New Requirements
For
Soil Fumigant Pesticide Products

EPA and UGA Grower Trainings
Nov 2010

Culpepper and Sumner

Reregistration Eligibility Decisions "REDs"

- Re-licensing decisions for chemicals used as soil fumigants
  - Methyl Bromide
  - Chloropicrin
  - Metam Sodium/Metam Potassium
  - Dazomet

CHANGES BEGIN WITH NEW LABELS EXPECTED AROUND DECEMBER 1, 2010

Goals of Mitigation Measures

Package of measures that work together to:

- Reduce
  - potential for direct exposure to toxic concentrations
  - likelihood of accidents and errors
- Foster planning and compliance
- Assure appropriate response to exposures

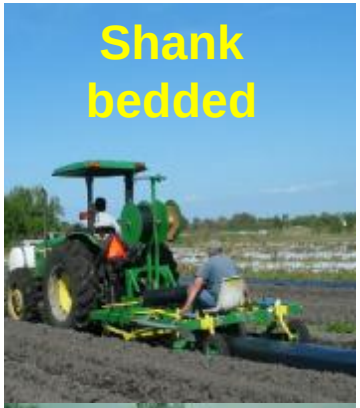
Implementation Schedule

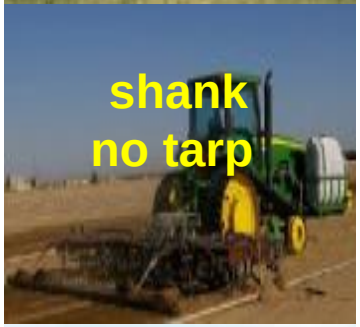
◙ under development

● adopt

Risk Mitigation Measure	2010	2011
Good agricultural practices (GAPs)	●	●
Restricted use (new measure for metam sodium/ potassium & dazomet only)	●	●
New handler protections including changes to respiratory protection, tarp cutting/removal and worker reentry restrictions	●	●
Fumigant management plans and post application summaries	●/◙	●
Buffer zone distances, credits, and posting		●
Emergency preparedness measures		●
Difficult to evacuate sites		●
Notice to state lead agencies		●
Safe handling information	●	●
First responder, community outreach and certified applicator training	◙	●
Rate reductions and use site limitations	●	●

Application Methods





	Methyl Bromide	Chloropicrin	Metam Sodium/ Potassium	Dazomet
Shank injection	●	●	●	
Spray blade			●	
Chemigation, drip		●	●	
Chemigation, sprinkler			●	
Chemigation, center pivot			●	
Hand held probe for tree holes	●	●		
Rotor tiller			⬬	●
Hot gas	●			

Examples of Generic GAPs

Soil moisture

- Appropriate for soil type
- Determined using USDA's Feel and Appearance method or an instrument

Soil preparation

- good tilth
- free of large clods
- crop residue (if present) must not interfere with soil seal

Photos courtesy of USDA NRCS

Another Example of a Generic GAP

Soil temperature

- Maximum soil temperature is 90 degrees F
- Depth of soil temperature measurement varies

Other GAPs

- Soil seal
- Calibrate, maintain, and clean equipment
- Prevent end-row spillage

Protections for Handlers & Workers (2010)

Restricted Use Pesticide Classification

Before reregistration:

-Restricted use:

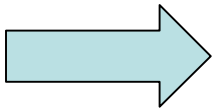
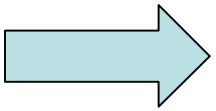
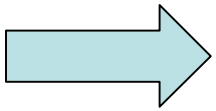
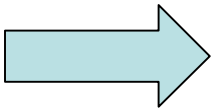
- methyl bromide
- 1,3-dichloropropene
- chloropicrin

-Non-restricted use products

- (most) metam sodium/potassium
- (most) dazomet

After reregistration: ALL are restricted use

Who is a “handler”?

A person in:	*from start of application*	*to end of:*
1. application block	 	entry restricted period
2. buffer zone	 	buffer zone period

Supervision of Handlers

Non-water run applications (e.g., shank, hot gas)

- “Certified applicators must be at the fumigation site in the line of sight of the application and must directly supervise all persons performing handling activities”

Water run applications (e.g., center pivot, drip)

- Certified applicator must be at site to begin the application
- Certified applicator or handlers under supervision of certified applicator must return every two hours to check on application
- Handlers communicate with certified applicator via cell phone or other means

Handlers Example

Must Wear Proper PPE:

Example Metam CLR Label:

Page 2: chemigation

Long-sleeve shirt and long pants

Shoes plus socks

Protective eyewear

AND you now determine who wears an APR

Respiratory Protection for Handlers

If experiencing sensory irritation, handlers must either:

1. Stop work, leave area & monitor air concentrations
   - Resume work only when concentrations are below trigger level & irritation is gone

OR

2. Wear a respirator & resume work
   -Measure air concentration every 2 hours
   -Stop work if having sensory irritation while wearing respirator, or measured concentration exceeds upper working limit of respirator

   - If still having sensory irritation, can resume work only when concentrations are below trigger level, irritation is gone, and have changed respirator cartridge

Note: air purifying respirators are required for methyl bromide products with less than 20% chloropicrin

Figure A. Requirements when handlers cease operations

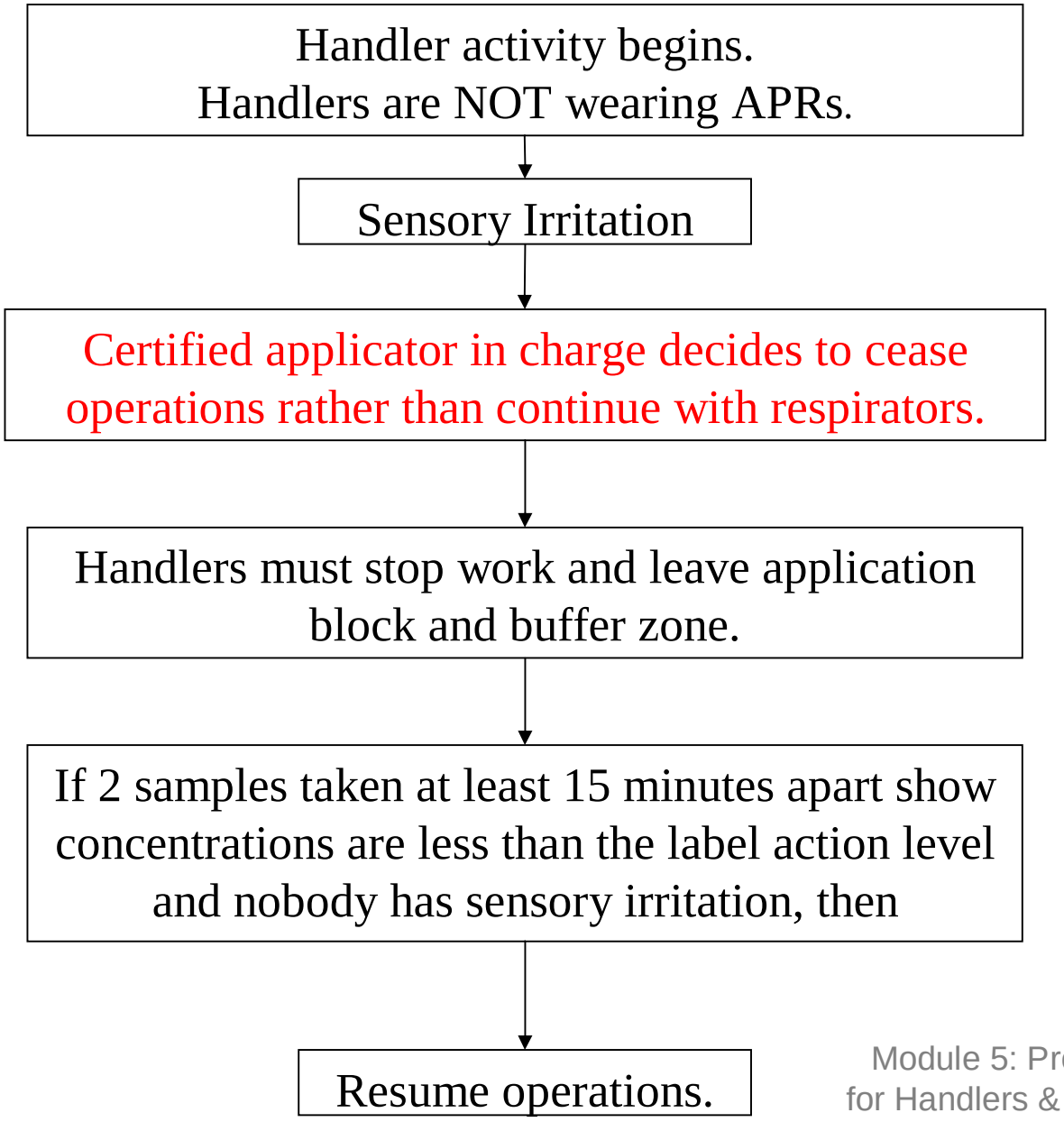
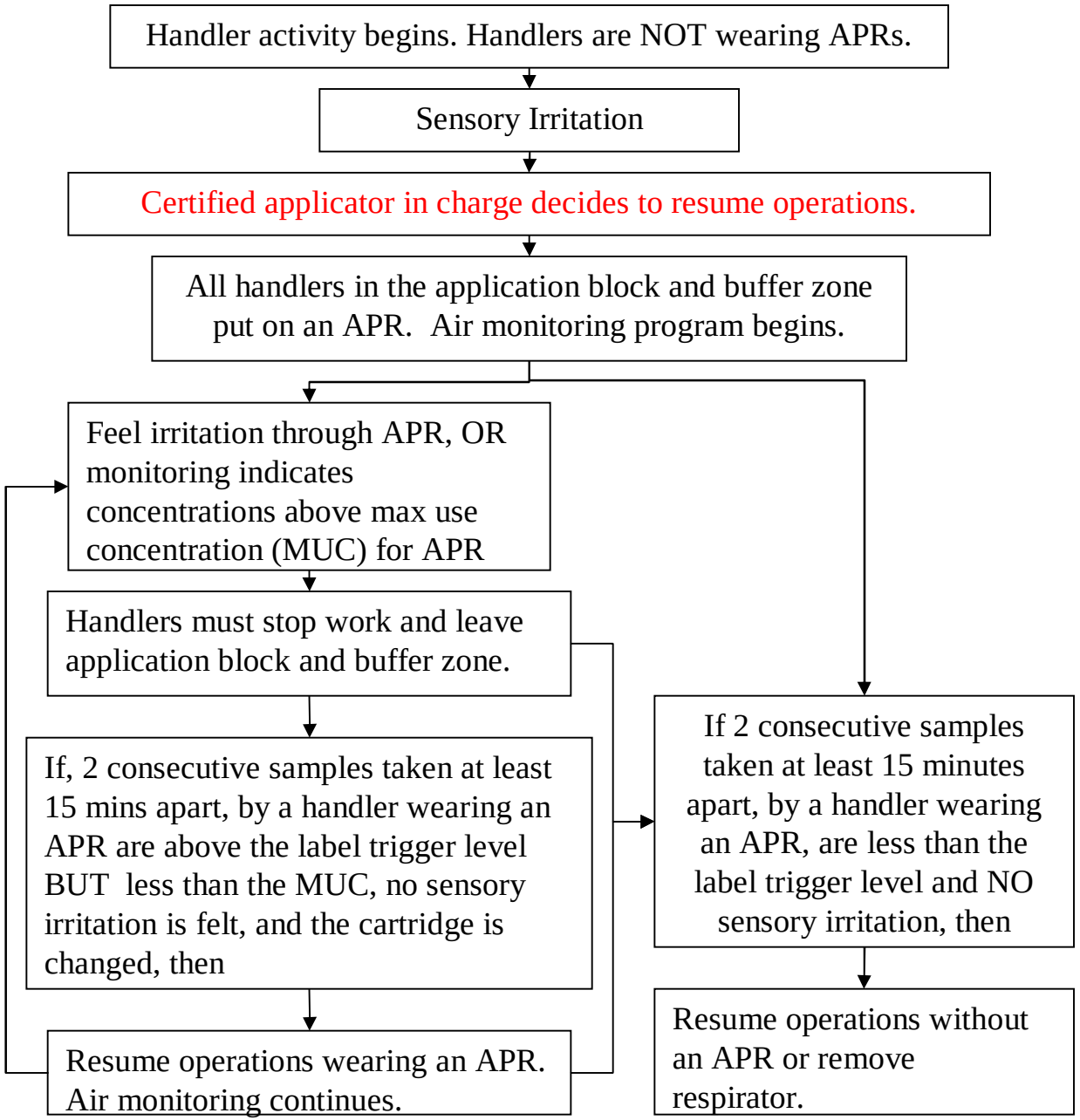


Figure B. Requirements when handlers resume work while using a respirator



Number of Handlers and Respirators Required On-site During Handler Activities

Product/ Formulation	**Min # of Handlers**	**Min # of Air-Purifying Respirators**  	**Min # of SCBAs** 
Methyl bromide or chloropicrin combo product with ≥ 20% chloropicrin	2	2 Full-face	1
Methyl bromide product with < 20% chloropicrin	2	2 Half-mask	1
Metam sodium/ potassium	1	1 Full-face	0
Dazomet	1	1 Full-face	0

Handlers who use respirators must be:

- fit-tested

- trained

- physically fit to wear a respirator*

* http://www.osha.gov/pls/oshaweb/owadisp.show_document?p_table=STANDARDS&p_id=9783

Handlers who use respirators must be:

- fit-tested

For Pic mixtures: at least 2 air purifying respirators and 1 SCBA on site when handling actives performed

- trained

For metam: at least 1 air purifying respirator on site when handling activities are performed

- physically fit to wear a respirator*

* http://www.osha.gov/pls/oshaweb/owadisp.show_document?p_table=STANDARDS&p_id=9783

A **self contained breathing apparatus**, or **SCBA**, sometimes referred to as a **Compressed Air Breathing Apparatus (CABA)**, **air pack**, or simply **Breathing Apparatus (BA)** is a device worn by rescue workers, firefighters, and others to provide breathable air if the max use concentration for the APR is exceeded, the air concnetration is unknow, or there is ann an **IDLH** (Immediate Danger to Life and Health) Atmosphere.

An SCBA typically has three main components: a **high-pressure tank** (*e.g.,* 2200 psi to 4500 psi), **a pressure regulator**, and an **inhalation connection** (mouthpiece, mouth mask or face mask), connected together and mounted to a carrying frame.

National Institute for Occupational Safety and Health

Emergency Escape Breathing Apparatus – are for escape only and Not Approved for responding to spills or other emergencies

Respirators – must be fit tested and use the appropriate cartridges for the fumigant product being used.

Half Faced Respirators

Full Faced Respirators

Fit Tested
No Facial hair that interferes with skin and face-piece seal

RESPIRATOR FIT TESTING

The OSHA Standard 1910.134 (1998) requires fit testing of all respirators including those with positive pressure. The respirator fit test is done to check that the mask size and mask model chosen fits the face. The fit test confirms that the mask fits the wearer's face and that there is minimal air leakage between the face and the mask.

A respirator medical evaluation (questionnaire) conducted within the last 12 months by a qualified Licensed Healthcare Practitioner (LHP) or physician.

TWO TYPES OF FIT TESTING

Qualitative fit testing is adequate and will comply with all APRs and most SCBAs (some SCBAs used for fire fighting may require quantitative fit test but these will not likely be used by applicators). Sample of total costs for having a company come to do fit tests and medical questionnaires are as follows: for <10 workers: $100 per worker, 11-20 workers: $78 per worker, 21-30 workers: $58 per worker (see http://bestfittest.com/). Companies may be willing to negotiate competitive prices.

Quantitative fit testing gives an objective measure of the quality of the seal between the wearer's face and the facepiece. A fit factor number is produced.

Cost:$8200 Rental:$600.00
Supplies: $125/24 test
Respirator Adapter: $125 - 275

Growers can do their own fit testing as long as they conduct once a year and document using an approved test.

RESPIRATOR FIT TEST RECORD

Company: _____
Address: _____
City: _____
State: _____ Zip: _____ Tel: _____

Date: _____

Name of Fit Tester: _____

Fit testing conducted in compliance with OSHA Standard 1910.134(F). ☐
If other local, state or federal regulations apply (such as MSHA), you may list them here:
_____

Signature: _____

Type of OSHA accepted fit test protocol used: (Qualitative): ___Saccharin ___Bitrex™ ___Isoamyl Acetate ___Irritant Smoke

(Quantitative): Portacount Model #_____ Occupational Health Dynamic Model #:_____

Name (please print)	Signature	Respirator Fit Tested (Make, Model, Style, Size)	Fit Test Pass	Fit Test Fail	Could not be fit tested due to:
			☐	☐	
			☐	☐	
			☐	☐	
			☐	☐	
			☐	☐	
			☐	☐	
			☐	☐	
			☐	☐	
			☐	☐	
			☐	☐	

Comments: _____

_____

GAS DETECTION

Detector tube Pump - $340.00 - $400.00

Gas Detection tubes - $12.00/sampling tube

Chemical	Gas
Metam Sodium	methyl isothiocyanate
Chlorpicrin	chlorpicrin
PALADIN	dimethyl disulfide
Telone II	1,3-dichloropropen
MIDAS	methyl iodide
Methyl Bromide	methyl bromide

Handheld volatile organic compound (VOC) detector
Its uses Photoionization Detector (PID)

Chemical	Gas
Metam Sodium	methyl isothiocyanate
Chlorpicrin	chlorpicrin
PALADIN	dimethyl disulfide
Telone II	1,3-dichloropropen
MIDAS	methyl iodide
Methyl Bromide	methyl bromide

MiniRAE 2000

PHOTOVAC

$3,500- 5,000

Tarp Perforation & Removal

Perforation

- 5 days after fumigant application is complete

Removal

- 2 hours after perforation is complete

Tarp Perforation Requirements - Broadcast Applications

- Must perforate *each panel* of tarp (mechanically) <u>two hours before removal</u>
- Complete before noon
- Cannot perforate if rainfall is expected within 12 hours

Early Tarp Perforation & Removal

Early removal (before 5 days) for broadcast applications

- Only if integrity of tarp is compromised by adverse weather conditions & tarp poses a safety hazard

Early perforation - flood prevention activities

Entry Restricted Period by Scenario

If application is…	*and* tarp is…	_____ days after application is completed	workers may enter…
1. Untarped	-	-	5 days after application is complete
2. Tarped	Perforated & Removed	within 14 days	after tarp is removed
3. Tarped	Perforated BUT Not Removed	within 14 days	48 hours after perforating tarps
4. Tarped	Perforated and/or Removed	more than 14 days	5 days after application is complete

Scenario 1 - Entry Restricted Period for Untarped Applications

5 days after application is complete

Shank Untarped

Drip Untarped

Center Pivot

Scenario 2 - Entry Restricted Period for Tarped Applications

If tarps are perforated & removed less than 14 days…

→ Enter after tarp is removed

Scenario 3 - (Not ideal, may lose efficacy)

Entry Restricted Period for Tarped Applications

When tarps remain on field at least 14 days, <u>but</u> poke hole between days 5 and 14 …

→ Enter 48 hours after perforating tarps

Scenario 4 (Ideal) - Entry Restricted Period for Tarped Applications

When tarps remain on field at least 14 days and are <u>not perforated</u> for 14 days or more…

→ Enter after 5 days

Summary

- All soil fumigants will be restricted use
- “Handlers” is defined – and activities listed on label
- Handlers must stop work or wear a respirator if experiencing sensory irritation
- Tarps must remain on treated fields for 5 days after application, with some exceptions
- Only protected handlers can enter the application block during the entry restricted period
- Entry restricted period varies by application scenario

Fumigant Management Plans and Post Application Summary Reports

What is a Fumigant Management Plan (FMP)?

- A written, site-specific plan prepared *before* fumigation begins

- Plan all aspects of a safe and effective fumigation to help:
  - Prevent accidents
  - Ensure, demonstrate & verify compliance
  - Define procedures in case of accidents or unforeseen events

FMPs – Who?

- Completed by grower, commercial applicator, crop consultant, or others
- Certified applicator in charge:
  - Verifies accuracy
  - Signs
- May be farm-wide
  - Common information in one place
  - Separate sections for information unique to each fumigant application
- Must be available to handlers, enforcement personnel, and emergency response personnel

Record Keeping

- Keep FMPs and Post Application Summaries for 2 years
  - supervising certified applicator
  - owner/operator (if not the certified applicator)

- Keep with other records required for application of RUPs

FMP Templates and Tools

- Adobe Acrobat templates
- Microsoft Word templates
- Web-based tool

FMP Sample Template

2010 SOIL FUMIGANT MANAGEMENT PLAN (METHYL BROMIDE/CHLOROPICRIN PRODUCTS)

The below text fields will expand as the text is entered. After completing each field, use *Tab key* to go to next text field or check box.

I. Certified Applicator Supervising the Fumigation

Name:	Phone number:	License and/or certificate number:	☐ Commercial applicator ☐ Private applicator
Employer name:	Employer address:		

II. General Site Information

Application block/field location (e.g., county, township-range-section quadrant), address including zip code, or global positioning system (GPS) coordinates:

III. Owner/operator of Application Block

Name:	Address:	Phone number:

IV. Recordkeeping

☐ The owner/operator of the application block has been informed that he/she as well as the certified applicator must keep a signed copy of the site-specific FMP and the post-application summary for 2 years from the date of application.

V. General Application Information

Target application date/window:	EPA Registration Number: -	Fumigant Product Name:	
Application method: ☐ Tarp bedded ☐ Tarp broadcast ☐ Deep untarp broadcast (CA only) ☐ Hot gas – outdoor ☐ Hot gas – greenhouse ☐ Hand held probes (tree hole)	Application Rate (lbs or gallons of product/treated acre):	Injection Depth (inches):	Application Block Size (acres):

VI. Emergency Response Plan

Description of evacuation routes (a diagram or drawing may be attached to the FMP):
☐ Check here if diagram or drawing is attached

Locations of telephones:

Contact information for first responders:	Local/state/federal contacts:	Other contact information for emergencies:

Emergency procedures/responsibilities in case of an incident, equipment/tarp/seal failure, complaints or elevated air concentration levels suggesting potential problems, or other emergencies:

FMP Sample Template

VII. Communication Between Applicator, Owner/Operator, and Other On-site Handlers

☐ Pesticide product labels and material safety data sheets are at the application site and available for employees to review.

Will the certified applicator be at the application site during all handler activities that take place after the application is complete until the entry restricted period expires? ☐ Yes ☐ No

If no, describe how the certified applicator will share the label requirements with owner/operator and/or handlers who will be present at the application site after the application is complete until the entry restricted period expires.

VIII. Handler Information (use EPA's Microsoft Word or Acrobat Adobe version of the handler information template)

☐ Information for all handlers is attached to the FMP

Comments/notes:

IX. Tarps (check here if section is not applicable ☐)

Brand name and tarp manufacturer:	Lot Number: Batch Number: Part Number:	Thickness:
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 damage that tarp will be repaired:	Minimum size of damage that will be repaired:	
Other factors used to determine when tarp repair will be conducted:		
Equipment/methods used to perforate tarps: ☐ mechanical: ☐ hand:		
Schedule and target dates for perforating tarps:		
Equipment, schedule and target dates for removing tarps:		

X. Soil Conditions

Soil texture/clay content:

Organic Content: ☐ < 1% ☐ ≥1%-2% ☐ ≥2%-3% ☐ >3%

Soil Temperature: Has the air temperature been above 100 °F in any of the 3 days prior to application? ☐ Yes or ☐ No

If yes, record the soil temperature measurement:

Soil Moisture: (check the box of the method used to determine the soil moisture)

USDA Feel and Appearance Method ☐	**Instrument** ☐	**Other** ☐
Description of soil:	Instrument used:	Describe method:
Percent soil moisture estimate:	Percent soil moisture:	Percent soil moisture:

FMP Sample Template

XI. Weather Conditions

Summary of the weather **on the day of the application** (a printed copy may be attached to the FMP):

☐ Check here if printed copy is attached to the FMP or complete the following:

Wind Speed: Inversion conditions: Air-Stagnation Advisories: Other:

Summary of the weather **during the 48-hour period following the fumigant application** (a printed copy may be attached to the FMP):

☐ Check here if printed copy is attached to the FMP or complete following:

Wind Speed: Inversion conditions: Air-Stagnation Advisories: Other:

XII. Posting Signs – Fumigant Treated Area

Name(s) of person(s) posting Fumigant Treated Area signs:

Treated Area Signs posting date: Treated Area Signs removal date:

XIII. Air Monitoring Plan

If monitoring indicates air concentrations greater than or equal to 1.5 ppm for chloropicrin or greater than or equal to 5 ppm for methyl bromide, handlers must stop work and leave the application block.

Will the product applied contain at least 20% chloropicrin? ☐ Yes or ☐ No

If Yes, if sensory irritation is experienced check which of the following be procedures will be followed:

☐ Intend to cease operations or ☐ Intend to continue operations with respiratory protection

Handler Tasks to be Monitored	Monitoring Equipment	Timing

Full Face Respirator Response Plan

If either: (1) a handler experiences any sensory irritation when wearing an full face 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 and the following ease the emergency plan detailed will be implemented:

FMP Sample Template

XIV. Good Agricultural Practices (GAPs)

☐ Check here if applicable mandatory GAPs are attached to the FMP (this could be a copy of the label highlighting the applicable GAPs). If this box is not checked, the checklist below must be completed.

General

- ☐ Tarps
- ☐ Weather Conditions
- ☐ Soil Temperature
- ☐ Soil Moisture
- ☐ Soil Preparation

Bedded and Broadcast Shank Applications

- ☐ Tarps
- ☐ Soil Preparation
- ☐ Application Depth and Spacing
- ☐ Prevention of End Row Spillage
- ☐ Calibration, Set-up, Repair, and Maintenance for Application Rigs

Tree Replant Application Using Handheld Equipment

- ☐ Soil Preparation
- ☐ Application Depth
- ☐ System Flush
- ☐ Soil sealing

- ☐ Hot Gas Applications to Soil, Potting Mixes, and Tobacco Seedling Trays
- ☐ Pre-Plant Soil Fumigation in Greenhouses
- ☐ Control of Armilluria mellea (oak root fungus) for orchard replant applications
- ☐ Non-tarp nematode control (only for deep shank orchard replant and hand held tree-hole application in CA)

Description of other product specific GAPs from label that will be followed:

FMP Sample Template

Handler Information

Handler Name, Address, and Phone Number	**Employer Name, Address, and Phone Number**	**Tasks Handlers are Trained and Authorized to Perform*** (check number(s) from below)	**PPE** (check all that apply)	**Respirator Information** (leave blank if "no respirator" is checked under PPE)
		☐ 1 ☐ 2 ☐ 3 ☐ 4 ☐ 5 ☐ 6 ☐ 7 ☐ 8 ☐ 9 ☐ 10	☐ Long-sleeved shirt/long-pants, shoes, socks ☐ Chemical-resistant apron ☐ Chemical-resistant footwear and socks ☐ Protective eyewear (NOT goggles) ☐ Chemical-resistant gloves ☐ Half-mask air-purifying respirator ☐ Full-face air-purifying respirator ☐ Self contained breathing apparatus ☐ Other: ☐ No respirator PPE training date:	Make: Model: Type: Style: Size: Cartridge type: Fit test date: Training date: Medical date: Make: Model: Type: Style: Size: Cartridge type: Fit test date: Training date: Medical date: Make: Model: Type: Style: Size: Cartridge type: Fit test date: Training date: Medical date:

☐ The above handler has received Fumigant Safe Handling information within the past 12 months.

*1. Loaders, drivers, tractor co-pilots, shovelers, cross-ditchers, or other direct application participants
2. Cleaning up fumigant spills (does not include emergency personnel not associated with the application)
3. Tasks with liquid contact potential
4. Installing, perforating, removing, repairing, or monitoring tarps until:
-14 days after the application is complete if tarps are not perforated and removed during those 14 days,
-Tarp removal is complete if tarps are both perforated and removed less than 14 days after the application, or
-48 hours after tarp perforation is complete if tarps will not be removed within 14 days after application.
5. Taking air samples (breathing zone)
6. Handling or disposing of fumigant containers
7. Cleaning, handling, adjusting, or repairing equipment that may contain fumigant residues
8. Installing, repairing, operating, or removing irrigation equipment in the application block
9. Performing scouting, crop advising, or monitoring tasks in the application block
10. Performing other WPS handling tasks

Comments/notes:

Post Application Summary Sample Template

2010 SOIL FUMIGANT POST APPLICATION SUMMARY
(METHYL BROMIDE/CHLOROPICRIN PRODUCTS)

(Only fill-in information if it is different from the FMP or where the label requires that measurements/information are recorded in post-application summary)

The below text fields will expand as the text is entered. After completing each field, use *Tab key* to go to next text field or check box.

General Application Information			
Application date:	EPA Registration Number: -	Fumigant Product Name:	
Application method: ☐ Tarp bedded ☐ Tarp broadcast ☐ Deep untarp broadcast (CA only) ☐ Hot gas – outdoor ☐ Hot gas – greenhouse ☐ Hand held probes (tree hole)	Application Rate (lbs or gallons of product/treated acre):	Injection Depth (inches):	Application Block Size (acres):

Weather Conditions

Summary of the weather **on the day of the application** (a printed copy may be attached to the post-application summary):
☐ Check here if printed copy is attached to the post-application summary or complete the following:
Wind Speed: Inversion conditions: Air-Stagnation Advisories: Other:

Summary of the weather **during the 48-hour period following the fumigant application** (a printed copy may be attached to the post-application summary):
☐ Check here if printed copy is attached to the post-application summary or complete following:
Wind Speed: Inversion conditions: Air-Stagnation Advisories: Other:

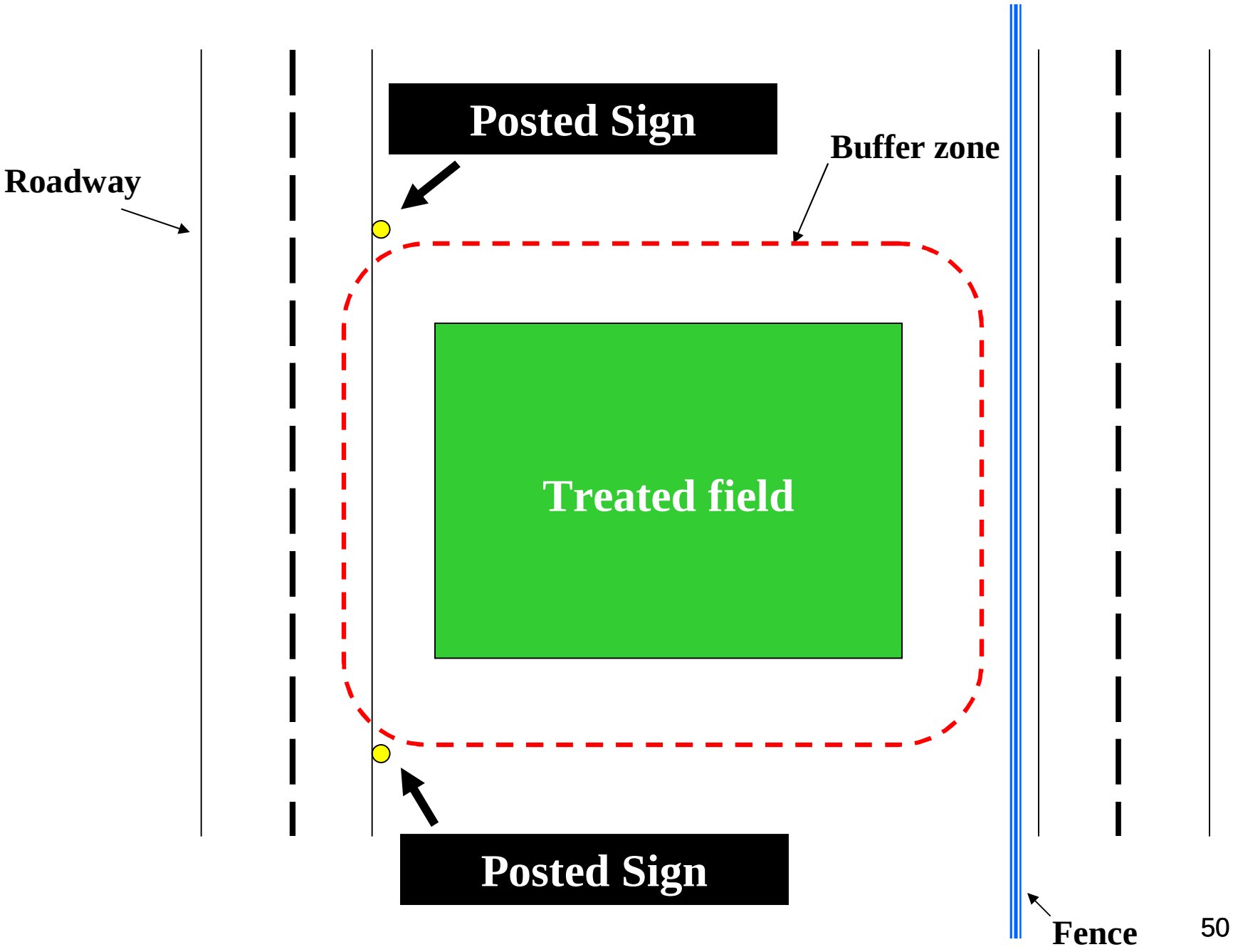
Tarp Damage and Repair (check here if section is not applicable ☐)	
Location and size of tarp damage:	
Description of tarp/tarp seal/tarp equipment failure:	
Date and time of tarp repair:	
Additional comments or other deviations from FMP (if applicable):	
Tarp Perforation/Removal (check here if section is not applicable ☐)	
Description of tarp removal procedures (if different than in the FMP):	
Date tarps were perforated:	Date tarps were removed:

Post Application Summary Sample Template

Complaints (check here if section is not applicable ☐)	
Person filing complaint: ☐ On-site handler ☐ Person off-site	If off-site person, name, address, and phone number of person filing complaints:
Description of control measures or emergency procedures followed after complaint:	
Additional comments:	
Description of Incidents (check here if section is not applicable ☐)	
Description of incident, equipment failure, or other emergency:	Date and time:
Description of emergency procedures followed:	
Was the incident reported to the state agency? ☐ Yes ☐ No	
Additional comments:	
Communication Between Applicator, Owner/Operator, and Other On-site Handlers (check if no changes from the FMP ☐)	
Was the certified applicator at the application site during all handler activities that took place after the application was completed until the entry restricted period expired? ☐ Yes ☐ No If no, list the names and phone numbers of persons contacted:	Date contacted:
Comments/notes (any deviation from FMP regarding how the information was shared):	
Posting Signs – Fumigant Treated Area	
Date(s) of Fumigant Treated Area sign removal:	Description of deviations from FMP (if applicable):
Handler Information for Changes Since the FMP	
Have there been any changes to the handler information since the FMP was completed (including handlers that were on-site that were not listed in FMP)? ☐ Yes ☐ No If yes, the updated handler information must be attached to the post application summary (use EPA's Microsoft Word or Acrobat Adobe version of the handler information template)	
Other Deviations from the FMP	
Additional comments/notes:	

Buffer Zones

Distances, Credits & Posting (2011)


Posted Sign
Buffer zone
Roadway
Treated field
Posted Sign
Fence

Treated Area Posting Signs
(already required on labels)

Buffer zone sign must include:

- **“Do Not Walk” symbol**
- **"DO NOT ENTER/NO ENTRE,"**
- **"[*Name of fumigant, name of product*] Fumigant BUFFER ZONE”**
- **certified applicator contact information**

Information for Handlers (2010)

- Registrants must develop and disseminate basic safety information for handlers
  - Increase fumigant handlers' safety awareness
- Information:
  - Safe handling practices
  - Respiratory protection
  - Early signs of exposure
  - What to do in case of exposure or emergency
- Certified applicators must make sure handlers receive information within the last year

Training for Certified Applicators (2011)

- Required for certified applicators in charge of fumigations
  - Increase knowledge and skill

- Information on how to:
  - Correctly apply fumigants
  - Protect workers and others
  - Comply with new label requirements

EPA Contact Information

- General Contact:
  - John Leahy (703) 305-6703

UGA Commercial Vegetable Information Website

http://www.caes.uga.edu/commodities/fruits/veg/index.html