

# **PRE-PLANT SOIL FUMIGATION - SWEET POTATO SLIPS**

## General Information

### DIRECTIONS FOR USE

#### RESTRICTED USE PESTICIDE

It is a violation of Federal law to use this product in a manner inconsistent with its labeling. Do not apply this product in a way that will contact workers or other persons, either directly or through drift. Only protected handlers may be in the area during application. For any requirements specific to your State or Tribe, consult the Agency responsible for pesticide regulation.

#### GENERAL APPLICATION RESTRICTIONS

This fumigant is a highly hazardous material and must be handled with care only by certified applicators or persons under their direct supervision who are trained with its proper use.

#### GENERAL PRECAUTIONS

- 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.

#### ENTRY RESTRICTED PERIOD AND NOTIFICATION ENTRY RESTRICTED PERIOD

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

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

#### TARP PERFORATION AND/OR REMOVAL

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

- Tarps must not be perforated until a minimum of 5 days (120 hours) have elapsed after the fumigant injection into the soil is complete (e.g., after injection of the fumigant product and tarps have been laid), unless a weather condition exists which necessitates the need for early perforation or removal, see Early Tarp Removal for Broadcast Applications Only and Early Tarp Perforation for Flood Prevention sections.
- If tarps will be removed before planting, tarp removal must not begin until at least 2 hours after tarp perforation is complete and 2 air monitoring samples are less than 1 ppm methyl bromide. (If 2 air monitoring samples have methyl bromide levels between 1 ppm and 5 ppm, then an air-purifying respirator is required before

tarp removal can begin.)

- If tarps will not be removed before planting, planting or transplanting must not begin until at least 48 hours after the tarp perforation is complete.
- If tarps are left intact for a minimum of 14 days after fumigant injection into the soil is complete, planting or transplanting may take place while the tarps are being perforated.
- Each tarp panel used for broadcast fumigation must be perforated.
- Tarps used for fumigations may be perforated manually ONLY for the following situations:

At the beginning of each row when a coulter blade (or other device which performs similarly) is used on a motorized vehicle such as an ATV.

In fields that are 1 acre or less.

During flood prevention activities.

- In all other instances, tarps must be perforated (cut, punched, poked, or sliced) only by mechanical methods.
- Tarp perforation for broadcast fumigations must be completed before noon.
- For broadcast fumigations, tarps must not be perforated if rainfall is expected within 12 hours.
- Early Tarp Removal for Broadcast Applications Only:

Tarps may be removed before the required 5 days (120 hours) if adverse weather conditions have compromised the integrity of the tarp, provided that the compromised tarp poses a safety hazard. Adverse weather includes high wind, hail, or storms that blow tarps off the field and create a hazard, e.g., tarps blowing into power lines and onto roads. A compromised tarp is a tarp that due to an adverse weather condition is no longer performing its intended function and is creating a hazard.

If tarps are removed before the required 5 days have elapsed due to adverse weather, the events must be documented in the Post-Application Summary.

- Early Tarp Perforation for Flood Prevention Activities:

Tarp perforation is allowed before the 5 days (120 hours) have elapsed. Tarps must be immediately retucked and packed after soil removal.

#### MANDATORY GOOD AGRICULTURAL PRACTICES (GAPS)

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

Tarps (required for all applications except for deep shank orchard replant [California only])

- 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.

## Soil Preparation

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

## Soil Sealing

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

## Bedded and Broadcast Shank Applications: Additional Mandatory GAPs

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

### Tarps

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

### Soil Preparation

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

### Application Depth and Spacing

- For Tarped-Broadcast and Tarped-Bedded Applications: The injection point must be a minimum of 8 inches from the nearest final soil/air interface. For tarped bedded applications the injection depth must not be deeper than the lowest point of the tarp (i.e., the lowest point of the tuck).
- For Untarped-Broadcast Applications (CA orchard replant only): The injection point must be a minimum of 18 inches from the nearest final soil/air interface.
- Apply Tri-Con 50/50 with chisel equipment. The shank spacing should be equal to the application depth, but may be up to 1½ times the application depth, not to exceed 24 inches. When applying Tri-Con 50/50 with a Nobel plow, use an outlet spacing of 9-12 inches along the sweeps.

### Prevention of End Row Spillage

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

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

- Brass, carbon steel or stainless steel fittings must be used throughout. Polyethylene tubing, polypropylene tubing, Teflon tubing or Teflon -lined steel braided tubing must be used for all low pressure lines, drain lines, and compressed gas or air pressure lines. All other tubing must be Teflon -lined steel braided.
- Galvanized, PVC, nylon or aluminum pipe fittings must not be used.
- All rigs must include a filter to remove any particulates from the fumigant, and for pressurized systems a check valve to prevent backflow of the fumigant into the pressurizing cylinder or the compressed air system.
- Rigs must include a flow meter or a constant pressure system with orifice plates to insure the proper amount of fumigant is applied.
- To prevent the backflow of fumigant into the compressed gas cylinder (e.g., nitrogen, other inert gas or compressed air), if a compressed gas cylinder is used, applicators must:

Ensure 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 the labeling for further requirements.

#### Pre-Plant Greenhouse Soil Fumigation: 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)



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.

- Applicator information (name, phone number, pesticide applicator license and/or certificate number, employer name, employer address).
- 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 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.]

## 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.

Limitations, Restrictions, and Exceptions

#### APPLICATION RESTRICTIONS:

- For use only on sites and at locations that qualify for exemptions under the Montreal Protocol (e.g., critical use exemption or quarantine and preshipment exemption uses) and for sites listed in the Table 2 of the label.
- This product may only be used on crops/uses identified in the Quarantine Uses section or in Tables 1 and 2 of the label.
- Tarps must be used for all applications, except for California orchard replant using the deep broadcast application method.
- The maximum application block sizes allowed for the application of Tri-Con 45/55 are:



100 acres for tarped bedded and broadcast applications

40 acres for untarped deep applications (i.e., California orchard replant)

#### NOTE CAREFULLY

Fumigation may temporarily raise the level of ammonia nitrogen and soluble salts in the soil. This is most likely to occur when heavy rates of fertilizer and fumigant are applied to soils that are either cold, wet, acid, or high in organic matter. To avoid injury to plant roots, fertilize as indicated by soil tests made after fumigation. To avoid ammonia injury and/or nitrate starvation to crops, avoid using fertilizers containing ammonia salts and use only fertilizers containing nitrates until after the crop is well established and the soil temperature is about 65 degrees F. Liming highly acid soils before fumigation stimulates nitrification and reduces the possibility of ammonia toxicity.

Method

[Broadcast](#)

Rates

[field\\_rates 0](#)

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Timings

[Preplant](#)