

# **SAFETY INFORMATION FOR HANDLERS PARTICIPATING IN A FIELD FUMIGANT APPLICATION FOR 1,3 DICHLOROPROPENE (1,3-D)/CHLOROPICRIN COMBINATION PRODUCTS**

The U.S. Environmental Protection Agency requires that certified applicators provide safety information to handlers of soil fumigants. Providing this information to handlers in a manner they can understand meets this requirement for 1,3-Dichloropropene/chloropicrin combination products.

# Introduction

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The 1,3-D/chloropicrin labels require that all handlers receive safe handling information **BEFORE** participating in a field fumigation. Handlers applying soil fumigants must also be trained according to the requirements of the Worker Protection Standard (WPS). This information alone does not satisfy the WPS required handler training.

***This review is only a reference and is not intended to be a substitute for product labels. The label is the law. Comply with all label requirements. Always refer to the label for detailed information and requirements for safe use of the product, first aid, and information for physicians.***

# Introduction

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Chapter 1 – Fumigants and How They Work

Chapter 2 – Safe Application and Handling of  
Soil Fumigants

Chapter 3 – Air Monitoring and Respiratory  
Protection

Chapter 4 – Appropriate Steps to Mitigate  
Exposure

# Chapter 1. Fumigants and How They Work

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## A. Purpose of Fumigation

- Before planting to eliminate pests such as nematodes, fungi, and weeds
- May be a liquid or gas, but moves as a gas through the soil to control pests
- No residual activity

# Chapter 1. Fumigants and How They Work

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## B. Early Signs and Symptoms of Exposure

- 1. 1,3-D plus chloropicrin:** Sensory irritation such as teary eyes and stinging sensation in the eyes or throat. Can cause difficulty in breathing or tightness of the chest. Ingestion symptoms include abdominal pain and possible vomiting or diarrhea. Skin irritation, local redness or tissue damage may result from skin contact.
- 2. Working Safely Around Fumigations:** Soil fumigants are hazardous materials and must be handled with care only by those individuals experienced with their proper use. Fumigants can off-gas into the air surrounding the treated area. As a handler, it is the responsibility of both you and the Certified Applicator to ensure that you have received the proper training to assist in fumigation activities before any such fumigation activity takes place.

# Chapter 1. Fumigants and How They Work

## C. Types of Fumigants

1. Chloropicrin
2. Methyl Bromide and Chloropicrin Combinations
3. 1,3-Dichloropropene and Chloropicrin Combinations
4. Iodomethane and Chloropicrin Combinations

*For more detailed information on the particular fumigants and combinations, please refer to the specific product labels and associated training materials.*

# Chapter 1. Fumigants and How They Work

## D. Resources for More Information

1. Application Supervisor (Certified Applicator)
2. Pesticide Label
3. Fumigant Management Plan
4. Material Safety Data Sheet (MSDS)
5. EPA Soil Fumigant Website

<http://www.epa.gov/fumigantraining>

# Chapter 2. Safe Application and Handling of Soil Fumigants

## A. Understanding the Roles of Handler Categories

1. The following activities are prohibited from being performed in the application block by anyone other than persons who have been appropriately trained and equipped from the start of the application until the entry restricted period ends.

### **Handler activities include those persons:**

- Participating in the application;
- Using devices to take air samples;
- Cleaning up fumigant spills;
- Handling or disposing of fumigant containers;



# Chapter 2. Safe Application and Handling of Soil Fumigants

## 1. Handler Activities include those persons:

- Cleaning, handling, adjusting, or repairing the parts of equipment that may contain fumigant residues;
- Installing, repairing, or operating irrigation equipment in the fumigant application block;
- Scouting, crop advising, or monitoring tasks;
- Installing, perforating, 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.
  - Performing any handling tasks as defined by the WPS.

# Chapter 2. Safe Application and Handling of Soil Fumigants

## A. Understanding the Roles of Handler Categories

2. The following roles are examples of handlers for a soil fumigation application:

- Tractor Driver or Pilot
- Tractor Co-Pilot
- Shovelers
- Tarp Perforators (cutters), Repairers, and Removers

# Chapter 2. Safe Application and Handling of Soil Fumigants

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## B. Understanding the Application Method and Equipment

- May be applied via shank injection or via drip applications
- Good Application Practices (GAPs) must be followed during all fumigant applications.

These include the following which are specifically applicable to handlers:

- Soil Preparation
- Soil Sealing
- Application Depth
- Prevention of End Row Spillage

***For more specific information and instructions on the above topics, please refer to the specific product labels and related training materials.***

# Chapter 2. Safe Application and Handling of Soil Fumigants

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## C. Re-Entry Restrictions for a Fumigated Field

**1. Entry by any person – other than a correctly trained and PPE-equipped handler – is PROHIBITED – from the start of the application until:**

- a. 5 days (120 hours) after the application for untarped applications
- b. 5 days (120 hours) after the application if tarps are not perforated and removed for at least 14 days following the application
- c. 48 hours after tarp perforation is complete if tarps will not be removed for at least 14 days following application, or
- d. Until tarp removal is completed if tarps are both perforated and removed less than 14 days after application.

See [Tarp Perforation and/or Removal](#) section for requirements about when tarps are allowed to be perforated.

# Chapter 2. Safe Application and Handling of Soil Fumigants

## **D. Tarp Perforation and Removal - all persons performing these handling activities must be provided the appropriate PPE and other protections.**

- a. No perforation until a minimum of 5 days (120 hours) have elapsed after the fumigant introduction unless a weather condition necessitates the need for early perforation or removal.
- b. Removed before planting: at least 2 hours after tarp perforation
- c. Not removed before planting: planting or transplanting must not begin until at least 48 hours after the tarp perforation
- d. Tarps left intact: a minimum of 14 days after fumigant injection, planting or transplanting may take place while the tarps are being perforated.
- e. Each tarp panel used for broadcast fumigation must be perforated.

# Chapter 2. Safe Application and Handling of Soil Fumigants

## D. Tarp Perforation and Removal (con't)

- f. May be perforated manually ONLY for the following situations:
  - At the beginning of each row with a blade used on a motorized vehicle
  - Fields that are 1 acre or less.
  - During flood prevention activities.
- g. All other instances tarps must be perforated only by mechanical methods.
- h. Tarp perforation for broadcast fumigations must be completed before noon.
- i. For broadcast fumigation, tarps must not be perforated if rainfall is expected within 12 hours.
- j. Early Tarp Removal for Broadcast Applications Only:
  - Adverse weather; if before 5 days elapse, must be documented

# Chapter 2. Safe Application and Handling of Soil Fumigants

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## D. Tarp Perforation and Removal (con't)

- k. Early Tarp Perforation for Flood Prevention Activities
  - Allowed before the 5 days; must be immediately retucked and packed after soil removal.

# Chapter 2. Safe Application and Handling of Soil Fumigants

## **E. Buffer Zone Restriction for 1,3 D**

When the Buffer zone restriction applies -

Applications shall not be made within 100 feet of an occupied structure.

For a structure within the buffer zone - No person shall be present at this structure at any time during the seven consecutive day period following application.



# Chapter 3. Air Monitoring and Respiratory Protection

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## A. Approved Air-Purifying Respirators

### 1. Approved Half-Face Respiratory Protection Equipment

- All handlers must wear a **half-face air-purifying respirator** (except in enclosed cabs or when using “Yetter rig” – exceptions not allowed in California) with either an organic-vapor-removing cartridge with a prefilter approved for pesticides or canister approved for pesticides.

cartridge style - NIOSH approval number prefix  
TC-23C

canister style - NIOSH approval number prefix  
TC-14G



# Chapter 3. Air Monitoring and Respiratory Protection

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## A. Approved Air-Purifying Respirators

### 2. Approved Full-Face Respiratory Protection Equipment for 1,3-D/chloropicrin combination products.

When a **full-face air-purifying respirator** is required, handlers must wear at minimum either:

- A full-face respirator with an organic-vapor-removing cartridge with a prefilter approved for pesticides (TC-23C), or
- A full-face respirator with a canister approved for pesticides (TC-14G).



# Chapter 3. Air Monitoring and Respiratory Protection

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## A. Approved Air-Purifying Respirators

### 3. Respirator fit testing, medical qualification, and training

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

- Fit-tested and fit-checked
- Trained
- Examined by a qualified medical practitioner

# Chapter 3. Air Monitoring and Respiratory Protection

## B. When to Wear Full-Face Respiratory Protection

1. **Respiratory Protection and Stop Work Triggers:** The following procedures must be followed to determine whether a **full-face air-purifying respirator** is required or if operations must cease for any person performing a handling task.
  - a. If at any time any handler experiences sensory irritation then either:
    - A full-face air-purifying respirator must be worn in the application block, or
    - Operations must cease and handlers not wearing full-face air-purifying respirators must leave the application block.

# Chapter 3. Air Monitoring and Respiratory Protection

## B. When to Wear Full-Face Respiratory Protection

### 1. Respiratory Protection and Stop Work Triggers (con't):

- b. When full-face air-purifying respirators are worn, then air monitoring samples must be collected at least every 2 hours in the breathing zone of a handler.
- c. All handler activities must cease and handlers must be removed from the application block If at any time:
  - a handler experiences any sensory irritation when wearing a full-face air-purifying respirator, or
  - an air sample is greater than or equal to 1.5 ppm,
  - if operations cease the emergency plan detailed in the FMP must be implemented.

# Chapter 3. Air Monitoring and Respiratory Protection

## **B. When to Wear Full-Face Respiratory Protection**

### **1. Respiratory Protection and Stop Work Triggers (con't):**

- d. A self-contained breathing apparatus (SCBA) is not permitted for routine handler tasks. Such respirators are only permitted in emergencies such as a spill or leak or when corrective action is needed to reduce air levels to acceptable levels. The employer of any handler must confirm that at least one self-contained breathing apparatus (SCBA) is on site and is ready for use in case of an emergency.

# Chapter 3. Air Monitoring and Respiratory Protection

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## C. Requirements for Removing Full-Face Respiratory Protection

- When taking air samples, a full-face air-purifying respirator must be worn.
- Monitoring devices must have a sensitivity of at least 0.15 ppm for chloropicrin.

# Chapter 3. Air Monitoring and Respiratory Protection

## C. Requirements for Removing Full-Face Respiratory Protection (con't)

- Work activities can resume if the following conditions exist provided that the appropriate full-face air-purifying respirator is worn:
  - 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 air-purifying respirator, and
  - Cartridges have been changed.
  - 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.



# Chapter 3. Air Monitoring and Respiratory Protection

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## C. Requirements for Removing Full-Face Respiratory Protection (con't)

- Handlers can **remove full-face** air-purifying respirators or resume work if all of the following conditions exist **provided that a half-face** air-purifying respirator is worn:
  - Two samples taken at least 15 minutes apart show levels of chloropicrin have decreased to less than 0.15 ppm and
  - Handlers do not experience sensory irritation, and
  - Air-purifying cartridges have been changed

# Chapter 3. Air Monitoring and Respiratory Protection

## D. Air Monitoring for Chloropicrin

### 1. Equipment Used for Air Monitoring:

- In general, fumigant vapors are detected using small tubes that change color once they are exposed to air.

### 2. Sensory Irritation:

- A full-face respirator need not be worn unless sensory irritation is experienced.

All handlers must wear a half-face air-purifying respirator (except in enclosed cabs or when using “Yetter rig” – exceptions not allowed in California) with either an organic-vapor-removing cartridge with a prefilter approved for pesticides or canister approved for pesticides.

# Chapter 3. Air Monitoring and Respiratory Protection - SUMMARY

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<b>Half-face Respirator</b>	<b>-Minimum protection at all times within fumigation block (except closed cabs, Yetter rigs – exceptions not allowed in California)</b>
<b>Full-face Respirator</b>	<b>- Sensory irritation - When taking chloropicrin air samples</b>
<b>Cease Operational Activities</b>	<b>-Sensory irritation while wearing full-face respirator - Chloropicrin air sample &gt; 1.5 ppm</b>
<b>Resume Operational Activities with Full-Face Respirator</b>	<b>- Chloropicrin air samples &lt; 1.5 ppm and &gt;0.15 ppm -No sensory irritation while wearing full-face respirator - Cartridges changed</b>
<b>Remove Full-face Respirator</b>	<b>-Chloropicrin air samples &lt; 0.15 ppm - No sensory irritation</b>

# Chapter 3. Air Monitoring and Respiratory Protection

## E. Other PPE Considerations

### 1. Clothing and Attire – All handlers must wear

- Long-sleeved shirt and long pants;
- Shoes and socks.

***For more specific information and requirements when handling the liquid or contact with the liquid is a potential, please refer to the specific product label.***

# Chapter 3. Air Monitoring and Respiratory Protection

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## E. Other PPE Considerations

### 2. Personal Hygiene

- Follow manufacturer's instructions for cleaning/maintaining PPE
- For cleaning/maintaining PPE use detergent and hot water.
- Keep and wash PPE separately from other laundry.
- Discard clothing that have been drenched or heavily contaminated with concentrate. Do not reuse them.

# Chapter 3. Air Monitoring and Respiratory Protection

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## F. Other Health Considerations

### 1. Heat Illness:

- Heat illness is caused by working in air temperatures that are excessively hot. Drink sufficient water or other suitable liquids when working under hot conditions.

# Chapter 4. Appropriate Steps to Exposure Mitigation

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## A. What to do in Case of Emergency

### 1. Preparing for Emergencies:

For all emergencies, follow the proper steps to make sure you are properly protected. This includes having quick access to respiratory protection, knowing what mitigation steps can be taken to reduce exposure (e.g., leaving the area and going upwind), and knowing evacuation routes, emergency contact information and the applicable first aid. In addition, the Fumigant Management Plan (FMP) includes emergency procedures.

# Chapter 4. Appropriate Steps to Exposure Mitigation

## A. What to do in Case of Emergency (con't)

### 2. Examples of Emergency Situations:

- **Equipment Failure:** Take immediate steps to avoid exposure, such as donning your respirator and moving upwind of the release.
- **Vapor Drift:** Use your respirator and move upwind of the treated field. For off-site drift of fumigant vapor, the Certified Applicator will start the necessary mitigation measures to reduce the release of the fumigant vapor.



# Chapter 4. Appropriate Steps to Exposure Mitigation

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## A. What to do in Case of Emergency (con't)

### 3. Notifying the Application Supervisor of a Suspected or Known Emergency Situation:

- If you suspect or know that you, another handler, or another person has been exposed to a fumigant and are experiencing the signs and symptoms of fumigant exposure, stop all work and contact the supervisor immediately.

# Chapter 4. Appropriate Steps to Exposure Mitigation

## A. What to do in Case of Emergency (con't)

### 4. Spill and Leak Procedures :

- Evacuate everyone from the immediate area of the spill or leak. Wear the appropriate personal protective equipment.
- Move leaking or damaged containers outdoors or to an isolated location. Observe strict safety precautions. Work upwind, if possible. Allow spilled fumigant to evaporate or to absorb onto vermiculite, dry sand, earth, or similar absorbent material. Do not permit entry into the spill or leak area by any other person until the concentration of chloropicrin is measured to be less than 0.15 ppm.

# Chapter 4. Appropriate Steps to Exposure Mitigation

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## B. How to Report and Incident

### 1. Requirements for Reporting an Incident:

- If you suspect or know an incident occurred, contact the supervisor immediately.

### 2. Documenting the Incident:

- The Certified Applicator will be aware of the types of information that must be collected.

# Chapter 4. Appropriate Steps to Exposure Mitigation

## B. How to Report and Incident (con't)

### 3. Reporting Your Observations to the Application

#### **Supervisor or Registrant:**

- The supervisor will gather the information needed and will assist you in determining what course of action may be needed to resolve the incident.
- Report the following information:
  - Name of person who is ill
  - Applicator's name (if not the applicator in charge)
  - Where and when (date) the incident occurred
  - What happened
  - Symptoms & illness
  - Name of fumigant product

# Required Training for Handlers Participating in a Field Fumigant Application

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