

JUL 1 1992

Ameribrom, Inc.
52 Vanderbilt Avenue
New York, NY 10017

Attn: Michael Eldan,
Regulatory Affairs Director

Subject: Revised Labeling for Aeration and Reentry Statements
Metabrom 99
EPA Registration No. 8622-17

Your product labeling package, revised in accordance with your company's May 18, 1992 letter of commitment, has been reviewed and the following comments apply.

Product Labeling

The labeling referred to above, submitted in connection with registration under the Federal Insecticide, Fungicide, and Rodenticide Act (FIFRA), as amended, is acceptable subject to the comments listed below. A stamped copy is enclosed for you records. Two copies of the finished printed labeling must be submitted to EPA before you distribute or sell the product. All products distributed or sold by August 1, 1992 must bear labeling which contains the revisions detailed in this letter.

1. On the left panel of the draft label under the "Directions for Use" heading, insert the statement: "This product is not to be used on commercial or residential structures that can be inhabited by people."

2. On the left panel of the draft label after the third paragraph of the "Specific Directions for Use" statement, insert the following sentences "Specific USEPA instructions for the aeration and reentry of fumigated commercial structures must be strictly followed. See attachment A."

3. Revise the last sentence on the last page of "Attachment A" to read: "The applicator must obtain a Methyl Bromide Fact Sheet and have ...".

CONCURRENCES

SYMBOL							
SURNAME							
DATE							

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY

3 9 63

4. All products distributed or sold by the registrant after August 1, 1992 and distributed or sold by any other person after September 1, 1992, must bear the approved labeling, revised in accordance with EPA's comments. Distribution or sale of methyl bromide pesticide products for commercial or residential structural fumigation after these dates without the revised labeling will be a violation of FIFRA §12(a)(1)(E).

Additionally, the following conditions, as set forth in your May 18, 1992 letter of commitment, have been added to the above referenced registration:

1. Ameribrom, Inc. will notify all its customers by certified mail that distribution or sale of methyl bromide pesticide products bearing EPA No. 8622-17, for residential or commercial structural fumigation, will be prohibited after September 1, 1992 unless the product's labeling includes the July 1992 revised use directions. Such notification will include a copy of the approved revised labeling. Ameribrom, Inc. will keep a copy of each notification and return receipt for two (2) years.

2. Ameribrom, Inc. will offer to relabel methyl bromide pesticide products for its distributors, and if the distributors accept the offer, Ameribrom, Inc. will relabel such products.

3. All products bearing EPA Registration No. 8622-17, distributed or sold by Registrant after August 1, 1992 will bear the July 1992 revisions concerning aeration and reentry and bear the fact sheet for commercial and residential fumigation.

If you should have any questions concerning this letter, you may call Robert Travaglini on (703) 305-6909.

Sincerely,

R. G. Douglas

Ruth G. Douglas
Product Manager (32)
Antimicrobial Program Branch
Registration Division (H7504C)

CONCURRENCES							
SYMBOL	H7504C						
SURNAME	Travaglini						
DATE	7-8-92						

PRECAUTIONARY STATEMENTS
HAZARDS TO HUMANS & DOMESTIC ANIMALS

DANGER
HIGH ACUTE TOXICITY

Extremely hazardous liquid and vapor under pressure. Do not breathe vapor. Inhalation may be fatal or cause serious acute illness or delayed lung or nervous system injury. Liquid or vapor can cause serious skin or eye injury which may have a delayed onset. Do not get liquid on skin, in eyes or on clothing.

This product contains chloropicrin as a warning odorant. Chloropicrin may be irritating to the upper respiratory tract, and even at low levels can cause painful irritation to the eyes, producing tearing. If these symptoms occur, leave the fumigation area immediately.

NOTE TO PHYSICIAN: Early symptoms of overexposure are dizziness, headache, nausea and vomiting, weakness and collapse. Lung edema may develop in 2 to 48 hours after exposure, accompanied by cardiac irregularities; these effects are the usual cause of death. Repeated overexposure can result in blurred vision, staggering gait and mental imbalance, with probable recovery after a period of no exposure. Blood bromide levels suggest the occurrence, but not the degree of exposure. Treatment is symptomatic.

ENVIRONMENTAL HAZARDS: This pesticide is toxic to wildlife. Do not discharge effluent containing this product into lakes, streams, ponds, estuaries, oceans, or public waters unless this product is specifically identified and addressed in an NPDES permit. Do not discharge effluent containing this product to sewer systems without previously notifying the appropriate treatment plant authority. For guidance contact your State Water Board or Regional Office.

PHYSICAL HAZARDS: Do not use or store near heat, open flames, or sparking electrical equipment.

CHEMICAL HAZARDS: Do not use application devices incorporating natural rubber or aluminum or magnesium or their alloys.

DIRECTIONS FOR USE

It is a violation of Federal Law to use this product in a manner inconsistent with its labeling.

PROTECTIVE CLOTHING: Wear loose clothing and socks that are cleaned after each wearing. Do not wear jewelry, gloves or boots when handling. Methyl bromide is heavier than air and can be trapped inside clothing and cause skin injury. If full-face respiratory protection is not required, wear goggles or full face shield for eye protection when handling liquid. After application, immediately remove clothing, shoes and socks. Do not reuse contaminated clothing or shoes until cleaned. Drenched clothing cannot be adequately decontaminated.

PESTICIDE STORAGE, HANDLING AND DISPOSAL

PESTICIDE STORAGE AND HANDLING:

Store in a secure manner either outdoors under ambient conditions or indoors in a well ventilated area. Post as a pesticide storage area.

Do not contaminate water, food or feed by storage. Store cylinders upright, secured to a rack or wall to prevent tipping. Cylinders should not be subjected to rough handling or mechanical shock such as dropping, bumping, dragging or sliding. Do not use rope slings, hooks, tongs, or similar devices to unload cylinders. Transport cylinders using hand truck, fork truck or other device to which the cylinder can be firmly secured.

Do not remove valve protection bonnet and safety cap until immediately before use. Replace safety cap and valve protection bonnet when cylinder is not in use.

PESTICIDE DISPOSAL: Pesticide wastes are toxic. Improper disposal of excess pesticide is a violation of Federal Law. If these wastes cannot be disposed of by use according to label instructions, either contact your State Pesticide or Environmental Control Agency, or the Hazardous Waste representative at the nearest EPA Regional Office for guidance, or follow registrant's instructions for return of partially empty cylinders.

CONTAINER DISPOSAL: When cylinder is empty, close valve by turning clockwise until hand screw safety cap onto valve outlet, and replace protection bonnet before returning to shipper. Only the registrant is authorized to refill cylinders. Do not use cylinders for any other purpose. Follow registrant's instructions for return of empty or partially empty cylinders.

RETURN OF CYLINDERS:

- (1) Cylinders are the property of the manufacturer or distributor where purchased and should be returned promptly by collect freight.
- (2) Do not ship cylinders without safety caps or valve protection bonnets.
- (3) When a cylinder is partially full and there is no further requirement for the product, contact the manufacturer or distributor for return instruction.
- (4) Containers should never be refilled by the consumer or used for any other product or purpose.

BEST AVAILABLE COPY

SPECIFIC DIRECTIONS FOR USE

The fumigant is a highly hazardous material and should be used only by individuals trained in its proper use. Before using, read and follow all label precaution and directions, including those in the Product Manual No. AM-210, Manual for the Safe Handling and Application of Methyl Bromide Products.

All persons working with this fumigant must be knowledgeable about the hazards, and trained in the use of required respirator equipment and detector devices, emergency procedures, and proper use of the fumigant (see the Product Manual No. AM-210).

When used for fumigation of enclosed spaces (e.g., structures, warehouses)

RESTRICTED USE PESTICIDE
DUE TO ACUTE TOXICITY

For retail sale to and use only by Certified Applicators or persons under their direct supervision, and only for those uses covered by the Certified Applicator's certification

METABROM 99
CONTAINS 0.25% CHLOROPICRIN

ACTIVE INGREDIENT:	By Wt.
METHYL BROMIDE	99.3%
INERT INGREDIENTS*	0.7%
TOTAL	100%

*Contains CHLOROPICRIN (warning odorant tear gas)

ACUTELY TOXIC CHEMICAL

14.3 LBS. Active Ingredient per gal. (LIQUID IN CYLINDER)

RECEIVED
COMMENTS
EPA
Letter Date:
8 2002
Federal Insecticide,
Fungicide, and Rodenticide Act of
1947
EPA Reg. 8022-17

KEEP OUT OF REACH OF CHILDREN

DANGER  **PELIGRO**
POISON

PRECAUCION AL USUARIO: Si usted no lee ingles, no use este producto hasta que la etiqueta le haya sido explicada ampliamente.

STATEMENT OF PRACTICAL TREATMENT

In all cases of overexposure, get medical attention immediately. Take person to a doctor or emergency treatment facility.

- If inhaled — Get exposed person to fresh air. Keep warm. Make sure person can breathe freely. If breathing has stopped apply artificial respiration. Do not give anything by mouth to an unconscious person.
- If on skin — Immediately remove contaminated clothing, shoes, jewelry, and any other item on skin. Wash contaminated skin area thoroughly with soap and water.
- If in eyes — Hold eyelids open and flush with a steady, gentle stream of water for at least 15 minutes.

See side panels for additional precautionary statements.

EPA REG. NO. 8622-17-AA

- EPA EST. NO. 10163-AZ-01
- EPA EST. NO. 15298-IS-01
- EPA EST. NO. 29516-FL-04
- EPA EST. NO. 29516-NC-01

Manufactured by:
AMERIBROM, INC.

52 VANDERBILT AVENUE
NEW YORK, N.Y. 10017
TELEPHONE: (212) 286-4000
FAX: (212) 286-4475

IN CASE OF EMERGENCY CONTACT:

Chemtrac (800) 424-9300
or
Ameribrom West
5419 Santa Clara Ave.
Camarillo, Calif. 93010
Call Collect: (805) 988-9719 (Calif.)
(212) 286-4000 (N.Y.)

AS21/Rev 0 Net contents: _____ LBS. _____ KGS. 3/82

Placarding Required: The applicator must placard or post all containers to the fumigated area with signs bearing, in English and Spanish:

- 1. The signal word DANGER/PELIGRO and the skull and crossbones symbol.
- 2. The statement, "Area under fumigation, DO NOT ENTER/NO ENTRE."
- 3. The date of fumigation.
- 4. Name of fumigant used.
- 5. Name, address, and telephone number of the applicator.

Do not remove a placard until the treated commodity is completely aerated. To determine whether aeration is complete, each fumigated site or vehicle must be monitored and shown

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or areas until cleared. Drained clothing cannot be adequately decontaminated.

PESTICIDE STORAGE, HANDLING AND DISPOSAL

PESTICIDE STORAGE AND HANDLING:

Store in a secure manner either outdoors under sheltered conditions or indoors in a well-ventilated area. Post as a pesticide storage area.

Do not contaminate water, food or feed by storage. Store cylinders upright, secured to a rack or wall to prevent tipping. Cylinders should not be subjected to rough handling or mechanical shock such as dropping, bumping, dragging or sliding. Do not use rope slings, hooks, tongs, or similar devices to unload cylinders. Transport cylinders using hand truck, fork truck or other device in which the cylinder can be firmly secured.

Do not remove valve protection bonnet and safety cap until immediately before use. Replace safety cap and valve protection bonnet when cylinder is not in use.

PESTICIDE DISPOSAL: Pesticide wastes are toxic. Improper disposal of excess pesticide is a violation of Federal Law. If these wastes cannot be disposed of by use according to label instructions, either contact your State Pesticide or Environmental Control Agency, or the Hazardous Waste representative at the nearest EPA Regional Office for guidance, or follow registrant's instructions for return of partially empty cylinders.

AMER DISPOSAL: When cylinder is empty, close valve by turning clockwise until hand screw safety cap onto valve outlet, and replace protection bonnet before returning to shipper. Only the registrant is authorized to refill cylinders. Do not use cylinders for any other purpose. Follow registrant's instructions for return of empty or partially empty cylinders.

RETURN OF CYLINDERS:

- (1) Cylinders are the property of the manufacturer or distributor where purchased and should be returned promptly by collect weight.
- (2) Do not ship cylinders without safety caps or valve protection bonnets.
- (3) When a cylinder is partially full and there is no further requirement for the product, contact the manufacturer or distributor for return instruction.
- (4) Containers should never be refilled by the consumer or used for any other product or purpose.

- If inhaled - Get exposed person to fresh air. Keep warm. Make sure person can breathe freely. If breathing has stopped apply artificial respiration. Do not give anything by mouth to an unconscious person.
- If on skin - Immediately remove contaminated clothing, shoes, jewelry, and any other item on skin. Wash contaminated skin area thoroughly with soap and water.
- If in eyes - Hold eyelids open and flush with a steady, gentle stream of water for at least 15 minutes.

See side panels for additional precautionary statements.

EPA REG. NO. 8622-17-AA

- EPA EST. NO. 10163-AZ-4
- EPA EST. NO. 15298-IS-0
- EPA EST. NO. 29516-FL-0
- EPA EST. NO. 29516-NC-

Manufactured by:
AMERIBROM, INC.

52 VANDERBILT AVENUE
NEW YORK, N.Y. 10017
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Call Collect: (805) 988-9719 (Calif.)
(212) 286-4000 (N.Y.)

Net contents: _____ LBS / _____ KGS.

SPECIFIC DIRECTIONS FOR USE

This fumigant is a highly hazardous material and should be used only by individuals trained in its proper use. Before using, read and follow all label precaution and directions, including those in the Product Manual No. AM-210, Manual for the Safe Handling and Application of Methyl Bromide Products.

All persons working with this fumigant must be knowledgeable about the hazards, and trained in the use of required respirator equipment and detector devices, emergency procedures, and proper use of the fumigant (see the Product Manual No. AM-210).

When used for fumigation of enclosed spaces (e.g. empty structures, warehouses, greenhouses, boxcars, grain bins or elevators and other transport vehicles and tarpaulin covered areas) and soil, two persons trained in the use of this product must be present during introduction of the fumigant, initiation of aeration, and after aeration when testing for reentry. Two persons do not need to be present if monitoring is conducted remotely (outside the area being fumigated).

Do not fumigate any raw or processed commodity with Metabrom 99.

Do not fumigate with this product when soil temperature is below 50°F. at 6-8 inches. Specific directions for use in empty structures, vehicles, chambers, vacuum chambers, railroad cars, and greenhouses are given in the Product Manual No. AM-210.

Placarding Required: The applicator must placard or post all entrances to the fumigation area with signs bearing, in English and Spanish:

- 1. The signal word DANGER/PELIGRO and the skull and crossbones symbol.
- 2. The statement, "Area under fumigation, DO NOT ENTER/NO ENTRE".
- 3. The date of fumigation.
- 4. Name of fumigant used.
- 5. Name, address, and telephone number of the applicator.

Do not remove a placard until the treated commodity is completely aerated. To determine whether aeration is complete, each fumigated site or vehicle must be monitored and tested to contain less than 5 ppm methyl bromide in the air space around and, when feasible, in the mass of the commodity. If less than 5 ppm methyl bromide is detected, the placard may be removed. However, if 5 ppm or greater methyl bromide is detected, the placard must be transferred with the commodity to the new site. Workers who transfer or handle incompletely aerated commodity must be informed and appropriate measures must be taken (i.e., ventilation or respiratory protection) to prevent exposures from exceeding 5 ppm greater methyl bromide.

Respiratory Protection: If the concentration of methyl bromide in the working area measured by a direct-reading detector device (e.g., Draeger Tube 63 described in the Product Manual), does not exceed 5 ppm (20 mg/m³), no respiratory protection is required.

If this concentration is exceeded at any time, all persons in the working area must wear protective clothing and a NIOSH/MSHA approved self-contained breathing apparatus (SCBA) or combination air-supplied/SCBA respirator (see the Product Manual No. AM-210).

BEST AVAILABLE COPY

**RESTRICTED USE PESTICIDE
DUE TO ACUTE TOXICITY**

Use only by Certified Applicators or persons under their direct supervision, and only in accordance with the label directions covered by the Certified Applicator's certification.

ABROM 99
INS 0.25% CHLOROPICRIN

NET WT: By Wt. 99.3%
GROSS WT: 0.7%
TOTAL: 100%
CHLOROPICRIN (warning odorant tear gas)

ACUTELY TOXIC CHEMICAL
Active ingredient per gal. (LIQUID IN CYLINDER)

KEEP OUT OF REACH OF CHILDREN



AVOID: Si usted no lee ingles, no use este producto hasta que se le explique ampliamente.

STATEMENT OF PRACTICAL TREATMENT
In case of exposure, get medical attention immediately. Take person to nearest hospital treatment facility.

Keep person to fresh air. Keep warm. Make sure person can breathe. If breathing has stopped apply artificial respiration. Do not give anything by mouth to an unconscious person. Immediately remove contaminated clothing, shoes, jewelry, and anything on skin. Wash contaminated skin area thoroughly with plenty of water. Flush eyes open and flush with a steady, gentle stream of water for at least 15 minutes.

See label for additional precautionary statements.

BEST AVAILABLE COPY

... treated areas must be aerated until the level of methyl bromide is below 5 ppm. Do not allow entry into the treated area by any person before this time unless protective clothing and a respiratory protection device (SCBA or combination air-supplied/SCBA) is worn. Also see separate Aeration and Ventilation section for commercial structures below.
Spill and Leak Procedures: Evacuate immediate area of spill or leak. Use SCBA or combination air-supplied/SCBA respirator for entry into affected area to correct problem. Move leaking or damaged cylinders or containers outdoors or to an isolated location, observing strict safety precautions. Work upwind if possible. Allow spill to evaporate. Do not permit entry into spill area by unprotected persons until concentration of methyl bromide is determined to be less than 5 ppm.
Contaminated soil, water, and other cleanup debris is a toxic hazardous waste. Report spill to the National Response Center (800-424-6802) if the reportable quantity of 1000 lbs. is exceeded.

PRECAUTIONS FOR USAGE PRIOR TO, DURING, AND AFTER SOIL FUMIGATION
Specific instructions for application appears in the Product Manual No. AM-210.

Prior to Fumigation: Comply with all local regulations and ordinances. Obtain an application permit from Agricultural Regulatory Agencies as required.

Never fumigate alone. It is imperative always to have an assistant and proper protective equipment in case of accidents.

Drivers of application equipment must advise other workers of all precautions and procedures. In addition, drivers must instruct their helpers in the mechanical operation of the tractor and how to safely work with the tractor and driver while fumigating.

Handle this fumigant in the open, with the operator "up wind" from the container where there is good ventilation.

Check fumigant pressure systems for leaks, before beginning operation.

Two trained persons must be present during introduction of the fumigant.

When fumigating soil from a tractor, 5 gallons of water must be carried on the tractor and placed where it is readily accessible. In addition to water available on the tractor, at least 5 gallons additional water must be available from the service truck. This water must be potable and in containers marked "Decontamination water not to be used for drinking."

All trash should be cleared from the field before starting fumigation.

During Fumigation: This fumigant should not be applied when there is an atmospheric inversion. Since uncomfortable concentrations of chloropicrin may drift to nearby areas, immediately cover treated area with plastic tarpaulin for a minimum of 48 hours.

Do not lift injection shanks to turn at the end of a pass until fumigant has drained from system following closure of shutoff valve.

If trash is inadvertently pulled by the shanks to the ends of the field when fumigating, it must be covered by lifting the shanks, then covering the trash with polyethylene film before making the turn for the next pass.

When changing the cylinders, be certain they are turned off and fumigant system is not under pressure.

After fumigation: Post all treated areas with warning signs.

Keep all animals, children and unauthorized people away from area under fumigation for 48 hours after fumigation and during removal of tarpaulin.

Two trained persons must be present during removal of the tarpaulin.

Spill and Leak Procedures: In case of a rupture of hose or fitting while applying fumigant, immediately stop tractor and motor. Evacuate immediate area of spill or leak. Use SCBA or combination air-supplied/SCBA respirator for entry into affected area to correct problem. Approach from upwind to make necessary repairs. Do not reenter area without respiratory protection until a spill has evaporated or a leak has been fixed.

See attached A

DWELLING FUMIGATION

When used for fumigation of dwellings, two persons trained in the use of this fumigant must be present during introduction of the fumigant, initiation of aeration, and aeration when setting for removal. Two persons do not need to be present if monitoring is conducted remotely (outside the dwelling being fumigated).

Dwelling to be fumigated is made gas-tight using a tarpaulin which has been staked and/or earth mounds placed at the ends of the tarpaulin. Area to be fumigated is calculated and the Metabrom introduced. Dwelling is to be posted showing date of fumigation. Following fumigation, dwelling is to be ventilated for several hours until treated site is below 5 ppm (20mg/m³).

Subterranean termites in tunnels must not be controlled unless gas is introduced into those areas by a special procedure.

Insects Controlled: Termites, wood borers and any other insects (cock roaches, spiders) in gas-tight fumigated dwelling. Metabrom controls all insects and trapped rodents within the treated structure.

Dosage Rate: See Table II of the Product Manual No. AM-210.

NOTE: Extinguish all pilot lights and glowing heating devices to avoid corrosion.

STRUCTURAL DAMAGE: and other: Mild including dwellings.

Remove the following materials from building before fumigation as they may develop undesirable odors: (1) High protein flour and cereals, horsehair articles, iodized salt, leather goods, rubber goods, sulfur containing compounds or synthetic detergents.

See Product Manual No. AM-210 and Table II for specific dosage per 1,000 cu. ft., fumigation and exposure time.

SOIL FUMIGATION (See Table I)

Do not use this product for soil fumigation in the STATE OF FLORIDA.

Pests controlled are: Nematodes, including root-knot spp., Phytophthora, Pratylenchus, Xiphinema, Criconemoides, and Paratylenchus on almonds, apricots, cherries, citrus, grape vineyards, peaches, pecans, pistachios, plums, prunes, strawberries, tomatoes and walnuts.

Field Fumigation: For overall application type applicator having the chisel fumigant to a depth of 6-8 inches immediately after treatment with roller or cultipacker and covered cover. Consult Table I for proper per acre as suggested in Table I, additional to the actual area treated.

Placed Tarp Fumigation: Metho dome, inflated plastic bags, crumpled straw, inverted baskets, flower

Evaporating pans are essential. Shallow pans or basins made of:
1. Use one evaporator pan for 1000 cu. ft. of soil.
2. Anchor one end of each polyethylene sheet to the ground.
3. Extend the free ends of the sheet to the windward side.
4. After the supports and tubing are in place, cover with polyethylene or coal oil cover of polyethylene or coal oil cover.
5. Position that cover with its edge to the windward side.
6. Seal six to ten inches of the edge with a mallet.
7. Attach a polyethylene tube to the top of the pan to meter small amount of fumigant.

Hot Gas Method: The hot gas heat exchanger, or a copper coil in the fumigant before introduction.

This method may be useful where ventilation is advantageous.

Dosage: Use one to two pounds of 24 hours when soil temperature to the depth it has been plowed 60°F; extend the exposure period to 50°F.

A. TREE SITE FUMIGATION: Pratylenchus and nematode fumigant nematodes in Florida sandy bear harvestable fruit for a depth of 6 inches immediately behind chisel feet. Immediately cover with treatment will control disease before setting transplants in.

B. SPECIAL INSTRUCTIONS (ROOT FUNGUS) ON DECK: Preparation for Applicator Metabrom 99, soil must be dry by: a) planting sudangrass if then withholding further irrigation. When soil is dry, cut a 36 inches and disc to smother.

Dosage and Method of Application: are planted in this treated soil with Methods and dosage of application.

1. Non-Tarp Chisel Applicator: pounds of Metabrom 99 per acre apart to a depth of 24-30 inches chisel line which may use a wing behind the chisel mark. Place the show upper chisel mark. Follow chisel line into the chisel line the adjacent soil surface.
2. Tarp Chisel Application: After fumigant per acre by chisel polyethylene film seal.
3. Deep Injection Auger-Prob (two pounds in fine-textured soil): Assume one injection site per acre in the center of the field.

Exposure and Aeration Period:

1. To insure the proper time of applications, we recommend ethylene film cover, and aeration which planting or replanting 14 days later.
 2. Metabrom 99 will not usually control may be observed weevil and rhizomes of Juncus.
- C. NON-TARP NEMATODE CONTROL:** For control of nematodes of Pratylenchus, and Paratylenchus vineyards, peaches, pecan walnuts.

Pretreatment Soil Preparation: is required. The soil should be previous crops should be watered. Soil moisture should be kept moist for at least four weeks before fumigation is below 50°F.

For best results, fumigate when soil temperature is above 50°F. Use the higher labeled rate.

Dosage and Method of Application: to soil where trees or vines are present. Soil should be watered at least 14 days before fumigation. Dosage of application are as follows:
1. Chisel Application: After fumigation of Metabrom 99 per acre

- 2-17-AA
- EPA EST. NO. 10163-AZ-01
 - EPA EST. NO. 15298-IS-01
 - EPA EST. NO. 29516-FL-04
 - EPA EST. NO. 29516-NC-01

IN CASE OF EMERGENCY CONTACT:
Chemtrac (800) 424-9300
or
Ameribrom West
5419 Santa Clara Ave.
Camarillo, Calif. 93010
Call Collect: (805) 988-9719 (Calif.)
(212) 286-4000 (N.Y.)

Net weight: 1.33 / 1.33 KGS. 300

The applicator must read and post all directions to the fumigated area in English and Spanish.

KEEP OUT OF REACH OF CHILDREN and the skull and crossbones symbol.

Under fumigation, DO NOT ENTER AND ENTREE.

Telephone number of the applicator.

When the treated commodity is completely aerated. To determine

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Exposed person to fresh air. Keep warm. Make sure person can breathe freely. If breathing has stopped apply artificial respiration. Do not give anything by mouth to an unconscious person. Immediately remove contaminated clothing, shoes, jewelry, and any other item on skin. Wash contaminated skin area thoroughly with soap and water. Hold eyelids open and flush with a steady, gentle stream of water for at least 15 minutes.

side panels for additional precautionary statements.

NO. 8622-17-AA

- EPA EST. NO. 10163-AZ-01
- EPA EST. NO. 15298-IS-01
- EPA EST. NO. 29516-FL-04
- EPA EST. NO. 29516-NC-01

by:
FROM, INC.
BILT AVENUE
N.Y. 10017
(212) 286-4000
286-4475

IN CASE OF EMERGENCY CONTACT:

Chemtec (800) 424-9300
OF
Amerifrom West
5419 Santa Clara Ave.
Camarillo, Calif. 93010
Call Collect: (805) 988-9719 (Calif.)
(212) 286-4000 (N.Y.)

Net contents: 135/ KGS. 362

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and DANGER/PELIGRO and the skull and crossbones symbol.

nt, "Area under fumigation, DO NOT ENTER/NO ENTRE"

lumigation.

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selection: If the concentration of methyl bromide in the working area, as direct-reading detector device (e.g., Draeger Tube as described in the Product net exceed 5 ppm (20 mg/m³), no respiratory protection is required.

ation is exceeded at any time, all persons in the working area must wear ng and a NIOSH/MSHA approved self-contained breathing apparatus (SCBA) air-supplied/SCBA respirator (see the Product Manual No. AM-210).

After fumigation: Post all treated areas with warning signs.

Keep all animals, children and unauthorized people away from area under fumigation for 48 hours after fumigation and during removal of tarpaulin.

Two trained persons must be present during removal of the tarpaulin.

Spill and Leak Procedures: In case of a rupture of hose or fitting while applying fumigant, immediately stop tractor and motor. Evacuate immediate area of spill or leak. Use SCBA or combination air-supplied/SCBA respirator for entry into affected area to correct problem. Approach from upwind to make necessary repairs. Do not reenter area without respiratory protection until a spill has evaporated or a leak has been fixed.

See attachment A

DWELLING FUMIGATION

When used for fumigation of dwellings, two persons trained in the use of this product must be present during introduction of the fumigant, initiation of aeration, and after aeration when testing for fumigant. Two persons do not need to be present if monitoring is conducted remotely (outside the dwelling being fumigated).

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Subterranean termites in tunnels cannot be controlled unless gas is introduced into those areas by a special procedure.

Insects Controlled: Termites, wood borers and any other insects (cockroaches, spiders) in gas-tight fumigated dwelling. Metabrom controls all insects and trapped rodents within the treated structure.

Dosage Rate: See Table II in Product Manual No. AM-210.

NOTE: Extinguish all flames such as pilot lights and glowing heating devices to avoid corrosion.

STRUCTURAL Damage: Control and other sites including dwellings.

Remove the following materials from building before fumigation as they may develop undesirable odors: fur, high protein flour and cereals, horsehair articles, iodized salt, leather goods, rubber goods, sulfur containing compounds or synthetic detergents.

See Product Manual No. AM-210 and Table II for specific dosage per 1,000 cu. ft., fumigation method and exposure time.

SOIL FUMIGATION (See Table I)

Do not use this product for soil fumigation in the STATE of FLORIDA.

Pests controlled are: Nematodes, including root-knot spp., Tylenchulus, Pratylenchus, Xiphinema, Criconemoides, and Paratylenchus on almonds, apples, apricots, cherries, citrus, grape vineyards, peaches, pecans, pistachios, plums, prunes, strawberries, tomatoes and walnuts.

Soil-borne fungi, including: Pythium, Rhizoctonia, Phytophthora, Pyrenochaeta, Sclerotinia, Sclerotium, Armillaria, and the clubroot organism, Plasmodiophora.

Weeds and weed seed: seeds, roots, stolons, and bulbs of broadleaf weeds and grasses including quackgrass, annual bluegrass, bromegrass, common lambsquarters, torpedograss, and bermudagrass. Not effective against mallows, dodder, and some species of clover.

Insects in the soil at the time of treatment including: wireworms, June beetle larvae, white grubs, and garden symphylan.

Pre-treatment Soil Preparation: Plow or rip the soil to the depth of which effective treatment is required. The soil should be worked until free of clods or large lumps. Residue from previous crops should be worked into the soil to allow for decomposition prior to fumigation. Soil moisture should be optimum for seed germination. For best results soil should be kept moist for at least four days prior to treatment. Do not fumigate if the soil temperature is below 50°F. For best results, fumigate when soil temperature is 80°F. to 90°F. at the depth of 6 inches. Use the higher labelled rate for muck and heavy clay soils.

When soil is 6 to 36 inches and disc

Dosage and Method of application are listed in this table. Methods and dosage are:

1. Non-Tarp Chisel Auger Application: 20 pounds of Metabrom per acre to a depth of 2 chisel line which is 18 inches behind the chisel mark. Place 1 chisel mark in the adjacent soil into the chisel line.
2. Tarp Chisel Application: 20 pounds of Metabrom per acre to a depth of 2 chisel line which is 18 inches behind the chisel mark. Place 1 chisel mark in the adjacent soil into the chisel line.
3. Deep Injection Auger: 20 pounds in line-6 Assume one injection in the center of the line.

Exposure and Aeration

1. To insure the proper applications, we recommend ethylene film after which planting 14 days later.
2. Metabrom 99 will no some control may be needed) and rhizomes.
3. NON-TARP NEMATODE CONTROL: For control of nematode Pratylenchus, and P. vineyards, peaches, walnuts.

Pre-treatment Soil Prep is required. The soil should be worked into the soil to allow for decomposition prior to fumigation. Soil moisture should be kept moist for at least 4 days prior to treatment. Soil moisture should be kept moist for at least 4 days prior to treatment. Soil moisture should be kept moist for at least 4 days prior to treatment.

For best results, fumigate when soil temperature is 80°F. to 90°F. at the depth of 6 inches. Use the higher labelled rate for muck and heavy clay soils.

Use the higher labelled rate for muck and heavy clay soils.

Dosage and Method of application are listed in this table.

1. Chisel Application: 20 pounds of Metabrom 99 per acre to a depth of 24-30 inch line which may be set behind the chisel 2 to 3 feet behind the chisel 2 to 3 feet behind the chisel 2 to 3 feet behind the chisel. This is followed by a second chisel line. This is followed by a second chisel line. This is followed by a second chisel line.
2. Deep Injection Auger: 20 pounds of Metabrom 99 per acre to a depth of 24-30 inch line which may be set behind the chisel 2 to 3 feet behind the chisel 2 to 3 feet behind the chisel 2 to 3 feet behind the chisel.

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Chisel Application: For overall application of Metabrom 99 inject the product with a chisel applicator having the chisels spaced no more than 12 inches apart and injecting the fumigant to a depth of 6-8 inches below the soil surface. The soil surface must be covered immediately after treatment with simultaneous film laying equipment or by sealing with a tarp or cultipacker and covered within 20 minutes with polyethylene film or other suitable material. Consult Table I for proper dosage. For row applications use the same dosage rates per acre as suggested in Table I. The actual amount used per acre, however, will be proportional to the actual area treated.

Tarp Fumigation Method: Support the center of the cover to provide a small gas space. Inflated plastic bags, crumpled fertilizer bags, burlap bags stuffed lightly with hay straw, inverted baskets, flowerpots or bottles placed in the soil may be used for support.

Evaporating pans are essential for the volatilization and uniform dispersion of fumigant. Allow pans or basins made of plastic or tin are satisfactory for this purpose. Use one evaporator pan for each 300 to 400 square feet of area. Anchor one end of each polyethylene tube into an evaporating pan with tape or a suitable weight. This ensures that the liquid will be directed into the evaporating pan. Extend the free ends of the polyethylene tubes outside of the area to be covered. After the supports and tubing are in place, cover the area to be fumigated with a gasproof cover of polyethylene or coated fabric film. Position that cover with its edges in a prepared furrow or trench. Seal six to ten inches of the outside edges with dirt. Tamp the dirt down so edges will not pull loose. Attach a polyethylene tube to the cylinder and open the fumigant. Use a cylinder dispenser or scale to meter small amounts.

Hot Gas Method: The "hot gas method" consists of using a commercially manufactured air exchanger, or a copper coil immersed in a vessel containing hot water, to vaporize fumigant before introduction.

This method may be useful where large amounts of fumigant are required and rapid vaporization is advantageous.

Exposure: Use one to two pounds of Metabrom 99 per 100 square feet for an exposure period 24 hours when soil temperature is 60°F. or higher. Methyl bromide penetrates the soil the depth it has been plowed or ripped. When soil temperature is between 50°F. and 60°F. extend the exposure period to 48 hours. Do not treat when soil temperature is below 50°F.

TREE SITE FUMIGATION DIRECTIONS (FOR USE IN FLORIDA ONLY)

Preplant or replant fumigation of citrus soil for control of Phytophthora and citrus nematodes in Florida sandy soils. Trees which are planted in this treated soil will not bear harvestable fruit for a period of at least 24 months. Apply with chisels spaced 12 inches apart to a depth of 6 to 8 inches. Seal fumigant with a drag or cultipacker following immediately behind chisels. Apply Metabrom 99 at the rate of 1 pound per 100 square feet. Immediately cover with a 4 mil. tarp and expose to fumigation for 96 hours. This treatment will control disease to a depth of 4 feet. Remove cover and aerate 2 weeks before setting transplants in treated area.

SPECIAL INSTRUCTIONS FOR THE CONTROL OF ARMILLARIA MELLEAE (OAK ROOT FUNGUS) ON DECIDUOUS FRUIT AND NUTS, CITRUS AND VINEYARDS

Preparation for Application: To obtain the maximum control of Armillaria melleae with Metabrom 99, soil must be dry to a depth requiring treatment. This can be accomplished by: a) planting sudangrass in the spring, irrigating until the grass has established itself, then withholding further irrigation; b) naturally, by allowing plants to grow without irrigation. When soil is dry, cut and remove grass, plants and debris. Rip soil to a depth of 18 inches and disc to smoothness.

Rate and Method of Application: This is a preplant or replant treatment. Crops which are planted in this treated soil will not bear harvestable fruit for a period of at least 24 months. Rate and dosage of application are as follows. See Table I.

Non-Tarp Chisel Application: After the soil has been properly prepared inject 400-870 pounds of Metabrom 99 per acre by chisel applications with 2 chisels spaced 66 inches apart to a depth of 24-30 inches. For non-tarp applications be sure to properly seal the chisel line which may be accomplished by the following equipment modifications.

Tarp Chisel Application: After the soil has been properly prepared, apply 400-870 pounds of fumigant per acre by chisels spaced 48-66 inches apart and cover with adequate polyethylene film seal.

Deep Injection Auger-Probe Treatment: Use one pound of Metabrom 99 in light soils two pounds in fine-textured soils) to a depth of 36 inches or more below the soil surface. Assume one injection site per 100 square feet (on a 10 ft. x 10 ft. grid pattern) with the injection in the center of the area to be treated.

Soil Moisture and Aeration Period: To insure the proper time-concentration relationship to control oak root fungus for chisel applications, we recommend a seven day exposure period before removing the polyethylene film cover, and a one day interval with Deep Injection Auger-Probe Treatment after which planting or replanting of trees, vines or other deep-rooted crops may begin 4 days later.

Metabrom 99 will not usually control weed seeds under very dry conditions. However, some control may be observed on deep-rooted perennials such as morningglory (bindweed) and rhizomes of Johnsongrass.

ON-TARP NEMATODE CONTROL

For control of nematodes (including Meloidogyne spp., Xiphinema spp., Criconemoides, ratylenchus, and Paratylenchus) on almonds, apples, apricots, cherries, citrus, grape vineyards, peaches, pecans, , sashies, plums, prunes, strawberries, tomatoes and olives.

Soil Preparation: Plow or rip the soil to a depth of which effective treatment is desired. The soil should be worked until free of clods or large lumps. Residue from previous crops should be worked into the soil to allow for decomposition prior to fumigation. Soil moisture should be optimum for seed germination. For best results soil should be moist for at least four days prior to treatment. Do not fumigate if the soil temperature is below 50°F.

Exposure: For best results, fumigate when soil temperature is 80°F. to 90°F. at the depth of 6 inches. Use the higher labeled rates for truck and heavy clay soils.

Rate and Method of Application: This is a preplant or replant treatment. Do not apply where trees or vines will bear harvestable fruit within 24 months. A waiting period of at least 14 days should be observed between application and planting. Methods and rate of application are as follows:
Chisel Application: After the soil has been properly prepared, inject 400-872 pounds

**TABLE I
METABROM 99 SOIL FUMIGATION USES**

Treatment Site	Rate (lbs/A)	Exposure Time
Field Soils to be Planted to		
Tomato	180-240	24-48 hrs
Strawberry	180-240	24-48 hrs
Citrus & Deciduous fruits & Nuts (non-food)	400-870 ¹	24-48 hrs
Nursery Soils		
Turf	180-435	24-48 hrs.
Ornamentals	180-435	24-48 hrs.
Forest Tree Seedlings	180-435	24-48 hrs.
Strawberry (non-food)	180-435	24-48 hrs
Greenhouse Soil (non-food crops, for Tomatoes, see rate above)	180-435	24-48 hrs
Seed or Transplant Beds (non-food)	180-435	24-48 hrs.
Tobacco	872	24-48 hrs.
Planting Mix	19/Cu Yd.	24-48 hrs.
¹ Deep injection application		
² Typical application		

**TABLE II
METABROM 99**

APPLICATION SUMMARY FOR STRUCTURAL PEST CONTROL AND OTHER SITES¹

Treatment Site	Pests	Rate (lb/1000 cu. ft.)		Exposure
		Volume	Design	
Commercial structures, Garages and Barns	termites, (dry-wood & dampwood), powder post beetles, silverfish, powder post beetle, death watch beetle, carpenter ants, rats, mice	Less than 100,000 cu. ft.	1-3 lb	24 hrs.
		100,000-500,000 cu. ft.	1 1/2-1 lb	24 hrs.
		500,000-1,000,000 cu. ft.	1-1 1/2 lb	24 hrs.
Warehouses (empty) Feed Rooms (empty) Grain Bins (empty) Barns, Boxes and Crates (empty)	cockroaches, rats, mice, confused flour beetle, rice weevil, granary weevil, saw toothed grain beetle, rusty grain beetle, lesser grain borer, cadelle, Khapra beetle, drugstore beetle, larger beetle, carpet beetle, capra beetle, coffee bean weevil, groundnut bruchid, common bean weevil, dried fruit beetle, golden spider beetle, Australian spider beetle, cigarette beetle, angoumois grain moth, Mediterranean flour moth, weevil, Indian meal moth, common grain mite	4-5 cu. ft.	12-18 hrs.	24 hrs.
		30	24 hrs.	24 hrs.
		30	24 hrs.	24 hrs.
		1 1/2-3 lb	24 hrs.	24 hrs.
		2-3 lb	2 hrs.	2 hrs.
Furniture	termites, (dry-wood & dampwood), bedbugs, cockroaches, silverfish, powder post beetle, death watch beetle, carpenter ants, clothes moth, cigarette beetle, drugstore beetle, carpet beetle	1-3 lb	24 hrs.	24 hrs.
		2-3 lb	2 hrs.	2 hrs.
Lumber and Wood Products	termites (dry-wood & dampwood), powder post beetle, round and flat headed borers, carpenter ants and bark beetles	1-3 lb	24 hrs.	24 hrs.
		2-3 lb	2 hrs.	2 hrs.
Greenhouses (empty)	mealybugs, scale insects and mites	30	4 hrs.	24 hrs.
Mushroom houses (empty)	mushroom flies	20	24 hrs.	24 hrs.
Poultry Houses (empty)	poultry mites, bedbugs	20	24 hrs.	24 hrs.
Baled Tobacco	drugstore beetle, cigarette beetle, tobacco beetle, tobacco moth	2-3 lb	48-72 hrs.	4 hrs.
Baled Cotton	pink bollworm, boll weevil	30 lb	24 hrs.	24 hrs.
		40 lb	2 hrs.	2 hrs.
Poultry houses (empty)	poultry mites, bedbugs	20	24 hrs.	24 hrs.

¹All temperatures below 80°F., increase the dosage by 1/2 pound per 1,000 cu. ft. for every 10°F. drop in temperature or use an automatic temperature controller to heat the fumigant. Do not fumigate when temperature is below 50°F.

²Atmospheric
³Vacuum Chamber (25-27)
NOTE: Remove food and feed commodities before fumigating dwellings.



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When soil is dry, cut and remove grass, plants and debris. Rip soil to a depth of 36 inches and disc to smoothness.

Dosage and Method of Application: This is a preplant or replant treatment. Crops which are planted in this treated soil will not bear harvestable fruit for a period of at least 24 months. Methods and dosage of application are as follows. See Table I.

1. **Non-Tarp Chisel Application.** After the soil has been properly prepared inject 400-870 pounds of Metabrom 99 per acre by chisel applications with 2 chisels spaced 66 inches apart to a depth of 24-30 inches. For non-tarp applications be sure to properly seal the chisel line which may be accomplished by the following equipment modifications.

Weld a wing behind the chisel 2 to 4 inches above the chemical outlet to break the chisel mark. Place the shovel behind the chisel at the soil surface to push dirt into the upper chisel mark. Follow with a cone-shaped press wheel with a shovel to pull additional soil into the chisel line. This is followed by a flat roller to press the soil even with the adjacent soil surface. This treatment will treat a strip 96 inches wide.

2. **Tarp Chisel Application.** After the soil has been properly prepared, apply 400-870 pounds of fumigant per acre by chisels spaced 48-66 inches apart and cover with adequate polyethylene film seal.

3. **Deep Injection Auger-Probe Treatment.** Use one pound of Metabrom 99 in light soils (two pounds in fine-textured soils) to a depth of 36 inches or more below the soil surface. Assume one injection site per 100 square feet (on a 10 ft. x 10 ft. grid pattern) with the injection in the center of the area to be treated.

Exposure and Aeration Period:

1. To insure the proper time-concentration relationship to control oak root fungus for chisel applications, we recommend a seven day exposure period before removing the polyethylene film cover, and a one day interval with Deep Injection Auger-Probe Treatment after which planting or replanting of trees, vines or other deep-rooted crops may begin 14 days later.

2. Metabrom 99 will not usually control weed seeds under very dry conditions. However, some control may be observed on deep-rooted perennials such as morningglory (bindweed) and rhizomes of Johnsongrass.

C. NON-TARP NEMATODE CONTROL

For control of nematodes (including *Meloidogyne* spp., *Xiphinema* spp., *Crictonemoides*, *Pratylenchus*, and *Paratylenchus*) on almonds, apples, apricots, cherries, citrus, grape vineyards, peaches, pecans, pistachios, plums, prunes, strawberries, tomatoes and walnuts.

Pretreatment Soil Preparation: Plow or rip the soil to a depth of which effective treatment is required. The soil should be worked until free of clods or large lumps. Residue from previous crops should be worked into the soil to allow for decomposition prior to fumigation. Soil moisture should be optimum for seed germination. For best results soil should be kept moist for at least four days prior to treatment. Do not fumigate if the soil temperature is below 50°F.

For best results, fumigate when soil temperature is 60°F. to 90°F. at the depth of 6 inches. Use the higher labelled rates for muck and heavy clay soils.

Dosage and Method of Application: This is a preplant or replant treatment. Do not apply to soil where trees or vines will bear harvestable fruit within 24 months. A waiting period of at least 14 days should be observed between application and planting. Methods and dosage of application are as follows:

1. **Chisel Application.** After the soil has been properly prepared, inject 400-872 pounds of Metabrom 99 per acre by chisel application with 2 chisels spaced 66 inches apart to a depth of 24-30 inches. For non-tarp applications be sure to properly seal the chisel line which may be accomplished by the following equipment modifications. Weld a wing behind the chisel 2 to 4 inches above the chemical outlet to break the chisel mark. Place a shovel behind the chisel at the soil surface to push dirt into the upper chisel mark. Follow with a cone-shaped press wheel with a shovel to pull additional soil into the chisel line. This is followed by a flat roller to press the soil even with the adjacent soil surface. This treatment will treat a strip 96 inches wide.

2. **Deep Injection Auger-Probe Treatment.** Use one pound of Metabrom 99 per injection site in lighter soils; two pounds of Metabrom 99 in fine textured soils. Use one injection site per 100 square feet (on a 10 ft. x 10 ft. grid pattern) with the injection in the center of the area to be treated. Tamp or compact the soil at the point of injection.

Metabrom 99 used with a tarp will not usually control most weed seeds. However, some control may be observed on deep-rooted perennials such as morningglory (bindweed) and rhizomes of Johnsongrass.

Baled Cotton	100000 lbs., 1000000 cu. ft.	3000	24 hrs
	pink bollworm, boll weevil	4000	2 hrs
Poultry houses (empty)	poultry mites, bedbugs	20	24 hrs

*At temperatures below 60°F., increase the dosage by 1/2 pound per 1,000 cu. ft. for every 10°F., drop in temp., re-ture or use an amount appropriate to heat the fumigant. Do not fumigate when temperature is below 50°F.

†Atmospheric.
 ‡Vacuum Chamber (25-27)
 NOTE: Remove food and feed commodities before fumigating dwellings



Warranty: Seller warrants that the product conforms to its chemical description and is reasonably fit for the purpose stated on the label when used in accordance with directions under normal conditions of use, but neither this warranty nor other warranty of MERCHANTABILITY or FITNESS FOR A PARTICULAR PURPOSE, express or implied, extends to the use of this product contrary to label instructions or under abnormal conditions, or under conditions not reasonably foreseeable to seller, and buyer assumes the risk of any such use. Buyer assumes all risks of use, storage or handling of this material not in strict accordance with directions given here-with.

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ATTACHMENT A

COMMERCIAL STRUCTURE FUMIGATION DIRECTIONS (Pest Control Operators Only)

(DO NOT USE ON DWELLING OR RESIDENTIAL STRUCTURES THAT CAN BE INHABITED BY PEOPLE.)

When used for fumigation of commercial structures, two persons trained in the use of this product must be present during introduction of the fumigant, initiation of aeration, and after aeration when testing for reentry.

The structures to be fumigated are made gas-tight using a tarpaulin which has been staked and/or earth mounds placed on the ends of the tarpaulin. Area to be fumigated is calculated and the Metabrom introduced. Structures are to be posted showing date of fumigation. Aerate according to directions below.

Subterranean termites in tunnels will not be controlled unless gas is introduced into those areas by a special procedure.

Insects Controlled: Termites, wood borers, and any other insects (cockroaches, spiders) in gas-tight fumigated dwelling. Metabrom will control all insects and trapped rodents within the treated structure.

Dosage Rate: See Table II and Product Manual No. AM-210.

Remove the following materials from building before fumigation as they may develop undesirable odors: furs, high protein flour and cereals, horsehair articles, iodized salt, patent leather articles, rubber goods, sulfur containing compounds or synthetic detergents.

See Product Manual No. AM-210 and Table II for specific dosage per 1,000 cu. ft., pests controlled and exposure time.

ACCEPTED
with COMMENTS
in EPA Letter Dated

Under the Federal Insecticide, Fungicide, and Rodenticide Act as amended, for the pesticide registered under EPA Reg. No.

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Aeration and Reentry:

At the end of the exposure period, after all tarpaulins or seals are removed from the structure, open all interior and exterior doors, windows, and vents that are operational. No person shall be allowed to reenter the structure unless wearing protective clothing and a NIOSH/MSHA approved self-contained breathing apparatus (SCBA) or combination air-supplied/SCBA respirator until the following criteria are met:

1. A) If non-mechanical or natural ventilation is used, the structure must be aerated for a minimum of seven days from the time the tarpaulins are removed.

B) After aeration is completed, the level of methyl bromide in the structure must be measured using a gas detector device with a minimum detection limit of 3 ppm for methyl bromide. Measurements must be taken from an interior electrical outlet by inserting the detection device in the ground receptacle, or from other enclosed space within the wall on an interior and a perimeter wall; and

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C) (i) The level of methyl bromide is less than 3 ppm from each area measured; or

(ii) If the level of methyl bromide is 3 ppm or greater, the structure shall be aerated for an additional 24 hours. At the end of the 24 hour period, the level of methyl bromide must be measured from the areas previously sampled. These procedures must be repeated until the level of methyl bromide is below 3 ppm.

2. If mechanical aeration is used:

A) For structures without attics, an aeration fan(s) must be inserted in a window or other exterior opening and sealed so that the air inside the structure is exhausted out of the structure. The aeration fan(s) must be capable of displacing 5,000 cubic feet of air per minute. To facilitate aeration, exterior openings, such as windows, vents, or an access door to the subarea, should be utilized. The structure must be aerated with the fan(s) operating for a minimum of 72 hours;

B) After aeration is completed, the level of methyl bromide in the structure must be measured using a gas detector with a minimum detection limit of 3 ppm for methyl bromide. Measurements must be taken from an interior electrical outlet by inserting the detection device in the ground receptacle, or from other enclosed space within the wall on an interior and a perimeter wall; and

C) (i) The level of methyl bromide is less than 3 ppm from each area measured; or

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(ii) If the level of methyl bromide is 3 ppm or greater, the structure must be aerated for an additional 12 hours. At the end of the 12 hour period, the level of methyl bromide must be measured from the areas previously sampled. These procedures must be repeated until the level of methyl bromide is below 3 ppm.

3. A) For structures with attics, an aeration fan must be inserted in the attic access door and a window or other exterior opening, and both sealed so that air inside the structure is exhausted outside the structure. The aeration fans must be capable of displacing a minimum of 5,000 cubic feet of air per minute. To facilitate aeration, exterior openings, such as windows, vents, or an access door to the subarea should be utilized. The structure must be aerated with the fans operating for a minimum of 72 hours;

B) After aeration is completed, the level of methyl bromide in the structure must be measured using a gas detector device with a minimum detection limit of 3 ppm for methyl bromide residues. Measurements must be taken from within an interior electrical outlet by inserting the detection device in the ground receptacle, or other enclosed space within an interior and a perimeter wall; and

C) (i) The level of methyl bromide is less than 3 ppm from each area measured; or

(ii) If the level of methyl bromide is 3 ppm or greater, aeration must continue for an additional 12 hours. At the end of

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the 12 hour period, the level of methyl bromide must be measured from the areas previously sampled. These procedures must be repeated until the level of methyl bromide is below 3 ppm.

4. For structures with basements, in addition to the requirements of paragraphs 1, 2, and 3 above, the windows, vents, and interior doors of the basement must be open, and

A) After aeration is completed, the level of methyl bromide in the basement must be measured using a gas detector device with a minimum detection limit of 3 ppm for methyl bromide residues. A measurement must be taken from an interior electrical outlet by inserting the detection device in the ground receptacle, or from other enclosed space within the wall on an interior wall. In the absence of an interior wall, a measurement must be taken of the ambient air in the basement; and

B) (i) The level of methyl bromide is less than 3 ppm; or

(ii) If the level of methyl bromide is 3 ppm or greater, the structure must be aerated for an additional 24 for natural ventilation or an additional 12 hours for mechanical aeration. At the end of the additional ventilation period, the level of methyl bromide must be measured from the area in the basement previously sampled. These procedures must be repeated until the level of methyl bromide is below 3 ppm.

The applicator must obtain a Fact Sheet and have the customer understand and sign before application is made. For instructions regarding the Fact Sheet see AM 21G.

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**STRUCTURAL FUMIGATION FACT SHEET
AM-220**

Draft

**ACCEPTED
with COMMENTS
in EPA Letter Draft**

JUL 8 1963

Under the Federal Insecticide,
Fungicide, and Rodenticide Act as
amended, for the pesticide
registered under EPA Reg. No.

8622-17

**AMERIBROM, INC.
52 Vanderbilt Avenue
New York, New York 10017
(212) 286-4000**

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Structural Fumigation Fact Sheet

A. The applicator must obtain a structural fumigation fact sheet which has been signed by, and provided to, the following persons:

(1) an adult occupant of a single family dwelling prior to the parties entering into a fumigation agreement,

(2) (A) The owner, manager, or designated agent of the building for multiple-family dwellings, provided he or she acknowledges in writing to the applicator that a copy of the Structural Fumigant Fact Sheet has been provided to an adult occupant of each unit prior to the parties entering into a fumigation agreement; or

(B) An adult occupant of each unit in a multiple family dwelling prior to the parties entering into a fumigation agreement, or

(3) the owner, manager, or designated agent for all structures or businesses other than family dwellings,

B. The Structural Fumigation Fact Sheet shall state:

The purpose of this handout is to inform the consumer of possible health hazards associated with the use of the structural fumigant, methyl bromide. To make sure you have been given an opportunity to read this, applicators are required to obtain the signature of the owners and occupants of property to be fumigated with methyl bromide. You will also be given a copy of this fact sheet to keep.

Structural Fumigants: Methyl Bromide

ATTENTION

Read This Fact Sheet Completely Before Signing

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Fumigation involves the introduction of poisonous gases into every part of the structure, including inside the walls. Because overexposure to these gases can be harmful to people, your building will be ventilated before you will be allowed to return.

This fact sheet provides basic information about the structural fumigant, methyl bromide, as well as information about why and how buildings are fumigated, methyl bromide health risks, how to know if you are exposed, ways to minimize your exposure, and several phone numbers to call for more information.

New rules for structural fumigation have substantially increased the time between fumigant use and the time an occupant is allowed back into the building. Post-fumigation ventilation has also been improved significantly. These changes should be adequately protective, but you should know some basic facts about structural fumigants.

Why Buildings Are Fumigated - Houses and other structures are fumigated to kill insect pests living in walls or wood. There are sometimes other ways to deal with these pests, and building owners should investigate them. However, fumigation is sometimes the only method for handling extensive infestations of wood-destroying insects. You can discuss the possibility of alternatives with your pest control company.

Why Buildings Are Fumigated - There are two pesticides used for structural fumigations: methyl bromide and sulfuryl fluoride (known by the trade name, Vikane.) Each has advantages and disadvantages in terms of their effectiveness in killing pests

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which professional fumigators can discuss with you. Your fumigator should also provide you with a list of items you need to remove from your home before the fumigation starts.

Methyl bromide is a gas. Before fumigation starts, the building to be fumigated is completely sealed and covered with a tarp to keep the gas in the building so it can penetrate wood to kill the pests. The tarp is left on for one to two days. Warning signs are posted around the building notifying people to keep out because the levels of the pesticide in the building during fumigation can kill a person.

After the tarp is removed, a professional fumigator will go into the building wearing a compressed air tank and mask and open the doors and windows. Powerful fans may also be set up to pull fresh air into the building.

It is now required that buildings fumigated with methyl bromide be aired out for a minimum of 72 hours after the tarp is removed. Then, the fumigators are required to measure the levels of methyl bromide inside the walls of buildings to make sure they are below three parts per million before you are allowed to go back in.

The ventilation procedures make it unlikely that any remaining fumigant in the living space will be a health hazard after the house is cleared for reoccupancy. However, you should be aware of the symptoms of overexposure to methyl bromide, since it is sensible to be cautious when dealing with a potentially hazardous chemical.

Small pockets of fumigant can remain in dead air space between walls and inside cabinets, and in porous material such as furniture, and may enter into the living space for a few days after fumigation. That's why a mandatory aeration period is required after the tarp is removed. Your building should not be cleared for reoccupancy until it is safe for you to reenter.

How Do You Know Whether You Are Exposed - Methyl bromide is a colorless, odorless gas, so a warning agent is added which causes watery eyes and a scratchy throat. If you experience these symptoms in a building that has been recently fumigated, you should leave immediately and call the pest control company to have your building retested. You should also consult with your physician.

Methyl Bromide Health Risks - Methyl bromide enters your body as a gas when you breathe it. Exposure which may occur from touching treated surfaces is insignificant.

Nervous system, eyes, and respiratory irritations:

Overexposure to methyl bromide can cause blurred vision, headache, and nausea. At higher concentrations, it can cause tremors, sleepiness, convulsions, pneumonia, and excess fluid in the lungs. These symptoms may not appear for 12 to 24 hours. If you experience these symptoms in a recently fumigated building, you should leave immediately and call the pest control company to have the building retested. You should also call your personal physician. Physicians are encouraged to report suspected pesticide-related illnesses to EPA.

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Birth defects: In recent animal studies, methyl bromide caused birth defects when pregnant animals were exposed under experimental conditions. There is no evidence that methyl bromide affects human reproduction, although some chemicals which cause birth defects in animals may also cause birth defects in humans. Any person, including pregnant women, should avoid unnecessary exposure.

Other effects: It is not known whether long-term exposure to methyl bromide causes cancer. Experiments in animals are underway to study this, although tests so far are negative. However, even if methyl bromide were shown to cause cancer over a lifetime of exposure in animals, it is unlikely that your exposure from the one-time fumigation of your building would be high enough to cause a significant risk of cancer.

Ways To Reduce Your Exposure If You Are Having Your Building Fumigated -

- o Carefully evaluate all your pest control alternatives.
- o Talk over your treatment program in advance with the pest control company, so you fully understand what will be done, and what you need to do.
- o Carefully follow the instructions you are given about items you are to remove from your building.
- o Stay out of the treated building for at least three days after the tarp is removed. If you have additional concerns, you may choose to be away for an extra period of time after the building is cleared for reoccupation.

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- o If you are interested or concerned, you can ask your pest control company to show you the records of the air monitoring it did before your building was cleared for reoccupation.
- o You may wish to increase ventilation by opening doors and windows.
- o If you have symptoms of exposure, or you believe that the aeration was not done properly, you should leave the building and contact the pest control company and your physician. You may also wish to call one of the phone numbers listed below.

For information about pesticides, the U.S. Environmental Protection Agency has a toll-free information service, the National Pesticide Telecommunications Network Hotline, which can be reached at 1 (800) 858-7378.

In a medical emergency, call 911, or contact the nearest Poison Control Center. See "Crisis Hotlines" listed near the front of the white pages in your phone book.

If you feel uncomfortable entering the structure, or if you do not fully understand the potential hazards, you should call the company that performed the fumigation:

Name: _____

Address: _____

City: _____

Telephone: _____

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I acknowledge receiving a copy of this methyl bromide fact sheet. (You will sign one copy for the company doing the fumigation, and get a second copy to keep for later reference.)

Signature: _____ Date: _____

Please print your name here: _____

Your address: _____

FOR FUMIGATION OF COMMERCIAL STRUCTURES, THESE DIRECTIONS SUPERSEDE ANY OTHER DIRECTIONS ON THE LABEL CONCERNING AERATION AND REENTRY

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Division of Pesticide Control, U.S. Environmental Protection Agency

Draft

**MANUAL FOR THE SAFE HANDLING
AND APPLICATION OF METHYL BROMIDE
PRODUCTS**

NO. AM - 210

AmeriBrom, Inc.

52 VANDERBILT AVENUE, NEW YORK, N.Y. 10017
TELEPHONE: (212) 263-4000
FAX: (212) 266-4475

ACCEPTED
with COMMENTS
in EPA Letter Docket

JUL 8 1988

Under the Federal Insecticide,
Fungicide, and Rodenticide Act as
amended, for the pesticide
registered under EPA Reg. No.

8622-17
[Faint, mostly illegible text]

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LIST OF AMERIBROM LABELED METHYL BROMIDE FORMULATIONS

PRODUCT NAME	EPA LABEL NO. 8622-	ACTIVE INGREDIENTS MBR - CHLOROPICRIN		USE
Methyl Bromide Grain Fumigant a	5	100		Grain Fumigant
Metabrom 98 a	6	98	2 c	Soil Fumigant
98-2	12AA	98	2 c	Soil Fumigant
67-33	13AA	67	33 d	Soil Fumigant
70-30 a	14	68.6	1.4 b,c	Soil Fumigant
75-25	15AA	75	25 d	Soil Fumigant
Metabrom 100	16AA	100		Grain, Space & Structural Fumigation.
Metabrom 99	17AA	99.65	.25 c	Soil, Empty Space and Structural Fumigation
50-50	39AA	50	50	Soil Fumigant
57-43	40AA	57	43	Soil Fumigant
Metaprin	43		100	Soil Fumigant
80-20	44	80	20	Soil Fumigant
90-10 a	50	89.5	1.8	Soil Fumigant
Methyl Bromide	15298-4-AA	100		Technical Product for Manufacturing

- a. Not for use in California
- b. Formulation also contains 30% solvent.
- c. Chloropicrin added as a warning odorant (tear gas).
- d. Chloropicrin added as a complimentary active ingredient.

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DIRECTIONS FOR THE SAFE HANDLING AND APPLICATION

Methyl Bromide is marketed as a liquidified gas under pressure in cylinders and in 1 and 1-1/2 pound cans. Methyl Bromide is a fumigant of wide use because of a high rate of diffusion and penetration into soil, space, sacks and packaged material where its broad spectrum pesticidal activity is fully expressed.

**GENERAL WARNINGS AND LIMITATIONS
FOR
AMERIBROM LABELED METHYL BROMIDE FORMULATIONS:
METABROM 100 AND METHYL BROMIDE GRAIN FUMIGANT**

**METABROM 99, METABROM 98, 98-2 AND 70-30
(METHYL BROMIDE WITH UP TO 2% CHLOROPICRIN)**

75-25, 67-33, 90-10 and 80-20

**(METHYL BROMIDE AND CHLOROPICRIN AS ACTIVE INGREDIENTS)
METAPICRIN (CHLOROPICRIN) IS ALSO MARKETED
HAZARDS TO HUMANS & DOMESTIC ANIMALS**

**DANGER
HIGH ACUTE TOXICITY**

Extremely hazardous liquid and vapor under pressure. Do not breathe vapor. Inhalation may be fatal or cause serious acute illness or delayed lung or nervous system injury. Liquid or vapor can cause serious skin or eye injury which may have a delayed onset. Do not get liquid on skin, in eyes or on clothing.

If the product is 100% methyl Bromide, the vapor is odorless and non-irritating to the skin and eyes during exposure. Exposure to toxic levels may occur without warning or detection by the user.

If the product contains up to 2% chloropicrin as a warning agent, note that chloropicrin may be irritating to the upper respiratory tract, and even at low levels can cause painful irritation to the eyes, producing tearing. If these symptoms occur, leave the fumigation area immediately.

NOTE TO PHYSICIAN: Early symptoms of overexposure are dizziness, headache, nausea and vomiting, weakness and collapse. Lung edema may develop in 2 to 48 hours after exposure, accompanied by cardiac irregularities: these effects are the usual cause of death. Repeated overexposure can result in blurred vision, staggering gait and mental imbalance, with probable recovery after a period of no exposure. Blood bromide levels suggest the occurrence, but not the degree of exposure. Treatment is symptomatic.

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ENVIRONMENTAL HAZARDS: This pesticide is toxic to wildlife. Do not discharge effluent containing this product into lakes, streams, ponds, estuaries, oceans, or public waters unless this product is specifically identified and addressed in an NPDES permit. Do not discharge effluent containing this product in sewer systems without previously notifying the sewage treatment plant authority. For guidance contact your State Water Board or Regional Office of the EPA.

PHYSICAL HAZARDS: Do not use or store near heat, open flames, or sparking electrical equipment.

CHEMICAL HAZARDS: Do not use application devices incorporating natural rubber or aluminum or magnesium or their alloys.

NOTE: If the product contains more than 2% chloropicrin as an active ingredient in addition to methyl bromide, note that the vapor of this volatile-liquid tear gas is very irritating to the upper respiratory tract, and even at low levels can cause painful irritation to the nose and throat, and to the eyes, producing tearing. If these symptoms occur, leave the fumigation area immediately. Continued exposure may cause painful irritation to the eyes or temporary blindness, which may cause panic that may in turn lead to further accidents.

THE PHYSICIAN SHOULD NOTE THAT: Early symptoms of overexposure, in addition to those noted above, are intense lachrimation and irritation of mucous membranes.

STATEMENT OF PRACTICAL TREATMENT

In all cases of overexposure, get medical treatment immediately. Take person to a doctor or emergency treatment facility.

If inhaled - Get exposed person to fresh air. Keep warm. Make sure person can breathe freely. If breathing has stopped apply artificial respiration. Do not give anything by mouth to an unconscious person.

If on skin - Immediately remove contaminated clothing, shoes, jewelry, and any other item on skin. Wash contaminated skin area thoroughly with soap and water.

If in eyes - Hold eyelids open and flush with a steady, gentle stream of water for at least 15 minutes.

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SEE THE PRODUCT LABEL FOR ADDITIONAL PRECAUTIONARY STATEMENTS
CHEMTREC (800) 424-9300

OR

AMERIBROM, INC.
52 VANDERBILT AVENUE, NEW YORK, N.Y. 10017
CALL COLLECT: (212) 286-4000

**RESTRICTED USE PESTICIDE
Due To Its Acute Toxicity**

It is for retail sale to and use only by Certified Applicators or persons under their direct supervision, and only for those uses covered by the Certified Applicator's certification.

DIRECTIONS FOR USE

It is a violation of Federal Law to use this product in a manner inconsistent with its labeling.

USE LIMITATIONS

Extremely hazardous liquid and vapor under pressure. Inhalation may be fatal or cause serious acute illness or delayed lung, nerve or brain injury. Do not breathe vapor. Liquid or vapor can cause serious skin or eye injury which may have delayed onset. Do not get liquid on skin, in eyes or on clothing. Wear full-body clothing that is cleaned after each wearing or disposable protective clothing. Do not wear gloves or boots when handling. Methyl bromide is heavier than air and may be trapped inside and cause skin injury. If full-face respiratory protection is not required, wear goggles or full face shield for eye protection when handling liquid. Do not reuse contaminated clothing or shoes until cleaned. Use only with adequate ventilation when applied to structures and for stored commodity fumigation. Keep children and animals away from areas under treatment. Wear a self contained breathing apparatus (SCBA) or combination air-supplied/SCBA respirator jointly approved by the Mining Enforcement and Safety Administration (MSHA) and by the National Institute for Occupational Safety and Health (NIOSH) under the provision of 30 Code of Federal Regulations part 11.

Fumigated areas must be placarded on all entrances with signs containing at least the signal word DANGER and the "Skull and Crossbones" and the words "Area under fumigation, do not enter until completely aerated", the date of fumigation, name of fumigant used, emergency telephone number for contact and the name and address of the fumigator. Do not remove warning signs until area is completely aerated and safe for entry, as indicated by a suitable detector.

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Before entering fumigated buildings and structures, determine the presence or absence of harmful concentrations of Methyl Bromide gas with a Draeger or Matheson - Kitagawa detector tube.

The threshold limit value (TLV) for methyl bromide is 5 parts per million (ppm) (the concentration below which personal protective devices are not required for persons entering or within a hazardous environment). Persons not wearing protective equipment should not enter the fumigated area until monitoring devices show methyl bromide concentrations of 5 parts per million or less.

For Ameribrom, Inc., formulations of methyl bromide with chloropicrin, i.e. 75-25, 67-33, 80-20 and 90-10, note that the TLC's of neither methyl bromide (5 ppm or 20 mg/m³) nor chloropicrin (0.1 ppm or 0.7 mg/m³) should be exceeded. Refer to the section Protective Equipment, on p. 39 of this manual for use directions for detectors and respiratory equipment.

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FUMIGATION FOR COMMERCIAL STRUCTURES

Aeration and Reentry:

At the end of the exposure period, after all tarpaulins or seals are removed from the structure, open all interior and exterior doors, windows, and vents that are operational. No person shall be allowed to reenter the structure unless wearing protective clothing and a NIOSH/MSHA approved self-contained breathing apparatus (SCBA) or combination air-supplied/SCBA respirator until the following criteria are met:

1. A) If non-mechanical or natural ventilation is used, the structure must be aerated for a minimum of seven days from the time the tarpaulins are removed.

B) After aeration is completed, the level of methyl bromide in the structure must be measured using a gas detector device with a minimum detection limit of 3 ppm for methyl bromide. Measurements must be taken from an interior electrical outlet by inserting the detection device in the ground receptacle, or from other enclosed space within the wall on an interior and a perimeter wall; and

C) (i) The level of methyl bromide is less than 3 ppm from each area measured; or

(ii) If the level of methyl bromide is 3 ppm or greater, the structure shall be aerated for an additional 24 hours. At the end of the 24 hour period, the level of methyl bromide must be measured from the areas previously sampled. These procedures must be repeated until the level of methyl bromide is below 3 ppm.

2. If mechanical aeration is used:

A) For structures without attics, an aeration fan(s) must be inserted in a window or other exterior opening and sealed so that the air inside the structure is exhausted out of the structure. The aeration fan(s) must be capable of displacing 5,000 cubic feet of air per minute. To facilitate aeration, exterior openings, such as windows, vents, or an access door to the subarea, should be utilized. The structure must be aerated with the fan(s) operating for a minimum of 72 hours;

B) After aeration is completed, the level of methyl bromide in the structure must be measured using a gas detector with a minimum detection limit of 3 ppm for methyl bromide. Measurements must be taken from an interior electrical outlet by inserting the detection device in the ground receptacle, or from other enclosed space within the wall on an interior and a perimeter wall; and

C) (i) The level of methyl bromide is less than 3 ppm from each area measured; or

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(ii) If the level of methyl bromide is 3 ppm or greater, the structure must be aerated for an additional 12 hours. At the end of the 12 hour period, the level of methyl bromide must be measured from the areas previously sampled. These procedures must be repeated until the level of methyl bromide is below 3 ppm.

3. A) For structures with attics, an aeration fan must be inserted in the attic access door and a window or other exterior opening, and both sealed so that air inside the structure is exhausted outside the structure. The aeration fans must be capable of displacing a minimum of 5,000 cubic feet of air per minute. To facilitate aeration, exterior openings, such as windows, vents, or an access door to the subarea should be utilized. The structure must be aerated with the fans operating for a minimum of 72 hours;

B) After aeration is completed, the level of methyl bromide in the structure must be measured using a gas detector device with a minimum detection limit of 3 ppm for methyl bromide residues. Measurements must be taken from within an interior electrical outlet by inserting the detection device in the ground receptacle, or other enclosed space within an interior and a perimeter wall; and

C) (i) The level of methyl bromide is less than 3 ppm from each area measured; or

(ii) If the level of methyl bromide is 3 ppm or greater, aeration must continue for an additional 12 hours. At the end of

the 12 hour period, the level of methyl bromide must be measured from the areas previously sampled. These procedures must be repeated until the level of methyl bromide is below 3 ppm.

4. For structures with basements, in addition to the requirements of paragraphs 1, 2, and 3 above, the windows, vents, and interior doors of the basement must be open, and

A) After aeration is completed, the level of methyl bromide in the basement must be measured using a gas detector device with a minimum detection limit of 3 ppm for methyl bromide residues. A measurement must be taken from an interior electrical outlet by inserting the detection device in the ground receptacle, or from other enclosed space within the wall on an interior wall. In the absence of an interior wall, a measurement must be taken of the ambient air in the basement; and

B) (i) The level of methyl bromide is less than 3 ppm; or
(ii) If the level of methyl bromide is 3 ppm or greater, the structure must be aerated for an additional 24 for natural ventilation or an additional 12 hours for mechanical aeration. At the end of the additional ventilation period, the level of methyl bromide must be measured from the area in the basement previously sampled. These procedures must be repeated until the level of methyl bromide is below 3 ppm.

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Structural Fumigation Fact Sheet

A. The applicator must obtain a structural fumigation fact sheet which has been signed by, and provided to, the following persons:

(1) an adult occupant of a single family dwelling prior to the parties entering into a fumigation agreement,

(2) (A) The owner, manager, or designated agent of the building for multiple-family dwellings, provided he or she acknowledges in writing to the applicator that a copy of the Structural Fumigant Fact Sheet has been provided to an adult occupant of each unit prior to the parties entering into a fumigation agreement; or

(B) An adult occupant of each unit in a multiple family dwelling prior to the parties entering into a fumigation agreement, or

(3) the owner, manager, or designated agent for all structures or businesses other than family dwellings,

B. The Structural Fumigation Fact Sheet shall state:

The purpose of this handout is to inform the consumer of possible health hazards associated with the use of the structural fumigant, methyl bromide. To make sure you have been given an opportunity to read this, applicators are required to obtain the signature of the owners and occupants of property to be fumigated with methyl bromide. You will also be given a copy of this fact sheet to keep.

Structural Fumigants: Methyl Bromide

ATTENTION

Read This Fact Sheet Completely Before Signing



Fumigation involves the introduction of poisonous gases into every part of the structure, including inside the walls. Because overexposure to these gases can be harmful to people, your building will be ventilated before you will be allowed to return.

This fact sheet provides basic information about the structural fumigant, methyl bromide, as well as information about why and how buildings are fumigated, methyl bromide health risks, how to know if you are exposed, ways to minimize your exposure, and several phone numbers to call for more information.

New rules for structural fumigation have substantially increased the time between fumigant use and the time an occupant is allowed back into the building. Post-fumigation ventilation has also been improved significantly. These changes should be adequately protective, but you should know some basic facts about structural fumigants.

Why Buildings Are Fumigated - Houses and other structures are fumigated to kill insect pests living in walls or wood. There are sometimes other ways to deal with these pests, and building owners should investigate them. However, fumigation is sometimes the only method for handling extensive infestations of wood-destroying insects. You can discuss the possibility of alternatives with your pest control company.

Why Buildings Are Fumigated - There are two pesticides used for structural fumigations: methyl bromide and sulfuryl fluoride (known by the trade name, Vikane.) Each has advantages and disadvantages in terms of their effectiveness in killing pests

which professional fumigators can discuss with you. Your fumigator should also provide you with a list of items you need to remove from your home before the fumigation starts.

Methyl bromide is a gas. Before fumigation starts, the building to be fumigated is completely sealed and covered with a tarp to keep the gas in the building so it can penetrate wood to kill the pests. The tarp is left on for one to two days. Warning signs are posted around the building notifying people to keep out because the levels of the pesticide in the building during fumigation can kill a person.

After the tarp is removed, a professional fumigator will go into the building wearing a compressed air tank and mask and open the doors and windows. Powerful fans may also be set up to pull fresh air into the building.

It is now required that buildings fumigated with methyl bromide be aired out for a minimum of 72 hours after the tarp is removed. Then, the fumigators are required to measure the levels of methyl bromide inside the walls of buildings to make sure they are below three parts per million before you are allowed to go back in.

The ventilation procedures make it unlikely that any remaining fumigant in the living space will be a health hazard after the house is cleared for reoccupancy. However, you should be aware of the symptoms of overexposure to methyl bromide, since it is sensible to be cautious when dealing with a potentially hazardous chemical.

Small pockets of fumigant can remain in dead air space between walls and inside cabinets, and in porous material such as furniture, and may enter into the living space for a few days after fumigation. That's why a mandatory aeration period is required after the tarp is removed. Your building should not be cleared for reoccupancy until it is safe for you to reenter.

How Do You Know Whether You Are Exposed - Methyl bromide is a colorless, odorless gas, so a warning agent is added which causes watery eyes and a scratchy throat. If you experience these symptoms in a building that has been recently fumigated, you should leave immediately and call the pest control company to have your building retested. You should also consult with your physician.

Methyl Bromide Health Risks - Methyl bromide enters your body as a gas when you breathe it. Exposure which may occur from touching treated surfaces is insignificant.

Nervous system, eyes, and respiratory irritations:

Overexposure to methyl bromide can cause blurred vision, headache, and nausea. At higher concentrations, it can cause tremors, sleepiness, convulsions, pneumonia, and excess fluid in the lungs. These symptoms may not appear for 12 to 24 hours. If you experience these symptoms in a recently fumigated building, you should leave immediately and call the pest control company to have the building retested. You should also call your personal physician. Physicians are encouraged to report suspected pesticide-related illnesses to EPA.



Birth defects: In recent animal studies, methyl bromide caused birth defects when pregnant animals were exposed under experimental conditions. There is no evidence that methyl bromide affects human reproduction, although some chemicals which cause birth defects in animals may also cause birth defects in humans. Any person, including pregnant women, should avoid unnecessary exposure.

Other effects: It is not known whether long-term exposure to methyl bromide causes cancer. Experiments in animals are underway to study this, although tests so far are negative. However, even if methyl bromide were shown to cause cancer over a lifetime of exposure in animals, it is unlikely that your exposure from the one-time fumigation of your building would be high enough to cause a significant risk of cancer.

Ways To Reduce Your Exposure If You Are Having Your Building Fumigated -

- o Carefully evaluate all your pest control alternatives.
- o Talk over your treatment program in advance with the pest control company, so you fully understand what will be done, and what you need to do.
- o Carefully follow the instructions you are given about items you are to remove from your building.
- o Stay out of the treated building for at least three days after the tarp is removed. If you have additional concerns, you may choose to be away for an extra period of time after the building is cleared for reoccupation.

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- o If you are interested or concerned, you can ask your pest control company to show you the records of the air monitoring it did before your building was cleared for reoccupation.
- o You may wish to increase ventilation by opening doors and windows.
- o If you have symptoms of exposure, or you believe that the aeration was not done properly, you should leave the building and contact the pest control company and your physician. You may also wish to call one of the phone numbers listed below.

For information about pesticides, the U.S. Environmental Protection Agency has a toll-free information service, the National Pesticide Telecommunications Network Hotline, which can be reached at 1 (800) 858-7378.

In a medical emergency, call 911, or contact the nearest Poison Control Center. See "Crisis Hotlines" listed near the front of the white pages in your phone book.

If you feel uncomfortable entering the structure, or if you do not fully understand the potential hazards, you should call the company that performed the fumigation:

Name: _____

Address: _____

City: _____

Telephone: _____

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I acknowledge receiving a copy of this methyl bromide fact sheet. (You will sign one copy for the company doing the fumigation, and get a second copy to keep for later reference.)

Signature: _____ Date: _____

Please print your name here: _____

Your address: _____

FOR FUMIGATION OF _____ COMMERCIAL STRUCTURES, THESE DIRECTIONS SUPERSEDE ANY OTHER DIRECTIONS ON THE LABEL CONCERNING AERATION AND REENTRY

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LIMITATIONS OF USE ON COMMODITIES

Commodities Unsuitable for Methyl Bromide Fumigations. The following is a list of materials which should not be exposed to methyl bromide:

1. Foodstuffs
 - a. Iodized salt stabilized with Sodium Hyposulfite.
 - b. Full fat soya flour.
 - c. Certain baking sodas, cattle licks (i.e., salt blocks) or other foodstuff containing reactive sulfur compounds.

NOTE: Never exceed the recommended dosage or exposure period for food or foodstuff commodities. Prior to repeated fumigation, have the food commodity analyzed for inorganic bromide residues.

2. Seeds, Bulbs and Plants
 - a. Seeds and bulbs to be used for planting. *
 - b. Nursery stock and other living plants. *
3. Pets
(All pets, including fish and birds.)
4. Rubber Goods
 - a. Sponge rubber.
 - b. Foam rubber, as in pillows, cushions, mattresses, and some car seats.
 - c. Rubber stamps and other similar forms of reclaimed rubber.

* For specific information on procedures to prevent commodity injury, contact Ameribrom, Inc., or the experts of the United States Department of Agriculture.

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5. Furs
6. Horsehair
7. Feathers
(Especially in feather pillows.)
8. Leather goods
(Particularly white or other leather goods tanned with sulfur processes).
9. Woolens
(Extreme caution should be used in the fumigation of Angora woolens. Some adverse effects have been noted on woolen socks, sweaters, shawls and yarn.)
10. Viscose Rayon
Those rayons processed or manufactured by a process in which carbon bisulfide is used.
11. Vinyl
12. Paper
 - a. Silver polishing papers
 - b. Certain writing and other papers cured by sulfide processes.
 - c. Photographic prints and blueprints stored in quantity.
 - d. Carbonless carbon paper
 - e. Blueprint papers
13. Cellophane**
14. Photographic Chemicals
(Darkroom chemicals, but not camera or film.)
15. Rug padding
Foam rubber, felt, etc.
16. Cinder Blocks
17. Mixed Concrete
(Occasionally picks up odors)
18. Mixtures of mortar and/or soil used for chinking log cabins.
**In the event of uncertainty about the possible presence of reactive sulfur compounds, conduct a trial fumigation of a small quantity of the material in question.

19. Charcoal

(Note: Methyl bromide is readily absorbed by charcoal. This may not only contaminate such materials but may reduce the concentration of the gas in the fumigated area to the point of ineffectiveness.)

**GENERAL WARNINGS AND LIMITATIONS
PREPLANT SOIL TREATMENT OF FOOD CROPS**

When fumigating soil, observe these precautions:

Drivers of application equipment must advise other workers of all precautions and procedures. In addition, drivers must instruct their helpers in the mechanical operation of the tractor and how to safely work with the tractor and driver while fumigating. Handle this fumigant in the open, with the operator upwind from the container where there is good ventilation.

Always have adequate clean water available to wash skin and/or flush eyes. When fumigating soil from a tractor, 5 gallons of water must be carried on the tractor and placed where it is readily accessible. In addition to water available on the tractor, at least 5 gallons of additional water must be available from the service truck. The water must be drinkable but in containers marked "WATER NOT FOR DRINKING".

Check fumigant pressure system for leaks before beginning operation.

Do not lift injection shanks to turn at end of a pass until fumigant has drained from system following closure of shutoff valve.

Trash pulled by the shanks to the end of the field when fumigating must be covered by lifting the shanks, then covering the trash with polyethylene film before making the turn for the next pass.

In case of a rupture of hose or fitting while applying fumigant, immediately stop tractor and motor. Get off tractor and get to a place where the problem can be observed without exposure to fumes. Approach from upwind with respiratory protection if required, and make necessary repairs.

When changing the cylinders be certain they are turned off and fumigant system is not under pressure. Do not open the system when there are people or structures downwind.

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Post all treated areas with warning signs as follows;

PLACARDING OR POSTING REQUIRED

(Check with local authorities in your state concerning the need to post fumigated areas).

The applicator must placard or post all entrances to the fumigated area with signs bearing, in English and Spanish:

1. The signal work DANGER/PELIGRO and the skull and crossbones symbol.
2. The statement, "Area under fumigation, DO NOT ENTER/ NO ENTRE"
3. The date of fumigation.
4. Name of fumigant used.
5. Name, address, and telephone number of the applicator.

Do not remove a placard until the treated commodity is completely aerated. To determine whether aeration is complete, each fumigated site or vehicle must be monitored and shown to contain less than 5 ppm methyl bromide in the air space around and, when feasible, in the mass of the commodity. If less than 5 ppm methyl bromide is detected, the placard may be removed. However, if 5 ppm or greater methyl bromide is detected, the placard must be transferred with the commodity to the new site. Workers who transfer or handle incompletely aerated commodity must be informed and appropriate measures must be taken (i.e. ventilation or respiratory protection) to prevent exposures from exceeding 5 ppm or greater methyl bromide.

Keep all animals, children and unauthorized people away from area under fumigation during the exposure period and during removal of tarpaulin.

Fumigation with methyl bromide and/or chloropicrin sometimes slows down the rate of nitrification (the conversion to nitrates from ammonia by bacterial action). Certain ammonia-sensitive plants such as tomatoes may suffer growth inhibition or stand reduction when planted in fumigated soils containing high amounts of ammonia nitrogen. Accumulation of ammonium is most likely to occur when maximum rates of fumigant and fertilizer are applied to soils that are acidic, wet, cold or high in organic matter. To lessen this hazard, at least one-half and preferable all the nitrogen fertilizer added immediately before or soon after fumigation should be in the form of nitrate nitrogen. This hazard may also be reduced by delaying planting until several months after fumigation if a nitrate form of nitrogen such as sodium or calcium nitrate is not readily available. Ammonium nitrate used sparingly will supply the nitrogen needed without risk. Phosphorous, potassium and other plant nutrients should be used according to soil needs.

Application should be made several months prior to planting to soils high in organic matter such as muck, compost, and heavily manured soils since they seem more likely to undergo some changes (possible effect on micro organisms) resulting in poor growth.

Do not treat very cold (below 50° F i.e., 10° C), very wet, or dry soils.

Be sure treated plots are free from gas before planting seed or setting out plants. If there is doubt as to complete aeration, working the soil after treatment will aid, particularly when the soil is cool and/or wet.

Do not contaminate fumigated areas by walking from unfumigated soil. Clean your shoes thoroughly if this is necessary. If the treated bed is in a location where flooding or washing is possible after rains, plow a furrow or make a trench around the treated area for proper drainage. Wooden frames around the beds are also satisfactory for preventing this type of contamination.

Do not allow domestic animals to feed on crop residues unless a tolerance exists for such use.

Do not feed hay or straw treated directly or harvested from treated soils to any animal.

Undesirable concentrations of chloropicrin following soil fumigation with this material may drift to nearby areas. If this occurs, immediately cover treated area with a plastic tarpaulin. The tarpaulins should remain in place overnight and be removed during the daytime. If the escaping vapors reach an undesirable concentration, as indicated by eye irritation, the treated areas should be recovered. Since air movement assists the dilution of the escaping fumes it is most likely that undesirable concentrations will build up during evening or nights when air is static. Application of this material should not be made when there is little or no air movement or when there is an inversion.

SOIL PREPARATION AND TREATMENT

PREPLANT SOIL PREPARATION

Plow or rip the soil to a depth to which effective treatment is required. The soil should be worked until free of clods or large lumps. Residue from previous crops should be worked into the soil to allow for decomposition prior to fumigation. Soil moisture should be optimum for seed germination. Coarse textured soils can be fumigated with higher moisture content than fine textured soils. For best results, soil should be kept moist for at least 4 days prior to treatment. Do not fumigate if the soil temperature is below 50° F (10° C). For best results, fumigate when soil temperature is 60° to 80° F (15.6° to 26.7° C) at the depth of 6 to 8 inches.

Soil Fumigation Methods

Use one of the following preplant methods:

1. Chisel method for applying broadcast or row, bed or strip application (suitable for light, non-compacted soils):

a. Overall field fumigation, using a chisel type applicator, inject the product with the chisels spaced no more than 12 inches apart. Inject the fumigant to a depth of 6 to 8 inches below the soil surface. The soil surface must be covered immediately after treatment with simultaneous film laying equipment or by sealing with a roller or a cultipacker and covered immediately with simultaneous film laying equipment or other suitable cover.

b. Row or Bed or Strip Application

Row or bed applications may be made at the broadcast rates but the amount used will be proportionately less per acre depending on row spacing and width of treatment in the row or bed. Injection of fumigant should be approximately 4" below surface of the bed but not deeper than the bed itself. Application should be made by a mechanical mulch layer or suitable bed pressing equipment with the mulch layer following immediately afterward. Attention should be given to insuring chisel marks are sealed by pressure to avoid fumigant escape until mulch is laid.

2. Raised tarp fumigation method:

Support the center of the cover to provide a small gas dome. Inflated plastic bags, crumpled fertilizer bags, burlap bags stuffed lightly with hay or straw, inverted baskets, flowerpots or bottles placed in the soil may be used for support. Evaporating pans are essential for the volatilization and uniform distribution of fumigant. Shallow pans or basins made of plastic or tinned sheet metal are satisfactory for this purpose.

- a) Use 1 evaporator pan for each 300 to 400 square feet of area.
- b) Anchor one end of each polyethylene tube into an evaporating pan with tape or a suitable weight. This insures that the liquid will be directed into the evaporating pan.
- c) Extend the free ends of the polyethylene tubes outside of the area to be covered.
- d) After the supports and tubing are in place, cover the area to be fumigated with a gasproof cover of polyethylene or coated fabric film.
- e) Position the cover with its edges in a prepared furrow or trench.
- f) Seal 6 to 10 inches of the outside edges with dirt. Tamp the dirt down so edges will not pull loose.
- g) Attach a polyethylene tube to the cylinder valve outlet and open. Use a cylinder dispenser or scale to meter small amounts.

3. Tree site injector method (suitable for light, non-compacted soils): Insert injector into soil to a depth of 18 inches or more. Tamp soil lightly around injector. Release entire dose for 100 square feet site. Move away from injector until all fumigant has been released, then remove injector and seal hole with tamped soil.

4. Augering method (suitable for use in non-compacted or lightly stratified soils): Dig hole 3 to 5 feet deep with auger and, if necessary back-fill hole to provide a final depth of 3 feet. Insert applicator tube or probe. Fill hole and release entire dosage for 100 square foot site. When fumigant has been completely released, remove applicator and tamp or compact hole with soil or cover site with polyethylene tarp for 7 days.

5. Back-Hoe method (especially suitable in highly compacted, hard pan soils): In stratified soils dig a trench 5 feet deep, 6 feet long and as wide as the hoe; in deeply compacted soil, prepare a site the size of the area in which the tree is to be grown. Back-fill with 2 feet of soil, place applicator outlet at the 3-foot level and complete back-fill. Release entire dose for 100 square feet, remove applicator and tamp soil lightly over opening to seal fumigant in the site.

6. Hot gas method: Apply hot gas after carefully preparing soil. The method consists of using a commercially manufactured heat exchanger or a copper coil immersed in a vessel containing hot water, to vaporize the fumigant before introduction under a polyethylene cover. This method is especially suitable for treating greenhouses or in general where large amounts of fumigant are required and rapid vaporization is advantageous.

Exposure and Aeration Periods: In general expose for 24 hours when temperature is above 60 F (15.6 C) and for 48 hours when temperature is between 50 to 60 F (10.0 to 15.6 C). After the exposure, aerate soil for 3-7 days before seeding or 5 to 14 days before setting our vegetative growth. If odor of fumigants persists at the end of aeration period, disc or plough the soil to assist aeration.

INSTRUCTIONS FOR CONTROLLING SPECIAL SOIL PROBLEMS

For the control of Armillaria Root Rot (Armillaria melea) on Deciduous Fruits and Nuts, Citrus and Vineyards

Pretreatment Soil Preparation: To obtain the maximum control of Armillaria melea, soil must be dry to a depth requiring treatment. This can be accomplished by: a) planting sudangrass in the

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spring, irrigating until the grass has established itself, then withholding further irrigation; b) by naturally allowing plants to grow without irrigation. When soil is dry, cut and remove grass, plants and debris. Rip soil to a depth of 36 inches and disc to smoothness.

Methods of Application: This is a preplant or replant treatment. Do not apply to soil where trees or vines will bear harvestable fruit within 24 months. Methods of application are as follows:

1. Non-tarp Chisel Application

After the soil has been properly prepared, inject dosage by chisel application with chisels spaced 48 to 66 inches apart to a depth of 24 to 30 inches. In the row, bed or strip, treatments may be made by using a single shank. Chisels should have a wing welded on the back 2 to 4 inches above the chemical outlet to partially break the chisel mark. To fill in the chisel mark and seal the surface, disc and ringroll immediately after fumigant injection. Be sure that the disc and ringroller cover an area sufficiently beyond the chisel lines to effect a good seal.

2. Tarp Chisel Application.

After the soil has been properly prepared, apply dosage by chisels spaced 48 to 66 inches apart and cover with adequate polyethylene film seal.

3. Deep injection Auger-Probe Treatment

Use 1 pound active per injection site in light soils (2 pounds in fine-textured soils) to a depth of 36 inches or more below the soil surface. Use 1 injection site per 100 square feet (on a 10 feet by 10 feet grid pattern) with the injection in the center of the area to be treated.

Exposure and Aeration Period:

To insure the proper time-concentration relationship to control Armillaria root rot, expose for 7 days before removing the polyethylene film cover after chisel applications, and expose for a 1 day interval with deep injection auger-probe treatment. Planting or replanting of trees, vines or other deep-rooted crops may begin 14 days after the period of exposure.

For Non Tarp Nematode Control on Deciduous Fruits and Nuts, Citrus and Vineyards

Pretreatment Soil Preparation:

Plow or rip the soil to the depth to which effective treatment is required. The soil should be worked until free of clods or large lumps. Residue from previous crops should be worked into the soil to allow for decomposition prior to fumigation. To insure

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maximum fumigant penetration, the soil at the point of injection should not contain more than 5 to 15 percent moisture depending on soil type. However, to improve sealing, the soil surface may be moistened by means of a sprinkler application of 0.25 to 0.5 inch of water prior to final penetration and application. Avoid treatment of soils that contain more than 30 percent clay or those with high organic content. For best results, fumigate when the soil temperature is 60° to 80° F (15.6° to 26.7° C) at the depth of 6 inches. Do not fumigate when soil temperature is below 50° F (10.0° C).

Method of Application:

This is a preplant or replant treatment. Do not apply to soil where trees or vines will bear harvestable fruit within 24 months. A waiting period of at least 14 days should be observed between application and planting. Method of application are as follows.

1. Chisel Application

After the soil has been properly prepared, inject fumigant with chisel spaced up to 66 inches apart to a depth of 24 to 30 inches. In the row, band or strip, treatments may be made by using a single shank. Chisels should have a wing welded on the back 2 to 4 inches above the chemical outlet to partially break the chisel mark. To fill in the chisel mark and seal the surface, disc and rigroll immediately after fumigant injection. Be sure that the disc and ringroller cover an area sufficiently beyond the chisel lines to effect a good seal.

2. Deep Injection Auger-Probe Treatment

Use 1 pound active per injection site in lighter soils; 2 pounds in fine textured soils. Use 1 injection per 100 square feet (on a 10 feet by 10 feet grid pattern) with the injection in the center of the area to be treated. Tamp or compact the soil at the point of injection.

Treating Compost or Piles of Soil

General Warnings and Limitations:

Fumigation should take place outdoors or in a well ventilated area away from desired plants or occupied buildings. The material to be treated should have a temperature of 60° F (15.6° C) or above, be loose, and moist enough for good seed germination. To insure a good seal, pile the material to a depth of 19 inches on a concrete floor or wet ground. Piles 2-3 feet high can also be treated provided perforations are made in the pile surface at one foot intervals to assist penetration.

Once the pile has been made, install supports to hold the cover a few inches above the pile surface to aid in proper fumigant diffusion. Place the outlet of the applicator tube or tubes in

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evaporating pans spaced about 30 feet apart on the pile surface. Cover with a polyethylene sheet of 1 mil or greater but not less than 1 mil. Seal the edges by burying, covering with moist sand or soil or by means of sand-filled tubes. (sand snakes). Introduce the fumigant into the evaporating pans as a liquid or by means of the hot gas method. Aerate for 24-72 hours before planting.

FOR GREENHOUSE FOOD CROP

GENERAL WARNINGS AND LIMITATIONS

The use of methyl bromide in confined spaces presents a potential hazard to humans and plant life. Special precautions must be made in order that these potential hazards be minimized. It is the responsibility of the individual supervising the fumigation operation to see that all safety precautions below are strictly observed.

- 1) Before the fumigation operation commences, the supervisor of the fumigation job shall have conducted proper training of all personnel involved in the fumigation (includes use of safety equipment) removed all persons from the area not directly involved in the fumigation, and inspected the equipment to insure proper aeration.
- 2) If a wind is blowing, all injection should be made upwind from a previous injection site. Immediately after injection of the fumigant and tarping, a qualified person wearing protective equipment, should monitor the area to detect leaks. If excessive leaks are found, the source of the leak should be resealed immediately.
- 3) During this operation, all windows and doors should be open and fans operating to maximize ventilation. Fumigated areas must be placarded on all entrances with signs containing at least the signal word DANGER and the "SKULL and CROSSBONES", and the words "Area under fumigation, do not enter until completely aerated" the date of fumigation, name of fumigant used, emergency telephone number for contact and the name and address of the fumigator. Do not remove warning signs until area is completely aerated and safe for entry, as indicated by a suitable detector. Exposure time should be 24 to 48 hours.

Refer To: General warnings and limitations for preplant soil treatment of food crop. P. 22

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GENERAL WARNINGS AND LIMITATIONS FOR INDOOR FUMIGATION

For structural fumigation:

At temperatures below 60°F (15.6°C) increase the dosage by 0.5 pound per 1000 cubic feet for every 10 F (5.6° C) drop in temperature or use an approved procedure to heat the fumigant. Do not fumigate when temperature is below 50°F (10.0°C).

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Claims for control of stored product pests and structural pests will also control rats and mice. When rodenticide claim is solely the object of fumigation, dosages are usually lower.

Overdosing, overexposure or repeated fumigation of food or feedstuff commodity should be avoided. When the prior history is not known, or in those instances where a repeated fumigation is necessary, the commodity should be analyzed for inorganic bromide residues before fumigation to make certain the proposed treatment will not result in residues that will exceed the tolerances established. Special care must be exercised to determine that methyl bromide fumigation of commodities such as animal feeds, flour, dried eggs, dried figs, dried milk, nuts, meats and meat products will not result in residues in excess of established tolerances. When used for fumigation of enclosed spaces, 2 persons trained in the use of methyl bromide must be present at all times during introduction of the fumigant, testing, and aeration periods.

Stored Commodity/Product Fumigation Methods

Unless otherwise specified in the use paragraph, use one of the following methods.

1. Chamber Fumigation

Load the chamber with the material to be fumigated, close exhaust ports, turn on circulating fan and close chamber door. Determine the proper rate of application and exposure time. Vaporize the liquid in the chamber by spraying it into the air stream in front of a blower or fan, passing it through a vaporizer, or allowing it to evaporate from a shallow pan. Before introducing the fumigant, place warning signs and a red warning light on the door. Two people wearing full-faced gas masks with an approved NIOSH/MSHA self-contained breathing apparatus (SCBA or combination air-supplied) are required when introducing the fumigant and opening the door after fumigation. All controls should be outside the chamber. At the end of the exposure period, aerate by opening the exhaust port, turning on the exhaust fan and opening the chamber door slightly to permit fresh air to enter.

Always check completeness of aeration with detection devices before allowing unprotected persons to enter the chamber.

2. Vacuum Chamber Fumigation

- a) Place material to be fumigated in the steel chamber and draw the desired vacuum.
- b) Release fumigant into the chamber (usually through a heating unit to insure complete vaporization).
- c) At the end of the exposure time, release the vacuum and change the air in the chamber at least 2 times. A vacuum of 15 inch mercury should be drawn for this purpose.

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3. Truck, Van or Trailer Fumigation - Closed Top Conveyances

- a) Seal the off-side door, ventilators and other openings from the inside.
- b) Use a closed-ended, perforated tube to distribute fumigant evenly. Secure the tube to the ceiling so the perforations direct fumigant toward the floor and prevent it from spraying the ceiling. Always apply fumigant from outside the truck, van or trailer.
- c) Seal the door and place warning signs on both sides of the truck, van or trailer. Fumigated areas must be placarded on all entrances with signs containing at least the signal work DANGER and the "Skull and Crossbones" and the words "Area under fumigation, do not enter until completely aerated", the date of fumigation, name of the fumigant used, emergency telephone number for contact, and the name and address of the fumigator. Do not remove warning signs until the fumigated area is completely aerated and safe for entry, as indicated by a suitable detector. See directions for placarding or posting given previously. p. 20.
- d) Do not fumigate while strong winds are blowing.
- e) After 12 to 18 hours, open the unit and aerate 1 to 1.5 hours. The truck, van or trailer may then be resealed for shipment.
- f) Advise consignee to check the truck, van or trailer for proper aeration on arrival. Do not move trucks, vans or trailers during fumigation. They must be completely aerated before movement is allowed.

4. Truck, Van or Trailer Fumigation - Top Conveyances

- a) Park trailer or van out of traffic area - if possible on the lee side of a building to protect from winds.
- b) Roll back the protective tarpaulin to expose the bulk grain or other commodity.
- c) Prepare a gas expansion dome by placing several cardboard boxes, empty 5-gallon pails or other propping materials on the top of the load down the center line. These props should be high enough to support the tarpaulin 12 to 18 inches at the center line above the grain or commodity surface after replacement.
- d) Place 2 shallow, plastic or non aluminum metal, containers on the center line grain surface of the load at points 0.3 and 0.6 the distance from the front of the conveyance. Direct into and firmly attach with tape one end of a 0.25 inch I.D. polyethylene applicator hose into each evaporating container to prevent liquid methyl bromide from contacting the commodity. Hand the other end of each hose over the side of the conveyance down to approximate waist height from the ground. The ends of the hose should have a brass fitting for attaching to the applicator.

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- e) Pull the tarpaulin back over the load, covering the props thereby creating the gas expansion dome. Do not tie down the tarpaulin but leave sufficient room to tape the gasproof cover to the conveyance sides below the edges of the tarpaulin.
- f) With the 4 or 6 mil polyethylene or other gasproof cover, completely over-cover the protective tarpaulin to extend down the sides of the container. Clean the containers of dirt and grease. With two-inch masking tape, seal the entire edge of the gasproof cover to the sides and ends of the container, below the tarpaulin, leaving the ends of the 2 applicator hoses exposed for attaching the applicator.
- g) Do not occupy truck cabs, van cabs or trailer attached tractor cabs during exposure and aeration periods. Lock the cab doors during the exposure and aeration periods.
- h) CLEAR THE IMMEDIATE WORKING AREA OF ALL UNAUTHORIZED PERSONNEL. Release one-half of the recommended dosage through each of the applicator tubes, from the applicator. Methyl bromide boils at 39 F (3.8 C).
- i) Following release of the methyl bromide and disconnection from the applicator, tape the open end of the applicator hose with masking tape and fasten the hose to the side of the conveyance.
- j) Using a Draeger detector, check for fumigant leaks at all taped margins and at the floor of the conveyance. Seal any point where methyl bromide is leaking.
- k) Securely attach the proper methyl bromide fumigation warning placards to each side and to the ends of the conveyance during the fumigation and aeration period.
- l) Do not move the vans, trucks and trailers during the exposure period of 12 to 24 hours. At the end of the exposure period, working in a well-ventilated area and from ground level only, unseal the taped edges and remove the gasproof cover. Also working from ground level only, starting with the downwind end first, peel back the protective tarpaulin cover toward the center of the container to expose the commodity load surface at each end. Do not remove warning placards until aeration has been completed.

UPON COMPLETION OF THE AERATION PROCEDURE, THE PROFESSIONAL FUMIGATOR IS RESPONSIBLE FOR THE RELEASE OF THE CONVEYANCE AND COMMODITY.

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5. Railroad Car Fumigation

- a) Car should be placed on seldom used trackage or siding so that it will not have to be moved while under fumigation.
- b) Methyl bromide must always be applied from outside the railroad car by means of a 0.25 inch copper or plastic tubing attached to a special puncturer can or to a methyl bromide cylinder. The tube may be introduced into the car through a hole drilled in the floor near the center of the car or through some other convenient hole such as a crack in the door or some roof opening. The discharge end of the tube should be secured near the ceiling at the center of the car. This may be accomplished by fastening the tube to a pole, stick or some other support that may be propped up to hold the end of the tube near the ceiling. The discharge end of the tube is plugged and a hole drilled through the opposite walls of the tube about 1 to 2 inches below the tip to permit escape of the methyl bromide mist above the commodity load and toward the opposite ends of the car.
- c) All car openings should be carefully sealed. Particular attention should be given the space around doors, the eaves, and the floor. During application and fumigation, all openings used to introduce the gas tube should be tightly sealed around the tube. Any holes bored through the car structure should be of a minimum size and carefully sealed following fumigation. Masking tape, caulking compound or greased paper may be used as sealing materials.
- d) Post warning signs conforming to Department of Transportation or as described on p. on both doors before applying methyl bromide.
- e) Methyl bromide may be applied by using special measuring devices that can be attached to the cylinders. Always wear safety glasses when working with methyl bromide.
- f) After application of the proper dosage, withdraw the tubing and seal the hose used for application. Keep the car sealed for 12 to 18 hours. A Draeger detector may be used to check sealed areas for leaks. The fumigated car should not be moved during the exposure period.
- g) At the end of the fumigation period, open all doors and vents to allow as much air circulation as possible. It will usually require about 30 minutes to aerate a car after fumigation, but this must be determined by the use of a Draeger detector. Keep all persons out of the car during fumigation and aeration and until such time as a suitable detector shows no methyl bromide present. Only then is it safe to enter the car without respiratory protection.

6. Grain Elevator Fumigation

The recirculation method is best for grain elevator fumigation since it allows more time for gas penetration in high resistance areas.

- a) Seal structure carefully, using masking tape for small openings and polyethylene sheeting secured with masking tape for large openings.
- b) Fumigated areas must be placarded on all entrances with signs containing at least the signal word DANGER and the "Skull and Crossbones" and the words "Area under fumigation, do not enter until completely aerated", the date of fumigation, name of the fumigant used, emergency telephone number for contact, and the name and address of the fumigator. Do not remove warning signs until the fumigated area is completely aerated and safe for entry, as indicated by a suitable detector.
- c) Use the rate and exposure time shown in site entries for specific grains to be treated.
- d) Fumigate by using a fan or blower to recirculate the methyl bromide through the perforated pipes or ducts at the bottom of the bin, up through the return duct or discharge the fumigant through polyethylene tubing in the head space at intervals of 100 feet or less.
- e) Check periodically for leaks with a Draeger detector.
- f) To aerate after fumigation, disconnect return air at the fan and discharge into outside air. Continue aeration until suitable detector shows the fumigant has dissipated. Use Draeger detector to check the elevator head space for possible pockets of methyl bromide.

7. Tarpaulin Fumigation

- a) Arrange the stacks, gas expansion dome, tubing and evaporating pans and tarpaulin. Follow these directions:

The stack: Stacks of stored commodities usually can be fumigated where they stand as long as the tarpaulin is large enough to cover the stack completely. Be sure to allow for a tarpaulin margin of at least 2 feet around the stack when the cover is laid over it. The stack should be on a concrete floor or other airtight surface. Where floors are not airtight (such as on a loading dock) cracks should be caulked or otherwise sealed to prevent escape of the fumigant. Sisal kraft paper, tar paper, or additional tarpaulin laid on the floor under the material to be fumigated will provide a satisfactory seal.

The gas expansion dome: Center 4 or more sacks upright on top of the stacked material to form a gas expansion dome. This facilitates gas distribution.

The tubing and evaporating pans: Copper, polyethylene,

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or saran tubing is used to inject the gas near the center of the expansion dome. The outlet of this tubing should be fastened to an evaporating pan to prevent liquid methyl bromide from dripping on the commodity being fumigated, or splashing on the tarpaulin.

The tarpaulin: Water-proofed canvas tarpaulins are not satisfactory. Before spreading the tarpaulin, sweep around the stack to provide a clean surface for sealing. Unroll or unfold the tarpaulin over the stack, providing a margin on the floor of 2 or 3 feet. Run the applicator tubing out from under the tarpaulin at a corner which should be folded. Seal the tarpaulin by weighting it down with a row of bagged material or sand-filled tubes. (Canvas or plastic tubing about 4 inches in diameter may be used for these sandsnakes).

- b) Once the above preparations are completed, fumigation can be done. Attach the applicator tubing to the cylinder of methyl bromide. Place warning placards on tarpaulins under fumigation. These placards must be present during aeration. Leave the stack undisturbed for 24 hours after releasing the fumigant.

8. Shipboard, In Transit or Shiphold Fumigation

Shipboard, in transit ship or shiphold fumigation is also governed by United States Coast Guard Regulations. Refer to and comply with these regulations prior to fumigation.

Prefumigation Procedures

- a) Prior to fumigating a vessel for in transit cargo fumigation, the master of the vessel or his representative, and the fumigator must determine whether the vessel is suitably designed and configured so as to allow for safe occupancy by the ship's crew throughout the duration of the fumigation. If it is determined that the design and configuration of the vessel does not allow for safe occupancy by the ship's crew throughout the duration of the fumigation, then the vessel will not be fumigated unless all crew members are removed from the vessel. The crew members will not be allowed to reoccupy the vessel until the vessel has been properly aerated and a determination has been made by the master of the vessel and the fumigator that the vessel is safe for occupancy.
- b) The person responsible for the fumigation must notify the master of the vessel, or his representative, of the requirements relating personal to protection equipment, detection equipment and that a person qualified in the use of this equipment must accompany the vessel with cargo under fumigation. Emergency procedures, cargo

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- ventilation, periodic monitoring and inspections, and first aid measures must be discussed with and understood by the master of the vessel or his representative. Personal protection equipment means a self contained breathing apparatus (SCBA) or combined air-supplied/SCBA respirator approved jointly by the National Institute of Occupational Safety and Health (NIOSH) and the Mine Safety and Health Administration (MSHA).
- c) Fumigated areas must be placarded on all entrances with signs containing at least the signal word DANGER and the "Skull and Crossbones", and the words "Area under fumigation", name of the fumigant used, emergency telephone number for contact, and the name and address of the fumigator. Do not remove warning signs until the fumigated area is completely aerated and safe for entry, as indicated by a suitable detector.
 - d) During the fumigation or until a manned vessel leaves port or the cargo is aerated, the person in charge of the fumigation shall insure that a qualified person using gas or vapor detection equipment tests spaces adjacent to spaces containing fumigated cargo and all regularly occupied spaces for fumigation leakage. If leakage of the fumigant is detected, the person in charge of the fumigation shall take action to correct the leakage, or shall inform the master of the vessel or his representative of the leakage so that corrective action can be taken.
 - e) If the fumigation is not completed and the vessel aerated before the manned vessel leaves port, the person in charge of the vessel shall insure that at least 2 units of personal protection equipment and 1 gas or vapor detection device, and a person qualified in their operation be on board the vessel during the voyage.

Precautions and Procedures During Voyage

Using appropriate gas detection equipment, monitor spaces adjacent to areas containing fumigated cargo and all regularly occupied areas for fumigant leakage. If leakage is detected, the area should be evacuated of all personnel, ventilated, and action taken to correct the leakage, before allowing the area to be occupied. Do not enter fumigated areas except under emergency conditions. If necessary to enter a fumigated area, appropriate personal protection equipment must be used. Never enter fumigated areas alone. At least 1 other person, wearing personal protection equipment, should be available to assist in case of an emergency.

Precautions and Procedures During Discharge

If necessary to enter hold prior to discharge, test spaces directly above grain surface for fumigant concentration,

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using appropriate gas detection and personal safety equipment. Do not allow entry to fumigated areas without personal safety equipment, unless fumigant concentrations are at safe levels, as indicated by a suitable detector.

9. Warehouse, Structural* and Food Plant Fumigation

Check with appropriate municipal and county authorities before fumigating to be completely familiar with local regulations. Ordinances may require watchmen, padlocks, or warning posters during and after fumigation and/or notification of the nearest fire station. Notify anyone who would normally be in the area before fumigating. Several types of buildings can be fumigated with methyl bromide. Frame, metal and concrete buildings used for storage of agricultural products can be fumigated if they are in good repair and tight, or can be made tight by sealing or tarping. The buildings include packing plants, grain elevators, milling and baking plants, port warehouse grain storage buildings and coffee warehouses. Cement blocks pose a special problem because of their porous nature, but can be fumigated if an increased dosage and exposure time is allowed to compensate for the diffusion loss. There is no rule of thumb allowing for leakage. The applicator will have to exercise judgement from his observation of the building's condition.

- a) The most important part of the entire fumigation job lies in the preparation and sealing of the structure. The properties of penetration and diffusion that make methyl bromide an ideal fumigant also make it difficult to confine - and for that reason, a good sealing job is necessary. High winds, for example, increase fumigant loss and cause fumigant to drift to the leeward side of the building. Sealing of the building begins with the closing of all external openings to the building. Seal roof ventilators and chimneys by wrapping them with tarpaulin, or plastic sheet, or by stripping the screened openings with a wide commercial masking tape. Stairwells and interior doors should be closed. Any broken panes should be replaced, then exterior doors and windows should be wedged tight, locked, and cracks caulked or taped. Check for cracks in the floor, roof, and around eaves and seal them. Special care should be taken to seal partitions to adjacent storage or work areas in a building. Adjoining buildings sharing a common wall must be cleared of personnel, animals, and items that will react to methyl bromide or commodities which might be damaged by exceeding the established tolerances for inorganic bromide before fumigation.

*See page 6 for directions.

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If this is not feasible, spread a glossy type building paper, Sisal draft or asphalt laminated paper, plastic film or a heavily oiled kraft or wrapping paper to prevent spread of the fumigant into undesired areas. In all such cases where the adjoining building is occupied, it should be checked frequently with an appropriate detector during fumigation to insure the safety of the occupants. Check local regulations for specific requirements. Appearance, economy and ease of cleanup will probably determine your choice of sealing materials.

Where time and neatness are factors, masking tapes and commercial caulking compounds will probably justify their extra cost. It is possible, however, to make your own paste by combining lubricating oil and a low grade of flour.

Because methyl bromide gas can penetrate accumulations of trash and sweepings, necessary cleanups may be postponed until after the fumigation has been completed. It is recommended that all doors and hatches on milling machinery be opened. These include elevator boots and repair openings, conveyor lids, settling chamber doors and dust trunks. This also applied to reels, purifiers, sifters, shovels and bran dusters, feeder gates on rolls and purifiers as well as other openings that will facilitate the entrance of gas to the equipment. Dead spouts are particularly difficult to penetrate and should be opened before the fumigation.

- b) Dosage recommendations are made on the basis of cubic content. In square or rectangular buildings simply multiply the interior length by width by height. In irregular shaped buildings, find the cubic content of each unit, then add them together to find the total. In case of peaked roofs the average height between the sidewall and the top of the roof may be used as the third multiple in calculating the cubic content. In taking measurements, no deductions should be made for space occupied by machinery, commodities or furnishings. Exceptions to this rule apply to fresh fruits and vegetables.
- c) Cylinders should be placed by a two-man team, using a clipboard to map the location of each cylinder in the building. The cylinders should be arranged so that the fumigator will start releasing the gas on the top floor and continue walking away from the released gas in the direction of the exit as he opens each subsequent cylinder.
- As methyl bromide is heavier than air, it is advisable

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to overdose the top floor slightly. In all cases, the size of cylinder can quite naturally follow the needed dosage for that particular cubic space. Cylinders should be located within a room so as to do the best job of diffusion into all areas. Cylinders should be set in an upright position and the shipping caps removed. Again, since methyl bromide is heavier than air, in order to prevent stratification at the lower levels, it is sometimes advisable to attach standpipes (or curved pipes directed upward) to the cylinder valves. If standpipes are used, they should be equipped with T fittings to direct the gas laterally and prevent direct contact.

- d) At this point, a practice session should be undertaken to familiarize the operators with the location of each cylinder and the sequence in which it is to be discharged. With SCBA equipment at ready position, quickly open and close the cylinder valves to make certain they are in working order and thus avoid delay during the actual release. If fans are to be used, they should be strategically located and made ready to switch on or off from outside the building. One 16 inch fan for every 50,000 cubic feet of space will be sufficient. Quite often, however, it is possible to use heating fans or other installations already in the building. Extinguish all open flames and turn off all high temperature electrical equipment including laboratory ovens, pilot lights, gas refrigerators, oil burners, etc. Presence of intense heat from such sources may change methyl bromide to hydrobromic acid which may be injurious to commodities and equipment. Place warning signs on all entrances to the building. Have lights to illuminate warning signs plainly. Inform police, fire and health officials that a fumigation process is about to begin. Observe location of nearest telephone for use in case of emergency. Make sure fumigators can recognize early symptoms of methyl bromide intoxication and that the appropriate physicians and hospitals have been provided a copy of "First Aid & Treatment for Methyl Bromide Exposure". Arrangements should be made to seal and bar the building entrances as soon as the job is complete. Watchmen should take up their stations to prevent any admittance during the fumigation.
- e) At this point, SCBA equipment should be donned, carefully checked, and the cylinders opened. Under no circumstances should the operators be in the building

longer than 30 minutes in releasing the gas. If it is impossible for one crew to do it within this time period, additional experienced crews should be used. Two persons trained in the use of methyl bromide must be present at all times during introduction of the fumigant, testing and aeration periods. Thus, in case one should become incapacitated for any reason, such as an accidental fall that would result in an injury or unconsciousness, the other man could move him to fresh air. These men should always remain close to each other from the time they open the first cylinder until the time they leave the building together. While the first 2 are in the building, it is advisable to have 2 additional men, with SCBA equipment ready and waiting at the exit to aid if needed. When releasing fumigant, start on the top floor and work toward exits. Where there is a basement, the gas should be released there immediately prior to releasing the gas on the ground floor. One man should check off locations of each cylinder so none are missed. All fans should be running while the gas is being released and left running until uniform distribution has been accomplished, which should not require more than 30 minutes to 1 hour. After this the fans should be turned off.

- f) Once the exposure period is complete, aeration should be started by opening the previously prepared doors and windows on the ground floor. Where ventilators are accessible from the outside, they should also be opened at this time. The ground floor should be allowed to aerate until a Draeger detector shows that the methyl bromide concentration has diminished to 5 ppm or less. At this point, at least 2 men, wearing SCBA equipment should begin opening windows, starting at the bottom and working upward. These men should not try to open all windows on any single floor the first time through but should open only those windows that are necessary for thorough ventilation and return to the outside as soon as possible. They should not remain inside the building for prolonged periods (not more than 15 minutes). The fans should be turned on once again and allowed to run until aeration is complete. After the building has been partially aerated, the men again wearing masks, should open as many of the remaining windows as needed to complete the aeration. No one should be allowed inside the building without a suitable mask until all parts of the building have been checked with a Draeger detector for methyl bromide concentration. Once the aeration has been completed, usually 2 or 3 hours, the building can be returned to normal condition for operation. Where possible, it is advisable to leave in place such sealing as will not hinder operation and operations so that this sealing does not have to be replaced for future fumigations.

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10. Recirculation Method

With recirculation, dosages can be reduced as much as 50 percent to 70 percent below those recommended because of more efficient use of the fumigant. Bulletins are available for dose and use recommendations.

Exposure Period for Stored Commodity Fumigation:

Unless otherwise specified, expose the treated commodities for a period of 12 to 24 hours.

Fumigation of stored grain with moisture content above 14 percent may injure germination. Do not fumigate if grain moisture is high or if grain temperature is below 60°F (15.6°C) or if there is excessive dockage.

NOTICE: All data, including the procedures discussed herein are believed to be accurate and reliable, but are presented without guarantee or responsibility on the part of the seller. As use conditions are not within its control, seller does not guarantee results from use of its products or other information described herein. In as much as any assistance furnished by the seller with reference to the safe use and disposal of its products is provided without charge. Seller assumes no obligation or liability therefore, except to the extent that any such assistance shall be given in good faith.

Protective Equipment

The EPA requires respiratory protection for methyl bromide concentrations above 5 ppm (20 mg/m³). If this concentration is exceeded at any time, all persons in the fumigation area must wear a NIOSH/MSHA approved self-contained breathing apparatus (SCBA) or combination air-supplied/SCBA respirator.

A. Equipment to measure leaks and residue vapor at and following fumigation.

To measure the concentration of methyl bromide in the fumigated area to determine if safe entrance (less than 5 ppm concentration is present) can be made, we suggest one of the following measuring devices or other comparable device be used. Follow manufacturers recommendation for type of detector and directions for use.

- 1. Draeger Tube Methyl Bromide 3/a No. 6728211

Manufactured by:
National Draeger, Inc.
101 Technology Drive
P.O. Box 120
Pittsburg, PA. 15230
Tel. (412) 787-8383

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- 2. Matheson-Kitagawa Detector Tubes 8014-157 Sb

Distributed by:
Matheson Gas Products
932 Paterson Plank Rd.
East Rutherford, N.J. 07073
Branches through United States
Tel. (201) 933-2400

3. Halide Detector

This detector has been used by the methyl bromide fumigation industry for years. The use of the halide detector is limited today as the threshold detection limit is only 15 ppm.

B. Respiratory Protection

The EPA requires that if concentrations of 5 ppm are exceeded at any time in the working area, all persons in the fumigation area must wear a NIOSH/MSHA approved self-contained breathing apparatus (SCBA) or combination air supplied/SCBA respirators on the market. The following are names of several respiratory protection devices which can be purchased. The manufacturers should be contacted to determine the adequacy of the equipment. Follow the manufacturers recommendation for use, cleaning, storage, fitting, maintenance etc.

- 1. Survivair Mark 2 SCBA
30 minute LP series 9842
Manufactured by:
Survivair
A Division of U.S.D. Corp.
3323 West Warner Ave.
P.O. Box 25018
Santa Ana, CA. 92799-5018

Distributed by:
SCC Products
Soil Chemicals Corp.
P.O. Box 782
Hallister, CA. 95024
Tel. (408) 637-1992

- 2. Scott Air Pak II or 2.2 or 4.5
SCBA Equipment
Manufactured by:
Scott Areation
225 Erie Street
Lancaster, N.Y. 14086
Tel. (716) 683-5100

- 3. Custom 4500 or Netralite Air Mask with FHR harness
Manufactured by:
MSA
600 Perm Center Boulevard
Pittsburgh, Penn. 15235
Tel. 1-800-672-2222

METHYL BROMIDE TECHNICAL

Common name: Methyl Bromide
Chemical name: Bromomethane.
Empirical Formula: CH₃Br.

Physical Characteristics

Color: Colorless to light yellow.
Physical State: Gas at 25° C.
Odor: Odorless.
Melting Point: -94° C.
Boiling Point: 4° C (40° F)
Specific Gravity: 1.732 at 0° C.
Solubility: 1.75 g/100 ml H₂O at 20° C and 748 mm Hg; readily soluble in lower alcohols, ethers, esters, ketones, halogenated and aromatic hydrocarbons, and CS₂.
Vapor Pressure: 1400 mm Hg at 20° C.
Octanol/Water Partition Coefficient: log P = 1.19 (15.5:1)
Stability: Degrades by hydrolysis; 35-day half-life in soil.
Flammability: Nonflammable.
Explosibility: Nonexplosive.
Storage Stability: Stable indefinitely upon storage.
Corrosion Characteristics: Non-corrosive to metal containers; traces of water or acid may lead to corrosion of application equipment.

Use Profile

Type of Pesticide: Acaricide; Fungicide; Herbicide; Insecticide; Nematicide; Rodenticide.
Pests Controlled: Insects; mites; rodents; plant pathogens; nematodes; termites; weeds.
Registered Uses: Preplant soil fumigation; stored commodities (both raw agricultural commodities and process foods/feeds); greenhouses; termite control; grain elevators; mills, ships and transportation vehicles.
Predominant Uses: Vegetables; tobacco; strawberries; commodity/structural; government quarantine; ornamentals; fruits.
Mode of Activity: Fumigations.
Formulation Types Registered: Gaseous, liquid under pressure, or liquid.