

5785-22

5/7/2010

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

OFFICE OF PREVENTION, PESTICIDES AND TOXIC SUBSTANCES

"CERTIFIED MAIL"

David McAllister  
Great Lakes Chemical Corporation  
P.O. Box 2200  
West Lafayette, IN 47996-2200

MAY 7 2010

Subject: Terr-O-Gas 98  
EPA Reg. No. 5785-22  
Pre-RED Mitigation Amendment dated April 8, 2010  
EPA Decision Number 432677

Dear Mr. McAllister:

The amended label referred to above, submitted in connection with reregistration of methyl bromide under the Federal Insecticide, Fungicide and Rodenticide Act as amended is acceptable provided the following label revisions are made and the following conditions are met:

**LABEL REVISIONS**

1. Page 2, revise the first paragraph as follows:

**"IMPORTANT:** A self-contained breathing apparatus (SCBA) is not permitted for routine handler tasks. Wear an SCBA and PPE required for liquid contact potential in emergencies such as a spill or leak or when corrective action is needed to reduce air levels to acceptable levels."

2. Page 4, in the 3<sup>rd</sup> sentence of the SPILL AND LEAK PROCEDURES FOR SOIL FUMIGATION section, delete "(including prescribed respirators)" and put "Hazards to Humans and Domestic Animals" in italics.
3. Page 8, revise the paragraph immediately before the USER SAFETY REQUIREMENTS section as follows:

**"IMPORTANT:** A self-contained breathing apparatus (SCBA) is not permitted for routine handler tasks. Wear an SCBA and PPE required for liquid contact potential in emergencies such as a spill or leak or when corrective action is needed to reduce air levels to acceptable levels."

4. Page 9, in the last sentence of the AGRICULTURAL USE REQUIREMENTS box, put "Hazards to Humans and Domestic Animals" in italics.

5. Page 12, replace the AIR RESCUE DEVICE AVAILABILITY FOR PRE-PLANT SOIL USES section with the following text:

**"Availability of Respirators for Emergencies**

The employer of any handler must confirm that at least one self-contained breathing apparatus (SCBA) is on-site and ready for use in case of an emergency. This must be documented in the FMP."

6. Page 18, under "Calibration, Set-up, Repair, and Maintenance for Application Rigs," in the first sub-bullet under the fifth bullet, revise the first sentence to read "If a compressed gas cylinder is used, make sure that positive pressure is maintained in the compressed gas cylinder at not less than 200 psi during the entire time it is connected to the application rig."

7. Page 23

- a. Replace the first major bullet with the following text:

"Air purifying respirators, SCBAs, and other personal protective equipment (PPE) for handlers (handler task; protective clothing; respirator make, model, type, style, and size; respirator cartridge type; respirator cartridge replacement schedule; eye protection; gloves; and other PPE)"

- b. Replace the 4<sup>th</sup> subbullet under "authorized on-site personnel" with the following:

- "For handlers designated to wear respirators (air-purifying respirator or SCBA):
- Date of medical qualification for respirator(s) that each handler is designated to wear,
  - Date of training for respirator(s) that each handler is designated to wear, and
  - Date of fit-testing for respirator(s) that each handler is designated to wear."

- c. Delete "(registrants may also include optional GAPs)" from the first subbullet under "Good Agricultural Practices (GAPs)".

8. Page 28, in the 3<sup>rd</sup> sentence of the SPILL AND LEAK PROCEDURES FOR SOIL FUMIGATION section,

- a. Delete "(including prescribed respirators)"
- b. Put "Hazards to Humans and Domestic Animals" in italics.

**CONDITIONS**

1. EPA has determined that the risk mitigation measures on the revised label for this product are necessary to adequately protect human health and the environment. Therefore, pursuant to 40 CFR § 152.130(d), EPA has decided that no product bearing previously approved labeling may be sold or distributed (release for shipment) by its registrant after December 1, 2010. Wherever state approval is required for sale or distribution of this product with this new labeling, EPA strongly encourages you to submit an application to the state authority as soon as possible. You should be aware that the Agency does not intend to modify the December 1, 2010, deadline because of any failure to obtain necessary state approvals.
2. Submit one copy of the final printed label that incorporates the required changes before the product is released for shipment.

One copy of the label stamped "Accepted with comments" is enclosed for your records. If you have any questions, please contact Susan Bartow by phone at (703) 603-0065 or via email at [bartow.susan@epa.gov](mailto:bartow.susan@epa.gov) or Mary Waller by phone at (703) 308-9354 or via email at [waller.mary@epa.gov](mailto:waller.mary@epa.gov).

Sincerely,



Mary L. Waller  
Product Manager (21)  
Fungicide Branch  
Registration Division (7504P)

Enclosure

4 8 31

ACCEPTED  
with COMMENTS  
In EPA Letter Dated

MAY 7 2010  
Under the Federal Insecticide,  
Fungicide, and Rodenticide Act  
as amended, for the pesticide  
registered under EPA Reg. No.  
5785-22

**RESTRICTED USE PESTICIDE  
DUE TO ACUTE TOXICITY**

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

**TERR-O-GAS® 98  
PREPLANT SOIL FUMIGANT**

ACTIVE INGREDIENT.....	By Wt.
Methyl bromide.....	98%
Chloropicrin.....	2%
TOTAL.....	100%

This product weighs 14.4 pounds per gallon.



**DANGER • PELIGRO • POISON  
KEEP OUT OF REACH OF CHILDREN**



Si Usted no entiende la etiqueta, busque a alguien para que se la explique a Usted en  
detalle. (If you do not understand the label, find someone to explain it to you in detail).

FIRST AID	
If inhaled	<ul style="list-style-type: none"><li>• Move person to fresh air. Keep warm.</li><li>• If person is not breathing, call 911 or an ambulance, then give artificial respiration, preferably by mouth-to-mouth, if possible.</li><li>• Do not give anything by mouth to an unconscious person. If <u>not unconscious</u>, rinse mouth out with water.</li><li>• In all cases of overexposure, get medical attention immediately. Take person to a doctor or emergency treatment facility.</li></ul>
If on skin or clothing	<ul style="list-style-type: none"><li>• Immediately remove contaminated clothing, shoes, and any other item on skin.</li><li>• Rinse skin immediately with plenty of water for 15-20 minutes.</li><li>• In all cases of overexposure, get medical attention immediately. Take person to a doctor or emergency treatment facility.</li></ul>
If in eyes	<ul style="list-style-type: none"><li>• Hold eye open and rinse slowly and gently with water for 15-20 minutes.</li><li>• Remove contact lenses, if present, after the first 5 minutes, then continue rinsing eye.</li><li>• In all cases of overexposure, get medical attention immediately. Take person to a doctor or emergency treatment facility.</li></ul>
HOT LINE NUMBER	
Have the product container or label with you when calling a poison control center or doctor, or going for treatment. You may also contact 1-800-949-5167 for emergency treatment information.	
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 overexposures 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.	

SEE SIDE PANEL FOR ADDITIONAL PRECAUTIONARY STATEMENTS

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EPA REG. NO. 5785-22  
EPA EST. NO. 5785-CA-01



P.O. BOX 2200  
WEST LAFAYETTE, IN 47996-2200  
U.S.A.

### **PRECAUTIONARY STATEMENTS HAZARDS TO HUMANS AND DOMESTIC ANIMALS**

**Danger.** Extremely hazardous liquid and vapor under pressure. Do not breathe vapors. Inhalation may be fatal or cause serious acute illness or delayed lung or nervous system injury which may have a delayed onset. This product contains chloropicrin which is very irritating to the upper respiratory tract, and even at low levels can cause painful irritation to the nose, throat, and eyes, producing tearing. If these symptoms occur, leave the fumigation area immediately. Continued exposure after irritation is evident, or higher concentrations, may cause painful irritation to the eyes or temporary blindness which may cause panic that may in turn lead to further accidents.

### **PERSONAL PROTECTIVE EQUIPMENT (PPE)**

Some materials that are chemical-resistant to this product are Teflon®, EVAL barrier laminate and Viton®. For more options, follow the instructions for category H on the chemical-resistance category selection chart.

**When not performing tasks with liquid contact potential, all handlers (including applicators) must wear:**

- Long-sleeved shirt and long pants, and
- Shoes and socks.
- Do not wear jewelry, gloves, goggles, tight clothing, rubber protective clothing, or rubber boots when handling. Methyl bromide and chloropicrin are heavier than air and can be trapped inside clothing and cause skin injury.

**While performing tasks with liquid contact potential, all handlers (including applicators) must wear:**

- Long-sleeved shirt and long pants,
- Chemical-resistant gloves,
- Chemical-resistant apron,
- Protective eyewear (Do NOT wear goggles), and
- Chemical-resistant footwear and socks.

**In addition, all handlers (including applicators) must wear a:**

- NIOSH-approved half-face, full-face, or hood-style respirator with a cartridge or canister certified by the manufacturer for protection from exposure to methyl bromide at concentrations up to 5 ppm (e.g., a 3M air-purifying respirator equipped with 3M Model 60928 Organic Vapor/Acid Gas/P100 cartridges).

**IMPORTANT:** an air-supplying respirator [i.e., a respirator connected directly to a clean air source or a self-contained breathing apparatus (SCBA)] is not permitted for routine handler tasks. Such respirators are only permitted in emergencies such as a spill or leak or when corrective action is needed to reduce air levels to acceptable levels.

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Observe all User Safety requirements and User safety recommendations as set forth in the supplemental labeling, **TOG98-5Rev.A.**

#### **ENVIRONMENTAL HAZARDS**

This pesticide is toxic to mammals and birds. Do not apply directly to water, or to areas where surface water is present or to intertidal areas below the mean high water mark. Do not contaminate water when disposing of equipment washwaters or rinsate.

Methyl bromide and chloropicrin have certain properties and characteristics in common with chemicals that have been detected in groundwater (methyl bromide and chloropicrin are highly soluble in water and have low adsorption to soil).

For untarped applications of methyl bromide and chloropicrin, leaching and runoff may occur if there is heavy rainfall after soil fumigation.

#### **PHYSICAL AND CHEMICAL HAZARDS**

Contents under pressure. Do not use or store near heat or open flame. In fires fueled by other materials, Terr-O-Gas® 98 may liberate hazardous gases. The use of Terr-O-Gas® 98 with aluminum, magnesium, zinc and alkali metals will result in the liberation of toxic gases, and possible fire and explosion. In addition, severe corrosion of containers and equipment made of these metals will occur.

#### **DIRECTIONS FOR USE**

##### **Restricted Use Pesticide**

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

Do not apply this product in a way that will contact workers or other persons, either directly or through drift. Only protected handlers may be in the area during application. For any requirements specific to your State or Tribe, consult the agency responsible for pesticide regulation.

#### **AGRICULTURAL USE REQUIREMENTS**

Use this product only in accordance with its labeling and with the Worker Protection Standard, 40 C.F.R. Part 170. Refer to supplemental labeling under "Agricultural Use Requirements" in the Directions for Use section for information about this standard.

### **STORAGE, HANDLING, AND DISPOSAL**

Do not contaminate water, food, or feed by storage or disposal.

**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. Store cylinders upright, secured to a rack or wall to prevent tipping. Do not subject containers 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 cylinders 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. When cylinder is empty, close valves, screw safety caps on to valve outlets, and replace protection bonnet before returning to shipper. Only the registrant, or his designee, is authorized to refill cylinders. Do not use cylinders for any other purpose.

**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, contact your State Pesticide or Environmental Control Agency, or the Hazardous Waste representative at the nearest EPA Regional Office for guidance.

**Container Disposal (cylinders).** Return empty cylinders according to the Great Lakes Chemical Corporation Cylinder Return Policy. Contact Great Lakes for policy details. Replace safety cap and valve protection bonnet. Return partial cylinders only after consulting Great Lakes Chemical Corporation for proper shipping instructions.

### **SPILL AND LEAK PROCEDURES FOR SOIL FUMIGATION**

In case of a rupture of hose or fitting while applying fumigant, immediately stop tractor and motor. Evacuate everyone from the immediate area of the spill or leak. Wear the personal protective equipment (including prescribed respirators) specified in the Hazards to Humans and Domestic Animals section of this labeling for entry into affected area to correct problem. Approach from upwind to make necessary repairs. Do not enter area without the required PPE until the spill has evaporated or the leak has been fixed.

Contaminated soil, water and other cleanup debris is a toxic hazardous waste. Report spill to the National Response Center (800-424-8802) if the reportable quantity of 1000 pounds is exceeded.

**Refer to the supplemental label # TOG98-5Rev.A for additional precautionary information, Directions for Use and Storage and Disposal instructions.**

**Notice: Read the entire label. Use only according to label directions.**

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#### **STATEMENT OF WARRANTY AND LIABILITY**

The directions for use of this product are believed to be adequate and must be followed carefully.

Seller warrants that this product complies with the specifications expressed in this label and supplemental label # **TOG98-5Rev.A**. SELLER MAKES NO OTHER WARRANTIES; AND DISCLAIMS ALL OTHER WARRANTIES, EXPRESS OR IMPLIED, INCLUDING BUT NOT LIMITED TO WARRANTIES OF MERCHANTABILITY AND FITNESS FOR THE INTENDED PURPOSE. To the extent consistent with applicable law, Seller's liability for default, breach, or failure under this label shall be limited to the amount of the purchase price. To the extent consistent with applicable law, Seller shall have no liability for consequential damages.

NET WEIGHT \_\_\_\_\_ LBS.

LOT NUMBER \_\_\_\_\_

**THIS LABEL MUST BE ACCOMPANIED BY A POISON GAS LABEL.**

**RESTRICTED USE PESTICIDE  
DUE TO ACUTE TOXICITY**

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

**TERR-O-GAS® 98**  
**PREPLANT SOIL FUMIGANT**

ACTIVE INGREDIENT.....By Wt.

Methyl bromide.....	98%
Chloropicrin.....	2%
<b>TOTAL.....</b>	<b>100%</b>

This product weighs 14.4 pounds per gallon.



**DANGER • PELIGRO • POISON**  
**KEEP OUT OF REACH OF CHILDREN**



**Si Usted no entiende la etiqueta, busque a alguien para que se la explique a Usted en detalle. (If you do not understand the label, find someone to explain it to you in detail).**

**Notice: Read this booklet and the entire label carefully prior to use of product. Use this product only according to label directions.**

<b>FIRST AID</b>	
If inhaled	<ul style="list-style-type: none"> <li>• Move person to fresh air. Keep warm.</li> <li>• If person is not breathing, call 911 or an ambulance, then give artificial respiration, preferably by mouth-to-mouth, if possible.</li> <li>• Do not give anything by mouth to an unconscious person. If <u>not unconscious</u>, rinse mouth out with water.</li> <li>• In all cases of overexposure, get medical attention immediately. Take person to a doctor or emergency treatment facility.</li> </ul>
If on skin or clothing	<ul style="list-style-type: none"> <li>• Immediately remove contaminated clothing, shoes, and any other item on skin.</li> <li>• Rinse skin immediately with plenty of water for 15-20 minutes.</li> <li>• In all cases of overexposure, get medical attention immediately. Take person to a doctor or emergency treatment facility.</li> </ul>
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**HOT LINE NUMBER**

Have the product container or label with you when calling a poison control center or doctor, or going for treatment. You may also contact 1-800-949-5167 for emergency treatment information.

**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 overexposures 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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SEE SIDE PANEL FOR ADDITIONAL PRECAUTIONARY STATEMENTS

EPA REG. NO. 5785-22

EPA EST. NO. 5785-CA-01



P.O. BOX 2200  
WEST LAFAYETTE, IN 47996-2200  
U.S.A.

Supplemental Label # TOG98-5Rev.A

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## PRECAUTIONARY STATEMENTS HAZARDS TO HUMANS AND DOMESTIC ANIMALS

**Danger.** Extremely hazardous liquid and vapor under pressure. Do not breathe vapors. Inhalation may be fatal or cause serious acute illness or delayed lung or nervous system injury which may have a delayed onset. This product contains chloropicrin which is very irritating to the upper respiratory tract, and even at low levels can cause painful irritation to the nose, throat, and eyes, producing tearing. If these symptoms occur, leave the fumigation area immediately. Continued exposure after irritation is evident, or higher concentrations, may cause painful irritation to the eyes or temporary blindness which may cause panic that may in turn lead to further accidents.

### PERSONAL PROTECTIVE EQUIPMENT (PPE)

Some materials that are chemical-resistant to this product are Teflon®, EVAL barrier laminate and Viton®. For more options, follow the instructions for category H on the chemical-resistance category selection chart.

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**When not performing tasks with liquid contact potential, all handlers (including applicators) must wear:**

- Long-sleeved shirt and long pants, and
- Shoes and socks.
- Do not wear jewelry, gloves, goggles, tight clothing, rubber protective clothing, or rubber boots when handling. Methyl bromide and chloropicrin are heavier than air and can be trapped inside clothing and cause skin injury.

**While performing tasks with liquid contact potential, all handlers (including applicators) must wear:**

- Long-sleeved shirt and long pants,
- Chemical-resistant gloves,
- Chemical-resistant apron,
- Protective eyewear (Do NOT wear goggles), and
- Chemical-resistant footwear and socks.

**In addition, all handlers (including applicators) must wear a:**

- NIOSH-approved half-face, full-face, or hood-style respirator with a cartridge or canister certified by the manufacturer for protection from exposure to methyl bromide at concentrations up to 5 ppm (e.g., a 3M air-purifying respirator equipped with 3M Model 60928 Organic Vapor/Acid Gas/P100 cartridges).

**IMPORTANT;** an air-supplying respirator [i.e., a respirator connected directly to a clean air source or a self-contained breathing apparatus (SCBA)] is not permitted for routine handler tasks. Such respirators are only permitted in emergencies such as a spill or leak or when corrective action is needed to reduce air levels to acceptable levels.

### **USER SAFETY REQUIREMENTS**

- Immediately after contamination, remove outer clothing, shoes and socks, and do not reuse until thoroughly aerated or ventilated. Keep such clothing and shoes outdoors until thoroughly aerated.
- Discard clothing and other absorbent materials that have been drenched or heavily contaminated with this product. Do not reuse them.
- Follow manufacturer's instructions for cleaning/maintaining PPE. If no such instructions for washables exist, use detergent and hot water. Keep and wash PPE separately from other laundry.

### **USER SAFETY RECOMMENDATIONS**

**Users should:**

- Wash hands before eating, drinking, chewing gum, using tobacco, or using the toilet.
- Remove clothing immediately if pesticide gets inside. Then wash thoroughly and put on clean clothing.
- Remove PPE immediately after handling this product. As soon as possible, wash thoroughly and change into clean clothing.

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### ENVIRONMENTAL HAZARDS

This pesticide is toxic to mammals and birds. Do not apply directly to water, or to areas where surface water is present or to intertidal areas below the mean high water mark. Do not contaminate water when disposing of equipment washwaters or rinsate.

Methyl bromide and chloropicrin have certain properties and characteristics in common with chemicals that have been detected in groundwater (methyl bromide and chloropicrin are highly soluble in water and have low adsorption to soil).

For untarped applications of methyl bromide and chloropicrin, leaching and runoff may occur if there is heavy rainfall after soil fumigation.

### PHYSICAL AND CHEMICAL HAZARDS

Contents under pressure. Do not use or store near heat or open flame. In fires fueled by other materials, Terr-O-Gas® 98 may liberate hazardous gases. The use of Terr-O-Gas® 98 with aluminum, magnesium, zinc and alkali metals will result in the liberation of toxic gases, and possible fire and explosion. In addition, severe corrosion of containers and equipment made of these metals will occur.

### DIRECTIONS FOR USE

#### Restricted Use Pesticide

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

Do not apply this product in a way that will contact workers or other persons, either directly or through drift. Only protected handlers may be in the area during application. For any requirements specific to your State or Tribe, consult the agency responsible for pesticide regulation.

### AGRICULTURAL USE REQUIREMENTS

Use this product only in accordance with its labeling and with the Worker Protection Standard, 40 CFR 170. This Standard contains requirements for the protection of agricultural workers on farms, forests, nurseries, and greenhouses, and handlers of agricultural pesticides. It contains requirements for training, decontamination, notification, and emergency assistance. It also contains specific instructions and exceptions pertaining to the statements in this labeling about personal protective equipment, restricted-entry intervals, and notification to workers. The requirements in this box only apply to uses of this product that are covered by the Worker Protection Standard (WPS).

No instructions elsewhere on this labeling relieve users from complying with the requirements of the WPS.

For the entry restricted period and notification requirements, see the *Entry Restricted Period* and *Notification* sections of this labeling. PPE For Entry During the Entry-Restricted Period: PPE for entry that is permitted by this labeling is listed in the Hazards to Humans and Domestic Animals section of this labeling.

### General Precautions

- 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 precautions and directions.
- All persons working with this fumigant must be knowledgeable about the hazards, and trained in the use of required respiratory equipment and detector devices, emergency procedures, and proper use of the fumigant.
- Comply with all local regulations and ordinances. Obtain an application permit from Agricultural Regulatory Agencies as required.
- Handle this fumigant in the open, with the operator "upwind" from the container where there is good ventilation.
- 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.
- Keep pets, livestock, and other domestic animals out of the treated area during application and during tarp perforation and/or removal, if a tarp is used.

### HANDLERS

The following activities are prohibited from being performed in the application block (i.e., the greenhouse or field or portion of a field treated with a fumigant in any 24-hour period) by anyone other than persons who have been appropriately trained and equipped as handlers in accordance with the requirements in the Worker Protection Standard (40 CFR Part 170), from the start of the application until the entry restricted period ends (NOTE: persons installing, perforating, removing, repairing, and monitoring tarps are considered handlers for the durations listed below). Those activities include those persons:

- Participating in the application as supervisors, loaders, drivers, tractor co-pilots, shovelers, cross ditchers, or as other direct application participants (the application starts when the fumigant is first introduced into the soil and ends after the fumigant has stopped being delivered/dispensed to the soil);
- Using devices to take air samples to monitor fumigant air concentrations;
- Cleaning up fumigant spills (this does not include emergency personnel not associated with the fumigation application);
- Handling or disposing of fumigant containers;
- Cleaning, handling, adjusting, or repairing the parts of fumigation equipment that may contain fumigant residues;
- Installing, repairing, operating, or removing irrigation equipment in the fumigant application block;
- Entering the application site to perform scouting, crop advising, or monitoring tasks;
- Installing, perforating (cutting, punching, slicing, poking), removing, repairing, or monitoring tarps:
  - until 14 days after application is complete if tarps are not perforated and removed during those 14 days, or
  - until tarp removal is complete if tarps are both perforated and removed less than 14 days after application; or

- o until 48 hours after tarp perforation is complete if they will not be removed within 14 days after application.

NOTE: see *Tarp Perforation and Removal* section on this labeling for requirements about when tarps are allowed to be perforated.

- Performing any handling tasks as defined by the WPS.

## **PROTECTION FOR HANDLERS**

### **SUPERVISION OF HANDLERS**

For all applications: from the start of the application until the fumigant has stopped being delivered/dispensed into the soil, i.e., after the soil is sealed, the certified applicator must be at the fumigation site in the line of sight of the application and must directly supervise all persons performing handling activities.

For handling activities that take place after the fumigant has been delivered/dispensed into the soil until the entry restricted period expires, the certified applicator does not have to be on-site, but must have communicated in a manner that can be understood by the site owner/operator and handlers responsible for carrying out those activities the information necessary to comply with the label and procedures described in the FMP (e.g., emergency response plans and procedures).

Communication activities must be captured in the FMP.

**IMPORTANT:** this requirement does not override the requirements in the Worker Protection Standard for Agricultural Pesticides for information exchange between owners/operators of agricultural establishments and commercial pesticide applicators.

The certified applicator must provide Fumigant Safe Handling information to each handler involved in the application or confirm that each handler participating in the application has received Fumigant Safe Handling information in a manner they can understand within the past twelve months. Fumigant Safe Handling information will be provided where this product is purchased or at [www.epa.gov/fumigantraining](http://www.epa.gov/fumigantraining).

For all handling tasks at least two handlers trained under the provisions of the WPS 40 CFR 170.230 must be present.

### **EXCLUSION OF NON HANDLERS FROM APPLICATION BLOCK**

The certified applicator supervising the application and the owner/operator of the establishment where the fumigation is taking place must make sure that all persons who are not trained and PPE-equipped and who are not performing one of the handling tasks as stated in this labeling are excluded from the application block during the entry-restricted period.

### **PROVIDING, CLEANING, AND MAINTAINING PPE**

The employer of any handler (as stated in this label) must make sure that all handlers are provided and correctly wear the required PPE. The PPE must be cleaned and maintained as required by the Worker Protection Standard for Agricultural Pesticides.

### **AIR-PURIFYING RESPIRATOR AVAILABILITY FOR PRE-PLANT SOIL USES**

At a minimum two handlers must have the appropriate air-purifying respirator and cartridges available. These handlers must be fit-tested, trained, and medically examined. This must be documented in the FMP.

The employer of any handler must confirm that an air-purifying respirator and appropriate cartridges of the type specified in the PPE section of this labeling are immediately available for each handler who will wear one.

### **AIR RESCUE DEVICE AVAILABILITY FOR PRE-PLANT SOIL USES**

The employer of any handler must confirm that at least one air rescue device (e.g., SCBA) is on-site and is ready for use in case of an emergency. This must be documented in the FMP.

### **RESPIRATOR FIT TESTING, MEDICAL QUALIFICATION, AND TRAINING**

Employers must verify that any handler who uses a respirator is:

- Fit-tested and fit-checked using a program that conforms to OSHA's requirements (see 29 CFR Part 1910.134)
- Trained using a program that conforms to OSHA's requirements (see 29 CFR Part 1910.134)
- Examined by a qualified medical practitioner to ensure physical ability to safely wear the style of respirator to be worn. A qualified medical practitioner is a physician or other licensed health care professional who will evaluate the ability of a worker to wear a respirator. The initial evaluation consists of a questionnaire that asks about medical conditions (such as a heart condition) that would be problematic for respirator use. If concerns are identified, then additional evaluations, such as a physical exam, might be necessary. The initial evaluation must be done before respirator use begins. Handlers must be reexamined by a qualified medical practitioner if their health status or respirator style or use-conditions change. Upon request by local/state/federal/tribal enforcement personnel, employers must provide documentation demonstrating how they have complied with these requirements.

### **RESPIRATORY PROTECTION AND STOP WORK TRIGGERS**

Air-purifying respirators must be worn during all handler tasks and the following air monitoring procedures must be followed to ensure that the upper protection limit of the air-purifying respirator plus respirator cartridge is not exceeded (i.e., 5 ppm for methyl bromide and 1.5 ppm for chloropicrin):

- Air monitoring samples for methyl bromide and chloropicrin must be collected at least every hour in the breathing zone of a handler performing a representative handling task. Breathing zone samples must be taken outside respiratory protection equipment and within a 10 inch radius of the handler's nose and mouth.
- To monitor air concentration levels, a direct reading detection device, such as a Matheson-Kitagawa, Draeger, or Sensidyne device must be used. The devices must have sensitivity of at least 1 ppm for methyl bromide and 0.15 ppm for chloropicrin.
- If at any time (1) a handler experiences any sensory irritation while wearing an air-purifying respirator, or (2) any air sample is greater than or equal to 5 ppm for methyl bromide, or (3) any air sample is greater than or equal to 1.5 ppm for chloropicrin, then

all handler activities must cease and handlers must be removed from the application block.

- In order to resume work activities:
  - Two consecutive air samples for methyl bromide and chloropicrin taken in the treatment area at least 15 minutes apart must be less than 5 ppm for methyl bromide and less than 1.5 ppm for chloropicrin.
  - During the collection of samples a full-face air-purifying respirator must be worn by the handler taking air samples.
- Hot gas tarped applications

Handlers must wear an air-rescue device (e.g., SCBA) to reenter the greenhouse/treated areas once the fumigation has started for a minimum of 48 hours after the fumigant has stopped being delivered/dispensed to the soil to perform an emergency function such as a spill or leak or when corrective action is needed to reduce air levels.

### TARP PERFORATION AND/OR REMOVAL

**IMPORTANT:** Persons perforating, repairing, removing, and/or monitoring tarps are defined, within certain time limitations, as handlers (see handlers as stated in this labeling) and must be provided the PPE and other protections for handlers as required on this labeling and in the Worker Protection Standard for Agricultural Pesticides.

- Tarps must not be perforated until a minimum of 5 days (120 hours) have elapsed after the fumigant injection into the soil is complete (e.g., after injection of the fumigant product and tarps have been laid), unless a weather condition exists which necessitates the need for early perforation or removal, see *Early Tarp Removal for Broadcast Applications Only* and *Early Tarp Perforation for Flood Prevention* sections.
- If tarps will be removed before planting, tarp removal must not begin until at least 2 hours after tarp perforation is complete and 2 air monitoring samples are less than 1 ppm methyl bromide. (If 2 air monitoring samples have methyl bromide levels between 1 ppm and 5 ppm, then an air-purifying respirator is required before tarp removal can begin.)
- If tarps will not be removed before planting, planting or transplanting must not begin until at least 48 hours after the tarp perforation is complete.
- If tarps are left intact for a minimum of 14 days after fumigant injection into the soil is complete, planting or transplanting may take place while the tarps are being perforated.
- Each tarp panel used for broadcast fumigation must be perforated.
- Tarps used for fumigations may be perforated manually **ONLY** for the following situations:
  - At the beginning of each row when a coulter blade (or other device which performs similarly) is used on a motorized vehicle such as an ATV.
  - In fields that are 1 acre or less.
  - During flood prevention activities.
- In all other instances, tarps must be perforated (cut, punched, poked, or sliced) only by mechanical methods.
- Tarp perforation for broadcast fumigations must be completed before noon.
- For broadcast fumigations, tarps must not be perforated if rainfall is expected within 12 hours.
- Early Tarp Removal for Broadcast Applications Only:

- Tarps may be removed before the required 5 days (120 hours) if adverse weather conditions have compromised the integrity of the tarp, provided that the compromised tarp poses a safety hazard. *Adverse weather* includes high wind, hail, or storms that blow tarps off the field and create a hazard, e.g., tarps blowing into power lines and onto roads. A *compromised tarp* is a tarp that due to an adverse weather condition is no longer performing its intended function and is creating a hazard.
- If tarps are removed before the required 5 days have elapsed due to adverse weather, the events must be documented in the Post-Application Summary.
- Early Tarp Perforation for Flood Prevention Activities:
  - Tarp perforation is allowed before the 5 days (120 hours) have elapsed.
  - Tarps must be immediately retucked and packed after soil removal.

### ENTRY RESTRICTED PERIOD AND NOTIFICATION

#### ENTRY RESTRICTED PERIOD

Entry (including early entry that would otherwise be permitted under the WPS) by any person – other than a correctly trained and PPE-equipped handler who is performing a handling task listed on this labeling – is **PROHIBITED** - from the start of the application until:

- 5 days (120 hours) after the application is complete for untarped applications, or
- 5 days (120 hours) after application is complete if tarps are not perforated and removed for at least 14 days following application. Note: Persons installing, repairing, or monitoring tarps are handlers until 14 days after the application is complete if tarps are not perforated and removed during those 14 days, or
- 48 hours after tarp perforation is complete if tarps will not be removed for at least 14 days following application, or
- until tarp removal is completed if tarps are both perforated and removed less than 14 days after application.

**NOTE:** see *Tarp Perforation and/or Removal* section on this labeling for requirements about when tarps are allowed to be perforated.

#### NOTIFICATION

Notify workers of the application by warning them orally and by posting Fumigant Treated Area signs. The signs must bear the skull and crossbones symbol and state:

- "DANGER/PELIGRO,"
- "Area under fumigation, DO NOT ENTER/NO ENTREE,"
- "Methyl Bromide and Chloropicrin Fumigant in USE,"
- the date and time of fumigation,
- the date and time entry restricted period is over,
- Terr-O-Gas® 98, and
- Name, address, and telephone number of the certified applicator in charge of the fumigation.

Post the Fumigant Treated Area sign instead of the WPS sign for this application but follow all WPS requirements pertaining to location, legibility, size, and timing of posting and removal.

Post the Fumigant Treated Area signs at all entrances to the application block (i.e., the greenhouse or field or portion of a field treated with a fumigant in any 24-hour period).

## MANDATORY GOOD AGRICULTURAL PRACTICES (GAPs)

The following GAPs must be followed during all fumigant applications. All measurements and other documentation planned to ensure that the mandatory GAPs are achieved must be recorded in the FMP and/or the Post-Application Summary.

**Tarps** (required for all applications except for deep shank orchard replant [California only] and hand held tree-hole applications)

- Tarps must be installed prior to starting hot gas applications.
- Tarps must be installed immediately after the fumigant is applied to the soil for bedded or broadcast applications.
- A written tarp plan must be developed and included in the FMP. The plan must include:
  - schedule and procedures for checking tarps for damage, tears, and other problems
  - plans for determining when and how repairs to tarps will be made, and by whom
  - minimum time following injection that tarp will be repaired
  - minimum size of tarp damage that will be repaired
  - other factors used to determine how and when tarp repair will be conducted
  - schedule, equipment, and methods used to perforate tarps
  - aeration plans and procedures following perforation of tarp, but prior to tarp removal or planting/transplanting
  - schedule, equipment, and procedures for tarp removal.

### Weather Conditions

- Prior to fumigation the weather forecast for the day of the application and the 48-hour period following the fumigation must be checked to determine if unfavorable weather conditions exist (see *Identifying Unfavorable Weather Conditions* section) or are predicted and whether fumigation should begin.
- Wind speed at the application site must be a minimum of 2 mph at the start of the application or forecasted to reach at least 5 mph during the application.
- Do not apply if a shallow, compressed (low-level) temperature inversion is forecast to persist for more than 18 consecutive hours for the 48-hour period after the start of application, or if there is an air stagnation advisory issued by the National Weather Service in effect for the area in which the fumigation is planned.
- Detailed local forecasts for weather conditions, wind speed, and air stagnation advisories may be obtained on-line at: <http://www.nws.noaa.gov> or by contacting your local National Weather Service Forecasting Office.

### *Identifying Unfavorable Weather Conditions*

- Unfavorable weather conditions block upward movement of air which results in trapping fumigant vapors near the ground. The resulting air mass can move off-site in unpredictable directions. These conditions typically exist prior to sunset and continue past sunrise and persist as late as noontime. Unfavorable conditions are common on nights with limited cloud cover and light to no wind and their presence can be indicated by ground fog or smog and can also be identified by smoke from a ground source that flattens out below a ceiling layer and moves laterally in a concentrated cloud.

### Soil Temperature

- The maximum soil temperature at the depth of injection must not exceed 90 degrees F at the beginning of the application.
  - If air temperatures have been above 100 degrees F in any of the three days prior to application, then soil temperature must be measured and recorded in the FMP.

### Soil Moisture

- The soil must be moist 9 inches below the surface. The amount of moisture needed in this zone will vary according to soil type and must be determined using the USDA Feel and Appearance Method for testing (see below). Surface soil generally dries rapidly and must not be considered in this determination.
- If there is insufficient moisture 9 inches below the surface, the soil moisture must be adjusted. If irrigation is not available and there is adequate soil moisture below 9 inches, soil moisture can be adjusted by discing or plowing before fumigant injection. To conserve existing soil moisture, pretreatment irrigation or pretreatment tillage should be done as close to the time of application as possible.
- Measure soil moisture at a depth of 9 inches at either end of the field, no more than 48 hours prior to application.

### Soil Moisture Determination

The USDA Feel and Appearance Method for estimating soil moisture as appropriate for the soil texture:

- For **coarse** textured soils (fine sand and loamy fine sand), the soil is moist enough (50 to 75 percent available soil water moisture) to form a weak ball with loose and clustered sand grains on fingers, darkened color, moderate water staining on fingers, will not ribbon.
- For **moderately coarse** textured soils (sandy loam and fine sandy loam), the soil is moist enough (50 to 75 percent available soil water moisture) to form a ball with defined finger marks, very light soil/water staining on fingers, darkened color will not stick.
- For **medium** textured soils (sandy clay loam, loam, and silt loam), the soil is moist enough (50 to 75 percent available soil water moisture) to form a ball, very light staining on fingers, darkened color, pliable, and forms a weak ribbon between the thumb and forefinger.
- For **fine** textured soils (clay, clay loam, and silty clay loam), the soil is moist enough (50 to 75 percent available soil water moisture) to form a smooth ball with defined finger marks, light soil/water staining on fingers, ribbons between thumb and forefinger.
- For **fields with more than one soil texture**, soil moisture content in the lightest textured (most sandy) areas must comply with this soil moisture requirement. Whenever possible, the field should be divided into areas of similar soil texture and the soil moisture of each area should be adjusted as needed. Coarser textured soils can be fumigated under conditions of higher soil moisture than finer textured soils; however, if the soil moisture is too high, fumigant movement will be retarded and effectiveness of the treatment will be reduced. Previous and/or local experience with the soil to be treated or the crop to be planted can often serve as a guide to conditions that will be acceptable. If there is uncertainty in determining the soil moisture content of the area to be treated, a local extension service agent, soil conservation service specialist, or pest control advisor (agriculture consultant) should be consulted for assistance.

### Soil Preparation

- Soil must be properly prepared and at the surface generally be free of clods that are golf ball size or larger. The area to be fumigated must be tilled to a depth of 5 to 8 inches.
- Field trash must be properly managed. Residue from a previous crop must be worked into the soil to allow for decomposition prior to fumigation. Little or no crop residue shall be present on the soil surface. Crop residue that is present must not interfere with the soil seal. Removing the crop residue prior to fumigation is important to limit the natural "chimneys" that occur in the soil when crop residue is present. These "chimneys" allow the soil fumigants to move through the soil quickly and escape into the atmosphere. This may create potentially harmful conditions for workers and bystanders and limit the efficacy of the fumigant. However, crop residue on the field serves to prevent soil erosion from both wind and water and is an important consideration. To accommodate erosion control, fumigant efficacy, and human health protection, clear fields of crop residue as close to the timing of the fumigation as possible to limit the length of time that the soil would be exposed to potentially erosive weather conditions.

### Soil Sealing

- *For Broadcast Untarped Applications (CA orchard replant only):* Use a disc or similar equipment to uniformly mix the soil to at least a depth of 3 to 4 inches to eliminate the chisel or plow traces. Following elimination of the chisel trace, the soil surface must be compacted with a cultipacker, ring roller, and roller in combination with tillage equipment.
- *For Bedded Applications:* Preformed beds must be sealed by disruption of the chisel trace using press sealers, bed shapers, cultipackers, or by re-shaping (e.g., relisting, lifting and replacing) the beds immediately following injection. Beds formed at the time of application must be sealed by disrupting the chisel trace using press sealers, or bed shapers.
- *For Tarped-Broadcast and Tarped Bedded Applications:* The use of a tarp does not eliminate the need to minimize chisel traces prior to application of the tarp, such as by using a Nobel plow or other injection shank that disrupts the chisel traces.

### Bedded and Broadcast Shank Applications: Additional Mandatory GAPs

In addition to the GAPs required for all soil fumigation applications, the following GAPs apply for injection applications:

### Tarps

- Tarps must be installed immediately after the fumigant is applied to the soil.

### Soil Preparation

- Trash pulled by the shanks to the ends of the field must be covered with tarp, or soil, depending on the application method before making the turn for the next pass.

### Application Depth and Spacing

- *For Tarped-Broadcast and Tarped-Bedded Applications:* The injection point must be a minimum of 8 inches from the nearest final soil/air interface. For tarped bedded applications the injection depth must not be deeper than the lowest point of the tarp (i.e., the lowest point of the tuck).
- *For Untarped-Bedded Applications:* The injection point must be a minimum of 12 inches from the nearest final soil/air interface.
- *For Untarped-Broadcast Applications (CA orchard replant only):* The injection point must be a minimum of 18 inches from the nearest final soil/air interface.

- Apply TERR-O-GAS® 98 with chisel equipment. The shank spacing should be equal to the application depth, but may be up to 1.5 times the application depth, not to exceed 24 inches. When applying TERR-O-GAS® 98 with a Nobel plow, use an outlet spacing of 9-12 inches along the sweeps.

#### **Prevention of End Row Spillage**

- Do not apply or allow fumigant to spill onto the soil surface. For each injection line either have a check valve located as close as possible to the final injection point, or drain/purge the line of any remaining fumigant prior to lifting injection shanks from the ground.
- Do not lift injection shanks from the soil until the shut-off valve has been closed and the fumigant has been depressurized (passively drained) or purged (actively forced out via air compressor) from the system.

#### **Calibration, Set-up, Repair, and Maintenance for Application Rigs**

- Brass, carbon steel or stainless steel fittings must be used throughout. Polyethylene tubing, polypropylene tubing, Teflon® tubing or Teflon® -lined steel braided tubing must be used for all low pressure lines, drain lines, and compressed gas or air pressure lines. All other tubing must be Teflon® -lined steel braided.
- Galvanized, PVC, nylon or aluminum pipe fittings must not be used.
- All rigs must include a filter to remove any particulates from the fumigant, and for pressurized systems a check valve to prevent backflow of the fumigant into the pressurizing cylinder or the compressed air system.
- Rigs must include a flow meter or a constant pressure system with orifice plates to insure the proper amount of fumigant is applied.
- To prevent the backflow of fumigant into the compressed gas cylinder (e.g., nitrogen, other inert gas, compressed air), if used, applicators must:
  - If a compressed gas cylinder is used, make sure that positive pressure is maintained in the cylinder at not less than 200 psi during the entire time it is connected to the application rig. *(This is not required for a compressed air system that is part of the application rig because if the compressor system fails the application rig will not be operable.)*
  - Ensure that application rigs are equipped with properly functioning check valves between the compressed gas cylinder or compressed air system and the fumigant cylinder. The check valve is best placed on the outlet side of the pressure regulator, and is oriented to only allow compressed gas to flow out of the cylinder or compressed air out of the compressed air system.
  - Always pressurize the system with compressed gas or by use of a compressed air system before opening the fumigant cylinder valve.
- Before using a fumigation rig for the first time, or when preparing it for use after storage, the operator must check the following items carefully:
  - Check the filter, and clean or replace the filter element as required.
  - Check all tubes and chisels to make sure they are free of debris and obstructions.
  - Check and clean the orifice plates and screen checks, if installed.
  - Pressurize the system with compressed gas or compressed air, and check all fittings, valves, and connections for leaks using soap solution.
- Install the fumigant cylinder, and connect and secure all tubing. Slowly open the compressed gas or compressed air valve, and increase the pressure to the desired level. Slowly open the fumigant cylinder valve, always watching for leaks.
- When the application is complete, close the fumigant cylinder valve and blow residual fumigant out of the fumigant lines into the soil using compressed gas or compressed air.

At the end of the application, disconnect all fumigant cylinders from the application rig. At the end of the season, seal all tubing openings with tape to prevent the entry of insects and dirt.

- Application equipment must be calibrated and all control systems must be working properly. Proper calibration is essential for application equipment to deliver the correct amount of fumigant uniformly to the soil. Refer to the manufacturer's instructions on how to calibrate your equipment, usually the equipment manufacturer, fumigant dealer, or Cooperative Extension Service can provide assistance.

#### Hot Gas Soil Applications (Greenhouse and Outdoor): Mandatory GAPS

- All delivery tubes must be placed under the tarp in such a way that they do not move during the application of methyl bromide.
- The fumigant must be introduced from outside of the application block (i.e., the greenhouse, or field or portion of a field treated with a fumigant in any 24-hour period) (see *entry restrictions* and *respiratory protection* sections for further details).
- All fittings, connections, and valves must be checked for methyl bromide leaks prior to fumigation. If cylinders are replaced during the fumigation process, the connections and valves must be checked for leaks prior to continuing the job.

#### Tree Replant Application Using Handheld Equipment: Mandatory GAPS

In addition to the GAPS required for all soil fumigation applications, the following GAPS apply for tree replant applications. This application method is used when methyl bromide is applied to individual tree sites in an existing orchard where shank applications are not possible:

##### **Site Preparation**

- Remove the tree stump and primary root system in each individual tree-site with a backhoe or other similar equipment, for example an auger.
- The hole must be backfilled with soil before application.

##### **Application Depth**

- The fumigant must be injected at least 18 inches into the soil.

##### **System Flush**

- Before removing the application wand from the soil the wand must be cleared using nitrogen or compressed air.

##### **Soil Sealing**

- After the wand is cleared and removed from the soil, the injection hole must be either covered with soil and tamped or the soil must be compacted over the injection hole.

##### **Planting Interval**

- Wait a minimum of two weeks after fumigation before planting or transplanting. If odors of the fumigant persist beyond this two-week period (and after tarps are perforated and removed), disc or plow the soil to help aeration, See *Tarp Perforation and/or Removal section* on this labeling for further requirements.

**Pre-Plant Soil Fumigation in Greenhouses: Mandatory GAPs**

- During the application keep doors, vents and windows to the outside open and fans or other mechanical ventilation systems running with the application block.
- Leaks through which gases could enter adjacent enclosed areas must be sealed.
- Application of Terr-O-Gas® 98 to greenhouse soils is by the same methods as for field soils (see above). Consult dosage rate table for proper rates of application.

**Hot Gas Applications to Soil, Potting Mixes, and Tobacco Seedling Trays: Mandatory GAPs**

- Potting mixes including decomposed compost, soil mixes, and manure can be fumigated with this product.
- Fumigation should take place outdoors or in a well ventilated area away from desirable plants or occupied buildings.
- The soil/potting mix material to be treated must be at least 60°F but must not exceed 90°F. The material must be loose and moist enough for good seed germination.
- To ensure a good seal, pile the potting soil mix material on a concrete floor or on wet ground.
- Pile to a depth of 18 inches. Piles two to three 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.
- Evaporating pans are essential for the volatilization and uniform dispersion of fumigant except where a vaporizer is used. Shallow pans or basins made of plastic or metal (except aluminum) are satisfactory for this purpose.
- For delivery of this product from outside the tarpaulin, polyethylene tubing is required.
- 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.
- Place evaporating pan(s) with anchored applicator tubing about 30 feet apart on the pile surface.
- Extend the free ends of the polyethylene tubes outside the area to be covered.
- Cover with a tarp that is 4 mil or greater in thickness.
- Seal the edges of tarps by burying, covering with moist sand, or soil or by means of sand snakes.
- Attach applicator tube to the cylinder valve outlet and release fumigant.
- Use a cylinder dispenser or scale to meter small amounts from cylinders.
- The fumigant must be introduced from outside of the application block (i.e., the greenhouse, or field or portion of a field treated with a fumigant in any 24-hour period) (see *entry restrictions* and *respiratory protection* sections for further details).
- Consult dosage rate table for proper rates of application.
- All fittings, connections, and valves must be checked for methyl bromide leaks prior to fumigation. If cylinders are replaced during the fumigation process, the connections and valves must be checked for leaks prior to continuing the job.
- At the end of the entry restriction period, unseal opposite ends of the tarp and allow to aerate for at least 30 minutes before completely removing the tarp.
- To avoid phytotoxicity, aerate for 24-72 hours before planting.
- Potting mixes in flats and tobacco seedling trays may also be treated. Arrange the flats or trays in loose criss-cross stacks no more than 5 feet high, then cover and seal with a tarp as described above. Introduce the fumigant at the top and in the center of the stack. Use one injection point for each 100 cubic feet of volume.

**SPECIAL INSTRUCTION FOR THE CONTROL OF ARMILLARIA MELLEA (OAK ROOT FUNGUS) ON VINEYARDS AND DECIDUOUS FRUITS AND NUTS:**

- To obtain the maximum control of *Armillaria mella* with Terr-O-Gas® 98, 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 36 inches and disc to smoothness.
- Crops which are planted in this treated soil will not bear harvestable fruit for a period of at least 24 months.
- Non-tarp Chisel Application (Not for Use in California):
  - Space chisels up to 66 inches apart to a depth of 24 to 30 inches.
  - In the row 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 cultipack immediately after fumigant injection. Be sure that the disc and cultipacker cover an area at least 33 inches beyond the chisel lines.
- Tarp Chisel Application:
  - Space chisels up to 66 inches apart to a depth of 24 to 30 inches.
  - In the row 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 cultipack immediately after fumigant injection. Be sure that the disc and cultipacker cover an area at least 33 inches beyond the chisel lines.
  - Apply tarp immediately after application.
- Refer to the dosage rate table for dosage rates
- To insure the proper time-concentration relationship to control oak root fungus, the soil should be left undisturbed for at least 7 days after chisel application.
- Replanting of trees, vines, or other deep-rooted orchard crops may begin 14 days later.

**SPECIAL INSTRUCTIONS FOR NON-TARP NEMATODE CONTROL (ONLY FOR DEEP SHANK ORCHARD PREPLANT/REPLANT AND HAND HELD TREE-HOLE APPLICATION IN CA):**

- Do not apply to soil where trees or vines will bear harvestable fruit within 24 months.
- Plow or rip the soil to the depth to which effective treatment is required.
- To insure maximum fumigant penetration, the soil at the point of injection should not contain more than 5 to 15% moisture depending on soil type. However, to ensure sealing, the top 8 to 12 inches of soil must be moistened to comply with the GAPs by means of a sprinkler application of 1/4 to 1/2 inch of water, by natural rainfall, or other soil watering method prior to final preparation and application.
- Avoid treatment of soils that contain more than 30% clay or those with high organic content.
- Fumigate when the soil temperature is 60°F to 80°F at the depth of 6 inches. Do not fumigate when soil temperature is below 50°F or above 90°F.
- Chisel Application:
  - Apply with chisels spaced up to 66 inches apart to a depth of 24 to 30 inches.
  - In the row 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 cultipack immediately after fumigant injection. Be sure that the disc and cultipacker cover an area at least 33 inches beyond the chisel lines.
- Refer to the dosage rate table for dosage rates.
- A waiting period of at least 14 days should be observed between application and planting.

### **SITE-SPECIFIC FUMIGATION MANAGEMENT PLAN (FMP)**

Prior to the start of fumigation, the certified applicator supervising the application must verify that a site-specific FMP exists for each application block (i.e., a greenhouse or field or portion of a field treated with a fumigant in any 24-hour period). In addition, a farm operation fumigating multiple application blocks may format the FMP in a manner whereby all of the information that is common to all the application blocks is captured once, and any information unique to a particular application block or blocks is captured in subsequent sections.

The FMP must be prepared by the certified applicator, the site owner/operator, registrant, or other party.

The certified applicator must verify in writing (sign and date) that the site-specific FMP(s) reflects current site conditions before the start of fumigation.

Each site specific FMP must contain the following elements:

- ❖ Applicator information (name, phone number, pesticide applicator license and/or certificate number, employer name, employer address)
- ❖ General site information
  - Application block location (e.g., county, township-range-section quadrant), address, or global positioning system (GPS) coordinates
  - Name, address, and phone number of owner/operator of the application block
- ❖ General application information (target application date/window, brand name of fumigant, EPA registration number)
- ❖ Tarp information and procedures for repair, perforation and removal (if tarp is used)
  - Brand name, lot number, thickness
  - Name and phone number of person responsible for repairing tarps
  - Schedule for checking tarps for damage, tears, and other problems
  - Maximum time following notification of damage that the person(s) responsible for tarp repair will respond
  - Minimum time following application that tarp will be repaired
  - Minimum size of damage that will be repaired
  - Other factors used to determine when tarp repair will be conducted
  - Name and phone number of person responsible for perforating and/or removing tarps (if other than certified applicator)
  - Equipment/methods used to perforate tarps
  - Schedule and target dates for perforating tarps
  - Schedule and target dates for removing tarps
- ❖ Soil conditions (description of soil texture in application block, method used to determine soil moisture)
- ❖ Weather conditions (summary of forecasted conditions for the day of the application and the 48-hour period following the fumigant application)
  - Wind speed

- Inversion conditions (e.g., shallow, compressed (low-level) temperature inversion)
- Air stagnation advisory
- ❖ Respirators, air rescue devices, and other personal protective equipment (PPE) for handlers (handler task, protective clothing, respirator type, respirator cartridge type, respirator cartridge replacement schedule, air rescue type, eye protection, gloves, other PPE)
- ❖ Emergency procedures (evacuation routes, locations of telephones, contact information for first responders, local/state/federal/tribal contacts, key personnel and emergency procedures/responsibilities in case of an incident, equipment/tarp/seal failure or complaints, or other emergencies).
- ❖ Fumigant Treated Area posting procedures (person(s) who will post Fumigant Treated Area signs, location of Fumigant Treated Area signs, procedures for Fumigant Treated Area sign removal)
- ❖ Plan describing how communication will take place between applicator, land owner/operator, and other on-site handlers (e.g., tarp perforators/removers, irrigators) for complying with label requirements (e.g., timing of tarp perforation and removal, PPE).
  - Name and phone number of persons contacted
  - Date contacted
- ❖ Authorized on-site personnel
  - Names, addresses and phone numbers of handlers
  - Name, address, and phone number for employers of handlers
  - Tasks that each handler is authorized and trained to perform
  - For handlers designated to wear air-purifying respirators (an air-purifying respirator is required for a minimum of 2 handlers):
    - date of medical qualification to wear an air-purifying respirator,
    - date of air-purifying respirator training, and
    - date of fit testing for an air-purifying respirator.
- ❖ Air monitoring plan for the breathing zone
  - Representative handler tasks to be monitored
  - Monitoring equipment to be used and timing of monitoring
- ❖ Good Agricultural Practices (GAPs)
  - Description of applicable mandatory GAPs (registrants may also include optional GAPs)
  - Measurements and documentation to ensure GAPs are achieved (e.g., measurement of soil and other site conditions)
- ❖ Description of hazard communication. (The application block has been posted in accordance with the label. Pesticide product labels and material safety data sheets are on-site and readily available for employees to review.)
- ❖ Record-keeping procedures (the owner/operator of the application block, as well as the certified applicator, must keep a signed copy of the site-specific FMP for 2 years from the date of application).

For situations where an initial FMP is developed and certain elements do not change for multiple fumigation sites (e.g., applicator information, authorized on-site personnel, record-keeping procedures, emergency procedures) only elements that have changed need to be updated in the site-specific FMP provided the following:

- The certified applicator supervising the application has verified that those elements are current and applicable to the application block before it is fumigated.
- Record-keeping requirements are followed for the entire FMP (including elements that do not change).

Once the application begins, the certified applicator must make a copy of the FMP available for viewing by handlers involved in the fumigation. The certified applicator or the owner/operator of the application block must provide a copy of the FMP to any local, state, federal, or tribal enforcement personnel who request the FMP. In the case of an emergency, the FMP must be made immediately available when requested by local/state/federal/tribal emergency response and enforcement personnel.

Within 30 days of completing the application portion of the fumigation process, the certified applicator supervising the application must complete a Post-Application Summary that describes any deviations from the FMP that have occurred, measurements taken to comply with GAPs, monitoring results, as well as any complaints and/or incidents that have been reported to him/her.

Specifically the Post-Application Summary must contain the following elements:

- ❖ Actual date of the application, application rate, and size of application block fumigated
- ❖ Summary of weather conditions on the day of the application and during the 48-hour period following the fumigant application
- ❖ Soil temperature measurement (if air temperatures were above 100 degrees F in any of the 3 days prior to the application)
- ❖ Tarp damage and repair information (if applicable)
  - Location and size of tarp damage
  - Description of tarp/tarp seal/tarp equipment failure
  - Date and time of tarp repair
- ❖ Tarp perforation/removal details (if applicable)
  - Description of tarp removal (if different than in the FMP)
  - Date tarps were perforated
  - Date tarps were removed
- ❖ Complaint details (if applicable)
  - Person filing a complaint (e.g., on-site handler, person off-site)
  - If off-site person, name, address, and phone number of person filing a complaint
  - Description of control measures or emergency procedures followed after a complaint
- ❖ Description of incidents, equipment failure, or other emergency and emergency procedures followed (if applicable)
- ❖ Details of elevated air concentrations monitored on-site (if applicable)
  - Location of elevated air concentration levels
  - Description of control measures or emergency procedures followed
  - Air monitoring results
    - When sensory irritation experienced:
      - Date and time of sensory irritation
      - Handler task/activity
      - Handler location where irritation was observed
      - Resulting action (e.g., cease operations, continue operations with an air-purifying respirator)
    - When using a direct read instrument:
      - Type of sample (e.g., breathing zone)
      - Sample date and time
      - Handler task/activity
      - Handler location
      - Air concentration
      - Sampling method

- ❖ Date of Fumigant Treated Area sign removal
- ❖ Any deviations from the FMP
- ❖ Record-keeping procedures (the owner/operator of the application block, as well as the certified applicator, must keep a signed copy of the Post-Application Summary for 2 years from the date of application).

## SOIL FUMIGATION

Compliance with all GAPs listed in this label is required for use of this product.

**APPLICATION METHODS.** Terr-O-Gas® 98 is to be used only as a preplant soil fumigant.

A. Tarpaulin Methods for Field, Nursery, Turf, Greenhouse, and Seed or Transplant Bed Soils.

Pests controlled when present in soil at time of treatment:

Plant-parasitic nematodes, including root-knot, root lesion (meadow), cyst, citrus, burrowing, false root-knot, lance, spiral, ring, sting, stubby root, dagger, awl, sheath and stunt (stylet).

Soil-borne disease causing organisms, including the fungi *Pythium*, *Rhizoctonia*, *Phytophthora*, *Pyrenochaeta*, *Sclerotinia*, *Sclerotium*, and *Fusarium* and the clubroot organism *Plasmodiophora*.

Weeds, including broadleaf weeds such as witchweed, broomrape and lambsquarters and grasses such as bermudagrass, annual bluegrass, torpedograss and quackgrass. Not effective against hard seed weeds, such as mallow, dodder, morningglory, and certain leguminous weeds.

Insects, including wireworms, cutworms, grubs, rootworms, ants and garden symphylans.

**NOTE:** Fumigation may temporarily reduce nitrification in the soil thus increasing levels of ammonium nitrogen and soluble ammonium salts to potentially phytotoxic levels. 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. Apply only fertilizer containing at least 30% nitrate until the crop is well established and soil temperature is above 65°F, then fertilize as indicated by soil test. Acid soils should be limed before fumigation to stimulate nitrification and to reduce possible ammonium toxicity.

## APPLICATION RESTRICTIONS

- For use only on sites and at locations that qualify for exemptions under the Montreal Protocol (e.g., critical use exemption or quarantine and preshipment exemption uses) and for sites listed in the table titled "Maximum Application Rates For Crops/Uses Without Critical Use Exemptions"
- This product may only be applied for uses identified in the Quarantine Uses section or in the tables of this label titled "Maximum Application Rates for Crops/Uses with Critical Use Exemptions" and "Maximum Application Rates For Crops/Uses Without Critical Use Exemptions"
- Tarps must be used for all applications, except for California orchard replant using the deep broadcast application method.
- The maximum application block sizes are:
  - 100 acres for tarped bedded and broadcast applications
  - 40 acres for untarped deep applications (i.e., California orchard replant)

**MAXIMUM APPLICATION BLOCK SIZES FOR HOT GAS APPLICATIONS**

The maximum application block sizes allowed for methyl bromide hot gas applications are:

- 10 acres for outdoor hot gas applications
- 45,000 square feet for greenhouse hot gas applications.

**Table 1. Maximum Application Rates For Crops/Uses With Critical Use Exemptions**

Crop	Broadcast Application Rate (lbs Product/A)
Eggplant	200
Cucurbits (including muskmelons, cantaloupe, watermelon, cucumber, squash, pumpkin, and gourds)	200
Forest Nursery Seedlings	400
Orchard Nursery Seedlings (raspberry, deciduous trees, roses)	400
Strawberry Nurseries	400
Orchard Replant <sup>1</sup> (walnuts, almonds, stone fruit, table and raisin grapes, wine grapes)	250
Orchard Replant (grapes)	250
Ornamentals <sup>2,3</sup>	400
Pepper, Bell	200
Strawberry Fruit	235
Sweet Potato Slips	200
Tomato (grown for fresh market)	200
<sup>1</sup> The maximum rate for greenhouse hot gas applications is 1 lb product/100 ft <sup>2</sup>	
<sup>2</sup> The maximum rate for fumigating potting mixes used for ornamentals (including decomposed compost, soil mixes and manure) is 1 lb product/yd <sup>3</sup>	
<sup>3</sup> The maximum rate for applications to individual tree holes using handheld equipment is 1.0 lb product/100 ft <sup>2</sup> in light soils and 1.5 lb product/100 ft <sup>2</sup> in fine-textured soils.	

**Table 2. Maximum Application Rates For Crops/Uses Without Critical Use Exemptions**

Crop	Broadcast Application Rates (lbs Product/A)
Peppers (grown for fresh market (CA))	200
Tomato (grown for fresh market (CA))	200
Caneberries (Raspberries, Blackberries, Boysenberries)	235
Ginger (HI)	350
Vidalia Onion (GA)	350
Golf Course Tees, Greens, and Fairways <sup>1</sup>	400
Athletic Fields <sup>1</sup>	400
Tobacco Seedling Trays	7 lbs/1,000 trays
<sup>1</sup> For resurfacing with hot gas method only.	

**Table 3. Maximum Application Rates For Quarantine Uses**

**Quarantine Uses**

This product may be used as part of a quarantine program as described below.

Quarantine applications with respect to methyl bromide, are treatments to prevent the introduction, establishment and/or spread of quarantine pests (including diseases), or to ensure their official control, where: (i) Official control is that performed by, or authorized by, a national (including state, tribal or local) plant, animal or environmental protection or health authority; (ii) quarantine pests are pests of potential importance to the areas endangered thereby and not yet present there, or present but not widely distributed and being officially controlled. This definition excludes treatments of commodities not entering or leaving the United States or any State (or political subdivision thereof).

**USDA-APHIS Quarantine Uses**

This product may be used as a soil fumigant at any crop or non-crop site as part of a quarantine program established by the United States Department of Agriculture-Animal and Plant Health Inspection Service (USDA-APHIS) under the Plant Protection Act (7 U.S.C. 7701 et seq.). Limitations including but not limited to application rates and methods and crops and cropping practices must be in accordance with those established by the USDA-APHIS quarantine program.

**Other Quarantine Uses (not USDA-APHIS Quarantine uses)**

Quarantine use of methyl bromide is restricted to fields used for the production of plant propagative material listed below and unplanted areas immediately adjacent thereto, where all production from the treated fields will be shipped to areas where a plant regulatory authority requires the source or the incoming material to be free of quarantine pests or be accompanied by a certificate issued by a plant regulatory official.

**Forest Seedlings:**

Conifer and hardwood seedling for reforestation, Christmas tree seedlings

**Nursery Stock:**

Roses, strawberry transplants, sweet potato slips, caneberry and blueberry nursery stock, fruit and nut trees, garlic transplants, onion transplants, vineyard stock, seed potato, tobacco seed beds, food crop transplants, and other wild or cultivated trees, shrubs, vines and forbs.

**Ornamental Plants:**

Caladiums, chrysanthemums, flower bulbs, flowering plants, ornamental grasses, rhizomes, shrubs, trees, and other perennials and annuals.

**Turf or Sod:**

For interstate and intrastate shipments to areas that require fumigation with methyl bromide to meet quarantine/phytosanitary requirements.

The maximum application rate for quarantine uses shall be 400 lbs of methyl bromide per acre, or less if specified in the applicable quarantine/phytosanitary requirements.

The U.S. Federal, state, or local plant, animal, environmental protection or health authority requiring the quarantine application and the particular quarantine/phytosanitary requirement must be identified in the site-specific fumigant management plan. Additionally, the requirement for the treatment (e.g., the State or Federal law) must be listed in the site-specific fumigant management plan.

### **STORAGE, HANDLING, AND DISPOSAL**

Do not contaminate water, food, or feed by storage or disposal.

**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. Store cylinders upright, secured to a rack or wall to prevent tipping. Do not subject containers 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 cylinders 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. When cylinder is empty, close valves, screw safety caps on to valve outlets, and replace protection bonnet before returning to shipper. Only the registrant, or his designee, is authorized to refill cylinders. Do not use cylinders for any other purpose.

**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, contact your State Pesticide or Environmental Control Agency, or the Hazardous Waste representative at the nearest EPA Regional Office for guidance.

**Container Disposal (cylinders).** Return empty cylinders according to the Great Lakes Chemical Corporation Cylinder Return Policy. Contact Great Lakes for policy details. Replace safety cap and valve protection bonnet. Return partial cylinders only after consulting Great Lakes Chemical Corporation for proper shipping instructions.

### **SPILL AND LEAK PROCEDURES FOR SOIL FUMIGATION**

In case of a rupture of hose or fitting while applying fumigant, immediately stop tractor and motor. Evacuate everyone from the immediate area of the spill or leak. Wear the personal protective equipment (including prescribed respirators) specified in the Hazards to Humans and Domestic Animals section of this labeling for entry into affected area to correct problem. Approach from upwind to make necessary repairs. Do not enter area without the required PPE until the spill has evaporated or the leak has been fixed.

Contaminated soil, water and other cleanup debris is a toxic hazardous waste. Report spill to the National Response Center (800-424-8802) if the reportable quantity of 1000 pounds is exceeded.

### **STATEMENT OF WARRANTY AND LIABILITY**

The directions for use of this product are believed to be adequate and must be followed carefully. Seller warrants that this product complies with the specifications expressed in this label. SELLER MAKES NO OTHER WARRANTIES; AND DISCLAIMS ALL OTHER WARRANTIES, EXPRESS OR IMPLIED, INCLUDING BUT NOT LIMITED TO WARRANTIES OF MERCHANTABILITY AND FITNESS FOR THE INTENDED PURPOSE. To the extent consistent with applicable law, Seller's liability for default, breach, or failure under this label shall be limited to the amount of the purchase price. To the extent consistent with applicable law, Seller shall have no liability for consequential damages.