



UNITED STATES ENVIRONMENTAL PROTECTION AGENCY  
WASHINGTON, D.C. 20460

*C. Farber*  
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OFFICE OF  
PESTICIDES AND TOXIC SUBSTANCES

MEMORANDUM

SUBJECT: EPA Registration No. 53201-1 (DEB No. 6243) -  
Methyl Bromide Preplant/Postharvest Protocol and  
Letters Dated December 22 and 29, 1989 - Record  
No. 258230 (No Accession/MRID Number)

FROM: Nancy Dodd, Chemist *Nancy Dodd*  
Tolerance Petition Section II  
Dietary Exposure Branch  
Health Effects Division (H7509C)

THRU: Michael T. Flood, Ph.D., Acting Section Head  
Tolerance Petition Section II  
Dietary Exposure Branch  
Health Effects Division (H7509C) *E. Heeber*

TO: Walter Francis, Acting PM 32  
Antimicrobial Program Branch  
Registration Division (H7505C)

and

Larry Schnaubelt  
Reregistration Branch  
Special Review and Reregistration Division (H7508C)

Introduction

The Methyl Bromide Industry Panel (MBIP) submits a letter and protocol dated December 22, 1989 and another letter dated December 29, 1989 concerning a postharvest fumigation protocol and risk assessment for methyl bromide (MeBr). The protocol dated December 22, 1989 concerns all MeBr-treated crops except cereal grains, tree nuts, and herbs and spices. [Data on tree nuts will be submitted by the U.S.]

Department of Agriculture (USDA)/California Prunes, Raisins and Walnut Marketing Board. Data on herbs and spices and cereal grains will be submitted by the American Spice Trade Association (ASTA)]. Issues raised by MBIP in the letter dated December 29, 1989 have been addressed by DEB in a memorandum dated May 18, 1990 (N. Dodd). (See Attachment 7). A protocol for postharvest fumigation of dried fruits and nuts has recently been reviewed (N. Dodd, February 22, 1990). A meeting was held on April 12, 1990 to discuss the February 22, 1990 review. Another meeting on May 3, 1990 concerned toxicology issues.

MBIP now indicates that crops which are registered for soil fumigation will also be registered for postharvest fumigation. DEB (N. Dodd, May 10, 1989) previously indicated that residue data reflecting postharvest fumigations will cover both soil fumigation uses and postharvest uses; this applies to crop parts which are treated postharvest but not to crop parts (such as corn forage/fodder/silage) which are not treated postharvest.

MBIP indicates that processing studies on raw commodities are not required for either preharvest or postharvest fumigation uses since processing involves elevated temperatures or extended drying times. DEB previously indicated (N. Dodd, May 10, 1989) that processing studies are not needed if processing involves extended drying times or elevated temperatures; however, additional data may be required if the ongoing plant metabolism studies reveal residues of concern other than MeBr.

MBIP indicates that the Grocery Manufacturers Association will conduct residue studies on processed commodities which are fumigated (such as raisins in warehouses).

MBIP submits a crop harvesting schedule (see Table A, Attachment 3) which indicates the time of year that crops will be available for fumigation.

MBIP submits a risk assessment for EPA's comment. The risk assessment was conducted by Technical Assessment Systems, Inc. DEB defers to DRES concerning the submitted risk assessment.

### Conclusions

Issues raised by MBIP in the letter dated December 29, 1989 have been addressed by DEB in a memorandum dated May 18, 1990.

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Conclusions regarding the December 22, 1989 protocol are listed below:

1. Number of Runs/Samplings

Duplicate samples and duplicate chambers will be acceptable provided results are similar. If results are not similar, the study may have to be repeated with triplicate chambers and triplicate samples.

2. Chamber Size

Small chambers will be adequate for postharvest fumigation provided that bridging data are provided which indicate that residues in small chambers (28.3 l) and commercial chambers are similar. (Refer to the Detailed Considerations section.)

3. Normal Atmospheric Pressure (NAP) vs. Vacuum

Data reflecting NAP will cover both NAP and vacuum treatments.

4. Rates and Exposure Times

The rates and exposure times in the protocol must cover maximum use rates and maximum exposure times on the labels. Where differences between the protocol and labels occur (see Detailed Considerations section for examples), the labels or the protocol will have to be revised.

5. Aeration Time

Labels should be revised so that minimum aeration times observed in the residue studies are specified on the labels. Also, the label should include a statement such that commodities may not be removed from fumigation chambers until the MeBr concentration in chamber air is 5 ppm or less.

6. Commodity Temperature\*, Fumigation and Aeration Temperatures

The indicated commodity temperatures are acceptable.

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\*Temperature of the crop at time of fumigation.

The minimum fumigation temperature specified on the label should be the temperature at which the residue tests are conducted. Since the boiling point of MeBr is 4.5 °C, DEB assumes that the minimum fumigation temperature on the label should probably be 50 °F (10 °C) (as was proposed for the dried fruit and nut protocol) rather than 40 °F.

If the aeration temperature in commercial practice will be the same as the fumigation temperature, it will not be necessary to list the minimum aeration temperature on the label. However, the aeration temperatures for the residue studies must be reported.

#### 7. Crop Groups

Adequate representative crops are selected for residue studies to establish crop group tolerances with the following exceptions:

- a. The crop group "leaves of root and tuber vegetables" is not represented.
- b. The crop group "foliage of legume vegetables" is not represented.
- c. The cereal grains are not specified for the cereal grains crop group. Representative commodities under 40 CFR 180.34(f)(9)(xv)(B) are "corn (fresh sweet corn and dried field corn), rice, sorghum, and wheat."
- d. The crop group "forage, fodder, and straw of cereal grains group" is not included.
- e. For crop group tolerances to be established, the pesticide use pattern of the representative crops in a crop group must be similar as described in 40 CFR 180.34(f)(3). The dosage rates and exposure times for the representative crops in a crop group must be the same; therefore, tolerances for the following crop groups listed in Table I cannot be established (based on dosage rates and exposure times listed in Table I, pages 31 and 32 of the December 22, 1989 submission [EPA Registration No. 53201-1, DEB No. 6243]): root and tuber vegetables, bulb vegetables, legume vegetables (except soybeans), fruiting vegetables, cucurbit vegetables, and small fruits and berries.

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- f. The representative crops for the root and tuber vegetables group listed in 40 CFR 180.34(f)(9)(i)(B) are carrot, potato, radish, and sugar beet. MBIP lists carrot, potato, radish, and turnip. DEB has previously determined (see Nancy Dodd's memorandum of communication dated August 4, 1987) that residue data on turnips could be substituted for residue data on sugar beets. Therefore, a crop group tolerance could be established for the "root and tuber vegetables group (except sugar beets)" rather than "root and tuber vegetables group." However, if MBIP plans to request registration of MeBr on sugar beets, residue data on sugar beets would be needed.
- g. For the legume vegetables (except soybeans) crop group, the bean must be of the Phaseolus genus and the pea must be of the Pisum genus as stated in 40 CFR 180.34(f)(9)(vi)(B). DEB has previously determined (N. Dodd, May 10, 1989) that a crop group tolerance for "legume vegetables (except soybeans)" based on data on beans (succulent and dry) and peas (succulent and dry) is acceptable.
- h. For postharvest uses, either field or greenhouse tomatoes can be used for the fruiting vegetables crop group in addition to peppers, the other representative commodity.
- i. Pistachio is not a member of the tree nuts crop group under 40 CFR 180.34(f)(9)(xiv)(A). Pistachio should be listed under "Miscellaneous."

8. Chamber Load Factor

A 30 percent load factor will be appropriate provided the labels are revised to limit fumigations to chambers with load factors of 30 percent or higher.

9. Bulk/Packages

Some of the fumigations should be conducted in shipping containers described in Attachment 5. However, storage containers and consumer packaging must also be represented. For example, bulk containers (such as wooden bins), cartons with liners, and consumer packages (with and without liners) should be represented if commodities are stored/packaged these ways.

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10. Waxing

The proposal to wax commodities for the residue studies which would be waxed before commercial fumigations is appropriate; however, DEB also concludes that commodities which are also fumigated before waxing should also be treated this way in some of the residue studies. It may be necessary to establish intervals between fumigation and waxing on the labels.

11. Sampling to Analysis Time

A 3-hour sampling to analysis interval is satisfactory. (Storage stability data will not be needed for samples analyzed within 12 hours of sampling. For samples stored longer than 12 hours, spiked samples should be handled just as the treated samples are to determine loss between treatment and analysis.)

12. Minimum Intervals Between Refumigations

MBIP should select a minimum time interval between refumigations for each commodity and revise labels so that refumigations will not occur within that time interval. Then the proposed studies should be conducted with refumigations occurring at the selected minimum time intervals.

13. Numbers of Fumigations

Labels for commodities which are to be treated one, two, or three times postharvest with MeBr should be revised to limit the number of postharvest applications to 1, 2, or 3, respectively.

14. Analytical Method

The modified King et al., headspace method (procedure #001, revised February 7, 1989) is acceptable for data collection.

15. Processing\*\*

MBIP should conduct processing studies unless "processing involves extensive drying or elevated temperature." For the crops listed in Table I of Part II of the December 22, 1989 protocol

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(Attachment 4), DEB concludes that residue data on the following processed commodities will be needed:

<u>Crop</u>	<u>Processed Commodities of Concern</u>
Soybeans	Grain dust
Potato	Wet peel
Mustard	Seeds
Beans	Cannery residue
Orange	Oil
Lemon	Oil
Grapefruit	Oil
Apples*	Wet pomace
Grapes*	Wet pomace
Sweet corn	Cannery waste
Field corn	Grits, meal, flour, grain dust
Cottonseed	Meal, hulls
Rice	Polished rice, hulls, bran, grain dust
Grain sorghum	Flour, grain dust
Wheat	Bran, grain dust, flour, middlings, shorts, wheat germ

16. Raw Agricultural Commodities (RAC's) and Animal Feeds

Table I, submitted by MBIP (Attachment 4), lists crops on which MBIP intends to conduct residue studies. Residue data are needed for commodities listed as "RAC" and "Feeds" in Table II of the Pesticide Assessment Guidelines (PAG), Subdivision O, Residue Chemistry. Exceptions are

\* Pressing can be done with or without heat.

\*\*Spiking for processing studies is not appropriate.

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"feeds" which are processed with extensive drying or elevated temperature. For the crops listed in Table I of Part II of the December 22, 1989 protocol (Attachment 4), DEB concludes that residue data on the RAC's and feeds listed in this review under paragraph 16 of the Detailed Considerations section are needed.

DEB also concludes that residue data for plant parts which are listed above but which are not treated postharvest (for example, forage, fodder, and silage of corn) would have to be provided from soil fumigation studies. Alternatively for crop parts which DEB now considers to be under grower control, grazing and feeding restrictions on the label would be possible. (Crops under grower control are identified in Table II of the PAG, Subdivision O, Residue Chemistry (October 1982) and revised in DEB's "Overview of Residue Chemistry Guidelines" by R. Loranger, October 10, 1989.)

17. Variety

Tomatoes

Residue data on both small (cherry) and large tomatoes are needed.

Nuts

As discussed in DEB's February 22, 1990 memorandum, the following varieties of nuts are acceptable:

Almond - Nonpareil variety  
Pecan - Stewart variety  
English walnut - Eureka variety\*  
Pistachio - Kerman variety  
Dates - Deglet Noor  
Figs - Adriatic

Other Commodities

The variety which is expected to result in the highest residue should be used for tolerance setting purposes.

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\*For risk assessment purposes, residue data on the Hartley variety would be useful but are not required by DEB for tolerance setting purposes.



18. Additional Factors

The following information should also be reported on Form A: commodity moisture, chamber humidity, method of MeBr introduction, and rate of air circulation.

Recommendation

DEB recommends that MBIP modify their protocol to incorporate the above conclusions into their proposed studies.

Note to PM: A copy of this entire review should be sent to MBIP.

Detailed Considerations

This protocol for postharvest fumigation with MeBr includes the following parameters:

1. triplicate runs
2. ~~controls~~
3. small (28.3 l) atmospheric chambers
4. Dosage rates, exposure and aeration times, minimum commodity temperature, and number of fumigations are given in Table I (Attachment 4).
5. chamber load of 30 percent
6. fumigation in bulk or packages
7. use of waxed commodities in cases where commodities are waxed before commercial fumigation
8. commodity sampling until residues decrease to 0.01 ppm MeBr
9. Processing studies will be conducted except where processing involves extensive drying or elevated temperature (See Table I).
10. "Residue analysis will be completed within 3 hours after the samples are collected and placed on dry ice."
11. "To validate the standard curve, a spiked sample will be run each day that samples are analyzed."

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12. Data will be reported on Forms A and B (See Attachments 1 and 2).

DEB's Comments/Conclusions re: The Protocol

1. Number of Runs/Samplings

MBIP has indicated that three separate runs (i.e., chambers) will be used for each commodity. MBIP has also submitted a sampling schedule which indicates that three samples will be taken at each sampling time.

In a later submission dated May 25, 1990 regarding the protocol for dried fruits and nuts, MBIP indicated that it wants to use duplicate chambers and duplicate samples.

DEB concludes that duplicate samples and duplicate chambers will be acceptable provided results are similar. If results are not similar, the study may have to be repeated with triplicate chambers and triplicate samples.

2. Chamber Size

MBIP has indicated that small 28.3 l chambers will be used.

DEB concludes that small chambers will be adequate for postharvest fumigation provided that bridging data are provided which indicate that residues in small chambers (28.3 l) and commercial chambers are similar. (In a meeting on May 17, 1990, DEB indicated that one bridging study on raisins has been submitted. DEB also indicated that one bridging study on Eureka walnuts should be provided to satisfy the requirement for dried fruits and nuts. Several additional studies comparing residues in large and small chambers will be needed for other crop types. MBIP should indicate to EPA which crops it intends to use for chamber comparison studies.)

3. Normal Atmospheric Pressure (NAP) vs. Vacuum

MBIP indicates that fumigation will occur in atmospheric chambers with a fan for gas circulation.

Figure 7 submitted in the walnut section of the protocol for dried fruits and nuts indicates that

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residues resulting from NAP treatments are higher than for vacuum fumigation.

Residue levels increase with increasing treatment time as well as with increasing treatment rate.

Previous discussions with MBIP of residues resulting from NAP vs. vacuum fumigation did not consider the shorter exposure time on the label for vacuum fumigation.

DEB concludes that data reflecting NAP will cover both NAP and vacuum treatments.

4. Rates and Exposure Times

Dosage rates and exposure times in Table I (Attachment 4) should reflect established label rates. Where differences occur, labels will have to be revised so that maximum rates and maximum exposure times correspond to dosage rates and exposure times used in the residue study. [For example, the 6 lb/1000 cu ft dosage rate and 12-hour exposure time for rice and wheat (in the EPA Compendium of Acceptable Uses issued March 7, 1984) would not be supported by the proposed protocol dosage rate of 3 lb/1000 cu ft and 24-hour exposure time. Since exposure time affects residues, the protocol for sorghum (6 lb/1000 cu ft, 12 hours exposure) would not support the compendium dosage rate of 4 lb/1000 cu ft with 24 hours exposure. The sweet corn protocol (3 lb/1000 cu ft, 4 hours exposure) does not support uses involving either higher dosage rates or longer exposure periods. The tobacco protocol (3 lb/1000 cu ft, 72 hours exposure) does not support higher rates for shorter times.] Commodities in the protocol with rates and/or exposure times which differ from or do not cover all of the rates/exposure times on the labels (as stated in the EPA Compendium issued on March 7, 1984) are cabbage, succulent beans, tomatoes, cocoa beans, corn, cottonseed, dates, figs, pineapple, popcorn, rice, sorghum, sweet corn, tobacco, and wheat. Commodities which do not yet have labels for postharvest use are not mentioned in the above list.

DEB concludes that the rates and exposure times in the protocol must cover maximum use rates and maximum exposure times on the labels. Where

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differences between the protocol and labels occur, the labels or the protocol will have to be revised.

5. Aeration Time

Minimum aeration times specified in Table I (Attachment 4) are 2 hours or 24 hours. MBIP indicates that these are "subject to change based on postharvest fumigation residue data obtained." MBIP also indicates that the chambers will be aerated until the MeBr concentration in the chambers is 5 ppm or less.

DEB concludes that labels should be revised so that minimum aeration times observed in the residue studies are specified on the labels. Also, the label should include a statement such that commodities may not be removed from fumigation chambers until the MeBr concentration in chamber air is 5 ppm or less.

6. Commodity Temperature, Fumigation and Aeration Temperatures

Minimum commodity temperatures specified in Table I (Attachment 4) are 10 °C (50 °F), 15 °C, or 18 °C. MBIP indicates that the commodity temperature for fumigation is based on Appendix V (Attachment 6), which indicates the ideal temperature for produce on display.

MBIP indicates that a minimum fumigation temperature of 40 °F will be stated on the label.

DEB concludes that the indicated commodity temperatures are acceptable.

DEB also concludes that the minimum fumigation temperature specified on the label should be the temperature at which the residue tests are conducted. Since the boiling point of MeBr is 4.5 °C, DEB assumes that the minimum fumigation temperature on the label should probably be 50 °F (10 °C) (as was proposed for the dried fruit and nut protocol) rather than 40 °F.

DEB also concludes that, if the aeration temperature in commercial practice will be the same as the fumigation temperature, it will not be necessary to list the minimum aeration temperature on the label. However, the aeration temperatures for the residue studies must be reported.

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7. Crop Groups

MBIP has listed crops to be fumigated from each crop group in Table I (pages 31 and 32 of the December 22, 1989 submission [EPA Registration No. 53201-1, DEB No. 6243]; Attachment 4 of this review).

DEB concludes that adequate representative crops are selected for residue studies to establish crop group tolerances with the following exceptions:

- a. The crop group "leaves of root and tuber vegetables" is not represented.
- b. The crop group "foliage of legume vegetables" is not represented.
- c. The cereal grains are not specified for the cereal grains crop group. Representative commodities under 40 CFR 180.34(f)(9)(xv)(B) are "corn (fresh sweet corn and dried field corn), rice, sorghum, and wheat."
- d. The crop group "forage, fodder, and straw of cereal grains group" is not included.
- e. For crop group tolerances to be established, the pesticide use pattern of the representative crops in a crop group must be similar as described in 40 CFR 180.34(f)(3). The dosage rates and exposure times for the representative crops in a crop group must be the same; therefore, the following crop groups listed in Table I cannot be established (based on dosage rates and exposure times listed in Table I (pages 31 and 32 of the December 22, 1989 submission [EPA Registration No. 53201-1, DEB No. 6243]; Attachment 4 of this review): root and tuber vegetables, bulb vegetables, legume vegetables (except soybeans), fruiting vegetables, cucurbit vegetables, and small fruits and berries.
- f. The representative crops for the root and tuber vegetables group listed in 40 CFR 180.34(f)(9)(i)(B) are carrot, potato, radish, and sugar beet. MBIP lists carrot, potato, radish, and turnip. DEB has previously determined (see Nancy Dodd's memorandum of communication dated August 4, 1987) that residue data on turnips could be substituted for residue

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data on sugar beets. Therefore, a crop group tolerance could be established for the "root and tuber vegetables group (except sugar beets)" rather than "root and tuber vegetables group." However, if MBIP plans to request registration of MeBr on sugar beets, residue data on sugar beets would be needed.

- g. For the legume vegetables (except soybeans) crop group, the bean must be of the Phaseolus genus and the pea must be of Pisum genus as stated in 40 CFR 180.34(f)(9)(vi)(B). DEB has previously determined (N. Dodd, May 10, 1989) that a crop group tolerance for "legume vegetables (except soybeans)" based on data on beans (succulent and dry) and peas (succulent and dry) is acceptable.
- h. For postharvest uses, either field or greenhouse tomatoes can be used for the fruiting vegetables crop group in addition to peppers, the other representative commodity.
- i. Pistachio is not a member of the tree nuts crop group under 40 CFR 180.34(f)(9)(xiv)(A). Pistachio should be listed under "Miscellaneous."

#### 8. Chamber Load Factor

MBIP indicates that chamber load will be 30 percent. MBIP indicates that 30 percent is the minimum load used in commercial fumigation.

A low load factor is expected to result in higher residues.

DEB concludes that a 30 percent load factor will be appropriate provided the labels are revised to limit fumigations to chambers with load factors of 30 percent or higher.

#### 9. Bulk/Packages

MBIP indicates that commodities will be fumigated "in bulk or in packages (depending on what is done in commercial fumigations)."

MBIP further indicates that the commodities will be fumigated as described in Attachment 5. Attachment 5 is a copy of container and weight standards for fresh fruit and vegetables from The Packer, 1978, Vol. 94, No. 53. MBIP also indicates that in cases

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where both boxes and cartons are used, the test will be conducted with cartons.

DEB concludes that some of the fumigations should be conducted in shipping containers described in Attachment 5. However, storage containers and consumer packaging must also be represented. For example, bulk containers (such as wooden bins), cartons with liners, and consumer packages (with and without liners) should be represented if commodities are stored/packaged these ways.

10. Waxing

MBIP indicates that commodities which are waxed before commercial fumigation would be waxed in the residue studies.

DEB concludes that the proposal to wax commodities for the residue studies which would be waxed before commercial fumigations is appropriate; however, DEB also concludes that commodities which are also fumigated before waxing should also be treated this way in some of the residue studies. It may be necessary to establish intervals between fumigation and waxing on the labels.

11. Sampling to Analysis Time

MBIP indicates that residue analysis "will be completed within 3 hours after samples are collected and placed on dry ice."

DEB concludes that a 3-hour sampling to analysis interval is satisfactory. (Storage stability data will not be needed for samples analyzed within 12 hours of sampling. For samples stored longer than 12 hours, spiked samples should be handled just as the treated samples are to determine loss between treatment and analysis.)

12. Minimum Intervals Between Refumigations

MBIP indicates that sampling will continue until the MeBr concentration in the commodity is 0.01 ppm or less.

DEB has previously indicated that factors affecting residues should resemble actual commercial practices. Residues will not be measured between commercial fumigations.

DEB concludes that MBIP should select a minimum time interval between refumigations for each commodity and revise labels so that refumigations will not occur within that time interval. Then the proposed studies should be conducted with refumigations occurring at the selected minimum time intervals.

13. Number of Fumigations

MBIP indicates that most commodities will be fumigated once. The exceptions are cocoa beans (2), coffee beans (3), copra (2), figs (2), and processed foods (2). MBIP submits documents from industry experts to support the number of fumigations. Those commodities to be treated once in the residue studies are not expected to receive more than one commercial fumigation.

DEB concludes that labels for commodities which are to be treated one, two, or three times postharvest with MeBr should be revised to limit the number of postharvest applications to one, two, or three, respectively.

14. Analytical Method

MBIP intends to use a modified King, et al. headspace method (procedure #001, revised February 7, 1989). This method is a revision of the method which was sent to FDA by Cindy Deyrup, Ph.D. (memorandum dated July 31, 1989) to be included in PAM II as Method A (procedure #001, dated December 1, 1988). The method as revised on February 7, 1989 and Method A are similar.

MBIP also indicates that "to validate the standard curve, a spiked sample will be run each day that samples are analyzed."

DEB concludes that the method (procedure #001, revised February 7, 1989) is acceptable for data collection.

15. Processing

MBIP should conduct processing studies unless "processing involves extensive drying or elevated temperature." For the crops listed in Table 1 of Part II of the December 22, 1989 protocol



(Attachment 4), DEB concludes that residue data on the following processed commodities will be needed:

<u>Crop</u>	<u>Processed Commodities of Concern</u>
Soybeans	Grain dust
Potato	Wet peel
Mustard	Seeds
Beans	Cannery residue
Orange	Oil
Lemon	Oil
Grapefruit	Oil
Apples*	Wet pomace
Grapes*	Wet pomace
Sweet corn	Cannery waste
Field corn	Grits, meal, flour, grain dust
Cottonseed	Meal, hulls
Rice	Polished rice, hulls, bran, grain dust
Grain sorghum	Flour, grain dust
Wheat	Bran, flour, middlings, shorts, wheat germ, grain dust

Note: In a meeting on May 3, 1990, DEB indicated that RACs could be spiked for processing studies. After a discussion in DEB, it was determined that spiking is not appropriate.

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\*Pressing can be done with or without heat.

16. RAC's and Animal Feeds

Table I submitted by MBIP (Attachment 4) lists crops on which MBIP intends to conduct residue studies. Residue data are needed for commodities listed as "RAC" and "Feeds" in Table II of the PAG, Subdivision O, Residue Chemistry. (Exceptions are "feeds" which are processed with extensive drying or elevated temperature.) For the crops listed in Table I of Part II of the December 22, 1989 protocol (Attachment 4), DEB concludes that residue data on the following RACs and feeds are needed:

<u>Crop</u>	<u>RAC</u>	<u>Feeds</u>
Carrot	Root	None
Potatoes	Tuber	Cull potatoes Processed potato waste <sup>1/</sup>
Radish	Fresh	None
Turnip	Root Tops	Roots (G) Tops (G)
Bulb onion	Bulb	None
Green onion	Whole plant	None
Garlic	Bulb	None
Lettuce	Fresh, with wrapper leaves Fresh, without wrapper leaves	None
Celery	Fresh	None
Spinach	Fresh	None
Broccoli	Fresh	None

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<sup>1/</sup>Feed additive tolerances for processed potato waste should be based on the maximum concentration factor observed for residues in/on granules, wet peel, or dry peel as stated in DEB's October 10, 1989 memorandum "Overview of Residue Chemistry Guidelines."

G = Grower has control. If the petitioner desires, label restrictions can restrict grazing or feeding so that residue data are not needed.

<u>Crop</u>	<u>RAC</u>	<u>Feeds</u>
Cabbage	Fresh, with wrapper leaves Fresh, without wrapper leaves	None
Mustard	Greens	Seeds
Beans	Seed and pod, succulent Seed, dry Vines	Seed Vines (G) Cannery residue
Peas	Seed and pod, succulent Vines Dried seed	Seed, dehydrated Vines (G)
Tomatoes	Fruit	Wet pomace
Pepper	Fruit	None
Cucumber	Fruit	None
Cantaloupe	Fresh	None
Summer squash	Fresh	None
Orange	Whole fruit	Pulp, wet
Lemon	Whole fruit	Pulp, wet
Grapefruit	Whole fruit	Pulp, wet
Apples	Fruit	None
Pears	Fruit	None
Cherries	Sweet fruit Sour fruit	None
Peaches	Fruit	None
Plums	Fruit	None
Rubus spp.	Berry	None
Blueberry	Berry	None
Strawberry	Fresh	None

<u>Crop</u>	<u>RAC</u>	<u>Feeds</u>
Cranberry	Berry	None
Grape	Fruit	Wet pomace
Almond	Nutmeat Hulls*	Hulls*
Pecan	Nutmeat	None
English walnut	Nutmeat	None
Pistachio	Nutmeat	None
Herbs and spices	Basil - dried leaves Chives - fresh shoots Dill - fresh leaves, seeds Marjoram - seasoning prepared from leaves Sage - seasoning prepared from dried leaves	None
Asparagus	Fresh	None
Avocado	Fresh	None
Cocoa bean	Bean	None
Coffee bean	Green bean	None
Copra (dried meat)**	Copra	
Corn, field	Grain Forage Silage Fodder	Grain, grain dust Forage Silage Fodder

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\*If the label will restrict postharvest fumigation of almonds in hulls, residue data on almond hulls will not be needed for postharvest uses.

\*\*For soil fumigation of the crop coconut, the RAC would be coconut (meat and liquid combined).

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<u>Crop</u>	<u>RAC</u>	<u>Feeds</u>
Corn, sweet	Sweet corn Forage	Forage Cannery waste
Cotton	Seed Forage	Meal Seeds, hulls Forage (G)
Dates	Fruit	None
Figs	Fresh	None
Okra	Fruit	None
Peanuts	Nutmeat Vines Hulls	Vines (G) Hulls
Pineapple	Fruit Forage	Bran Forage (G)
Popcorn	Grain Forage Fodder	Forage Fodder
Rice	Grain  Straw	Grain with hulls, grain dust Straw (G) Milled byproducts
Grain sorghum	Grain Forage Fodder Silage	Grain, grain dust Fodder (G) Silage (G)
Sweet sorghum	Seed Forage Fodder	Forage (G) Fodder (G)
Soybean	Seed Forage	Seed, grain dust Ensiled Forage (G)

Tobacco	Freshly harvested green leaves***	None
Wheat	Grain  Forage	Grain, grain dust Forage (G) Milled byproducts

DEB also concludes that residue data for plant parts which are listed above but which are not treated postharvest (for example, forage, fodder, and silage of corn) would have to be provided from soil fumigation studies. Alternatively for crop parts which DEB now considers to be under grower control, grazing and feeding restrictions on the label would be possible. (Crops under grower control are identified in Table II of the PAG, Subdivision O, Residue Chemistry (October 1982) and revised in DEB's "Overview of Residue Chemistry Guidelines" by R. Loranger, October 10, 1989.)

17. Variety

Tomatoes

Residue data on both small (cherry) and large tomatoes are needed.

Nuts

As discussed in DEB's February 22, 1990 memorandum, the following varieties of nuts are acceptable:

Almond - Nonpareil variety  
Pecan - Stewart variety

English Walnut - Eureka variety\*\*\*\*  
Pistachio - Kerman Variety  
Dates - Deglet Noor  
Figs - Adriatic

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\*\*\*Total residues as described in PAG, Subdivision O, Residue Chemistry.

\*\*\*\*For risk assessment purposes, residue data on the Hartley variety would be useful but are not required by DEB for tolerance setting purposes.

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Other Commodities

The variety which is expected to result in the highest residue should be used for tolerance setting purposes.

18. Additional Factors

The following information should also be reported on Form A: commodity moisture, chamber humidity, method of MeBr introduction, and rate of air circulation.

Attachment 1: Form A  
Attachment 2: Form B  
Attachment 3: Table A - Crop Harvest Schedule  
Attachment 4: Table I  
Attachment 5: The Packer - Shipping Containers  
Attachment 6: The Packer - Produce Temperature & Display Chart  
Attachment 7: DEB's memo dated 5/18/90

cc with Attachments: RF, SF, Circulation (6), PP#5F3300,  
N. Dodd (DEB), MeBr Registration Standard File- W.  
Boodee, R. Schmitt (DEB), C. Furlow (PIB/FOD, H7506C),  
Larry Schnaubelt (SRRD), PM 32  
RDI:M. Flood:8/2/90:R. Loranger:8/3/90  
H7509C:DEB:CM#2:Rm800D:X1681:KENCO:nd:8/8/90

POST-HARVEST FUMIGATION DATA

DATE \_\_\_\_\_ FUMIGATION CHAMBER NO. \_\_\_\_\_

DESCRIPTION OF CHAMBER  
(size, NAP, vacuum) \_\_\_\_\_

PREFUMIGATION

COMMODITY TEMP. \_\_\_\_\_

FUMIGANT USED

DOSAGE \_\_\_\_\_ EXPOSURE PERIOD \_\_\_\_\_

COMMODITIES FUMIGATED

\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

FUMIGATION STARTED

DATE \_\_\_\_\_ TIME \_\_\_\_\_

CONCENTRATION DURING EXPOSURE PERIOD:

START: \_\_\_\_\_

DURING: \_\_\_\_\_

END: \_\_\_\_\_

AERATION COMMENCED:

DATE \_\_\_\_\_ TIME \_\_\_\_\_

DURATION \_\_\_\_\_

COMMODITY SAMPLED

SAMPLE I.D.

\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_



POST-HARVEST FUMIGATION ANALYSIS

SAMPLE I.D. NUMBER

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HOW HANDLED

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SHIPPING DATA

DATE \_\_\_\_\_ TIME \_\_\_\_\_

PACKING \_\_\_\_\_ LOCATION \_\_\_\_\_

SAMPLE RECEIVING DATA

DATE \_\_\_\_\_ TIME \_\_\_\_\_

CONDITION \_\_\_\_\_ DISPOSITION \_\_\_\_\_

ANALYSIS PERFORMED

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RESULTS

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\_\_\_\_\_  
SIGNATURE

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**TABLE A**  
**CROP HARVEST SCHEDULE**

CROP GROUP	REPRESENTATIVE CROP	PERIOD OF DOMESTIC HARVEST
Root and Tuber	Potato	June - July
	Carrot	All Year
	Radish	March - may
	Turnip	
Bulb Vegetables	Green Onion	May - July
	Small Bulb Onion	All Year
	Large Bulb Onion	All Year
	Garlic	July - December
Bressica	Broccoli	January - March
	Cabbage	All Year
	Mustard Greens	All Year
	Cauliflower	All Year
Leafy Vegetables	Celery	All Year
	Leaf Lettuce	All Year
	Head Lettuce	All Year
	Spinach	All Year
Legume Vegetables	Succ. Beans	April - September
	Succ. Peas	January - June
	Dry Beans	All Year
	Dry Peas	All Year
	Soybeans	All Year
Fruiting Vegetables	Tomato	
	Field	July - November
	Greenhouse	All Year
	Pepper	May - November
Cucurbit Vegetables	Cantaloupe	June - September
	Cucumber	May - July
	Summer Squash	April - June
	Watermelon	June - August
Citrus Fruit	Lemon	March - September
	Orange	December - May
	Grapefruit	May - September
Pome Fruits	Apple	September - February
	Pear	July - November

CROP GROUP	REPRESENTATIVE CROP	PERIOD OF DOMESTIC HARVEST
Stone Fruits	Cherry	May - August
	Peach	May - October
	Plum	May - October
Small Fruits and Berries	Strawberry	April - June
	Grape	July - October
	Raspberry	June - October
	Blueberry	June - August
	Cranberry	October - December
Tree Nuts	Almond	All Year
	English Walnut	All Year
	Pecans	All Year
Cereal Grains	Sweet Corn	May - September
	Field corn	All year
	Popcorn	All year
	Rice	All year
	Wheat	All Year
	Sorghum	All Year
Herbs and Spices	Basil	All Year
	Chives	All Year
	Dill	All Year
	Marjoram	All Year
	Sage	All Year
Miscellaneous	Asparagus	March - May
	Avocado	February - October
	Cocoa Bean	All Year
	Coffee Bean	All Year
	Copra	
	Cottonseed	November - December
	Okra	June - September
	Peanuts	All Year
	Pineapple	March - June
	Pistachios	All Year

TABLE I

CROP GROUP	CROP	DOSAGE (1) lb/1000 ft.	EXPOSURE TIME (HOURS)(2)	MINIMUM COMMODITY TEMPERATURE AT FUMIGATION (C)(3)	MINIMUM (4) AERATION TIME (HOURS)	PROCESSING REQUIRED (5) BY REG. STD	NUMBER OF SEQUENTIAL POST-HARVEST FUMIGATIONS (6)
Root and Tuber	Carrot	4	4	10	2	---	1
	Potato	3	6	15	2	+	1
	Radish	3	4	10	2	---	1
	Turnip	3	4	15	2	---	1
Bulb Vegetables	Onion (green)	3	6	10	2	---	1
	Onion (large bulb)	3	6	15	2	---	1
	Garlic	3	4	15	2	---	1
Leafy Vegetables	Head lettuce	4	2	10	2	---	1
	Leaf lettuce	4	2	10	2	---	1
	Celery	4	2	10	2	---	1
	Spinach	4	2	10	2	---	1
Brassica	Broccoli	4	2	10	2	---	1
	Cabbage	4	2	10	2	---	1
	Mustard Greens	4	2	10	2	---	1
Legume vegetables (except soybeans)	Beans (succulent)	3.5	2	10	2	+	1
	Beans (dry)	3.5	24	15	2	---	1
	Peas (succulent)	3	2	10	2	---	1
	Peas (dry)	4	24	15	2	---	1
Fruiting Veg.	Tomatoes (field)	3	2	10	2	+	1
	Tomatoes (greenhouse)	3	2	10	2	---	1
	Peppers	4	2	10	2	---	1
Cucurbit Veg.	Cucumbers	2.5	4	10	2	---	1
	Cantaloupe	2.5	2	10	2	---	1
	Summer Squash	4	2	10	2	---	1
Citrus Fruits	Orange	3	2	18	2	+	1
	Lemon	3	2	18	2	---	1
	Grapefruit	3	2	18	2	---	1
Pome Fruits	Apple	5	2	10	2	+	1
	Pear	5	2	10	2	---	1
Stone Fruits	Cherry	5	2	10	2	---	1
	Peach	5	2	15	2	---	1
	Plums	5	2	15	2	---	1
Cereal Grains (8)							

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TABLE I Continued:

Page 2

CROP GROUP	CROP	DOSAGE (1) lb/1000 ft.	EXPOSURE TIME (HOURS) (2)	MINIMUM COMMODITY TEMPERATURE AT FUMIGATION (C) (3)	MINIMUM (4) AERATION TIME (HOURS)	PROCESSING NUMBER OF SEQUENTIAL REQUIRED (5) BY REG. STD. FUMIGATIONS (6)	POST-HARVEST FUMIGATIONS (6)
Small Fruits and Berries	Rubus spp.	2	4	10	2	---	1
	Blueberry	3	4	10	2	---	1
	Strawberry	4	2	10	2	---	1
	Grape	2	4	10	2	---	1
Tree Nuts (See footnote #7)	Almond						
	Pecan						
Herbs and Spices (See Footnote #8)	English Walnut						
	Pistachio						
	Basil						
	Chives						
Miscellaneous	Dill						
	Marjoram						
	Sage						
	Asparagus	4	2	10	2	---	1
Miscellaneous	Avocado	2	4	10	2	---	1
	Cocoa Beans	1.5	24	10	24	+	2
	Coffee Bean	2.5	24	15	24	+	3
	Copra	2.5	24	15	24	---	2
	Corn	4	12	15	24	+	1
	Cottonseed	4	24	15	24	---	1
	Dates	1	24	10	24	---	1
	Figs	1	24	10	24	---	1
	Grape	4	2	10	24	---	2
	Okra	3.5	2	15	24	+	1
	Peanuts	3.5	24	15	24	---	1
	Pineapple	2	6	10	2	+	1
	Popcorn	1.5	12	15	24	---	1
	Rice	3	24	15	24	---	1
	Sorghum	6	12	15	24	---	1
	Soybean	6	12	15	24	---	1
	Sweet Corn	3	4	10	2	+	1
	Tobacco	3	72	15	24	---	1
	Wheat	3	24	15	24	---	1
	Processed Foods	2.5	24	10	24	---	2

## FOOTNOTES:

- (1) Dosage information taken from Methyl Bromide Registration Standard, existing methyl bromide labels, and U.S.D.A. quarantine treatment research.
- (2) Commodity will be packaged for fumigation as per attached Appendix IV. Where both box and carton are used, carton will be tested as worst case scenario.
- (3) Commodity temperature for fumigation is based on data in Appendix V. Methyl Bromide labels will state minimum temperature for fumigation is 40 degrees F.
- (4) Minimum aeration time subject to change based on post-harvest fumigation residue data obtained.
- (5) Residue data for processed products is required when processing does not involve extensive drying or elevated temperature. See Appendix VI.
- (6) Documentation from industry experts certifying the number of sequential fumigations is found in Appendix VII.
- (7) USDA/California Prune, Raisin, and Walnut Marketing Board to submit data on this group.
- (8) ASTA (American Spice Trade Association) to submit data on this group.

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# Shipping Containers Fresh Fruits & Vegetables

The following are container and weight standards.  
Each entry includes all or part of the following information.

Example:  
Commodity  
(weight in pounds) shipping area, type of container, type of pack and/or number of items per container.

## FRESH VEGETABLES

### Artichokes

(20-25) carton or box by count or loose pack

### Asparagus

(30-36) pyramid crate  
(15-17) 1/2-pyramid crate or carton  
(24-25) carton of 16 1 1/2-pound packages

### Broccoli

(20-24) 14 to 18 bunches, carton

### Cabbage

(50-55) sack, crate, or carton  
Savoy  
(37) sack, crate, or carton

### Carrots

(23-27) bunched: carton, 2-dozen bunches  
(48) topped: 48 1-pound bags or 24 2-pound bags  
in master container  
(25-55) topped: mesh bag, loose, as marked  
(15-17) mini: 20 12-ounce cello

### Cauliflower

(18-24) flat or two-layer carton of 9-16  
trimmed heads  
(45-55) Long Island-type crate

### Celery

(60-65) California: 15 1/2-inch crate, flat pack  
(55-60) Florida: 14 1/2-inch crate

### Celery Hearts

(24-28) California: carton of 12 18-film bags  
(2 to 3 stalks each)  
(32-38) Florida: carton of 12 18-film bags  
(2 to 3 stalks each)

### Chinese cabbage

(50-53) 15 1/2-inch wirebound crate  
(40-45) 1 1/9-bushel wirebound crate

### Corn, sweet

(42-50) wirebound crate 4 1/2 to 5 dozen  
(35-40) sacks

### Cucumbers

(50-55) bushel carton or wirebound crate  
(50-55) 1 1/9-bushel carton and wirebound  
(28-32 Los Angeles lug  
(22-28) carton of 24

### Cucumbers, greenhouse

(8-10) carton, one-layer pack

### Eggplant

(20-23) carton packed 18s and 24s  
(30-35) bushel carton, 1 1/9-bushel carton  
or wirebound crate

### Escarole and endive

(30-36) carton or wirebound crate of 24 heads  
(25-28) 1 1/9-bushel wirebound crate

### Lettuce

Iceberg  
(36-45) Western Iceberg carton of 18-30 heads  
Romaine  
(20-25) 1 1/9-bushel wirebound crate

### Onions

Dry  
(50) sack  
(25) sack  
(45) carton, 15 3-pound bags  
(40) carton, 20 2-pound bags

### Green

(15-25) carton or crate, 4-dozen bunches  
(20) carton or crate, 2-dozen bunches

### Peppers

(25-30) bushel carton  
Green  
(25-30) California: 1 1/9-bushel wirebound crate  
(27-34) California: carton

### Chill

(16-25) California: lug or carton, loose pack  
(20) Texas and Mexico: 3/4-bushel carton

**Avocados**  
 (25-28) two-layer carton, flat or lug Page 2 of  
 (12½-14) one-layer carton or flat  
 (36-40) Florida: 4/5-bushel carton

**Potatoes**  
 (100) 100-pound sack  
 (50) 50-pound sack or carton  
 (20) 20-pound film or paper bag  
 (50) 5 10-pound film or paper bags  
 (50) 10 5-pound film or paper bags

**Radishes, topped**  
 (12) carton of 25 8-ounce film bags  
 (11-12) carton of 30 6-ounce film bags  
 (40) 40-pound film bag

**Spinach**  
 (20-22) carton or wirebound crate, 2-dozen  
 (7½-8) 12 10-ounce film bags  
 (20-25) bushel basket or crate

**Squash**  
**Winter**  
 (40-50) 1 1/9-bushel crate  
 (800-900) bulk bin carton, collapsible  
 and reuseable  
 (900-2,000) various bulk bins  
**Summer**  
 (21) 5/9-bushel crate or carton  
 (21) 1/2-bushel basket or carton  
 (24-28) carton or Los Angeles lug  
 (18-22) 3/4 lug  
 (42-45) 1 1/9-bushel crate

**Sweet potatoes**  
 (50) carton or bushel basket  
 (40) California: carton

**Tomatoes**  
**Cherry**  
 (16-18) 12-pint carton  
**Mature green**  
 (30) carton  
**Pinks and ripe**  
 (20) two-layer flat, carton, or tray pack  
 (30) three-layer lug or carton  
 (30) carton, loose pack  
**Greenhouse**  
 (8-10) basket

## FRESH FRUITS

**Apples**  
 (40-45) carton, tray pack  
 (37-44) carton, cell pack  
 (37-43) carton or box, loose pack  
 (36) carton of 12 3-pound bags  
 (40) carton of 8 5-pound film bags

**Apricots**  
 (24-26) Los Angeles, California: lug  
 (26) Washington: carton or box

A-24

**Berries**  
**Blueberries**  
 (11-12) 12 1-pint trays  
**Cranberries**  
 (24) carton of 24, 1-pound packages  
**Strawberries**  
 (10-12) 12 1-pint trays  
 (32) 16-quart crate

**Cherries**  
 (18-20) lug or carton  
 (12) cherry lug

**Figs**  
 (5-6) one-layer flat, tray pack  
 (10-15) two-layer flat, tray pack

**Grapefruit**  
 (42½) Florida: 4/5-bushel carton  
 (40) Texas: 7/10-bushel carton  
 (34) Western Desert area: carton  
 (33½) Western Summer: carton

**Grapes, table**  
 (22) California Coachella Valley: lug, plain pack  
 (23) California, other areas: lug or carton, plain pack

**Kiwifruit**  
 (6½-8) California: one-layer flat, sizes 25-49  
 (21-23) California: lug

**Lemons**  
 (38) carton

**Limes**  
 (20) carton  
 (10) 1/5-bushel carton

**Mangos**  
 (14) Florida: flat  
 (10-11) Mexico: lug

**Melons**  
**Cantaloupes**  
 (35-40) 1/2 carton or crate-packed 12, 15, 18, 23  
 (70-80) jumbo crate, packed 18 to 45  
 (53-55) 2/3 carton packed 15, 18, 24, 30  
**Casabas**  
 (32-34) carton, bliss style, packed 4, 5, 6, or 8  
**Crenshaws**  
 (30-33) carton, bliss style, packed 4, 5, 6, or 8  
**Honeydews**  
 (29-32) carton, various counts  
 (40) flat crate standard  
**Persians**  
 (35-50) carton, 4, 5, or 6

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**Nectarines**

- (22) Los Angeles, California: lug, two-layer tray pack  
 (25) lug or carton, tight-fill

**Oranges**

- (45) Florida: 4/5-bushel carton  
 (42½-45) Texas: 7/10-bushel carton  
 (38) California-Arizona: 7/10-bushel carton

**Peaches**

- (22) California: two-layer, lug or carton  
 (18) California: Western peach box  
 (25) Other areas: 1/2-bushel crate or carton  
 (38) Other areas: 3/4-bushel crate or carton

**Papayas**

- (10) carton

**Pears**

- (45-48) standard box or carton, wrap pack  
 (36) carton, tight-fill pack

**Pineapples**

- (40) two-layer carton  
 (20) one-layer carton

**Plums**

- (28-30) lug or carton, loose pack  
 (24-32) four-basket crate

**Prunes**

- (30) carton

**Tangelos**

- (40-45) Florida: 4/5-bushel carton  
 (25-30) California: 1/2-bushel carton

**Tangerines**

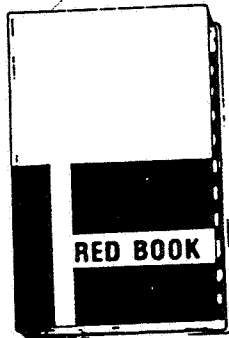
- (47-50) Florida: 4/5-bushel carton  
 (25-30) California: 1/2-bushel carton

**Watermelons**

- (40,000) Western and New Mexico: bulk  
 (45,000) Florida, Texas and other states: bulk  
 (800-1,000) Florida, Texas and other states:  
 bulk bin, small size  
 (1,400-1,800) Florida, Texas and other states:  
 bulk bin, small size  
 (65-80) Florida, Texas and other states: carton,  
 (65-80) Texas and Mexico: carton, 3 or 4

1/ Weight ranges are shown for most commodities. Actual weights larger and smaller than the ranges shown may be found. The mid-point of the range should be used if a single value is desired.

Source: "Conversion Factors and Weights and Measures for Agricultural Commodities and Their Products," Statistical Bulletin No. 616 of the U.S. Department of Agriculture's Economics, Statistics and Cooperatives Service.



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# Produce Temperature & Display Guide

The following two charts depict what is considered to be the ideal temperature for maintaining produce during display periods. Also included are instructions as to whether or not the particular commodity benefits from sprinkling. The charts are divided into two distinct areas, those commodities which require temperatures

below 50 degrees Fahrenheit and those which require temperatures above this mark.

The charts are designed for quick reference. For further information on a particular item refer to the commodity section.

## Items where ideal temperature is 50° F or under

Item	Ideal Temperature	Sprinkle	Item	Ideal Temperature	Sprinkle
Alfalfa Sprouts	36-40°	Lightly	Endive & Escarole	32°	Lightly
Apples	32°	None	Grapes	32°	None
Apricots	31-32°	None	Kiwifruit	32°	None
Artichokes	33-38°	Lightly	Lettuce	34°	Lightly
Asparagus	32°	Lightly	Melons (Ripe)	50°	None
Avocados (Ripe)	45-55°	None	Mushrooms	34°	None
Beans (Lima)	41-45°	Yes	Nectarines (Ripe)	32°	None
Beans (Snap)	45-50°	Lightly	Okra	45°	None
Beets	32°	Yes	Onions (Dry)	32°	None
Blueberries	33-34°	None	Onions (Green)	32°	Lightly
Broccoli	32°	Lightly	Oranges	32-45°	None
Brussels Sprouts	32°	Yes	Peaches (Ripe)	31-32°	None
Cabbage	32°	Yes	Pears (Ripe)	35-45°	None
Cantaloupes	40°	None	Peas (Snow)	33-35°	None
Carrots	32°	Lightly	Peppers	45-50°	Lightly
Cauliflower	32°	Lightly	Pineapple (Ripe)	45°	None
Celery	32°	Yes	Plums	32°	None
Cherries	32-35°	None	Potatoes	38-40°	None
Collards	32°	Yes	Radishes	32°	Yes
Corn	34-38°	Yes	Rutabagas	32°	Yes
Cranberries	36-40°	None	Spinach	32°	Yes
Cucumbers	45-50°	None	Squash (Summer)	45-50°	None
Dates	40°	None	Strawberries	32°	None
Eggplant	45-50°	Yes	Tangerines	45-48°	None
			Turnips	32°	Yes

## Items where ideal temperature is 50° F or above

Item	Ideal Temperature	Sprinkle	Item	Ideal Temperature	Sprinkle
Avocados (Unripe)	65-70°	None	Papayas	55-65°	None
Bananas	58-64°	None	Peaches (Unripe)	65-70°	None
Grapefruit	55-58°	None	Pears (Unripe)	60-70°	None
Limes	55°	Lightly	Pumpkins	50-55°	None
Lemons	55-58°	Lightly	Squash (Winter)	50-55°	None
Mangos	55°	None	Sweet Potatoes	55°	None
Melons (Unripe)	60-65°	None	Tomatoes	55-70°	None
Nectarines (Unripe)	65-75°	None	Watermelons	65-70°	None



UNITED STATES ENVIRONMENTAL PROTECTION AGENCY  
WASHINGTON, D.C. 20460

MAY 18 1990

MEMORANDUM

OFFICE OF  
PESTICIDES AND TOXIC SUBSTANCES

SUBJECT: Methyl Bromide Reregistration Letter from the Methyl Bromide Industry Panel (MBIP) dated 12/29/89

FROM: Nancy Dodd, Chemist *Nancy Dodd*  
Tolerance Petition Section II  
Dietary Exposure Branch  
Health Effects Division (H7509C)

THRU: Michael T. Flood, Ph.D., Acting Section Head *Stephanie Willett*  
Tolerance Petition Section II  
Dietary Exposure Branch  
Health Effects Division (H7509C)

TO: Walter Francis, Acting Product Manager #32  
Antimicrobial Program Branch  
Registration Division (H7505C)

and

Larry Schnaubelt  
Reregistration Branch  
Special Review and Reregistration Division (H7508C)

The MBIP has submitted a letter dated 12/29/89 which raises several issues regarding methyl bromide protocols and reregistration. The protocols were submitted in response to the Methyl Bromide Registration Standard. The MBIP's issues will be repeated below, followed by DEB's conclusions:

MBIP's Issue #1

Possibility of requesting a temporary exemption from the requirement for inorganic bromide tolerance for pre-plant soil fumigation uses. The request will be based on the lack of HED's toxicological concern with inorganic bromide; the recent E.P.A. decision to delete inorganic bromide tolerances; and the large volume of data showing no residue of methyl bromide per se resulting from pre-plant soil fumigations.

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DEB's Conclusion re: Issue #1

Assuming concurrence from Toxicology Branch, DEB has no objection to a temporary exemption from the requirement for inorganic bromide tolerances for pre-plant soil fumigation uses. However, this is an administrative decision.

DEB notes that an exemption from a tolerance for a toxic chemical like methyl bromide per se (as opposed to inorganic bromide) will not be granted.

MBIP's Issue #2a

Will the submitted pre-plant/post-harvest protocol cover pre-plant uses of methyl bromide?

DEB's Conclusion re: Issue #2a

Residue data from postharvest applications will cover pre-plant soil fumigation uses for plant parts which are treated postharvest. Residue data for plant parts which are not treated postharvest (for example, forage, fodder, and silage of corn) would have to be provided from soil fumigation studies. Alternatively for crop parts which DEB now considers to be under grower control, grazing and feeding restrictions on the label would be possible. (Crops under grower control are identified in Table II of the Pesticide Assessment Guidelines, Subdivision O, Residue Chemistry (Oct. 1982) and revised in DEB's "Overview of Guidance, Pesticide Assessment Guidelines, Subdivision O-Residue Chemistry" by R. Loranger, 8/30/89.

MBIP'S Issue #2b

Will the bridging studies developed by U.S.D.A. and submitted with the Dried Fruit and Nut protocol be applicable to the enclosed pre-plant/post-harvest fumigation protocol? These bridging studies investigated chamber size, fumigation temperature, packaging, etc.

DEB's Conclusion re: Issue #2b

Studies which identified "worst case" conditions and which were accepted in connection with the Dried Fruit and Nut protocol are acceptable for this protocol. Additional bridging data on chamber size are needed. Residue data should be provided for each individual commodity or for the representative crops of the crop groups. (Bridging data for dried fruit as suggested by the MBIP are not acceptable).

MBIP's Issue #2c

Is the risk assessment that is a part of the enclosed pre-plant/post-harvest protocol an acceptable method of risk assessment?

DEB's Conclusion re: Issue #2c

DEB defers to the Dietary Risk Evaluation System (Jim Kariya) concerning Part I, Appendix I of the submission.

MBIP'S Issue #2d

Can the general term "processed foods" be used on a pesticide label or would specific processed foods have to be listed on the label?

DEB's Conclusion re: Issue #2d

Each specific processed food which is to be fumigated must be listed because each must have a tolerance.

MBIP's Issue #2e

In light of E.P.A.'s memo dated 7/7/89, are we now correct that inorganic bromide residue data is not required to meet the re-registration standard requirements?

DEB's Conclusion re: Issue #2e

Based on memos from HFASB/HED (Dave Ritter, Toxicologist, 4/19/89) and from Anne Lindsay, Director, Registration Division (5/19/89), DEB is no longer requiring residue data for inorganic bromide to meet registration standard requirements.

MBIP's Issue #2f

If the statement in (e) above is correct and data to date show no residues of methyl bromide per se from pre-plant fumigation, do we still need to generate methyl bromide per se residue data in all of the states listed in previous DEB communications?

DEB's Conclusion re: Issue #2f

Previous DEB memos requested adequate geographic representation for soil fumigation uses. Any data reflecting soil fumigations must include adequate geographic representation. The issue of adequate geographic representation does not apply to postharvest fumigations.

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DEB notes that pre-plant soil fumigation data previously submitted (PP#5F3198) indicate that residues of methyl bromide per se may be detectable at the method sensitivity of the King et al. headspace method in PAM II (0.01 ppm).

cc: RF, SF, Circulation (6), PP#5F3300, PP#5F3198, N. Dodd (DEB), Methyl Bromide Registration Standard File - W. Boodee, R. Schmitt (DEB), Larry Schnaubelt (SRRD), PM#32, C. Furlow (PIB/FOD, H7506C)

H7509C:DEB:CM#2:Rm800D:X1681:NDodd:vg:5/10/90  
RDI: M. Flood:5/3/90:R.Loranger:5/3/90

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