 18 for 2011. During its first meeting of the year held in Agadir, Morocco (20-24 April, 2009), Parties requested 382.140 tonnes for 2010 and 2,500.814 tonnes for 2011. At this meeting, interim recommendations were made on all nominations totaling 289.874 tonnes for 2010 and 2,154.467 tonnes for 2011 (Table 3.3).

After the 29 OEWG, two Parties, Australia and USA, requested the subcommittee to consider further information relating to their nominations and some recommendations were changed in light of the new or additional information supplied. In its final assessment, MBTOC-S has recommended a further 2.018 tonnes for 2010 and 1.346 tonnes for 2011 for US strawberry runners respectively and 1.490 tonnes for the Australian strawberry runners. No change was made to the interim recommendation for the other 6 CUNs where Parties requested reevaluation.(Table 3.1). The final recommendation for 2010 was 291.892 tonnes and for 2011 was 2157.303 tonnes (Table 3.2).

Table 3.1. Changes occurring to nominated and recommended amounts of MB for preplant soil uses after the May 2008 interim report.

Party	CUN	Initial nomination by the Party	Interim MBTOC recommendation	Revised nomination by the Party after the 29 th OEWG*	Final MBTOC recommendation	
					2010	2011
Australia	Strawberry runners	29.790	22.350	29.790		23.840
	TOTAL	29.790	22.350	29.790		23.840
United States	Cucurbits ^a	218.032	195.698	218.032		195.698
	Eggplant ^a	21.561	19.725	21.561		19.725
	Forest Nurseries	106.043	93.547	106.043		93.547
	Peppers ^a	212.775	206.234	212.775		206.234
	Strawberry fruit ^a	1023.471	812.709	1023.471		812.709
	Strawberry runners*	7.381	4.690	7.381	2.018	6.0355
	Tomatoes ^a	336.191	292.751	336.191		292.751
	TOTAL	1925.454	1625.354	1925.454	2.018	1626.700

* At the OEWG, the US delegation presented an action plan for phase out of MB for strawberry runners in the SE Region. The plan described an action plan to phase out by 2013 with the following schedule - 25% reduction of 2.69 t in 2010, 50% reduction in 2011 and 75% in 2012. ^a - Recommended amounts did not change as dosage rates considered effective for application and conformed to standard presumptions.

In the 2009 round, MBTOC has sometimes suggested quantities of MB for 2010 or 2011 different from those nominated. Grounds used for these changes are given in detail after the relevant CUNs in Table 3.7. The adjustments follow the standard presumptions given in Tables 3.2 and 3.3 below, unless indicated otherwise. MBTOC recommended a greater transition rate for several nominations as it considers alternatives are available and can be adopted for a larger portion of the nomination by 2010 or 2011 than those indicated by the Party. MBTOC acknowledged the reduction schedule put forward in the Japanese Action Plan in 2009, however considered that further reductions were feasible and made modest reductions in order to assist Japan meet its phase out by 2013. For some nominations, MBTOC adjusted for revised standard MB dosage rates (as presented at 19th MOP) for vegetables, strawberries and strawberry runners, where either data from research trials (often within the CUN) had provided information to support the dose rate or where commercial use rates supported the presumptions. MBTOC S did not accept the high MB dosage rates requested by the Australian runner industry and several sectors in the USA and maintained the standard presumptions for dosage rates for use with barrier films and MB/Pic formulations provided to the 19th MOP.

As in previous assessments, MBTOC evaluation of CUNs for preplant soil use used adoption in regions with similar climatic zone and cropping practices as an indication of the feasibility (technical and economic) for adoption of an alternative to a similar sector.

Table 3.2 Summary of MBTOC S final recommendations for 2010 and 2011 by country for CUNs received in 2009 for preplant soil use of MB (tonnes)

Country	CUE approved at 20 th MOP		CUN submitted for		MBTOC-S final recommendation in 2009 round	
	2009	2010	2010	2011	2010	2011
Australia		29.790		29.790		23.840
Canada		7.462		7.462		5.261
Israel	608.454		382.140		289.874	
Japan		261.600		244.070		234.396
USA*		2998.948	2.018	2,222.039	2.018	1,893.806
Total	608.454	3297.800	384.158	2,500.814	291.892	2,157.303

* The number shown is the revised nomination by USA after the 29th OEWS.

Table 3.3 Summary of the amounts approved by Parties at 19th MOP for 2010, and amounts recommended by MBTOC S (in square brackets) for CUE's for preplant uses of MB (tonnes) by sector for 2010 and 2011 submitted in the 2009 round.

Country and Sector	Years	
	2010	2011
1. Australia		
1. Strawberry runners	29.790	[23.840]
2. Canada		
1. Strawberry runners	7.462	[5.261]
3. Israel		
1. Broomrape protected	[12.500]	-----
2. Cucumber	[15.973]	-----
3. Cut flowers & bulbs protected	[63.464]	-----
4. Cut flowers open field	[28.554]	-----
5. Melon protected & open field	[70.000]	-----
6. Strawberry fruit - Sharon and Gaza	[57.063]	-----
7. Strawberry runners - Sharon and Gaza	[22.320]	-----
8. Sweet potatoes	[20.000]	-----
TOTAL	[289.874]	
4. Japan		
1. Cucumber	-	[27.621]
2. Ginger open field	-	[47.450]
3. Ginger protected	-	[7.036]
4. Melon	-	[73.548]
5. Pepper green & hot	-	[65.691]
6. Watermelon	-	[13.050]
TOTAL	261.600	[234.396]
5. USA		
1. Cucurbits	-	[195.698]
2. Eggplants (field)	-	[19.725]
3. Forestry nursery	-	[93.547]
4. Nurseries stock: fruits, nuts & flowers	-	[7.955]
5. Orchard replant	-	[183.232]
6. Ornamentals	-	[64.307]
7. Pepper (field)	-	[206.234]
8. Strawberry (field)	-	[812.709]
9. Strawberry runners	[2.018]	[4.690] + [1.346]
10. Sweet potatoes	-	[11.612]
11. Tomatoes (field)	-	[292.751]
TOTAL	2,998.948 + [2.018]	[1893.806]

3.2. Issues related to CUN Assessment for Preplant Soil Use

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, i.e. use of grafted plants.

Key issues which assisted MB reductions and also affected the need for MB in the 2009 round were i) uptake and commercial adoption of methyl iodide (iodomethane) in the

southeast of USA where use with barrier films has improved its performance and cost effectiveness, ii) regulations on key alternatives, particularly 1,3-D township caps and buffer zones on 1,3-D, metham sodium and Pic used alone or in mixtures (iii) restrictions on use of high rates of Pic (greater than 200 kg/ha (20 g/m²)) in some counties of California, iv) lack of effective alternative controls for nutsedge, and v) lack of studies in specific sectors i.e. orchard replant.

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 more difficult to adopt for propagation materials, such as strawberry runners and nurseries, however the lack of research studies provided with CUNs has also led to difficulties in assessment. MBTOC considers that several of these do not fully satisfy the requirements of Decision IX/6 and urges Parties to increase studies in these sectors. 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. In addition to the recent registration of MI in the USA, commercial registration is being sought in all other countries applying for CUEs for preplant soil of MB (Australia, Japan, Israel), except Canada.

MBTOC notes that a large proportion of MB has been nominated for uses where regulations or legislation prevent reductions of MB dosage. For many uses, the mandatory use of MB has been specified at a high dosage for either treatment of certified propagation material or because bans are imposed on the use of barrier films which otherwise could have reduced the MB dosage rate. Also regulations on the use of 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 to allow use of MB alternatives that lie within the Montreal Protocol's goals. To this effort, MBTOC acknowledges the granting of a permit in Canada which aligns the 20g/m² to MBTOC's recommended rate with barrier films for this use. This enabled Canada to reduce the 2009 nomination.

3.2.1. Registration of alternatives for preplant uses - Decision Ex I/4 (9i) and (9j)

Decision Ex. I/4 (9i) requires MBTOC *“To report annually on the status of re-registration and review of methyl bromide uses for the applications reflected in the critical-use exemptions, including any information on health effects and environmental acceptability”*. Further, Decision Ex I/4 (9j) requires MBTOC *“To report annually on the status of registration of alternatives and substitutes for methyl bromide, with particular emphasis on possible regulatory actions that will increase or decrease dependence on methyl bromide”*.

Reregistration Eligibility Decision (RED) documents for use of MB, Pic, MS, and dazomet for preplant soil fumigation were completed in the USA on July 15, 2008. As an outcome, new safety measures such as buffer zones to protect bystanders, reduced application rates, health protection measures for workers are required in the RED. The mitigation required in the REDs will be implemented in two stages -- most of the measures not related to buffer zones will be implemented in 2010 with the buffer zones

being implemented in 2011. 1,3-D, which was included in the fumigant cluster for comparative purposes only, completed reregistration in the U.S. in 1998, and no further mitigation is expected at this time.

The registration of formulations of a key alternative, 1,3-D/Pic is uncertain in Israel. MI, a major alternative to MB, is now registered in all but three states in the United States (Registration is still pending in California, Washington and New York). The registration now includes the southeast region and Florida for field-grown ornamentals, peppers, strawberries and tomatoes and was expanded to include other crops in 2009, such as forest nurseries. Trials with MI continue being conducted in Japan, Australia, New Zealand, Turkey, Morocco, South Africa, Israel, Italy, Costa Rica, Guatemala, Brazil, Mexico and Chile, and the registration process is proceeding in most other countries applying for CUEs beside other states in the USA, including Australia, Israel and Japan. To ensure that the mitigation measures for MI will be consistent with the measures being required for the other fumigants, the label requirements are presently being reexamined in the USA. 1,3-D/Pic, may be subject to similar provisions when the soil fumigants are evaluated together again in 2013.

The EC has further reported that registration for 1,3-D and other alternatives including chloropicrin, dazomet and metham, sodium are under review. A grace period for the registration of 1,3-D became due on 20 March 2009, but its future registration is uncertain. Recognising the role of 1,3-D as an alternative to MB, and to achieve the objectives of the Montreal Protocol, this grace period may be extended by a further 18 months, pending a review to assess the concrete impact of its withdrawal on the use of MB. The manufacturer of 1,3-D has compiled a dossier of additional technical information and intends to apply for re-registration of 1,3-D under Directive 91/414 (Dow AgroSciences 2007)'. (EC Management Strategy, 2008).

A number of other chemicals which may be alternatives to MB are being considered for impending registration in specific countries recently, including dimethyl disulphide (DMDS) in Europe and the USA .

3.2.2. *Update on rates of adoption of alternatives for preplant uses - Decision XIX/9*

As of the 2008 round, Decision XIX/9 para. 3 requests: ‘ *the Technology and Economic Assessment Panel to ensure that recent findings with regard to the adoption rate of alternatives are annually updated and reported to the Parties in its first report of each year and inform the work of the Panel*’ .

Technical alternatives exist for almost all uses requesting CUNs, but uptake of alternatives varies between countries, crops and the pest pressure. In general similar alternatives are being adopted by the same sectors throughout a number of countries, although the rate of adoption has varied depending on regulations on their use, differences in registration between countries and other market forces. In this round as in previous rounds of CUNs, MBTOC has recognised that time is needed to effect phase-in of alternatives and has accepted this as a reasonable technical argument for lack of availability to the end user sensu Decision IX/6.

Where possible, data is included in this report showing actual rates of adoption in key regions which have phased out MB recently. In particular, recent adoption data from

the EC Management Strategy (2008) has been included to show rates of transition to alternatives by several sectors in the Member States (Appendix IV). In addition, past adoption rates of alternatives in many countries is presented in previous Assessment Reports (MBTOC 2007). Figures 3.1 – 3.2 in this report show the apparent reduction rates for MB use achieved by many Parties in a number of key sectors. As noted above, true reduction and adoption rates may vary from the rate of change of CUN/CUE because of factors such as use of stocks or transfer of approved MB between categories. The CUN reviews presented in Table 3.7 also provide detail of some of the key alternatives that Parties have and should consider to further replace MB for the remaining uses.

For several major preplant soil uses, adoption data from other regions has shown that where industries have previously been heavily dependent on MB, e.g. strawberries, tomatoes and other vegetable crops (e.g. Australia, Italy, Spain, Belgium, Portugal, New Zealand) almost complete adoption of alternative technologies (especially those requiring similar application technologies) has been achieved in a 3 to 4 year period. These regions have similar pests complexes to those requesting CUNs, but may have different regulatory issues. Possible adoption rates for transition to alternatives for preplant soil uses have also been supplied recently by Japan in their National Action Plan. This plan indicates the expected rates of transition to alternatives to assist complete phase out of MB by 2013.

Further guidance from the Parties, giving expected rates of adoption of alternatives following registration, would assist MBTOC in evaluation of CUNs in future.

3.2.3. Sustainable alternatives for preplant uses

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 the USA in particular, MB and most other fumigants have been subjected to reviews that could affect future regulations over their use for preplant soil fumigation. For preplant soil uses of MB, the regulatory restrictions on 1,3-D and Pic are preventing further adoption of these products in the USA, particularly California and this is 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, without reference to sustainability.

3.2.4. Frequency of allowed MB use for preplant uses

In the CUN round for 2009, reductions in MB for preplant (soil) uses could be achieved in some nominations, where alternatives were effective, by reducing the frequency of MB fumigations. Instead of all fumigation being made with MB, potential exists to reduce frequency by rotation with other methods (i.e. fumigants) in order to reduce MB

use to every 2nd or 3rd year. In some production systems, MB is already used only every 3rd or 4th year as a result of uptake of alternative strategies and crop rotations. MBTOC S urges Parties to consider reduced frequency of MB use by rotation with alternatives for remaining CUN uses where possible.

3.3. Standard presumptions used in assessment of nominated quantities.

The tables below (Tables 3.4 and 3.5) 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. Studies and reports to support them appear in Annex III. They were revised for some sectors after consideration by the Parties at the 19th 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. Actual dosage rate of MB in MB/Pic formulations is shown in Table 3.6 below.

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). MBTOC considered the maximum MB application rate for 98% MB to be either 250 or 350 kg/ha (25 or 35 g/m²), in conjunction with low permeability barrier films (e.g., VIF, or equivalent) and totally impermeable films (TIF) combined with extended exposure periods. Several Parties have indicated that 250 kg/ha (25 g/m²) of 98:2 were effectively used in standard commercial application for many sectors, especially on sandy soils. MBTOC considers 100% MB or 98:2 MB/Pic formulations only necessary for CUE uses where other MB/Pic formulations are not registered or where regulations prescribe their use.

In cases where use of high Pic-containing mixtures of MB/Pic (approximately 67:33 or 50:50 or lower) and barrier films are considered feasible, maximum dosage rates of either 150 or 175 kg MB/ha (15.0-17.5 g/m²) where nutsedge is the key pest and 125 or 150 kg/ha (12.5-15.0 g/m²) for pathogens were considered for use as the maximum standard presumptions, unless there was a regulatory or technical reason indicated otherwise by the Party (see Table 4.4 below). MBTOC considers these dosage rates to give similar efficacy and yields at a similar cost to higher dosage rates of MB/Pic with barrier films. As a special case, MBTOC accepted a maximum rate of 200 kg/ha (20 g/m²) with high Pic-containing mixtures with barrier films for certified nursery production, unless regulations prescribed higher rates. However, studies have 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.

During 2008, the US delegation indicated that they were not able to conform to dosage rates suggested by MBTOC for vegetables and strawberries at present (see Table 3.5) as they did not have enough trial information to confirm their use for specific circumstances. In view of this, MBTOC conducted a review of MB use rates being adopted across all Parties presently applying for CUNs including with the use of barrier

films in early 2009. In the case of the US, the growers interviewed in the south east region reported that their present use rates were below the standard presumptions when barrier films were used. (Schneider, pers comm.). Information from one source showed that a use rate of 7.5 g/m² which is significantly below MBTOC's standard presumption with barrier film resulted in significant loss. MBTOC agreed this use rate was too low. One US state reported that 20% of the vegetable acres treated with MB in a single state had presently adopted barrier film and 80% of the acreage treated with methyl bromide used standard films. The average commercial use rate when barrier films was used was less than 11.0 g/m². This rate is below the new presumptions of 12.5 g/m² for pathogens and 15 g/m² for nutsedge. MBTOC expects that there will be 100% adoption of barrier films by 2011 and has calculated CUN amounts based on use of barrier films.

At the 29th OEWG, the US Party requested a review of the dosage rates applied to several nominations based on information from a metaanalysis they had conducted during 2009. Upon further consideration of this information, MBTOC did not consider there was sufficient evidence that higher dosage rates of MB were required with barrier films than specified in the standard presumptions for the specific circumstances and thus applied the revised standard presumptions (ie 12.5 g/m² for pathogens and 15.0 g/m² for nutsedge) in this round.

Table 3.4. Standard presumptions used in assessment of CUNs for the 2009 round – soil treatments.

	Comment	CUN adjustment	Exceptions
1. Dosage rates	Maximum guideline rates for MB:Pic 98:2 are 25 to 35 g/m ² with barrier films (VIF or equivalent); for mixtures of MB/Pic are 12.5 to 17.5 g MB/m ² for pathogens and nutsedge respectively, under barrier films depending on the sector. All rates are 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, TIF)	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 Pic (Pic) is not registered
4. MB/Pic Formulation: Weeds/nutsedge 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 Pic or Pic-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, emission regulations on MB, or open field production of high health propagative material

Table 3.5. Maximum dosage rates for preplant soil use of MB by sector used in the 2009 round (standard presumptions).

Film Type	Maximum MB Dosage Rate (g/m ²) in MB/Pic mixtures (67:33, 50:50) 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 for non certified nursery stock

3.4. 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 MB (e.g. MB/Pic 50:50, 45:55 or less). These formulations are considered to be equally as effective in controlling soilborne pathogens as formulations containing higher quantities of MB (e.g. 98:2, 67:33) (e.g. Porter *et al.*, 1997; Melgarejo *et al.*, 2001; López-Aranda *et al.*, 2003; Santos *et al.*, 2007; Hamill *et al.*, 2004; Carey and Godbehere, 2004; Gilreath and Santos, 2005; Hanson *et al.*, 2006; Hanson *et al.* 2009). Where such formulations are registered or otherwise permitted, non-Article 5 countries have widely adopted formulations containing high proportions of Pic in mixtures with MB to meet Montreal Protocol restrictions. Their use can be achieved with similar application machinery which allows co-injection of MB and Pic or by use of premixed formulations. Consistent performance has been demonstrated with both barrier and non barrier films. Parties are urged to consider even lower dosage rates of MB by modifying MB/Pic mixtures used and adoption of barrier films where regulations permit as the basis for future CUNs. This includes rates as low as 75 kg/ha (7.5 g/m²) in 250 kg/ha of 30:70 or 33:67 mixtures or 100 kg/ha (10 g/m²) of MB in 250 kg/ha of 50:50 MB/Pic mixtures in conjunction with barrier films as these have shown similar effectiveness to higher rates of MB in 67:33 MB /Pic and 335 to 800 kg/ha (33.5 to 80 g/m²) of MB 98% with standard polyethylene.

Table 3.6. 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/m ²)			
	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 2008 (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 PE films

3.5. 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 and totally impermeable films (TIF), 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.

The use of low permeability barrier films or other techniques, ensuring at least the same level of environmental protection, was compulsory in the 27 member countries of the European Union (EC Regulation 2037/2000) for MB before phaseout and currently for the alternative chloropicrin in Italy and Spain for preplant soil uses. 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 to over 50,000 acres and it is also exclusively used with the alternative MI to assist its effectiveness at low dosage rates (Allan, pers. comm., 2008; Chism, pers.comm, 2009). Barrier films are consistently improving the performance of other alternatives at lower dosage rates. An exception to the adoption of barrier films is in the

State of California in the USA where a regulation currently prevents use of VIF with MB (California Code of Regulations Title 3 Section 6450(e)), but not with the alternatives. The regulation on MB 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.

Table 3.7. Final evaluations of CUNs for preplant soil use submitted in 2008 for 2010 or 2011

Country	Industry	CUE for 2005 (1ExMOP and 16MOP)	CUE for 2006 (16MOP +2ExMOP+17MOP)	CUE for 2007 (MOP17+ MOP18)	CUE for 2008 (MOP18+ MOP19)	CUE for 2009 (MOP19+ MOP20)	CUE for 2010 (MOP20)	CUN for 2010	MBTOC rec. for 2010 (addtl or new)	CUN for 2011 (addtl or new)	MBTOC rec. for 2011 (addtl or new)
Australia	Strawberry runners	35.750	37.500	35.750	35.750	29.790	29.790	-	-	29.790	23.840
<p>MBTOC comments 2009: MBTOC recommends a reduced CUE of 23.840 tonnes be approved for 2011. The reduction by MBTOC is based on adoption of the reduced rate for MB of 187.5 kg/ha 18.75 g/m²). The key pests affecting strawberry runner production are fungi (<i>Phytophthora</i>, <i>Pythium</i>, <i>Rhizoctonia</i>, <i>Verticillium</i> spp.) 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 MB dose of 25 g/m² is required to meet certification standards. The Party's request exceeds MBTOC's standard presumption of 20 g/m², but this rate continues to remain unregistered. The Party indicates that the registration authority (APVMA) requires 2 years of trials before approving a reduced rate. The Party has however one years data indicating that yields with reduced rates under barrier films, LDBF (MB:Pic 50:50 @ 375 kg/ha) provided similar yields to the currently registered standard of MB:Pic 50:50 @ 500 kg/ha. The second year's results will be available in August/September 2009. The Party has indicated that it is possible that the registration for the reduced rate of MB:Pic will occur in time for use in 2011. The Party states that the most promising alternative, MI/Pic has been demonstrated in small scale trials to compare with the efficacy to MB:Pic. Commercial scale-up trials are in progress and could lead to registration in 2011 or possibly beforehand. If MI:Pic is available, it would allow for further reduction of the nomination. A key alternative, 1,3-D:Pic, is considered ineffective due to phytotoxicity and doubling of plant back times in the heavy and wet soil conditions in the high elevation regions. The Party also indicates that the Victorian Strawberry Certification Authority (VSICA) completed the first year of a 2-year development program for soil-less systems for production of foundation stock strawberry runners. Results indicated that the productivity of the soil-less system is similar to the current method of production in MB:Pic fumigated soils, and the economics of the soil-less system compares favourably with the current method of production. VSICA plans to establish a commercial facility by 2011 which, if successful, would eliminate VSICA's need for MB for foundation stock in 2011/2012. MBTOC encourages the Party to (1) expedite the registration of MI/PIC and EDN (Mattner et al, 2008) and (2) implement to the greatest extent economically feasible the use of soil-less systems for the production of foundation stock strawberry runners. Upon reevaluation, MBTOC took account of the recent trial information which showed that the reduced dosage of MB/Pic at 17.5 g/m² with standard films was not as effective as higher doses, however notes that this was for one cultivar and without barrier films. Other studies show that a rate of 20g/m² of MB in mixtures of MB (MB/Pic 50:50) at 400 kg/ha is effective for nurseries when barrier films are used and MBTOC has calculated the recommendation on this basis. Even without barrier films, the 20 g/m² dose rate is proving effective. MBTOC recognizes that a label change or a permit may need to be obtained for use of the lower dosage rates (20g/m²), and has based its recommendation on this outcome.</p> <p>MBTOC comments on economics 2009: The nomination was not based on economic arguments. CUN states that "...the first of a two year trial that evaluates the economic and biological feasibility of production of foundation stock by soil-less systems was completed this year". It compared productivity with the status quo system of production in MB:Pic treated soil in insect proof cages. Results confirm the potential of the soil-less system are being used to design the second season's trial to be established in November 08." They conclude that "The economics of the system compare favourably with the current methods of production."</p>											

Country	Industry	CUE for 2005 (1ExMOP and 16MOP)	CUE for 2006 (16MOP +2ExMOP+17MOP)	CUE for 2007 (MOP17+MOP18)	CUE for 2008 (MOP18+MOP19)	CUE for 2009 (MOP19+MOP20)	CUE for 2010 (MOP20)	CUN for 2010	MBTOC rec. for 2010 (addtl or new)	CUN for 2011 (addtl or new)	MBTOC rec. for 2011 (addtl or new)
Canada	Strawberry runners (PEI)	6.840	6.840	7.995	7.462	7.462	7.462	-	-	5.261	5.261
<p>MBTOC comments 2009: MBTOC recommends 5.261 tonnes for this use in 2011. The CUN for 2011 is based on a reduced rate for MB of 20 g/m² and MBTOC acknowledges the Party's reduction in the absence of formal registration for this dose rate. The Party has attempted to replace MB with 1,3-D, but it was banned for use in Prince Edward Island in January 2003 due to ground water contamination. PIC 100 has been registered by the Pest Management Regulatory Agency (PMRA) but the PEI authorities have denied a permit for its use until further groundwater testing has been conducted. While MB:PIC 67:33 @ 500 kg/ha is the only use rate registered for strawberry runners, which exceeds MBTOC's standard presumption of 20 g/m² of MB, the grower has petitioned the PMRA to use a lower rate with barrier films. PMRA, in the absence of a formal label amendment, has granted permission to use a lower rate, but at the grower's own risk and liability. In 2008 the grower tested 25% and 30% lower rates under barrier films and results will be available in 2009. The permit for Pic 100 is still pending approval at PEI, even though Canada registered Pic in 2007. No studies on other potential alternative fumigants, such as Pic, DMS, MI/Pic have taken place. MBTOC expects that future nominations will also demonstrate significant progress with key alternatives. MBTOC encourages the Party (1) to finalize the permits necessary for use of Pic100 and (2) consider the adoption of soilless cultures for at least part of the production cycle.</p> <p>MBTOC comments on economics 2009: The nomination was not based on economic arguments. No economic arguments or data provided</p>											
Israel	Broomrape	None	None	250.000	250.000	125.000	-	12.500	12.500	-	-
<p>MBTOC comments 2009: MBTOC recommends 12.500 tonnes for this use in 2010 for one year only. The nomination for 2010 is for greenhouse use in tomatoes and pepper and is additional to the outdoor field nominations in previous years. MB use for a national broomrape eradication project on outdoor field crops has been approved as a CUN for the years 2007, 2008 and 2009, but the allocated amounts have not been utilized. It is not clear to MBTOC why the allocated MB quantities can not be used to fumigate the 50 ha of green house for broomrape in tomato and pepper production, but have assumed that this amount is not available. MBTOC notes that in 2005 CUN the Party stated it would not apply for additional uses and MBTOC is unclear why this nomination has been submitted.</p> <p>MBTOC acknowledges that a registration for Pic is being considered in Israel and that this would possibly allow for lower dosages of MB to be used for <i>Orobanche</i> and other pathogens as a transition strategy. In the 2008 nomination, the Party reported that results of field trials with 1,3-D in sequence with metham sodium are promising and that registration is expected in 2009. In the 2009 nomination, the Party confirms that Telon EC is a very good chemical alternative for the control of <i>O. aegyptica</i> the main species parasitizing tomato. It is not clear from the nomination whether 1,3-D/Pic EC (Telon EC) has been registered. Telon EC suppresses broomrape when applied under plastic sheets through the drip irrigation system in tunnels or greenhouses. Its efficacy is further enhanced when applied in combination with MS. It is not clear if this fumigant can eradicate the parasitic plant. The Party has also identified some alternatives for controlling low infestations of <i>Orobanche</i> (e.g. solarization) but they are considered not adequate for controlling severe infestations of <i>O. aegyptiaca</i>. Field trials were carried out with sulfosulfuron, imazapic, and imazomox (Abanga <i>et al.</i>, 2007; Nadal <i>et al.</i>, 2008; Miller <i>et al.</i>, 2009).</p> <p>MBTOC comments on economics 2009: The nomination was not based on economic arguments. CUN states that "Biological control of broomrape with either the aid of a parasitic fly or with <i>Fusaria</i> do not provide economic answers for the broomrape problem" but provides no further supporting evidence.</p>											

Country	Industry	CUE for 2005 (1ExMOP and 16MOP)	CUE for 2006 (16MOP +2ExMOP+17MOP)	CUE for 2007 (MOP17+MOP18)	CUE for 2008 (MOP18+MOP19)	CUE for 2009 (MOP19+MOP20)	CUE for 2010 (MOP20)	CUN for 2010	MBTOC rec. for 2010 (addtl or new)	CUN for 2011 (addtl or new)	MBTOC rec. for 2011 (addtl or new)
Israel	Cut flowers-bulbs-protected	303.000	240.000	220.185	114.450	85.431	-	72.266	63.464	-	-
<p>MBTOC comments 2009: MBTOC recommends a reduced amount of 63.464 tonnes for this use in 2010. The recommended amount is based on a further 10% transition rate applied for adoption of substrates (lilium, calla lilies, gerberas, anemones and carnations outside the Ghaza area), and chemical alternatives in those species where the nomination states these are now registered. The nomination is for a variety of cut flowers produced under cover, which are mainly affected by weeds (<i>Cyperus</i> in particular), nematodes (root-knot but also ectoparasites such as <i>Longidorus</i>) and fungi. MBTOC does not consider MB essential for the control of ectoparasitic nematodes. MBTOC does not recommend the use of 1.75 tonnes for fumigating substrates used in rose production as alternatives, such as steam, are efficient for this use. Overall, there is very little change from nominations submitted in previous years, particularly in 2007 and 2008 and progress in phase out is still largely based on transitional measures - LPBF barrier films with reduced rates. In spite of this, registration of certain alternatives, such as metham sodium and 1,3-D, has now expanded to include additional flower types. Substrate production protocols are now available for many of the flowers presently treated with MB (Bar-Yosef <i>et al</i>, 2001; Gullino <i>et al</i>, 2003; Savvas and Passan, 2002; Urrestarazu, 2004; Urrestarazu, 2005). MBTOC is aware that carnation cultivars resistant to fusarium wilt are available, commercially used and accepted by international markets (Gullino and Garibaldi, 2007))</p> <p>MBTOC comments on economics 2009: The nomination was not based on economic arguments. No economic arguments or data provided.</p>											
Israel	Cut flowers-open field	77.000	67.000	74.540	44.750	34.698	-	42.554	28.554	-	-
<p>MBTOC comments 2009: MBTOC recommends a reduced amount of 28.554 tonnes for this use in 2010. Overall, there is very little change from nominations submitted in previous years, particularly in 2007 and 2008. Progress towards phase-out is still based on transitional measures - barrier films with reduced rates of MB. The nomination is for open field production of cut flowers, which are mainly affected by weeds (<i>Cyperus</i> spp in particular) and nematodes (root-knot but also ectoparasites such as <i>Longidorus</i>) and fungi. MBTOC does not consider MB necessary for controlling ectoparasitic nematodes. 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 Pic content are also not registered. In spite of this, registration of metham sodium and 1,3-D has expanded and now includes additional flower types. More expansion of registration is expected this year. Solarization has been proven to be an efficient alternative for some flower types (ref) and is being successfully used in combination with alternative chemicals such as metham sodium and 1,3-D. In keeping with the 2008 recommendation, a 25% transition rate has been applied to the nominated amount to allow for adoption of alternatives, including chemicals and solarization, which is being adopted successfully. The reduction has not been applied to the 10.125 t requested for nurseries of geophytes where high health plant material needs to be produced, although no certification issues are involved.</p> <p>MBTOC comments on economics 2009: The nomination was not based on economic arguments. No economic arguments or data provided.</p>											

Country	Industry	CUE for 2005 (1ExMOP and 16MOP)	CUE for 2006 (16MOP +2ExMOP+17MOP)	CUE for 2007 (MOP17+ MOP18)	CUE for 2008 (MOP18+ MOP19)	CUE for 2009 (MOP19+ MOP20)	CUE for 2010 (MOP20)	CUN for 2010	MBTOC rec. for 2010 (addtl or new)	CUN for 2011 (addtl or new)	MBTOC rec. for 2011 (addtl or new)
Israel	Cucumber	None	None	25.000	18.750	-	-	18.750	15.937	-	-
<p>MBTOC comments 2009: MBTOC recommends a reduced amount of 15.937 tonnes for this use in 2010. The reduction is based on the adoption of grafted plants, improved sanitation and possible uptake of other alternatives (MS and 1,3-D) on 15% of the nomination. For 2010, the Party requested 18.750 t, which was the same amount approved by the Party's at the 18th MOP. The need for MB under the specific conditions of the intensive indoor cucumber cultivation in the central part of Israel could be considered as a niche request. The crop was not submitted for CUE in the years 2005 and 2006 since the crop's most pathogen control problems were resolved commercially at a satisfactory level. 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. The reasons for this nomination are the appearance of a new race of <i>F. oxysporum</i> f. sp. <i>radicis cucumerinum</i>. The pathogen is highly virulent and the infestation level particularly high in the affected location and it can devastate entire greenhouses in a short period of time. The required MB will be aimed at the eradication of the pathogen. Although MS and 1,3-D is an effective alternative application of the mixture in winter at low temperature it may cause crop phytotoxicity and buffer zones limit its use. The Party also states that MS was subject to accelerated degradation in field studies. MBTOC acknowledges that alternatives, such as MS+1,3-D, 1,3-D/PIC, grafting, sanitation programs; soilless systems (López-Medina et al., 2004; Lieten, 2004; Savvas and Passam, 2002; Mutitu et al., 2006) may be feasible alternatives for part or all of the nomination. It encourages the Party to review the technical and economic feasibility of alternatives (grafting, substrates, and grafting + nematicides) and consider a reassessment the buffer zone for other chemical alternatives in use with barrier films and new application in methods in future nominations.</p> <p>MBTOC comments on economics 2009: The nomination was not based on economic arguments. No economic arguments or data provided.</p>											
Israel	Melon - protected and field	125.650	99.400	105.000	87.500	87.500	-	87.500	70.000	-	-
<p>MBTOC comments 2009: MBTOC recommends a reduced amount of 70.000 tonnes for this use in 2010. The reduction is based on the adoption of chemical and non chemical alternatives (Pivonia <i>et al.</i>, 2008) which have been shown to be effective for control of <i>Monosporascus cannonballus</i>, according to the information supplied by the Party, and uptake of grafted plants and other alternatives on 20% of the nomination. <i>Monosporascus</i> is the key pathogen in the Arava Valley. MB is being used for spring melon in the Arava because of low temperatures prevailing at planting time and short plant back. Regulatory restrictions do not play a role in this case. 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. While the Party's request for MB over the years first showed a reduction tendency due to the adoption of barrier films, during the last three CUN rounds, the request has stabilized at 87.5 tonnes. MBTOC, on the one hand, understands that the widely used formulations with more Pic (MB/Pic 67:33, 50:50) could be as effective as the currently used MB 98:2 formulations and urges the Party to make the necessary efforts to assess this situation under the criteria of Dec.IX/6 and reduce the nominated amounts. MBTOC understands an alternative fungicide has shown effective control of <i>Monosporascus</i> in Israel (Pivonia <i>et. al</i>; 2008; Israel melon CUN). MBTOC understands the transition to the alternatives is already ongoing and applied a transition rate based on other countries experience. Another encouraging</p>											

Country	Industry	CUE for 2005 (1ExMOP and 16MOP)	CUE for 2006 (16MOP +2ExMOP+17MOP)	CUE for 2007 (MOP17+MOP18)	CUE for 2008 (MOP18+MOP19)	CUE for 2009 (MOP19+MOP20)	CUE for 2010 (MOP20)	CUN for 2010	MBTOC rec. for 2010 (addtl or new)	CUN for 2011 (addtl or new)	MBTOC rec. for 2011 (addtl or new)	
		<p>alternative is grafted melon which shows potential in the medium-long term. The use of grafted vegetables in Israel is increasing rapidly. Grafted watermelons, for example, now account for 60 to 70% of the total cultivated area of this crop (Cohen et al, 2007). On melon, however, problems of scion-rootstock compatibility and fruit quality require an additional research effort. MBTOC notes that Pic and MB:Pic mixtures and the fungicide, fludioxonil, are effectively used for <i>Monosporascus</i> in other countries under similar conditions (e.g. Stanghelini et al. 2003; Martyn 2002).</p> <p>MBTOC comments on economics 2009: The nomination was not based on economic arguments. CUN states that Basamid is not feasible economically since its price has increased considerably, and because of waiting period constraints. CUN also provides data (Section F) showing that the use of Basamid results in negative profit margins despite the fact that the cost of MB per kg is higher. The source of the data is not provided.</p>										
Israel	Strawberry fruit - protected (Sharon and Ghaza)	196.000	196.000	93.000	105.960	77.750 (42.75 Sharon) 35.00 Ghaza	-	47.500 (Sharon) 50.000 (Ghaza)	32.063 (Sharon) 25.000 (Ghaza)	-	-	
		<p>MBTOC comments 2009: MBTOC recommends a reduced CUE of 32.063 tonnes for Sharon and a reduced amount of 25.000 tonnes for Ghaza totalling 57.062 tonnes. The key pests affecting strawberry fruit 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 reduction for Sharon is based on increased uptake of 20% for Telon EC followed by MS which has been shown to be effective. Telone EC has a smaller buffer than 1,3-D/Pic shank applied, i.e. 100 m compared to 250 m. The latter registration has been suspended. MBTOC has adjusted the nomination to the Ghaza Strip to conform with its standard presumption of 250 kg/ha used with barrier films in sandy loam soils. MBTOC urges the Party to (1) complete as soon as possible its reconsideration of buffers for MB alternatives when used under barrier films and (2) recommit resources to develop less costly soil-less cultures in suspended pot technology, which had been diverted in the past to other priorities, and (3) pursue the timely testing and registration of MI</p> <p>MBTOC comments on economics 2009: The nomination was not based on economic arguments. Regarding Sharon, the CUN provides comparative data on the net revenue of a range of alternatives to MB, seemingly showing that all alternatives result in higher profit margins. The per kg price of MB is higher than that of all the alternatives. Regarding Gaza, CUN argues that there are no alternatives to MB, which will mean that the crop can no longer be grown in the area, leading to "a genuine case of economic disruption." The argument appears to be based on the political realities of the area.</p>										

Country	Industry	CUE for 2005 (1ExMOP and 16MOP)	CUE for 2006 (16MOP +2ExMOP+17MOP)	CUE for 2007 (MOP17+MOP18)	CUE for 2008 (MOP18+MOP19)	CUE for 2009 (MOP19+MOP20)	CUE for 2010 (MOP20)	CUN for 2010	MBTOC rec. for 2010 (addtl or new)	CUN for 2011 (addtl or new)	MBTOC rec. for 2011 (addtl or new)
Israel	Strawberry runners (Sharon and Ghaza)	None	None	0.000	31.900	28.075 15.825 (Sharon) 12.25 (Ghaza)	-	13.570 (Sharon) 17.50 (Ghaza)	13.570 (Sharon) 8.75 (Ghaza)	-	-
<p>MBTOC comments 2009: MBTOC recommends 13.570t for Sharon and a reduced CUE of 8.75 t for Ghaza for this use in 2010. The key pests affecting strawberry runner production are fungi (<i>Rhizoctonia solani</i>, <i>Verticillium dahliae</i>, <i>Fusarium</i> and <i>Phytophthora</i> spp., <i>Sclerotinia sclerotiorum</i>, <i>Macrophomina phasoeolina</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 standard polyethylene films and 250 kg/ha (25 g/m²) with barrier films are necessary to meet certification standards in Ghaza and Sharon respectively. The requested amount for the Ghaza region has been adjusted to MBTOC's standard presumption of 250 kg/ha for MB use in sandy loam soils. 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. MBTOC urges the Party to continue trials with alternatives that meet the pathogen tolerance required to meet the certification standards. The reduction is based on barrier films being available.</p> <p>MBTOC comments on economics 2009: The nomination was not based on economic arguments. No economic data or analysis provided.</p>											
Israel	Strawberry runners and Fruit (Ghaza totals only)					28.075	-	67.500	33.75	-	-
<p>MBTOC comments 2009: Comments are included in text boxes above as the Party consolidated the Israel and Ghaza nominations. MBTOC urges the Party to assist with the availability of barrier films to Ghaza so that MB dosages can be reduced. The reduction is based on barrier films being available.</p>											
Israel	Sweet Potatoes	None	None	None	111.500	95.000	-	20.000	20.000	-	-
<p>MBTOC comments 2009: MBTOC recommends 20.000 tonnes for this use in 2010. The Party states that they expect registration of MB alternatives by 2010 and that adoption of these alternatives was the basis for the reduction from 95 tonnes granted for use in 2009 for production of sweet potato transplants. Data from early trials indicate that Telone II + Adochem super at 400 l/ha appears to be an excellent alternative for MB once registration has been obtained. The MB rates stated in the CUN are consistent with MBTOC's standard presumptions and the use of barrier films. Trials conducted in the USA with Pic as an alternative indicate that it provides better yields and returns to growers than MB. Solarization also significantly increased yields and with more effective herbicides may also become a MB alternative (Stoddard, 2008)</p>											

Country	Industry	CUE for 2005 (1ExMOP and 16MOP)	CUE for 2006 (16MOP +2ExMOP+17MOP)	CUE for 2007 (MOP17+MOP18)	CUE for 2008 (MOP18+MOP19)	CUE for 2009 (MOP19+MOP20)	CUE for 2010 (MOP20)	CUN for 2010	MBTOC rec. for 2010 (addtl or new)	CUN for 2011 (addtl or new)	MBTOC rec. for 2011 (addtl or new)
	MBTOC comments on economics 2009: The nomination was not based on economic arguments. CUN states that semi-commercial application of Telon on a total area of 100 ha in 2005 lead to unsatisfactory results and economic losses. CUN also provides data showing that Telon 200+MS 400 l/ha results in a 79% increase in net revenue compared to MB. The source of the data is not provided.										
Japan	Cucumber	88.300	88.800	72.400	51.450	34.300	30.690	-	-	29.120	27.621
	<p>MBTOC comments 2009: MBTOC recommends a reduced amount of 27.621 tonnes for this use in 2011. The recommended quantity represents a 10% reduction from the recommended amount at the 20th MOP approved amount based on uptake of available alternatives, e.g. steam, soil less culture, grafting, pathogen free seeds, 1,3-D and Pic and cultural practices such as rotation, root isolation and sanitation. Japan had made public an action plan to complete phase out of MB for soil use in 2013 and submitted a revised national management strategy to the Ozone Secretariat in April 2008. MBTOC acknowledges that the Party will phase out MB by using a variety of alternatives in 2013. The nomination is based on the need to control particular viruses of cucumber, since 2005. Globally, such viruses are not considered as soil borne 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%. 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 soil borne 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 <i>et.al.</i> Ozkan, 2004; Engindeniz, 2004). The Party is encouraged to consider substrate production, which implemented correctly can produce higher yields than MB (MBTOC, 2002, 2007; 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 (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 2009: The nomination was not based on economic arguments. CUN states that certain alternatives are being tested for technical and economic feasibility. These include inoculation of attenuated virus as vaccine and the bag cultivation system.</p>										

Country	Industry	CUE for 2005 (1ExMOP and 16MOP)	CUE for 2006 (16MOP +2ExMOP+17MOP)	CUE for 2007 (MOP17+MOP18)	CUE for 2008 (MOP18+MOP19)	CUE for 2009 (MOP19+MOP20)	CUE for 2010 (MOP20)	CUN for 2010	MBTOC rec. for 2010 (addtl or new)	CUN for 2011 (addtl or new)	MBTOC rec. for 2011 (addtl or new)
Japan	Ginger (Field)	119.400	119.400	109.701	84.075	63.056	53.400	-	-	47.450	47.450
<p>MBTOC comments 2009: MBTOC recommends 47.450 tonnes for this use in 2011. MBTOC recognizes that the Party will phase-out all usage of MB by 2013 and that various regions will reduce their dosage rate as low as 16-20 g/m² under barrier films which are within or lower than MBTOC's standard presumptive rates. MBTOC recommends that all growing regions aim to reduce their rates to this level by 2011. The nomination is for control of <i>Pythium</i> spp. (<i>Pythium ultimum</i> var. <i>ultimum</i>, <i>Pythium zingiberium</i>) in open field cultivated ginger fields using MB (98:2) applied from small cans. MBTOC recognized the difficulties that growers have in adopting some alternatives and the time required to introduce alternatives and new disease management strategies. The CUN states that Cyazofamid controls <i>Pythium</i> efficiently but application rates and methods need to be investigated in more detail. The use of fungicides specific to Oomycetes, such as phosphonates, has been tested but data as to efficacy is not provided. This current nomination provides promise that alternative treatments to MB are now applicable to Japanese production systems for ginger.</p> <p>MBTOC comments on economics 2009: The nomination was not based on economic arguments. CUN shows that hot water treatment is not economically feasible because of high initial and running cost, but provides no further details (i.e. data or sources). CUN also provides detailed data on the net revenue of alternatives (Dazomet, Metalaxyl) compared to MB, where both result in negative net revenue (in the case of Dazomet because of lower yields, and in the case of Metalaxyl because gross revenue is zero).</p>											
Japan	Ginger (protected)	22.900	22.900	14.471	11.100	8.325	8.300	-	-	7.770	7.036
<p>MBTOC comments 2009: MBTOC recommends a reduced rate of 7.036 tonnes for this use in 2011. Currently three of five growing regions have good control of root diseases using a rate of 20-21 g /m² under impermeable film. MBTOC recommends that the other two regions adopt a rate of 25 g/m² (Wakayama and Miyazaki). This would reduce the nomination to 7.036 tonnes. The nomination is for control of <i>Pythium</i> spp. (<i>Pythium ultimum</i> var. <i>ultimum</i>, <i>Pythium zingiberium</i>) in protected ginger fields using MB (98:2) applied from small cans. MBTOC recognized the difficulties that growers have in adopting some alternatives and the time required to introduce alternatives and new disease management strategies. The CUN states that Cyazofamid controls <i>Pythium</i> efficiently, but application rates and methods need to be investigated in more detail. The use of fungicides specific to Oomycetes, such as phosphonates has been tested but data as to efficacy is not provided. Reduced emission technologies, such as low permeability barrier films, are now being used and should allow for much reduced dosage rates (e.g. 25 g/m² for 98:2 with LPBF). This current nomination has reduced the quantity by 15.2% from the 2010 application, but it is envisioned that alternative treatments to MB may be available by 2011 as several are pending registration for Japanese production systems for ginger. MBTOC suggests consideration be given to phosphonate fungicides (AG3) developed in Israel and shown to control <i>Pythium</i> and other Phycomycete induced diseases.</p> <p>MBTOC comments on economics 2009: The nomination was not based on economic arguments. CUN states that Pic might cause a decrease in yield either by cutting short the harvest of the previous crop or a delay in planting, resulting in economic loss. CUN also shows that hot water treatment is not economically feasible because of high initial and running cost, but provides no further details (i.e. data or sources). CUN also provides detailed data on the net revenue of alternatives (dazomet, Metalaxyl) compared to MB, where both result in negative net revenue (in the case of dazomet because of lower yields, and in the case of Metalaxyl because gross revenue is zero).</p>											

Country	Industry	CUE for 2005 (1ExMOP and 16MOP)	CUE for 2006 (16MOP +2ExMOP+17MOP)	CUE for 2007 (MOP17+MOP18)	CUE for 2008 (MOP18+MOP19)	CUE for 2009 (MOP19+MOP20)	CUE for 2010 (MOP20)	CUN for 2010	MBTOC rec. for 2010 (addtl or new)	CUN for 2011 (addtl or new)	MBTOC rec. for 2011 (addtl or new)
Japan	Melon	194.100	203.900	182.200	136.650	91.100	81.720	-	-	77.600	73.548
<p>MBTOC comments 2009: MBTOC recommends a reduced amount of 73.548 tonnes for this use in 2011. The recommended quantity represents a 10% reduction from the 20th MOP approved amount based on uptake of available alternatives, e.g. steam, soil less culture, grafting, pathogen free seeds, 1,3 D+Pic and cultural practices such as rotation, root isolation and sanitation. Japan had made public of action plan of complete phase out of MB for critical use nomination for soil use in 2013 and submitted revised national management strategy to the Ozone Secretariat in April 2008. MBTOC acknowledges that the Party will phase out MB by using a variety of alternatives in 2013. The nomination is based on the need to control a particular virus of melons. Globally, this virus is not considered as a soil-borne pathogen but can survive in crop debris for several years. The problem mainly arises from continuous monoculture. An integrated program including cultural practices has been proven to be effective in many other countries. 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%. MBTOC recognises the unique farming system used for melons 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 soil-borne 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 <i>et al.</i>, 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 soil less 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 (TEAP, 2004). Resistant root stocks are now available in Japan. However, according to the party, the root stocks are not resistant to all the pathogen races. High yielding varieties resistant to the virus are available. Steam has also been found to control the virus, particularly in the upper soil layer.</p> <p>MBTOC comments on economics 2009: The nomination was not based on economic arguments. CUN states that certain alternatives are being tested for technical and economic feasibility. These include inoculation of attenuated virus as vaccine and the bag cultivation system. CUN also shows, based on data from Chosei region, Chiba Prefecture that a resistant cultivar produces only 30.8% in net revenue compared with the conventional cultivar with MB.</p>											
Japan	Pepper (green & hot)	187.200	200.700	156.700	121.725	81.149	72.990	-	-	68.260	65.691
<p>MBTOC comments 2009: MBTOC recommends a reduced amount of 65.691 tonnes for this use in 2011, which represents a 10% reduction from the approved amount in 2010. The Party nominated an amount which represented 6.49% reduction from the amount nominated for 2010. According to the Party, this reduction is due to the introduction and deployment of alternative technology, more distribution of low permeable barrier film with the dose rate reduction and reduction if the frequency of MB application to every two years. In comparison to the previous nomination, one region did not apply for 2011, resulting in 5 regions instead of 6. Japan provided a comprehensive National Action Plan detailing step wise phase out by 2013 using a range of alternatives. MBTOC acknowledges the excellent National Action Plan to phase out MB by 2013. They also provided details of an additional strategy which involves immunisation with avirulent virus strains, use of soil less culture and resistant varieties which the Party believes will be widely accepted in the future. According to the Party, the development of resistant varieties is progressing well for the control of some viral strains. The Party reported also that soil less culture (bag cultivation, Kaneko 2006) using various substrates (disease</p>											

Country	Industry	CUE for 2005 (1ExMOP and 16MOP)	CUE for 2006 (16MOP +2ExMOP+17MOP)	CUE for 2007 (MOP17+MOP18)	CUE for 2008 (MOP18+MOP19)	CUE for 2009 (MOP19+MOP20)	CUE for 2010 (MOP20)	CUN for 2010	MBTOC rec. for 2010 (addtl or new)	CUN for 2011 (addtl or new)	MBTOC rec. for 2011 (addtl or new)
		<p>free soil from mountain, paddy field, peat moss, coconuts shell and timber bark) are being used. Also, resistant varieties (Bagu 1 gou and L4 Miogi) are currently available to some PMMoV strains, plant vaccination by attenuated virus (Kanda, 2008), grafting on resistant root stocks (Anou 4 gou and 5 gou) are feasible alternatives. Others such as biological control, wrapping the underground part of seedling with easily decomposing paper and soil amendments are under development.</p> <p>MBTOC comments on economics 2009: The nomination was not based on economic arguments. CUN states that certain alternatives are being tested for technical and economic feasibility. These include inoculation of attenuated virus as vaccine and the bag cultivation system.</p>									
Japan	Watermelon	129.000	98.900	94.200	32.475	21.650	14.500	-	-	13.870	13.050
		<p>MBTOC comments 2009: MBTOC recommends a reduced amount of 13.050 tonnes for this use in 2011. The recommended quantity represents a 10% reduction from approved amount at the 20th MOP based on uptake of available alternatives, e.g. steam, soil less culture, grafting, pathogen free seeds, 1,3-D and Pic and cultural practices such as rotation, root isolation and sanitation. Japan had made public an action plan to complete phase out of MB for MB soil use by 2013 and submitted a revised national management strategy to the Ozone Secretariat in April 2008. MBTOC acknowledges that the Party will phase out MB by using variety alternatives in 2013. The nomination is based on the need to control a particular virus of watermelons. Globally, this virus is not considered as a soil-borne pathogen but can survive in crop debris for several years. The problem mainly arises from continuous monoculture. An integrated program including cultural practices has been proven to be effective in many other countries. 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%. MBTOC recognises the unique farming system used for watermelons in Japan which has been in place for many years. However, in many countries some watermelon production has already shifted to substrates in greenhouse conditions and has become the most widely used technique for eliminating a wide array of soil-borne 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 <i>et al.</i>, 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 soil less 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 (TEAP, 2004). Resistant root stocks are now available in Japan. However, according to the Party, the root stocks are not resistant to all the pathogen races. High yielding varieties resistant to CGMMV are also available. Steam has also been found to control the virus, particularly in the upper soil layer.</p> <p>MBTOC comments on economics 2009: The nomination was not based on economic arguments. CUN states that certain alternatives are being tested for technical and economic feasibility. These include inoculation of attenuated virus as vaccine and the bag cultivation system.</p>									

Country	Industry	CUE for 2005 (1ExMOP and 16MOP)	CUE for 2006 (16MOP +2ExMOP+17MOP)	CUE for 2007 (MOP17+ MOP18)	CUE for 2008 (MOP18+ MOP19)	CUE for 2009 (MOP19+ MOP20)	CUE for 2010 (MOP20)	CUN for 2010	MBTOC rec. for 2010 (addtl or new)	CUN for 2011 (addtl or new)	MBTOC rec. for 2011 (addtl or new)
United States	Cucurbits	1,187.800	747.839	592.891	486.757	407.091	302.974	-	-	218.032	195.698
<p>MBTOC comments 2009: MBTOC recommends a reduced amount of 195.698 tonnes for this use in 2011. The reduction is based on adjustment for the standard dosage rates from 150-175kg/ha to 125-150 kg/ha for MB/Pic mixtures with barrier films, which are the highest use rates considered necessary by MBTOC for these crops. From the recommended amount, 13.095 t are for Georgia squash, 10.087 t for Georgia cucumber; 39.598 t for Georgia melon; 127.950 t for the Southeast region, and 4.969 t for Maryland and Delaware. MBTOC acknowledges the reduction made by the Party for transition to a 3 way combination of 1,3 D + Pic, followed by Pic alone, followed by metham-sodium, that shows good results against key cucurbit pests in spring season fumigation. MBTOC notes that MI is not yet registered for use in these crops, but the Party stated cucurbits could likely be added to the label during 2009 (Chism, pers. com. 2009). If this happens, MBTOC expects a considerable impact on future nominations. MBTOC is aware of progress reported on several recent studies showing halosulfuron will effectively control yellow and purple nutsedge and a number of other weeds common in vegetable production, alone or combined with other herbicides (Macrae <i>et al.</i>, 2008; Trader <i>et al.</i>, 2008; Brandenberger <i>et al.</i>, 2005) on cucurbits and other related crops (Norsworthy, et al, 2007; Bangarwa, et al., 2008). Also glyphosate appears as a suitable tool for managing nutsedge between spring and autumn crops (Webster et al. 2008). 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 et al 2002, Driver and Lows 2003). A combination of 1,3-D or metham sodium with Pic + herbicides (Trifluralin, napropamide, halosulfuron, s-metalochlor) is considered as the best alternative strategy in Florida for nutsedge control in several crops. MBTOC stresses the need of considering also non chemical methods within an integrated pest management strategy. Hausbeck, Lamour and others (2004) have reported many efficient management strategies to control Phytophthora 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 the use of registered fungicides (Mefonoxan, Dimethomorph, Zoxamide + Mancozeb, Copper hydroxide+dimethomorph). MBTOC notes the use of grafting and resistant varieties are considered as alternatives for long lasting crops in many Mediterranean countries (Bello, et al., 2001). Yellow nutsedge emergence in transplanted cantaloupe was suppressed by the combined effects of thin-film mulches and competitive size differential provided by using cantaloupe transplants (Johnson & Mullinix, 2007). Incorporating Brassica spp. residue to reduce populations of soilborne fungi of watermelon was also tested, with interesting results (Njoroge, 2008)]</p> <p>MBTOC comments on economics 2009: According to the CUN, where nutsedges are severe, metham-sodium used alone is technically and economically infeasible due to planting delays, yield losses and inconsistent efficacy, while 1,3 D + Pic is economically infeasible in some areas due to a 21 day planting delay and yield losses. Economic data to support these arguments as well as the CUN generally are provided for all areas and all alternatives. CUN shows expected yield losses of 6 percent in Maryland and Delaware, 29 percent in the Southeastern states and 50% in Georgia. CUN notes these regions may experience lower prices because of missed market windows. The UGA-3-WAY research conducted at the University of Georgia is feasible and the CUN was adjusted to reflect this reduction in southern states in areas that do not face Karst geology issues as a replacement of a MB+ Pic spring time application.</p>											

Country	Industry	CUE for 2005 (1ExMOP and 16MOP)	CUE for 2006 (16MOP +2ExMOP+17MOP)	CUE for 2007 (MOP17+MOP18)	CUE for 2008 (MOP18+MOP19)	CUE for 2009 (MOP19+MOP20)	CUE for 2010 (MOP20)	CUN for 2010	MBTOC rec. for 2010 (addtl or new)	CUN for 2011 (addtl or new)	MBTOC rec. for 2011 (addtl or new)
United States	Eggplant (field)	76.721	82.167	85.363	66.018	48.691	32.820	-	-	21.561	19.725
	<p>MBTOC comments 2009: MBTOC recommends a reduced amount of 19.725 tonnes for this use in 2011. The reduction is based on adjustment for the standard dosage rates from 150-175kg/ha to 125-150 kg/ha for MB/Pic mixtures with barrier films, which are the highest use rates considered necessary by MBTOC for this crop. The Party has made a 35% reduction in MB use from the amount approved by the Party's for 2010. Of this amount, 8.745 t are for Georgia and 10.980 t are for Florida. The Party did not recommend a CUN for Michigan for 2011. US nomination is only for those areas where the alternatives are still under extensive evaluation and pest pressure (nutsedge, nematodes and P. capsici) is high. The Party is projecting rates of 150 kg/ha for pathogens and 175 kg/ha for nutsedge. MBTOC accepted rates nominated by the Party for use with barrier films. The Party states that the treatment, known as the "UGA 3-WAY", consisting of three successive soil fumigations, beginning with 1,3-D + Pic application, followed by a Pic application, followed by a metham-sodium or metham-potassium application (Culpepper, 2007) is an alternative for MB in spring crops. For summer and fall crops, this system needs further development for use in areas with moderate to high nutsedge pressure. In addition, metham sodium and metham potassium in the fall require longer waiting periods for planting than MB. Delays could result in missed market windows. A further constraint to adoption of the UGA-3 WAY is that 1,3-D is restricted in areas of Karst topography where ground water is vulnerable to leaching from 1,3-D. The Party states that trials with dimethyl disulfide (DMDS) plus Pic are promising, but this combination does not effectively control certain grasses (MacRae and Culpepper, 2008). Trials will continue with this alternative. An application to register DMDS is under consideration at USEPA. MI is not registered for eggplant. The US nomination is only for those areas where the alternatives are still under extensive evaluation and pest pressure (nutsedge, nematodes and P. capsici) is high.. MBTOC accepted rates nominated by the Party for use with barrier films (1164-165 Kg/). MBTOC also accepted the Party's substantial reductions for uptake of other alternatives. The Party states that a 50:50 formulation (MB/Pic) is widely used in Florida but does not provide information about the formulation used in Georgia. MBTOC considers that further reductions in MB amount may be possible with changes to formulations of 30:70 used in combination with barrier films commercially feasible. According to the Party, non chemical alternatives such as grafting, soilless culture, are not suitable alternatives. MBTOC considers that the Party should develop these alternatives which are widely used in many countries and regions with similar climate and pest (Besri, 2008). It is important to note that MB is not used in any other non A5 country on eggplant.</p>										
	<p>MBTOC comments on economics 2009: The nomination is partly based on economic arguments. CUN notes that the treatment known as UGA-3-WAY is being tested, as is another potential alternative, Dimethyl disulfide (DMDS), with promising results. However, further testing of both is required. CUN provides detailed partial (and provisional) budgets for Georgia and Florida that show that the UGA-3-WAY Spring application may yield equal (Florida) or higher (Georgia) net farm income than MB but that the Fall application results in negative net farm income in both areas.</p>										

Country	Industry	CUE for 2005 (1ExMOP and 16MOP)	CUE for 2006 (16MOP +2ExMOP+17MOP)	CUE for 2007 (MOP17+MOP18)	CUE for 2008 (MOP18+MOP19)	CUE for 2009 (MOP19+MOP20)	CUE for 2010 (MOP20)	CUN for 2010	MBTOC rec. for 2010 (addtl or new)	CUN for 2011 (addtl or new)	MBTOC rec. for 2011 (addtl or new)
United States	Forestry nursery	192.515	157.694	122.032	131.208	122.060	117.826	-	-	106.043	93.547
<p>MBTOC comments 2009: MBTOC recommends a reduced amount of 93.547 tonnes for this nomination in 2011, which includes 53.703 t for Southern Forest Nursery, 3.978 t for International Paper, 11.162 t for Weyerhaeuser (SE), 12.304 t for Weyerhaeuser (NW), 8.467 t for NE Forest & Conservation Nursery, and 3.933 t for Michigan Seedling Assoc. The nominated amount has been adjusted to 260 kg/ha (26 g/m²) for nutsedge control and 200 kg/ha (20 g/m²) for pathogens to conform to the standard presumption for dosage rate of MB/Pic formulation under HDPE. A 10% reduction has been made to the nominated amount to account for adoption of alternatives, particularly but not exclusively MI. MBTOC acknowledges the 15-20% transition to alternatives already put in place by the Party, but considers that there are sufficient alternatives to justify the additional reduction recommended for this CUN. Key pests are nutsedge, nematodes and fungi; propagative material requires a very high level of pathogen control in order to avoid their widespread distribution from the nursery to the production fields. The CUN is for nurseries with moderate or high pest pressure where alternatives are not effective. Nutsedge 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 MB treatment. For the Northeast Forest and Conservation Nursery, only 40% is for nutsedge control and 60% of the nomination was adjusted to conform to standard presumptions of 20 g/m². For Michigan Seedlings only 50% is for nutsedge control, so 50% of the nomination was adjusted to 20 g/m². The nomination is for certified forest seedlings produced in 6 forest nursery regions. 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. The key alternatives which have been shown to be as efficient as MB are MI which has been found effective (i.e. Enebak, 2006) and recently registered; chloropicrin alone (South, 2007; 2008); 1,3-D/Pic (South, 2008) , 1,3-D /Pic/metham sodium (South, 2008); metham sodium + Pic (Cram et al., 2007); and dazomet (Muckennfuss et al., 2005; Enebak et al., 2006). DMDS + Pic has produced encouraging results (Quicke et al, 2007) although the former is still not registered. Integrated pest management systems have also been shown to be effective (South et al., 2006; Hildebrand et al., 2004). The Party acknowledged that Pic and metham when used in conjunction with barrier films (LPBF) may provide an effective technical alternative and avoid crop injury. Enebak (2007) found that with LPBF, use rates of MB can be significantly reduced. The Party states that gluing of LPBF that is necessary for broadacre fumigation of nursery stock is not commercially available, but progress has been made in this respect.. LPBF will be adopted when the effective gluing technologies are locally and commercially available, however, MBTOC expects that future nominations will be based on its use. An efficient glue manufactured in California by AC Products was recently reported to MBTOC (Product code W669F01, referred by Politiv Ltd, Israel). MBTOC observed a demonstration of an effective heat welding technique used with barrier films that was initially described for use with HDPE for solarization trials in Israel (Grinstein and Hetzroni, 1991; Grinstein, 1992). MBTOC considers that 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. Jacob et al (2009) report effective control of weeds in Iowa Nurseries with different herbicides. MBTOC acknowledges the initiation of large scale demonstration trials for this sector by the Party now with promising results (Quicke, 2007; Quicke, 2008; Weiland, 2008). A report from this trial on the first year of the 5 year trial, indicates that seedling counts similar to MB were achieved by several other treatments, but no indication of pathogen or weed pressure was given (Quicke <i>et al.</i>, 2007). Limited substrate production of these crops is reported as economical for small niche markets; however, MBTOC is aware that International Paper, one of the applicants within this CUN, produces over 40 million tree seedlings per year in substrates in their Brazil operation. Frequency of fumigation is once in two to four years, depending on crop.</p> <p>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.</p>											

Country	Industry	CUE for 2005 (1ExMOP and 16MOP)	CUE for 2006 (16MOP +2ExMOP+17MOP)	CUE for 2007 (MOP17+MOP18)	CUE for 2008 (MOP18+MOP19)	CUE for 2009 (MOP19+MOP20)	CUE for 2010 (MOP20)	CUN for 2010	MBTOC rec. for 2010 (addtl or new)	CUN for 2011 (addtl or new)	MBTOC rec. for 2011 (addtl or new)
	<p>MBTOC comments on economics 2009: The nomination is partly based on economic arguments. CUN shows that MI provides the same yields as MB, but that fumigation and hand weeding costs increase. This results in a decline in net operating revenue for the Southern Forest Nursery Management Cooperative of 7%, for Arborgen of 10%, for Weyerhaeuser of 18%, for Northeastern Forest and Conservation of 14%, and for Michigan Seedling Association of 4%. CUN emphasizes that these results do not show other possible impacts due to a) a potential loss in efficacy if current studies overestimate yields using MI; b) the cost advantages in the forest in terms of lower pest pressure (e.g. faster growth, less use of pesticides) when MB is used; c) the fact that MI will have to be accepted by state control boards as meeting phytosanitary requirements for nursery shipments; d) the fact that fumigation contractors and nurseries do not currently have the equipment to broadcast MI; and e) lack of clarity as to whether the MI label (MIDAS) allows its use for production of deciduous tree seedlings, which are generally more valuable than conifer seedlings and have greater pest management requirements.</p>										
United States	Nurseries stock (fruit, nut, flower)	45.800	64.528	28.275	51.102	25.326	17.363	-	-	7.955	7.955
	<p>MBTOC comments 2009: MBTOC recommends a total of 7.955 tonnes for this use in 2010. This comprises 0.955 tonnes for roses, and 7.0 tonnes for fruit and nut trees. 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. The rates in the nomination conform to MBTOC's standard presumptions. MBTOC recognises that propagative material requires a very high level of soilborne pest and pathogen control in order to avoid their wide spread distribution. MBTOC acknowledges the Party's adoption of MB:Pic formulations of 67:33 and 50:50 as is used in other countries. MBTOC acknowledges the federal registration of MI for use in nurseries, but also recognizes that it is not yet registered in California.</p> <p>MBTOC comments on economics 2009: The nomination is not based on economic arguments. CUN concludes that 1,3-D+Pic is an economically feasible alternative to MB in California Rose production where Telone® restrictions do not apply. A similar conclusion is reached with regard to California deciduous fruit and nut nursery trees; however, township restrictions and certification restrictions hinder growers from using Telone® and render it technically infeasible.</p>										

Country	Industry	CUE for 2005 (1ExMOP and 16MOP)	CUE for 2006 (16MOP +2ExMOP+17MOP)	CUE for 2007 (MOP17+MOP18)	CUE for 2008 (MOP18+MOP19)	CUE for 2009 (MOP19+MOP20)	CUE for 2010 (MOP20)	CUN for 2010	MBTOC rec. for 2010 (addtl or new)	CUN for 2011 (addtl or new)	MBTOC rec. for 2011 (addtl or new)
United States	Orchard replant	706.176	527.600	405.400	393.720	292.756	215.800	-	-	203.591	183.232
	<p>MBTOC comments 2009: MBTOC recommends a reduced amount of 183.232 tonnes for this use in 2011. A 10% reduction has been made to the nominated amounts to account for uptake of alternatives proven to be effective (Browne <i>et al</i>, 2007; 2008; McKenry, 2006). The CUN is for orchard/vineyard replant disorder of unknown etiology; 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 labeled 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 Pic 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. Recent promising results with a one year fallow combined with Nemaguard rootstock have been reported by McKenry (2006). The Party confirms that MB/Pic 67:33 formulation is used for California stone fruit, raisin grapes and wine grapes and now as well for almond and walnut at a dose rate of 20g/m². Commercial adoption of 67:33 formulation and others containing lower amounts of MB (e.g. 50:50) were used predominantly for orchard replant treatment in other countries before switching to alternatives. The recommended amount is based on application of MBTOC's standard presumption of 200 kg/ha (20 g/m²) for control of pests and pathogens without the use of LPBF. MBTOC recognizes that regulatory restraints prevent the use of LPBF barrier films with MB in California but urges the Party to consider continued evaluation of their use to improve the performance of alternatives.</p> <p>MBTOC comments on economics 2009: The CUN states that the use of partial budgeting does not depict the real cost of orchard replant due to the fixed cost and the non-bearing years of the orchard. Instead, a cost benefit analysis with a 7% discount rate is used that takes these factors into account.</p> <p><i>Walnut orchard:</i> The CUN refers back to the partial budget and mentions that MB results in about \$530 more per hectare than a hectare treated with 1,3-D and Pic. However the NPV and IRR (close to 14%) of both alternatives are similar.</p> <p><i>Almonds:</i> CUN states that the results of walnuts would also apply to almonds grown on heavier soils. Tree mortality has been estimated as high as 50% where almonds are replanted, with a 25- 40% yield loss with one year fallow and no fumigant treatment and a reduction of 24-35% compared to MB. Accordingly, the CUN argues that the use of MB adds value of \$63.3 million annually to California nut production</p> <p><i>California Stone Fruit:</i> CUN states that differences in net operating revenue for even small changes in yield can be substantial. This analysis suggests that the benefits of MB alone are approximately \$125/hectare. A decrease of 12% in net operating revenue in the partial budget results, but both alternatives have a negative NPV although MB provides additional benefits.</p> <p><i>California Grape:</i> In the case of California grapes MB shows no benefit over 1,3-D once a vineyard is in production. However in cases where 1,3 D cannot be used because of township caps MB results in an additional \$270/perhectare compared to metham sodium and an additional cost of \$400 compared to no fumigation. However the net present value using MB and 1,3 D results in negative figures which questions the viability of investing in grapes. The CUN concludes that MB and Pic contribute about \$7.2 million annually to the California economy in area where 1,3D cannot be used.</p>										

Country	Industry	CUE for 2005 (1ExMOP and 16MOP)	CUE for 2006 (16MOP +2ExMOP+17MOP)	CUE for 2007 (MOP17+MOP18)	CUE for 2008 (MOP18+MOP19)	CUE for 2009 (MOP19+MOP20)	CUE for 2010 (MOP20)	CUN for 2010	MBTOC rec. for 2010 (addtl or new)	CUN for 2011 (addtl or new)	MBTOC rec. for 2011 (addtl or new)
United States	Ornamentals	154.000	148.483	137.835	138.538	107.136	84.617	-	-	70.178	64.307
<p>MBTOC comments 2009: MBTOC recommends a reduced amount of 64.307 tonnes for this use in 2011. This includes 52.167 t for California and 12.141 t for Florida. MBTOC acknowledges the substantial reduction in Florida. MBTOC does not recommend the requested usage for New York as alternatives are available for replacing this use in <i>Anemone coronaria</i> cut flowers i.e. steam and substrates under protected cultivation (Fennimore <i>et al.</i>, 2008; Rea <i>et al.</i>, 2008). 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. 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. <i>Portulacca</i>, <i>Ambrosia</i> and others), and previous crop propagules. The Party has adjusted dosage rates for all regions to 20 g/m² which conforms to MBTOC's standard presumptions. MBTOC considers alternatives available for some flower types in California, for example 1,3-D/Pic, metham sodium and combinations (Klose <i>et al.</i>, 2007, Klose, 2008) and has reduced the nomination by 10% for phase in of these alternatives. In Florida, MI is now registered and other alternatives are available, for example 1,3-D/Pic and solarization sometimes combined with chemicals (McSorley <i>et al</i>, 2006 ab; McSorley <i>et al</i>, 2008)</p> <p>MBTOC comments on economics 2009: The nomination was not based on economic arguments. A major change in this CUN is the availability of MI in Florida (registered in 2008), but not in California and New York. Its economic impacts as an alternative to MB are relatively small. The partial budget of Florida lilies resulted in a 4% loss as a percentage of net operating revenue. However CUN mentions that loss figures may not be completely accurate since some nurseries are publicly owned (i.e. subsidized seedling prices and production cost). In addition few long-term trials have been implemented.</p> <p>With regards to substrates some crops (e.g. roses) experience yield gains however for most crops an increase in yield is not enough to offset the increased cost of production. A partial budget was also conducted for California Lily and Ranunculus using 1,3D+pic, Dazomet and Metham Sodium with significant losses (as a percentage of net operating revenue) compared to MB ranging from 194-243%. For New York anemones partial budgeting considered steam sterilization with 0%-10% and 20% yield losses due to the lack of research resulting in the absence of yield loss estimates. Losses (as a percentage of net operating revenue) range between 9.1 to 30%. CUN also mention that some growers have attempted using steam but switched back due to high costs and applications issues.</p>											
United States	Peppers (field)	1,094.782	1,243.542	1,106.753	756.339	548.984	463.282	-	-	212.775	206.234
<p>MBTOC comments 2009: MBTOC recommends a reduced amount of 206.234 tonnes for this use in 2011. The reduction is based on adjustment for the standard dosage rates from 150-175kg/ha (15 to 17 g/m²) to 125-150 kg/ha (12.5 to 15 g/m²) for MB/Pic mixtures with barrier films, which are the highest use rates considered necessary by MBTOC for this crop. The Party has made a 53.4% reduction in MB use from the amount approved by the Party's for 2010. MBTOC acknowledges the substantial reduction by the Party for uptake of alternatives. Of this amount, 32.926 t is for Georgia, 164.158 t is for Florida and 9.150 t is for the Southeast. The Party did not submit a CUN for Michigan for 2011. The Party is projecting rates of 150 kg/ha (15 g/m²) for pathogens and 170 kg/ha g/m²) for nutsedge. In addition, the par states that the treatment, known as the "UGA 3-WAY", consisting of three successive soil fumigations, beginning with 1,3-D + Pic application, followed by a Pic application, followed by a metham-sodium or metham-potassium application (Culpepper, 2007a) is an alternative for MB in spring crops. For summer and fall crops,</p>											

Country	Industry	CUE for 2005 (1ExMOP and 16MOP)	CUE for 2006 (16MOP +2ExMOP+17MOP)	CUE for 2007 (MOP17+MOP18)	CUE for 2008 (MOP18+MOP19)	CUE for 2009 (MOP19+MOP20)	CUE for 2010 (MOP20)	CUN for 2010	MBTOC rec. for 2010 (addtl or new)	CUN for 2011 (addtl or new)	MBTOC rec. for 2011 (addtl or new)
		<p>this system needs further development for use in areas with moderate to high nutsedge pressure. In addition, 1,3-D is restricted in areas of Karst topography where ground water is vulnerable to leaching from 1,3-D. In addition, metham sodium and metham potassium 1,3-D in the fall require longer waiting periods for planting than MB. Delays could result in missed market windows. The time limitations on the registration of Midas, a mixture of MI and Pic have been removed and this product has shown good efficacy against key pepper pests, including nutsedge, in a number of trials with peppers and related vegetables such as tomatoes. Midas has received state-level approval in 47 US states (California, Washington, and New York are the exceptions at this time). However, the Party states that some time will be necessary before Midas achieves a full adoption. Constraints: (1) the cost of MI formulations which is higher than MB, (2) growers and researchers will need time to evaluate MI use in the various local production conditions covered by this nomination, and (3) growers and applicators will need to make some equipment modifications to adapt to the lower flow rates typical with less expensive MI application rates and to avoid the corrosion of some metals that can occur with MI (Sumner 2005, Noling <i>et al.</i>, 2006). The Party states that trials with dimethyl disulfide (DMDS) plus Pic are promising, but does not effectively control certain grasses. Trials will continue with this alternative. An application to register DMDS is under consideration at US EPA. 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, however the reduction in the nominated amount was not based on use of these formulations. According to the Party, non chemical alternatives such as grafting soilless culture, are not commercially feasible. MBTOC considers that the Party should develop these alternatives which are widely used in many countries and regions with similar climate and pest. It is important to note that MB is not used in other country on pepper.</p> <p>MBTOC comments on economics 2009: The nomination was partly based on economic arguments. CUN describes the economic impact of using MI as being negligible; as a result it appears to be technically feasible in all parts of the US where it has been registered. However, growers require time to transition; hence the amount of MB nominated has been adjusted downward. In Georgia, Florida, and the Southeastern U.S., the Georgia 3-Way on spring plantings and MI are considered technically (and thus economically) feasible alternatives, although some limitations exist. The loss of gross revenue using the Georgia 3-Way is negligible in Florida and the Southeastern U.S., while gains in gross revenue are expected in Georgia. Although no gains in gross revenue are expected when using MI, losses in net revenue are negligible. One drawback to the Georgia 3-Way is that yield losses are expected in fall plantings, with studies in Georgia's application show a 50% yield loss. These losses are not expected when MI is used. The Georgia 3-Way also cannot be used on peppers that are grown in karst soils since it contains 1,3-D; however, MI can.</p>									

Country	Industry	CUE for 2005 (1ExMOP and 16MOP)	CUE for 2006 (16MOP +2ExMOP+17MOP)	CUE for 2007 (MOP17+ MOP18)	CUE for 2008 (MOP18+ MOP19)	CUE for 2009 (MOP19+ MOP20)	CUE for 2010 (MOP20)	CUN for 2010	MBTOC rec. for 2010 (addtl or new)	CUN for 2011 (addtl or new)	MBTOC rec. for 2011 (addtl or new)
United States	Strawberry (field)	2,052.846	1,730.828	1,476.019	1,349.575	1,269.321	1007.477	-	-	1023.471	812.709
<p>MBTOC recommends a reduced amount of 812.709 tonnes for this use in 2011. The reduction is based on adjustment for the standard dosage rates from 150-175kg/ha to 125-150 kg/ha for MB/Pic mixtures with barrier films in the Eastern States, which are the highest use rates considered necessary by MBTOC for this crop, and greater uptake of alternatives (Pic EC, 1,3-D/Pic) and mixtures of MB/Pic with lower rates of MB (MB/Pic 50:50 or less) in California. The recommended amounts are 751.596 tonnes for California, 20.009 tonnes for Eastern USA and 41.104 tonnes for Florida. For California, the Party nominated 952.543 t (4,856 ha at 196 kg/ha). However the volume that approved by the Party's for 2010 was 856.598 t on 4,370 ha and hence there is an increase in the area and amount requested. The nomination is based on township caps limiting further adoption of 1,3-D and county regulations affecting use of high rates of Pic in some counties on a case by case basis. The nomination states that two emerging disease problems in California and the persistence of yellow nutsedge are the main reasons why further adoption of alternatives is unlikely.</p> <p>In California the nomination was reduced to account for uptake of alternatives where township caps have not been exceeded and to account for greater uptake of formulations of MB/Pic 50:50. PUR use data for 2007 show that 98:2 and 67:33 formulations are still being used, and even though that 57:43 was used on 70% of the California strawberry area, MBTOC considers that transition to MB/Pic 50:50 is still possible (2.5% adjustment). The 2007 use rates of MB dose in formulations for 50:50 mixtures are 170 kg MB/ha (i.e. 170 kg Pic/ha) compared to 57:43 mixtures at 209 kg MB/ha (i.e. 158 kg Pic/ha) respectively. Both dose rates respect the restrictions on use of Pic and should enable 50:50 formulations to be used more widely. The most recent PUR data (2003-2007) showed that alternatives based on 1,3-D, Pic and metham have been widely adopted in some counties, but not others, (i.e. good adoption in Ventura but little adoption in Monterey) between 2000-2007. In California, 1,3-D use increased from 2,001 ha (2003) to 4,752 ha (2007) and metham sodium increased from 384 ha (2001) to 745 ha (2007). PUR data indicate that in Ventura county alone the adoption rate of MB alternatives has been about 800 ha per year, across the years between 2003 and 2007. In Monterey and Santa Cruz, the historical proportional use of MB in this expanding area has been approximately 75% of the production area and this shows no progress in adoption of MB alternatives. Data on 2009 township caps have shown that there is room for further uptake of alternatives based on 1,3-D and other alternatives in some counties (Pic EC, Metham and Pic) and MBTOC has calculated a 10% reduction for uptake of alternatives. In the areas affected by township caps, trials with alternatives that do not contain 1,3-D (such as Pic, Pic EC, Pic + metham, Pic + dazomet, often with LPBF) provided yields that are statistically comparable with MB (Ajwa et al., 2002, 2003, 2004, 2005, 2006; Nelson et al., 2001ab; Shem-Tov et al., 2005, 2006ab). Pic EC provided an average 99% yield compared to MB, with low variance (studies cited in TEAP, 2006). Further clarification of the restrictions on the use of alternatives is required in future nominations. VOC regulations may provide an opportunity for growers to use barrier films in California, and the Party is urged to consider their implementation. These films can be used with alternatives and can reduce the dosage rates required for effective pathogen and weed control. In California, weed management research showed that the herbicide oxyfluorfen can be applied safely to strawberry for control of common weed species in annual plasticulture strawberry production, thereby reducing time required for hand weeding (Daugovish <i>et al.</i>, 2008).</p> <p>In Eastern states, the Party reports a transition rate of 52%. MBTOC considers this transition appropriate progress, given that IM/Pic has been registered in 2008 and is technically feasible for the total nomination area, but note that the Party applies a dose rate above the standard presumptions (12.5-15 g/m²). For Florida, the Party reports a transition rate of 53%. Given that technically and economically feasible alternatives are available, MBTOC commends this transition and made no further adjustment based on uptake of alternatives, but did adjust dosage rates to conform to the standard presumptions.</p>											

Country	Industry	CUE for 2005 (1ExMOP and 16MOP)	CUE for 2006 (16MOP +2ExMOP+17MOP)	CUE for 2007 (MOP17+ MOP18)	CUE for 2008 (MOP18+ MOP19)	CUE for 2009 (MOP19+ MOP20)	CUE for 2010 (MOP20)	CUN for 2010	MBTOC rec. for 2010 (addtl or new)	CUN for 2011 (addtl or new)	MBTOC rec. for 2011 (addtl or new)
	MBTOC comments on economics 2009: The nomination was not based on economic arguments. CUN states that eastern growers that have access to IM experience a decline of 1-4% in gross revenue in the first year of use due to increased costs to retrofit application equipment (hoses, nozzles, flow meters) that will allow the use of IM. Southeastern and Florida strawberry growers that use IM are expected to experience no change in yield or quality. For California strawberry producers, there is no change in impacts from previous year estimates as IM is under registration review but registration is not expected in the near future. The loss to gross revenue for growers using the best alternative to MB is estimated to remain about 14%.										
United States	Strawberry runners	54.988	56.291	4.483	8.838	7.944	4.690	-	2.018	7.381	6.036
	<p>MBTOC comments 2009: MBTOC recommends 4.690 tonnes for California in 2011, and 2.018 tonnes for SE in 2010 and 1.346 tonnes for south east in 2011. Upon further consideration, MBTOC has accepted the action plan of the Party for 2010 and 2011 for amounts of 2.018 t and 1.346 t respectively. MBTOC considers that MI is technically suitable for strawberry fruit production from runners grown in MI treated soil, but accepts that time is required to conduct commercial scale up trials of MI in fruit fields. MBTOC has not made a decision on 2012 as this will be dependent on current and future trial information.</p> <p>The CUN comprises 4.690 tonnes for California and 2.691 tonnes for SE. The key pests affecting strawberry runners are weeds (purple and yellow nutsedge), fungi (<i>Rhizoctonia</i> and <i>Pythium spp</i> in SE, <i>Phytophthora</i>, <i>Verticillium</i> in California), nematodes (root-knot, sting in CA). The CUN is for MB use on 28 ha of 2172 ha, however 99% of the hectares are exempted under QPS. MBTOC does not recommend use of MB for North Carolina and Tennessee, as MI/Pic formulations are registered and are technically feasible (TEAP, 2006). These formulations have been shown to give similar pathogen control in soils and will meet requirements of certification (Kabir et al, 2005; Fennimore et al 2007, 2008; MBO). MBTOC also believes distribution of MI/Pic across 11 ha should be very rapid and training is possible within the two year period for total adoption. For California, MBTOC recommends the nomination, but expects that future nominations will show reports of trials with key alternatives over the last few years in order to satisfy the criteria of Decision IX/6. The CUN states that MB at a dosage of 26.3 g/m² in CA and 25.5 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 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 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. MBTOC encourages the Party to expedite the commercial scale testing of these alternatives as well as the registration of MI in CA and to consider changes to there certification regulations in CA.</p> <p>MBTOC comments on economics 2009: The nomination was not based on economic arguments. CUN states that IM is under registration review in California; however registration is expected to be at least one year in the future. The loss to gross revenue for growers using 1,3-D + Pic followed by an application of metham sodium at a rate of up to 250 lb ai./ha is estimated to be about 11%. California strawberry nursery growers are not expected to see any yield or quality impacts with 1,3-D + Pic plus metham sodium. Eastern growers that have access to MI are expected to experience a loss of 13% in gross revenue in the first year of use due to increased costs to retrofit application equipment (hoses, nozzles, flow meters) that will allow the use of MI. Southeastern Strawberry nursery producers that use MI are expected to experience no change in yield or quality.</p>										

Country	Industry	CUE for 2005 (1ExMOP and 16MOP)	CUE for 2006 (16MOP +2ExMOP+17MOP)	CUE for 2007 (MOP17+MOP18)	CUE for 2008 (MOP18+MOP19)	CUE for 2009 (MOP19+MOP20)	CUE for 2010 (MOP20)	CUN for 2010	MBTOC rec. for 2010 (addtl or new)	CUN for 2011 (addtl or new)	MBTOC rec. for 2011 (addtl or new)
United States	Sweet Potatoes slips	None	0.000	0.000	18.144	18.144	14.515	-	-	14.515	11.612
<p>MBTOC comments 2009: MBTOC recommends a reduced amount of 11.612 tonnes for this use in 2011. The nomination was based on a rate of 180 kg/ha of MB. The basis of the nomination is that township caps limit the use of 1,3-D and 1,3-D combinations, however MBTOC notes that fungal pathogens are the key problem and not nematodes. MBTOC considers MS and Pic should be considered. The industry sector is now carrying out extensive trials for replacing MB. A recent trial indicate that Pic is providing transplants that give yields and returns above that of MB and new herbicides can control weeds. Varieties with greater tolerance to nematodes are available. If Pic proves successful in the forthcoming trials, MBTOC considers it can be adopted as a suitable alternative and would anticipate substantial adoption by 2011. Telone, the alternative to MB, cannot be used in Dec-Jan and township caps are exceeded in Nov which is the fumigation window for slips. MBTOC recognizes the importance of producing pest free seed stock. Test of reduced rates of Telone are being carried out as this is the preferred fumigant of growers. Trials by Stoddard (2008) show Pic to be a good alternative and to provide better yields and returns to growers than MB.</p> <p>MBTOC comments on economics 2009: The nomination was not based on economic arguments. CUN shows trial data that reflect that yield increases by 11% with the use of Pic, resulting in a gain in gross and net operating revenue of 7 and 22% respectively.</p>											
United States	Tomatoes (field)	2,876.046	2,476.365	2,065.246	1,406.484	1,003.876	737.584	-	-	336.191	292.751
<p>MBTOC comments 2009: MBTOC recommends a reduced amount of 292.751 tonnes for this use in 2011. The reduction is based on adjustment for the standard dosage rates from 150-175kg/ha to 125-150 kg/ha for MB/Pic mixtures with barrier films, which are the highest use rates considered necessary by MBTOC for this crop. The Party has made a 54% reduction in MB use from the amount approved by the Party's for 2010. Of this amount, 19,411 t is for Georgia, 219.240 t is for Florida and 40.821 t is for the Southeast, 12.914 t is for Virginia and 0.365 t is for Maryland. The Party did not recommend a CUN for Michigan. The Party is projecting rates of 150 kg/ha for pathogens and 175 kg/ha for nutsedge. The transition rate included in the nomination is based on an estimate of projected use of the "UGA 3-WAY", consisting of three successive soil fumigations, beginning with 1,3-D + Pic application, followed by a Pic application, followed by a metham-sodium or metham-potassium application as well as the increased use of MI (Culpepper, 2007). The UGA 3-WAY has been shown to be effective for tomatoes in Georgia, but has not yet been successful in other parts of the Southern US and needs further development. In addition, 1,3-D is restricted in areas of Karst topography where ground water is vulnerable to leaching from 1,3-D. The time limitations on the registration of Midas, a mixture of MI and Pic have been removed and this product has shown good efficacy against key pepper pests, including nutsedge, in a number of trials with peppers and related vegetables such as tomatoes. Midas has received state-level approval in 47 US states (California, Washington, and New York are the exceptions at this time). However, the Party states that some time will be necessary before Midas achieves a full adoption. Constraints: (1) the cost of MI formulations which is higher than MB, (2) growers and researchers will need time to evaluate MI use in the various local production conditions covered by this nominations, and (3) growers and applicators will need to make some equipment modifications to adapt to the lower flow rates typical with less expensive MI application rates and to avoid the corrosion of some metals that can occur with MI (Sumner 2005, Noling <i>et al.</i> 2006).The Party states that trials with DMDS plus Pic are promising, but DMDS is not registered in the US. An application to register DMDS is under consideration at USEPA (MacRae and Culpepper, 2008). According to the Party, non chemical alternatives such as grafting soilless culture, are not economically feasible. MBTOC considers that the party should develop these alternatives which are widely used in many countries and regions with similar climate and pest (Besri 2008). It is important to note that MB is not used in other country on tomato.</p>											

Country	Industry	CUE for 2005 (1ExMOP and 16MOP)	CUE for 2006 (16MOP +2ExMOP+17MOP)	CUE for 2007 (MOP17+MOP18)	CUE for 2008 (MOP18+MOP19)	CUE for 2009 (MOP19+MOP20)	CUE for 2010 (MOP20)	CUN for 2010	MBTOC rec. for 2010 (addtl or new)	CUN for 2011 (addtl or new)	MBTOC rec. for 2011 (addtl or new)
		<p>MBTOC comments on economics 2009: The nomination was partially based on economic arguments. CUN concludes that MI would be the economically feasible alternative for use in Eastern and Florida US tomato production in areas exhibiting karst topographical features, but a transition period is required. In areas where karst features are not present it appears that tomato growers can use a combination of three fumigants applied sequentially (1,3-D, Pic, and metham-sodium/potassium) and achieve yields that are comparable to those produced by using MB for spring crops only.</p>									

4. Final Report – Issues Specific to MBTOC Quarantine, Structures and Commodities

At the Open Ended Working Group in Geneva in July 2009, MBTOC Quarantine, Structures and Commodities (QSC) held bilateral meetings with Australia, Israel, the Russian Federation and the United States. The purpose was to discuss Parties' views concerning MBTOC's interim CUN recommendations, receive and provide additional information and discuss outstanding technical and economic questions.

Following the meeting, MBTOC QSC provided letters to the Parties summarizing our understandings, responding to requests for more information and informing Parties that we did not believe we would have sufficient workload to necessitate, nor funding to allow, a second meeting. We indicated we would conduct re-reviews of CUN decisions if Parties' requested and provided additional information.

The discussion and subsequent letters resulted in the withdrawal of the CUN for postharvest uses from the Russian Federation. Israel noted in further correspondence that MBTOC's interim recommendation for the treatment of dates would be difficult to comply with, but that Israel would try to make the changes recommended. Israel did not ask MBTOC QSC to re-review its CUN for dates. Australia did not ask for a re-review of its rice CUN. The United States asked MBTOC to re-review its CUN for commodities and provided some additional information concerning processing methods for dried fruit.

Given this decreased workload and ongoing funding difficulties for non A-5 members to attend meetings, we decided not to have a second meeting this year. Accordingly, we devised a new process to conduct the re-review by email and telephone. It proceeded as follows:

1. All re-review requests and supporting documents received from Parties were circulated to all MBTOC (QSC, Soils and Economist) members.
2. MBTOC's QSC Chair and review team leader updated the confidential B Form with new information received from Parties and initiated discussion with QSC and economist members. The B Form is used to summarize key technical and economics issues for review, and to compare these issues year over year.
3. Considerable discussion ensued amongst members; all discussion was circulated to all QSC members and economists.
4. The Chair drafted a recommended text box, based on the discussion comments; it was circulated to MBTOC QSC, Soils and Economists.
5. Each member was required to indicate their views and agreement (or not) by email or by phone. In fact, each member agreed to the text box in writing.
6. The text box is included in the final report in exact wording agreed by consensus.

MBTOC QSC is highly communicative and its members have a high degree of interest and involvement. Consequently, although this process took considerable time, we were

able to achieve full discussion leading to eventual consensus on the CUN for US commodities as requested.

Funding Request to Parties

The method of holding a second meeting by email only, while functional for the review of one CUN, decreased our time and ability to search for, prepare and review updates on uses of methyl bromide, alternatives research and registration issues. This report is much thinner in content than usual! Parties are referred to the May 2009 TEAP report which provides details on the CUN process, pertinent decisions and a detailed new Progress Report.

MBTOC is obligated under Decision XV I/4 Annex 16 to meet twice a year when making CUN recommendations to ensure it has full information and to allow Parties to provide information. In future years, and particularly in 2010 when we will be preparing the Assessment Report and evaluating critical use nominations, we firmly request that UNEP and Party funding of MBTOC members improve to allow us to meet our meeting obligations and complete our work with credibility. Some MBTOC members are now retired from their research institutes and there seems to be an expectation that they will cover travel costs themselves personally. Other members must try to cover travel costs from their already thin research budgets. Some Non-A5 members report it is a struggle for them to obtain funding in the current economic climate to fund attendance since Parties already contribute to the MLF.

The lack of funding for MBTOC members is not sustainable. Yet, it is not a simple matter of finding new members to substitute for the current unfunded members. All over the world, Parties have closed institutes of stored product entomology research. Expertise in this subject is very rare; MBTOC is fortunate to have members with decades of experience. Surely funding could be found to support their travel and work on MBTOC.

MBTOC Membership Issues

MBTOC QSC currently has 19 members from 14 countries. In late 2009 and early 2010, we will re-evaluate membership to ensure best contribution and to ensure best use of funds from Parties and UNEP.

Details of evaluations

Parties submitted nine CUNs for the use of MB in structures and commodities in 2009. This total does not include the Russian Federation CUN for postharvest uses of methyl bromide which was withdrawn by the Party in July 2009. The total MB volume nominated in 2009 for non-QPS post-harvest uses was 197.802 tonnes.

In this 2009 round, two nominations were for 2010 for a total MB amount of 6.30 tonnes and seven were for 2011 for a total MB amount of 191.502 tonnes.

In its interim report of May 2009, MBTOC provided interim recommendations on all CUNs with the resulting recommendations of 4.569 tonnes for 2010 and, for 2011,

182.686 tonnes. MBTOC did not recommend 1.731 tonnes for 2010 and 8.816 for 2011.

Subsequent to the publication of the May 2009 TEAP report, the United States requested a re-review of its CUN for dried commodities. As a result of that re-review MBTOC recommended an additional 3.035 tonnes for US commodities over its interim recommendation of 1.965 tonnes. The resulting final recommendation for US commodities is 5.0 tonnes, as explained in the text box below.

The Final totals for CUN recommendations in the 2009 round are 4.569 tonnes for 2010 and 185.721 tonnes for 2011.

Table 4.1 provides the MBTOC QSC final recommendations for the CUNs submitted in 2009.

Table 4.1 MBTOC QSC Final Recommendations for CUNs in the 2009 Round

Country	Industry	CUE for 2005 (ExMOP1 and MOP16)	CUE for 2006 (MOP 16 +ExMOP2+ MOP17)	CUE for 2007 (MOP17+ MOP18)	CUE for 2008 (MOP18+ MOP19)	CUE for 2009 (MOP19+ MOP20)	CUE for 2010 (MOP20)	CUN for 2010	MBTOC rec. for 2010 (addtl or new)	CUN for 2011 (addtl or new)	MBTOC rec. for 2011 (new)
Australia	Rice	6.150	6.150	9.205	9.200	7.820	6.650	-	-	5.660	4.87
<p>MBTOC comments 2009: MBTOC recommends 4.87 tonnes, a 14% reduction of the nominated amount for packed rice for Australia in 2011. Australia nominated 5.66 tonnes. In preparing this calculation MBTOC reviewed the actual MB use for packaged rice as reported in the Party's accounting frameworks for 2006, 2007 and 2008. Using the average of these three years as a baseline (6.085 tonnes), we then applied a 20% transition rate with the result of 4.87 tonnes. To date, Australia has not adopted any alternatives to methyl bromide for packaged rice. Other countries are achieving an average of 20% transition to alternatives per year. It is clear that phosphine treatment or controlled atmosphere treatments would provide the necessary pest efficacy for packaged rice and these alternatives are registered for this use in Australia. All other non-A(5) countries worldwide and many A(5) countries use methyl bromide alternatives for rice.</p> <p>As we have noted in previous years, MBTOC does not find Australia's continued zero adoption of alternatives to be consistent with Decision IX/6. If it were to recommend the full 2011 nomination, MBTOC thought would be quite unlikely that there would be any adoption of alternatives, given the region's water allocation rules and arrangements and the drought described by the Party in this and previous CUNs. On page 5 of Party correspondence of March 31, the Party said "that the process of fumigating packaged rice is a quality control step, not a disinfestation step per se in order to guarantee a supply of high quality rice that is insect free. The applicant does not fumigate rice prior to processing nor are such facilities available to the applicant." MBTOC finds that the continued use of MB as a contingency against the possible presence of pests after milling, as opposed to using MB only in response to a known infestation, is an unacceptable use.</p>											
<p>MBTOC comments on economics 2009:</p> <p>This CUN is partly based on economic arguments. CUN states that two potential technically and economically feasible alternatives, namely sulfuryl fluoride and phosphine, have been identified. Sulfuryl fluoride, which requires less significant process changes and investment to implement, was registered in 2007 and trials commenced in January 2009. If trials prove it to be technically and economically feasible, the applicant indicates they may not require methyl bromide beyond 2012. On the other hand, phosphine fumigation is considered to be the best solution, both technically and economically, even though it would require a considerable change to processing methods and a substantial infrastructure investment. It is not clear to MBTOC on what basis the applicant argues that phosphine is 'the best solution' in economic terms. The CUN, in fact, relates the difficulties faced by the applicant in raising the capital for transition to phosphine. Economic data are presented to show that the treatment costs with phosphine are expected to be 15.5 times as large as with methyl bromide, but this would not be the case if phosphine were to be used in the same way as MB for packaged goods... CUN states further that the applicant has been unable to finance a transition to phosphine due to continued severe drought conditions in the growing area; hence it is unaffordable to them. MBTOC cannot substantiate this claim based on an analysis of the financial statements of one enterprise. In late 2008, the applicant purchased a majority share in a US rice processing company. When questioned by MBTOC about the conflicting claim of its stated inability to invest in alternatives with this large investment in a facility, the applicant responded by pointing to the strategic nature of these investments during turbulence in the global rice market.</p>											

Country	Industry	CUE for 2005 (ExMOP1 and MOP16)	CUE for 2006 (MOP 16 +ExMOP2+ MOP17)	CUE for 2007 (MOP17+ MOP18)	CUE for 2008 (MOP18+ MOP19)	CUE for 2009 (MOP19+ MOP20)	CUE for 2010 (MOP20)	CUN for 2010	MBTOC rec. for 2010 (addtl or new)	CUN for 2011 (addtl or new)	MBTOC rec. for 2011 (new)
Canada	Mills	47 (included mills and pasta)	34.774	30.167 (included mills only)	28.650	26.913	22.878	-	-	14.107	14.107

MBTOC comments 2009:

MBTOC recommends the nominated 14.107 tonnes for the treatment of flour mills in 2011. The Party's nomination for 2011 is 38% less than the amount of MB approved by the Parties for 2010. The CUN includes 20 facilities, but the amount nominated only allows for one fumigation per year of 9 or 10 mills. Therefore the Party's nominated amount requires about 50% of the flour milling sector to transition to alternatives by 2011.

This is accomplished through two means: first, in the past few years the Party has conducted numerous trials and demonstrations of alternatives which have been reported to MBTOC. These trials, while not all entirely successful for pest efficacy, have allowed the sector to better understand and improve efficacy and management. Improvements in IPM techniques, including investments in new equipment and facility dust control, have also contributed to the reduced need for methyl bromide.

The Party has indicated concern about the difficulty in obtaining successful pest efficacy with alternatives and points out that Canadian mills are located in cold climate zones (defined as "considerable variation in ambient temperatures, including extended periods (4 to 5 months) of cold winter weather"). As a result the Party asserts that fumigations in winter months are essentially impractical. The CUN asserts that this heightens the importance of predictable and lasting (20 to 26 weeks) pest population control by chemical fumigation or heat treatment alternatives.

The Party has submitted test results indicating that the main mill pests require a higher than originally first considered dosage rate of sulfuryl fluoride to obtain sufficient efficacy. MBTOC acknowledges this and has seen this reported by Bell et al, 1999 and Bell et al, 2003. Reichmuth and Klementz, 2008 did examine methods to combine treatments to overcome the difficulty to obtain pest efficacy with some pest species found in mills during SF fumigations. As noted in MBTOC's review of flour milling alternatives, best efficacy with SF is seen when mill temperature is maintained throughout the fumigation period at or above 27° C, in all parts of the mill (TEAP, 2008).

The second factor allowing the Party's nominated transition to alternatives is that Canadian regulation now allows those companies which are included in the CUN to share the MB domestic allocation so that only those mills most in need of MB will receive the allocation. As part of its domestic regulations allowing this transfer of allocation, Government of Canada has further approval and reporting requirements, pursuant to Canada's Ozone-depleting Substances Regulations (ODSR 1998). 2008 was the first full calendar year in which the amended ODSR 1998 were in effect. Therefore, the mills which might be fumigated with MB may change each year, but only between the mills within the mill sector already included in the CUN.

The Party and MBTOC acknowledge the higher costs associated with alternative treatments. Additionally, MBTOC acknowledges that registration for sulfuryl fluoride in Canada is not yet complete and the lack of MRLs for fluorine residues arising from SF treatment makes the use of SF more difficult for some mills.

Differences in regulation between Canada and the US, the only other Party with a CUN for flour milling, only partly explain the differences in adoption of alternatives over time. As reported in TEAP 2008, MBTOC is examining sector structural differences to improve its understanding of the prospects for adoption of alternatives in the future. For example, in the US MBTOC has been told that 42% of mills also produce bakery or cereal mixes. On the other hand, the majority of the Canadian applicant's member companies are wheat milling establishments but the CUN also includes oat milling companies. Some of the mill locations participating in Canada's CUN for the flour milling industry operate bakery mix capacity that is co-located with the primary milling activity. Approximately 25% of mill locations participating in the CUN have bakery mix capacity on site. This difference may partly explain how Canada mills have been able to maintain a nearly similar transition rate to US mills even though the regulatory approval for sulfuryl fluoride is

Country	Industry	CUE for 2005 (ExMOP1 and MOP16)	CUE for 2006 (MOP 16 +ExMOP2+ MOP17)	CUE for 2007 (MOP17+ MOP18)	CUE for 2008 (MOP18+ MOP19)	CUE for 2009 (MOP19+ MOP20)	CUE for 2010 (MOP20)	CUN for 2010	MBTOC rec. for 2010 (addtl or new)	CUN for 2011 (addtl or new)	MBTOC rec. for 2011 (new)
<p>different in the two different countries.</p> <p>MBTOC also notes the interconnection between Canadian CUNs for flour mills and pasta facilities. The CUN for flour mills includes four mills that process durum wheat into semolina used in the manufacture of pasta and one of these is both a durum mill and a pasta facility. Control of pests in the flour mill will then contribute to the reduction of pests coming into the pasta facility.</p> <p>MBTOC comments on economics 2009:</p> <p>This CUN is not based solely on economic arguments, although economic concerns are indicated. CUN argues that market penetration of the technically most viable alternatives is being hampered by:</p> <ul style="list-style-type: none"> • Insufficient evidence that SF can be effective under Canada's typically cold weather conditions. • Lack of full registration of SF • Current market cost of heat treatment technology and services. • Concerns by the milling industry that repeat fumigations using phosphine may have a cumulative effect of corroding conductive metals present in electrical and electronic equipment and controls <p>CUN also states that, while the amount of sulfuryl fluoride required to fumigate for the exclusive presence of confused flour beetle is comparable in cost and volume to methyl bromide, the results of field trials already completed have demonstrated that 2 to 6 times as much SF is actually required to fumigate when red flour beetles are present, which represents a significant increase in cost. CUE notes that the required use of alternatives within a short time period would add an estimated 2 to 4 per cent to manufacturing costs of wheat flour, semolina and other milled grain products. In the current economic climate this added cost cannot be passed on down the supply chain. Furthermore, there are still no subsidies available to offset these increased costs. MBTOC notes that lack of government financial assistance programs has not been a consideration in assessments of economic feasibility.</p>											

Country	Industry	CUE for 2005 (ExMOP1 and MOP16)	CUE for 2006 (MOP 16 +ExMOP2+ MOP17)	CUE for 2007 (MOP17+ MOP18)	CUE for 2008 (MOP18+ MOP19)	CUE for 2009 (MOP19+ MOP20)	CUE for 2010 (MOP20)	CUN for 2010	MBTOC rec. for 2010 (addtl or new)	CUN for 2011 (addtl or new)	MBTOC rec. for 2011 (new)
Canada	Pasta	(see Canada mills)	10.457	6.757	6.067	4.74	-	4.740	3.529	-	-

MBTOC comments 2009:

MBTOC recommends 3.529 tonnes, a 25.5% reduction of the nominated amount for pasta facilities in 2010. The Party nominated 4.740 tonnes for 2010 which did not show any adoption of alternatives over the amount granted by the Parties for 2009. The CUN includes three pasta facilities, each requesting one MB fumigation per year. MBTOC's reduced nomination allows for just two fumigations in this sector, thus necessitating one facility to transition to alternatives.

The method for sharing the MB domestic allocation amongst companies included in the CUN in the same sector is allowed under Canadian regulations. As part of its domestic regulations allowing this transfer of allocation, Government of Canada has further approval and reporting requirements, pursuant to Canada's Ozone-depleting Substances Regulations (ODSR 1998). 2008 was the first full calendar year in which the amended ODSR 1998 were in effect.

MBTOC's recommendation allows for a consistent approach to that taken by the Party for flour milling. Furthermore MBTOC notes that the equivalent CUN from the US, (the reader is referred to MBTOC text box for US NPMA), which is the only other CUN for pasta, has declined significantly each successive year, including an over 50% reduction in the nomination for 2011.

MBTOC acknowledges that registration for sulfuryl fluoride in Canada is not yet complete and the lack of MRLs for fluorine residues arising from SF treatment makes the use of SF more difficult for some pasta processing facilities. In Canada full registration of SF, including MRLs for fluorine residues in food resulting from SF fumigation of the facility, is expected in 2009. If that occurs, the Party indicates it will conduct another full site trial.

In the meanwhile, the sector conducted one trial using sulfuryl fluoride in 2008, and two trials in parts of facilities in 2007. The result of these trials were submitted to MBTOC (CPMA, 2009). Red flour beetle was the test species and the Party has noted that this species, common in mills and food processing facilities in North America, is more difficult to kill than other species with SF. MBTOC acknowledges this and refers the reader to Canada flour mills text box for references. The Party reported tests in three plants achieved 100% mortality for adults, but egg stage resulted in some survival with egg mortality ranging from 69-94%. Pest rebound occurred faster in SF fumigation than in comparable MB fumigations. Again as noted in MBTOC's review of flour milling alternatives improved efficacy with SF is seen when mill temperature is maintained throughout the fumigation period at or above 27degrees C, in all parts of the mill (TEAP,2008). The cost of SF treatment was higher than methyl bromide treatment.

The CUN page 10 says they can not use heat because heat would damage finished goods. MBTOC believes there are methods of circumventing this problem by, for example, segregating finished goods from the treatment. CUN Page 10 also gives some heat cost estimates, but no supporting evidence is included. MBTOC continues to note that heat treatment is used in pasta facilities in other countries, for example, 13 pasta facilities in Italy use heat treatment to control pests. The CUN indicates concern about the potential of heat treatment to damage equipment and facilities, but the Party has not substantiated this concern with tests, engineering reports or otherwise. Pasta facilities operate at quite high temperatures resulting from the operation of equipment and just a small additional heat increase might be all that is needed to conduct efficient heat treatment. In addition, if pasta facilities had understanding of the location of pests and if that understanding indicated that pests were mostly located in one type of equipment, spot heat treatment with appropriate additional methods to prevent pest escape might also be used. The requirements for full site and spot heat treatment are reviewed in MBTOC's flour mill review (TEAP, 2008).

Country	Industry	CUE for 2005 (ExMOP1 and MOP16)	CUE for 2006 (MOP 16 +ExMOP2+ MOP17)	CUE for 2007 (MOP17+ MOP18)	CUE for 2008 (MOP18+ MOP19)	CUE for 2009 (MOP19+ MOP20)	CUE for 2010 (MOP20)	CUN for 2010	MBTOC rec. for 2010 (addtl or new)	CUN for 2011 (addtl or new)	MBTOC rec. for 2011 (new)
MBTOC comments on economics 2009:											
This CUN is not based on economic arguments. CUN argues that heat treatment remains a costly alternative, estimating that the cost to carry out the heat treatment is twice the cost of doing a methyl bromide treatment. This increases to three or four times when the cost of monitoring (ensure comparable results) is included. No cost data was supplied and MBTOC requires substantiation of these cost estimates.											
Israel	Dates	3.444	2.755	2.200	1.800	None	2.100	1.56	1.04		
MBTOC comments 2009:											
<p>MBTOC recommends a reduced nomination of 1.04 tonnes, about 60% of the nominated amount for dates in 2010. The Party nominated 1.56 tonnes and noted that methyl bromide is only used for those date varieties for which heat treatment or other alternatives have not been shown to be effective.</p> <p>The basis for the reduction in the nomination was to decrease the dosage rate to 20g m⁻³ from 30g m⁻³ as specified in correspondence. MBTOC had concern about the excessively high dosage rates reported in the CUN, page 17 which indicated a MB dosage rate of 300g per tonne of dates, however, the CUN also notes that the actual dosage rate used is 20 g m⁻³, which is the dosage rate recommended by MBTOC as technically effective. Later correspondence indicated a dosage rate of 30g m⁻³.</p> <p>The CUN gives a packing factor for non-Medjool dates as 400kg m⁻³; the correspondence indicates 300kg m⁻³. At 20 g m⁻³, a reasonable rate, a well constructed product stack should use about 22 g for each 400kg (10% allowance for packing) or 55 g m⁻³. Based on the reported dosage rate and the packing information examined, we surmise that the chambers used must have low load factors (lots of free space), which seems to be an inappropriately inefficient use of MB. MBTOC's recommendation is based on its understanding of reasonable packing density and dosage rates.</p> <p>MBTOC also notes that in April 2009, Vapormate™, a formulation of ethyl formate and CO₂, was registered for disinfestation of dried fruit in Israel. The use of ethyl formate is an effective disinfestation method for dried fruit, and Israel is currently testing to measure its efficacy on dates.</p>											
MBTOC comments on economics 2009:											
This CUN is not based on economic arguments. CUN argues that the economic feasibility of heat treatment is clear because of the experience with the controlled drying of Medjool dates: it is critical in maintaining their quality. CUN states further that it is too early for economic feasibility for other (non-heat) alternatives to be evaluated at this stage, but that it is highly possible that this will reveal that one or more of these alternatives are economically feasible.											

Country	Industry	CUE for 2005 (ExMOP1 and MOP16)	CUE for 2006 (MOP 16 +ExMOP2+ MOP17)	CUE for 2007 (MOP17+ MOP18)	CUE for 2008 (MOP18+ MOP19)	CUE for 2009 (MOP19+ MOP20)	CUE for 2010 (MOP20)	CUN for 2010	MBTOC rec. for 2010 (addtl or new)	CUN for 2011 (addtl or new)	MBTOC rec. for 2011 (new)
Japan	Chestnuts	7.100	6.800	6.500	6.300	5.800	5.400	-	-	5.350	5.35
<p>MBTOC comments 2009:</p> <p>MBTOC recommends the Party's nominated amount of 5.350 tonnes for 2011, which is a 1% reduction over the amounts granted by the Parties for 2010. Japan tried 14 different possible alternatives (reported in its CUN of 2005, JPN13, 2005) and decided that methyl iodide was technically and economically feasible. Now the party is awaiting registration for this purpose.</p> <p>In Japan, there are two levels for registration: 1) toxicological assessment of methyl iodide that has been completed; 2) worker safety issues and food sanitation approval that still have to be completed by the Ministry of Health, Labour and Welfare (MHLW). The Ministry for Agriculture, Forestry and Fisheries (MAFF) sent a letter to MHLW to declare the need for a high priority for setting the corresponding MRLs. On March 6, 2009, the evaluation by MHLW was completed. Now, the release of the registration is expected for 2009. If this occurs, MBTOC expects that the Party will not authorize the full nominated amount of MB for 2011. On these grounds, MBTOC expects a significant and quick phase-in of the newly registered alternative.</p> <p>In the instance that registration of MI for this purpose is not achieved, SF also works well to control pests of chestnuts, but Japan is concerned about the lack of full control of the eggs of the chestnut weevil <i>Curculio sikkimensis</i> (Soma <i>et al</i>, 2005; Kawakami, <i>et al</i>, 2003; Vinghes and Ducom, 2001). Japanese consumers use fresh chestnuts as special gifts and so the consumers might keep product in their homes for a few weeks. Under these circumstances, the presence of live eggs or larvae in chestnuts following SF treatment would be unacceptable.</p> <p>Chestnut consumption in France and other countries is different in that the chestnuts are consumed directly after purchase. On the other hand, transition to SF has just occurred in France and it is yet unclear if consumers in France may eventually have the same complaints due to surviving eggs and larvae.</p> <p>MBTOC asked about the use of hot water treatment, as used in some countries. But, the skin of hot-water-treated chestnuts becomes dull; as a result consumers might think the product is not fresh. CO₂ under high pressure (20 bar) is used in one location in Portugal for disinfestation of fresh chestnuts with existing pressure chambers, that are also used for other products. In 2003, Japan tested the efficacy of this method. Despite the sufficient efficacy, the high investment for the chambers (several million € per chamber) - when they would be intended to be used only for this purpose – was considered to be far too costly. This work was not continued because of the high investment costs for this treatment.</p> <p>In Japan, disinfestations have to take place in numerous wide spread small farm holdings. So, there is a strong logistic argument against having a central facility that gathers product from several small farms. In the light of the scientific work of the Party and the lack of any alternative other than methyl iodide, the solution for the replacement of this difficult application seems to be quickly achievable when registration occurs.</p>											
<p>MBTOC comments on economics 2009:</p> <p>This CUN is not based on economic arguments.</p>											

Country	Industry	CUE for 2005 (ExMOP1 and MOP16)	CUE for 2006 (MOP 16 +ExMOP2+ MOP17)	CUE for 2007 (MOP17+ MOP18)	CUE for 2008 (MOP18+ MOP19)	CUE for 2009 (MOP19+ MOP20)	CUE for 2010 (MOP20)	CUN for 2010	MBTOC rec. for 2010 (addtl or new)	CUN for 2011 (addtl or new)	MBTOC rec. for 2011 (new)
United States	Commodities	89.166	87.719	78.983	58.921	45.623	19.242	-	-	10.041	5.0

MBTOC comments 2009:

MBTOC recommends 5.0 tonnes of methyl bromide for the commodities included in this CUN in 2011. The Party nominated 10.41 tonnes of MB for this sector, disaggregated to the following amounts: dates 2.009 tonnes; walnuts 1.17 tonnes; California Dried Plum Board 6.266 tonnes; beans 0.595 tonnes. MBTOC's final recommendation does not disaggregate the CUN into commodity sectors. Instead the recommendation is intended to provide MB to any sector member included in this CUN, but only in the instance of proven lack of efficacy of, or technically justifiable inability to use, or to complete the transition to, alternatives. In the instance where sector members have demonstrated a proven lack of efficacy or technically justifiable inability to use alternatives, and if the volume of MB in this recommendation is inadequate, sector members could buy MB from stocks. This sector is rapidly transitioning to alternatives and there are several alternatives that are available (phosphine, sulfuryl fluoride, heat, controlled atmospheres, cold and combination treatments). The USG has not provided adequate information to indicate where, exactly, and under what circumstances exactly, is the need for MB critical in the processing of the commodities included in this CUN. The processing scenarios provided to MBTOC by USG, while helpful to understand potential avenues for infestation and the fumigation interventions, did not indicate which fumigations have already been, are being, and can be transitioned to alternatives. However, the USG has provided new, preliminary, research results showing possibly inadequate efficacy for a commodity pest under some circumstances consistent with harvest conditions (Walse, 2008). MBTOC believes it could be mid 2010 before the results of ongoing research and commercial scale-up tests are fully known. MBTOC suggests that USG further reduce this recommendation in domestic allocation if, by then, the sector has made or could make more progress in adopting alternatives.

The US nomination for dates was for the Deglet-Noor variety harvested in California. In recent years there has been a lack of understanding of the impact of parameters such as date variety, conditions at harvest and particularly moisture content of the dates at time of fumigation, and how these parameters relate to control of pests and fungi in dates. Consequently, the US believed that its Deglet-Noor dates at harvest were similar to the Deglet-Noor dates harvested in North African countries. The North African countries have indicated considerable concern to Parties that alternatives for their high moisture dates were not currently known. In 2003, MBTOC agreed that it did not, at that time, know of pest control alternatives to high moisture fresh dates. However, MBTOC has recently gained the understanding that the moisture content of US dates at time of harvest is between 17-23%. In the instance of US dates it appears that the length of time needed to achieve date maturity on the tree, also results in considerable drying, while the dates are still on the tree. Thus, US dates were referred to as 'fresh' but the American definition stands in contrast to the Deglet-Noor dates of North African countries which are also harvested 'fresh' at maturity but are at 35-40% moisture content. It is the moisture content and not the freshness of recent picking that impacts the potential for alternatives to be effective. When dates are at 17-23% moisture content, they are a dried fruit from the viewpoint of regulation allowing the use of alternatives and from the viewpoint of spoilage potential. In the case of the US, the word 'fresh' in this instance is a marketing term. Therefore, heat, phosphine, controlled atmosphere and cold treatment seem likely to be effective and are registered for use in the US. In addition, sulfuryl fluoride is also registered for treatment of dates and recent trials have indicated efficacy, at least for adults and larvae of some pests. As noted above, recently submitted preliminary research indicates potential problems with efficacy for egg kill for one pest of dried fruit (Walse, 2008). It remains to be seen whether this is an actual barrier to adoption of sulfuryl fluoride for dates, or whether manipulation of fumigation parameters such as temperature could resolve this problem. For further discussion of date infestation and treatment issues, the reader is referred to the review of date treatment elsewhere in May 2009 TEAP/MBTOC Progress Report. In the instance of a future CUN for dates, MBTOC will expect research reports which indicate the extent of the problem with the target pest, and showing that manipulation of fumigation parameters was insufficient to result in adequate efficacy.

Country	Industry	CUE for 2005 (ExMOP1 and MOP16)	CUE for 2006 (MOP 16 +ExMOP2+ MOP17)	CUE for 2007 (MOP17+ MOP18)	CUE for 2008 (MOP18+ MOP19)	CUE for 2009 (MOP19+ MOP20)	CUE for 2010 (MOP20)	CUN for 2010	MBTOC rec. for 2010 (addtl or new)	CUN for 2011 (addtl or new)	MBTOC rec. for 2011 (new)
<p>Walnut sector has virtually completed its transition to sulfuryl fluoride and other alternatives for commodity exported to the EU; the remaining small use of MB is to allow for quick treatment of packaged product when the other treatments would be too slow. MBTOC expects that even this use will quickly diminish as logistics for alternative treatments are improved. In the instance of a future CUN for walnuts, MBTOC will expect considerable information exactly describing which step in processing or logistic circumstance critically needs MB, the likely volume of product so affected and indicating practical plans to eliminate even this use. There are numerous alternatives available for walnuts.</p> <p>The California Dried Plum Board nomination includes dried plums, dried raisins and figs. MBTOC believes that transition to alternatives should be completed for dried plums and raisins by 2011. MB should be used for these commodities only in the instance proven lack of efficacy of, or technically justifiable inability to use, or to complete the transition to, alternatives. Plums are dried using a heat process which also results in disinfestation. Plums can be stored in cool or cold storage without risk of sugar crystallization and if they are infested after drying they can be treated with phosphine. Figs are infested at harvest and need a treatment before storage, but several alternative treatments are available and should be used. MBTOC has not been given the volumes of figs treated by alternatives and the volume of figs intended to be treated by MB, but from the MB volume nominated, it seems MB is used for a small portion of the harvest. In the instance of a future CUN for figs, MBTOC will expect considerable information exactly describing which step in processing or logistic circumstance critically needs MB, the likely volume of product so affected and indicating practical plans to eliminate even this use. Raisin sector can use phosphine, controlled atmosphere, sulfuryl fluoride or cool storage and should only resort to MB in the instance of proven lack of efficacy of, or technically justifiable inability to use, or to complete the transition to, alternatives. Bean sector is currently quickly transitioning to phosphine, but sulfuryl fluoride could also be used to resolve logistical issues caused by lack of available treatment facilities or options.</p> <p>MBTOC comments on economics 2009: This CUN is not based solely on economic arguments. CUN summarizes economic losses due to use of:</p> <ul style="list-style-type: none"> • Phosphine. Losses arise from additional production downtimes due to longer fumigation time and from capital expenditures required to adopt an alternative. Economic losses due to downtime with phosphine are persistent. MBTOC agrees with this analysis. <p>Sulfuryl Fluoride. SF is shown to be a viable alternative to MB; costs per lb are comparable although application rates may be higher. Walnuts have inelastic demand; cost increase can be passed to consumers. Sulfuryl fluoride was found to be technically and economically feasible for walnuts, dried fruit, and dried beans</p>											

Country	Industry	CUE for 2005 (ExMOP1 and MOP16)	CUE for 2006 (MOP 16 +ExMOP2+ MOP17)	CUE for 2007 (MOP17+ MOP18)	CUE for 2008 (MOP18+ MOP19)	CUE for 2009 (MOP19+ MOP20)	CUE for 2010 (MOP20)	CUN for 2010	MBTOC rec. for 2010 (addtl or new)	CUN for 2011 (addtl or new)	MBTOC rec. for 2011 (new)
United States	NPMA food processing structures (cocoa beans removed)	83.344	69.118	82.771	69.208	54.606	37.778	-	-	17.365	17.365

MBTOC comments 2009:

MBTOC recommends the nominated amount of 17.365 tonnes for food processing facilities in 2011. The Party's nomination reflects a 54% decrease in MB use in its food processing sector over the amount of MB granted by the Parties for 2010.

This CUN includes facilities that prepare processed foods (such as chips, crackers, cookies and pasta), spices and herbs processing facilities, and also cheese processing plants (with cheese present in storage). The food processing sector represents by far the largest portion of the MB nomination in this CUN (14.498 tonnes). Herb and spice blending facilities (1.055 tonnes) and cheese storages (1.812 tonnes) are relatively small.

Food processing facilities in the United States have reduced the number of methyl bromide fumigations by incorporating many different techniques to control pests. The most critical strategy implemented is IPM, especially sanitation, in all areas of a facility. Facilities are now being monitored for pest populations, using visual inspections, pheromone traps, light traps and electrocution traps. When insect pests are found, facilities will attempt to contain the infestation with treatments of low volatility pesticides applied to both surfaces and cracks and crevices; spot treatments with heat or phosphine will be used in areas that are suitable. Incoming ingredients are inspected for insect pests and may be treated with phosphine. These techniques contribute to reduced pest pressure and avoid the need for full site treatment.

MBTOC notes that perhaps especially with herb and spice processing equipment, in the instance of pest infestation centered in a particular piece of equipment, spot heat treatment with additional measures to prevent pest escape might be effective. MBTOC described a suitable spot heat method in its flour milling review of TEAP, 2008.

With this nomination, the Party has moved ahead of its transition plan indicated in earlier CUNs. The Party's CUN in 2007 indicated that 16% of the MB use included in its food processing nomination would not be able to transition. But, with the 2009 nomination, the transition to alternatives in food processing sector is now approaching the level previously indicated as unable to transition. MBTOC inquires if the part of the sector previously designated as unable to transition is now considered able to transition to alternatives?

Although the other sectors included in this CUN have made very substantive reductions in MB nominated, cheese storage sector has not reduced its nomination. MBTOC acknowledges a lack of knowledge of currently technically effective MB alternatives. The CUN indicates that, "Cheese manufacturers may target their products during fumigations with methyl bromide when a mite infestation is identified by USDA inspection and a fumigation is ordered." MBTOC assumes that under these circumstances, records of the fumigation must be kept by government inspectors or by the processing facility. Therefore MBTOC requests that as part of any future CUN, actual MB use figures for cheese processing sector be submitted. MBTOC needs these records to monitor that the amounts it recommends are consistent with the amounts actually needed. The Party has reported that the ongoing multi-state research project on mite infestation in cured pork also includes investigations of mites in cheese. However, MBTOC also encourages the Party to contact EU and Canadian cheese producers to see how they manage pests in cheese storages without MB.

Country	Industry	CUE for 2005 (ExMOP1 and MOP16)	CUE for 2006 (MOP16 +ExMOP2+ MOP17)	CUE for 2007 (MOP17+ MOP18)	CUE for 2008 (MOP18+ MOP19)	CUE for 2009 (MOP19+ MOP20)	CUE for 2010 (MOP20)	CUN for 2010	MBTOC rec. for 2010 (addtl or new)	CUN for 2011 (addtl or new)	MBTOC rec. for 2011 (new)
MBTOC comments on economics 2009:											
This CUN is not based solely on economic arguments. CUN summarizes economic losses due to use of: <ul style="list-style-type: none"> Heat treatment. Heat treatments are technically and economically feasible in some cases. However, in very cold regions, heat is costly and production time is lost; in old facilities, high heat could inflict structural damage; heat is not feasible for treating commercial-scale commodity volumes, as heat is a poor penetrator of packaging, boxes, and commodities; structures with many concrete partitions are not good candidates for heat treatment because heat may not be evenly distributed. Economic losses due to downtime with heat treatment are persistent. MBTOC does not agree that production time is lost, although the treatment cost may be higher. Phosphine. Although phosphine kills insects, it is corrosive to components of the electronics that run the manufacturing equipment. Phosphine also requires a longer application time. Phosphine is not a suitable alternative to methyl bromide when rapid fumigations are needed to meet customer timelines. Resistance has also been reported for several stored product pests. Furthermore, cheese makers claim that phosphine causes damage to the cheese Carbon dioxide. Facilities in the United States are not airtight enough for modified atmospheres or carbon dioxide to be effective primarily due to age of the facility; specifically, most facilities are more than 25 years old. Sulfuryl fluoride. A portion of the food processing facilities can economically convert to sulfuryl fluoride. Other facilities cannot due to economic losses that would result from higher treatment costs which arise at lower temperatures. For a small percentage, SF is not technically feasible due to cold temperatures. Adding heat to increase the efficacy of SF is also not an economically feasible option. MBTOC requires substantiation of these claims.											
United States	Mills and processors	483.000	461.758	401.889	348.237	291.418	173.023	-	-	135.299	135.299
MBTOC comments 2009:											
MBTOC recommends 135.299 tonnes, the nominated amount for 2011. In 2007, the Party implemented an acceptable transition plan for this sector requiring annual decreases of 18-20%, depending on the type of facility. This plan continues to be implemented, and sometimes exceeded, by the Party, although not in consistent year over year increments. Thus MBTOC notes that for 2011, the pet food and rice milling sector nominations have not decreased over 2010 levels, perhaps because earlier transitions were higher than originally planned. <p>The CUN indicates that continued lack of regulatory approval for fluorine residues in pet foods and in food mixes that are sometimes present in rice mills is the reason for lack of progress in adopting alternatives in these sectors. However, MBTOC notes that this was also the reason given last year for a slowing of the adoption of alternatives in rice milling and pet food facilities. MBTOC continues to express its concern about the possibility of continued lack of adoption of alternatives in these sectors if research to overcome the problem of segregating commodities during SF fumigation of facilities is not conducted.</p> <p>In its text boxes of 2008, MBTOC noted, "Pet food facilities could, however, expand use of full site or spot heat treatment, utilizing appropriate pest barrier methods to prevent pest escape from spot heat treatments." And, "The three sectors included in this CUN are expected to work to improve treatment logistics that improve product segregation so that more adoption of alternatives can be accomplished even if regulatory barriers to the use of SF persist. When conducting SF fumigations where food mixes are</p>											

Country	Industry	CUE for 2005 (ExMOP1 and MOP16)	CUE for 2006 (MOP 16 +ExMOP2+ MOP17)	CUE for 2007 (MOP17+ MOP18)	CUE for 2008 (MOP18+ MOP19)	CUE for 2009 (MOP19+ MOP20)	CUE for 2010 (MOP20)	CUN for 2010	MBTOC rec. for 2010 (addtl or new)	CUN for 2011 (addtl or new)	MBTOC rec. for 2011 (new)
<p>present, the applicant could trial tarping off the food under positive pressure or removing food ingredients and mixes to non-fumigated areas or sealing off stored product warehouses to allow SF treatment of facility while ensuring that food is not exposed (TEAP October 2008)". Food isolation techniques during SF fumigations are commonly commercially used in Germany and the UK, for example. In the EU the need to segregate food commodities has not stymied the adoption of SF for food processing facilities and mills. The CUN for 2009 and Party correspondence indicated that this research recommended by MBTOC was not done. MBTOC indicates that without the conduct of suitable research to overcome the regulatory problem, it can not continue to recommend MB use in pet food and rice milling, particularly if there were to be another year of CUN without re-implementing the previous years' transition rates.</p> <p>In addition to this concern, we note that CUNs and Party correspondence indicates there is a segment of the pet food facilities and rice milling that will be unable to transition to alternatives, at all. The CUN of 2008 and earlier years indicates about 5 tonnes of MB use in rice milling and 6 tonnes in pet foods sector will not be able to adopt alternatives at all. MBTOC has insufficient information to allow it to agree that there is a segment of these two sectors unable to transition at all to alternatives. Without very considerable information and examination of these sectors by the Party and MBTOC, we will assume that a transition of 18-20% of the entire sector is achievable. MBTOC notes that flour milling has continued its transition at acceptable levels and makes no further comment about this sector.</p>											
<p>MBTOC comments on economics 2009:</p> <p>This CUN is not based solely on economic arguments. CUN summarizes economic losses due to use of:</p> <ul style="list-style-type: none"> Heat treatment. Food processing facilities located in cold climates (which are able to convert to heat treatment) may experience economic losses from additional production downtimes associated with heat-up time. Economic losses in cold weather facilities due to downtime with heat treatment are persistent. <p>Sulfuryl Fluoride. A portion of the food processing facilities can economically convert to sulfuryl fluoride. Other facilities cannot due to economic losses that would result from higher treatment costs which arise at lower temperatures. For a small percentage, SF is not technically feasible due to cold temperatures. According to the CUN adding heat to increase the efficacy of SF is also not an economically feasible option. With regard to pet food, it would be desirable to analyze the cost of isolating product from exposure to sulfuryl fluoride.</p>											

Country	Industry	CUE for 2005 (ExMOP1 and MOP16)	CUE for 2006 (MOP 16 +ExMOP2+ MOP17)	CUE for 2007 (MOP17+ MOP18)	CUE for 2008 (MOP18+ MOP19)	CUE for 2009 (MOP19+ MOP20)	CUE for 2010 (MOP20)	CUN for 2010	MBTOC rec. for 2010 (addtl or new)	CUN for 2011 (addtl or new)	MBTOC rec. for 2011 (new)
United States	Cured pork	67.907	40.854	18.998	19.669	18.998	4.465	-	-	3.730	3.73

MBTOC comments 2009:

MBTOC recommends the Party's nominated amount of 3.73 tonnes for Southern cured pork in 2011. The Party nominated 16% less MB for 2011 than was granted by the Parties for this use in 2010. This reduction was taken on the previous year's 25% reduction. Formerly, the frequency of fumigation was up to five times a year, and now fumigation is reported to occur only one time per year.

The pork becomes infested with *Tyrophagus putrescentiae* (Ham or cheese mites) and *Necrobium rufipes* (Redlegged ham beetle) (Phillips et al, 2008). There is currently no technically effective and registered alternative for the treatment of these pests of cured pork, but decreases in MB use have resulted from IPM improvements in the processing facilities, reduced frequency of fumigations, and improvements in reporting historical MB use. This sector is collaborating in a multi-state research program (Phillips et al, 2008). This program has resulted in IPM improvements in the facilities which contributed to a reduced need for fumigation.

Additionally, this research program has resulted in an improved understanding of the inter-reaction between ham curing time and the incidence of pest infestation. When cured pork is stored longer than 6 months, there is a higher incidence of infestation. So, managing the overall ham process might assist to reduce pest infestation.

The use of sulfuryl fluoride as a pest control method was investigated through this program, but it was not effective on mites. Effective treatment was only achieved when 3x the allowed label rate was used, and at that point, fluorine residues were unacceptably high (Sekhorn et al, 2008). The researchers are now investigating the potential effectiveness of phosphine, or low O₂ and high CO₂, but they are concerned that the poorly structured traditional ham storage houses in the US won't hold the CO₂.

In its text box of October 2008, MBTOC recommended that the Party test the method used in Spain which involves dipping the hams in a mixture of oil and lard at 90°C. At the 2008 MBAO conference, the researchers informed us that they are planning to investigate these alternative techniques. When the researchers are ready to start these investigations they intend to contact MBTOC for more specific information.

MBTOC comments on economics 2009:

This CUN is not based on economic arguments.

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6. MBTOC Work plan for 2010

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 MB 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 (and 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 2010 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 Twenty First 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 2010 - 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 2010 as set out in Table 6.1 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 and a declaration of interest for each member is contained in Annex VII.

The work plan also includes an indicative budget for the activities in 2010, which relate to evaluation of CUNs. MBTOC anticipates two meetings in 2010 as per the workplan, since aside from CUNs it is required to complete the 2010 Assessment Report. MBTOC firmly requests improved UNEP and Party funding of MBTOC members and meetings to allow appropriate compliance with meeting obligations and workload with credibility. Some MBTOC members are now retired from their research institutes and there seems to be an expectation that they will cover travel costs from personal funds. Other members must try to cover travel costs from their already thin research budgets. Some Non-A5 members report it is a struggle for them to obtain funding in the current economic climate to fund attendance since Parties already contribute to the MLF.

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. Provision of some funding for non-Article 5 MBTOC members to attend meetings is strongly recommended.

Annex 1 of Decision XVI/4 outlines a schedule by which up to two MBTOC meetings are envisioned per year to evaluate CUNs. The schedule further allows MBTOC to

seek further information from Parties and in turn for Parties to provide additional information in response to MBTOCs interim recommendations made during the first meeting.

Table 6.1. MBTOC work plan and indicative budget: 2010

Tasks and actions	Indicative budget needs where applicable	Indicative completion date	Dates of meetings
Parties submit their nominations for critical-use exemptions to the Secretariat	-	24 January 2010	
The nominations are forwarded to MBTOC co-chairs for distribution to the subgroups of appointed members	-	7 February 2010	
Initial summarization of the nominations	-		
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			
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	-	21 February 2010	
Nominating Party develops and submits its response to the MBTOC co-chairs	-	7 March 2010	
MBTOC Meeting No 1 <ul style="list-style-type: none"> • 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 • Bilateral meetings • Conduct work on the 2010 MBTOC Assessment report 	Funds for travel of 6 non-A5 members: US\$12,000 Meeting Costs \$3,500 Soils Meeting Costs \$3,500 QSC	April 2010	Antalya, Turkey (Soils Tentative QSC unknown), possibly Turkey)
8. MBTOC provides its draft recommendations on the CUNs to TEAP		End of April, 2010	
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.		April 2010	TBD
10. The Secretariat posts the finalised report on its web site and circulates it to the Parties	-	May 2010	
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		End June 2010	Bangkok (Tentative)
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	-	Late June 2010	
13. MBTOC Meeting No 2: 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	Funds for travel of 5 non-A5 members: US\$12,000 Meeting costs: \$US 3,500 Soils Meeting costs US\$3,500 QSC	Mid July 2009	US (California) (Tentative)

Tasks and actions	Indicative budget needs where applicable	Indicative completion date	Dates of meetings
<ul style="list-style-type: none"> finalise the report, including notice of any proposed new standard presumptions to be applied by MBTOC conduct any bilateral consultations requested by Parties progress, to the best extent possible, the MBTOC 2010 Assessment report. Report is due December 31st, 2010 			
14. MBTOC draft final report considered by TEAP, finalised and made available to Parties through the Secretariat	-	End July, 2010	
15. 22th Meeting of the Parties			End October 2010. Nairobi (Tentative)
Total budget:	US \$: 38,000 <ul style="list-style-type: none"> US\$ 24,000 (Travel of Non Article 5 member) Meeting Costs (UNEP) \$14,000 		

Note: If Parties give early indication that they will fund non-A(5) MBTOC members, this budgetary request could be reduced.

7. Summary Report of the Activities Carried out by MBTOC in 2009

- Initial summarization of the CUNs (initial sorting and recording carried out by the Secretariat).
- Preparation of questions for Parties. Assessment of responses received.
- First meeting of MBTOC sub committees on the assessment of the CUNs: MBTOC-S Morocco, and MBTOC QSC, Rotterdam 13-18 April 2009. One A5 economist resigned. Two new A5 members joined the MBTOC S subcommittee. Interim recommendations and report prepared for the Parties. Bilateral meetings were held by MBTOC-S with USA.
- Site visits: MBTOC-S conducted a field trip to observe alternatives adopted by vegetable growers including substrate production and alternative fumigants in Morocco. MBTOC-QSC conducted a site visit to the ports and MB recapture facilities in Netherlands and Belgium.
- Completion of the interim report for consideration by the 29 OEWG as part of 2009 TEAP Progress Report of May 2009.
- 29 OEWG (Geneva, 15-18 July 2009). Bilateral meetings with Australia, Californian Strawberry Commission (USA), Israel, Japan, Russian Federation and USA.
- Second round review of CUN nominations from July to September 2009 by email correspondence. Eight members of MBTOC-S who were attending the International Soil Disinfestation Conference met in Leuven Belgium to discuss planning and logistics for the 2010 CUN round and Assessment report.
- Preparation of the final report on the CUNs for consideration by the Parties at their 20th Meeting.

ANNEX 1. 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.*

Para. 2 of Decision IX/6 does not assign TEAP the responsibility for determining the existence of “significant market disruption” specified in paragraph 1(a)(i).

TEAP assigned its Methyl Bromide Technical Options Committee (MBTOC) to determine whether 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*, and to address the criteria listed in Decision IX/6 1(b).

ANNEX II. Decision XVI/4

Review of the working procedures and terms of reference of the Methyl Bromide Technical Options Committee

Report of the Sixteenth Meeting of the Parties to the Montreal Protocol (Annex I), Prague, 22–26 November 2004), paragraph 15.

A. Working procedures of the Methyl Bromide Technical Options Committee relating to the evaluation of nominations for critical uses of methyl bromide

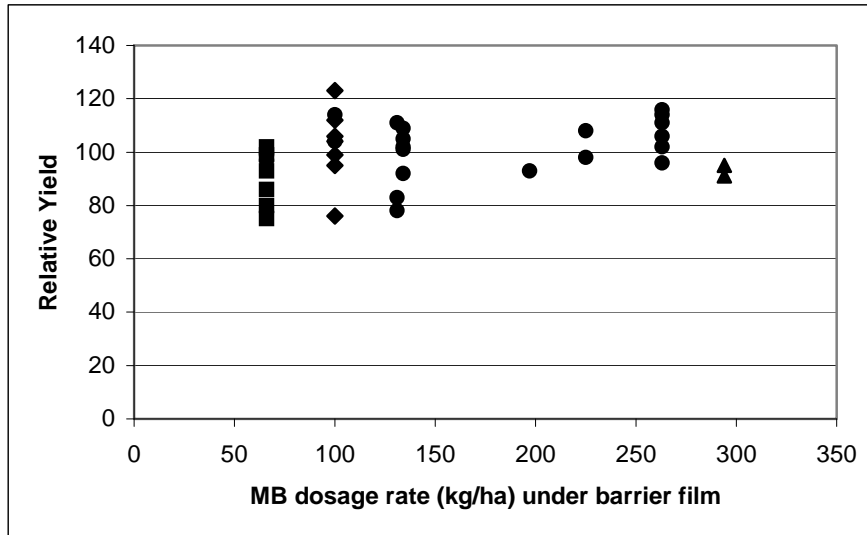
15. An annual work plan will enhance the transparency of, and insight in, the operations of MBTOC. Such a plan should indicate, among other things:
 - (a) Key events for a given year;
 - (b) Envisaged meeting dates of MBTOC, including the stage in the nomination and evaluation process to which the respective meetings relate;
 - (c) Tasks to be accomplished at each meeting, including appropriate delegation of such tasks;
 - (d) Timing of interim and final reports;
 - (e) Clear references to the timelines relating to nominations;
 - (f) Information related to financial needs, while noting that financial considerations would still be reviewed solely in the context of the review of the Secretariat's budget;
 - (g) Changes in the composition of MBTOC, pursuant to the criteria for selection;
 - (h) Summary report of MBTOC activities over the previous year, including matters that MBTOC did not manage to complete, the reasons for this and plans to address these unfinished matters;
 - (i) Matrix with existing and needed skills and expertise; and
 - (j) Any new or revised standards or presumptions that MBTOC seeks to apply in its future assessment of critical-use nominations, for approval by the Meeting of the Parties.

ANNEX III. Relative effectiveness of MB/Pic formulations applied in combination with low permeability barrier films (LPBF) compared to the commercial standard MB/Pic formulation applied under standard low density polyethylene films (LDPF).

Country	Region	Commodity	Brand or Type of Barrier Film	Untreated	Methyl Bromide/Chloropicrin Mixtures (Product rate per treated area)													Notes	Reference		
				Yield	Std film		Barrier Film – Relative yield compared to standard polyethylene														
					MB/Pic Formuln.	Product Rate kg/ha	Not Spec 300	98:2 400	98:2 300	67:33 98	67:33 196	67:33 200	67:33 294	67:33 336	67:33 392	50:50 200	33:67 200				
MB Dosage rate (g/m2)					392	294	66	131	134	197	225	263	100	66							
Spain	Vinderos	Strawb. Runner	VIF - NotSpec	74	50:50	400											93	Fusarium, Phytophthora, Pythium, Rhizoctonia and Verticillium	De Cal et al 2004		
	Navalmanzano			78	50:50	400														80	
Spain	Vinderos	Strawb. Runner	VIF - Not Spec	68	50:50	400										114	102	Fusarium, Cladosporium, Rhizoctonia	Melgarejo et al 2003		
	Navalmanzano			34	50:50	400											76			75	
Spain	Avitorejo	Strawb. Fruit	VIF - Not Spec		50:50	400											97	2003 results	Lopez-Aranda et al 2003		
	Malvinas				50:50	400														99	
Spain	Valencia	Strawb. Fruit	VIF - Not Spec	59	Not Spec	600	94											1998 Fusarium At 10cm & 30cm 1999 results	Bartual et al 2002		
				53	Not Spec	600	93														
Spain	Avitorejo	Strawb. Fruit	VIF - Not Spec	80	67:33	400										112	Meloiodogyne and weeds (unspec.)	Lopez-Aranda et al 2001			
	Tariquejo			54	67:33	400													106		
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 1999 results, nurseries 2000 results, nurseries	Melgarejo et al 2001			
	Arevalo, Nav.			84	50:50	400									104, 104						
	Vinaderos, Nav.			49	50:50	400										95, 123					
Spain	Huelva	Strawb. Fruit	VIF - Not Spec	82	67:33	400											1997-1998 Inoc.unspecified 1998-1999 Inoc. Unspecified 1999-2000 Inoc. Unspecified	Lopez-Aranda et al 2000			
				72	67:33	400															
				68	67:33	400															

Country	Region	Commodity	Brand or Type of Barrier Film	Untreated	Methyl Bromide/Chloropicrin Mixtures (Product rate per treated area)													Notes	Reference
				Yield	Std film		Barrier Film – Relative yield compared to standard polyethylene												
					MB/Pic Formuln.	Product Rate kg/ha	Not Spec	98:2	98:2	67:33	67:33	67:33	67:33	67:33	67:33	67:33	50:50		
MB Dosage rate (g/m2)					392	294	66	131	134	197	225	263	100	66					
Spain	Moncada	Strawb. Fruit	VIF - Not Spec	60	98:2	600			95								1998 No major pathogens but Fusarium buried 10cm&30cm.	Cebolla et al 1999	
France	Douville	Strawb. Fruit	VIF - Not Spec	65	Not Spec	800		99									Inoculum not specified	Fritsch 1998	
NZ	Havelock North	Strawb. Fruit	VIF - Not Spec	83	67:33	500							98				Phytophthora	Horner 1999	
USA	Florida	Pepper	VIF Plastopil	69	67:33	392					78						Nutgrass	Gilreath and Santos 2005e	
			VIF Plastopil	69	67:33	392				99							Present		
			VIF Vikase	69	67:33	392					83								
			VIF Vikase	69	67:33	392				86									
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							108				Inoculum not specified	Ajwa et al 2004	
				80	67:33	392								96					
USA	Florida	Tomato	VIF - Not Spec	31	67:33	392					111		93		114		Nutgrass and rootknot nematodes	Hamill et al 2004	
USA	California	Strawb. Fruit	VIF - Not Spec	75	67:33	392									106		Watsonville, high pathogen pressure	Ajwa et al 2003	
				83	67:33	392									111				
				65	67:33	392									102				
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									116			Duniway et al 1998	
USA	Georgia	Nurseries	VIF – not spec		67:33	389	See reference											Carey and Godbehere, 2004	
USA	California	Roses			67:33	392	See reference											Hanson et al, 2006; 2009	
					98'2	392	See reference												
USA	Florida	Pepper	VIF – not spec		67:33	392	See reference											Santos and Gilreath, 2004	
USA	Florida	Pepper	VIF – not spec		67:33	392	See reference											Santos et al, 2005	
USA	California	Ornamentals	VIF – not spec		67:33	392	See reference											Klose 2007, 2008	
Unweighted averages (relative % yield)				66			94	99	93	93		102		103	108	104	91		

Figure 1. 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 Table 3.

ANNEX IV Part A: Trend in Preplant Soil Applications

List of nominated (2005 – 2011 in part) and exempted (2005 – 2010 in part) amounts of MB granted by Parties under the CUE process for each crop or commodity.

Party	Industry	Total CUN MB Quantities							Total CUE MB Quantities					
		2005	2006	2007	2008	2009	2010	2011	2005	2006	2007	2008	2009	2010
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	29.790	29.790	35.750	37.500	35.750	35.750	29.790	29.790
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	7.462	5.261	(a)14.792	6.840	7.995	7.462	7.462	7.462
Canada	Strawberry runners (Quebec)		1.826						(a)	1.826	1.826			
Canada	Strawberry runners (Ontario)										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			
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			

Party	Industry	Total CUN MB Quantities							Total CUE MB Quantities					
		2005	2006	2007	2008	2009	2010	2011	2005	2006	2007	2008	2009	2010
France	Pepper	Incl in.tomato cum	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	125.000	12.500				250.000	250.000	125.000	
Israel	Cucumber - protected new 2007			25.000	18.750		18.750				25.000	18.750	-	
Israel	Cut flowers – open field	77.000	67.000	80.755	53.345	42.777	42.554		77.000	67.000	74.540	44.750	34.698	
Israel	Cut flowers – protected	303.000	303.000	321.330	163.400	113.821	72.266		303.000	240.000	220.185	114.450	85.431	
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	87.500		125.650	99.400	105.000	87.500	87.500	
Israel	Potato	239.000	231.000	137.500	93.750	75.000			239.000	165.000	137.500	93.750	75.000	
Israel	Seed production	56.000	50.000			22.400			56.000	28.000			NR	
Israel	Strawberries – fruit (Sharon)	196.000	196.000	176.200	64.125	52.250	47.500		196.000	196.000	93.000	105.960	42.750	
Israel	Strawberry runners (Sharon)	35.000	35.000		20	15.800	13.570		35.000	35.000	28.000	31.900	15.825	
Israel	Strawberry runners and fruit Ghaza				87.875	67.500	67.500						47.250	
Israel	Tomatoes			90.000							22.750			
Israel	Sweet potato					95.000	20.000					111.500	95.000	
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	34.100	29.120	88.300	88.800	72.400	51.450	34.300	30.690
Japan	Ginger – field	119.400	119.400	112.200	112.100	102.200	53.400	47.450	119.400	119.400	109.701	84.075	63.056	53.400
Japan	Ginger – protected	22.900	22.900	14.800	14.800	12.900	8.300	7.770	22.900	22.900	14.471	11.100	8.325	8.300
Japan	Melon	194.100	203.900	182.200	182.200	168.000	90.800	77.600	194.100	203.900	182.200	136.650	91.100	81.720
Japan	Peppers (green and hot)	189.900	200.700	169.400	162.300	134.400	81.100	68.260	187.200	200.700	156.700	121.725	81.149	72.990
Japan	Watermelon	126.300	96.200	94.200	43.300	23.700	15.400	13.870	129.000	98.900	94.200	32.475	21.650	14.500
Malta	Cucumber		0.096							0.127				
Malta	Eggplant		0.128							0.170				
Malta	Strawberry		0.160							0.212				

Party	Industry	Total CUN MB Quantities							Total CUE MB Quantities					
		2005	2006	2007	2008	2009	2010	2011	2005	2006	2007	2008	2009	2010
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 (+Andalu cia)				20.000	15.000	43.490 (+Andalu cia)			
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			
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	411.757	340.405	218.032	1187.800	747.839	592.891	486.757	407.091	302.974
USA	Eggplant – field	76.761	101.245	96.480	79.546	62.789	34.732	21.561	76.721	82.167	85.363	66.018	48.691	32.820
USA	Forest nursery seedlings	192.515	157.694	152.629	133.140	125.758	120.853	106.043	192.515	157.694	122.032	131.208	122.060	117.826
USA	Ginger	9.200							9.200	0.000				
USA	Orchard replant	706.176	827.994	405.415	405.666	314.007	226.021	203.591	706.176	527.600	405.400	393.720	292.756	215.800
USA	Ornamentals	210.949	162.817	149.965	138.538	137.776	95.204	70.178	154.000	148.483	137.835	138.538	107.136	84.617
USA	Nursery stock - fruit trees, raspberries, roses	45.789	64.528	12.684	51.102	27.663	17.954	7.955	45.800	64.528	28.275	51.102	25.326	17.363
USA	Peppers – field	1094.782	1498.530	1151.751	919.006	783.821	463.282	212.775	1094.782	1243.542	1106.753	756.339	548.984	463.282
USA	Strawberry fruit – field	2468.873	1918.400	1733.901	1604.669	1336.754	1103.422	1023.471	2052.846	1730.828	1476.019	1349.575	1269.321	1007.477
USA	Strawberry runners	54.988	56.291	4.483	8.838	8.837	7.381	7.381	54.988	56.291	4.483	8.838	7.944	4.690
USA	Tomato – field	2876.046	2844.985	2334.047	1840.100	1406.484	994.582	336.191	737.584	2476.365	2065.246	1406.484	1003.876	737.584
USA	Turfgrass	352.194	131.600	78.040	52.189	0				131.600	78.04	0		
USA	Sweet potato	224.528			18.144	18.144	18.144	14.515				18.144	18.144	14.515

ANNEX IV– Part B: Trends in Post-harvest Structural and Commodity Applications

List of nominated (2005 – 2011 in part) and exempted (2005 – 2010 in part) amounts of methyl bromide granted by Parties under the CUE process for each crop or commodity.

Party	Industry	Total CUN MB Quantities							Total CUE MB Quantities					
		2005	2006	2007	2008	2009	2010	2011	2005	2006	2007	2008	2009	2010
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	7.820	5.660	6.150	6.150	9.205	9.200	7.820	6.650
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	22.878	14.107	(a)47	34.774	30.167	28.650	26.913	22.878
Canada	Pasta manufacturing facilities	(a)	10.457	6.757	6.067	4.740	4.7400		(a)	10.457	6.757	6.067	4.7400	
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	2.100			3.444	2.755	2.200	1.800	2.100	
Israel	Flour mills (machinery & storage)	2.140	1.490	1.490	0.800	0.300			2.140	1.490	1.040	0.312	0.300	

Party	Industry	Total CUN MB Quantities							Total CUE MB Quantities					
		2005	2006	2007	2008	2009	2010	2011	2005	2006	2007	2008	2009	2010
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	5.400	5.350	7.100	6.800	6.500	6.300	5.800	5.400
Latvia	Grains		2.502							2.502				
Netherlands	Strawberry runners post harvest		0.120	0.120		0.120				0	0.120			
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	19.242	10.041	89.166	87.719	78.983	58.921	45.623	19.242
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	37.778	17.365	83.344	69.118	82.771	69.208	54.606	37.778
USA	Smokehouse hams (Dry cure pork products) (building and product)	136.304	135.742	40.854	19.669	19.699	4.465	3.730	67.907	81.708	18.998	19.699	18.998	4.465
USA	Mills and Processors	536.328	505.982	401.889	362.952	291.418	173.023	135.299	483.000	461.758	401.889	348.237	291.418	173.023

ANNEX VII. Disclosure and Members of MBTOC Committees

Committee contact details and Disclosure of Interest

To assure public confidence in the objectivity and competence of TEAP, TOC, and TSB members who guide the Montreal Protocol, Parties to the Protocol have asked that each member to disclose proprietary, financial, and other interests. TEAP members have published such information for several years in the TEAP annual report.

As a result, Decision XVIII/19 was issued during the 18th Meeting of Parties to the Montreal Protocol held in New Delhi, India from 28 October to 3 November 2006. All MBTOC members are presently required to complete a disclosure of interest form and these are presented in summarized form below.

A – MBTOC Soil subcommittee Members - September 2009

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 on MB and alternatives in A5 (PhD)	A	Morocco	A5
2. Marta Pizano	F	Consultant	Consultant, MB alts, particularly cut flower production	A	Colombia	A5
3. Ian Porter	M	Department of Primary Industries (Government research)	Researcher, soils MB use and alts, particularly fungal pathogens and IPM (PhD)	A	Australia	Non-A5
Members						
4. Antonio Bello	M	Centro de Ciencias Medioambientales (Government research)	Non-chemical alternatives (PhD, Prof.)	A	Spain	Non-A5
5. Aocheng Cao	M	Chinese Academy of Agricultural Sciences (Government research)	Researcher, soil alternatives, particularly in China (A5) context (PhD)	B	China	A5
6. Peter Caulkins	M	Associate Director, Special Review & Reregistration Division US EPA	Registration of alternatives, regulatory issues (PhD)	C	USA	Non A-5
7. Abraham Gamliel	M	Agricultural Research Organization, The Volcani Center, (Government Research)	Alternatives for soils, horticulture (PhD)	C	Israel	Non-A5
Racquel Ghini	F	Empresa Brasileira de Pesquisa Agropecuária, Brazil	Researcher in horticulture, Develeoped solar	D	Brazil	A5

Names	Gender	Affiliation	Expertise	Length of service	Country	Article 5 status
			collectors for treatment of substrates			
9. George Lazarovits	M	Agriculture & Agri-food Canada (Government research)	Researcher, non chemical control of soilborne pathogens (PhD)	C	Canada	Non-A5
10 Andrea Minuto	M	Centro Regionale di Sperimentazione ed Assistenza Agricola CERSAA (CCIAA Savona) Albenga	Researcher, MB and alternatives in soils (PhD)	C	Italy	Non-A5
11. James D. Schaub	M	United States Department of Agriculture (Government regulatory)	Agricultural economist (PhD)	B	USA	Non-A5
12. Sally Schneider	F	United States Department of Agriculture (Government research)	Researcher in soils alts, particularly replant problems and propagative material nurseries (PhD)	B	USA	Non-A5
13. JL Staphorst	M	Plant Protection Research Institute (Parastatal research)	Expert Soil Microbiologist (DSc)	A	South Africa	A5
14. Akio Tateya	M	Syngenta Japan K.K.	Application of MB and alts, particularly in Japan	A	Japan	Non-A5
15 Alejandro Valeiro	M	Instituto Nacional de Tecnología Agropecuaria (Government research)	Introduction/use of soils alts, including tobacco	B	Argentina	A5
16. Nick Vink	M	University of Stellenbosch (Academia)	Agricultural economics (PhD, Prof.)	C	South Africa	A5
17 Janny Vos	F	CABI, The Netherlands	Plant Pathologist-IPM	D	Holland	
18. Jim Wells	M	Environmental Solutions Group, LLC (Consultant)	Registration and regulatory - MB and alternatives, soil uses	A	USA	Non-A5
19. Suat Yilmaz	M	West Mediterranean Agricultural Research Institute (Government Research)	Institute Director, Plant Pathologist and Alternatives for soils (PhD)	D	Turkey	A5
Totals	M =14 F =5		A= 6 B= 5 C = 5 D= 3			A5=8 Non-A5=11

A - >10 years B - 5-10 C - 2-5 D - <2 year
Article 5 countries: 7 (39 %) Non Article (countries): 11 (61 %)

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. Prof. 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. Prof. Besri works occasionally as a consultant to UNEP on matters related to the Montreal Protocol. Neither Prof. Besri's spouse, business partner or dependant children, 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. 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 MB 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. Presently, she is also a co-chair of the methyl bromide QPS task force. 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

Consultant
Victoria, AUSTRALIA

Dr Ian Porter is the Principal Research scientist in Plant Pathology with the Victorian Department of Primary Industries (DPI) but presently conducts MBTOC work on leave from his organisation. DPI has an interest in developing sustainable control measures for plant pathogens and biosecurity. He has been a member of a number of National Committees

regulating ODS, has led the Australian research program on methyl bromide alternatives for soils and has 29 years experience in researching sustainable methods for soil disinfestation 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, Ian, his 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 conducted projects 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 past MBTOC activities.

Members of record

Dr. Antonio Bello

Consejo Superior de Investigaciones Científicas
Madrid
SPAIN

Dr. Antonio Bello Pérez is a full time Research Professor at the Centre for Environmental Sciences in 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 for Plant Protection
Chinese Academy for 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.

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.

Raquel Ghini

Article 5 member

Empresa Brasileira de Pesquisa Agropecuária
BRAZIL

Dr Raquel Ghini. is a research scientist at Embrapa ("Empresa Brasileira de Pesquisa Agropecuária"). She is employed as a full time researcher on non-chemical alternatives for the control of soilborne plant diseases and the impacts of Global Climate Change on plant diseases. She is also a professor at UNESP University, Faculty of Agronomy, Botucatu, SP, Brazil. Dr. Ghini developed a solar collector for substrate desinfestation . This equipment has been adopted by the ornamentals growers as part of a UNIDO project to phase out methyl bromide in Brazil. This equipment cannot be patented because it is in public domain. Neither Dr. Ghini, nor her spouse or their children have any proprietary interest in alternatives or substitutes to ODS, nor own stock in companies producing ODSs or their alternatives or substitutes, or consult for organizations seeking to phase-out ODSs. She is coordinating a national project aiming to evaluate impacts of Climate Change on plant diseases, pests and weeds in Brazil. Expenses related to Dr. Ghini's attendance to MBTOC meetings are paid by UNEP

Dr. George Lazarovits

Agriculture & Agri-food Canada
London, Ontario
CANADA, N5V 4T3.

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. Andrea Minuto

Centro Regionale di Sperimentazione ed Assistenza Agricola CERSAA
(CCIAA Savona)
Regione Rollo n° 98 17031
Albenga (SV)
ITALY

Dr Andrea Minuto is a full time employee at the CERSAA experimental station in Italy. CERSAA has an interest in the topics of pest and disease control including soil disinfection because of the activities carried out in the frame of regional and national programmes of technology transfer to growers including soilborne pests and diseases management issues. 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 CERSAA) for organizations seeking to phaseout 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 Italian Ministry of Environment, Territory and Sea.

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
USDA ARS
Beltsville, Maryland
UNITED STATES

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**Article 5 member**

Recently retired senior soil microbiologist from the Plant Protection Research Institute (PPRI)
Agriculture Research Council (ARC)
Pretoria
SOUTH AFRICA

Dr. Staphorst is presently an advisor to 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 has been 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.

Mr. Alejandro Valeiro

National Project Coordinator

National Institute for Agriculture and Technology (INTA)

Tucumán

ARGENTINA

Article 5 member

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

University of Stellenbosch

Department of Agricultural Economics

SOUTH AFRICA

Article 5 member

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.

Dr. Janny Vos

CABI, Kastanjelaan 5

3833 AN Leusden

THE NETHERLANDS

Dr. Janny Vos, MBTOC-Soil Member is a senior IPM specialist at CAB International (CABI). Dr Vos is a full time senior manager at the CABI Netherlands office. CABI has an interest in the topics of the Montreal Protocol because it fits with CABI's mission to improve people's lives worldwide and focus on solving problems in agriculture and environment. Dr. Vos 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 no consulting for organizations seeking to phaseout ODSs. Dr. Vos works occasionally as a consultant to EC on matters related to the Montreal Protocol. Travel to MBTOC meetings is paid by the Netherlands government.

Mr James Wells

President

Environmental Solutions Group, LLC

Sacramento, California

UNITED STATES

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. Mr. 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.

Dr Suat Yilmaz,

Director and National Project Coordinator,

West Mediterranean Agricultural Research Institute,

Antalya,

TURKEY

Article 5 member

Dr. Suat Yilmaz is a plant pathologist and National Project Coordinator of the Turkish Methyl Bromide Phase out Project supported by UNIDO. He is employed as the Director of the West Mediterranean Agricultural Research Institute (BATEM), at the Ministry of Agriculture and Rural Affairs (MARA). The BATEM has an interest in the topics of the Montreal Protocol because it is the research and development institute for solving the farmer's problems and for developing environmentally safe crop production systems for vegetable and cut flower sectors. Dr. Yilmaz does not work as a consultant to any organization on matters related to the Montreal Protocol. Neither his spouse nor children 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 UNEP.

MBTOC Quarantine, Structures and Commodities SUBCOMMITTEE					
Chair					
1. Michelle Marcotte	F	Consultant	Consultant, particularly food processing, regulations, structural and commodity treatments and irradiation	A	Canada Non-A5
Members					
2. Jonathan Banks	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	CARDI	Research entomologist (Ph D)	D	Belize 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	MAF, New Zealand	Forester, government advisor on MB alternatives in forest products and QPS treatments	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	Croatian Institute for Agriculture, Food and Rural Affairs - Institute for Plant Protection (Government)	Postharvest and structural treatments, regulations	C	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	JKIGermany (Government research)	Director the Institute for Ecological Chemistry, Plant Analysis and Stored Product Protection of the Federal Institute for Cultivated Plants, Professor at Humboldt-University Berlin Chemist (PhD)	B	Germany Non-A5
14. Jordi Riudavets	M	IRTA-Department of Plant Protection. (Government Research)	IPM for stored products and horticultural crops (PhD)	C	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

MBTOC Quarantine, Structures and Commodities SUBCOMMITTEE					
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= 10 B= 3 C = 8		CEIT & A5=7 Non-A5=13

A - >10 years

B – 5-10

C – 2-5

Co-chair

Ms Michelle Marcotte MBTOC Co-Chair Quarantine, Structures and Commodities

Marcotte Consulting Inc.

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

10104 East Franklin Ave.

Glenn Dale, 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-USA 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 USAID 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 Laboratory
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

James Wattstraat 6,

3281 NK

Numansdorp, The Netherlands

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

Central Farm, Western Highway

Cayo District

Belize, Central America

Mailing address: P.O. Box 2. Belmopan City

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

4 Istanbul Street
Merville Park
Parañaque, Metro Manila
THE PHILIPPINES

Article 5 member

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
71, avenue Edouard Bourleau - BP 71
33883 VILLENAVE D'ORNON CEDEX

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
P.O. Box 2526
Wellington, New Zealand

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 preshipment treatments uses a significant amount of methyl bromide (170 tonnes in 2007). Current responsibilities cover researching, developing and reviewing New Zealand's import standards including operational standards such as treatments for imported and export 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 **Article 5 Member**
President
Pestcon Pest Management and General Services
33 Evening News, West Triangle
Quezon City
THE PHILIPPINES

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, Fisheries and Rural Development 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**Article 5 member**

Coordinator, Kenya Ozone Office, National Environment Management Office
Ministry of the Environment and National Resources
PO Box 67839
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 Union (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
UNITE D 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 phaseout 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

Article 5 member

Estación Experimental Agroindustrial Obispo Colombrés
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4101 Tucumán
ARGENTINA

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.