NOMINATING PARTY: The United States of America

FILE NAME: USA CUN11 SOIL PEPPERS Open Field

BRIEF DESCRIPTIVE TITLE OF NOMINATION:
Methyl Bromide Critical Use Nomination for Preplant Soil Use for Peppers Grown in Open Fields (Submitted in 2009 for 2011 Use Season)

CROP NAME (OPEN FIELD OR PROTECTED): Peppers Open Field

QUANTITY OF METHYL BROMIDE REQUESTED:

TABLE 1: QUANTITY OF METHYL BROMIDE REQUESTED IN EACH YEAR OF NOMINATION

Year	NOMINATION AMOUNT
2011	212,775 kilograms

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Following the requirements of Decision IX/6 paragraph (a)(1) The United States of America has determined that the specific use detailed in this Critical Use Nomination is critical because the lack of availability of methyl bromide for this use would result in a significant market disruption. . ■ Yes ☐ No

________________ ________________ __________

Signature Name Date

Title: ______________________________

(Details on this page are requested under Decision Ex. I/4(7), for posting on the Ozone Secretariat website under Decision Ex. I/4(8).)

This form is to be used by holders of single-year exemptions to reapply for a subsequent year's exemption (for example, a Party holding a single-year exemption for 2005 and/or 2006 seeking further exemptions for 2007). It does not replace the format for requesting a critical-use exemption for the first time.

In assessing nominations submitted in this format, TEAP and MBTOC will also refer to the original nomination on which the Party's first-year exemption was approved, as well as any supplementary information provided by the Party in relation to that original nomination. As this earlier information is retained by MBTOC, a Party need not re-submit that earlier information.

CONTACT OR EXPERT(S) FOR FURTHER TECHNICAL DETAILS:

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LIST OF DOCUMENTS SENT TO THE OZONE SECRETARIAT IN OFFICIAL NOMINATION PACKAGE:

1. PAPER DOCUMENTS: **Title of paper documents and appendices**	**No. of pages**	**Date sent to Ozone Secretariat**
USA CUN11 SOIL PEPPERS Open Field	15	
2. ELECTRONIC COPIES OF ALL PAPER DOCUMENTS: ***Title of each electronic file (for naming convention see notes above)**	**No. of kilobytes**	**Date sent to Ozone Secretariat**
USA CUN11 SOIL PEPPERS OPEN FIELD		

* Identical to paper documents

METHYL BROMIDE CRITICAL USE RENOMINATION FOR PREPLANT SOIL USE (OPEN FIELD OR PROTECTED ENVIRONMENT)

PEPPERS

1. SUMMARY OF THE NEED FOR METHYL BROMIDE AS A CRITICAL USE:

This renomination covers only peppers grown in the southeastern US, Georgia, Florida,. These crops generally are grown in open fields on plastic tarps, often followed by various other crops. Harvest is destined for the fresh market.

Only areas that cannot use alternative fumigants or non-fumigant options have been included in the calculation of nominated amounts and area to be treated. The applicants' requests have also been adjusted downward to account for the lower methyl bromide dose rates (see BUNNIE in Appendix A) for the southern regions of US pepper production, since increased use of high barrier films in conjunction with lower rates has been reported there.

In developing this renomination the USG examined several recent studies to determine whether yield losses and market window losses associated with the best available fumigant alternative could be altered from previous nominations. Unfortunately none of the studies located by the USG met the criteria that earlier cited studies did. These criteria include: the use of fumigant alternatives registered for the crop nominated, the presence of both a methyl bromide standard and an untreated control as treatments as well as the monitoring of yields under each treatment. Several such studies included a methyl bromide treatment or an untreated control but not both, or included both but did not monitor yield, or included unregistered alternatives. However, research conducted at the University of Georgia that examined use of a three way combination of alternative fumigants (1,3 D followed by chloropicrin followed by metam-sodium) did meet these criteria, Therefore, nominations for the southern US areas were adjusted to reflect the apparent technical feasibility of this three way combination of alternative fumigants under VIF or metallized films, as a replacement for spring-time applications of methyl bromide+chloropicrin, after accounting for areas in the south that face prohibition of 1,3-D due to the presence of karst topographical features.

The recent renewal of the federal registration of iodomethane, along with its registration at the state level in all the pepper producing regions covered by this nomination, will be factored into calculations of the total amount of methyl bromide being requested for peppers. This calculation takes into account the issue that time will be needed for the industry to transition to the use of this material in areas where it is feasible. This transition is part of the BUNNIE included in Appendix A.

2. SUMMARIZE WHY KEY ALTERNATIVES ARE NOT FEASIBLE

The U.S. nomination is only for those areas where the alternatives are not suitable. In U.S. pepper production there are several factors that make the potential alternatives to methyl bromide unsuitable. These include:

- Pest control efficacy of alternatives: the efficacy of alternatives may not be comparable to methyl bromide in some areas, making these alternatives technically and/or economically infeasible for use in pepper production.
- Geographic distribution of key target pests: i.e., some alternatives may be comparable to methyl bromide as long as key pests occur at low pressure, and in such cases the U.S. is only nominating a CUE for peppers where the key pest pressure is moderate to high such as nutsedge in the Southeastern U.S.
- Regulatory constraints: e.g., 1,3 D use is limited in Georgia and Florida due to the presence of karst topography.
- Infeasibility of fall-season fumigation in the southeastern US, even with the best available combination of alternatives (1,3 D + chloropicrin followed by chloropicrin followed by metam-sodium).

Florida, Georgia, and the Southeastern U.S. (outside Florida and Georgia) are each presented as separate regions in this nomination to reflect the separate applications from growers in these areas. A brief description of their need for methyl bromide follows, also presented on a regional basis.

3. IS THE USE COVERED BY A CERTIFICATION STANDARD?

Methyl bromide is not used to meet a certification standard for pepper vegetable production.

4. IF PART OF THE CROP AREA IS TREATED WITH METHYL BROMIDE, INDICATE THE REASON WHY METHYL BROMIDE IS NOT USED IN THE OTHER AREA, AND IDENTIFY WHAT ALTERNATIVE STRATEGIES ARE USED TO CONTROL THE TARGET PATHOGENS AND WEEDS WITHOUT METHYL BROMIDE THERE.

In southeastern U.S., Florida, and Georgia, areas not treated have low levels of nutsedge or nematodes in pepper fields

5. WOULD IT BE FEASIBLE TO EXPAND THE USE OF THESE METHODS TO COVER AT LEAST PART OF THE CROP THAT HAS REQUESTED USE OF METHYL BROMIDE? WHAT CHANGES WOULD BE NECESSARY TO ENABLE THIS?

Better, more consistent pest control efficacy from the alternatives would be required.

6. SUMMARY OF RECENT RESEARCH

As mentioned earlier in this document, iodomethane formulated with chloropicrin has shown good efficacy against key pepper pests, including nutsedge, in a number of trials with peppers and related vegetables such as tomatoes (e.g., Louws et al. 2006, Culpepper 2006, 2007, 2008, Culpepper et al. 2008, Olsen 2008). Iodomethane had time limitations removed from its federal label in October, 2008, and has received state-level approval in 47 US states (California, Washington, and New York are the exceptions at this time). However, other important constraints must be considered when assessing the feasibility of iodomethane as a methyl bromide alternative. These include: (1) the cost of iodomethane formulations is higher than methyl bromide, and will probably remain so for the next several years, (2) growers and researchers will need time to evaluate iodomethane 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 iodomethane application rates and to avoid the corrosion of some metals that can occur with iodomethane (Sumner 2005, Noling et al. 2006). The economic impact of using iodomethane is further described in Part E of this document (below). A consideration of these aspects has led the USG to conclude that while iodomethane appears to be technically feasible to manage key pepper pests in all parts of the US where it has been registered, time will be needed for growers and extension service experts to adapt its use successfully. Therefore, the amount of methyl bromide nominated for peppers has been adjusted downward while also considering the time needed to transition to iodomethane.

In the short term, and in situations where pepper producers cannot use iodomethane, the USG concludes that other fumigant alternatives to methyl bromide would have to be used. The details of this conclusion are similar to the previous year's pepper CUN, and are further discussed below.

Narrative description of studies relevant to key weeds and nematodes

For nutsedge pests, which are widespread in all requesting regions, pepper growers do not currently have technically feasible alternatives to methyl bromide use at planting. Metam-sodium and 1,3 D + chloropicrin have shown some efficacy in small-plot trials in other vegetable crops (e.g, tomato). However, at best, metam sodium may allow at least 44 % yield loss, while 1,3 D may allow at least 29 % loss. Both often show less control than methyl bromide (in terms of population suppression) of nutsedges. These factors suggest that even this alternative will not be economically feasible even in the best-case technical scenario. It should be noted also that there is evidence that both 1,3 D and methyl isothiocyanate levels decline more rapidly, thus further compromising efficacy, in areas where these are repeatedly applied (Smelt et al., 1989; Ou et al., 1995; Gamliel et al., 2003). This is probably due to enhanced degradation of these chemicals by soil microbes (Dungan and Yates, 2003).

Other chemical alternatives to methyl bromide that have shown promise against nutsedges and nematodes (e.g., pebulate and dimethyl disulfide) are currently unregistered for peppers,

In one recent study, Culpepper and Langston (2004) conducted studies at 2 sites in spring 2003 and one site in the fall season of 2004. Plot sizes were 20 feet X 32 inches (4.94 m^2). Treatments were: Methyl bromide standard (67:33 formulation), untreated control, 2 formulations of Telone (1,3 D + chloropicrin) at various doses, followed by an additional application of either chloropicrin or metam-sodium, a third formulation of 1,3 D + chloropicrin ("Inline"), and iodomethane. An additional set of plots received the same fumigant treatments but also received an herbicide treatment (clomazone + halosulfuron) later in the season.

Some important caveats must be mentioned when considering these results:

(1) Plots used were quite small, and it is not at all clear if the promising results will hold reliably in larger commercial fields. This is particularly worrisome given the highly variable results reported by other researchers for the same methyl bromide alternatives.
(2) The nutsedge populations in this study were dominated by yellow nutsedge (90 % of the total number). It is not clear if populations where purple nutsedge is dominant will be controlled as effectively. A number of other studies have indicated that purple nutsedge is a hardier species, and even in Culpepper and Langston's study, it appeared more resistant to the methyl bromide alternatives. For example, iodomethane gave "77 % control" of yellow nutsedge, but only "37 % control" of purple nutsedge. Control in this case was apparently defined as the reduction in nutsedge populations as compared to populations in the untreated control.

Another recent study of methyl bromide alternatives involving key weed pests was done by Gilreath et al. 2005 (Crop Prot (24): 903-908). One of 3 trials in that study showed an average of 30 % lower bell pepper yields with nutsedge and nematodes as the key pests present. In the other 2 trials yields were not significantly different across different fumigant treatments, but nutsedge pressure was lower in those trials as compared to the third. Other important caveats to these results are - this was a small-plot study and was done in Florida. Thus it is not clear how applicable the results are to the more northern regions requesting methyl bromide for vegetable crops (e.g., Delaware, Maryland, and Virginia).

In addition to the studies described above, several other recent studies conducted in the production circumstances of the southeastern US have examined several fumigant alternatives to methyl bromide, most done in crops other than peppers (e.g., Santos et al. 2006, Candole et al. 2007, Santos and Gilreath 2007, Gilreath and Santos 2005, 2007). These studies either focused solely on nutsedge weeds or a combination of nutsedges, diseases, and nematodes. However, USG has examined these papers and concludes that for peppers, these studies do not meet all the criteria that allowed the use of earlier studies in estimating yield and quality losses that may occur if such methyl bromide alternatives are used as direct replacements for methyl bromide.

These criteria are: the use of fumigant alternatives registered for the crop nominated, the presence of both a methyl bromide standard and an untreated control as treatments as well as the monitoring of yields under each treatment. Several such studies included a methyl bromide treatment or an untreated control but not both (Santos and Gilreath 2007, Johnson and Mullinix 2007), or included both but did not monitor yield (Candole et al. 2007), or included unregistered alternatives (e.g., Gilreath and Santos 2005, 2007, Santos et al. 2006). While these studies (the majority of which were small-plot trials) indicate continued promise of methyl bromide alternatives such as 1,3-D, metam-sodium, chloropicrin, herbicides, or combinations thereof, they cannot yet be used to alter yield estimates**.**

Therefore, for this nomination, the USG concludes that, for pepper 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. These loss estimates are illustrated in Table 2 below, and are used as the basis of part of the economic assessment in the following section.

TABLE 2. DATA ON YIELD LOSSES WITH LIKELY METHYL BROMIDE ALTERNATIVES AND NUTSEDGE PRESENT AS A CROP PEST.

Chemicals	Rate (kg/ha)	Average Nutsedge Density (#/m^2)	Average Marketable Yield (ton/ha)	% Yield Loss (compared to MB)
Untreated (control)	-	300 [ab]	20.1 [a]	59.1
methyl bromide + Pic (67-33), chisel-injected	390 kg	90 [c]	49.1 [b]	---
1,3 D + Pic (83-17), chisel-injected	327 l	340 [a]	34.6 [c]	29.5
Metam Na, Flat Fumigation	300 l	320 [a]	22.6 [a]	54.0
Metam Na, drip irrigated	300 l	220 [b]	32.3 [c]	34.2

Locascio et al. 1997.

Recent studies that are useful (within the context of this nomination) in assessing technical feasibility of a combination of methyl bromide alternatives include the series of trials being conducted by Culpepper et al. at the University of Georgia (e.g., Culpepper 2006, Culpepper et al. 2007a,b, Culpepper 2008). These studies indicate that a 3-way, sequential combination of several fumigant alternatives is technically feasible for spring-time fumigation of most vegetable crops. The 3-way combination consists of 1,3 D + chloropicrin ("Telone C35" brand), followed by chloropicrin at about 168 kg/ha, followed by metam-sodium, all under VIF or metallized (high barrier) tarps, and will henceforth be referred to as the 'UGA 3 way', as Culpepper et al. have. An example of the results obtained in spring fumigation with this combination in peppers is presented in the table below. Also see several research reports available from the University of Georgia at www.gaweed.com).

TABLE 3. NUMBER OF PEPPER FRUIT - METHYL BROMIDE: CHLOROPICRIN VERSUS THREE WAY COMBINATION. SPRING 2006

Fruit Size	Methyl Bromide : Chloropicrin (# of Fruit)	UGA 3 way 1,3-D fb chloropicrin fb metam Na
Jumbo	30 b	125 a
X-Large	219 a	237 a
Large	153 a	143 a
Chopper	217 a	252 a
Cull	11 a	9 a
Jumbo + X-Large + Large	402 b	505 a

Footnote: Culpepper 2006. fb means followed by or a sequential treatment. Plots were 3 rows by 100 feet long.

Since Georgia is similar to other areas of the southeastern US, except Maryland/Delaware peppers which face a different key pest (*F. oxysporum niveum*), these results should be applicable to **spring** usage of methyl bromide in these regions. However, other results thus far indicate that **summer/fall** fumigation is not similarly effective with this combination of alternatives (Culpepper, personal communication, Culpepper 2006, 2008).

Results of one of several experiments conducted by Culpepper et al. at the University of Georgia illustrate the infeasibility of the use of the 'UGA 3 way' method in place of methyl bromide for fall-season fumigations in vegetable production. In this experiment, fields were fumigated during for fall-season crop production on July 17 2007. Soil temperature was 84 degrees at 8 inches. The experiment consisted of 4 fumigant treatments (Table 4) that were replicated three times. Even under high-barrier film ("Blockade"), the 'UGA 3 way' gave less control of purple nutsedge as compared to the methyl bromide standard under the same type of film. Yields were consistently lower with the 'UGA 3 way' as well, with a roughly 50 % reduction in both number and weight of harvested vegetables (Table 4). The economic implications of this level of yield loss for Georgia pepper growers are further described in section 7, below.

Table 4. Comparing methyl bromide and the 3-Way for the control of nutsedge and pepper yield.

Fumigant	Mulch	Late-season purple nutsedge control	Harvests 1-2 (Jumbo pepper)		Harvests 1-4 (Jumbo pepper)	
		%	# fruit/plot	lbs/plot	# fruit/plot	lbs/plot
UGA-3 Way	LDPE	48 d	34 c	16 c	44 c	19 c
UGA-3 Way	Blockade	60 c	50 b	24 b	71b	32 b
Methyl Bromide + chloropicrin	Blockade	85 b	106 a	48 a	136 a	61 a
None	LDPE	0 f	13 d	6 d	19 d	8 d

Notes: (1) The UGA 3 Way consisted of 1,3 D + chloropicrin ("Telone C35" brand) at approximately 192 kg/ha, followed by chloropicrin at 168 kg/ha, followed by metam-sodium at approximately 358 kg/ha. Methyl bromide + chloropicrin was applied in a 50:50 mix at approximately 160 kg/ha of each. Rates as shown are not planting bed-strip adjusted. (2) "Mulch" refers to the tarp type. LDPE = traditional high permeability tarp; Blockade = low permeability tarp manufactured by Pliant Corp.

It is important to note that caveats accompany even the technical feasibility of the 'UGA 3 way' use in spring fumigations. Growers must make several application modifications to properly use the approach, and this may incur significant capital expenditure. Culpepper et al. estimate their costs to do this for their research trials at about $ 15,000 (Culpepper et al. 2007b). Application costs will also increase as more chemicals and runs of tractor equipment are required to conduct the 'UGA 3 way', and the cost of VIF or metallized film is between 1.75 and two times greater than standard LBPF (Culpepper, personal communication).

Time and further research and extension education will also be needed to implement the 'UGA 3-way' method in areas outside Georgia where the method has been less-studied, and where different problems may need to be resolved. An example of this issue is illustrated in recent work by Chellemi et al. (2008). These researchers evaluated the 'UGA 3 way' in on-farm tests in Florida peppers. Results of four trials were highly variable, with two showing better yields than the methyl bromide standard, and two showing worse results. All four trials showed a reduction in larger (more profitable) peppers in the 'UGA 3 way' as compared to the methyl bromide standard. The cause appeared to be an overload of potassium in the soil, created by the combined use of the metam-potassium in the 'UGA 3 way' and the growers' standard practice of applying a high-potassium fertilizer.

7. ECONOMIC FEASIBILITY OF ALTERNATIVES

The following economic analysis is organized by methyl bromide critical use application regions.

Reader, please note that in this study net revenue is calculated as gross revenue minus operating costs. This is a good measure as to the direct losses of income that may be experienced by the users. It should be noted that net revenue does not represent net income to the users. Net income, which indicates profitability of an operation of an enterprise, is gross revenue minus the sum of operating and fixed costs. Net income should be smaller than the net revenue measured in this study. We did not include fixed costs because these costs are often difficult to measure and verify.

Summary of Economic Feasibility

The economic analysis of pepper applications compared data on the yields, crop prices, revenues and costs of using methyl bromide or alternative pest control regimens. This was done in order to estimate impacts on pepper growers with the decreasing availability of methyl bromide. The alternatives identified as technically feasible (in cases of low pest infestation[1]) for Georgia, Florida, and the Southeaster U.S. for peppers are: (a) Iodomethane and (b) the Georgia 3-Way Method, which includes 1,3-dichloropicrin with chloropicrin followed by metam sodium.

The economic reviewers then analyzed crop budgets for pre-plant sectors to determine the likely economic impact if methyl bromide were unavailable. Various measures were used to quantify the impacts, including the following:

(1) **Loss per Hectare.** For crops, this measure is closely tied to income. It is relatively easy to measure, but may be difficult to interpret in isolation.

(2) **Loss per Kilogram of Methyl Bromide**. This measure indicates the value of methyl bromide to crop production.

(3) **Loss as a Percentage of Gross Revenue.** This measure has the advantage that gross revenues are usually easy to measure, at least over some unit, *e.g.*, a hectare of land or a storage

[1] It should be noted that the USG does not request methyl bromide for use in areas of low to moderate pest pressure. Only cases where key pests are present at moderate to high levels require methyl bromide for pest pressure.

operation. However, high value commodities or crops may provide high revenues but may also entail high costs. Losses of even a small percentage of gross revenues could have important impacts on the profitability of the activity.

(4) **Loss as a Percentage of Net Operating Revenue**. We define net cash revenues as gross revenues minus operating costs. This is a very good indicator as to the direct losses of income that may be suffered by the owners or operators of an enterprise. However, operating costs can often be difficult to measure and verify.

(5) **Operating Profit Margin**. We define operating profit margin to be net operating revenue divided by gross revenue per hectare. This measure would provide the best indication of the total impact of the loss of methyl bromide to an enterprise. Again, operating costs may be difficult to measure and fixed costs even more difficult, therefore fixed costs were not included in the analysis.

These measures represent different ways to assess the economic feasibility of methyl bromide alternatives for methyl bromide users, who are pepper producers in this case. Because producers (suppliers) represent an integral part of any definition of a market, we interpret the threshold of significant market disruption to be met if there is a significant impact on commodity suppliers using methyl bromide. The economic measures provide the basis for making that determination.

GEORGIA, FLORIDA, AND THE SOUTHEASTERN U.S.

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 to methyl bromide, although some limitations exist. Referring to Table 5, 6, and 7, the loss of gross revenue using the Georgia 3-Way is negligible in Florida and the Southeastern U.S. in comparison to methyl bromide, 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, making methyl bromide unnecessary for pepper production in areas with karst topography. Note that data describing Georgia and Florida pepper production are based on double cropping production practices.

TABLE 5. GEORGIA : ECONOMIC IMPACTS OF METHYL BROMIDE ALTERNATIVES

GEORGIA PEPPER	METHYL BROMIDE	GEORGIA 3-WAY: SPRING APPLICATION	GEORGIA 3-WAY: FALL APPLICATION	IODOMETHANE
PRODUCTION LOSS (%)	0%	0%	50%	0%
PRODUCTION PER HECTARE	5,797	5,797	2,899	5,797
* PRICE PER UNIT (US$)	$12	$12	$12	$12
= GROSS REVENUE PER HECTARE (US$)	$67,907	$67,907	$33,954	$67,907
- OPERATING COST PER HECTARE (US$)	$55,279	$41,211	$41,211	$56,433
= NET REVENUE PER HECTARE (US$)	$12,629	$26,696	-$7,258	$11,475
LOSS MEASURES *				
1. LOSS PER HECTARE (US$)	$0	-$14,067	$19,886	$1,154
2. LOSS PER KILOGRAM OF METHYL BROMIDE (US$)	$0	-$151	$214	$12
3. LOSS AS A PERCENTAGE OF GROSS REVENUE (%)	0%	-21%	29%	2%
4. LOSS AS A PERCENTAGE OF NET OPERATING REVENUE (%)	0%	-111%	157%	9%
5. OPERATING PROFIT MARGIN (%)	19%	39%	-21%	17%

* Interpret the loss measures with caution. Negative numbers presented in rows indicating a "loss" should be interpreted as a "gain". Positive numbers can be interpreted as losses.

TABLE 6. FLORIDA: ECONOMIC IMPACTS OF METHYL BROMIDE ALTERNATIVES

FLORIDA PEPPER-DOUBLE CROP	METHYL BROMIDE	GEORGIA 3-WAY	IODOMETHANE
PRODUCTION LOSS (%)	0%	0%	0%
PRODUCTION PER HECTARE	4,379	4,379	4,379
* PRICE PER UNIT (US$)	$12	$12	$12
= GROSS REVENUE PER HECTARE (US$)	$51,756	$51,756	$51,756
- OPERATING COST PER HECTARE (US$)	$48,934	$49,030	$49,522
= NET REVENUE PER HECTARE (US$)	$2,822	$2,726	$2,234
LOSS MEASURES *			
1. LOSS PER HECTARE (US$)	$0	$96	$588
2. LOSS PER KILOGRAM OF METHYL BROMIDE (US$)	$0	$1	$6
3. LOSS AS A PERCENTAGE OF GROSS REVENUE (%)	0%	0%	1%
4. LOSS AS A PERCENTAGE OF NET OPERATING REVENUE (%)	0%	3%	21%
5. OPERATING PROFIT MARGIN (%)	5%	5%	4%

* Interpret the loss measures with caution. Negative numbers presented in rows indicating a "loss" should be interpreted as a "gain". Positive numbers can be interpreted as losses.

TABLE 7. SOUTHEASTERN USA (EXCEPT GEORGIA): ECONOMIC IMPACTS OF METHYL BROMIDE ALTERNATIVES

SOUTHEASTERN USA (EXCEPT GEORGIA) PEPPER	METHYL BROMIDE	GEORGIA 3-WAY	IODOMETHANE
PRODUCTION LOSS (%)	0%	0%	0%
PRODUCTION PER HECTARE	2,965	2,965	2,965
* PRICE PER UNIT (US$)	$8	$8	$8
= GROSS REVENUE PER HECTARE (US$)	$24,463	$24,463	$24,463
- OPERATING COST PER HECTARE (US$)	$21,955	$22,051	$22,543
= NET REVENUE PER HECTARE (US$)	$2,508	$2,412	$1,920
LOSS MEASURES *			
1. LOSS PER HECTARE (US$)	$0	$96	$588
2. LOSS PER KILOGRAM OF METHYL BROMIDE (US$)	$0	$1	$6
3. LOSS AS A PERCENTAGE OF GROSS REVENUE (%)	0%	0%	2%
4. LOSS AS A PERCENTAGE OF NET OPERATING REVENUE (%)	0%	4%	23%
5. OPERATING PROFIT MARGIN (%)	10%	10%	8%

* Interpret the loss measures with caution. Negative numbers presented in rows indicating a "loss" should be interpreted as a "gain". Positive numbers can be interpreted as losses.

8. RESULTANT CHANGES TO REQUESTED EXEMPTION QUANTITIES

The USG has applied an aggressive transition rate, which is reflected in the nomination amount and detailed in Table 8.

TABLE 8. NOMINATION AMOUNT: 2011 Methyl Bromide Usage Newer Numerical Index (BUNNI) – Transition Use Reduction Description Spreadsheet.

SECTOR		PEPPERS			
		Southeast Pepper	Georgia Pepper	Florida Pepper	Sector Total / Average
Quantity Requested for 2010:	Amount (kgs)	21,579	75,510	359,995	457,084
Quantity Recommended by MBTOC/TEAP for 2010 :	Amount (kgs)	21,579	75,510	359,995	457,084
Quantity Approved by Parties for 2010:	Amount (kgs)	21,579	75,510	359,995	457,084
	Area (ha)	127	444	2,118	2,689
	Rate	170	170	170	170
Transition from 2010 Baseline Adjusted Value	Percentage (%)	-83%	-80%	-77%	-78%
Quantity Required for 2011 Nomination:	Amount (kgs)	**9,140**	**33,201**	**170,434**	**212,775**
	Area (ha)	**61**	**221**	**1136**	**1418**
	Rate	**150**	**150**	**150**	**150**

CITATIONS

Candole, B.L., A.S. Csinos, and D. Wang. 2007. Concentrations in soil and efficacy of drip - applied 1,3-D+chloropicrin and metam sodium in plastic-mulched sandy soil beds. *In press* at: Crop Prot. (2007), doi:10.1016/j.cropro.2007.03.021.

Chellemi, D. O. 2008. Field validation of a fumigant alternative. Proc. Annual Int. Res. Conf. on Methyl Bromide Alternatives and Emissions Reductions. Available on the web at http://mbao.org/2008/008Chellemi.pdf.

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