

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



UNEP

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

OCTOBER 2010

**EVALUATION OF 2010 CRITICAL USE NOMINATIONS FOR METHYL
BROMIDE AND RELATED MATTERS**

FINAL REPORT

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The text of this report is composed in Times New Roman.

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Reproduction: UNON Nairobi

Date: October 2010

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UNITED NATIONS ENVIRONMENT PROGRAMME
Ozone Secretariat, P.O. Box 30552, Nairobi, Kenya

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ISBN: 9966-7319-7-0

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Acknowledgement

The Technology and Economic Assessment Panel and its Methyl Bromide Technical Options Committee acknowledge with thanks the outstanding contributions from all of the individuals and organisations who provided support to Panel and Committee Co-Chairs and members. Particular appreciation goes to Meg Seki, UNEP Senior Science Officer, for her technical and scientific support and her contribution to the report. The opinions expressed are those of the Panel and the Committee and do not reflect the reviews of any sponsoring or supporting organisation.

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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 QPS	Methyl Bromide Technical Options Committee, Quarantine and Preshipment Subcommittee
MBTOC SC	Methyl Bromide Technical Options Committee, Structures and Commodities Subcommittee
MBTOC S	Methyl Bromide Technical Options Soils Subcommittee
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 2010 final report provides the final evaluations by MBTOC of CUNs submitted for methyl bromide (MB) in 2011 and 2012 by Parties in accordance with Decision IX/6. 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

This final report provides new updated recommendations for the CUNs for which the Parties provided further information and requested reassessment, lists the CUNs for which interim assessments have not changed and provides information on the CUNs from Parties on stocks (Decision Ex.1/4 (9f)). Partial information on actual MB consumption for critical uses (Decision XVII/9) and apparent adoption rates of alternatives, as evidenced by trend lines on reduction of MB CUNs (Decisions XIX/9, XX/5) are also provided. This condensed report covers full evaluation of CUNs where Parties requested a review after the 30th OEWG and any other CUNs where circumstances have changed. The interim May 2010 TEAP report has further details of assessment in this round.

Standard presumptions used in the final assessment in the 2010 round were the same as those used previously.

MBTOC Soils (MBTOC S) has initial responsibility for the pre-plant uses and alternatives of methyl bromide. MBTOC Structures and Commodities (MBTOC SC) has initial responsibility for issues concerning methyl bromide uses and MBTOC Quarantine and Preshipment (QPS) for issues related to alternatives for quarantine and pre-shipment.

Outcomes from deliberations of CUNs by MBTOC S and MBTOC SC were discussed and vetted via electronic communication and each member was asked to provide consensus on the final recommendation. Recommendations made by MBTOC S and MBTOC SC were circulated to all MBTOC as part of the process of reaching consensus within the whole committee.

1.1 Disclosure of interest

As in past reports, all MBTOC members have updated disclosure of interest forms relating specifically to their level of national, regional or enterprise involvement for the 2010 CUN process. The Disclosure of Interest declarations can be found on the internet at http://ozone.unep.org/Assessment_Panels/TEAP/index.shtml and a list of members in Annex III 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.

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.

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 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 up to the date of the assessment.

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. It is important that Parties continue to provide updates on regulatory changes with alternatives and MB and breakdown of the economic feasibility of alternatives compared to MB if they are relevant to the nomination. Without this information, further CUNs may not be assessable, as MBTOC may not be able 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)

Under decision Ex.I/4(9f) Parties nominating critical use exemptions are requested 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 the final assessment of nominations 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 was reported in the May TEAP 2010 report. No further information from Parties was required for this report.

Table 2.1 - Quantities of MB 'on hand' at the beginning and end of 2009, as reported by Parties in 2010 under Decision XVI/6.

Party	Critical use exemptions authorized by MOP for 2009	Quantity of MB as reported by Parties (metric tonnes)				
		Amount on hand at start of 2009	Quantity Acquired for CUEs in 2009 (production +imports)	Amount available for use in 2009	Quantity used for CUEs in 2009	Amount on hand at the end of 2009
Australia	37.61	0	33.278	33.278	33.278	0
Canada	39.1	1.997	28.279	30.276	23.8	6.38
EC						
Israel	Not Reported					
Japan	305.380	11.882	278.616	290.498	286.532	3.966
USA	2,276	4,273 (a)	2,274	6,547	2,215	3,063 (b) 59(c)

(a) Amount of pre-2005 stocks

(b) Includes the pre-2005 stocks which may be used for non CUE uses

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

2.4 Trends in Methyl Bromide Use for CUEs since 2005

In order to meet part of the requirement of Decision XVII/9 trends in phase out by Parties were shown in the interim report. Figs 2.1 and 2.2 show the trend in two of the remaining sectors which have changed amounts of MB requested since the interim assessment in April 2010.

Figure 2.1 - Amounts of MB exempted for CUE uses in the strawberry fruit industry 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 and the dotted line the final recommendation by MBTOC.

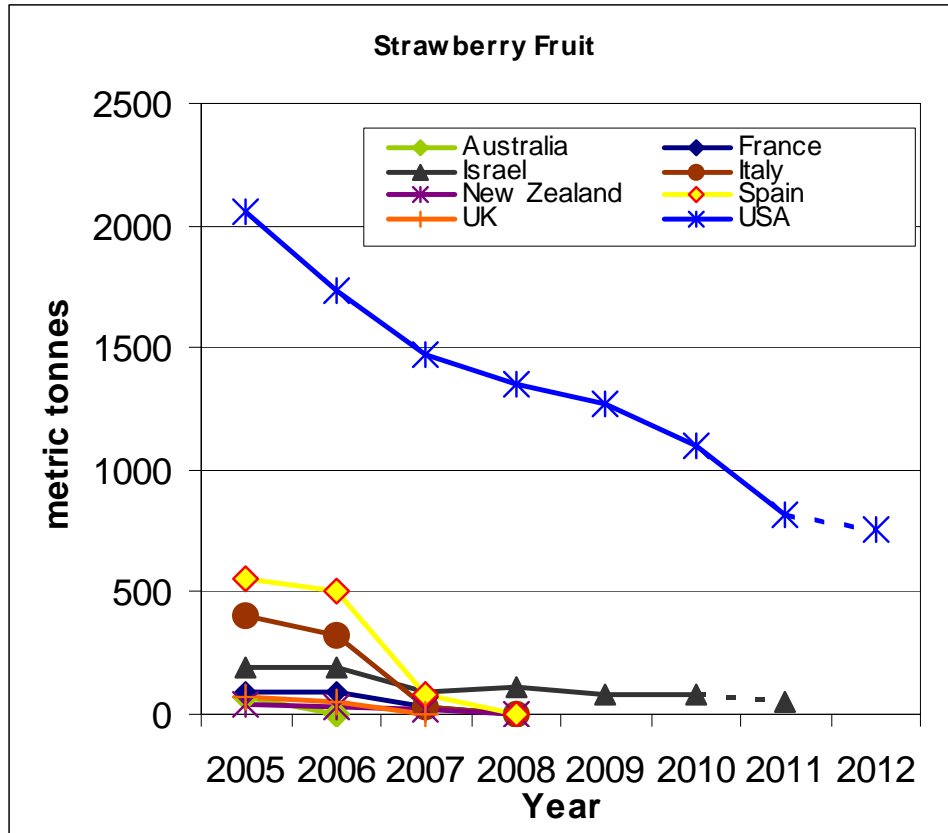


Figure 2.2 - Amounts of MB exempted for CUE uses in mills and food processing facilities from 2005 to 2011. Solid lines indicate trend in CUE methyl bromide. Dashed lines indicate quantity of methyl bromide nominated by the Party in either 2010 or 2011.

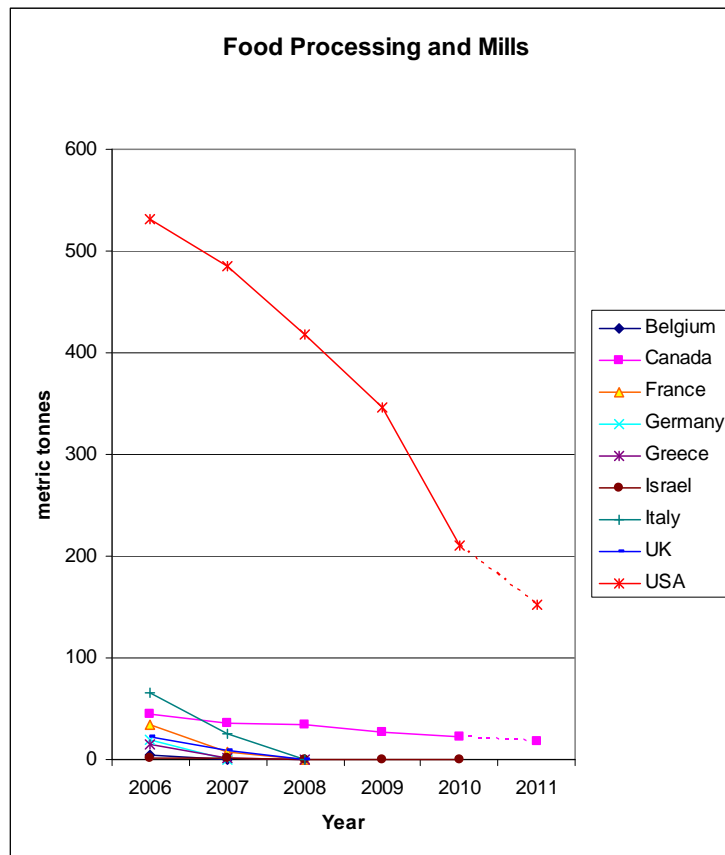


Table 2.2 - Summary of Critical Use Nomination (2005 – 2012 in part) and Exemption (2005 – 2011 in part) for Amounts of MB Granted by Parties under the CUN/CUE Process. (Note: A breakdown of CUN and CUE amounts by sector is given in Annex I and II)

	Quantities Nominated								Quantities Approved							Final Recommendation by MBTOC in 2010 round	
	2005	2006	2007	2008	2009	2010	2011	2012	2005 (1ExMOP and 16MOP)	2006 (16MOP+ 2ExMOP+ 17MOP)	2007 (17MOP + 18MOP)	2008 (18MOP + 19MOP)	2009 (19MOP)	2010 (20MOP + 21MOP)	2011 (21MOP)	2011	2012
Australia	206.950	81.250	52.145	52.900	38.990	37.610	35.450 +5.95	34.660 Rev 33.443	146.600	75.100	48.517	48.450	37.610	36.440	28.710	5.95	33.413
Canada	61.992	53.897	46.745	42.241	39.115	35.080	19.368 +3.529	16.281	61.792	53.897	52.874	42.188	39.115	30.340 +3.529	19.368	2.084	16.281
European Community ¹	5754.361	4213.47	1239.873	245.00	0	0	0	0	4392.812	3536.755	689.142	245.146	0	0	0	0	0
Israel	1117.156	1081.506	1236.517	952.845	699.448	383.700	232.247	*	1089.306	880.295	966.715	860.580	610.854	290.878	*	224.497	-
Japan	748.000	741.400	651.700	589.600	508.900	288.500	249.420	221.104	748.000	741.400	636.172	443.775	305.380	267.000	239.746	0	219.609
New Zealand	53.085	53.085	32.573	0	0	0	0	0	50.000	42.000	18.234	0	0	0	0	0	0
Switzerland	8.700	7.000	0	0	0	0	0	0	8.700	7.000	0	0	0	0	0	0	0
USA	10753.997	9386.229	7417.999	6415.153	4958.034	3299.490	2388.128	1181.779 Rev 1178.604	9552.879	8081.753	6749.060	5355.976	4261.974	3232.856 +2.018	2055.200	0	1022.826
TOTALS	18704.241	15617.837	10677.552	8297.739	6244.487	4044.380	2928.142 Rev 2934.092	1453.824 Rev 1449.432	16050.089	13418.200	9160.714	6996.115	5254.933	3572.183	2343.024	232.531	1292.129

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

3. Final evaluation of CUNs – 2010 round for 2011 and 2012 exemptions

The three MBTOC subcommittees met at either San Jose, USA or Zagreb in Croatia to conduct the prepare the 2010 Assessment report, conduct final review of CUNs and deal with other matters as requested by Parties. Key issues included discussing issues related to questions raised on QPS by the Australian delegation after the 30th OEWG, registration of alternatives and conduct of field tours to key remaining users of methyl bromide. One MBTOC economist attended the meeting in San Jose, the other two were available through electronic communication.

The meetings were held as required by the time schedule for considerations of CUNs given in Annex I referred to in Decision XVI/4. Consensus decisions were made in subcommittees, but all comments made by members were considered in final recommendations. Outcomes from deliberations by the MBTOC Soils and MBTOC Structures and Commodities subcommittees were circulated to all members of MBTOC via electronic communication as part of the process of reaching consensus within the whole committee.

In considering the CUNs submitted in 2010, as previously, 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 continued to provide consistent treatment of CUNs within and between Parties while at the same time taking local circumstances into consideration. The CUN final assessment in 2010 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 allows MBTOC to seek further information from Parties and for Parties to provide further information in response to MBTOC's interim recommendations made during the first meeting.

CUNs assessed in this report relate to CUEs sought for 2011 and 2012. After the 30 OEWG in Geneva, MBTOC Soils was requested to review one nomination (the US strawberry fruit nomination) and MBTOC SC three nominations (Australia rice, US commodities and US NPMA (cheese stores in particular)). Both subcommittees of MBTOC conducted their reevaluation of CUNs at face to face meetings in September using new information provided by Parties at the 30 OEWG and later.

4. MBTOC Soils: Final Evaluations of 2010 Critical Use Nominations for Methyl Bromide

4.1 Summary of outcomes

In the interim assessment by MBTOC in April 2010 recommendations were made on all 27 CUNs submitted for preplant soil uses, 9 for 2011 and 18 for 2012. A further supplementary CUN for 2011 of 5.95 tonnes was recommended for the Australian strawberry runner sector. The recommended amounts totalled 230.447 tonnes for 2011 and 1164.452 tonnes for 2012 (Table 4.1). At the 30 OEWG, MBTOC held bilateral meetings with Australia, Canada, the USA and the Californian Strawberry Commission. The US Party advised that further information would be provided to support a review of the strawberry fruit nomination, however an official request was not obtained until during the second meeting in San Jose held from 21 to 25 September, 2010.

MBTOC S advises that the relatively late notice for a review of the CUN created difficulties for evaluation and finalization of the report. Accordingly, MBTOC Soils requests Parties to notify the Ozone Secretariat by 31 July each year of any requests to re-review CUNs.

During the final meeting in San Jose, MBTOC S held a bilateral meeting with the US delegation and the Californian Strawberry Commission, and participated in a field tour of some of the major CUN users, including strawberry fruit and nursery production, flower production and other nursery plant producers. After further review of information by MBTOC S, the recommendation for the US strawberry fruit nomination was changed in light of the new or additional information supplied for Californian. In its final assessment, MBTOC S has recommended a further 28.656 tonnes for use in California due to regulatory restrictions on use of key alternatives. No change was made to the interim recommendations for the other 26 nominations. The final recommendation for 2011 was 230.447 tonnes and for 2012 was 1193.108 tonnes (Table 4.1).

MBTOC continues to acknowledge the substantial reductions made by Israel and USA in this round and the action plans to phase out MB in Israel by the end of 2011 and for Japan by the end of 2012.

Table 4.1 - Changes occurring to nominated and recommended amounts of MB (metric tonnes) for preplant soil uses after the May 2010 interim report.

Party	CUN	Initial nomination by the Party	Interim MBTOC recommendation	Revised nomination by the Party after the 30 th OEWG	Final MBTOC recommendation for 2012
USA	Strawberry fruit ^a	756.515	649.348	753.974	678.004

Table 4.2 - Summary of MBTOC S final recommendations for 2011 and 2012 by country for CUNs received in 2010 for preplant soil use of MB (tonnes)

Country	CUE approved at 21 st MOP		CUN for 2011 and 2012		MBTOC S Final Recommendation	
	2010	2011	2011	2012	2011	2012
Australia		23.840	5.950	29.790	5.950	29.760
Canada		5.261		5.261		5.261
Israel	290.878		232.247		224.497	
Japan		224.451		216.120		216.120
USA		1977.830		1020.478		941.967
Total	290.878		238.197	1271.649	230.447	1193.108

Table 4.3. Summary of the final recommendations by MBTOC S (in square brackets) for CUE's for preplant uses of MB (tonnes) for 2011 and 2012 submitted in the 2010 round.

Country and Sector	Years	
	2011	2012
1. Australia 1. Strawberry runners	[5.95]	[29.760]
2. Canada 1. Strawberry runners		[5.261]
3. Israel 1. Broomrape protected 2. Cucumber 3. Cut flowers open field 4. Cut flowers & bulbs protected 5. Melon protected & open field 6. Strawberry fruit - Sharon and Gaza 7. Strawberry runners - Sharon and Gaza 8. Sweet potatoes TOTAL	[12.500] [12.500] [23.292] [52.330] [35.000] [41.875] [27.000] [20.000] [224.497]	
4. Japan 1. Cucumber 2. Ginger open field 3. Ginger protected 4. Melon 5. Pepper green & hot 6. Watermelon TOTAL		[26.162] [42.235] [6.558] [67.936] [61.154] [12.075] [216.120]
5. USA 1. Cucurbits 2. Eggplants (field) 3. Forestry nursery 4. Nurseries stock: fruits, nuts & flowers 5. Orchard replant 6. Ornamentals 7. Pepper (field) 8. Strawberry (field) 9. Strawberry runners 10. Sweet potatoes 11. Tomatoes (field) TOTAL		[59.500] [6.904] [34.230] [1.591] [18.324] [48.164] [28.366] [678.004] [3.752] [8.709] [54.423] [941.967]

4.1.1. Issues related to CUN Assessment for Preplant Soil Use

Key issues which influenced assessment and the need for MB for preplant use of MB in the 2010 round were:

- i) Increased adoption and registration of methyl iodide (MI or iodomethane) with barrier films in most states of the USA (not California) that use MB in mid 2008 which has led to commercial adoption on large sale areas in the US and substantial reduction in the US nominations in SE US and Florida.
- ii) Continued and progressive acceptance of a 3 way fumigant strategy (1,3-dichloropropene, metham sodium, Pic) as being effective for nutsedge and pathogen control in USA.
- iii) Changing 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.
- iv) Introduction of a new formulation of 1,3-D/Pic ('Pic chlor 60') in the USA which increases the area that may be treated with 1,3-D in regions affected by township caps.
- v) Effect of restrictions on use of high rates of Pic (greater than 200 kg/ha (20 g/m²)) in some counties of California.
- vi) Lack of acceptance in specific sectors that alternatives exist, e.g. orchard replant in heavy soils, and nursery industries.

MBTOC notes that further progress in reduction of use of MB for many sectors in some regions of USA is limited by regulations on the use of alternatives which are used in most other states of the USA. MBTOC urges the Party to consider review of these regulations in the light of new technology. The key issues which affect reductions of MB include;

- regulations preventing the use of barrier films with methyl bromide, thus preventing lower dose rates of at least 30% of MB for similar efficacy.
- Higher township cap emission factors for use of shank applied 1,3-D/Pic which is a key alternative for the strawberry sector in many regions of the world. The high emission factor of 1.8 compared to 1.1 for Telone In Line is preventing adoption and development of 1,3-D/Pic mixtures and is leading to use of a less effective alternative. This alternative appears to be failing in some areas.

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.

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

The potential registration of methyl iodide in California is still subject to extensive review. 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 and was extended, but its future registration is uncertain.

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 and MI in Australia respectively.

4.1.3. Standard presumptions used in assessment of nominated quantities.

The tables below (Tables 4.4) provide the standard presumptions applied by MBTOC Soils for the final assessment of this round of CUNs. 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.

Table 4.4 - Standard presumptions used in assessment of CUNs for the 2010 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 is not available at higher concentrations
4. MB/Pic Formulation: Weeds/nutsedge ass 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 4.5 - Final evaluation of the preplant soil use CUNs requested to be reviewed for 2012 by the United States after the 30th OEWG

Country	Industry	CUE for 2005 ¹	CUE for 2006 ²	CUE for 2007 ³	CUE for 2008 ⁴	CUE for 2009 ⁵	CUE for 2010 ⁶	CUE for 2011 ⁷	CUN for 2011 (addtl or new)	CUN for 2012	MBTOC rec. for 2011 (addtl or new)	MBTOC rec. for 2012 (new)
United States	Strawberry (field)	2052.846	1,730.828	1,476.019	1,349.575	1,269.32	1,007.477	812.709	-	(756.515) Rev 753.974	-	Interim 649.348 Final 678.004
<p>MBTOC comments 2010: MBTOC recommends a reduced CUE of 678.004 t for this use in 2012. This comprises a reduced amount of 673.085 t for California and the requested amount of 1.647 t for Eastern USA and 3.272 t for Florida.</p> <p>California recommendation During its second meeting in USA in September 2010, the Party requested MBTOC to review the interim assessment for the Strawberry Fruit nomination from California based on updated information from the Californian Strawberry Commission (CSC). The US nominated 752.230 t in January 2010 and subsequently revised the CUN to 749.055 t after the April MBTOC meeting. In the interim May TEAP report, MBTOC recommended a reduced amount of 644.429 t based on reductions for uptake of MB/Pic formulations, 1,3-D/Pic and Pic alone in areas where township caps and restrictions allowed for use of the alternatives. At its second meeting in USA, MBTOC reviewed further information provided by the CSC and accepted the need for MB in areas where restrictions affected uptake of alternatives, but did not accept the need for the full amount of MB requested for some counties where alternatives had been adopted.</p> <p><u>California nomination in relation to current use of MB</u> For California, the Party nominated 751.596 t (4421 ha at 170 kg/ha). This nominated amount was 100% of the previous CUE for California in 2011.</p> <p><u>California Strawberry Commission information</u> At the second MBTOC meeting, the CSC provided evidence that PUR data need to be inflated by a percentage equivalent to the acreage that is unaccounted for in the information obtained for the PUR, but is identified by recent CSC surveys. The CSC indicated that by 2012, 1,3-D and Pic will be restricted in 2104 ha in Monterey county alone, due to township caps on 1,3-D and other regulations that restrict use of Pic. CSC also indicated that in the other counties, 20% of the area that was Pic-fumigated in 2008 will be in critical need of MB in 2012.</p> <p><u>Current transition to MB alternatives in California</u> In California, the three major strawberry producing districts for which MB is nominated are Oxnard, Watsonville/Salinas and Santa Maria, which report in 2010 strawberry fruit production areas of, respectively, almost 5000 ha, 5800 ha and almost 4000 ha (CSC survey). The most recent PUR data (2003-2008) show that alternatives, namely 1,3-D, Pic and metham have been widely adopted in two of these production districts (i.e. excellent transition has occurred in Oxnard and some transition in Watsonville/Salinas). In California, 1,3-D use has more than doubled from 2,001 ha (2003) to 4,408 ha (2008). In addition, there is a sizeable organic production acreage (over 700 ha in 2010). In Ventura county, MB alternatives are implemented in areas with township caps.</p> <p><u>Restrictions to transition in California</u> In Ventura, the production season is significantly shorter than that of Monterey county where drip application of 1,3-D and Pic, an alternative adopted in southern counties, results in incomplete protection against soil-borne diseases over the long production season. MBTOC suggests shank injection of 1,3-D/Pic would result in improved</p>												

Country	Industry	CUE for 2005 ¹	CUE for 2006 ²	CUE for 2007 ³	CUE for 2008 ⁴	CUE for 2009 ⁵	CUE for 2010 ⁶	CUE for 2011 ⁷	CUN for 2011 (addtl or new)	CUN for 2012	MBTOC rec. for 2011 (addtl or new)	MBTOC rec. for 2012 (new)
		<p>disease control, however township cap regulations impose a penalty on shank injection. MBTOC urges the Party to reconsider the evidence that led to this regulation. PUR use data for 2008 indicate that MB:Pic 57:43 formulations are used on 78% of the MB fumigated acreage, and that 50:50 formulations are used on 5% of the California use area. The Party has adopted a dose rate of 196 kg MB/ha in its CUN for 2012 and MBTOC has accepted this, although MBTOC encourages wider use of 50:50 formulations, which still allow for complying with regulatory restrictions on Pic use. Regulations in California prohibit the use of VIF films with MB application, and therefore discourage reduction of MB dose rates as well as emission control through use of VIF. MB stocks are still available, and can be used on any crop. The registration progress of MI/Pic in California is on going, however it is not expected to become available before 2012-2013. MBTOC urges the Party to develop an action plan for California, particularly addressing the restrictions on the use of alternatives adopted elsewhere in the USA, and showing stepwise reductions to effectively progress the transition to MB alternatives.</p> <p>Eastern States recommendation For Eastern states the Party nominated 1,647 t (11 ha @ 150 kg/ha). This is a transition of 92% from 20 t as per the CUE in 2011. MBTOC commends this progress, which is realistic given that MI/Pic has been registered in 2008 and is technically feasible for the total nomination area.</p> <p>Florida recommendation For Florida, the Party nominated 3,272 t (22 ha @ 150 kg/ha). This is a transition of 92% from 41 t as per the CUE in 2011. Given that technically and economically feasible alternatives are available, MBTOC considers this transition realistic.</p> <p>Comments requested in Dec. XX1/11 (para 9)</p> <ul style="list-style-type: none"> • Dec. IX/6 b(i) Emission reduction: Yes in Florida and Eastern states, with use of VIF; No in California where VIF is not used; • Dec. IX/6 b(iii) Research program: Yes, there is an ongoing research program, which the CUN refers to; • Dec. IX/6 b(iii) Appropriate efforts: Yes in Florida and Eastern states; while in California there is varying effort in the different production districts. 										

Table 4.6 - Final evaluations of CUNs which did not change after the interim assessment (after 30th OEWG) for pre plant soil use for 2011 or 2012

Country	Industry	CUE for 2005 ¹	CUE for 2006 ²	CUE for 2007 ³	CUE for 2008 ⁴	CUE for 2009 ⁵	CUE for 2010 ⁶	CUE for 2011 ⁷	CUN for 2011 (addtl or new)	CUN for 2012	MBTOC rec. for 2011 (addtl or new)	MBTOC rec. for 2012 (new)
Australia	Strawberry runners	35.750	37.500	35.750	35.750	29.790	29.790	23.840	5.95	29.790	5.95	29.760
<p>MBTOC comments 2010: MBTOC recommends the supplementary nomination of 5.95 tonnes of MB for use in 2011. The second year of a 2-year study showed that the reduced rate of 18.75 g/m² did not adequately control root and crown rot on the Festival variety and currently could not be used as it is not registered. Therefore the requested amount from the Party was accepted for the 2011 nomination.</p> <p>MBTOC recommends a reduced CUE of 29.760 tonnes for use in 2012. The reduction by MBTOC is based on adoption of the soilless production system for the foundation generation. 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 an 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's first 2-year effort using a reduced rate of 18.75 g/m² resulted in unsatisfactory results in the second year of testing. The Party has indicated, however, that it is initiating a second 2-year trial using the reduced rate of 20 g/m² which should be completed in September 2011. The Party states that the most promising alternative, MI/Pic has been demonstrated in commercial scale field trials to compare with the efficacy to MB:Pic. The registrant has indicated that additional data has been requested by the national registration authority (APVMA) which will be submitted this year and should lead to registration in 2011. 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 second 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 suggests the following actions by the Party: (1) Report the first year's results with reduced rates of 20 g/m² of MB with its next CUN submission and report to MBTOC the tentative second year results by August 2011; (2) Provide a comprehensive update of the registration status of MI and ethane dinitrile (3) Provide the results from the new trials using recaptured MB and Pic as well as a comprehensive plan for commercialization, and (4) Since the production of 60,000 foundation generation plants has been found to be economically feasible, the Party needs to provide the economic analysis that supports their assertion that any further expansion in future generations is not economically feasible, (5) consider other methods (new barrier films, potassium thiosulphate absorbant, etc.) for emission controls.</p> <p>MBTOC comments on economics 2010: The nomination states "The second part of a two year trial that evaluated the economic and biological feasibility of production of foundation stock by a soil-less system is now complete. It compared productivity with the status quo system of production in MB:Pic treated soil in insect proof cages. Results confirm the biological and economic feasibility of adopting the soil-less system for production of the foundation generation of runners (A1)." The CUN further states "The economics of the system compare favourably with the current methods of production."</p> <p>Comments requested in Dec. XX1/11 (para 9)</p> <ul style="list-style-type: none"> Dec. IX/6 b(i) Emission control: No, barrier films are not being used and the regulations require higher MB rates of use than the standard presumptions. Standard LDPE films are still used because they are reported to perform the same as barrier films in the cold temperatures and heavy wet soils typical for strawberry runner production and the Party states that barrier films provide no further effectiveness. 												

Country	Industry	CUE for 2005 ¹	CUE for 2006 ²	CUE for 2007 ³	CUE for 2008 ⁴	CUE for 2009 ⁵	CUE for 2010 ⁶	CUE for 2011 ⁷	CUN for 2011 (addtl or new)	CUN for 2012	MBTOC rec. for 2011 (addtl or new)	MBTOC rec. for 2012 (new)
		<ul style="list-style-type: none"> Dec. IX/6 b(iii) Research program: Yes, ongoing research is being conducted in (a) supporting reduced application rates of MB:Pic, (b) supporting the registration of MI; unknown for EDN; (c) use of recaptured MB. Dec. IX/6 b(iii) Appropriate effort: The nomination demonstrates a research effort with a number of key alternatives, but commercialization of any alternative confronted with significant regulatory obstacles 										
Canada	Strawberry runners (PEI)	6.840	6.840	7.995	7.462	7.462	7.462	5.261	-	5.261	-	5.261
	<p>MBTOC comments 2010: MBTOC recommends 5.261 tonnes for this use in 2012. The CUN for 2012 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 dosage rate. The Party has attempted to replace MB with 1,3-D, but 1,3-D was banned for use in Prince Edward Island in January 2003 due to ground water contamination. Chloropicrin (PIC 100) has been registered by PMRA, but the PEI authorities have denied a permit for its use until further ground water testing has been conducted. MI registrant has not applied for registration in Canada. The company has also been testing organic production from 2006 - 2009 with different varieties. Reduced yields resulted (yield reductions ranged from 40% - 70%). One variety using the organic production system compared favourably to conventional production. Organic trials continued in 2009. While MB:Pic 67:33 @ 500 kg/ha is the only use rate registered for strawberry runners, which exceeds MBTOC's standard presumption of 200 kg/ha, the grower petitioned PMRA to use a lower rate under barrier films. PMRA, in the absence of a formal label amendment, granted permission to use a lower rate, but at the grower's own risk and liability. In 2008 the grower tested two plots totalling 2.4 ha using 25% & 30% lower rates under barrier films and expanded the area tested in 2009. The results were comparable using the reduced rates with barrier films. The CUN for 2012 is based entirely on a reduced rate for MB of 200 kg/ha for the entire area to be fumigated. For future submissions, MBTOC suggests actions for the Party to (1) complete the necessary ground water studies to obtain the PIC 100 permit and (2) test the adoption of soilless cultures for at least part of the production cycle, (3) consider MI.</p> <p>MBTOC comments on economics 2010: The nomination was not based on economic arguments.</p> <p>Comments requested in Dec. XX1/11 (para 9)</p> <ul style="list-style-type: none"> Dec. IX/6 b(i) Emission reduction: Yes, uses barrier films with reduced application rate of MB conforming to MBTOC's presumptions Dec. IX/6 b(iii) Research program: Yes, focus has been on organic production testing, but trials with MI not being conducted. Dec. IX/6 b(iii) Appropriate effort: The Party demonstrates an active research program and is seeking registration of PIC100 											
Israel	Broomrape	None	None	250.000	250.000	125.000	12.500	-	12.500		12.500	
	<p>MBTOC comments 2010: MBTOC recommends 12.500 tonnes for this use in 2011. The nomination is for a specific species of broomrape (<i>O. aegyptica</i>), and greenhouse use in tomatoes and peppers and is additional to the outdoor field nominations in previous years. MB use for a national broomrape eradication on outdoor field crops has been approved as a CUN for the years 2007, 2008, 2009 and 2010, however the allocated amounts have not been utilized. It is MBTOC's understanding is that previous MB approved for broomrape control has not been produced, and therefore is unavailable for this nomination. In the 2010 nomination, the Party confirms that Telone EC is a very good chemical alternative for the control of <i>O. aegyptica</i>, the main species parasitizing tomato, however the registration is unclear and use may not be resolved for all species of broomrape. Telone EC as a stand alone application or in sequential application with MS suppresses broomrape when applied under plastic sheets through the drip irrigation system in tunnels or greenhouses. The Party has also</p>											

Country	Industry	CUE for 2005 ¹	CUE for 2006 ²	CUE for 2007 ³	CUE for 2008 ⁴	CUE for 2009 ⁵	CUE for 2010 ⁶	CUE for 2011 ⁷	CUN for 2011 (addtl or new)	CUN for 2012	MBTOC rec. for 2011 (addtl or new)	MBTOC rec. for 2012 (new)
		<p>identified some alternatives for controlling low infestations of Orobanche (e.g. solarization). In addition to Telone EC alone or with MS, MBTOC has identified other alternatives, such as Sulfonylurea, imazapic, and imazomox (Eizenberg et al, 2004), (Abanga <i>et al.</i>, 2007; Nadal <i>et al.</i>,2008; Miller <i>et al.</i>, 2009). Barrier films are used to reduce rates by 50% and also emissions. The Party discusses an on-going research program in the nominations however no results are reported.</p> <p>MBTOC comments on economics 2010: The nomination states that since an eradication program is being proposed, the standard format of an economic evaluation is not appropriate. The CUN also states, without supporting evidence, 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. MBTOC takes note of these statements in light of the fact that the nomination is not based on economic arguments.</p> <p>Comments requested in Decision XXI/11 (para 9)</p> <ul style="list-style-type: none"> ▪ Dec. IX/6 b(i)- Emission Reduction: Yes, the Party is using barrier films and standard rates. ▪ Dec. IX/6 b(iii)- Research Program: No, the research is supposedly on-going, but is not reported in the nomination. ▪ Dec. IX/6 b(iii)- Appropriate Effort: Israel has indicated that it will no longer be applying for CUE's after 2011. 										
Israel	Cut flowers-bulbs-protected	303.000	240.000	220.185	114.450	85.431	63.464	-	52.955		52.330	
		<p>MBTOC comments 2010: MBTOC recommends a reduced amount of 52.330 tonnes for this use in 2011. MBTOC does not recommend use for MB on substrates being 0.625 t. MBTOC recognizes that in 2012 the Party will totally phase out MB uses. There is very little change from nominations submitted in previous years, particularly in 2009 and 2010. Phase-out efforts are still based on transitional measures – high 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 additional flower types. More expansion of registration is expected this year. Substrate production protocols are now available for many of the flowers for which they claim they are yet to be developed ("artificial" production is not critically impacted by local conditions and this makes experiences from other countries valid). MBTOC notes the Party has adjusted MB dosages used for carnations grown in Ghaza to 25 g/m². MBTOC is aware that carnation cultivars resistant to fusarium wilt are available and commercially used and accepted by international markets.</p> <p>MBTOC comments on economics 2010: No economic arguments are provided in the nomination.</p> <p>Comments requested in Dec. XX1/11 (para 9)</p> <ul style="list-style-type: none"> ▪ Dec. IX/6 b(i) Emission reduction: Yes, barrier films are currently used in protected flowers and rates conform with MBTOC's standard presumptions. ▪ Dec IX/6 b(iii) Research program: No. Poor to no research have been conducted on alternatives. This appears to be an orphan sector in the alternatives to methyl bromide program and is dependent on research from other sectors. ▪ Dec. IX/6 b(iii) Appropriate effort: Israel has indicated that it will no longer be applying for CUEs after 2011. 										

Country	Industry	CUE for 2005 ¹	CUE for 2006 ²	CUE for 2007 ³	CUE for 2008 ⁴	CUE for 2009 ⁵	CUE for 2010 ⁶	CUE for 2011 ⁷	CUN for 2011 (addtl or new)	CUN for 2012	MBTOC rec. for 2011 (addtl or new)	MBTOC rec. for 2012 (new)
Israel	Cut flowers-open field	77.000	67.000	74.540	44.750	34.698	28.554	-	23.292	-	23.292	-
<p>MBTOC comments 2010: MBTOC recommends the nominated amount of 23.292 tonnes for this use in 2011. The nominated amount was an 18% reduction over the approved amount for 2010. MBTOC recognizes that in 2012 the Party will totally phase out MB uses. Overall, due to the MB phase out stated by the Party, there is very little change from nominations submitted in previous years, particularly in 2009 and 2010. Phase-out efforts are still based on transitional measures - barrier films with reduced rates of methyl bromide. 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 in these cropping systems. 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, in spite of successful trials. MB formulations with higher chloropicrin 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 registrations of potential alternatives are expected this year. Solarisation has been proven to be an efficient alternative for some flower types (Yakabe and MacDonald, 2010) and is being successfully used in combination with alternative chemicals such as metham sodium and 1,3-D.</p> <p>MBTOC comments on economics 2010: No economic arguments are provided in the nomination.</p> <p>Comments requested in Dec. XX1/11 (para 9)</p> <ul style="list-style-type: none"> ▪ Dec. IX/6 b(i) Emission reduction: Yes, barrier films are currently used in open field flowers and rates conform with MBTOC's standard presumptions. ▪ Dec IX/6 b(iii) Research program: No. Poor to no research has been conducted on alternatives. This appears to be an orphan sector in the alternatives to methyl bromide program and is dependent on research from other sectors. ▪ Dec. IX/6 b(iii) Appropriate effort: Israel has indicated that it will no longer be applying for CUE's after 2011. 												
Israel	Cucumber	None	None	25.000	18.750	-	15.937	-	12.500	-	12.500	-
<p>MBTOC comments 2010: MBTOC recommends 12.500 tonnes for this use in 2011. The recommended quantity represents a 21.6% reduction from the 21th MOP approved amount based on uptake of available alternatives, such as grafted plants, improved sanitation and possible uptake of other alternatives (MS and 1,3-D). 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 key pathogen 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 combined with 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 reduce the nomination further.</p>												

Country	Industry	CUE for 2005 ¹	CUE for 2006 ²	CUE for 2007 ³	CUE for 2008 ⁴	CUE for 2009 ⁵	CUE for 2010 ⁶	CUE for 2011 ⁷	CUN for 2011 (addtl or new)	CUN for 2012	MBTOC rec. for 2011 (addtl or new)	MBTOC rec. for 2012 (new)
	<p>MBTOC comments on economics 2010: No economic arguments are provided in the nomination.</p> <p>Comments requested in Dec. XX1/11 (para 9)</p> <ul style="list-style-type: none"> Dec. IX/6 b(i) Emission reduction: Yes, barrier films and dosage rates conform to the standard presumptions. Dec. IX/6 b(iii) Research program: Limited reporting of any research, but have used information from other sectors. Dec. IX/6 b(iii) Appropriate effort: Efforts in IPM technology, promotion of grafted seedlings. Israel has indicated that it will no longer be applying for CUE's after 2011. 											
Israel	Melon - protected and field	125.650	99.400	105.000	87.500	87.500	70.000	-	35.000	-	35.000	-
	<p>MBTOC comments 2010: MBTOC recommends 35.000 tonnes for this use in 2011. The request is reduced to half of last year's nomination (down to 35 tonnes) due to the adoption of a pesticide through drip systems which uses new application technology, eg. Azoxystrobin. <i>Monosporascus cannonballus</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. 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. Additionally, MBTOC understands some alternative fungicides show very effective control of <i>Monosporascus</i> and are now available to the growers (Pivonia et al; 2008; Israel melon CUN, Pivonia et al 2009). 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, but fludioxonil has not been shown effective in Israel (e.g. Stanghelini et al. 2003; Martyn 2002, Pivonia et al 2009). MBTOC understands the transition to the alternatives is already ongoing and applied a transition rate based on other countries experience. Another encouraging alternative is grafted melon (Cohen et al, 2007). On melon, however, problems of scion-rootstock compatibility and fruit quality require an additional research effort. Furthermore, new diseases, such as crown rot of melons and cucumbers need to be addressed, as the pathogen has already invaded the relevant area. MBTOC suggests the following actions by the Party: (1) to consider further expansion of the adoption of Azoxystrobin and (2) consider formulations with more chloropicrin (MB/Pic 67:33, 50:50) as they are effective and (3) non chemical alternatives, such as grafting.</p> <p>MBTOC comments on economics 2010: The nomination states that granular Basamid, is similar in mode of action to MS, however is not feasible economically because of a dramatic increase in the prices of Basamid and waiting period constraints. CUN provides the results of a financial comparison between the use of MB and different formulations of Basamid that show significant losses when the alternatives are not used, with the closest comparator being Basamid 60, which shows losses of net revenue in the order of 30-50%. MBTOC is not able to verify the accuracy of these data. MBTOC notes that the nomination is not based on economic arguments.</p> <p>Comments requested in Dec. XX1/11 (para 9)</p> <ul style="list-style-type: none"> Dec. IX/6 b(i) Emission reduction: Yes, barrier films are is used and MB dosage rates conform with standard presumptions Dec. IX/6 b(iii): Research program: Yes, current trials have validated previous research. Dec. IX/6 b(iii): Appropriate effort: Active research program reviewing pesticide application and fumigant registration. Israel has indicated that it will no longer be applying for CUE's after 2011. 											

Country	Industry	CUE for 2005 ¹	CUE for 2006 ²	CUE for 2007 ³	CUE for 2008 ⁴	CUE for 2009 ⁵	CUE for 2010 ⁶	CUE for 2011 ⁷	CUN for 2011 (addtl or new)	CUN for 2012	MBTOC rec. for 2011 (addtl or new)	MBTOC rec. for 2012 (new)
Israel	Strawberry fruit - protected (Sharon and Ghaza)	196.000	196.000	93.000	105.960	77.750 (42.75 Sharon, 35.00 Ghaza)	57.063 (32.063 Sharon, 25.00 Ghaza)	-	28.500 (Sharon) 20.50 (Ghaza)		21.375 (Sharon) 20.50 (Ghaza)	
<p>MBTOC comments 2010: MBTOC recommends 21.375 tonnes for Sharon for this use in 2011 and 20.500 tonnes for Ghaza making a total of 41.875 t for this use in 2011. In Sharon, the Party reduced the amount by 11% and MBTOC has reduced by a further 14% based on increased uptake of MS followed by Telon EC which has been shown to be effective. 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 Party is concerned particularly about <i>Macrophomina</i> control, although recent trials showed good results with metham sodium formulations. Previous research has also shown that Telon EC followed by MS was effective. Telone EC has a smaller buffer than 1,3-D/Pic shank applied, i.e. 100 m compared to 250 m, however the registration is unclear. Bromopic is registered, but past results with application have prevented further studies until recently when trials are evaluating it under barrier films. MBTOC acknowledges the Party for indicating an intention to not submit CUNs in 2011 for 2012.</p> <p>MBTOC comments on economics 2010: The nomination shows that the gross and net revenue of all considered alternatives (Telopic, Bazamid and Telodrip) are higher than for MB. However, these are not feasible due to registration and buffer zone issues.</p> <p>Comments requested in Dec. XX1/11 (para 9)</p> <ul style="list-style-type: none"> ▪ Dec. IX/6 b(i) Emission reduction: Yes, however further dosage reduction would be possible if use of Bromopic with barrier films was not prevented because of high buffer zones ▪ Dec. IX/6 b(iii) Research program: Yes, however trials on key alternatives as shown above do not appear to be being conducted as they are not reported ▪ Dec. IX/6 b(iii) Appropriate effort: The nomination indicates limited information on progress with alternatives, but that the Party will not be seeking nominations for MB use in 2012. 												

Country	Industry	CUE for 2005 ¹	CUE for 2006 ²	CUE for 2007 ³	CUE for 2008 ⁴	CUE for 2009 ⁵	CUE for 2010 ⁶	CUE for 2011 ⁷	CUN for 2011 (addtl or new)	CUN for 2012	MBTOC rec. for 2011 (addtl or new)	MBTOC rec. for 2012 (new)
Israel	Strawberry runners (Sharon and Ghaza)	None	None	-	31.900	28.075 15.825 (Sharon) 12.250 (Ghaza)	22.320	-	13.500 (Sharon) 13.500 (Ghaza)		13.500 (Sharon) 13.500 (Ghaza)	
<p>MBTOC comments 2010: MBTOC recommends 13.5 t for Sharon and 13.5 t for Ghaza for this use in 2011. 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 phaseolina</i>), root knot nematodes and purple nutsedge. The Party stated that MB 98:2 at a rate of 500 kg/ha (50 g/m²) with 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 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 2010: No economic arguments are provided in the nomination.</p> <p>Comments requested in Dec. XX1/11 (para 9)</p> <ul style="list-style-type: none"> ▪ Dec. IX/6 b(i) Emission reduction: Yes for Sharon and No for Ghaza as MBTOC is unclear on the availability of barrier films. Further dosage reduction would be possible if use of Bromopic with barrier films was not prevented because of high buffer zones ▪ Dec. IX/6 b(iii) Research program: Yes, however trials on key alternatives as shown above do not appear to be being conducted as they are not reported ▪ Dec. IX/6 b(iii) Appropriate effort: The nomination indicates limited information on progress with alternatives, but that the Party has indicated an intention to phase out MB by the end of 2011. 												
Israel	Sweet Potatoes	None	None	None	111.500	95.000	20.000	-	20.000		20.000	
<p>MBTOC comments on 2010: MBTOC recommends 20.000 tonnes for 2011 (compared to 95 t used in 2009 and 20 t in 2010) for production of sweet potato transplants. The previous nomination in 2009 included use for field grown crops, but now the nomination is only for seedbeds and clean propagation material. MBTOC recognizes the need for clean propagation material. In the light sandy soils root-knot nematodes- <i>Meloidogyne</i> spp. the scab pathogen <i>Streptomyces ipomoea</i> and <i>Pythium</i> spp. are the disease issues on the plants used for propagation purposes. The applicant states that they expect registration of MB alternatives (eg. Telone II) by 2010, but this has not yet been approved. Root knot nematode resistant cultivars are available, but they are not commercially desirable in Israel. No data is presented from trials since 2006, although that data suggested that Telone II + metham sodium (Adochem super) 400 l/ha was an excellent alternative for MB and registration was sought. The Party has not provided further evidence of research conducted from that date. The MB rates stated in the CUN are consistent with MBTOC's standard presumptions and barrier films are being used. 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 (Reference: http://mbao.org/2008/027Stoddard.pdf). MBTOC expects that if any disease control products are registered prior to 2011 that the quantity of MB nominated will be</p>												

Country	Industry	CUE for 2005 ¹	CUE for 2006 ²	CUE for 2007 ³	CUE for 2008 ⁴	CUE for 2009 ⁵	CUE for 2010 ⁶	CUE for 2011 ⁷	CUN for 2011 (addtl or new)	CUN for 2012	MBTOC rec. for 2011 (addtl or new)	MBTOC rec. for 2012 (new)
	<p>adjusted downward to reflect the availability of the alternative(s). In the absence of this, MBTOC expects data on the suitability of the use of alternative varieties resistant to nematodes which are used effectively in other countries.</p> <p>MBTOC comments on economics 2010: The Party states that “the semi-commercial application of Telon on a total area of 100 ha in 2005 led to unsatisfactory results and economic losses”. CUN also shows that application of Telon 200+MS 400 l/ha results in higher gross and net revenue than MB 350 kg/ha.</p> <p>Comments requested in Dec. XX1/11 (para 9)</p> <ul style="list-style-type: none"> ▪ Dec. IX/6 (i) Emission reduction: Yes, barrier films and rates comply with MBTOC presumptions are being followed. ▪ Dec. IX/6 (iii) Research program: No, has not been updated since 2006, but the Party has identified alternatives that are in the registration process. ▪ Dec. IX/6 (iii) Appropriate effort: The Party has identified an intention to phase out MB by the end of 2011.. 											
Japan	Cucumber	88.300	88.800	72.400	51.450	34.300	30.690	27.621	-	26.162	-	26.162
	<p>MBTOC comments on 2010: MBTOC recommends 26.162 tonnes for this use in 2012. The recommended amount is based on the reduction that the Party has made on the melon combination which has the same pathogen problems as the cucumber. Japan had made public an action plan to complete phase out of methyl bromide for soil use in 2013 and submitted revised national management strategy for critical use nomination of methyl bromide to the Ozone Secretariat in April 2008. MBTOC acknowledges that the Party will phase out MB by using a number of alternatives in 2013.</p> <p>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 & Ozkan, 2004; Engindeniz, 2004). The Party is encouraged to consider substrate production, which implemented correctly can produce higher yields than MB (MBTOC, 2002, 2006; Batchelor 2000, 2002; Savvas and Passam 2002). Studies conducted in Japan support soilless culture as a feasible option (Fukuda and Anami 2002, Sakuma and Suzuki 1995). MBTOC notes however that even when growing in substrates there is a critical need for a high degree of sanitation and for the use of pathogen free transplants. Large numbers of growers can be trained to use substrates systems in a short period of time as experienced in many MLF projects (UNEP/TEAP, 2004). The CUN states that the Aichi Agricultural Research Centre (2005) identified the effectiveness of KGMMV control by methyl iodide in pot tests. MBTOC encourages the Party to continue to pursue the registration of methyl iodide for soil uses (methyl iodide was registered for imported timber in Japan in 2004, under JMAFF registration No. 21407).</p> <p>MBTOC comments on economics 2010: No economic arguments are provided in the nomination prior to testing for technically feasible alternatives.</p>											

Country	Industry	CUE for 2005 ¹	CUE for 2006 ²	CUE for 2007 ³	CUE for 2008 ⁴	CUE for 2009 ⁵	CUE for 2010 ⁶	CUE for 2011 ⁷	CUN for 2011 (addtl or new)	CUN for 2012	MBTOC rec. for 2011 (addtl or new)	MBTOC rec. for 2012 (new)
	Comments requested in Dec. XX1/11 (para 9)											
	<ul style="list-style-type: none"> ▪ Dec. IX/6 b(i) Emission reduction: Yes, barrier films are used in part of applications and rates in the nomination conform to the standard presumptions. ▪ Dec. IX/6 b(iii) Research program: Yes, a certain trials are now energetically undertaken now to find alternative technology to control KGMMV such as plant debris humus acceleration by input of wheat bran as the material for the microbe reproduction, use of bag culture with fertigation of the mixture of vermiculite, wooden bark manure, peat moss, rice bran and mountain soil and use of bio-decomposition pot for avoiding contact of seedling root with the virus contaminated soil. And seedling dipping in extract of <i>Lentinus edodes</i> mycelia just before planting has been tested. ▪ Dec. IX/6 b(iii) Appropriate effort: Party has identified an action plan that will phase out MB by the end of 2012. 											
Japan	Ginger (Field)	119.400	119.400	109.701	84.075	63.056	53.400	47.450	-	42.235	-	42.235
	<p>MBTOC comments 2010: MBTOC recommends the requested rate of 42.235 t for 2012 (a reduction of 5.215 t or 11.5% from 2011). This was mostly achieved by reductions of acreage and some reduction in dosage rates. Fields are now fumigated on alternative years rather than yearly. Several regions now use dosage rates as low as 16-20 g/m² under LBPF which are within or lower than MBTOC's standard presumptive rates. The nomination is for control of <i>Pythium spp.</i> (<i>P. ultimum var. ultimum</i>, <i>P. zingiberium</i>) in open field cultivated ginger fields using MB (98:2) applied from small cans. The party has provided MBTOC with a list of studies that indicate highly promising results for the implementation of alternatives by 2013, the date for complete phase out of MB in Japan.</p> <p>MBTOC comments on economics 2010: The nomination states that hot water treatment can possibly be considered as a technically feasible alternative under specific topographical and soil conditions, but that initial and running costs are high, hence it is not economically feasible. No data are provided to support this argument. CUN provides data that shows that net revenues when using alternatives such as dazomet or Metalaxyl are lower that for MB. MBTOC is not able to verify the accuracy of these data.</p> <p>Comments requested in Dec. XX1/11 (para 9)</p> <ul style="list-style-type: none"> ▪ Dec. IX-6 (i) Emission reduction: Yes, barrier films and rates complying with MBTOC presumptions are being followed except that the products in 98:2 in small cans. ▪ Dec. IX-6 (iii) Research program: Yes, the research program has been updated and the party has identified alternatives that are in the registration process. ▪ Dec. IX-6 (iii) Appropriate effort: The Party has identified an action plan that will phase out MB by the end of 2012. 											
Japan	Ginger (protected)	22.900	22.900	14.471	11.100	8.325	8.300	7.036	-	6.558	-	6.558
	<p>MBTOC comments 2010: MBTOC recommends the total requested amount of 6.558 tonnes for 2012. This represents a reduction of 6.8% reduction from 2011 year amount approved 2012 under LBPF. The nomination is for control of <i>Pythium spp.</i> (<i>P. ultimum var. ultimum</i>, <i>P. zingiberium</i>) in protected ginger fields using MB (98:2) applied from small cans. Several regions now use dosage rates as low as 16-20 g/m² under LBPF which are within or lower than MBTOC's standard presumptive rates. MBTOC has now been provided by the Party with the results of numerous studies which have highly promising results for the implementation of alternatives by 2013, the date for complete phase out of MB in Japan.</p>											

Country	Industry	CUE for 2005 ¹	CUE for 2006 ²	CUE for 2007 ³	CUE for 2008 ⁴	CUE for 2009 ⁵	CUE for 2010 ⁶	CUE for 2011 ⁷	CUN for 2011 (addtl or new)	CUN for 2012	MBTOC rec. for 2011 (addtl or new)	MBTOC rec. for 2012 (new)
	<p>MBTOC comments on economics 2010: Substantially as above</p> <p>Comments requested in Dec. XX1/11 (para 9)</p> <ul style="list-style-type: none"> ▪ Dec. IX-6 (i) Emission reduction: Yes, barrier films and rates complying with MBTOC presumptions are being followed except that the products in 98:2 in small cans. ▪ Dec. IX-6 (iii) Research program: Yes, the research program has been updated and the party has identified alternatives that are in the registration process. ▪ Dec. IX-6 (iii) Appropriate effort: The Party has identified an action plan that will phase out MB by the end of 2012. 											
Japan	Melon	194.100	203.900	182.200	136.650	91.100	81.720	73.548	-	67.936	-	67.936
	<p>MBTOC comments 2010: MBTOC recommends a reduced amount of 67.936 tonnes for this use in 2012. The recommended quantity represents a 12.5 % reduction from the 21th 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 has an action plan to complete phase out of methyl bromide 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 and lead to a reduction of 10 % by adoption of alternatives and low permeable barrier film with the dose rate reduction in 2011. 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 & 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 (UNEP/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 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 2010: The nomination argues that no alternatives are technically or economically feasible, while the economic (and technical) feasibility of the inoculation of the attenuated virus is being trialled at present. The nomination argues that there is an important market window for melons in Japan, while virus-resistant varieties fetch lower prices in the market. These statements are supported by budget data. MBTOC is not able to verify the accuracy of these data.</p>											

Country	Industry	CUE for 2005 ¹	CUE for 2006 ²	CUE for 2007 ³	CUE for 2008 ⁴	CUE for 2009 ⁵	CUE for 2010 ⁶	CUE for 2011 ⁷	CUN for 2011 (addtl or new)	CUN for 2012	MBTOC rec. for 2011 (addtl or new)	MBTOC rec. for 2012 (new)
	<p>Comments requested in Dec. XX1/11 (para 9)</p> <ul style="list-style-type: none"> ▪ Dec. IX/6 b(i) Emission reduction: Yes, barrier films and rates conform to the standard presumptions. ▪ Dec. IX/6 b(iii) Research program: Yes, several control technologies are now checked whether they are adaptable to each specific production region with the complete replacement of methyl bromide. Those are appropriate use of the mixture of chloropicrin and 1,3 D to control MNSV without any phytotoxicity, methyl iodide use, selection of resistant variety in the respective production regions, effectiveness on the rotation by tomato. ▪ Dec. IX/6 b(iii) Appropriate effort: Party has identified an action plan that will phase out MB by the end of 2012. 											
Japan	Pepper (green & hot)	187.200	200.700	156.700	121.725	81.149	72.990	65.691	-	61.154	-	61.154
	<p>MBTOC comments 2010: MBTOC recommends 61.154 tonnes for this use in 2012. The Party nominated an amount representing 7% reduction from the amount approved for 2011 (2012: 61.154 t, 2011: 68.260 t) and has indicated it will not apply for further nominations under their action plan. According to the Party, this reduction is due to the introduction and deployment of alternatives, more distribution of low permeable barrier film with the dose rate reduction and reduction of the frequency of MB application to every two years. Five regions applied for MB: Miyazaki: 72.9 ha (20.717 t), Kagoshima: 32.6 ha (6.006 t), Ibaraki: 116.3 ha (25.593 t), Kochi 31.9 ha (7.020 t), Wakayama: 4.5 ha (1.818 t). The total area nominated is 258.2 ha, 61.101 t, The average MB rate is 236 kg/ha. However, the MB rates vary from one region to another (184kg/ha to 400 Kg/ha) according to the pest pressure : Japan provided a comprehensive National Action Plan detailing step wise phase out by 2013 using a range of non chemical alternatives:(Bag culture with fertigation, Inoculation of attenuated virus as vaccine, development of the bio-decomposed pot for the seedling, resistant varieties, hydroponics, solarization) and chemical alternatives (dazomet, metam sodium, chloropicrin and chloropicrin capsule) .The Party believes that all these alternatives will be widely accepted in the future. The development of resistant varieties is progressing well for the control of some viral strains. Soil less culture (bag cultivation, Kaneko 2006) using various substrates (disease 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 2010: No economic arguments are provided in the nomination.</p> <p>Comments requested in Dec. XX1/11 (para 9)</p> <ul style="list-style-type: none"> ▪ Dec. IX/6 b(i)- Emission reduction: No, but the use of barrier films varies from region to region with some regions not using barrier films. The Party's nomination however conforms to MBTOC's standard presumptions. ▪ Dec. IX/6 b(iii)- Research program: Yes, a detailed research program is on-going. ▪ Dec. IX/6 b(iii)- Appropriate effort: The Party has presented a detailed research program in place, in accordance with Decision IX/6. MBTOC believes that the Party will be able to phase out MB completely by 2013 in alignment with their National Management Plan. 											

Country	Industry	CUE for 2005 ¹	CUE for 2006 ²	CUE for 2007 ³	CUE for 2008 ⁴	CUE for 2009 ⁵	CUE for 2010 ⁶	CUE for 2011 ⁷	CUN for 2011 (addtl or new)	CUN for 2012	MBTOC rec. for 2011 (addtl or new)	MBTOC rec. for 2012 (new)
Japan	Watermelon	129.000	98.900	94.200	32.475	21.650	14.500	13.050	-	12.075	-	12.075
<p>MBTOC comments 2010: MBTOC recommends 12.075 tonnes for this use in 2012. This represents a 9.25% reduction of the approved 13.05 tonnes by the Parties at the 21st MOP. 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 methyl bromide for critical use nomination for soil use in 2013 and submitted revised national management strategy for critical use nomination of methyl bromide to the Ozone Secretariat in April 2008. MBTOC acknowledges that the Party will phase out MB by using variety alternatives in 2013 and lead to a reduction of 10 % by adoption of alternatives and low permeable barrier film with the dose rate reduction in 2011.</p> <p>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 & 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 (UNEP/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 2010: No economic arguments are provided in the nomination.</p> <p>Comments requested in Dec. XX1/11 (para 9)</p> <ul style="list-style-type: none"> ▪ Dec. IX/6 b(i) Emission reduction: No, barrier films are used for part of the nomination, but rates conform to the standard presumptions with barrier films ▪ Dec. IX/6 b(iii) Research program: Yes, research effort have been conducted on key fumigant and non chemical alternatives. ▪ Dec. IX/6 b(iii) Appropriate effort: Extensive action plan showing research efforts for phase out by 2013. 												

Country	Industry	CUE for 2005 ¹	CUE for 2006 ²	CUE for 2007 ³	CUE for 2008 ⁴	CUE for 2009 ⁵	CUE for 2010 ⁶	CUE for 2011 ⁷	CUN for 2011 (addtl or new)	CUN for 2012	MBTOC rec. for 2011 (addtl or new)	MBTOC rec. for 2012 (new)
United States	Cucurbits	1,187.800	747.839	592.891	486.757	407.091	302.974	195.698	-	59.500	-	59.500
<p>MBTOC recommendation for 2010: MBTOC recommends 59.500 tonnes for this use in 2012. From this amount, 4.076 t are for Georgia squash, 3.285 t for Georgia cucumber; 12.073 t for Georgia melon; 38.321 t for <u>the Southeast region</u> and 1.739 t for <u>MarDel</u>. MBTOC recognizes the reduction made by the Party of 70% down from 2011 recommendation for transition to a 3 way combination of 1,3 D + chloropicrin, followed by chloropicrin alone, followed by metam-sodium, that shows good results against key cucurbit pests in spring season fumigation.</p> <p>MBTOC recognizes the for cucurbit growers who can only use either 1,3-D + chloropicrin or metam-sodium+chloropicrin in fall-season fumigations to control nutsedge and nematode pests, the yield loss estimates used in last year's nomination continue to be applicable. While one study in 2006 showed good efficacy of a combination of 1,3 D + chloropicrin and the herbicides napropamide + halosulfuron or metolachlor + trifloxysulfuron in small plots of Florida tomatoes (Santos et al. 2006), these results are not applicable to cucurbits because neither metolachlor or trifloxysulfuron are registered in the US for cucurbits, and halosulfuron can have phytotoxic effects on cucurbits</p> <p>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 2010: The nomination 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> <p>Comments requested in Dec. XX1/11 (para 9)</p> <ul style="list-style-type: none"> Dec. IX/6 b(i) Emission reduction: Yes, barrier films used in all of the applications. Dec. IX/6 b(iii) Research program: Yes, studies were conducted in other crops such as tomatoes, which are relevant also to cucurbits. Studies specific to cucurbits (Hausbeck and Cortright (2007), showed that cucurbit plant vigor was measured to determine fumigant/mulch performance under either LPDE or barrier films plastic mulch for the control of <i>Fusarium oxysporum</i>. Of the fumigants used in the study, the MB and MI treatments resulted in cantaloupe plants with the highest vigour. In general, treatments under LPDE had higher plant vigor when compared with plants grown under barrier films. Research continues to also be conducted to identify <i>Fusarium</i> resistant watermelon stock that can be grafted on a commercially feasible basis. Other studies were also given in the CUN for these crops. Dec. IX/6 b(iii) Appropriate effort: 												

Country	Industry	CUE for 2005 ¹	CUE for 2006 ²	CUE for 2007 ³	CUE for 2008 ⁴	CUE for 2009 ⁵	CUE for 2010 ⁶	CUE for 2011 ⁷	CUN for 2011 (addtl or new)	CUN for 2012	MBTOC rec. for 2011 (addtl or new)	MBTOC rec. for 2012 (new)
United States	Eggplant	76.721	82.167	85.363	66.018	48.691	32.820	19.725	-	6.904	-	6.904
<p>MBTOC comments 2010: MBTOC recommends 6.904 tonnes which is the total requested amount by the Party. The Party has made a 65 % reduction in MB use from the amount approved by the Party's for 2011 (19.725 t). MBTOC acknowledges the substantial reduction by the Party for uptake of alternatives, particularly the use of the 3 way system. Of this amount, 3.061 t are for Georgia and 3.843 t are for Florida. 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 125 kg/ha both for pathogens and for nutsedge. 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. This research is on-going, however specific studies conducted or in progress since the last nomination were not cited in the CUN. 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..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. MBTOC considers that the Party should develop non chemical alternatives e.g. grafting, biofumigation, soil less culture... which are widely used in many countries and regions with similar climate and pest (Besri, 2008). It is important to note that MB not used in any other non A5 country on eggplant. There is no indication in the nomination that research in these areas is continuing.</p> <p>MBTOC comments on economics 2010: The nomination 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> <p>Comments requested in Decision XXI/11 (Para 9)</p> <ul style="list-style-type: none"> ▪ Dec. IX/6 b(i) Emission reduction: No, there is no information in the nomination about the use of VIF or equivalent film, however, the rates (125 kg/ha) are consistent with the use of barrier films and MBTOC's standard presumptions ▪ Dec. IX/6 b(iii) Research program: Yes, equivalent research is on-going in similar sectors, however specific studies conducted or in progress since the last nomination were not cited in the CUN ▪ Dec. IX/6 b(iii) Appropriate effort: The Party is increasing uptake based on adoption of alternatives such as the Georgia 3-Way and Methyl Iodide. More effort to implement grafting, resistant root stocks, etc. may facilitate the phase out of MB in areas where regulatory constraints prevent the use of some of the chemical alternatives. 												

Country	Industry	CUE for 2005 ¹	CUE for 2006 ²	CUE for 2007 ³	CUE for 2008 ⁴	CUE for 2009 ⁵	CUE for 2010 ⁶	CUE for 2011 ⁷	CUN for 2011 (addtl or new)	CUN for 2012	MBTOC rec. for 2011 (addtl or new)	MBTOC rec. for 2012 (new)
United States	Forest nursery	192.515	157.694	122.032	131.208	122.060	117.826	93.547	-	34.230	-	34.230
<p>MBTOC comments 2010: MBTOC recommends an amount of 34.230 tonnes for this nomination in 2012. MBTOC recognizes a reduction in the nominated amount with respect to last years' approved amount, but was informed by the Party that some of this amount was moved into QPS MB. Despite requests from the Party it is unclear what proportion of this amount has been moved into QPS. The nomination indicates 100% reduction by three groups and 48% for the remaining three groups (the Southern Forest Nursery Management Cooperative, the Michigan Seedling Growers, and the Northeastern Forest and Conservation Nursery Association. Key pests are nutsedge, nematodes and fungi. MBTOC recognises that propagative material requires a very high level of soilborne pest and pathogen control in order to avoid their wide spread distribution. 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. The nomination is for certified forest seedlings produced in 3 forest nursery regions. 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. Gluing of LPBF remains a challenge (Quicke et al., 2009; Walters et al., 2009). 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. 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, 5-year demonstration trials for this sector by the Party now with promising results (Quicke, 2007; Quicke, 2008; Weiland, 2008). Recent findings confirm the promising results of MI, MI/Pic, DMDS, DMDS/Pic, but no indication of pathogen or weed pressure was given (Quicke, 2009; Weiland, 2009). Limited substrate production of these crops is reported as economical for small niche markets; however MBTOC is aware that International Paper produces over 40 million tree seedlings per year in substrates in their Brazil operation. MBTOC encourages additional effort on use of substrates, better methods for gluing barrier films, and use of MI.</p> <p>MBTOC comments on Economics 2010: The Party states that estimated costs of fumigation per hectare for northeastern nurseries average \$8,300 for iodomethane (98:2), \$10,500 for iodomethane (50:50), and \$4,820 for methyl bromide (98:2). CUN notes that there are no yield losses with the use of iodomethane, hence if these cost differences are maintained the industry would find iodomethane to be economically infeasible. However, CUN shows losses in net operating revenue of 7% (Southern Forest Nursery Management Cooperative) and 14% (Northeastern Forest and Conservation) respectively.</p> <p>Comments requested in Dec. XX1/11 (para 9)</p> <ul style="list-style-type: none"> ▪ Dec. IX/6 b (i) Emission reduction: No. Barrier films are not used, but rates conform to the standard presumptions without barrier films. Inability to glue effectively and the lack of commercial availability of gluing LPBF have restricted the ability to use barrier films. 												

Country	Industry	CUE for 2005 ¹	CUE for 2006 ²	CUE for 2007 ³	CUE for 2008 ⁴	CUE for 2009 ⁵	CUE for 2010 ⁶	CUE for 2011 ⁷	CUN for 2011 (addtl or new)	CUN for 2012	MBTOC rec. for 2011 (addtl or new)	MBTOC rec. for 2012 (new)
	<ul style="list-style-type: none"> ▪ Dec. IX/6 b (iii) Research program: Yes. Research effort has been conducted on alternatives. ▪ Dec. IX/6 b (iii) Appropriate effort: The reduction and research indicates appropriate efforts. 											
United States	Nurseries stock (fruit, nut, flower)	45.800	64.528	28.275	51.102	25.326	17.363	7.955	-	1.591	-	1.591
	<p>MBTOC comments 2010: MBTOC recommends a total of 1.591 tonnes for this use in 2012. This comprises 0.191 tonnes for roses, and 1.400 tonnes for the California Assoc. of Nursery and Garden Center. MBTOC notes the large reduction in this nomination, which is 80% less than last year's approved amount. The rates conform to MBTOC's standard presumptions. This nomination is for propagative materials that need to be certified as free of pests and diseases (CDFA,2009; USDA-APHIS,2007). The amount of MB is specified in certification requirements, regardless of the formula (CDFA, 2009). The California Dept of Food and Agriculture has approved the use of 1,3-dichloropropene as a certified nursery stock soil treatment for certain crops under specific conditions and recently added methyl iodide (MI), if and when it is registered for use in California (CDFA, 2009). MBTOC recognises that propagative material requires a very high level of soilborne pest and pathogen control in order to avoid their wide spread distribution. Research trials indicate some materials (such as MI) and some combinations (such as 1,3-D /Pic) show promise as alternatives for specific circumstances, although effective rates may be higher than those needed in annual crops and use of an effective barrier film is necessary (Schneider et. al, 2008; Schneider et. al, 2009a; Schneider et. al, 2009b; Walters et. al, 2009). Other materials (such as metham sodium and chloropicrin) were not adequate for certified nursery standards (Schneider et. al, 2009b). Advances using alternatives are being made (Hanson et al., 2007; Hanson et al., 2007; Hanson et al., 2009). Few effective herbicides are available to nursery managers in California (Shrestha et al., 2008). An alternate approach to the use of soil treatments is the use of containerized, or soil-less substrate, production systems where this approach is economically feasible and is able to produce a product, i.e, root system, of acceptable size and quality to the marketplace. MBTOC encourages continued research on chemical and non-chemical alternatives and on high barrier films in hope (anticipation?) of the future approval for use in California.</p> <p>MBTOC comments on economics 2010: The nomination concludes that 1,3-D+Chloropicrin 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> <p>Comments requested in Dec. XX1/11 (para 9)</p> <ul style="list-style-type: none"> ▪ Dec. IX/6 b(i) Emission reduction: Yes. Barrier films cannot be used for this nomination in California, but rates conform to the standard presumptions. ▪ Dec. IX/6 b(iii) Research program: Yes, An area wide program is evaluating the key alternatives, including methyl iodide/Pic and spot treatment of Pic. ▪ Dec. IX/6 b(iii) Appropriate efforts: A range of alternatives are being considered and commercialised. 											

Country	Industry	CUE for 2005 ¹	CUE for 2006 ²	CUE for 2007 ³	CUE for 2008 ⁴	CUE for 2009 ⁵	CUE for 2010 ⁶	CUE for 2011 ⁷	CUN for 2011 (addtl or new)	CUN for 2012	MBTOC rec. for 2011 (addtl or new)	MBTOC rec. for 2012 (new)
United States	Orchard replant	706.176	527.600	405.400	393.720	292.756	215.800	183.232	-	18.324	-	18.324
<p>MBTOC Comments for 2010: MBTOC recommends a CUE of 18.324 tonnes be approved for this use in 2012. This includes 12.700 t for stone fruit, 0.626 t for raisons, 1.844 t for walnuts, 1.660 t for almond and 1.494 t for wine grapes. MBTOC acknowledges that the CUN is a 90% reduction from the previously approved amount. The CUN is for orchard/vineyard replant disorder of unknown etiology for a portion of replant sites in California where alternatives are not suitable, either because of regulatory restrictions or physical characteristics such as unacceptable soil type, moisture or topography. The CUN is for heavy soils or soils which cannot be treated to a sufficient depth to kill of old roots and the associated pathogens in deeper soil. Regulatory constraints (maximum labelled rated) prevent the use of 1,3-D at the rates needed for effective. The best alternatives for orchard replant that have been identified are 1,3-D or 1,3-D with chloropicrin, chloropicrin alone, and/or metam-sodium, especially in coarse-textured soils (Caprile and McKenry, 2006; Wang et al., 2009; Browne et al., 2007; Browne et al., 2008; Beede et al., 2008). Under certain soil and moisture conditions (less than 12% to 1.5 meters) 1,3-D is an effective management tool for replant problems and is currently used to replant the majority of orchard and vineyard sites. 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 rootstocks such as Nemaguard, Viking, Krymsk1, and Flordaguard have been reported by McKenry (2006). Additional alternatives proven to be effective include IM or 1,3-D and spot treatments applied through GPS-controlled shanks or through a spot drip application system (Browne <i>et al.</i>, 2007; 2008). 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.</p> <p>MBTOC comments on economics 2010: Walnut and almond orchards: 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/Pic. However the NPV and IRR (close to 14%) of both alternatives are similar. MBTOC notes that there is an error in Table 1 of the CUN. Losses with almonds are expected to be higher because of higher tree mortality rates. California Stone Fruit: CUN states that differences in net operating revenue for even small changes in yield can be substantial. This analysis suggests that the benefits of methyl bromide alone are approximately \$125/hectare. The result is a decrease of 12% in net operating revenue, but both alternatives have a negative NPV although MB provides additional benefits.</p> <p>Comments requested in Dec. XX1/11 (para 9)</p> <ul style="list-style-type: none"> ▪ Dec. IX/6 b(i) Emission reduction –Yes. Barrier films cannot be used for this nomination in California, but rates conform to the standard presumptions. ▪ Dec IX/6 b(iii) Research program - Yes, an area wide program is evaluating the key alternatives, including methyl iodide/Pic, spot treatment of Pic. ▪ Dec. IX/6 b(iii) Appropriate efforts - A range of alternatives are being considered and commercialised. 												

Country	Industry	CUE for 2005 ¹	CUE for 2006 ²	CUE for 2007 ³	CUE for 2008 ⁴	CUE for 2009 ⁵	CUE for 2010 ⁶	CUE for 2011 ⁷	CUN for 2011 (addtl or new)	CUN for 2012	MBTOC rec. for 2011 (addtl or new)	MBTOC rec. for 2012 (new)
United States	Ornamentals	154.000	148.483	137.835	138.538	107.136	84.617	64.307	-	48.164	-	48.164
<p>MBTOC comments 2010: MBTOC recommends the requested amount of 48.164 tonnes for this use in 2012. This includes 46.950 t for California and 1.214 t for Florida. MBTOC acknowledges the 25% reduction in the nominated amount compared to the previous amount approved, including a significant reduction of 90% in Florida. This rate of adoption would support a 4 year transition to available alternatives. In Florida, methyl iodide (MI) is now registered and other alternatives are available, for example 1,3-D/Pic and solarization alone or in combination with chemicals (McSorley et al, 2006; McSorley et al, 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., Fusarium spp., Pythium spp., Phytophthora spp., and Rhizoctonia spp.), plant parasitic nematodes (e.g., root knot, root lesion, stunt and dagger), weeds (e.g. Cyperus spp. Portulaca, Ambrosia 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 et al., 2007, Klose, 2008). Steaming systems and application methods are being evaluated in California, in an effort to identify the most feasible approach to this technique (Gilbert et al, 2009). MBTOC recognizes the potential for phytotoxicity issues for MI on ornamentals. MBTOC encourages the Party to conduct appropriate trials to facilitate the transition to MI/Pic if and when registration is received. MBTOC also encourages continued research on non-chemical and chemical alternatives.</p> <p>MBTOC comments on Economics 2010: A major change in this CUN is the availability of iodomethane in Florida (registered in 2008), but not in California. Its economic impacts as an alternative to methyl bromide are relatively small. The partial budget of Florida lilies resulted in a 4% loss as a percentage of net operating revenue. In California the alternatives to methyl bromide imply a significant negative economic impact on growers; however, the data show that growers incur a loss even when using MB.</p> <p>Comments requested in Dec. XX1/11 (para 9)</p> <ul style="list-style-type: none"> ▪ Dec. IX/6 b(i) Emission reduction: Yes, for part of the nomination. Barrier films are currently used in Florida. Barrier films cannot be used in California due to regulatory constraints. Rates conform to the standard presumptions with barrier films. ▪ Dec. IX/6 b(iii) Research program: Yes, research efforts have been conducted on alternatives. ▪ Dec. IX/6 b(iii) Appropriate efforts: The nomination indicates significant efforts have been made to switch to alternatives. Substantial reduction indicates appropriate efforts particularly in Florida. In California, efforts have been made within the constraints imposed by regulations. 												

Country	Industry	CUE for 2005 ¹	CUE for 2006 ²	CUE for 2007 ³	CUE for 2008 ⁴	CUE for 2009 ⁵	CUE for 2010 ⁶	CUE for 2011 ⁷	CUN for 2011 (addtl or new)	CUN for 2012	MBTOC rec. for 2011 (addtl or new)	MBTOC rec. for 2012 (new)
United States	Peppers (field)	1094.782	1,243.542	1,106.753	756.339	548.984	463.282	206.234	-	28.366	-	28.366
<p>MBTOC comments 2010: MBTOC recommends the total requested amount of 28.366 tonnes for 2012. The Party has made a 86.2 % reduction in MB use from the amount approved by the Party's for 2011. MBTOC acknowledges the substantial reduction by the Party for uptake of alternatives. Of this amount, 0.947 t is for Georgia, 27.077 t is for Florida and 0.341 t is for the Southeast. The Party did not again submit a CUN for Michigan for 2012. The Party is projecting rates of 125 kg/ha (12.5 g/m²) for both pathogens and nutsedge.</p> <p>In addition, 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, 2007a) is an alternative for MB in spring crops. For Georgia fall crops, this system needs further development for use in areas with moderate to high nutsedge pressure. 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 1,3-D in the fall require longer waiting periods for planting than MB. Delays could result in missed market windows. Midas, a mixture of MI and Pic, 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. The main constraints to the widely use of MI are : (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). 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, MBTOC considers that the Party should also develop some non chemical alternatives e.g. grafting, biofumigation, soil less etc. 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 non Article 5 countries on pepper. There is no indication in the nomination that research in these areas is continuing.</p> <p>MBTOC comments on economics 2010: The nomination describes the economic impact of using iodomethane 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 iodomethane 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 iodomethane, 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 iodomethane 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, iodomethane can be.</p> <p>Comments requested in Decision XXI/11 (para 9)</p> <ul style="list-style-type: none"> Dec. IX/6 b(i) Emission Reduction: No, there is no information in the nomination about the use of VIF or equivalent film, however, the rates (125 kg/ha) are consistent with the use of barrier films and MBTOC's standard presumptions Dec. IX/6 b(ii) Research Program: Yes, equivalent research is on-going in similar sectors, however specific studies conducted or in progress since the last nomination were not cited in the CUN Dec. IX/6 b(iii) Appropriate Efforts: It appears that the Party is making an appropriate effort to replace MB with alternatives such as the Georgia 3-Way and Methyl Iodide. More effort to implement grafting, resistant root stocks, etc. may facilitate the phase out of MB in areas where regulatory constraints prevent the use of some of the chemical alternatives. 												

Country	Industry	CUE for 2005 ¹	CUE for 2006 ²	CUE for 2007 ³	CUE for 2008 ⁴	CUE for 2009 ⁵	CUE for 2010 ⁶	CUE for 2011 ⁷	CUN for 2011 (addtl or new)	CUN for 2012	MBTOC rec. for 2011 (addtl or new)	MBTOC rec. for 2012 (new)
United States	Strawberry runners	54.988	56.291	4.483	8.838	7.944	4.690+ 2.018	6.036	-	3.752	-	3.752
<p>MBTOC comments for 2010: MBTOC recommends 3.752 tonnes for California in 2012, but does not accept use in the south eastern States as a suitable alternative is available. In the previous round, MBTOC accepted the action plan of the Party for 2010 and 2011 for amounts of 2.018 t and 1.346 t respectively in the south east. MBTOC considers that MI is technically suitable for strawberry fruit production from runners grown in MI treated soil, and accepted that time was required to conduct commercial scale up trials of MI in fruit fields. The submission showed no evidence that these commercial scale up trials were ineffective so MBTOC does not consider further need for MB in these regions.</p> <p>The CUN does not specify regions for use and applies generally for 3.752 tonnes, however 99% of the hectares are exempted under QPS. The key pests previously stated as 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 in California</i>), nematodes (root-knot, sting in CA). Alternatives s that have been evaluated in research trials over the past several years are 1,3-D/chloropicrin, 1,3-D/chloropicrin + metam-sodium, 1,3-D and metam-sodium, and dazomet as a follow-up application to 1,3-D/chloropicrin or chloropicrin (Fennimore <i>et al.</i>, 2008b) the latter proving very effective. These formulations have been shown to give similar pathogen control in soils and will meet requirements of certification (Kabir <i>et al</i>, 2005; Fennimore <i>et al</i>/2007, 2008; MBO). [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 Party's request is based on 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). California regulations prohibit the use of LPBF with MB. The Party did not provide further information on commercial scale up trials requested in the 2009 round.</p> <p>MBTOC comments on Economics: The nomination states that iodomethane is under registration review in California; however registration is not expected in the near future. California strawberry nursery growers are expected to see a yield decrease of 10% with 1,3-D + chloropicrin. Net revenue declines from more than \$12000/ha to a loss of almost \$8000/ha.</p> <p>Comments requested in Dec. XX1/11 (para 9)</p> <ul style="list-style-type: none"> • Dec. IX/6 b(i) Emission control: No, regulations prevent the use of barrier films with MB but barrier films can be used with alternatives. Rates conform to standard presumptions. • Dec. IX/6 b(iii) Research program: Yes, ongoing research is being conducted showing that MI/Pic especially is effective, but it is not yet registered in California. • Dec. IX/6 b(iii) Appropriate effort: MI has qualified for certification use by CFDA, however it is not yet registered 												

Country	Industry	CUE for 2005 ¹	CUE for 2006 ²	CUE for 2007 ³	CUE for 2008 ⁴	CUE for 2009 ⁵	CUE for 2010 ⁶	CUE for 2011 ⁷	CUN for 2011 (addtl or new)	CUN for 2012	MBTOC rec. for 2011 (addtl or new)	MBTOC rec. for 2012 (new)
United States	Sweet Potato slips	None	0.000	0.000	180144	18.144	14.515	11.612	-	8.709	-	8.709
<p>MBTOC comments for 2010: MBTOC recommends 8.709 t for this use in 2012. Two years of trials indicate that Pic combined with herbicides provide transplants that give yields and returns above that of MB. MBTOC recognizes that this is a 25 % reduction from the 2011 year application. The pathogens of concern are a complex of Pythium diseases, roots rots, Pox (<i>Streptomyces ipomea</i>); Scurf (<i>Monilochaetes infuscans</i>); Fusarium wilt (<i>Fusarium oxysporum</i>); Black rot (<i>Ceratocystis fimbriata</i>), root knot caused by nematodes, and the infestation of various weed species. The basis of the nomination is that township caps limit the use of 1,3-D and 1,3-D combinations the preferred MB alternative treatments. The industry sector is now carrying out extensive trials for replacing MB. 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. Trials by Stoddard (2008) indicate that Pic combined with herbicides has provided transplants that give yields and returns above that of MB. Second year trials carried out by Stoddard et al. (2009) confirmed result obtained in 2008 that showed that Piic is a good alternative to MB. Solarization also significantly increased yield and with more effective herbicides may also become a MB alternative. No VIF is used as it is not permitted in California. Nematode resistant cultivars are available worldwide and should be considered for any nematode issues. The applicant will be conducting the third year of trials in 2010 and in 2011 replicated trial will be done in 6 to 8 locations. If results comparable to 2008-09 are obtained with the alternatives are verified from these tests MBTOC expects complete phase out for this sector by 2013.</p> <p>MBTOC comments on economics 2010: The nomination shows trial data that reflect that yield increases by 11% with the use of chloropicrin, resulting in a gain in gross and net operating revenue of 7 and 22% respectively.</p> <p>Comments requested in Dec. XX1/11 (para 9)</p> <ul style="list-style-type: none"> • Dec. IX/6 b(i) Emission control: No, barrier films are not used in California as legislation prohibits this. Rates comply with MBTOC presumptions. • Dec. IX/6 b(iii) Research program: Yes, A very active research program is in place to find alternatives and the party has indentified alternatives that are now being implemented. • Dec. IX/6 b(iii) Appropriate Effort: The Party has identified an action plan that will phase out MB as soon as alternative technologies have been proven effective. 												
United States	Tomatoes (field)	2876.046	2,476.365	2,065.246	1,406.484	1,003.876	737.584	292.751	-	54.423	-	54.423
<p>MBTOC comments 2010: MBTOC recommends 54.423 tonnes the total requested amount by the Party. The Party has made a 81.4 % reduction in MB use from the amount approved by the Party's for 2011 (292.751 tonnes). Of this amount, 0.073 t is for Maryland, 0.646 t for Virginia, 8.164 t for SE, 3.882 t for Georgia, and 41. 657 t for Florida. MBTOC acknowledges the substantial reducti by the Party for uptake of alternatives, particularly the 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 tomato pests, including nutsedge, in a number of trials with 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</p>												

Country	Industry	CUE for 2005 ¹	CUE for 2006 ²	CUE for 2007 ³	CUE for 2008 ⁴	CUE for 2009 ⁵	CUE for 2010 ⁶	CUE for 2011 ⁷	CUN for 2011 (addtl or new)	CUN for 2012	MBTOC rec. for 2011 (addtl or new)	MBTOC rec. for 2012 (new)
		<p>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). Lows (2009), Bausher (2009) provides evidence that 'Big Power', 'Beaufort', and 'Maxifort' rootstock can be utilized to manage soil borne pathogens. Freeman et al (2009) reported that although grafted plants add significantly to input costs at current prices, the net economic result is often positive when infestations are high. There is no indication in the nomination that research in these areas is continuing. Therefore, MBTOC considers that more research is necessary to demonstrate appropriate effort to replace MB under decision IX/6. It is important to note that MB is not used any more in developed countries on tomato.</p> <p>MBTOC comments on economics 2010: CUN concludes that iodomethane 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, chloropicrin, and metam-sodium/potassium) and achieve yields that are comparable to those produced by using methyl bromide for spring crops only.</p> <p>Comments requested in Decision XXI/11</p> <ul style="list-style-type: none"> • Dec. IX/6 b(i)- Emission Reduction: No, there is no information in the nomination about the use of VIF or equivalent film, however, the rates (125 kg/ha) are consistent with the use of barrier films • Dec. IX/6-b(iii)-Research Program: Yes, the research is on-going, however specific studies conducted or in progress since the last nomination were not cited in the nomination • Dec. IX/6-b(iii)-Appropriate Efforts: The Party made large reductions recently. Consideration of grafting, resistant root stocks, etc. may facilitate the phase out of MB in areas where regulatory constraints prevent the use of some of the chemical alternatives. 										

¹1ExMOP and 16MOP

²16MOP+2ExMOP+17MOP

³MOP17+MOP18

⁴MOP18+MOP19

⁵MOP19+MOP20

⁶MOP20

⁷MOP21

5. Final CUN Report – Issues Specific to MBTOC Structures and Commodities

At the Open Ended Working Group in Geneva in July 2010, MBTOC Structures and Commodities (SC) held bilateral meetings with Australia, Canada, Japan and the United States. The purpose was to discuss Parties' views concerning MBTOC SC's interim CUN recommendations, receive and provide additional information and discuss outstanding technical and economic questions. We indicated we would conduct re-reviews of CUN decisions if Parties requested and provided additional information. Additionally, Canada provided some corrections to MBTOC SC's reporting of its accounting framework.

Following the meeting, MBTOC SC, via the Ozone Secretariat sent letters to the Parties summarizing MBTOC SC's understanding of the nominations and the possibility of a re-review, if this was seen as necessary. Additionally, we responded to requests for information. MBTOC SC informed UNEP of corrections to the tables relating to Canada's methyl bromide accounting.

Australia and the United States requested re-reviews of three CUNs in late August and mid-September. MBTOC SC met in Zagreb Croatia 14-17 September 2010 to finalize the critical use nominations for Australia rice, US commodities and one element of the US NPMA CUN, concerning pest control in cheese stores and, to work on the Assessment Report.

MBTOC SC advises that the relatively late notice by these Parties requesting re-reviews of CUNs created attendance difficulties for its members. Accordingly, MBTOC SC requests Parties to notify the Ozone Secretariat by 31 July each year of any requests to re-review CUNs.

MBTOC wishes to thank Government of Croatia, Ministry of Environment and the National Ozone Unit for meeting with MBTOC SC and for the interesting discussion of progress being made in Croatia towards an accelerated phase out of ozone depleting substances. MBTOC notes that Croatia has phased out the use of methyl bromide including MB used for QPS (except that remaining QPS MB stocks will be used).

5.1. Membership and Funding Issues

MBTOC has indicated 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 seeking CUEs to provide information after MBTOC's first review. Parties can request a re-review if they disagree with MBTOC's first-review recommendations, and by providing additional information supporting their CUN. When MBTOC is not preparing an Assessment report each four years and when Parties re-reviews are minimal, MBTOC has only occasionally met once per year.

Typically the number of meetings per year is limited largely by the availability of funds for members' travel and subsistence. Constraints on the available of funds for non-A5 MBTOC members, which have been discussed in several previous interim and final reports, now seriously affect the ability of MBTOC SC to work. Some MBTOC members are now retired from their research institutes. In some cases there has been an expectation that they will personally finance their own travel and subsistence, or carry over debt for lengthy periods pending repayment from Governments. Other members try to cover travel costs from their diminished research budgets. One Non-A5 member reports inability to obtain funding for attendance at meetings since the member's Party notes it already contributes to the MLF.

MBTOC SC has fewer members (12 members from 9 countries) since MBTOC QSC was divided into SC and QPS in 2009. Additionally, two former members of MBTOC QSC who were transferred to MBTOC QPS remain corresponding members of MBTOC SC.

MBTOC SC members have expressed concern that quarantine issues, for which they have considerable expertise, and which have always been handled by the MBTOC SC members, have been removed from this group, leaving essentially no opportunity for input or contribution by MBTOC SC members. Of 12 MBTOC SC members, 6 attended the Zagreb meeting, and one of those members was a corresponding member from the MBTOC QPS.

Due to these difficulties in funding for meetings, MBTOC intends to meet only once in 2011.

5.2 Details of evaluations

Parties have submitted eight CUNs for the use of MB in structures and commodities in 2010. The total MB volume nominated in 2010 for non-QPS post-harvest uses was 185.704 tonnes.

In the 2010 first nomination submission, one government nomination was for 2011 for a total MB amount of 3.529 tonnes (Canada Pasta). In the 2010 second nomination submission, seven nominations from governments for 2012 totaled 182.175 tonnes of methyl bromide.

MBTOC SC published its interim recommendations on the CUN nominations in the Volume 2 of the TEAP May 2010 Report.

Subsequently, Australia requested that MBTOC re-review the interim recommendation and provided a new phase-out plan for the use of MB to disinfest Australian rice. The phase out plan provided for a 25% decreased CUN for 2012 over the Party's earlier nomination for 2012, plus significant reductions in 2013 and 2014. The Party said it would ensure these decreases took place even in times of low harvest. The Party indicated that it would not nominate for rice in 2015. On this basis, MBTOC was able to increase its recommendation for the Australia rice CUN.

The United States requested MBTOC to re-review its Commodities CUN which includes dried fruit, walnuts and dates. The US provided additional technical information and conducted a bilateral meeting in a conference call. Upon consideration of the concerns of the efficacy of an alternative for pest control in in-shell walnuts, MBTOC was able to increase its final recommendation for walnuts, but not for dried fruit.

The US also requested that MBTOC re-review the part of the NPMA CUN which pertained to cheese infested while in storage in manufacturing facilities (referred to as 'cheese stores'). In May 2010, MBTOC had not recommended any of the sectors included in the NPMA CUN, however, upon receipt of the inspection information from the US, and after doing a calculation of the amount of MB which might be required, MBTOC was able to recommend a small amount of MB for cheese stores. MBTOC still did not recommend methyl bromide for other sectors in the US NPMA nomination.

MBTOC recommended 2.084 tonnes for 2011 and 101.105 tonnes for 2012. MBTOC did not recommend 84.599 tonnes. Table 5.1 provides the MBTOC SC final recommendations for the nominations submitted in 2010.

Table 5.1 - Final evaluations of CUNs for structures and commodities submitted in 2010 for 2011 or 2012

	Industry	CUE for 2005 ¹	CUE for 2006 ²	CUE for 2007 ³	CUE for 2008 ⁴	CUE for 2009 ⁵	CUE for 2010 ⁶	CUE for 2011 ⁷	CUN for 2011 (Addtl or new)	CUN for 2012	MBTOC rec. for 2011(addtl or new)	MBTOC rec. for 2012 (new)
Australia	Rice	6.150	6.150	.205	9.200	7.820	6.650	4.87	-	4.870		3.653
<p>MBTOC comments 2010: See also Australia Rice CUN text box in TEAP May 2010. MBTOC recommends 3.653 tonnes for Australia rice for 2012, on the basis of the revised CUN in which the Government of Australia stated it would phase out the use of MB for rice by the end of 2014. The revised CUN provided for additional significant step-downs in 2013 and 2014; Australia indicated it would not nominate for 2015 and would ensure that phase out is maintained regardless of rice harvest yields, including during poor harvests. MBTOC notes that the recommended amount for 2012 is 25% lower than the amount of MB granted by the Parties for 2011.</p> <p>Rice harvest volumes are unpredictable. For at least seven years, rice harvests have been considerably lower than the long-term average due to drought and water allocation issues in the growing region.</p> <p>There are several technically effective and registered alternatives available for this application and in common commercial use worldwide for this purpose.</p> <p>Emission Reduction: Yes. The applicant now intends to send all MB-fumigated rice through MB recapture equipment. The applicant previously recaptured a majority percentage of the MB used.</p> <p>Research Program. Unable to assess. A research project in 2009 was interrupted due to the unfortunate death of the scientist in charge. For several years the applicant has indicated that they have chosen phosphine as their alternative; MBTOC does not believe there is a need for further research on phosphine. The applicant is now considering sulfuryl fluoride and so should conduct further research on this fumigant as proposed in recent correspondence.</p> <p>Appropriate effort. Insufficient. The CUE in 2011 shows a reduction of only 21% during 6 years (a reduction of about 3.5% per year on average). As with all postharvest registration issues, neither the applicant nor the Party mandated with Montreal Protocol nominations has control over pesticide registration. This applicant, however, has not made appropriate efforts to adopt alternatives, since no alternatives have been adopted in spite or registration of technically effective and affordable alternatives being available. Economists need partial budget analysis to allow an economic assessment</p> <p>MBTOC comments on economics 2010: 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 November 2007 and SunRice commenced trials in January 2009. The Party notes the need to generate supporting data. Phosphine fumigation is considered by the Party to be the best solution, both technically and economically, although the applicant requires that the introduction of phosphine also include a considerable change to processing methods and a substantial infrastructure investment. The CUN suggests that projected operating costs with the phosphine system would be 15 times that for methyl bromide. The CUN relates the difficulties faced by the applicant in raising the capital for transition to phosphine. 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 recognizes that the phosphine system contemplated by the applicant is a significant different process than the current MB based process. However, it is unclear that construction of one or more pilot silos, or other fumigation structures and incremental implementation of a phosphine system is unaffordable. The company indicates it has returned to normal profitability.</p>												

	Industry	CUE for 2005 ¹	CUE for 2006 ²	CUE for 2007 ³	CUE for 2008 ⁴	CUE for 2009 ⁵	CUE for 2010 ⁶	CUE for 2011 ⁷	CUN for 2011 (Addtl or new)	CUN for 2012	MBTOC rec. for 2011(addtl or new)	MBTOC rec. for 2012 (new)
Canada	Mills	47 (included mills and pasta)	34.774	30.167	28.650	26.913	22.878	14.107	-	11.020	-	11.020
<p>MBTOC comments 2010: MBTOC recommends the nominated amount of 11.020 tonnes for Canada flour mills in 2012. The party's nomination was a reduction of 22% over the amount of MB granted by the Parties for 2011. In 2012 there will be 19 mills included in the application, one fewer than in 2011. The applicant has reduced its nomination by about half since 2010, due to the results of a multi-year research program and the advent of the new regulation which allows sharing of the MB allocation by companies within the CUN. The amount of MB recommended for 2012 will only fumigate 7-8 mills.</p> <p>With this and other CUNs MBTOC remarks that heat treatments (in combination with DE) should also be used, when possible. The reason for this is that there may be ongoing problems with achieving the full registration of sulfuryl fluoride. In a recent letter, the Government of Canada explained that availability of heaters is limited during weekends traditionally used to conduct pest control treatments. MBTOC recommends that efforts to overcome this logistical problem be intensified.</p> <p>Concerning heat treatments for mills, MBTOC notes that research shows practical/logistical challenges and possible insufficient efficacy for heat treatment with mills >40,000 m³. MBTOC also notes that in large mills that have concrete basements it might be difficult or economically infeasible to heat the mill sufficiently to allow the same degree of control of pest control as can be achieved with a gas fumigant (depending on the weather at time of treatment). With a concrete basement acting as a heat sink and refuge for the pests, the pest population rebounds faster. However, there is also evidence that heat treatment can be optimized and effective once it is learned how exactly to conduct the heat treatment in each individual mill. There is a long learning curve to achieve optimization because whole site treatment is usually only done once per year, so it might take several years to really optimize the treatment method for that particular mill. It would be good to have heat treatment experience and therefore a choice of effective treatments.</p> <p>MBTOC does recognize the need to ensure the optimization of effective heat treatment or fumigation in the context of increasing requirements for food hygiene.</p> <p>We note, with concern, that this use could be ongoing for several years unless there is regulatory change or greater adoption of heat treatment. The applicants report they are awaiting the full registration for SF which would allow contact of SF on commodities. MBTOC notes that it is possible that the full registration of SF will never occur. Therefore the Party is requested to provide a management plan which will allow for phase out of MB in this sector in the eventuality that full registration of SF is not achieved.</p> <p>Emission control. Mills are now not treated annually, which reduces emissions.</p> <p>Ongoing research – Excellent research multi-mill, multi-stakeholder research program in past with several full reports submitted to MBTOC (SF, heat and DE, SF and elevated temperature, phosphine + CO₂, etc). Research has not been reported in past two years; MBTOC is not convinced that further research in this field is absolutely necessary. When mills are not MB fumigated, they are being heat treated and all are now in enhanced IPM.</p> <p>Appropriate effort in the CUN? Full registration of SF has not been achieved; there is still no food tolerance for F residues from SF treatment of mills. This action has been delayed for several years and hinders ability to fully adopt SF as an alternative treatment. Neither the millers nor the Party can affect fumigant registration. In spite of delay in achieving full registration, the mills are continuing to make progress.</p>												

	Industry	CUE for 2005 ¹	CUE for 2006 ²	CUE for 2007 ³	CUE for 2008 ⁴	CUE for 2009 ⁵	CUE for 2010 ⁶	CUE for 2011 ⁷	CUN for 2011 (Addtl or new)	CUN for 2012	MBTOC rec. for 2011(addtl or new)	MBTOC rec. for 2012 (new)
	<p>MBTOC comments on economics 2010: 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>The Party has stated in the past that operating margins in this industry are small. This CUN suggests 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. The competitive conditions faced by flour mills make it unlikely a substantial portion of these added costs could be passed on down the supply chain. Regarding the observation that there are no government 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. The Party has indicated concerns that SF has been shown to have significant global warming potential and this could result in future constraints on its use, which adds another factor which might slow adoption of SF.</p>											
Canada	Pasta	(see Canada mills)	10.457	6.757	6.067	4.740	3.529	-	3.529	-	2.084	
	<p>MBTOC comments 2010: MBTOC recommends 2.084 tonnes for Canada pasta facilities in 2011. This is a 41% decrease of the amount granted by the Parties for this use in 2010. The Party nominated 3.529 tonnes for 2011, which is the same amount granted by the Parties for 2010. There are three facilities, each requesting one fumigation per facility. Concerning the nominated amounts, MBTOC notes that given the facility volumes, the MB nominated is only sufficient for partial facility fumigation, in two of the pasta facilities.</p> <p>All facilities are making IPM improvements. Facility #1 of the CUN reports poor gas-tightness and we cannot recommend the use of MB in a facility of poor gas-tightness any longer. We note that facility #2 reporting medium gas-tightness will have to make facility improvements to show good gas-tightness to be considered for any future CUN.</p> <p>In the CUN for the 2009 round, MBTOC recommended that one facility conduct a trial with an alternative and report the results to MBTOC and to the other companies in the sector. Although the facilities have said they conducted SF trials in the sections where food products would not be contacted, reports documenting those trials were not submitted to MBTOC. No research reports have been submitted this year.</p> <p>The applicants report they are awaiting the full registration for SF which would allow contact of SF on commodities. MBTOC notes that it is possible that the full registration of SF will never occur. Therefore the Party is requested to provide a management plan which will allow for phase out of MB in this sector in the eventuality that full registration of SF is not achieved.</p> <p>It has been reported that other pasta facilities in Canada and the US use heat alone or SF and elevated temperature for pest control. For several years MBTOC has recommended that heat treatments be conducted in Canadian pasta facilities. These applicants however, have not reported to MBTOC the results of any heat treatments in their facilities, or elsewhere. The applicants indicate concerns about using heat, but in spite of repeated requests have not submitted any evidence to support this concern.</p>											

	Industry	CUE for 2005 ¹	CUE for 2006 ²	CUE for 2007 ³	CUE for 2008 ⁴	CUE for 2009 ⁵	CUE for 2010 ⁶	CUE for 2011 ⁷	CUN for 2011 (Addtl or new)	CUN for 2012	MBTOC rec. for 2011(addtl or new)	MBTOC rec. for 2012 (new)
		<p>Heat treatments are successfully conducted at other pasta manufacturers. Heat and IPM have been used for a number of years in pasta facilities in North America, including large pasta facilities comprising mills, interior silos and processing lines (Gyovai, 2009). Europe has more than 180 pasta facilities; this sector completed the MB phase-out several years ago even in countries that have not registered SF (Buckley 2008). Heat and IPM are used for pasta in cold northern European countries in which SF is not registered (European Community, 2008). There is ample evidence that heat treatment can be optimized and effective once it is learned how exactly to conduct the heat treatment in each individual facility. There is also ample evidence worldwide that the concerns mentioned by the applicant can be addressed by service providers when they conduct heat treatments. Spot heat treatment of infested equipment is also a likely alternative. There is a long learning curve to achieve optimization of full site heat because such treatment is usually only done once per year, so it might take several years to fully optimize the treatment method for that particular facility. There is a much shorter learning curve to conduct spot heat treatments; spot heat treatments of infested equipment are used in several food processing companies. It would be good to have heat treatment experience and therefore a choice of effective treatments, particularly because full registration of SF may not be achieved soon.</p> <p>SF can be used for empty structures only and not for food products in Canada. There are some rooms in the pasta plants which contain food ingredients and products which must be sealed off at the time of fumigation. Full registration of SF, including establishment of MRLs for cereal grains and milled grain products is taking longer than expected and as of April 2010 it has not occurred. However, MBTOC notes that it is not an adequate phase out plan to continue to request MB while awaiting a registration change that continues to be delayed and considering that other methods are being used in similar situations. The other methods include heat alone (either full site or spot heat), SF treatment of non-food facility rooms, and avoidance of full site treatments through other means.</p> <p>Emissions reduction. MBTOC has not recommended MB use in the one facility reporting poor gas-tightness. Another facility reporting medium gas-tightness is working to improve but will have to achieve good gas-tightness to even be considered for a CUN in future rounds.</p> <p>Research effort. Insufficient. Full reports of research and trials of alternatives are required in the types of facilities included in the CUN.</p> <p>Appropriate effort. As with all post harvest registration issues, neither the applicant nor the Party mandated with Montreal Protocol nominations has control over pesticide registration. Many similar companies have switched to alternatives. As indicated, inadequate effort has been made to ensure MBTOC receives sufficient information about this sector and to supply actual data, research reports and partial budget analysis.</p> <p>MBTOC comments on economics 2010: This CUN is not based on economic arguments. The current CUN adds no economic information. It restates earlier assertions that heat treatment remains a costly alternative with technical concerns about damage to building and equipment. The CUN states that cost data on alternatives for pasta manufacturing facilities will be provided "as it becomes available." MBTOC cannot conclude there is an economic basis for this CUN absent substantiation of the costs of alternatives..</p>										

	Industry	CUE for 2005 ¹	CUE for 2006 ²	CUE for 2007 ³	CUE for 2008 ⁴	CUE for 2009 ⁵	CUE for 2010 ⁶	CUE for 2011 ⁷	CUN for 2011 (Addtl or new)	CUN for 2012	MBTOC rec. for 2011(addtl or new)	MBTOC rec. for 2012 (new)
Japan	Chestnuts	7.100	6.800	6.500	6.300	5.800	5.400	5.35	-	4.984	-	3.489
<p>MBTOC comments 2010: MBTOC recommends 3.489 tonnes for 2012 which is a 30% reduction over the Party's nominated 4.984 tonnes for Japan fresh chestnuts for 2012. The Party nominated a 7% reduction for this year over the 2011 amount; the reduction was to be achieved by logistical changes in on-farm fumigation.</p> <p>To date there has been no adoption of alternatives in this commodity, but methyl iodide (MI) was registered for fresh chestnuts in Japan in 2009. The Government of Japan says market supply cannot be achieved until 2011. MBTOC notes that since MI has been registered and will be available in 2011, it is therefore expected that Japan will begin adoption of MI as of the September-October harvest in 2011. In 2011, which MBTOC views as the first year of adoption, a 15% market penetration of MI should be achievable, with a resulting reduction in MB use. MBTOC also believes that a further 15% market penetration should be achievable in 2012.</p> <p>Japan says they must take time to train farmers in safe use of the new fumigant, but this necessary training can and should begin to take place with the 2010 harvest (September – October of 2010). MBTOC sees the need for training in the use of MI. Japan has informed MBTOC that a firm phase out plan for MB use on chestnuts will be submitted later. (Japan NMS has indicated an intention to phase out of soil use of MB by 2013.) There is no need to change fumigation infrastructure in the switch between MB and MI, but in consideration of the need for on-farm training, MBTOC believes that a 30% reduction in 2012 is both responsible and achievable.</p> <p>The Party notes that the price of MI is currently 4x higher than MB, but MBTOC notes that the cost of fumigation is a very small (and possibly insignificant) percentage of the price of this high value commodity. Therefore, even at current MI price, we do not find the cost of MI fumigation to be significant against the high value of chestnuts. Furthermore, the MI manufacturer is planning to do some research trials to investigate the use of a lower dosage rate (~50%) which will therefore lower costs.</p> <p>Emission reduction To date regular reductions in MB use through logistical improvements.</p> <p>Research program in past 12 months. Extensive research program has been completed, no further research needed other than to see if reduced dosage of MI can be achieved, and that is optional. There is established efficacy of MI for this purpose in Japan and it has been registered.</p> <p>Appropriate effort? Registration for methyl iodide proceeded as per normal and was registered after appropriate review.</p> <p>MBTOC comments on economics 2010: CUN states that an economic assessment has not been conducted because methyl iodide, registered in 2009, is scheduled to be sold after two years, in 2011, but that the price of methyl iodide is expected to be four times higher than MB.</p>												

	Industry	CUE for 2005 ¹	CUE for 2006 ²	CUE for 2007 ³	CUE for 2008 ⁴	CUE for 2009 ⁵	CUE for 2010 ⁶	CUE for 2011 ⁷	CUN for 2011 (Addtl or new)	CUN for 2012	MBTOC rec. for 2011(addtl or new)	MBTOC rec. for 2012 (new)
United States	Commodities	89.166	87.719	78.983	58.921	45.623	19.242	5.000	-	4.907	-	2.419
	<p>MBTOC comments 2010: See also US Commodities CUN text box in TEAP May 2010.</p> <p>MBTOC recommends 2.419 tonnes for US commodities in 2012. This is a 49% reduction over the amount nominated, based on 75% reduction in the dried fruit nomination (0.829 t recommended), 0% reduction in walnuts (0.527 t recommended) and 0% reduction in dates (1.063 t recommended). The Party nominated 4.907 t for commodity use in 2012. The commodities included in the CUN are dried fruit (3.317 t) (dried plums, figs and raisins), walnuts (0.527 t) and dates (1.063 t).</p> <p>The May 2010 interim CUN report recommended a reduced CUN for walnuts, and indicated some methods which MBTOC believed would assist this sector to circumvent pest problems. The USG viewed that some of these methods were technically and economically infeasible, provided further information to MBTOC in advance of its September meeting and held a conference call with USG officials, sector members and MBTOC.</p> <p>The sector is rapidly adopting alternatives, but this rapid adoption is of concern to some sector members because there has been inadequate time to judge the efficacy of treatments throughout the marketing channel at such large-scale. Unless MBTOC receives data to justify this concern this aspect is unlikely to be considered favorably in any future CUN.</p> <p>MBTOC received clarification on the pest issues, and concerns about treatment efficacy at the temperatures observed at harvest times for walnuts. MBTOC considered more time may be needed to finalize the treatments for walnuts against the eggs of some pests of in-shell walnuts.</p> <p>Dried fruit and nut sector members indicated a need to use MB when rapid treatments are needed in advance of immediate demands for domestic shipments. MBTOC believed that this was more likely a problem for in-shell walnut sector versus dried fruit sector. Controlled atmosphere storage is used in other countries to disinfect dried fruits and nuts and might assist to resolve some of the concerns the sector has with phosphine when commodity is located in processing facilities. The sector is encouraged to more rapidly improve the logistics of treatment when rapid shipment is required, as has been done in similar situations in other fruit and nut producing regions.</p> <p>Emissions reduction. This sector has very considerably reduced use of MB, and therefore emissions. Fumigation takes place in chambers or suitable enclosures.</p> <p>Research effort. Research on dates is excellent thus far but more remains to be done, for example, to optimize SF treatment by elevating temperature. MBTOC needs detailed and complete reports on research conducted on the other commodities included in this CUN.</p> <p>Appropriate effort. The CUE for 2011 shows a reduction of 94% during 6 years (a reduction of 16% per year on average). The CUN nominated for 2012 showed an intended reduction of only 2% per year. Several alternatives are already registered.</p> <p>MBTOC comments on economics 2010: The same economic arguments are provided as in the previous year. CUN is not based on economic (in) feasibility.</p>											

	Industry	CUE for 2005 ¹	CUE for 2006 ²	CUE for 2007 ³	CUE for 2008 ⁴	CUE for 2009 ⁵	CUE for 2010 ⁶	CUE for 2011 ⁷	CUN for 2011 (Addtl or new)	CUN for 2012	MBTOC rec. for 2011(addtl or new)	MBTOC rec. for 2012 (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	-	0.2
<p>MBTOC comments 2010: See also US NPMA CUN text box in TEAP May 2010.</p> <p>MBTOC recommends 0.200 tonnes to fumigate cheese storages when holding cheese infested with mites in 2012. The other sectors included in this CUN are not recommended for the reasons outlined in US NPMA CUN text box in TEAP May 2010.</p> <p>The Party nominated 17.365 tonnes for food processing facilities in 2012. Of that total nomination, 1.812 tonnes was nominated for cheese stores. In May 2010, the interim CUN report did not recommend any component of the food processing facilities included in this CUN. At that time MBTOC noted that the nomination was inadequately justified, and that no actual MB use data was submitted to justify the nomination for cheese stores. At the same time we recognized that infestation of cheese stores by mites is reported to occur occasionally, and there is no registered alternative to disinfest cheese infested with mites. MBTOC requested further information.</p> <p>The Party provided further information in advance of the September 2010 MBTOC meeting and then held a conference call with USG officials and MBTOC members to discuss the information. In its written response, USG was able to clarify government inspection requirements for cheese stores and provide regulations showing that infested cheese is considered adulterated and cannot enter commerce until the mites are removed. But, during the conference call the USG was unable to provide data to support its nominated volume of MB. Under these circumstances, MBTOC estimated the MB requirements to fumigate one or two cheese stores of medium size against mites, once per year. We determined that 200 kg would be adequate and recommended accordingly.</p> <p>Emissions reduction. The sector has considerably reduced MB use and therefore reduction but we have not been provided with information about the gas-tightness in the facilities included in the CUN</p> <p>Research effort. Insufficient. Full reports of research and trials of alternatives are required in all the types of facilities included in the CUN.</p> <p>Appropriate effort. The CUE for 2011 shows a reduction of 79% during 6 years (a reduction of 13% per year on average) As with all postharvest registration issues, neither the applicant nor the Party mandated with Montreal Protocol nominations has control over pesticide registration. Many of the companies formerly associated with this CUN have switched to alternatives and/or decreased their use of MB to only once every few years. As indicated, inadequate effort has been made to ensure MBTOC receives sufficient information about this sector and to supply actual data, research reports and partial budget analysis.</p> <p>MBTOC comments on economics 2010: The same economic arguments are provided as in the previous year. CUN is not based on economic (in) feasibility.</p>												

	Industry	CUE for 2005 ¹	CUE for 2006 ²	CUE for 2007 ³	CUE for 2008 ⁴	CUE for 2009 ⁵	CUE for 2010 ⁶	CUE for 2011 ⁷	CUN for 2011 (Addtl or new)	CUN for 2012	MBTOC rec. for 2011(addtl or new)	MBTOC rec. for 2012 (new)
United States	Mills and processors	483.000	461.758	401.889	348.237	291.418	291.418	173.023	-	135.299	-	74.510
<p>MBTOC comments 2010: MBTOC recommends 74.510 tonnes, for US food processing structures in 2012. Compared to 2011, this represents a 50% decrease in flour milling, a 50% decrease for rice milling and a zero decrease for pet food facilities from the amounts nominated by the Party. The Party has nominated 135.299 tonnes for the food processing structures included in this CUN. This was the same amount granted by the Parties for 2011. The Party nominated flour milling (107.066 t), rice processing (14.511 t), and pet food manufacturing (13.722 t), but MBTOC recommends for flour milling (53.533 t), rice processing (7.255 t) and pet food manufacturing (13.722 t).</p> <p>As in previous years, MBTOC comments that substantiation for this CUN is very thin. In fact, although one flour mill study by researchers at Kansas State University was presented, no studies in rice mills or pet food establishments have been submitted. There have been several North American flour mill studies including a heat treatment study by Kansas State University and those by Canadian companies in association with Agriculture and Agri-Food Canada, but these were not included or considered by the applicant.</p> <p>Furthermore, the applicant's interpretation of the success of the one Kansas State University flour mill study submitted is not in agreement with the study's authors. The study authors concluded that, "Both MB treatments killed 100% of all stages in the boxes except for large larvae in a few locations. In these locations, the mortality of large larvae ranged from 96-98%. SF treatments killed 100% of all stages except eggs. In the May treatment with SF, egg mortality ranged from 44-100% with only two boxes showing 100% mortality, because of under-dosing. Under-dosing occurred because the mill temperature was assumed to be greater than 27°C when it was actually below 27°C. In the second SF trial, only three boxes had egg mortalities that were less than 100%. However, data from the two replications showed that the mean mortalities of eggs and large larvae between MB and SF were not significantly different from each other." (Hartzer et al, Kansas State University, 2010 in press)</p> <p>In response to MBTOC's request in correspondence, short summary paragraphs were sent in letters from USG about trials in rice mills and pet food facilities. This is insufficient information and does not adequately support the CUN.</p> <p>According to the USG, there has been much progress in the alternatives of methyl bromide. Alternatives are not only sulfuryl fluoride, but also heat and microsanitation. The use of fogging, space, and crack and crevice treatments has greatly decreased the number of times structures are fumigated. However the Party reports that many companies desire to retain the ability to utilize methyl bromide in the event of a difficult infestation. MBTOC notes that MB use on a contingency basis is not a critical use and that an emergency use provision still exists under the Montreal Protocol for such events.</p> <p>The applicants for US food structures CUN indicate that trials are conducted but the information is proprietary and will not be submitted to MBTOC; since these same organizations withholding the results of trials are also the applicant requesting MB, MBTOC finds this situation to be an inherent conflict of interest. The applicant is assured that proprietary information would be handled confidentially within MBTOC, in addition, company names need not be sent to MBTOC.</p> <p>The Party reports that, "a vast majority of pet food facilities have transitioned away from use of methyl bromide as part of their routine pest management program. Companies that have completed the transition away from methyl bromide either view their pest management programs as proprietary or as a competitive advantage, so we are unable to share specifics on those alternative programs. We can suppose that such programs utilize techniques such as microsanitation, spot heat treatment, insect growth inhibitors, and fumigation treatment with Vapona ULV fogging, phosphine and ProFume."</p>												

	Industry	CUE for 2005 ¹	CUE for 2006 ²	CUE for 2007 ³	CUE for 2008 ⁴	CUE for 2009 ⁵	CUE for 2010 ⁶	CUE for 2011 ⁷	CUN for 2011 (Addtl or new)	CUN for 2012	MBTOC rec. for 2011(addtl or new)	MBTOC rec. for 2012 (new)
		<p>The CUN indicates that lack of adequate registration negatively impacts the ability of pet food facilities to use sulfur dioxide because the SF label does not include pet food and the applicant says that the pet food cannot be moved out of the establishment before fumigation with SF.</p> <p>The pet food facility applicants in particular report they are awaiting label extensions for SF which would allow contact of SF on commodities. MBTOC notes that it is possible that this will never occur. Therefore the Party is requested to provide a management plan which will allow for phase out of MB in this sector in the eventuality that label extensions for SF are not achieved.</p> <p>In flour and rice milling, a different problem is presented with the use of SF. The GWP of SF has been reported by TEAP and elsewhere to be approximately 4000 times that of carbon dioxide (refer to Progress Report for more details). Furthermore more SF is used to fumigate a facility than MB (the amount varies from 1.5 to 4x more depending on temperature at time of fumigation). No actual evidence in the form of letters or policy positions of retailers or other industrial customers were presented to MBTOC. In response to MBTOC correspondence, USG said that Walmart is pressuring millers to reduce their carbon footprint and the applicants say this is preventing their use of SF.</p> <p>No new economic data has been presented in this year's CUN for structures. SF requires elevated temperature in combination and when this is done the combined treatment is technically comparable to MB. The cost of SF treatment is higher (with or without additional heat). However, Parties to the Montreal Protocol have not indicated that a higher cost is a sufficient reason to avoid using an alternative.</p> <p>MBTOC economists are adopting a standard that a 15-20% decrease in net revenue is still an economically feasible alternative. For pet foods, reviewing Table 5 of CUN, the Party indicates 0.8% loss on gross revenue for the worst case scenario of having to heat a cold manufacturing facility of 4°C to 54.4°C. (MBTOC notes that only the most dire and completely unlikely circumstance would see the temperature of an entire pet food establishment fall this low.) This table also indicates that 0.06% loss of gross revenue on an elevated temperature-plus-SF treatment when the treatment is required to raise the temperature from 4.4°C to 29.4°C plus SF treatment. (Again it is completely unlikely that an entire pet food establishment temperature would be this low.). In the instance of a SF treatment there would be additional costs of moving the pet food out of the building. Therefore, according to MBTOC's economic's standard, both heat treatment alone and elevated temperature plus SF treatment are economically feasible. The comparable data for rice and flour milling were not provided to MBTOC.</p> <p>For several years, MBTOC has asked for partial budget analysis for all the sectors included in this CUN, including the flour and rice milling sectors, but these have not been received. In the absence of gross revenue data, we assume the fumigation costs for flour and rice milling sectors are a comparable percentage to pet food manufacturing.</p> <p>Emission reduction. There is still work to be done to improve the sealing of mills and facilities. Improved sealing would allow the use of lower dosages which would decrease emissions.</p> <p>Research effort: Insufficient. Full reports of research and trials of alternatives are required in all the types of facilities included in the CUN.</p> <p>Appropriate effort. As with all postharvest registration issues, neither the applicant nor the Party mandated with Montreal Protocol nominations has control over pesticide registration. Many of the companies formerly associated with this CUN have switched to alternatives and/or decreased their use of MB to only once every few years. As indicated, inadequate effort has been made to ensure MBTOC receives sufficient information about this sector and to supply actual data, research reports and partial budget analysis.</p> <p>MBTOC comments on economics 2010: The same economic arguments are provided as in the previous year. CUN is not based on economic (in)feasibility.</p>										

	Industry	CUE for 2005 ¹	CUE for 2006 ²	CUE for 2007 ³	CUE for 2008 ⁴	CUE for 2009 ⁵	CUE for 2010 ⁶	CUE for 2011 ⁷	CUN for 2011 (Addtl or new)	CUN for 2012	MBTOC rec. for 2011(addtl or new)	MBTOC rec. for 2012 (new)
United States	Cured pork	67.907	40.854	18.998	19.669	18.998	4.465	3.73	-	3.730	-	3.730
<p>MBTOC comments 2010: MBTOC recommends 3.730 tonnes for cured pork products in 2012. The Party nominated 3.730 tonnes for cured pork products for 2012 the same amount nominated for 2011. Some decrease in the MB nomination has been achieved over the years resulting from IPM, emissions controls and treatment improvements. There is no alternative registered for this use. There is a multi-state, multi-university research program ongoing which is testing several alternative treatments, increasing knowledge of pest and dose response to potential alternatives. Initial work on phosphine showed efficacy but also showed changes in odor of the pork. Earlier work by this group using SF indicated lack of efficacy. (Shilling, 2009a, 2009 b). MBTOC notes that mites are one of the key pests of cured pork and that mites will not be controlled by the phosphine treatment. Additionally, phosphine is not registered for this purpose in the US. MBTOC encourages registration of effective fumigants, once identified. Full reports of this research has been sent to MBTOC, and communicated to the industry sector. MBTOC has been able to observe and confirm the conditions and processing of the cured pork at various sites included in this CUN.</p> <p>Emissions reduction. Over the years the applicants have made facility improvements to improve gastighness, but this is a traditional meat curing process and some of the facilities are older and unusual. The research program continues to work with the applicants to improve gas tightness, IPM and other process improvements which reduce the need for fumigation and result in decreased use of MB. This work needs to continue.</p> <p>Research effort. Excellent research effort to date but more needs to be done. A multi-state, multi-university research program is ongoing and full reports of research have been made available to MBTOC.</p> <p>Appropriate effort. As with all postharvest registration issues, neither the applicant nor the Party mandated with Montreal Protocol nominations has control over pesticide registration. There are no alternatives registered for the treatment of pests in meat at this time.</p> <p>MBTOC comments on economics 2010: CUN states that no economic analysis was done due to the lack of technically feasible alternatives</p>												

¹ExMOP and 16MOP
²16MOP+2ExMOP+17MOP
³MOP17+MOP18
⁴MOP18+MOP19
⁵MOP19+MOP20
⁶MOP20
⁷MOP21

6. MBTOC Activity Report (2010) and Workplan in 2011

6.1. Membership issues

- In response to Decision XXI/10, TEAP disbanded the QPS Task Force that was in place since 2009 and reorganised MBTOC into three subcommittees: S (soils), QPS (quarantine and pre-shipment) and SC (structures and commodities). The QPS subcommittee is now composed of members of the QPSTF, some of which were previously members of MBTOC-SC.
- One new economist joined MBTOC in 2010.

6.2. Activity report for 2010

- Initial summarization of the CUNs (initial sorting and recording carried out by the Secretariat).
- Preparation of questions for Parties. Assessment of responses received from Parties.
- First meeting of MBTOC sub committees in April 2010 on the assessment of the CUNs: MBTOC met in full (all three sub-committees) in Chipiona, Spain.
- Interim recommendations and report prepared for the Parties by May 2010. Bilateral meetings were held by MBTOC-S and MBTOC SC with USA.
- MBTOC- QPS worked on the issues requested through Decision XXI/10 and published its report in the TEAP Progress Report of May 2010
- Site visits: MBTOC-S conducted a field trip to observe alternatives adopted by fruit, vegetable and flower growers in the Chipiona region of Spain. MBTOC-SC conducted a site visit to rice processing facilities in Isla Mayor Spain (near Sevilla) where rice is disinfested with flow-through phosphine.
- Completion of the interim report for consideration by the 30 OEWG as part of 2010 TEAP Progress Report of May 2010.
- 30 OEWG (Geneva, 14-19 June 2010). Bilateral meetings with Australia, California Strawberry Commission (USA), Canada, Israel, Japan and USA.
- MBTOC-S and MBTOC-QPS met September 20-24 in San Jose, California, USA. A bilateral was held with the California Strawberry Commission and the USG. The US Government requested MBTOC to review the strawberry fruit CUN in the light of new information submitted. Field trips were organized for MBTOC-S to strawberry and flower farms and for MBTOC-QPS to the Parlier USDA research laboratories
- MBTOC-SC received requests to re-review three CUNs: Australia rice, USA Commodities and one element of the USA NPMA CUN. MBTOC-SC met in Zagreb, Croatia from 13-17 September. MBTOC SC met with the Ministry of Environment of Croatia and the Croatian Ozone Unit for interesting discussions. A bilateral was held with the USA and members of its dried fruit and nut commodities sector. Three CUNs were re-reviewed the final report was drafted and agreed by consensus.
- MBTOC-S and MBTOC-SC prepared the final report on the CUNs for consideration by the Parties at their 21st Meeting.
- MBTOC-QPS received questions from Australia on the TEAP 2010 May Report and on the 2009 final QPSTF report. These were addressed during the San Jose meeting and a response prepared to be submitted as an addendum to the TEAP report
- All three subcommittees continued work on the MBTOC 2010 Assessment Report during their respective meetings of September 2010

6.3. Work plan and indicative budget for 2011

Table 6.1 - MBTOC work plan and indicative budget: 2011

Tasks and actions	Indicative budget needs where applicable	Indicative completion date	Dates of meetings
1. Parties submit their nominations for critical-use exemptions to the Secretariat	-	24 January 2011	
2. The nominations are forwarded to MBTOC co-chairs for distribution to the subgroups of appointed members	-	7 February 2011	
3. Initial summarization of the nominations	-		
4. Nominations in full are assessed by the subgroups of appointed members. The initial findings of the subgroups, and any requests for additional information are forwarded to the MBTOC co-chairs for clearance			
5. MBTOC co-chairs forward the cleared advice on initial findings and may request additional information on to the nominating Party concerned and consult with the Party on the possible presumption therein	-	21 February 2011	
6. Nominating Party develops and submits its response to the MBTOC co-chairs	-	7 March 2011	
7. 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 • First of the 2011 assessment report 	Funds for travel of 1 non-A5 members: US\$3,000 Meeting Costs \$3,000	March 2011	Antalya, Turkey (tentative)
8. MBTOC provides its draft recommendations on the CUNs to TEAP		April, 2011	
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 4-8 2011 (tentative)	Montreal (tentative)
10. The Secretariat posts the finalised report on its web site and circulates it to the Parties	-	May 2011	
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		June 2011	
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 2011	

Tasks and actions	Indicative budget needs where applicable	Indicative completion date	Dates of meetings
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 <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 • draft work plan and budget for MBTOC for 2012 	Funds for travel of 1 non-A5 members: US\$3,000 Meeting costs: \$US 3,000	If necessary	?
14. MBTOC draft final report considered by TEAP, finalised and made available to Parties through the Secretariat	-	End July, 2010	
15. 22 nd Meeting of the Parties			November 2011
Total budget:	US \$: 12,000 <ul style="list-style-type: none"> • US\$ 6,000 (Travel of Non Article 5 member) • Meeting Costs \$6,000 		

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Annex 1 - Part A: Trend in Preplant Soil Applications

List of nominated (2005 – 2012 in part) and exempted (2005 – 2011 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 Quantities						
		2005	2006	2007	2008	2009	2010	2011	2012	2005	2006	2007	2008	2009	2010	2011
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	29.790	35.750	37.500	35.750	35.750	29.790	29.790	23.840
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	5.261	(a)14.792	6.840	7.995	7.462	7.462	7.462	5.261
Canada	Strawberry runners (Quebec)		1.826	1.826						(a)	1.826	1.826				
Canada	Strawberry runners (Ontario)			6.129								6.129				
France	Carrots	10.000	8.000	5.000						8.000	8.000	1.400				
France	Cucumber	85 revised	60.000	15.000						60.000	60.000	12.500				

Party	Industry	Total CUN MB Quantities								Total CUE Quantities						
		2005	2006	2007	2008	2009	2010	2011	2012	2005	2006	2007	2008	2009	2010	2011
		to 60														
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				
France	Pepper	Incl in.tomato cun	27.500	6.000							27.500	6.000				
France	Strawberry fruit	90.000	86.000	34.000						90.000	86.000					
France	Strawberry runners	40.000	4.000	35.000						40.000	40.000	28.000				
France	Tomato (and eggplant for 2005 only)	150(all solanaceo us)	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	12.500				250.000	250.000	125.000	12.500	
Israel	Cucumber - protected new 2007			25.000	18.750			18.750	12.500			25.000	18.750	-	15.937	
Israel	Cut flowers – open field	77.000	67.000	80.755	53.345	42.777	42.554	23.292		77.000	67.000	74.540	44.750	34.698	28.554	
Israel	Cut flowers – protected	303.000	303.000	321.330	163.400	113.821	72.266	52.955		303.000	240.000	220.185	114.450	85.431	63.464	
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	35.000		125.650	99.400	105.000	87.500	87.500	70.000	
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	28.500		196.000	196.000	93.000	105.960	42.750		
Israel	Strawberries – fruit (Sharon & Ghaza)														57.063	
Israel	Strawberry runners (Sharon)	35.000	35.000		20	15.800	13.570	13.500		35.000	35.000	28.000	31.900	15.825		
Israel	Strawberry runners and fruit Ghaza				87.875	67.500	67.500	34.000						47.250		
Israel	Strawberry runners (Sharon & Ghaza)														22.320	
Israel	Tomatoes			90.000								22.750				
Israel	Sweet potato					95.000	20.000	20.000					111.500	95.000	20,000	
Italy	Cut flowers (protected)	250.000	250.000	30.000						250.000	187.000	30.000				

Party	Industry	Total CUN MB Quantities								Total CUE Quantities						
		2005	2006	2007	2008	2009	2010	2011	2012	2005	2006	2007	2008	2009	2010	2011
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	26.162	88.300	88.800	72.400	51.450	34.300	30.690	27.621
Japan	Ginger – field	119.400	119.400	112.200	112.100	102.200	53.400	47.450	42.235	119.400	119.400	109.701	84.075	63.056	53.400	47.450
Japan	Ginger – protected	22.900	22.900	14.800	14.800	12.900	8.300	7.770	6.558	22.900	22.900	14.471	11.100	8.325	8.300	7.036
Japan	Melon	194.100	203.900	182.200	182.200	168.000	90.800	77.600	67.936	194.100	203.900	182.200	136.650	91.100	81.720	73.548
Japan	Peppers (green and hot)	189.900	200.700	169.400	162.300	134.400	81.100	68.260	61.101	187.200	200.700	156.700	121.725	81.149	72.990	65.691
Japan	Watermelon	126.300	96.200	94.200	43.300	23.700	15.400	13.870	12.075	129.000	98.900	94.200	32.475	21.650	14.500	13.050
Malta	Cucumber		0.096								0.127					
Malta	Eggplant		0.128								0.170					
Malta	Strawberry		0.160								0.212					
Malta	Tomatoes		0.475								0.594					
New Zealand	Nursery material	1.085	1.085								0.000					
New Zealand	Strawberry fruit	42.000	42.000	24.780						42.000	34.000	12.000				
New Zealand	Strawberry runners	10.000	10.000	5.720						8.000	8.000	6.234				
Poland	Strawberry Runners	40.000	40.000	25.000	12.000					40.000	40.000	24.500				
Portugal	Cut flowers	130.000	8.750							50.000	8.750					
Spain	Cut Flowers – Cadiz	53.000	53.000	35.000						53.000	42.000					
Spain	Cut Flowers – Catalonia	20.000	18.600	12.840	17.000 (+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	54.500					
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	59.500	1187.800	747.839	592.891	486.757	407.091	302.974	195.698
USA	Eggplant – field	76.761	101.245	96.480	79.546	62.789	34.732	21.561	6.904	76.721	82.167	85.363	66.018	48.691	32.820	19.725

Party	Industry	Total CUN MB Quantities								Total CUE Quantities						
		2005	2006	2007	2008	2009	2010	2011	2012	2005	2006	2007	2008	2009	2010	2011
USA	Forest nursery seedlings	192.515	157.694	152.629	133.140	125.758	120.853	106.043	34.230	192.515	157.694	122.032	131.208	122.060	117.826	93.547
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	18.324	706.176	527.600	405.400	393.720	292.756	215.800	183.232
USA	Ornamentals	210.949	162.817	149.965	138.538	137.776	95.204	70.178	48.164	154.000	148.483	137.835	138.538	107.136	84.617	64.307
USA	Nursery stock - fruit trees, raspberries, roses	45.789	64.528	12.684	51.102	27.663	17.954	7.955	1.591	45.800	64.528	28.275	51.102	25.326	17.363	7.955
USA	Peppers – field	1094.782	1498.530	1151.751	919.006	783.821	463.282	212.775	28.366	1094.782	1243.542	1106.753	756.339	548.984	463.282	206.234
USA	Strawberry fruit – field	2468.873	1918.400	1733.901	1604.669	1336.754	1103.422	1023.471	753.974	2052.846	1730.828	1476.019	1349.575	1269.321	1007.477	812.709
USA	Strawberry runners	54.988	56.291	4.483	8.838	8.837	7.381	7.381	3.752	54.988	56.291	4.483	8.838	7.944	4.690 + 2.018	6.036
USA	Tomato – field	2876.046	2844.985	2334.047	1840.100	1406.484	994.582	336.191	54.423	737.584	2476.365	2065.246	1406.484	1003.876	737.584	292.751
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	8.709				18.144	18.144	14.515	11.612

ANNEX II – Part B: Post-harvest Structural and Commodity Applications

List of nominated (2005 – 2012 in part) and exempted (2005 – 2011 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	2012	2005	2006	2007	2008	2009	2010	2011
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	3.653	6.150	6.150	9.205	9.200	7.820	6.650	4.870
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	11.020	(a)47	34.774	30.167	28.650	26.913	22.878	14.107
Canada	Pasta manufacturing facilities	(a)	10.457	6.757	6.067	4.740	4.7400	2.084		(a)	10.457	6.757	6.067	4.7400	3.529	
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					

Party	Industry	Total CUN MB Quantities								Total CUE MB Quantities						
		2005	2006	2007	2008	2009	2010	2011	2012	2005	2006	2007	2008	2009	2010	2011
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	1.04	
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		
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	3.489	7.100	6.800	6.500	6.300	5.800	5.400	5.350
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					
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	2.419	89.166	87.719	78.983	58.921	45.623	19.242	5.000
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,	83.344	83.344	85.801	72.693	66.777	37.778	17.365	0.2	83.344	69.118	82.771	69.208	54.606	37.778	17.365

Party	Industry	Total CUN MB Quantities								Total CUE MB Quantities						
		2005	2006	2007	2008	2009	2010	2011	2012	2005	2006	2007	2008	2009	2010	2011
	dried milk and cheese processing facilities) NPMA															
USA	Smokehouse hams (Dry cure pork products) (building and product)	136.304	135.742	40.854	19.669	19.699	4.465	3.730	3.730	67.907	81.708	18.998	19.699	18.998	4.465	3.730
USA	Mills and Processors	536.328	505.982	401.889	362.952	291.418	173.023	135.299	74.510	483.000	461.758	401.889	348.237	291.418	173.023	135.299

ANNEX III: Members of MBTOC Committees

Committee contact details

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 and this information can now be found at http://ozone.unep.org/Assessment_Panels/TEAP/toc-members-disclosures.shtml.

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. Ian Porter	M	Consultant and Department of Victorian Primary Industries Dept.(Government research)	Researcher, soils MB use and alts, particularly fungal pathogens and IPM (PhD)	A	Australia	Non-A5
Members						
3. Antonio Bello	M	Centro de Ciencias Medioambientales (Government research)	Non-chemical alternatives (PhD, Prof.)	A	Spain	Non-A5
4 Aocheng Cao	M	Chinese Academy of Agricultural Sciences (Government research)	Researcher, soil alternatives, particularly in China (A5) context (PhD)	B	China	A5
5. Peter Caulkins	M	Associate Director, Special Review & Reregistration Division US EPA	Registration of alternatives, regulatory issues (PhD)	C	USA	Non A-5
6. Abraham Gamliel	M	Agricultural Research Organization, The Volcani Center, (Government Research)	Alternatives for soils, horticulture (PhD)	C	Israel	Non-A5
7. Racquel Ghini	F	Empresa Brasileira de Pesquisa Agropecuária, Brazil	Researcher in horticulture, Deveolped solar collectors for treatment of substrates	D	Brazil	A5
8. George Lazarovits	M	Agriculture & Agri-food Canada (Government research)	Researcher, non chemical control of soilborne pathogens (PhD)	C	Canada	Non-A5
9 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
10. Marta Pizano	F	Consultant	Consultant, MB alts, particularly cut flower production	A	Colombia	A5
11. 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
12. JL Staphorst	M	Plant Protection Research Institute (Parastatal research)	Expert Soil Microbiologist (DSc)	A	South Africa	A5

Names	Gender	Affiliation	Expertise	Length of service	Country	Article 5 status
Co-Chairs						
13. Akio Tateya	M	Syngenta Japan K.K.	Application of MB and alts, particularly in Japan	A	Japan	Non-A5
14 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
15 Janny Vos	F	CABI, The Netherlands	Plant Pathologist-IPM	D	Holland	
16 Jim Wells	M	Environmental Solutions Group, LLC (Consultant)	Registration and regulatory - MB and alternatives, soil uses	A	USA	Non-A5
17. Suat Yilmaz	M	West Mediterranean Agricultural Research Institute (Government Research)	Institute Director, Plant Pathologist and Alternatives for soils (PhD)	D	Turkey	A5

A - >10 years

B – 5-10

C – 1-5

B – MBTOC SC Members - October 2010

MBTOC Structures and Commodities Subcommittee					
Chair					
1. Michelle Marcotte	F	Consultant	Consultant, particularly food processing, regulations, structural and commodity treatments and irradiation, particularly for quarantine	A	Canada Non-A5
Members					
2. Chris Bell	M	Consultant, retired from Central Science Laboratory (Government research)	Postharvest technologies, particularly fumigants, phosphine; sulfuryl fluoride, controlled atmospheres and heat' (PhD)	A	UK Non-A5
3. Fred Bergwerff	M	Eco2, Netherlands	Fumigator, specialist in non-MB systems, including CA and heat.	B	Netherlands Non-A5
4. Ricardo Deang	M	Consultant	Regulatory and registration. Entomologist (PhD)	A	Philippines A5
5. Patrick Ducom	M	Consultant, retired from Ministère de l'Agriculture (Government research)	Postharvest and structural alternatives	A	France Non-A5
6. Alfredo Gonzalez	M	Fumigator	Phosphine, QPS and non-QPS treatments. Structures, commodities.	B	Philippines A5
7. Darka Hamel	F	Croatian Institute for Agriculture, Food and Rural Affairs - Institute for Plant Protection (Government)	Postharvest and structural treatments, regulations	C	Croatia CEIT
8. Christoph Reichmuth	M	In transition to Professor at Humboldt University Berlin. Retired from JKI Germany (Government research) (October 2010)	Phosphine, heat, QPS, MB recapture and emissions, stored product pest control. Formerly Director the Institute for Ecological Chemistry, Plant Analysis and Stored Product Protection of the Federal Institute for Cultivated Plants. Chemist (PhD)	C	Germany Non-A5
9. Jordi Riudavets	M	IRTA-Department of Plant Protection. (Government Research)	IPM for stored products and horticultural crops (PhD)	C	Spain Non-A5
10. John Sansone	M	SCC Products (Fumigator)	Fumigator, particular expertise in structures	A	US Non-A5
11. Robert Taylor	M	Consultant, retired from UK research institute	Postharvest technology, specifically A5 uses	A	UK Non-A5
12. Chris Watson	M	Consultant, retired from 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
MBTOC QSC assigned to MBTOC QPS and now acting as MBTOC SC Corresponding members					
1. Ken Glassey	M	MAF, New Zealand	Forester, government advisor on MB alternatives in forest products and QPS treatments	B	New Zealand Non-A5
2. Ken Vick	M	United States Department of Agriculture (Government research)	Research in MB alternatives, for soil, structures and commodities including QPS. Entomologist (PhD)	A	US Non-A5

C – MBTOC QPS subcommittee Members - October 2010

Names		Affiliation	Expertise	Length of service	Country	Article 5 status
Co-Chairs						
1. Marta Pizano	F	Consultant	Consultant, MB alternatives, particularly horticulture	A	Colombia	A5
Members						
2. Jonathan Banks	M	Consultant	QPS, stored grains, fumigation technologies, recapture systems (PhD)	A	Australia	Non A5
3. Tom Batchelor	M	Touchdown Consulting	Sound knowledge of technical issues on QPS (PhD)	C (A)*	Belgium	Non A5
4. Ken Glassey	M	MAF, New Zealand (Government research)	Phytosanitary quarantine treatments, biosecurity	C	New Zealand	Non A5
5. Takashi Misumi	M	MAFF (Government research)	Quarantine Disinfestation Technologies	B	Japan	Non A5
6. David Okioga	M	Kenya Ozone Office (Government)	Plant quarantine services, MB alts (PhD)	A	Kenya	A5
7. Ian Porter	M	Consultant and Department of Victorian Primary Industries Dept.(Government research)	Researcher, soils MB use and alts, particularly fungal pathogens and IPM (PhD)	A	Australia	Non-A5
8. Ken Vick	M	USDA (Government research)	Research in MB alternatives, for soil, structures and commodities including QPS. Entomologist (PhD)	A	USA	Non A5
9. Eduardo Willink	M	Estación Experimental Agroindustrial Obispo Colombres (Government research)	Quarantine treatments, systems approach and pest host status	C	Argentina	A5
TOTALS	F 1 M 8					A5 = 3 Non A5 = 6

*Dr Batchelor was a member of MBTOC between 1992 and 2002. He joined MBTOC again in 2009

A - >10 years

B – 5-10

C – 1-5

D – MBTOC Economists - October 2010

Names	Gender	Affiliation	Expertise	Length of service	Country	Article 5 status
1. James D. Schaub	M	United States Department of Agriculture (Government regulatory)	Agricultural economist (PhD)	B	USA	Non-A5
2 James Turner	M			A		Non- A5
3. Nick Vink	M	University of Stellenbosch (Academia)	Agricultural economics (PhD, Prof.)	C	South Africa	A5