



# Addendum to the Field Fumigation Study Guide

**December 2011**

This addendum updates the *Field Fumigation Study Guide* with recent US EPA changes to soil fumigant pesticide labeling that will affect soil fumigant applications.

The *Addendum to the Field Fumigation Study Guide* was published by the  
California Department of Pesticide Regulation  
Pest Management and Licensing Branch  
Licensing and Certification Program  
1001 I Street, P.O. Box 4015  
Sacramento, CA 95812-4015  
Phone: 916.445.4038  
licenseemail@cdpr.ca.gov  
It can be down loaded as a PDF file from the  
Licensing and Certification web site:  
<http://www.cdpr.ca.gov/docs/license/liccert.htm>

#### MISSION

DPR's mission is to protect human health and the environment by regulating pesticide sales and use and by fostering reduced-risk pest management. DPR's strict oversight begins with pesticide product evaluation and registration and continues through statewide licensing of commercial applicators, dealers, consultants, and other pesticide professionals; evaluation of health impacts of pesticides through illness surveillance and risk assessment; environmental monitoring of air, water, and soil; field enforcement (with the county agricultural commissioners) of laws regulating pesticide use; residue testing of fresh produce; and encouraging development and adoption of least-toxic pest management practices through incentives and grants. DPR is one of five boards and departments within the California Environmental Protection Agency.

**Pest Management and Licensing Branch**  
Certification and Licensing Program  
(916) 445-4038

**Enforcement Branch**  
(916) 324-4100

This study guide addendum may be reproduced or distributed without permission except for profit-making purposes.

This study guide is printed on recycled paper.

# Table of Contents

---

## Addendum

Introduction

Background

New Label Changes

Soil Fumigant Active Ingredients Affected by Label Changes

Safety Measures on the Label

Suggested Study Materials and Fact Sheets Summaries

Summary

Figure 1:

Sample Fumigant Label

Attachment 1:

US EPA Fact Sheets Compendium:

Implementation Schedule

2010 Site-Specific Fumigant Management Plans and Post-

Application Summaries

Worker Protections Measures

Buffer Zones

Posting Requirements for Buffer Zones

Emergency Preparedness and Response Requirements



## **INTRODUCTION**

This document, *Addendum to the Field Fumigation Study Guide*, updates the primary study guide *Field Fumigation Study Guide (Volume 9 in the Pesticide Application Compendium)* written by Susan Cohen and Tunyalee Martin of the University of California Davis. The US Environmental Protection Agency's (US EPA) new fumigant labeling safety requirements are described in detail in the Addendum.

The Field Fumigation Study Guide and the Addendum to the Field Fumigation Study Guide will help you prepare for the Department of Pesticide Regulation's (DPR) Qualified Applicator License (QAL) or Qualified Applicator Certificate (QAC) exam in pest control Category O, Field Soil Fumigation.

## **BACKGROUND**

US EPA changed safety requirements on soil fumigant labels to better protect applicators/handlers, agricultural workers, and bystanders against fumigant exposure. All of the new safety requirements are being implemented through fumigant product labeling, not by regulation. Labeling changes were initiated in 2010, with plans to complete the changes in 2012. A sample 2010 label with the new safety measures highlighted has been included as Figure 1. Refer to this for examples of the new fumigant labeling protective measures that have been completed to date.

## **SOIL FUMIGANT ACTIVE INGREDIENTS AFFECTED BY LABEL CHANGES**

- Chloropicrin
- Dazomet
- 1,3-Dichloropropene with chloropicrin
- Iodomethane
- Metam sodium
- Metam potassium
- Methyl bromide
- Methyl isothiocyanate (MITC)

## **SAFETY MEASURES ON THE LABEL**

The US EPA fumigant safety measures are addressed in use directions, requirements, and prohibitions related to the topics listed below. Attachment 1 of this Addendum includes US EPA Fact Sheets that explain the safety measures.

- Buffer zones
- Emergency preparedness and response requirements
- Posting requirements
- Compliance assistance and assurance measures
- Agricultural worker protections
- Community outreach and education programs
- Applicator training requirements and safety information for handlers
- Site-specific fumigant management plans
- Good agricultural practices
- Restricted use pesticides
- Application method, practice, and rate restrictions

## **SUGGESTED STUDY MATERIALS AND FACT SHEET SUMMARIES**

Below is a list of the study material that you should review to prepare for the QAL or QAC exam.

**Table 1. Suggested Field Fumigation Exam Study Materials**

<b>Study Material</b>	<b>Where to Obtain Materials</b>
<i>Field Fumigation Study Guide (Pesticide Compendium 9)</i>	University of California Agriculture and Natural Resources sale publication code #9005 Order online: <a href="http://anrcatalog.ucdavis.edu/Items/9005.aspx">http://anrcatalog.ucdavis.edu/Items/9005.aspx</a>
<i>Addendum to the Field Fumigation Study Guide (this document)</i>	No cost • Review online: <a href="http://www.cdpr.ca.gov/docs/license/pubs/fieldfum_studyguide_addendum.pdf">www.cdpr.ca.gov/docs/license/pubs/fieldfum_studyguide_addendum.pdf</a>
Knowledge Expectations: Field Fumigation Pest Control	No cost • Review online: <a href="http://www.cdpr.ca.gov/docs/license/knwldg_expcttns_subcat_o.pdf">www.cdpr.ca.gov/docs/license/knwldg_expcttns_subcat_o.pdf</a>

DPR has incorporated the US EPA Soil Fumigant Fact Sheets as study material in this Addendum for new certification applicants. The Fact Sheets summarize the labeling protective measures in an easy to understand format. They can also be viewed and downloaded from DPR’s Licensing Web site at, [www.cdpr.ca.gov/docs/license/pubs/fact\\_sheets\\_soilfum.pdf](http://www.cdpr.ca.gov/docs/license/pubs/fact_sheets_soilfum.pdf). In addition, more information can be viewed

at the Web site, “US EPA’s Implementation of Risk Mitigation Measures for Soil Fumigant Pesticides” at, [www.epa.gov/oppsrrd1/reregistration/soil\\_fumigants/](http://www.epa.gov/oppsrrd1/reregistration/soil_fumigants/). The Web site includes various additional training materials developed by fumigant registrants that can be used as supplemental information for applying a specific fumigant and for training fumigant applicators and workers.

The following is a summary of some of the labeling-driven protections, for which you should review each soil fumigant label to see if they are included. The US EPA Fact Sheets contain more comprehensive information.

- **Buffer zones and posting requirements** – Labeling will include buffer zone distances and posting requirements. Buffer zones will be determined by fumigant application rate, acreage treated, application method and depth, and soil sealing method. To determine the buffer zone for your application, review the fumigant labeling, California pesticide use regulations, and local county restricted material permit conditions for more details and to determine the most restrictive requirements. Follow the most restrictive requirements when it appears there are conflicts between labeling, regulations, and permit conditions. The labels of a few fumigants currently include these changes, while a majority of fumigant labels will be revised during Phase 2, anticipated during 2012.
- **Restricted use pesticides** – US EPA has recently re-classified metam sodium, metam potassium, and dazomet as Federal restricted use pesticides. This action has no impact on DPR-certified fumigant applicators as these fumigants had already been designated as California restricted materials, requiring applicator/handler certification, restricted material permits, and notices of intent before fumigating.
- **Agricultural worker protections** – These labeling requirements focus on handler activities, requiring training for non-certified applicators/handlers, and adding requirements for respirator use, tarpaulin removal, and the entry-restricted period. Current pesticide use regulations may address these requirements, making it imperative that you review labeling and regulations for the more restrictive requirements to follow.
- **Applicator training programs and safety information for handlers** – Labeling will require registrants to develop and implement training programs for applicators. The training information is to include work practices and good agricultural practices for reducing exposure and improving

safety for workers and bystanders. In addition to having access to the registrant developed training and safety information as required by labeling, fumigant applicators will have access to DPR's 'Fumigant Resource Center' at, [www.cdpr.ca.gov/docs/emon/methbrom/mb\\_main.htm](http://www.cdpr.ca.gov/docs/emon/methbrom/mb_main.htm). This resource is for applicators and handlers, and contains updated labels, templates for fumigants management plans, and additional safety information.

- **Good agricultural practices and information on application rates, methods, and practices** – Fumigant labeling will require certain good agricultural practices designed to reduce off-gassing to improve safety and pest control effectiveness. These good agricultural practices include proper soil preparation and moisture, air and soil temperature, soil sealing methods, equipment calibration, and weather criteria. The labeling will also include restrictions or prohibition of certain methods, practices, and rates for difficult to address risks, and remains the primary source for specific fumigant use requirements and restrictions, unless stricter regulations or permit conditions prevail.
- **Fumigant management plans, and emergency preparedness and response requirements** – Most fumigant labeling has been revised to include fumigation management plan requirements. Emergency preparedness and revisions to response requirements are scheduled for completion during Phase 2 during 2012. The labeling requirement for a management plan is for applicators to provide a step-by-step list in preparation for the fumigation. The purpose of the list is to assure that the application is made in compliance with the label prior to making the application, and to capture information for taking actions in case of an emergency. DPR makes available to users fumigation management plan templates and guidance in completing them: [www.cdpr.ca.gov/docs/emon/methbrom/mb\\_main](http://www.cdpr.ca.gov/docs/emon/methbrom/mb_main). Fumigant management plans have to be completed prior to the fumigation and made available upon request by DPR or county enforcement staff.
- **Compliance assistance and assurance measures** – Fumigant labeling will require users nationwide to contact their state lead agency, the department responsible for pesticide use enforcement, prior to making fumigant applications to assure that fumigators are in compliance with field soil fumigant use requirements. In California, long standing regulations assure that DPR-certified fumigators meet that contact requirement when they submit to the local County Agricultural Commissioner a notice of intent to apply these California-designated restricted materials.

- **Community outreach and education programs** – Fumigant labeling will require registrants to develop and implement community outreach programs. The programs are to include safety information available to community members to address bystander exposure risks. The information is intended to educate the public about fumigants, buffer zones, recognizing early signs of exposure, and how to respond appropriately in case of an incident. These requirements are aimed at registrants, not the fumigant user, but it is important to be aware of this requirement.

## **SUMMARY**

You should study the *Field Fumigation Study Guide*, this *Addendum to the Field Fumigation Study Guide*, particularly the US EPA Fact Sheets, and review the knowledge expectations to prepare for the QAL or QAC exam for the Field Soil Fumigation Category O. The knowledge expectations can guide you to the specific material to focus on during your exam preparation. All applicators/handlers must follow regulatory requirements and read labels carefully before an application. If possible, certified individuals should seek continuing education with a fumigant focus for their renewal requirements in order to remain informed.

**Figure 1. Sample Fumigant Label**  
(Follows on next page)

**FIGURE 1. SAMPLE FUMIGANT LABEL**

The following fumigant label was updated during Phase 1 to include the new US EPA safety provisions that went into effect in late 2010. Fumigant labels will be updated again in late 2011 for Phase 2 (available in 2012) to include the new requirements for emergency preparedness and response, safety requirements for buffer zones and other related measures. Text boxes highlight the new safety provisions that are being implemented through the product label changes.

**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® 57**  
PREPLANT SOIL FUMIGANT

ACTIVE INGREDIENT	By Wt.
Methyl bromide	57%
Chloropicrin	43%
<b>TOTAL</b>	<b>100%</b>

This product weighs 14.2 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.

**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.

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

Supplemental Label # TOG57-3Rev. A  
EPA REG NO. 5785-28  
EPA EST. NO. 5785-CA-01

© Registered trademark of Great Lakes Chemical Corporation  
© 2010 Great Lakes Chemical Corporation

Table of Contents	Section Number
First Aid	1
Precautionary Statements	2
Personal Protective Equipment (PPE)	3
User Safety Requirements/Recommendations	4
Environmental, Physical, and Chemical Hazards	5
Directions for Use	6
Agricultural Use Requirements	7
General Precautions	8
Handlers	9
Protection for Handlers	10
Respiratory Protection and Stop Work Triggers	11
Tarp Perforation and/or Removal	12
Entry Restricted Period and Notification	13
Mandatory Good Agricultural Practices (GAPs)	14
Site-specific Fumigation Management Plan (FMP)	15
Soil Fumigation Directions and Application Methods	16
Table 1	17
Maximum Application Rates for CUE crops/uses	
Table 2	18
Maximum Application Rates for Non-CUEs crops/uses	
Table 3	19
Maximum Application Rates for Quarantine Uses	
Storage, Handling, and Disposal	20
Spill and Leak Procedures for Soil Fumigation	21
Statement of Warranty and Liability	22

Designated as restricted use pesticide. Sale to and use by certified applicators only or use by persons under their direct supervision.

## PRECAUTIONARY STATEMENTS HAZARDS TO HUMANS AND DOMESTIC ANIMALS

2

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)

3

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, light 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, when an air-purifying respirator is required, handlers (including applicators) must wear a:**

- NIOSH-approved 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:** 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.

### USER SAFETY REQUIREMENTS

4

- Immediately after contamination remove outer clothing, shoes and socks, and do not reuse clothing and shoes.
- Discard clothing or heavily contaminated items.
- Follow manufacturer's instructions for cleaning and washing PPE.

**New fumigant handler requirements and safety information. Includes clear description of what constitutes handler activities.**

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.

### ENVIRONMENTAL HAZARDS

5

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).

### 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® 57 may liberate hazardous gases. The use of Terr-O-Gas® 57 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

6

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

7

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

8

- 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

9

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
  - 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

10

### 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

comply with carrying out those activities the information necessary to understand the requirements 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.

#### 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.

#### 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 consists of a questionnaire (heart condition) that would be identified, then additional 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.

**New respiratory protection and stop work triggers**

#### RESPIRATORY PROTECTION AND STOP WORK TRIGGERS 11

The following procedures must be followed to determine whether an air-purifying respirator is required or if operations must cease for any person performing a handling task as stated in this label.

- If at any time any handler experiences sensory irritation (tearing, burning of the eyes or nose) then either:
  - An air-purifying respirator (APR) must be worn by all handlers who remain in the application block, or
  - Operations must cease and handlers not wearing an air-purifying respirator must leave the application block.
- Handlers can remove air-purifying respirators or resume operations if two consecutive breathing-zone samples taken at the handling site at least 15 minutes apart show that levels of methyl bromide have decreased to less than 1 ppm and levels of chloropicrin have decreased to less than 0.15 ppm, provided that handlers do not experience sensory irritation. During the collection of air samples, a full-face air-purifying respirator must be worn by the handler taking the air samples. Samples must be taken where the irritation is first experienced.
- 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.
- When breathing zone samples are required, they must be taken outside respiratory protection equipment and within a ten inch radius of the handler's nose and mouth.

When air-purifying respirators are worn, air monitoring samples must be collected at least every 2 hours in the breathing zone of a handler performing a representative handling task.

- If at any time: (1) a handler experiences any sensory irritation when wearing an air-purifying respirator, or (2) a methyl bromide air sample is greater than 5 ppm or a chloropicrin air sample is greater than or equal to 1.5 ppm, then all handler activities must cease and handlers must be removed from the application block. If operations cease the emergency plan detailed in the FMP must be implemented.
- Handlers can resume work activities without an air-purifying respirator if two consecutive breathing-zone samples taken at the handling site at least 15 minutes apart show levels of methyl bromide have decreased to 1 ppm and levels of chloropicrin have decreased to less than 0.15 ppm, provided that handlers do not experience sensory irritation. During the collection of air samples an air-purifying respirator must be worn by the handler taking the air samples. Samples must be taken where the irritation is first experienced.
- Work activities can resume if all of the following conditions exist provided the appropriate air-purifying respirator is worn:
  - two consecutive breathing zone samples for methyl bromide taken at the handling site at least 15 minutes apart must be less than 5 ppm, but are greater than 1 ppm,
  - two consecutive breathing zone samples for chloropicrin taken at the handling site at least 15 minutes apart must be less than 1.5 ppm, but are greater than 0.15 ppm,
  - handlers do not experience sensory irritation while wearing the APR,
  - cartridges have been changed, and
  - during the collection of air samples an air-purifying respirator must be worn by the handler taking the air samples. Samples must be taken where the irritation is first experienced.

#### TARP PERFORATION AND/OR REMOVAL 12

**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 coultter 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 13

##### 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 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 ENTRE,"
- "Methyl Bromide and Chloropicrin Fumigant in USE,"
- the date and
- the date and
- Terr-O-Gas®
- Name, address, and telephone number of the certified applicator in charge of the fumigation.

**Mandatory good agricultural practices**

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) 14

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)

- 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> by con

**New entry restricted period and notification requirements**

Identify Unfavorable weather conditions which can move off-site in unpredictable directions. These conditions typically exist prior to sunset and continue past sunrise and persist as late as noon-time. 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, pre-treatment 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 are 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 **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

Required site-specific fumigant management plan

## 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 compressed gas 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.

## 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-Tarp 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.

## SITE-SPECIFIC FUMIGATION MANAGEMENT PLAN (FMP) 15

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

• 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)

• 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 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.
- Air monitoring plan
  - If sensory irritation is experienced, indicate whether operations will be ceased or operations will continue with an air-purifying respirator
  - If the intention is to cease operations when sensory irritation is experienced, provide the name, address, and phone number of the handler that will perform monitoring activities prior to operations resuming
- When air-purifying respirators are worn:
  - Representative handler tasks to be monitored
  - Monitoring equipment to be used and timing of monitoring
- Good Agricultural Practices (GAPs)
  - Description of applicable mandatory 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 DIRECTIONS.

16

Compliance with all GAPs listed in this label is required for use of this product. Terr-O-Gas® 57 may be used only for pre-plant soil fumigation.

## APPLICATION METHODS.

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 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.

Pretreatment Soil Preparation. Do not fumigate if the soil temperature is below 50°F. For best results, fumigate when soil temperature is 60°F to 80°F at the depth of application. Follow applicable GAP soil preparation procedures and soil condition requirements listed in this label.

**1. Broadcast Application.** Follow applicable application procedures and GAPs listed in this label. Consult the dosage rate table for treatment rates. Inject Terr-O-Gas® 57 with a chisel type applicator having chisels at the spacing noted under *Application Depth and Spacing* and injecting the fumigant below the soil surface at the depth noted under *Application Depth and Spacing*. The soil surface must be covered with a suitable tarp immediately after treatment. Follow all applicable procedures and GAPs listed for use of tarps.

**2. Row or Bed Application.** Apply the broadcast rate to the area actually treated, i.e., the area delimited by the film mulch. Follow applicable application procedures and GAPs listed in this label. Consult the dosage rate table for treatment rates. Use one or more shanks per bed at the spacing noted under *Application Depth and Spacing*. Inject the fumigant below the surface of the bed at the depth noted under *Application Depth and Spacing* and simultaneously cover with polyethylene film or other suitable tarp cover. Follow all applicable procedures and GAPs listed for use of tarps.

## 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 pre-shipment 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
- The maximum application block sizes are:
  - 100 acres for tarped bedded and broadcast applications

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

17

Crop	Broadcast Application Rates (lbs Product/A)
Eggplant	325-350
Muskmelons	325-350
Forest Nursery Seedlings	350-450
Orchard Nursery Seedlings (raspberry, deciduous trees, roses)	350-450
Strawberry Nurseries	350-450
Ornamentals	350-450
Pepper, Bell	325-350
Strawberry Fruit	350-412
Sweet Potato Slips	325-350
Tomato (grown for fresh market)	325-350

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

19

**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.

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

18

Crop	Broadcast Application Rates (lbs Product/A)
Peppers (grown for fresh market (CA))	300-350
Tomato (grown for fresh market (CA))	300-350

**STORAGE, HANDLING, AND DISPOSAL**

20

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, longs 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**

21

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 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**

22

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.



## **ATTACHMENT 1:**

### **US EPA Fact Sheets**

*Please Note:*

*The original dates of 2010 and 2011 for Phase 1 and Phase 2 that are published in the EPA Factsheets were pushed out a year and are now 2011 and 2012, respectively.*



EPA is requiring important new safety measures for soil fumigant pesticides to increase protections for agricultural workers and bystanders – people who live, work, or otherwise spend time near fields that are fumigated. These measures are for the soil fumigants chloropicrin, dazomet, metam sodium/potassium, and methyl bromide.

This fact sheet summarizes the soil fumigant product label changes that go into effect in 2010 and 2011. For detailed information on these new requirements for soil fumigants, visit EPA's website at: [http://www.epa.gov/oppsrrd1/reregistration/soil\\_fumigants/](http://www.epa.gov/oppsrrd1/reregistration/soil_fumigants/).

### ***Changes that Go Into Effect in 2010***

#### **Changes that go into effect in 2010:**

**Agricultural Worker Protection:** Persons engaged in any of a number of activities that are part of the fumigation process are considered “handlers.” New restrictions address respiratory protection, tarp handling and an entry-restricted period.

**Handler Training Information:** New labels will require fumigant registrants to develop and disseminate training information and materials for fumigant handlers (those working under the supervision of the certified applicator in charge of fumigations).

**Good Agricultural Practices:** Many good agricultural practices recommended on fumigant labels become mandatory on the new labels to minimize inhalation and other risks from fumigant applications. Examples of good agricultural practices include proper soil preparation/tilling, ensuring optimal soil moisture and temperature, and appropriate use of sealing techniques.

**Application Method, Practice and Rate Restrictions:** New labels will restrict certain fumigant application methods and practices for which data are not currently available to determine appropriate protections, or that lead to risks that are otherwise difficult to address. These include certain untarped applications for some fumigants. The label also lowers the maximum application rate, thereby reducing the potential for inhalation exposure and risk.

**Restricted Use Pesticide Classification:** EPA determined that all of the soil fumigants undergoing reregistration meet the criteria for restricted use. Therefore, EPA will reclassify metam sodium/potassium and dazomet as restricted use pesticides.

**Site-Specific Fumigant Management Plans (Partial):** New labels will require fumigant users to prepare a written, site-specific fumigant management plan (FMP) before fumigations begin. In 2010, FMPs do not need to address any of the requirements that go into effect in 2011. These written plans will help prevent accidents and misuse, and will capture steps to take in case an accident occurs. EPA is developing FMP templates for each fumigant.

## Changes that Go Into Effect in 2011

### **Changes that go into effect in 2011:**

**Buffer zones:** New labels will require fumigant users to establish a buffer zone around treated fields to reduce risks from acute inhalation exposure to bystanders. Buffer zone distances are scenario-based using applicable site conditions, and will be provided in look-up tables on product labels. EPA is also giving “credits” to encourage users to employ practices that reduce emissions (for example, use of high-barrier tarps). Credits will reduce buffer distances. Some credits will also be available for site conditions that reduce emissions (e.g., high organic or clay content of soils).

**Posting requirements:** For buffer zones to be effective, bystanders need to be informed about the location and timing of fumigations. New labels will require buffer zones be posted at usual points of entry and along likely routes of approach to the buffer unless

- a physical barrier prevents access to the buffer, or
- all of the area within 300’ of the buffer is under the control of the owner/operator.

The signs must include a “do not walk” symbol, fumigant product name, and contact information for the fumigator.

**Site-Specific Fumigant Management Plans (Complete):** In addition to the FMP requirements listed above, FMPs will need to include those requirements that go into effect in 2011.

**Emergency Preparedness and Response Requirements:** New labels will require registrants to provide training information to first responders in high fumigant use areas. In addition, EPA is requiring site-specific measures in areas where bystanders may be close to fumigant buffer zones. Fumigators may choose *either* to monitor the buffer perimeter or to provide emergency response information directly to neighbors.

- If the fumigator chooses to monitor, the emergency response plan stated in the FMP must be implemented if air concentrations reach action levels on labels. This monitoring must be done four times per day during the buffer zone period at times when the greatest potential exists for fumigants to move off-site.
- If the fumigator chooses instead to provide emergency response information directly to neighbors, the certified applicator supervising the fumigation, or someone under his/her direct supervision, must ensure that nearby residents and business owners/operators have been provided the response information at least one week prior to the fumigant application. The method for distributing information to neighbors must be described in the FMP.

**Applicator and Handler Training Programs:** New labels will require fumigant registrants to develop and implement training programs for applicators in charge of soil fumigations. The registrants also must prepare and disseminate training materials for fumigant handlers (those working under the supervision of the certified applicator in charge of fumigations).

**Community Outreach Programs and Information for First Responders:** EPA will require fumigant registrants to develop and implement community outreach programs and information for first responders to ensure that information about fumigants and safety is available within communities where soil fumigation occurs.

**Compliance Assistance and Assurance Measures:** In states that require notification of fumigant applications, fumigators must notify State and Tribal Lead Agencies for pesticide enforcement about applications they plan to conduct. This information will aid those states in planning compliance assistance and assurance activities.

## Soil Fumigant Mitigation Factsheet:

# 2010 Site-Specific Fumigant Management Plans and Post-Application Summaries

### *Fumigant Management Plans*

EPA is requiring important new safety measures for soil fumigant pesticides to increase protections for agricultural workers and bystanders – people who live, work, or otherwise spend time near fields that are fumigated. These measures are for the soil fumigants chloropicrin, dazomet, metam sodium/potassium, and methyl bromide.

This fact sheet summarizes new requirements to protect fumigant handlers and other workers from fumigant exposures. When new fumigant labels appear in the market place in 2010, fumigant users will need to comply with these new requirements.

### **Elements of FMPs**

To address the risk to bystanders, handlers and workers the Agency is requiring site-specific fumigant management plans (FMPs) and post-application summaries. Each site-specific FMP must contain the following elements:

- ❖ Applicator information (name, phone number, license and/or certificate number, employer name, employer address)
- ❖ General site information
  - Application block location (e.g., 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, application method, application rate, injection depth, application block size)
- ❖ 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

## **Fumigant Management Plans (continued)**

- 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
- ❖ 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)
- ❖ 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, complaints, or other emergencies)
- ❖ Posting procedures (person(s) who will post signs, dates for posting and for sign removal)
- ❖ Plan describing how communication will take place between applicator, land owner/operator, and other on-site handlers (e.g., tarp cutters/removers, irrigators) for complying with label requirements (e.g., timing of tarp cutting and removal, PPE)
  - Name and phone number of persons contacted
  - Date contacted
- ❖ Authorized on-site personnel
  - Names, addresses and phone numbers of all handlers
  - Employer name, addresses, and phone numbers for all handlers
  - Tasks that each handler is authorized and trained to perform
  - 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
    - Date of fit testing for respirator(s) that each handler is designated to wear
- ❖ Air monitoring plan
  - For handlers without respiratory protection:
    - If sensory irritation is experienced, indicate whether operations will be ceased or operations will continue with respiratory protection
    - If intend to cease operations when sensory irritation is experienced, provide the name, address, and phone number of the handler that will perform monitoring activities prior to operations resuming

## **Fumigant Management Plans (continued)**

- For handlers with respiratory protection:
  - Representative handler tasks to be monitored
  - Monitoring equipment to be used and timing of monitoring
- For monitoring the breathing zone when using **methyl bromide formulations with < 20% chloropicrin**:
  - Representative handler tasks to be monitored
  - Monitoring equipment to be used and timing of the monitoring
- ❖ Good Agricultural Practices (GAPs)
  - Description of applicable mandatory 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.
- Recordkeeping 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/tribal enforcement personnel who request the FMP. In the case of an emergency, the FMP must be made available when requested by local/state/federal/tribal emergency response and enforcement personnel.

## **Post-Application Summaries**

### **New Requirements for Post-Application Summaries**

Within 30 days of completing the application portion of the fumigation process, the certified applicator supervising the application must complete a post-fumigation application summary that describes any deviations from the FMP that have occurred, measurements taken to comply with GAPs 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 complaint (e.g., on-site handler, person off-site)
  - If off-site person, name, address, and phone number of person filing complaint
  - Description of control measures or emergency procedures followed after complaint
- ❖ Description of incidents, equipment failure, or other emergency and emergency procedures followed (if applicable)
- ❖ Details of elevated air concentrations monitored (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 respiratory protection)
    - When using a direct read instrument for breathing zone sample:
      - Sample date and time

***Post-Application  
Summaries (continued)***

- Handler task/activity (if applicable)
- Handler location
- Air concentration
- Sampling method
- ❖ Date of sign removal
- ❖ Any deviations from the FMP

In addition to recordkeeping requirements from 7 CFR part 110 “Recordkeeping Requirements for Certified Applicators of Federally Restricted Use Pesticides,” this decision requires that both the certified applicator and owner/operator of the application block keep a signed copy of the post-application summary record for 2 years from the date of application.

Applicators and other stakeholders have the flexibility to use EPA’s template, prepare their own FMP templates, or use other commercially available software with certain elements listed above in check-list and/or fill in the blank format.

A second phase of risk mitigation measures, including buffer zones, will appear on fumigant labels in late 2011. The Fumigant Management Plan and Post-Application Summary will be updated to include these new measures.

---

For additional information, please see EPA’s Web page on risk mitigation measures for the soil fumigants, [http://www.epa.gov/oppsrrd1/reregistration/soil\\_fumigants/](http://www.epa.gov/oppsrrd1/reregistration/soil_fumigants/).



EPA is requiring important new safety measures for soil fumigant pesticides to increase protections for agricultural workers and bystanders -- people who live, work, or otherwise spend time near fields that are fumigated. These measures are for the soil fumigants chloropicrin, dazomet, metam sodium/potassium, and methyl bromide.

This fact sheet summarizes new requirements to protect fumigant handlers and other workers from fumigant exposures. When new fumigant labels appear in the market place in 2010, fumigant users will need to comply with these new requirements.

### ***Handler activities on labels***

#### **To address risks to fumigant handlers and workers, EPA is requiring:**

##### **A clear description of handler activities on labels**

All persons performing fumigant-handler activities must be trained and equipped as handlers in accordance with the requirements in the WPS (40 CFR Part 170). Handler activities include:

- Participating in the application as supervisors, loaders, drivers, tractor co-pilots, shovelers, cross ditchers, or as other direct application participants (note: 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);
- Monitoring 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 application block or surrounding buffer zone during the buffer zone period;
- Entering the application site or surrounding buffer zone during the buffer zone period to perform scouting or crop advising 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
  - until 48 hours after tarp perforation is complete if tarps will be perforated but not removed within 14 days after application.

### ***On-site supervision and training***

##### **On-site supervision and training**

- Direct, on-site supervision by certified applicators during most fumigant applications
- New training provided by registrants for certified applicators who supervise fumigant applications
- New training information for other handlers.

## ***Respiratory protection requirements***

## ***Tarp perforation and removal requirements***

## ***Entry-restricted period requirements***

### **Respiratory protection requirements**

- Handlers must either stop work and leave the area or use air-purifying respirators if they experience sensory irritation (this does not apply to formulations with less than 20% chloropicrin)
- For methyl bromide formulations with less than 20% chloropicrin, handlers must wear air-purifying respirators during handling activities
- Air monitoring while handlers use respirators to ensure concentrations do not exceed the upper working limit of respirators
- All handlers who will wear a respirator must be fit-tested, trained, and medically examined to ensure they do not have health problems such as a heart condition that could make use of a respirator dangerous
- An air purifying respirator with the appropriate cartridges must be available for each handler who will wear a respirator.

### **Tarp perforation and removal requirements**

- If tarps are used, they may not be perforated until at least 5 days (120 hours) have elapsed after the fumigation is complete unless a weather condition exists that necessitates early removal
- Tarp removal may not begin until at least 2 hours after tarp perforation is complete and tarp removers must follow respiratory protection requirements
  - For methyl bromide, air monitoring with direct-read instruments is required before tarp removal can begin
- If tarps are not removed, planting may not begin until at least 48 hours after tarp perforation is complete
- If tarps are left on the soil for at least 14 days after the fumigation is complete, planting may begin when the tarps are being perforated
- Tarps must be perforated using mechanical methods (e.g., all-terrain vehicles with cutting implements) except for small areas (less than 1 acre), at the start of a row, and during flood prevention activities.

### **Entry-restricted period requirements**

- Entry into treated fields (including early entry that would otherwise be permitted under the WPS) by any person other than a trained and equipped handler is prohibited from the start of the application until
  - 5 days (120 hours) after application has ended for untarped applications, or
  - After tarps are perforated and removed if tarp removal is completed less than 14 days after application, or
  - 48 hours after tarps are perforated if they will not be removed at least 14 days after the application, or
  - 5 days (120 hours) after application is complete if tarps are not perforated and removed 14 days after the application is complete.

## Entry Restricted Period by Scenario

If the application is [ ____ ]	and Tarp is [ ____ ]	[ ____ ] days after application is completed	workers may enter [ ____ ]
1.	Untarped	-----	5 days after application is complete
2.	Tarped	Perforated <b>and</b> Removed	Within 14 days
3.	Tarped	Perforated <b>BUT NOT</b> Removed	48 hours after perforating tarps
4.	Tarped	Perforated <b>and/or</b> Removed	More than 14 days

---

For additional information, please see EPA's Web page on risk mitigation measures for the soil fumigants, [http://www.epa.gov/oppsrrd1/reregistration/soil\\_fumigants/](http://www.epa.gov/oppsrrd1/reregistration/soil_fumigants/).



EPA is requiring important new safety measures for soil fumigant pesticides to increase protections for agricultural workers and bystanders -- people who live, work, or otherwise spend time near fields that are fumigated. These measures are for the soil fumigants chloropicrin, dazomet, metam sodium/potassium, and methyl bromide.

This fact sheet summarizes new requirements to protect fumigant handlers and other workers from fumigant exposures. When new fumigant labels appear in the market place in 2010, fumigant users will need to comply with new requirements. Requirements for Buffer Zone Mitigation Measures, however, will not appear on fumigant labels until late 2011.

## **Buffer Zone Distances**

A buffer zone provides distance between the application site (i.e., edge of field) and bystanders, allowing airborne residues to disperse before reaching the bystanders. This buffer will reduce the chances that air concentrations where bystanders are located will cause acute adverse health effects.

EPA has selected buffer distances that will protect bystanders from acute exposures, but which are not so great as to eliminate benefits of soil fumigant use. The size of the buffer zones is based on the following factors:

- application rate;
- field size;
- application equipment and methods; and,
- credits for use of emission-reduction measures such as high-barrier tarps and site conditions.

Buffer zone distances are scenario-based using applicable site conditions and will be based on look-up tables on product labels. EPA is also giving “credits” to encourage users to employ practices which reduce emissions. Credits will reduce buffer distances. Some credits will also be available for site conditions that reduce emissions (e.g., high organic or clay content of soils).

To address the risk to bystanders who live and work near fumigated fields, the Agency is requiring buffer zones. The following summarizes the buffer zone requirements:

### **General**

- A “buffer zone” must be established around the perimeter of each application block or greenhouse where a soil fumigant is applied. The buffer zone must extend from the edge of the application block or greenhouse perimeter equally in all directions.
- All non-handlers including field workers, nearby residents, pedestrians, and other bystanders must be excluded from the buffer zone during the buffer zone period, except for people in transit (see exemptions section below).
- The “buffer zone period” starts at the moment when any fumigant is delivered/ dispensed to the soil within the application block or greenhouse and lasts for a minimum of 48 hours after the fumigant has stopped being delivered/dispensed to the soil.

## **New Requirements for Buffer Zones**

### **General**

## ***Buffer Zone Distances***

### ***Authorized Entry to Buffer Zones***

### ***Buffer Zone Proximity***

### ***Exemptions for Transit Through Buffer Zones***

### ***Structures Under the Control of Owner/Operator of the Application Block***

### ***Areas Not Under the Control of Owner/Operator of the Application Block***

#### **Buffer zone distances**

- Buffer zone distances must be based on look-up tables on product labels (25 feet is the smallest distance regardless of site-specific application parameters).
- For selective replant fumigation in an orchard using hand held application methods (e.g., deep injection auger probes) to treat individual tree holes, the minimum buffer zone will be 25 feet measured from the center of each injection site (i.e., tree hole).

#### **Authorized entry to buffer zones**

- Only authorized handlers who have been properly trained and equipped according to EPA's Worker Protection Standard (WPS) and label requirements may be in the buffer zone during the buffer zone period.

#### **Buffer zone proximity**

- To reduce the potential for off-site bystander exposure to peak fumigant emissions from multiple fumigated fields, buffer zones from multiple application blocks may only overlap under the following conditions:
  - For continuous-move center-pivot applications (metam sodium/potassium products only), buffers may overlap only if applications are made using low-drift systems.
  - For all other application methods, buffers may overlap only if at least 12 hours have elapsed from end of the application for which a buffer is already in place to the start of the subsequent application.
  - The certified applicators in charge of the fumigations must provide information to handlers who may work in the buffers about the protective equipment, signs of exposure, and health effects associated with each fumigant to which they may be exposed.

#### **Exemptions for transit through buffer zones**

- Vehicular and bicycle traffic on public and private roadways through the buffer zone is permitted
- Bus stops or other locations where persons wait for public transit are not permitted within the buffer zone.
- See the Posting Fact Sheet for additional requirements that may apply.

#### **Structures under the control of owner/operator of the application block**

- Buffer zones may not include buildings used for storage such as sheds, barns, garages, etc., **UNLESS**,
  - The storage buildings are not occupied during the buffer zone period, and
  - The storage buildings do not share a common wall with an occupied structure.
- See the Posting Fact Sheet for additional requirements that may apply.

#### **Areas not under the control of owner/operator of the application block**

- Buffer zones may not include residential areas (including employee housing, private property, buildings, commercial, industrial, and other areas that people may occupy or outdoor residential areas, such as lawns, gardens, or play areas) **UNLESS**,

**Areas Not Under the Control of Owner/Operator of the Application Block, continued**

- The occupants provide written agreement that they will voluntarily vacate the buffer zone during the entire buffer zone period, and
  - Reentry by occupants and other non-handlers does not occur until the buffer zone period has ended.
  - For methyl bromide formulations with less than 20% chloropicrin, air monitoring with direct-read instruments shows concentrations are below action levels before reentry is permitted.
- Buffer zones may not include agricultural areas owned/operated by persons other than the owner/operator of the application block, **UNLESS**,
    - The owner/operator of the application block can ensure that the buffer zone will not overlap with a buffer zone from any adjacent property owners, taking into account the amended requirements for overlapping buffers, and
    - The owner/operator of the areas that are not under the control of the applicator provides written agreement to the applicator that they, their employees, and other persons will stay out of the buffer zone during the entire buffer zone period.
  - Buffer zones may not include publicly owned and/or operated areas (e.g., parks, sidewalks, walking paths, playgrounds, athletic fields, etc), **UNLESS**,
    - The area is not occupied during the buffer zone period,
    - Entry by non-handlers is prohibited during the buffer zone period, and
    - Written permission is given by the appropriate state and/or local authorities to include public areas in the buffer zone.
  - Buffer zones may include publicly owned and/or operated roads, including rights of ways. As mentioned in the previous bullet, if a sidewalk or permanent walking path is associated with it, written permission must be given by the appropriate state and/or local authorities.

**Fumigation Restrictions Near Difficult-to-Evacuate Sites**

**Fumigation Restrictions Near Difficult-to-Evacuate Sites**

- The Agency has defined “difficult-to-evacuate” sites to include schools, state-licensed daycare centers, nursing homes, assisted living facilities, hospitals, in-patient clinics, and prisons.
- No fumigant applications with buffer zones greater than 300 feet will be permitted within ¼ mile of a difficult-to-evacuate site unless the site is not occupied during the application and the 36-hour period following the application.
- If the fumigation buffer zone is 300 feet or less, then no fumigant applications will be permitted within 1/8 mile of a difficult-to-evacuate site unless the site is not occupied during the application and the 36-hour period following the application.

---

For additional information, please see EPA’s Web page on risk mitigation measures for the soil fumigants, [http://www.epa.gov/oppsrrd1/reregistration/soil\\_fumigants/](http://www.epa.gov/oppsrrd1/reregistration/soil_fumigants/).



# Posting Requirements for Buffer Zones

EPA is requiring important new safety measures for soil fumigant pesticides to increase protections for agricultural workers and bystanders -- people who live, work, or otherwise spend time near fields that are fumigated. These measures are for the soil fumigants chloropicrin, dazomet, metam sodium/potassium, and methyl bromide.

This fact sheet summarizes new requirements to protect fumigant handlers and other workers from fumigant exposures. When new fumigant labels appear in the market place in 2010, fumigant users will need to comply with new requirements. Posting Requirements for Buffer Zones, however, will not appear on fumigant labels until late 2011.

## ***New Requirements for Posting Buffer Zones***

### **New Requirements for Posting Buffer Zones**

Current soil fumigant labels require treated areas to be posted, and handlers are required to wear specific personal protective equipment when they are in a treated area. For buffer zones to be effective, bystanders need to be informed of the location of the buffer to ensure they do not enter areas designated as part of the buffer zone. The perimeter of the fumigant buffer zones must be posted as described below.

Posting of a buffer zone is required unless there is a physical barrier that prevents bystander access to the buffer zone.

### **Additional Posting Requirements**

#### **Buffer zone posting signs must:**

- Be placed at all usual points of entry and along likely routes of approach from areas where people who are not under the land owner/operator's control may approach the buffer zone.
  - Some examples of points of entry include, but are not limited to, roadways, sidewalks, paths, and bike trails.
  - Some examples of likely routes of approach are the area between a buffer zone and a roadway, or the area between a buffer zone and a housing development.
- The printed side of the sign must face away from the treated area toward areas from which people could approach.
- Signs must remain legible the entire posting period.
- Signs must be posted before the application begins and remain posted until the buffer zone period has expired.
- Signs must be removed within three days after the end of the buffer zone period.

**Exception:** If multiple contiguous blocks are fumigated within a 14-day period, the entire periphery of the contiguous blocks' buffer zones may be posted. The signs must remain posted until the last buffer zone period expires and signs may remain posted until three days after the buffer zone period for the last block has expired.

## ***Additional Posting Requirements***

## Contents of Signs

### Buffer Zone Sign

## Contents of Signs

Signs must meet the general standards outlined in the Worker Protection Standard (WPS) for text size and legibility (see 40 CFR §170.120). Registrants must provide generic buffer zone posting signs that meet these criteria at points of sale for applicators to use.

Current soil fumigant labels require treated areas to be posted, and handlers are required to wear specific personal protective equipment when they are in a treated area.

The **buffer zone** sign must include the following:

- Do not walk sign
- "DO NOT ENTER/NO ENTRE,"
- "[Name of fumigant] [Name of product] Fumigant BUFFER ZONE,"
- Contact information for the certified applicator in charge of the fumigation



## Treated Area Sign

The **treated area sign** (currently required for fumigants) must state the following:

- Skull and crossbones symbol
- "DANGER/PELIGRO,"
- "Area under fumigation, DO NOT ENTER/NO ENTRE,"
- "[Name of fumigant] Fumigant in USE,"
- Date and time of fumigation,
- Date and time entry prohibition is lifted
- Name of the product
- Name, address, and telephone number of the certified applicator in charge of the fumigation.

# DANGER/PELIGRO



AREA UNDER FUMIGATION

\_\_\_\_\_ FUMIGANT IN USE

START DATE/TIME: \_\_\_\_\_

END DATE/TIME: \_\_\_\_\_

PRODUCT: \_\_\_\_\_

APPLICATOR CONTACT INFORMATION:

\_\_\_\_\_

# DO NOT ENTER/NO ENTRE

---

For additional information, please see EPA's Web page on risk mitigation measures for the soil fumigants, [http://www.epa.gov/oppsrrd1/reregistration/soil\\_fumigants/](http://www.epa.gov/oppsrrd1/reregistration/soil_fumigants/).





## Soil Fumigant Mitigation Factsheet:

# Emergency Preparedness and Response Requirements

EPA is requiring important new safety measures for soil fumigant pesticides to increase protections for agricultural workers and bystanders -- people who live, work, or otherwise spend time near fields that are fumigated. These measures are for the soil fumigants chloropicrin, dazomet, metam sodium/potassium, and methyl bromide.

This fact sheet summarizes new requirements to protect fumigant handlers and other workers from fumigant exposures. When new fumigant labels appear in the market place in 2010, fumigant users will need to comply with new requirements. Requirements for Emergency Preparedness and Response, however, will not appear on fumigant labels until late 2011.

### ***New Requirements for Emergency Preparedness and Response***

### ***Fumigant Site Monitoring***

#### **New Requirements for Emergency Preparedness and Response**

To reduce risks to people who may be near a buffer zone (e.g., at their home or working in a nearby field), EPA is requiring applicators to either provide on-site monitoring of the buffer zone perimeter in areas where residences and other occupied structures are within a specific distance, or, as an alternative to on-site monitoring, provide emergency response information directly to neighbors. Whether measures are required depends on the size of the buffer zone and how close people may be to the buffer zone. An example of each element is discussed in more detail below.

#### **Fumigation Site Monitoring**

If emergency response measures are required based on the criteria described below, and the fumigator chooses to monitor the buffer perimeter rather than to provide information directly to the neighbors, here is what the fumigator must do:

- Monitoring must begin on the day the application begins and continue until the buffer zone period expires.
- Monitoring must take place approximately 1 hour before sunset on the day the application begins and continue once during the night, once at 1 hour after sunrise, and once during the day until the end of the buffer zone period.
- Monitor for sensory irritation for metam sodium/potassium, dazomet, chloropicrin, and methyl bromide products that include at least 20% chloropicrin.
- Air concentrations of methyl bromide must be measured using a direct-read instrument if the methyl bromide product applied contains less than 20% chloropicrin.
- Monitoring must be conducted by a certified applicator or someone under his/her supervision.
- Monitoring must take place in areas between the buffer zone perimeter and residences or other occupied areas that trigger this requirement.

## ***Fumigant Site Monitoring, continued***

## ***Response Information for Neighbors***

- If at any time the person monitoring the air concentrations experiences sensory irritation consistent with fumigant exposure, then the emergency response plan stated in the FMP must be immediately implemented.
- If other problems occur, such as a tarp coming loose, then the appropriate control plan must be activated.
- For formulations with less than 20% chloropicrin, the location and results of the air monitoring must be recorded in the post-application summary.
- For formulations with 20% or greater chloropicrin, the location where any sensory irritation occurred must be recorded in the post-application summary.

EPA believes this will help ensure that if a problem occurs during or after the fumigation, the appropriate steps can be taken to reduce the risk of exposure. While protective, site monitoring may be burdensome for users fumigating in areas with few people. Therefore, users have the option of providing emergency response information directly to neighbors rather than monitoring.

### **Response Information for Neighbors**

As an alternative to on-site monitoring, the certified applicator supervising the fumigation (or someone under his/her direct supervision) would need to ensure that residences and businesses that meet the criteria outlined below have been provided the information below at least one week before fumigant application in a specified field. The dates that fumigation is planned to take place may be stated as a range of dates, up to four weeks long. If an application is not made during the four-week window indicated, the information must be delivered again.

Information that must be provided includes:

- The general location of the application block,
- Fumigant(s) applied including the active ingredient, name of the fumigant products(s), and the EPA Registration number,
- Contact information for the applicator and property owner/operator,
- Time period in which the fumigation is planned to take place (must not range more than 4 weeks),
- Early signs and symptoms of exposure to the fumigant(s) applied, what to do, and emergency responder phone number to call (911 in most cases), and
- How to find additional information about fumigants.

The method for distributing information to neighbors must be described in the FMP and may be accomplished through mail, telephone, door hangers, or through other methods that can be reasonably expected to effectively inform residences and businesses within the required distance from the edge of the buffer zone.

## When are Emergency Preparedness and Response Measures Needed?

## When are Emergency Preparedness and Response Measures Needed?

### Site-Specific Proximity Triggers for Buffer Zones Greater than 25 Feet

If the buffer zone is:	AND there are residences and businesses:
> 25 feet and ≤ 100 feet	50 feet from the edge of the buffer zone
> 100 feet and ≤ 200 feet	100 feet from the edge of the buffer zone
> 200 feet and ≤ 300 feet	200 feet from the edge of the buffer zone
> 300 feet	300 feet from the edge of the buffer zone
<b>Applicator must either :</b> <b>Monitor the air (Option 1)</b> <b>or</b> <b>Provide information to neighbors (Option 2)</b>	

Exception: If the buffer zone is 25 feet, the minimum buffer zone size, then Emergency Preparedness and Response measures are not required. Also, if all of the land within 300 feet of the edge of the buffer zone is under the control of the owner/operator of the fumigated field, then Emergency Preparedness and Response measures are not required regardless of the size of the buffer zone.

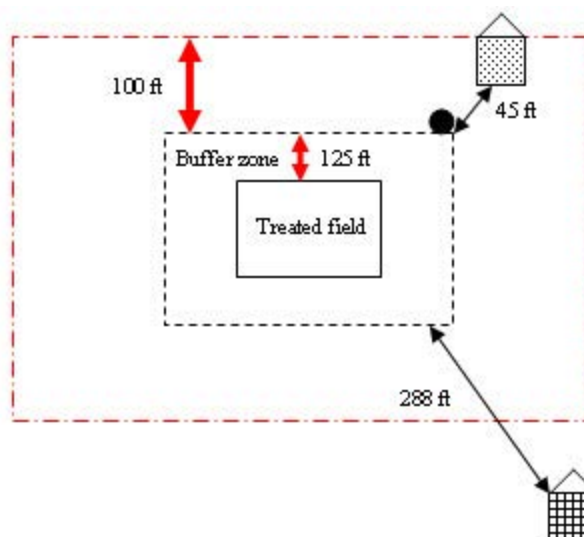
Because site monitoring may be burdensome for users fumigating in areas with few residences or businesses, EPA is allowing fumigant users the option of providing emergency response information directly to neighbors instead of monitoring.

## Example Site Map for Informing Neighbors

### Example Site Map for Informing Neighbors

Below is an example to clarify this requirement:

- IF the buffer zone is **125 feet**, then these requirements apply to residences within 100 feet of the buffer zone. Either the applicator must monitor the area between the dotted house and the buffer zone or residents of the dotted house must be provided emergency response information.
- The location of the cross-hatched house would not prompt any action since it is outside the specified distance.



For additional information, see EPA's Web page on risk mitigation measures for the soil fumigants, [www.epa.gov/oppsrrd1/reregistration/soil\\_fumigants/](http://www.epa.gov/oppsrrd1/reregistration/soil_fumigants/).







DEPARTMENT OF PESTICIDE REGULATION

1001 I Street  
P.O. Box 4015  
Sacramento, CA 95812  
[www.cdpr.ca.gov](http://www.cdpr.ca.gov)

General Information  
(916) 445-4300