

**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.

Tri-Clor

Fumigant

ACTIVE INGREDIENT:

Chloropicrin99%

OTHER INGREDIENTS: 1%

TOTAL:100%

This product weighs 13.88 lbs./gal. @ 68°F (20°C).

KEEP OUT OF REACH OF CHILDREN



DANGER

PELIGRO

POISON

*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.)*

**IN ALL CASES OF OVEREXPOSURE, GET MEDICAL ATTENTION IMMEDIATELY.
TAKE PERSON TO A DOCTOR OR TO AN EMERGENCY TREATMENT FACILITY.**

FIRST AID

If inhaled:	<ul style="list-style-type: none">• Move person to fresh air.• If person is not breathing, call 911 or an ambulance; then give artificial respiration, preferably by mouth-to-mouth, if possible.• Call a poison control center or doctor for further treatment advice.
If on skin or clothing:	<ul style="list-style-type: none">• Take off contaminated clothing.• Rinse skin immediately with plenty of water for 15-20 minutes.• Call a poison control center or doctor for treatment advice.
If in eyes:	<ul style="list-style-type: none">• Hold eye open and rinse slowly and gently with water for 15-20 minutes.• Remove contact lens, if present, after the first 5 minutes, then continue rinsing eye.• Call a poison control center or doctor for treatment advice.

NOTE: Have the product container or label with you when calling a poison control center or doctor, or going for treatment. Do not give anything by mouth to an unconscious person.

NOTE TO PHYSICIAN

Chloropicrin is a volatile liquid that is the active ingredient in tear gas. As a gas it is a powerful lachrymator. Early symptoms of overexposure are lachrymation, respiratory distress, and vomiting. Pulmonary edema may develop later. Treatment is symptomatic.

EMERGENCY PHONE NUMBER: Chemtrec, 1-800-424-9300

See side panels for additional precautionary statements.

PRECAUTIONARY STATEMENTS

HAZARDS TO HUMANS AND DOMESTIC ANIMALS

DANGER. 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. CONSULT YOUR DEALER REPRESENTATIVE OR THE DISTRIBUTOR FOR CORRECT PROCEDURE BEFORE USING. READ AND FOLLOW ALL LABEL DIRECTIONS AND PRODUCT LITERATURE SPECIFIC TO YOUR REQUIREMENTS. POISONOUS LIQUID AND VAPOR. INHALATION MAY BE FATAL. CHLOROPICRIN IS READILY IDENTIFIABLE BY SMELL. EXPOSURE TO VERY LOW CONCENTRATIONS OF VAPOR WILL CAUSE IRRITATION OF EYES, NOSE, AND THROAT. CONTINUED EXPOSURES AFTER IRRITATION IS EVIDENT, OR HIGHER CONCENTRATIONS, MAY CAUSE PAINFUL IRRITATION TO EYES OR TEMPORARY BLINDNESS. LIQUID WILL CAUSE CHEMICAL BURNS TO SKIN OR EYES. DO NOT GET ON SKIN, IN EYES, OR ON CLOTHING. HARMFUL OR FATAL IF SWALLOWED. CHLOROPICRIN FUMIGANT HAS THE CAPACITY TO CAUSE MARKED IRRITATION TO THE UPPER RESPIRATORY TRACT, AND IS A STRONG LACHRYMATOR (TEAR PRODUCING EYE IRRITANT). LOW CONCENTRATIONS, BELOW THOSE NECESSARY TO CAUSE SERIOUS SYSTEMIC INTOXICATION, ARE CAPABLE OF CAUSING SEVERELY PAINFUL EYE IRRITATION, HENCE WILL NOT BE VOLUNTARILY TOLERATED. HOWEVER, THE EFFECT MAY BE SO POWERFUL THAT A PERSON MAY BECOME TEMPORARILY BLINDED AND PANIC-STRICKEN AND THAT IN TURN MAY LEAD TO ACCIDENTS.

PERSONAL PROTECTIVE EQUIPMENT (PPE)

Some materials that are chemical-resistant to this product are listed below. For more options, follow the instructions for Category H on the chemical resistance category selection chart. PPE constructed of saranex, neoprene, and chlorinated polyethylene provide short-term contact or splash protection against liquid in this product. Longer-term protection is provided by PPE constructed of viton, Teflon, and EVAL barrier laminates (for example, responder suits manufactured by Life-guard or silvershield gloves manufactured by North). Where chemical-resistant materials are required, leather, canvas, or cotton materials offer no protection from this product and must not be worn as the sole article of protection when contact with this product is possible.

When performing tasks with NO potential for contact with liquid fumigant, all handlers (including applicators) must wear:

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

When performing tasks with potential for contact with liquid fumigant, 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 with socks.

In addition, when an air-purifying respirator is required under this label's *Directions for Use, Protection for Handlers, Respiratory Protection and Stop Work Triggers* sections, handlers must wear at minimum either:

- A NIOSH certified full facepiece air-purifying respirator equipped with an organic vapor (OV, NIOSH approval prefix TC-23C) cartridge and a particulate pre-filter (Type N, R, P, or HE, NIOSH approval number prefix TC-84A), or
- A gas mask with a canister approved for organic vapor (NIOSH approval number prefix TC-14G).

IMPORTANT: A self-contained breathing apparatus (SCBA) is not permitted for routine handler tasks. If responding to an emergency, when corrective action is needed to reduce air concentrations to acceptable levels, wear an SCBA. Escape-only SCBA respirators must not be used by handlers for responding to emergencies. In addition, wear PPE required for potential contact with liquid fumigant.

USER SAFETY REQUIREMENTS

- Follow manufacturer's instructions for cleaning/maintaining PPE. If no such instructions for washables exist, use detergent and hot water. Keep and wash PPE separately from other laundry.
- Discard clothing and other absorbent materials that have been drenched or heavily contaminated with this product's concentrate. Do not reuse them.

USER SAFETY RECOMMENDATIONS

Users should:

- Wash hands before eating, drinking, chewing gum, using tobacco, or using the toilet.
- Remove clothing immediately if pesticide gets on clothing. Then wash thoroughly and put on clean clothing.
- Remove PPE immediately after handling this product. Wash the outside of gloves before removing. As soon as possible, wash thoroughly and change into clean clothing.
- Supply your physician with information on Chloropicrin, which is available from your Dealer Representative or the Distributor.

ENVIRONMENTAL HAZARDS

- This pesticide is toxic to mammals and birds. Do not apply directly to water, or to areas where surface water is present or to intertidal areas below the mean high water mark. Do not contaminate water when disposing of equipment washwaters or rinsate.
- Chloropicrin has certain properties and characteristics in common with chemicals that have been detected in groundwater (chloropicrin is highly soluble in water and has low adsorption to soil).
- For untarped applications of chloropicrin, leaching and runoff may occur if there is heavy rainfall after soil fumigation.

PHYSICAL OR CHEMICAL HAZARDS

Do not use containers or application equipment made of magnesium, aluminum, or their alloys, as under certain conditions this fumigant may be severely corrosive to such metals. [See the *Calibration, Set-up, Repair and Maintenance for Application Rigs and System Controls and Integrity* sections of this labeling for further requirements for application equipment.] Do not permit water to be used to clean the fumigant pressure system, as corrosion will result. Diesel oil is satisfactory for this purpose.

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 handlers may be in the application block from the start of the application until the entry restricted period ends, and in the buffer zone during the buffer zone period. For any requirements specific to your State or Tribe, consult the agency responsible for pesticide regulation.

Agricultural Use Requirements

Use this product only in accordance with its labeling and with the Worker Protection Standard, 40 CFR Part 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. 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 *Personal Protective Equipment (PPE)* section of this labeling.

Terms Used in This Labeling

Soil Fumigant Training Program: Certified applicator training that provides information on (1) how to correctly apply the fumigant, including how to comply with new label requirements; (2) how to protect handlers and bystanders; (3) how to determine buffer zone distances; (4) how to complete an FMP and the post-application summary; (5) how to determine when weather and other site-specific factors are not favorable for fumigant application; (6) how to comply with required GAPs and how to document compliance with GAPs in the FMP; and (7) how to develop and implement emergency response plans.

Fumigant Safe Handling Information: Information that must be provided annually to handlers must include the following: (1) what fumigants are and how they work, (2) safe application and handling of soil fumigants, (3) air monitoring and respiratory protection requirements for handlers, (4) early signs and symptoms of exposure, (5) appropriate steps to take to mitigate exposures, (6) what to do in case of an emergency, and (7) how to report incidents.

Application Block: Area within the perimeter of the fumigated portion of a field or greenhouse (including furrows, irrigation ditches, roadways). The perimeter of the application block is the border that connects the outermost edges of total area treated with the fumigant product.

Application Rate: The ratio of fumigant mass applied compared to the soil surface area (e.g., pounds of product per acre). The application rate is expressed on this labeling in terms of either the “treated area application rate” or the “broadcast equivalent application rate.” The “treated area application rate” relates to only the rate of fumigant applied to the portion of the field that is fumigated (e.g., rate within the bed or strips). The “broadcast equivalent application rate” relates to the rate of fumigant applied within the entire perimeter of the application block. For bedded and strip applications, the “broadcast equivalent application rate” must be calculated to determine the buffer zone distance required by this labeling.

Start of the Application: The time at which the fumigant is first delivered/dispensed into the soil in the application block.

Application is Complete: The time at which the fumigant has stopped being delivered/dispensed into the soil and the soil has been sealed; drip lines have been purged (if applicable).

Entry Restricted Period: This period begins at the start of the application and expires depending on the application method and if tarps are used when the tarps are perforated and removed. Entry into the application block during this period is only allowed for appropriately PPE-equipped handlers performing handling tasks. See the *Entry Restricted Period and Notification* section for additional information.

Buffer Zone: An area established around the perimeter of each application block. The buffer zone must extend outward from the edge of the application block perimeter equally in all directions.

Buffer Zone Period: Begins at the start of the application and lasts for a minimum of 48-hours after the application is complete. Non-handlers must be excluded from the buffer zone during the buffer zone period.

Difficult to Evacuate Sites: Pre-K to Grade 12 schools, state licensed daycare centers, nursing homes, assisted living facilities, hospitals, in-patient clinics, and prisons.

Owner: Any person who has a present possessory interest (fee, leasehold, rental, or other) in an agricultural establishment. A person who has both leased such agricultural establishment to another person and granted that same person the right and full authority to manage and govern the use of such agricultural establishment is not an owner. See definition of “owner” in WPS (40 CFR §170.3).

Roadway: Portion of a street or highway improved, designed or ordinarily used for vehicular travel, exclusive of the sidewalk or shoulder even if such sidewalk or shoulder is used by persons riding bicycles. In the event a highway includes two or more separated roadways, the term *roadway* shall refer to any such roadway separately.

Representative Handling Task: For air monitoring, the locations and handler activities sampled must represent each handler's exposure occurring within the application block. For example, for an application consisting of a seven-handler crew (1 tractor driver, 1 tractor co-pilot, 4 shovelers, and 1 certified applicator supervising) two breathing zone samples could be collected: one sample for the tractor co-pilot and one sample for a downwind shoveler. Results of previous sampling may indicate which tasks and locations are worst case and therefore representative of all handlers.

Application Restrictions

- The use of this product is restricted to the methods described in this label.

Product Information

TRI-CLOR FUMIGANT is a pre-plant fumigant for the control of soil-borne pests, such as wireworms and nematodes, and diseases caused by certain species of *Pythium*, *Phytophthora*, *Fusarium*, and *Verticillium*.

Use Precautions

- 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.
- Comply with all local regulations and ordinances. Obtain an application permit from Agricultural Regulatory Agencies as required.
- Obtain medical assistance at once in case of illness after exposure, and do not allow conditions which could accidentally cause further exposure until recovery is complete.
- Never fumigate alone. It is imperative to always have an assistant and proper protection equipment, to aid in case of an accident.
- Drivers of application equipment must advise other workers of all precautions and procedures. In addition, drivers must instruct their helpers in the mechanical operation of the tractor and how to work with the tractor driver while fumigating.
- Handle this fumigant in the open, when possible, with the operator “upwind” from the container where there is good ventilation.
- 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.
- 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°F. Liming highly acid soils before fumigation stimulates nitrification and reduces the possibility of ammonia toxicity.

Certified Applicator Training

Any certified applicator supervising a soil fumigant application must have successfully completed one of the soil fumigant training programs listed on the following EPA website www.epa.gov/fumiganttraining for the active ingredient(s) in this product. The training must be completed in the time frames listed on the website. The FMP must document the date and location where the soil fumigant training program was completed.

Handlers

The following activities are prohibited from being performed by anyone other than persons who have been appropriately trained and equipped as handlers in accordance with the requirements in WPS (40 CFR Part 170):

- Monitoring fumigant air concentrations;
- Cleaning up fumigant spills (this does not include emergency personnel not associated with the application);
- Handling or disposing of fumigant containers;

- Cleaning, handling, adjusting, or repairing the parts of application equipment that may contain fumigant residues; and
- Performing any handling tasks as defined by the WPS (40 CFR 170).

The following activities are prohibited from being performed in the application block from the start of the application until the entry restricted period ends and in the buffer zone during the buffer zone period by anyone other than persons who have been appropriately trained and equipped as handlers in accordance with the requirements in WPS (40 CFR Part 170). (NOTE: persons repairing and monitoring tarps are considered handlers for the duration listed below). Prohibited activities (except for trained and equipped handlers) include:

- Participating in the application as supervisors, loaders, drivers, tractor co-pilots, shovelers, cross ditchers, or as other direct application participants;
- Installing, repairing, operating, or removing irrigation equipment;
- Performing scouting, crop advising, or monitoring tasks;
- Installing, perforating (cutting, punching, slicing, poking), or removing tarps; and
- Repairing or monitoring tarps until 14 days after application is complete if tarps are not perforated and removed during those 14 days.

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

Handlers do not include local, state, or federal officials performing inspection, sampling, or other similar official duties.

Protection for Handlers

Supervision of Handlers:

For all applications, from the start of the application until the application is complete, a certified applicator must be at the application block 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 application is complete until the entry restricted period expires, the certified applicator is not required to be on-site, but must have communicated in a manner that can be understood by the site owner and handlers responsible for carrying out those activities the information necessary to comply with the label and procedures described in the FMP (e.g., emergency response plans and procedures).

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

The certified applicator must provide **Fumigant Safe Handling Information** to each handler or confirm that within the past 12 months, each handler has received **Fumigant Safe Handling Information** in a manner that he/she can understand. **Fumigant Safe Handling Information** will be provided where this product is purchased or at www.epa.gov/fumigantraining.

For all handling tasks at least two handlers must be present.

Exception: After the application is complete, only one trained handler is required to perform fumigant site monitoring tasks outside of the buffer zone.

Exclusion of Non Handlers from the Application Block and Buffer Zone:

The certified applicator supervising the application and the owner of the establishment where the application 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, and
- excluded from the buffer zone during the buffer zone period (see buffer zone exemption for transit on roadways in *Buffer Zone Requirements* section).

Local, state, or federal officials performing inspection, sampling, or other similar official duties are not excluded from the application block or the buffer zone by this labeling. The certified applicator supervising the application and the owner of the establishment where the application is taking place are not authorized to, or responsible for, excluding those officials from the application block or the buffer zone.

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:

The employer of any handler must confirm that an air-purifying respirator and appropriate cartridges/canisters of the type specified in the *PPE* section of this labeling are immediately available for each handler who will wear one. At a minimum two handlers must have the appropriate air-purifying respirator and cartridges/canisters available (see *Respirator Fit Testing, Medical Qualification, and Training* section for additional requirements).

Exception: Air-purifying respirators do not need to be made available for handlers performing fumigant site monitoring tasks outside of the buffer zone.

Cartridges or canisters must be replaced when odor or sensory irritation from this product becomes apparent during use, if the measured concentration of chloropicrin is greater than or equal to 1.5 ppm, or after 8 hours of cumulative use, whichever occurs first.

Respirator Fit Testing, Medical Qualification, and Training:

Using a program that conforms to OSHA's requirements (see 29 CFR Part 1910.134), employers must verify that any handler who uses a respirator is:

- Fit-tested and fit-checked,
- Trained, and
- Examined by a qualified medical practitioner to ensure physical ability to safely wear the style of respirator to be worn. A qualified medical practitioner is a physician or other licensed health care professional who will evaluate the ability of a worker to wear a respirator. The initial evaluation consists of a questionnaire that asks about medical conditions (such as a heart condition) that would be problematic for respirator use. If concerns are identified, then additional evaluations, such as a physical exam, might be necessary. The initial evaluation

must be done before respirator use begins. Handlers must be reexamined by a qualified medical practitioner if their health status or respirator style or use-conditions change.

- Upon request by local/state/federal/tribal enforcement personnel, employers must provide documentation demonstrating how they have complied with these requirements.

Respiratory Protection and Stop Work Triggers:

The following procedures must be followed to determine whether an air-purifying respirator (full facepiece or gas mask) is required or if operations must cease for any person performing a handling task (except for fumigant site monitoring outside of the buffer zone) 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 (full facepiece or gas mask) must be worn by all handlers who remain in the application block or surrounding buffer zone, or
 - Operations must cease and handlers not wearing an air-purifying respirator must leave the application block and surrounding buffer zone.
- Handlers can remove air-purifying respirators (full facepiece or gas mask) or resume operations if two consecutive breathing zone samples taken at the handling site at least 15 minutes apart show that 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 (full facepiece or gas mask) must be worn by the handler taking the air samples. Samples must be taken at the location where the irritation was first experienced.
- When using monitoring devices to monitor air concentration levels, a direct read detection device, such as an electronic device or a colorimetric device (e.g., Matheson-Kitagawa, Draeger, or Sensidyne) must be used. The devices must have sensitivity of at least 0.15 ppm for chloropicrin. Persons using direct read detection devices must follow the manufacturer's directions.
- When breathing zone samples are required, they must be taken outside respiratory protection equipment and within a 10 inch radius of the handler's nose and mouth.
- When air-purifying respirators (full facepiece or gas mask) 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 sensory irritation when wearing an air-purifying respirator (full facepiece or gas mask), or (2) 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 surrounding buffer zone.
- Handlers can resume work activities without air-purifying respirators (full facepiece or gas mask) if two consecutive breathing zone samples taken at the handling site at least 15 minutes apart show 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 (full facepiece or gas mask) must be worn by the handler taking the air samples. Samples must be taken at the location where the irritation was first experienced or where the sample(s) were greater than or equal to 1.5 ppm.
- Handlers can resume work activities if all of the following conditions exist provided an air-purifying respirator (full facepiece or gas mask) 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.
- handlers do not experience sensory irritation while wearing the air-purifying respirator (full facepiece or gas mask), and
- filter cartridges/canisters have been changed.
- During the collection of air samples an air-purifying respirator (full facepiece or gas mask) must be worn by the handler taking the air samples. Samples must be taken at the location where the irritation was first experienced or where the sample(s) were greater than or equal to 1.5 ppm.

Tarp Perforation and/or Removal

IMPORTANT: Persons perforating, repairing, removing, and/or monitoring tarps are defined, within certain time limitations, as handlers (see *Handlers* section), and they 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 application is complete, unless a weather condition exists which necessitates early tarp perforation or removal (see *Early Tarp Removal for Broadcast Applications Only* and *Early Tarp Perforation during Flood Prevention Activities for Bedded Applications Only* requirements).
- If tarps are perforated within 14 days after the application is complete, tarp removal must not begin until at least 2 hours after tarp perforation is complete.
- If tarps are perforated but not removed within 14 days after the application is complete, planting or transplanting must not begin until at least 48 hours after the tarp perforation is complete.
- If tarps are not perforated or removed within 14 days after the application is complete, planting or transplanting may take place while the tarps are being perforated.
- Each tarp panel used for broadcast application must be perforated.
- Tarps 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 applications must be completed before noon.
- For broadcast applications, 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.
- Early Tarp Perforation during Flood Prevention Activities for Bedded Applications Only:

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

Entry Restricted Period and Notification

Entry Restricted Period

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

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

NOTES:

- See *Tarp Perforation and/or Removal* section on this labeling for requirements about when tarps are allowed to be perforated.
- If early tarp removal occurs for a broadcast application the entry restricted period is a minimum of 5 days after the application is complete.
- When listing application information for soil fumigant applications to comply with part 170.122 of the WPS, list the entry restricted period time frame in place of the REI.

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,”
- “Chloropicrin Fumigant in USE,”
- “the date and time of fumigation,
- the date and time entry restricted period is over,
- “TRI-CLOR FUMIGANT”, and
- Name, address, and telephone number of the certified applicator in charge of the fumigation.

Post the Fumigant Treated Area sign instead of the WPS sign for this application, but follow all WPS requirements pertaining to location, legibility, text size, and sign size (40 CFR §170.120).

Post Fumigant Treated Area signs at all entrances to the application block no sooner than 24 hours prior to application.

Fumigant Treated Area signs must remain posted for no less than the duration of the entry restricted period.

Fumigant Treated Area signs must be removed within 3 days after the end of the entry restricted period.

Mandatory Good Agricultural Practices (GAPs)

The following GAPs must be followed during all fumigant applications.

Tarps (when tarps are used in TRI-CLOR FUMIGANT applications)

- A written tarp plan must be developed and included in the FMP.
- Once a tarp is perforated, the application is no longer considered tarped.

Weather Conditions

- To determine if unfavorable weather conditions exist or are predicted (see *Identifying Unfavorable Weather Conditions* section) and whether an application should proceed, the National Weather Service weather forecast must be checked by the certified applicator supervising the application:
 - on the day of, but prior to the start of the application, and
 - on a daily basis during the application if the time period from the start of the application until the application is complete is greater than 24 hours.
- Do not apply if an air stagnation advisory issued by the National Weather Service is in effect for the area in which the application is planned, during the application, or the 48 hours after the application is complete.
- Do not apply if light wind conditions (< 2 mph) are forecast to persist for more than 18 consecutive hours from the time the application starts until 48 hours after the application is complete.
- Detailed National Weather Service forecasts for local weather conditions, wind speed, and air stagnation advisories may be obtained on-line at: <http://www.nws.noaa.gov>, on NOAA weather radio, or by contacting your local National Weather Service Forecasting Office.

Identifying Unfavorable Weather Conditions

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

Soil Preparation

- Soil must be properly prepared and at the surface generally be 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 the start of the application. 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 the start of the application 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 start of the application as possible to limit the length of time that the soil would be exposed to potentially erosive weather conditions.

TRI-CLOR FUMIGANT

Bedded and Broadcast Shank Applications: Additional GAPs

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

Tarps (when tarps are used in TRI-CLOR FUMIGANT applications)

- 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.

Soil Temperature

- The maximum soil temperature at the depth of injection must not exceed 90° F at the beginning of the application.
 - If air temperatures have been above 100° F in any of the three days prior to the start of the application, then soil temperature must be measured and recorded in the FMP. Record temperature measurements at the application depth or 12 inches, whichever is shallower.

Application Methods and Equipment

- Apply TRI-CLOR FUMIGANT with chisel equipment or a Noble plow.
- For shallow (injection depth minimum 8-10 inches) broadcast work, use a shank spacing of 9-12 inches.
- For deep applications (injection depth minimum 18 inches), a shank spacing up to 24 inches may be used; however, it is recommended that the shank spacing not exceed 18 inches.
- When applying TRI-CLOR FUMIGANT with a Noble plow, use an outlet spacing of 9-12 inches along the sweeps.

Application Depth

- *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 Untarped-Bedded Applications:* The injection point must be a minimum of 12 inches from the nearest final soil/air interface.
- *For Untarped-Broadcast Applications:* The injection point must be a minimum of 10 inches from the nearest final soil/air interface.

- *For Untarped-Broadcast Deep Applications:* The injection point must be a minimum of 18 inches from the nearest final soil/air interface.

Soil Sealing

- *For Broadcast Untarped Applications:* 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, 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 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 Noble plow or other injection shank that disrupts the chisel traces.

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. Surface soil generally dries rapidly and must not be considered in this determination.
- Soil moisture must be determined using one of the following methods:
 - the USDA Feel and Appearance Method for testing (see below), or
 - an instrument, such as a tensiometer.
- Available water capacity must be equal to or greater than 50% for shank applications. If there is less than 50% available water capacity 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 the start of the application. To conserve existing soil moisture, pretreatment irrigation or pretreatment tillage should be done as close to the start of the 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 the start of the application.

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

- For **coarse** textured soils (fine sand and loamy fine sand), the soil is moist enough (50 to 75% available water capacity) 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% available water capacity) 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% available water capacity) 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% available water capacity) 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 conservationist, or pest control advisor (agriculture consultant) should be consulted for assistance.

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 ensure 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:
 - 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, if a compressed gas cylinder is used. *(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.
 - A pressure relief valve must be installed between the regulator and the check valve to ensure a regulator failure does not over pressurize the fumigant cylinder.

- 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.
- In case of the rupture of a hose or fitting while applying the fumigant, immediately stop the tractor or motor. Get off the tractor and get to a place where the problem can be observed without exposure to the fumes. Approach from upwind, with respiratory protection if required and make the necessary repairs.
- When changing cylinders, be certain they are turned off and the fumigant system is not under pressure.
- 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. If the rig uses a centrifugal pump instead of compressed gas to inject fumigant into the soil, you may clear residual fumigant from the fumigant lines using an application wand connected to the system's low point via a drain hose. Place the wand in the soil until all residual fumigant has drained from the system. The wand and drain hose must be free of dirt to allow proper drainage. At the end of the application season, 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

After application, leave the soil undisturbed for 10 to 14 days. Wet soil retards diffusion of the fumigant, thus requiring a longer soil exposure period. At the end of the soil exposure period, aerate the soil by plowing or deep cultivation. If heavy rains accompanied by low temperatures occur during the soil exposure period, working the soil several times is essential for thorough aeration. Aeration is usually complete when the odor of the fumigant is no longer evident.

TABLE 1¹ -- PREPLANT SOIL FUMIGATION USES

Field soils to be planted to	Application Rate (pounds product/ treated acre)³ for untarped shank broadcast applications	Application Rate (pounds product/ treated acre)³ for tarped shank bed, strip and broadcast; untarped shank bed; and untarped deep shank broadcast applications
Floral crops, Nursery Crops (including forest nursery seedlings)	175	350
Plant and seed beds	175	300-350
Eggplant, Cucumbers, Melons, Tomatoes	175	300-350
Sweet potatoes, Yams	175	150-350
Onions	175	200-350
Strawberries	175	150-350
All other crops ²	175	350

¹ Do not exceed specified maximum application rates in Table 1.

² Not to be used with aquatic plants or for forestry uses.

³To facilitate application of this product when applying in low dosages, dilution with the solvent Exxsol[®] D-80 is allowed. The maximum rate of Exxsol[®] D-80 shall not exceed 150 lbs./acre.

Calculating the Broadcast Equivalent Application Rate

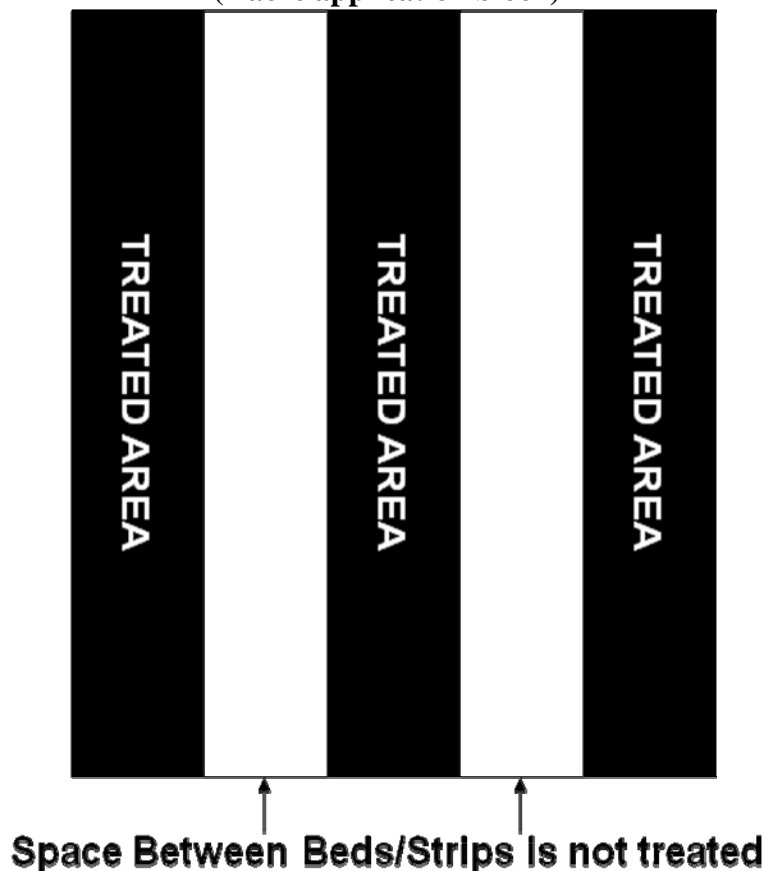
To calculate the broadcast equivalent rate for bedded or strip applications the following information is needed:

- pounds (or gallons) of product per treated acre
- strip or bed bottom width (inches)
- center-to-center row spacing (inches)
- application block size (acres)

Pounds (or gallons) of product **per treated acre** is the ratio of total amount of product applied to the size of the **total area treated** (e.g., the rate of product applied in the bed). For bedded or strip applications, the **total area treated** is the summation of the area (i.e., length x width) of each treated bed bottom or strip that is located within the application block as shown by the black areas in Figure 1 (e.g., black areas are 0.6A or 60% of the area within the application block). The area of the space between the beds/strips is not factored in the total area treated.

The **application block size** is the acreage within the perimeter of the fumigated portion of a field (including furrows, irrigation ditches, roadways). The perimeter of the application block is the border that connects the outermost edges of total area treated with the fumigant product.

Figure 1. Bedded/Strip Application
(1 acre application block)

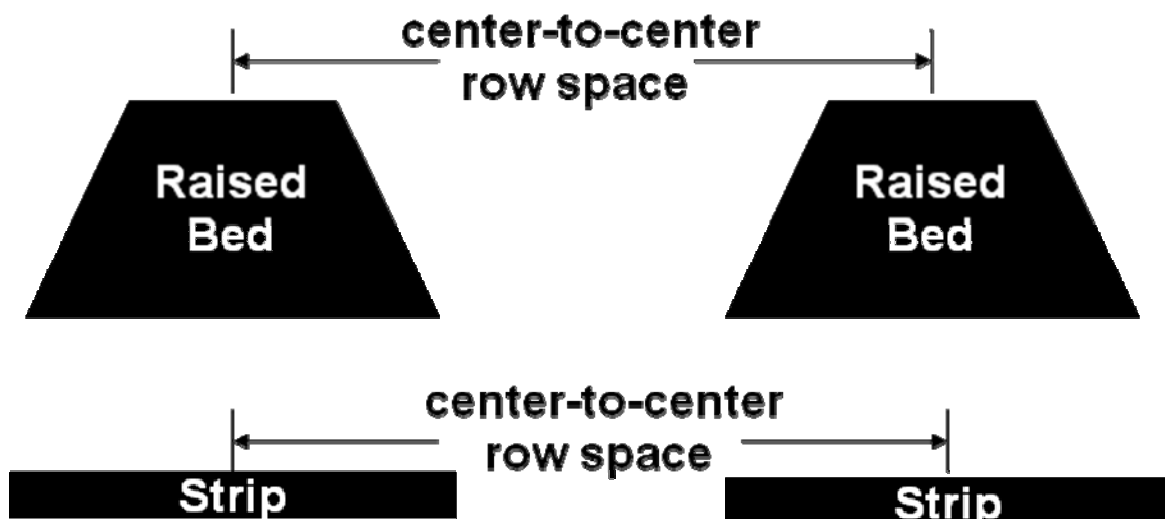


The “broadcast equivalent rate” must be calculated with the following formula:

$$\text{Broadcast equivalent rate} \left(\frac{\text{pounds (or gallons) product/acre}}{\text{pounds (or gallons) of product/ treated acre applied in the strip or bed}} \right) = \frac{\text{strip or bed bottom width (inches)}}{\text{center-to-center row spacing (inches)}} \times \text{pounds (or gallons) of product/ treated acre applied in the strip or bed}$$

- The bed width must be measured from the bottom of the bed.
- The center-to-center row spacing must be calculated as shown in Figure 2.
- If there are any ditches, waterways, drive rows and other areas that are not fumigated that are in the application block, multiply the above broadcast equivalent equation by **(total area of strips or beds + row spacing)/(application block size)**. A sample calculation is provided below.

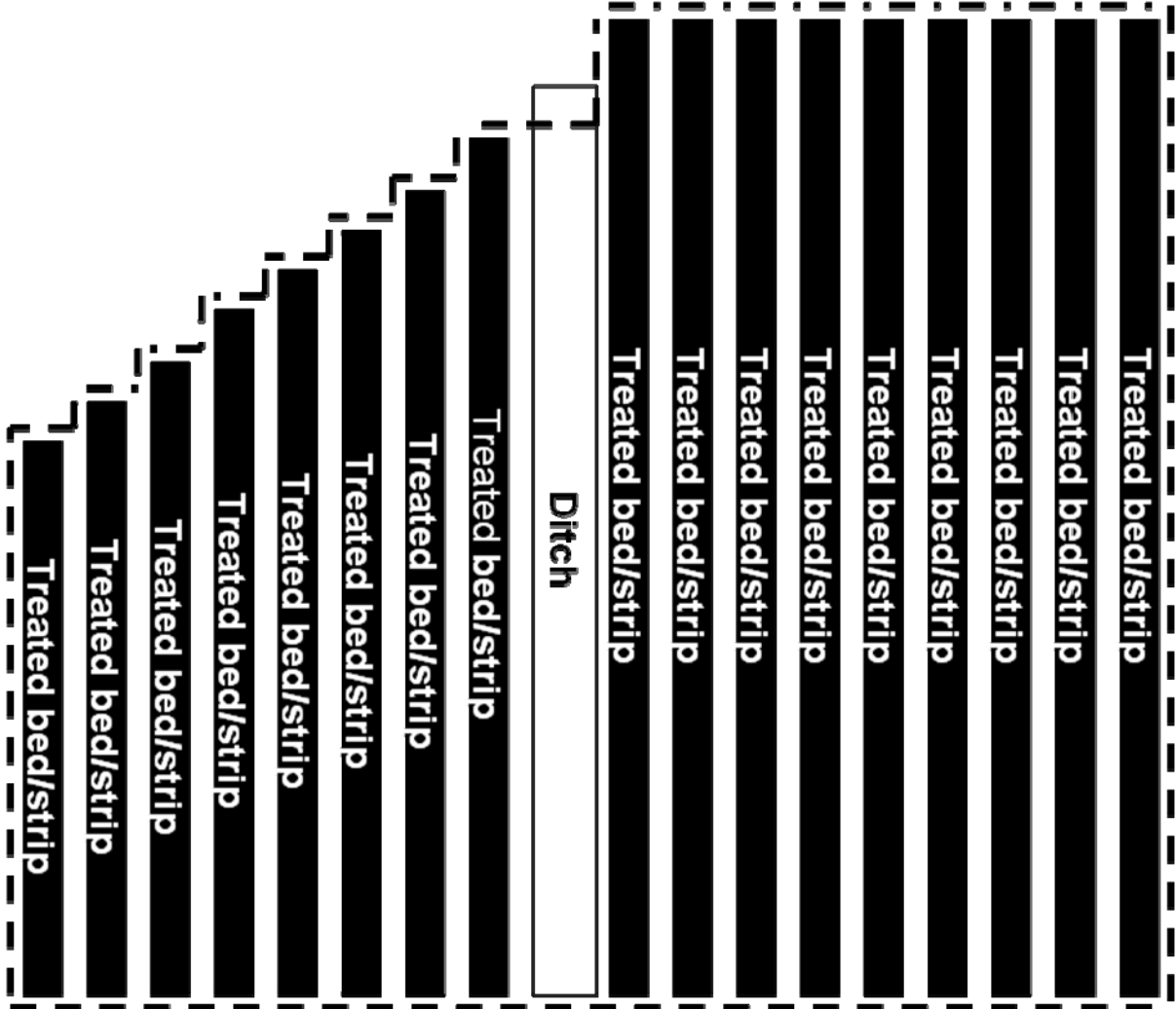
Figure 2. Center Row Spacing



Sample broadcast equivalent rate calculation

Assumptions:

- Application method is shank bedded
- Bed width is 30 inches (measured at the bottom of bed)
- Center-to-center row spacing is 60 inches
- 200 pounds of product per treated acre is applied in the beds
- Total application block size is 10 acres
- Ditch in the middle of application block is 0.25 acres
- Area of beds + row spacing is 9.75 acres



$$\begin{array}{rcl}
 \text{broadcast} & & \text{area of} \\
 \text{equivalent rate} & = & \text{strips or beds} \\
 \text{(pounds} & & \text{+ row} \\
 \text{product/acre)} & & \text{spacing} \\
 & & \text{x} \\
 & & \text{x} \\
 & & \text{pounds} \\
 & & \text{product/} \\
 & & \text{treated acre} \\
 & & \text{applied in the} \\
 & & \text{bed} \\
 \\
 & & \text{center-to-center row} \\
 & & \text{spacing} \\
 & & \text{(inches)} \\
 & & \text{application} \\
 & & \text{block size} \\
 \\
 & = & \frac{30 \text{ inch width beds}}{60 \text{ inch row spacing}} \text{ x } \frac{9.75 \text{ acres}}{10 \text{ acres}} \text{ x } 200 \text{ pounds} \\
 & & \text{product/} \\
 & & \text{treated acre} \\
 \\
 & = & 97.5 \text{ pounds product/acre}
 \end{array}$$

For certain types of application methods, such as nontarped, buried drip applications for melons, the beds are significantly wider (approximately 80 to 84 inches) than the treated root zone area. In this case the calculations above would be modified so the strip or bed width (inches) is replaced with the treated bed area (inches).

Buffer Zone Requirements

A buffer zone must be established for every fumigant application. The following describes the buffer zone requirements:

- The buffer zone must extend outward from the edge of the application block perimeter equally in all directions.
- All non-handlers, including field workers, residents, pedestrians, and other bystanders, must be excluded from the buffer zone during the buffer zone period except for transit (see *Buffer Zone Exemption for Transit on Roadways*).
 - Local, state, or federal officials performing inspection, sampling, or other similar official duties are not excluded from the application block or the buffer zone by this labeling. The certified applicator supervising the application and the owner of the establishment where the application is taking place are not authorized to, or responsible for, excluding those officials from the application block or the buffer zone.
- The buffer zone period begins at the start of the application and lasts for a minimum of 48 hours after the application is complete.

Buffer zone proximity

- Before the start of application, the certified applicator must determine whether their buffer zone will overlap any chloropicrin buffer zone(s).
- To reduce the potential for off-site movement from multiple fumigated fields, buffer zones from multiple chloropicrin application blocks must not overlap UNLESS:
 1. A minimum of 12 hours have elapsed from the time the earlier application(s) is complete until the start of the later application, and
 2. *Fumigant Site Monitoring* or *Response Information for Neighbors* have been implemented if there are any residences or businesses within 300 feet of any of the buffer zones.

Structures under the control of the owner of the application block

- Buffer zones must not include buildings used for storage, (e.g., sheds, barns, garages) UNLESS:
 1. The storage buildings are not occupied during the buffer zone period, and
 2. The storage buildings do not share a common wall with an occupied structure.

Areas not under the control of the owner of the application block

- Buffer zones must not include residential areas (e.g., employee housing, private property), buildings (e.g., commercial, industrial), outdoor residential areas (e.g., lawns, gardens, play areas) and other areas that people may occupy, UNLESS:
 1. The occupants provide written agreement, prior to the start of the application, that they will voluntarily vacate the buffer zone during the entire buffer zone period, and
 2. Reentry by occupants and other non-handlers must not occur until,
 - 1) The buffer zone period has ended, and
 - 2) Sensory irritation is not experienced upon re-entry.
- Buffer zones must not include agricultural areas owned and/or operated by persons other than the owner of the application block, UNLESS:
 1. The owner of the application block can ensure that the buffer zone will not overlap with a chloropicrin buffer zone from any other property owners, except as provided in the *Buffer Zone Proximity* section, and
 2. The owner of the other property 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 must not include roadways and rights of way UNLESS:
 1. The area is not occupied during the buffer zone period, and
 2. Entry by non-handlers is prohibited during the buffer zone period.
Buffer Zone Exemption for Transit on Roadways
Vehicular and bicycle traffic on public and private roadways through the buffer zone is permitted. (NOTE: Buffer zones are not permitted to include bus stops or other locations where persons wait for public transit.)
- For all other publicly owned and/or operated areas such as parks, sidewalks, permanent walking paths, playgrounds, and athletic fields, buffer zones must not include these areas UNLESS:
 1. The area is not occupied during the buffer zone period,
 2. Entry by non-handlers is prohibited during the buffer zone period, and
 3. Written permission to include the public area in the buffer zone is granted by the appropriate state and/or local authorities responsible for management and operation of the area.

Certified applicators must comply with all local laws and regulations.

See the *Posting* section for additional requirements that may apply.

Buffer Zone Distances

Buffer zone distances must be calculated using the application rate and the size of the application block.

- Buffer zone distances must be based on look-up tables in this labeling (25 feet is the minimum distance regardless of site-specific application parameters).
- If after applying all applicable buffer zone credits the buffer zone is greater than ½ mile (2,640 ft), then the application is prohibited.
- For all other applications Tables 2 to 7 must be used to determine the minimum buffer distances as appropriate for the method of application. Round up to the nearest rate and block size, where applicable. Applications are prohibited for rates or block sizes that exceed what is presented in the buffer zone tables.

Table 2. Strip Tarp Buffer Zone Distances in Feet

Broadcast Equivalent Application Rate (lbs Product/Acre)	Application Block Size (Acres)																														
	1	2	3	4	5	6	7	8	9	10	15	20	25	30	35	40	50	60	70	80	90	100	110	120	130	140	150	160			
45	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	30	30	30	35	35		
50	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	30	35	38	41	44	47		
55	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	30	30	30	35	40	45	49	53	56	60		
60	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	30	36	50	55	60	65	70	76	81	87			
65	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	34	43	60	75	85	100	108	117	125	133			
70	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	38	50	75	100	115	130	141	152	163	173			
75	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	30	32	36	46	56	70	83	110	125	135	150	163	175	188	200
80	25	25	25	25	25	25	25	25	25	25	25	25	25	30	31	39	48	68	88	102	116	130	145	160	175	190	204	219	233		
85	25	25	25	25	25	25	25	25	25	25	25	25	25	30	34	46	59	89	119	134	149	164	179	194	209	226	244	261	279		
90	25	25	25	25	25	25	25	25	25	25	25	30	33	41	50	65	79	114	149	166	184	196	214	232	249	269	290	311	331		
95	25	25	25	25	25	25	25	25	25	25	25	37	49	64	80	94	108	142	176	198	221	236	258	279	298	323	348	373	397		
100	25	25	25	25	25	25	25	25	25	25	25	45	64	87	110	123	136	170	203	230	258	277	302	326	348	377	406	435	463		
105	25	25	25	25	25	25	25	25	25	25	25	53	80	110	140	153	165	198	230	263	295	325	355	382	407	441	475	509	543		
110	25	25	25	25	25	25	30	30	31	32	66	100	129	157	170	184	218	253	280	306	356	389	419	446	483	520	558	595			
115	25	25	25	25	25	30	31	34	36	39	80	120	147	174	188	202	239	276	297	318	388	424	456	485	525	566	606	647			
120	25	25	25	25	25	30	34	38	42	46	93	140	166	191	206	221	260	299	314	329	419	458	493	524	568	611	655	699			
125	25	25	25	25	25	31	38	44	51	57	106	154	182	209	224	239	281	322	340	358	451	492	529	563	610	657	704	753	803		
130	25	25	25	25	25	34	44	53	62	71	117	163	195	228	243	258	302	346	375	404	482	526	566	602	652	702	753	803			
135	25	25	25	25	25	37	49	61	74	86	129	171	209	246	261	276	324	371	410	449	514	561	603	641	694	748	801	855			
140	25	25	25	25	25	40	55	70	85	100	140	180	223	265	280	295	345	395	445	495	545	595	640	680	737	793	850	907			
145	25	30	31	34	36	52	68	83	99	114	154	194	238	282	301	319	371	424	474	525	577	629	677	721	781	841	901	961			
150	25	31	36	42	48	64	80	96	112	129	169	209	254	299	321	344	398	452	504	555	609	664	714	761	825	888	952	1015			
155	25	34	42	51	59	76	93	109	126	143	183	223	270	316	342	368	424	481	533	585	641	698	751	802	869	936	1003	1070			
160	25	36	46	57	68	85	102	118	135	152	194	235	283	330	360	389	448	506	561	615	674	732	789	843	913	983	1054	1124			
165	25	37	49	61	74	90	107	123	140	156	201	245	293	340	374	408	469	529	587	645	706	766	826	884	957	1031	1104	1178			
170	25	39	52	66	79	96	112	128	144	161	208	255	303	350	388	426	489	552	614	675	738	801	863	924	1001	1078	1155	1232			
175	25	40	55	70	85	101	117	133	149	165	215	265	313	360	403	445	510	575	640	705	770	835	900	965	1045	1126	1206	1287			
180	25	41	57	72	87	104	120	137	153	170	221	273	322	370	415	457	525	591	658	725	792	859	926	993	1075	1158	1241	1323			
185	25	42	58	74	90	107	124	141	158	174	227	280	331	381	426	470	539	608	677	745	814	883	951	1020	1105	1190	1275	1360			
190	25	43	60	76	92	110	127	144	162	179	233	288	340	391	438	483	554	624	695	765	836	907	977	1048	1135	1222	1310	1397			
195	25	45	61	78	95	113	131	148	166	184	240	295	349	401	449	496	568	641	713	785	858	930	1003	1075	1165	1255	1344	1434			
200	25	46	63	80	97	115	134	152	170	189	246	303	358	411	461	509	583	657	731	805	880	954	1029	1103	1195	1287	1379	1470			
205	25	47	64	82	100	118	137	156	175	193	252	310	367	422	472	521	597	674	750	825	902	978	1054	1130	1225	1319	1413	1507			
210	30	48	66	84	102	121	140	160	179	198	258	318	376	432	484	534	612	690	768	846	924	1002	1080	1158	1255	1351	1448	1544			
215	30	49	68	86	104	124	144	163	183	203	264	326	385	442	495	547	627	706	786	866	946	1026	1106	1186	1284	1383	1482	1581			
220	31	50	69	88	107	127	147	167	187	207	270	333	393	453	507	559	641	723	805	886	968	1050	1131	1213	1314	1415	1516	1618			
225	32	51	71	90	109	130	150	171	192	212	276	341	402	463	518	572	656	739	823	906	990	1074	1157	1241	1344	1448	1551	1654			
230	33	53	72	92	112	133	154	175	196	217	283	348	411	473	530	585	670	756	841	927	1012	1097	1183	1268	1374	1480	1585	1691			
235	34	54	74	94	115	136	157	179	200	222	289	356	420	483	541	598	685	772	859	947	1034	1121	1209	1296	1404	1512	1620	1728			
240	34	55	75	96	117	139	160	182	204	226	295	363	429	494	553	610	699	789	878	967	1056	1145	1234	1323	1434	1544	1654	1765			
245	35	56	77	98	119	141	164	186	209	231	301	371	438	504	564	623	714	805	896	987	1078	1169	1260	1351	1464	1576	1689	1801			
250	36	57	79	100	121	144	167	190	213	236	307	379	447	514	576	636	729	821	914	1007	1100	1193	1286	1379	1493	1608	1723	1838			
255	36	58	80	102	124	147	171	194	217	240	313	386	456	525	587	648	743	838	933	1027	1122	1217	1311	1406	1523	1641	1758	1875			
260	37	59	82	104	126	150	174	198	221	245	319	394	465	535	599	661	758	854	951	1047	1144	1241	1337	1434	1553	1673	1792	1912			
265	38	61	83	106	129	153	177	201	225	250	326	401	474	545	610	674	772	870	969	1067	1166	1264	1363	1461	1583	1705	1827	1948			

Table 3. Bed Tarp Buffer Zone Distances in Feet

Broadcast Equivalent Application Rate (lbs Product/Acre)	Application Block Size (Acres)																												
	1	2	3	4	5	6	7	8	9	10	15	20	25	30	35	40	50	60	70	80	90	100	110	120	130	140	150	160	
75	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	30	35	40	45
80	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	30	35	40	45
85	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	30	35	40	45
90	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	30	35	40	45
95	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	30	35	40	45
100	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	30	35	40	45
105	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	30	35	40	45
110	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	30	35	40	45
115	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	30	35	40	45
120	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	30	35	40	45
125	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	30	35	40	45
130	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	30	35	40	45
135	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	30	35	40	45
140	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	30	35	40	45
145	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	30	35	40	45
150	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	30	35	40	45
155	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	30	35	40	45
160	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	30	35	40	45
165	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	30	35	40	45
170	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	30	35	40	45
175	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	30	35	40	45
180	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	30	35	40	45
185	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	30	35	40	45
190	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	30	35	40	45
195	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	30	35	40	45
200	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	30	35	40	45
205	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	30	35	40	45
210	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	30	35	40	45
215	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	30	35	40	45
220	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	30	35	40	45
225	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	30	35	40	45
230	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	30	35	40	45
235	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	30	35	40	45
240	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	30	35	40	45
245	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	30	35	40	45
250	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	30	35	40	45
255	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	30	35	40	45
260	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	30	35	40	45
265	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	30	35	40	45

Table 5. Broadcast Tarp Buffer Zone Distances in Feet

Broadcast Application Rate (lbs Product/Acre)	Application Block Size (Acres)																												
	1	2	3	4	5	6	7	8	9	10	15	20	25	30	35	40	50	60	70	80	90	100	110	120	130	140	150	160	
70	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	30	30	35	40	45	50	55	
80	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	30	32	37	40	43	45	45	50	55	60	64	69	73	
90	25	25	25	25	25	25	25	25	25	25	25	25	25	25	30	30	39	49	55	61	65	65	70	70	76	82	88	93	
95	25	25	25	25	25	25	25	25	25	25	25	25	25	25	30	31	46	61	70	79	83	88	95	95	103	111	119	127	
100	25	25	25	25	25	25	25	25	25	25	25	25	25	25	30	33	53	73	85	97	110	115	120	125	135	146	156	167	
105	25	25	25	25	25	25	25	25	25	25	25	25	25	25	30	35	60	85	100	115	130	145	160	170	184	198	213	227	
110	25	25	25	25	25	25	25	25	25	25	25	30	34	36	38	45	51	78	104	120	136	150	165	180	190	206	222	238	253
115	25	25	25	25	25	25	25	25	25	25	25	34	42	46	51	59	68	95	122	140	158	170	185	200	210	228	245	263	280
120	25	25	25	25	25	25	25	25	25	25	25	38	51	57	64	74	84	113	141	160	179	195	215	230	240	260	280	300	320
125	25	25	25	25	25	25	25	25	25	25	25	42	59	68	76	89	101	130	159	180	201	221	241	260	275	298	321	344	367
130	25	25	25	25	25	25	25	25	25	25	25	46	68	79	89	103	117	148	178	200	222	242	262	282	297	322	347	371	396
135	25	25	25	25	25	25	25	25	25	25	25	51	76	89	102	118	134	165	196	220	244	268	290	310	330	358	385	413	440
140	25	25	25	25	25	25	25	25	25	25	25	55	85	100	115	133	150	183	215	240	265	290	315	335	355	385	414	444	473
145	25	25	25	25	25	30	30	30	32	34	64	94	112	129	147	164	198	231	259	286	311	335	360	380	412	443	475	507	
150	25	25	25	25	25	30	32	35	39	42	73	104	124	144	161	179	213	248	277	306	335	364	390	415	450	484	519	553	
155	25	25	25	25	25	30	35	40	46	51	82	113	135	158	175	193	229	264	296	327	357	385	415	440	477	513	550	587	
160	25	25	25	25	25	32	39	46	52	59	91	122	147	172	190	207	244	281	314	348	382	415	450	480	520	560	600	640	
165	25	25	25	25	25	34	42	51	59	68	100	131	159	186	204	221	259	297	333	369	404	439	474	504	546	588	630	672	
170	25	25	25	25	25	35	46	56	66	76	109	141	171	201	218	236	275	314	351	389	427	465	503	536	581	625	670	715	
175	25	25	25	25	25	37	49	61	73	85	118	150	183	215	233	250	290	330	370	410	450	490	530	565	612	659	706	753	
180	25	30	30	30	32	45	58	70	83	96	129	161	194	226	249	271	312	353	394	434	474	514	554	589	638	687	736	785	
185	25	30	32	36	39	53	66	80	93	106	140	173	205	238	265	291	334	376	417	459	499	539	579	614	665	716	768	819	
190	25	30	36	41	46	61	75	89	103	117	151	184	217	249	281	312	355	399	441	483	523	563	603	638	691	744	798	851	
195	25	32	39	46	54	68	83	98	113	128	162	196	228	261	297	333	377	421	464	507	547	587	627	662	717	773	828	883	
200	25	34	43	52	61	76	92	107	123	139	173	207	240	272	313	354	399	444	488	531	571	611	651	686	744	801	858	915	
205	25	36	46	57	68	84	100	117	133	149	184	219	251	284	329	374	421	467	511	556	596	636	676	711	770	829	888	948	
210	25	38	50	63	75	92	109	126	143	160	195	230	263	295	345	395	443	490	535	580	620	660	700	735	796	858	919	980	
215	25	39	54	68	82	99	116	132	149	166	203	239	274	309	359	409	456	504	549	594	634	674	714	749	812	874	937	999	
220	25	41	57	73	89	106	122	139	155	171	210	249	286	324	373	422	470	519	564	609	649	689	729	764	827	891	954	1018	
225	25	43	61	79	96	113	129	145	161	177	218	258	298	338	387	436	484	533	578	623	663	703	743	778	843	908	972	1037	
230	25	45	64	84	104	119	135	151	167	183	225	267	310	352	401	449	498	547	592	637	677	717	757	792	858	924	990	1056	
235	25	46	68	89	111	126	142	157	173	189	233	276	321	366	415	463	512	561	606	651	691	731	771	806	874	941	1008	1075	
240	25	48	71	95	118	133	148	164	179	194	240	286	333	381	429	476	526	576	621	666	706	746	786	821	889	958	1026	1094	
245	25	50	75	100	125	140	155	170	185	200	248	295	345	395	443	490	540	590	635	680	720	760	800	835	905	974	1044	1113	
250	25	51	77	103	129	144	159	174	189	204	254	303	355	407	453	499	551	604	656	708	748	788	828	863	935	1007	1079	1150	
255	25	52	79	105	132	147	163	178	193	209	260	311	365	419	463	507	563	619	677	736	776	816	856	891	965	1039	1113	1188	
260	25	53	80	108	136	151	167	182	197	213	266	319	375	431	474	516	574	633	698	764	804	844	884	919	995	1072	1148	1225	
265	25	54	82	111	139	155	170	186	202	217	272	326	385	444	484	524	586	647	719	791	831	871	911	946	1025	1104	1183	1262	
270	25	54	84	113	143	159	174	190	206	221	278	334	395	456	494	533	597	661	740	819	859	899	939	974	1055	1137	1218	1299	
275	25	55	86	116	146	162	178	194	210	226	284	342	405	468	505	541	609	676	761	847	887	927	967	1002	1086	1169	1253	1336	
280	25	56	88	119	150	166	182	198	214	230	290	350	415	480	515	550	620	690	783	875	915	955	995	1030	1116	1202	1288	1373	
285	25	57	89	122	154	171	188	205	222	239	300	361	423	484	526	569	642	715	798	881	921	961	1001	1036	1123	1209	1295	1382	
290	25	58	91	124	158	176	194	212	230	248	310	373	430	488	538	588	664	740	814	888	928	968	1008	1043	1129	1216	1303	1390	
295	25	59	93	127	161	180	199	218	237	256	320	384	438	491	549	606	686	765	829	894	934	974	1014	1049	1136	1224	1311	1398	
300	25	60	95	130	165	185	205	225	245	265	330	395	445	495	560	625	708	790	845	900	940	980	1020	1055	1143	1231	1319	1407	
305	30	64	100	136	172	192	212	233	253	273	341	408	460	512	573	633	718	803	862	920	960	1000	1040	1075	1165	1254	1344	1433	
310	32	68	105	142	178	199	220	240	261	282	352	422	475	528	585	642	729	817	878	940	980	1020	1060	1095	1186	1278	1369	1460	
315	35	73	110	148	185	206	227	248	269	290	363	435	490	545	598	650	740	830	895	960	1000	1040	1080	1115	1208	1301	1394	1487	
320	37	75	113	151	189	210	231	252	273	294	367	441	498	554	608	661	752	843	906	969	1012	1052	1092	1127	1221	1315	1409	1503	
325	39	78	116	155	194	214	235	256	276	297	372	446	505	564	618	671	764	856	916	977	1027	1077	1117	1155	1251	1348	1444	1540	
330	41	81	120	159	198	218	239	260	280	301	376	452	513	573	628	682	775	869	927	986	1036	1086	1126	1166	1263	1360	1458	1555	
335	44	83	123	163	202	223	243	263	284	304	381	458	520	582	638	693	787	881	938	994	1044	1094	1139	1179	1277	1376	1474	1572	
340	46	8																											

Table 6. Broadcast Untarp Buffer Distances in Feet

Broadcast Application Rate (lbs Product/Acre)	Application Block Size (Acres)																													
	1	2	3	4	5	6	7	8	9	10	15	20	25	30	35	40	50	60	70	80	90	100	110	120	130	140	150	160		
30	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25		
35	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	30	35	43	50	63	75	85	95	105	115	125	134	144	153	
40	25	25	25	25	25	25	25	25	25	25	25	25	25	25	38	50	80	110	138	165	175	185	200	210	228	245	263	280		
45	25	25	25	25	25	25	25	25	25	25	25	25	25	41	58	76	95	133	170	201	233	253	283	310	330	358	385	413	440	
50	25	25	25	25	25	25	25	25	25	25	25	25	25	58	90	115	140	185	230	265	300	335	370	405	440	477	513	550	587	
55	25	25	25	25	25	25	25	25	25	25	25	25	46	68	100	133	161	190	238	285	325	365	405	445	485	520	563	607	650	693
60	25	25	25	25	25	25	25	25	25	25	25	68	110	143	175	208	240	290	340	385	430	470	510	550	585	634	683	731	780	
65	25	25	25	25	25	30	33	37	41	45	95	145	183	220	253	285	343	400	448	495	540	585	630	670	726	782	838	893		
70	25	25	25	25	25	33	41	49	57	65	123	180	223	265	298	330	395	460	510	560	610	660	710	755	818	881	944	1007		
75	25	25	30	30	30	42	56	70	84	98	158	218	263	307	343	380	452	523	578	633	688	743	798	848	919	989	1060	1131		
80	25	30	30	30	32	52	72	92	112	132	194	257	303	348	389	430	508	587	647	707	767	827	887	942	1021	1099	1178	1256		
85	25	30	30	33	35	61	87	113	139	165	230	295	343	390	435	480	565	650	715	780	845	910	975	1035	1121	1208	1294	1380		
90	25	34	43	52	61	86	111	136	161	186	248	309	366	423	473	523	616	709	794	879	949	1019	1089	1154	1250	1346	1443	1539		
95	25	41	56	72	88	112	136	160	184	208	265	323	389	455	510	565	666	768	873	978	1053	1128	1203	1273	1379	1485	1591	1697		
100	25	47	69	92	114	137	160	183	206	229	283	336	412	488	548	608	717	826	951	1076	1156	1236	1316	1391	1507	1623	1739	1855		
105	25	54	83	111	140	162	184	206	228	250	300	350	435	520	585	650	768	885	1030	1175	1260	1345	1430	1510	1636	1762	1888	2013		
110	25	56	88	119	150	173	196	218	241	264	325	386	473	559	628	696	817	938	1079	1220	1310	1400	1490	1575	1706	1838	1969	2100		
115	25	59	93	126	160	184	207	231	254	278	350	422	510	598	670	742	867	991	1128	1265	1360	1455	1550	1640	1777	1913	2050	2187		
120	25	61	98	134	170	194	219	243	268	292	375	458	548	637	713	788	916	1044	1177	1310	1410	1510	1610	1705	1847	1989	2131	2273		
125	25	64	103	141	180	205	230	256	281	306	400	494	585	676	755	834	966	1097	1226	1355	1460	1565	1670	1770	1918	2065	2213	2360		
130	25	66	108	149	190	216	242	268	294	320	425	530	623	715	798	880	1015	1150	1275	1400	1510	1620	1730	1825	1977	2129	2281	2433		
135	25	71	118	164	210	238	265	293	320	348	450	553	651	750	833	915	1040	1165	1314	1463	1578	1695	1810	1925	2085	2246	2406	2567		
140	25	76	128	179	230	259	288	317	346	375	475	575	680	785	868	950	1065	1180	1353	1525	1645	1765	1885	2005	2172	2339	2506	2673		
145	25	78	130	183	235	268	301	334	367	400	500	600	706	811	903	994	1108	1223	1402	1581	1706	1831	1956	2080	2253	2427	2600	2773		
150	25	79	133	186	240	277	314	351	388	425	525	625	731	838	938	1038	1151	1265	1451	1638	1768	1900	2030	2160	2340	2520	2700	2880		
155	25	80	135	190	245	286	327	368	409	450	550	650	757	864	973	1081	1194	1308	1501	1694	1850	1990	2130	2265	2454	2643	2831	3020		
160	25	81	138	194	250	295	340	385	430	475	575	675	783	890	1008	1125	1238	1350	1550	1750	1910	2070	2230	2380	2578	2777	2975	3173		
165	25	85	146	206	267	310	353	397	440	483	595	707	817	927	1038	1150	1283	1417	1600	1783	1943	2103	2263	2400	2600	2800	3000	3200		
170	25	90	154	219	283	325	367	408	450	492	615	738	851	963	1069	1175	1329	1483	1650	1817	1982	2132	2285	2425	2627	2829	3031	3233		
175	25	94	163	231	300	340	380	420	460	500	635	770	885	1000	1100	1200	1375	1550	1700	1850	2000	2150	2300	2450	2654	2858	3063	3267		

If after applying applicable credits the buffer zone distances are still greater than 1/2 mile (2,640 feet), then the application is prohibited.

Table 7. Broadcast Deep (18 inches) Untarp Buffer Zone Distances in Feet

Broadcast Application Rate (lbs Product/Acre)	Application Block Size (Acres)																												
	1	2	3	4	5	6	7	8	9	10	15	20	25	30	35	40	50	60	70	80	90	100	110	120	130	140	150	160	
30	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25
35	25	25	25	25	25	25	25	25	25	25	25	30	30	33	35	38	41	44	48	51	55	67	80	92	105	113	122	131	139
40	25	25	25	25	25	25	25	25	25	25	30	35	40	46	51	57	63	70	77	84	99	114	129	144	156	168	180	192	
45	25	25	25	25	25	25	25	25	25	25	33	40	48	56	64	73	83	93	103	114	134	154	174	194	210	226	242	258	
50	25	25	25	25	25	25	25	25	25	25	35	45	56	67	78	88	102	115	129	143	168	193	218	243	263	284	304	324	
55	25	25	25	25	25	25	25	25	25	25	40	55	71	88	104	120	140	160	181	203	230	258	285	313	339	365	391	417	
60	25	25	25	25	25	25	25	25	25	25	45	65	87	108	130	152	178	205	233	262	292	322	352	382	414	446	478	509	
65	25	25	25	25	25	25	25	25	25	25	50	75	102	129	156	183	217	250	285	321	351	381	411	446	483	520	558	595	
70	25	25	25	25	25	25	25	25	25	25	55	85	118	150	183	215	255	295	338	380	410	440	470	510	553	595	638	680	
75	25	25	25	25	25	30	32	35	38	40	77	114	148	183	216	249	294	340	384	429	459	489	519	554	600	646	693	739	
80	25	25	25	25	25	33	39	45	51	55	99	143	179	215	249	283	334	385	431	478	508	538	568	598	648	698	748	797	
85	25	25	25	25	25	37	46	55	63	70	121	171	209	248	282	316	373	430	478	526	557	587	617	647	700	754	808	862	
90	25	25	25	25	25	42	53	65	76	85	143	200	240	280	315	350	413	475	525	575	605	635	665	695	753	811	869	927	
95	25	25	25	30	30	46	60	74	89	101	161	220	263	305	341	378	445	513	566	620	650	680	710	740	802	863	925	987	
100	25	25	30	30	30	50	67	84	102	118	179	240	285	330	368	405	478	550	608	665	695	725	755	785	850	916	981	1047	
105	25	30	30	33	35	58	81	104	127	150	215	280	330	380	420	460	543	625	690	755	785	815	845	875	948	1021	1094	1167	
110	25	32	38	45	51	74	97	120	143	166	234	301	355	408	450	493	579	665	735	804	839	874	909	944	1023	1101	1180	1259	
115	25	36	46	57	68	91	114	137	160	183	253	323	379	436	481	526	615	705	779	854	889	924	959	994	1077	1160	1243	1325	
120	25	40	55	69	84	107	130	153	176	199	272	344	404	464	511	559	652	745	824	903	938	973	1008	1043	1130	1217	1304	1391	
125	25	44	63	82	101	124	147	170	193	216	291	366	429	491	541	591	688	785	869	952	987	1022	1057	1092	1183	1274	1365	1456	
130	25	48	71	94	117	140	163	186	209	232	310	387	453	519	572	624	725	825	913	1001	1036	1071	1106	1141	1236	1331	1426	1521	
135	25	52	79	106	134	157	180	203	226	249	329	409	478	547	602	657	761	865	958	1051	1091	1131	1171	1211	1312	1413	1514	1615	
140	25	56	88	119	150	173	196	219	242	265	348	430	503	575	633	690	798	905	1003	1100	1140	1180	1220	1260	1365	1470	1575	1680	
145	25	59	92	126	159	183	207	231	255	279	365	451	527	603	664	725	841	956	1061	1166	1206	1246	1286	1326	1437	1547	1658	1768	
150	25	61	97	133	169	193	218	243	267	292	382	471	551	631	695	760	884	1008	1120	1231	1271	1311	1351	1391	1507	1623	1739	1855	
155	25	63	101	140	178	203	229	255	280	306	399	492	575	659	727	795	927	1059	1178	1297	1337	1377	1417	1457	1578	1700	1821	1943	
160	25	66	106	147	187	214	240	266	293	319	416	513	600	686	758	830	970	1111	1237	1363	1413	1453	1493	1533	1661	1789	1916	2044	
165	25	68	111	154	196	224	251	278	306	333	433	534	624	714	790	865	1014	1162	1295	1429	1474	1519	1564	1609	1743	1877	2011	2145	
170	25	70	115	161	206	234	262	290	318	346	450	554	648	742	821	900	1057	1214	1354	1494	1539	1584	1629	1674	1814	1953	2093	2232	
175	25	73	120	168	215	244	273	302	331	360	468	575	673	770	853	935	1100	1265	1413	1560	1605	1650	1695	1740	1885	2030	2175	2320	
180	25	75	126	176	226	257	287	317	347	377	491	605	704	803	886	969	1139	1309	1452	1594	1639	1684	1729	1774	1922	2070	2218	2365	
185	25	78	131	185	238	269	300	332	363	394	515	635	735	836	920	1004	1179	1354	1491	1629	1674	1719	1764	1809	1960	2111	2261	2412	
190	25	81	137	193	249	282	314	347	379	411	538	665	767	869	953	1038	1218	1398	1530	1663	1713	1763	1813	1863	2018	2174	2329	2484	
195	25	84	143	202	261	294	328	361	395	429	562	695	798	901	987	1072	1257	1442	1570	1697	1747	1797	1847	1897	2055	2213	2371	2529	
200	25	87	149	210	272	307	342	376	411	446	585	725	830	934	1020	1106	1296	1486	1609	1731	1781	1831	1881	1931	2092	2253	2414	2575	
205	25	90	154	219	284	319	355	391	427	463	609	755	861	967	1054	1141	1336	1531	1648	1766	1816	1866	1916	1966	2130	2294	2458	2621	
210	25	93	160	228	295	332	369	406	443	480	633	785	893	1000	1088	1175	1375	1575	1688	1800	1850	1900	1950	2000	2167	2333	2500	2667	
215	32	101	170	238	307	345	383	420	458	496	650	805	913	1021	1111	1201	1409	1617	1721	1825	1875	1925	1975	2025	2194	2363	2531	2700	
220	39	109	179	249	319	358	396	435	473	511	668	825	934	1043	1135	1228	1444	1659	1755	1850	1900	1950	2000	2050	2221	2392	2563	2733	
225	46	118	189	260	331	371	410	449	488	527	686	845	955	1064	1159	1254	1478	1701	1788	1875	1925	1975	2025	2075	2248	2421	2594	2767	
230	54	126	199	271	344	383	423	463	503	543	704	865	975	1086	1183	1281	1512	1744	1822	1900	1950	2000	2050	2100	2275	2450	2625	2800	
235	61	134	208	282	356	396	437	477	518	559	722	885	996	1107	1207	1307	1546	1786	1855	1925	1975	2025	2075	2125	2302	2479	2656	2833	
240	68	143	218	293	368	409	450	492	533	574	740	905	1017	1129	1231	1334	1581	1828	1889	1950	2000	2050	2100	2150	2329	2508	2688	2867	
245	75	151	228	304	380	422	464	506	548	590	758	925	1038	1150	1255	1360	1615	1870	1923	1975	2025	2075	2125	2175	2356	2538	2719	2900	
250	82	159	235	312	389	431	474	516	559	601	769	936	1057	1179	1283	1387	1641	1896	1962	2029	2094	2159	2224	2289	2480	2671	2861	3052	
255	89	166	243	320	397	440	483	527	570	613	780	946	1077	1207	1311	1414	1668	1921	2002	2082	2162	2242	2322	2402	2602	2802	3003	3203	
260	96	174	251	328	406	449	493	537	581	624	791	957	1096	1236	1339	1441	1694	1947	2041	2136	2231	2326	2421	2516	2726	2935	3145	3355	
265	104	181	259	337	414	459	503	547	591	636	802	968	1116	1264	1366	1469	1721	1973	2081	2189	2299	2409	2519	2629	2848	3067	3286	3505	
270	111	189	267	345	423	468	513	557	602	647	813	979	1136	1293	1394	1496	1747	1999	2121	2243	2363	2483	2603	2723	2950	3177	3404	3631	
275	118	196	275	353	431	477	522	568	613	659	824	989	1155	1321	1422	1523	1774	2024	2160	2296	2431	2566	2701	2836	3072	3309	3545	3781	
280	125	204	283	361	440	486</																							

Buffer Zone Credits

The buffer zone distances for TRI-CLOR FUMIGANT applications may be reduced by the percentages listed below. Credits may be added, but credits cannot exceed 80%. Also, the minimum buffer zone distance is 25 feet, regardless of buffer zone credits available.

- See www.tarpcredits.epa.gov for a list of tarps that have been tested and determined to qualify for buffer reduction credits. Only tarps listed on this website qualify for buffer reduction credits.
- 10% reduction in buffer zone distance IF the Symmetry™ application system is used with a tarp that qualifies for a credit and the application rate is ≤ 100 pounds a.i./treated acre. The 10% credit for the Symmetry™ application system is added to the buffer zone credit for the tarp. For example if the Symmetry™ application system is used with a tarp that qualifies for a 40% credit the total credit for the tarp and the application system would be 50%.
- 15% reduction in buffer zone distance, IF potassium thiosulfate (KTS) is applied at a minimum rate of 300 pounds per acre.
- 15% reduction in buffer zone distance, IF $\frac{1}{4}$ to $\frac{1}{2}$ inch of water is applied.
- 10% reduction in buffer zone distance, IF the organic content of the soil in the application block is $\geq 1\%$ - 2%; a 20% reduction in buffer zone distance, IF the organic content of the soil in the application block is $>2\%$ - 3%; and a 30% reduction in the buffer zone distance, IF the organic content of the soil in the application block is $>3\%$.
- 10% reduction in buffer zone distance, IF the soil temperature is measured to be 50°F or less. Record temperature measurements at the application depth or 12 inches, whichever is shallower.
- 10% reduction in the buffer zone distance, IF the clay content of the soil in the application block is greater than 27%.

Examples of Buffer Zone Calculations with Credits Applied

If the buffer zone is 50 feet and the application qualifies for a buffer zone credit since the soil organic content is 1.5%, then the buffer zone can be reduced by 10%, i.e., reduced by 5 feet based on the following calculation: 50 feet – (50 feet x 10%) = 45 feet.

If the buffer zone is 50 feet and the application qualifies for two buffer zone credits since the soil organic content is 1.5% and the clay content is greater than 27%, then the buffer zone can be reduced by 20% (10% organic content credit + 10% clay content credit), i.e., reduced by 10 feet based on the following calculation 50 feet - (50 feet x 20%) = 40 feet.

Posting Fumigant Buffer Zones

- Posting of a **buffer zone** is required unless there is a physical barrier that prevents bystander access to the buffer zone.
- Buffer Zone signs must be placed along or outside the perimeter of the buffer zone, at all usual points of entry and along likely routes of approach from areas where people not under the owner'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 include, but are not limited to, the area between a buffer zone and a roadway, or the area between a buffer zone and a housing development.

- When posting, the certified applicator supervising the application must ensure compliance with all local laws and regulations.
- Buffer Zone signs must meet the following criteria:
 - The printed side of the sign must face away from the application block toward areas from which people could approach.
 - Signs must remain legible during the entire posting period and must meet the general standards outlined in the WPS for sign size, text size, and legibility (see 40 CFR §170.120).
 - Signs must be posted no sooner than 24 hours prior to the start of the application and remain posted until the buffer zone period has expired.
 - Signs must be removed within 3 days after the end of the buffer zone period.
 - Buffer Zone signs which meet the criteria above will be provided at points of sale for applicators to use. Templates may be downloaded from http://www.epa.gov/pesticides/reregistration/soil_fumigants/index.htm
 - The Buffer Zone signs must contain the following information:
 - The 'Do Not Walk' symbol
 - DO NOT ENTER/NO ENTRE,
 - TRI-CLOR FUMIGANT (Chloropicrin) BUFFER ZONE,
 - Contact information for the certified applicator in charge of the fumigation.

Exception: If multiple contiguous blocks are fumigated within a 14-day period, the entire periphery of the contiguous blocks' buffer zones may be posted. Buffer Zone signs must be posted no sooner than 24-hours prior to the start of the first application. The signs must remain posted until the last buffer zone period expires, and signs must be removed within 3 days after the buffer zone period for the last block has expired.

Restrictions for Difficult to Evacuate Sites

Difficult to evacuate sites are pre-K to grade 12 schools, state licensed daycare centers, nursing homes, assisted living facilities, hospitals, in-patient clinics, and prisons.

- No fumigant application with a buffer zone greater than 300 feet is permitted within 1/4 mile (1320 feet) of difficult to evacuate sites unless the site is not occupied by children from state-licensed day care centers, students (pre-K to grade 12), patients, or prisoners during the application and the 36-hour period following the end of the application.
- No fumigant application with a buffer zone of 300 feet or less is permitted within 1/8 mile (660 feet) of difficult to evacuate sites unless the site is not occupied by children from state-licensed day care centers, students (pre-K to grade 12), patients, or prisoners during the application and the 36-hour period following the end of the application.

Emergency Preparedness and Response Measures

If the buffer zone is 25 feet, then the *Emergency Preparedness and Response Measures* are not applicable.

Triggers for Emergency Preparedness and Response Measures

The certified applicator must either follow the directions under the *Fumigant Site Monitoring* section or follow the directions under the *Response Information for Neighbors* section if:

- the buffer zone is greater than **25 feet** but less than or equal to **100 feet**, and there are residences or businesses within **50 feet** from the outer edge of the buffer zone, or

- the buffer zone is greater than **100 feet** but less than or equal to **200 feet**, and there are residences or businesses within **100 feet** from the outer edge of the buffer zone, or
- the buffer zone is greater than **200 feet** but less than or equal to **300 feet**, and there are residences or businesses within **200 feet** from the outer edge of the buffer zone, or
- the buffer zone is greater than **300 feet** or the **buffer zones overlap**, and there are residences or businesses within **300 feet** from the outer edge of the buffer zone.

Fumigant Site Monitoring

NOTE: *Fumigant Site Monitoring* is ONLY required if the *Emergency Preparedness and Response Measures* are triggered AND directions from the *Response Information for Neighbors* section are not followed.

From the start of the application until the buffer zone period expires, a certified applicator or handler(s) under his/her supervision must:

- Monitor for sensory irritation in areas between the buffer zone outer perimeter and residences and businesses that trigger this requirement.
- Monitoring for sensory irritation must begin in the evening on the day of application and continue until the buffer zone period expires. Monitor a minimum of 8 times during the buffer zone period, including these periods:
 - 1 hour before sunset,
 - during the night,
 - 1 hour after sunrise, and
 - during daylight hours.

Implement the emergency response plan immediately if a handler monitoring experiences sensory irritation.

Response Information for Neighbors

NOTE: *Response Information for Neighbors* is ONLY required if the *Emergency Preparedness and Response Measures* are triggered AND directions from the *Fumigant Site Monitoring* section are not followed.

The certified applicator supervising the application must ensure that residences and businesses that trigger the requirement have been provided the response information at least **1 week** before the application starts. The information provided may include application dates that range for no more than **4 weeks**. If the application does not occur when specified, the information must be delivered again.

Information that must be included:

- The location of the application block.
- Fumigant(s) applied including the active ingredient, name of the fumigant product(s), and the EPA Registration number.
- Contact information for the applicator and property owner.
- Time period in which the application 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 who to call if you believe you are being exposed (911 in most cases).
- How to find additional information about fumigants.

The method used to share the response information for neighbors can be accomplished through mailings, door hangers, or other methods that will effectively inform the residences and businesses within the required distance from the edge of the buffer zone.

Notice to State and Tribal Lead Agencies

If your state and/or tribal lead agency requires notice, information must be provided to the appropriate state or tribal lead agency prior to the application. Please refer to www.epa.gov/fumigantstatenotice for a list of states and tribal lead agencies that require notice and information on how to submit the information.

The information that must be provided to state and tribal lead agencies includes the following:

- Location of the application blocks,
- Fumigant(s) applied including EPA registration number,
- Applicator and property owner contact information, and
- Time period that fumigation may occur.

Emergency Response Plan

The certified applicator must include in the FMP a written emergency response plan that identifies:

- Evacuation routes,
- Locations of telephones,
- Contact information for first responders and local/state/federal/tribal personnel, and
- Emergency procedures/responsibilities (e.g., adding water to the field, repairing tarps, fixing equipment, evacuating upwind) if:
 - there is an incident,
 - sensory irritation is experienced outside of the buffer zone, and/or
 - there are equipment/tarp/seal failures or complaints, or other emergencies.

Site-Specific Fumigation Management Plan (FMP)

Prior to the start of application, the certified applicator supervising the application must verify that a site-specific FMP exists for each application block. In addition, an agricultural 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, registrant, or other party.

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

Each site specific FMP must contain the following elements:

- Certified Applicator Supervising the Application

- Name,
- Phone number,
- Pesticide applicator license and/or certificate number,
- Specify if commercial or private applicator,
- Employer name,
- Employer address, and
- Date and location of completing EPA approved soil fumigant training program.
- 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 application block owner
 - Map, aerial photo, or detailed sketch showing:
 - application block location
 - application block dimensions
 - buffer zone dimensions
 - property lines
 - roadways
 - rights-of-ways
 - sidewalks
 - permanent walking paths
 - bus stops
 - nearby application blocks
 - surrounding structures (occupied and non-occupied)
 - locations of Buffer Zone signs, and
 - locations of difficult to evacuate sites with distances from the application block labeled.
- General application information
 - Target application date/window,
 - Fumigant Product Name, and
 - EPA registration number.
- Tarp Plan (if tarp is used)
 - Schedule for checking tarps for damage, tears, and other problems,
 - Minimum size of damage that will be repaired,
 - Factors used to determine when tarp repair will be conducted,
 - Equipment/methods used to perforate tarps,
 - Target dates for perforating tarps, and
 - Target dates for removing tarps.
- Soil conditions
 - Description of soil texture and moisture in application block,
 - Method used to determine soil moisture, and
 - Soil temperature measurement if air temperatures were above 100° F in any of the 3 days prior to the application.
- Buffer zones
 - Application method,
 - Injection depth,
 - Application rate from lookup table on label,

- Application block size from lookup table on label,
- Credits applied and measurements taken (if applicable),
 - Tarp brand name, lot number, thickness, manufacturer, batch number, and part number
 - Symmetry™ application system
 - Potassium thiosulfate
 - Water seal
 - Organic matter content
 - Clay content
 - Soil temperature
- Buffer zone distance, and
- Description of areas in the buffer zone that are not under the control of the owner of the application block. If buffer zones extend onto areas not under the control of the owner, attach the written agreement and keep it with the FMP.
- Record Emergency Response Plan as described in the *Emergency Response Plan* section.
- Posting of Fumigant Treated Area and Buffer Zone
 - Person(s) who will post and remove (if different) Fumigant Treated Area and Buffer Zone signs, and
 - Location of Buffer Zone signs.
- Emergency Preparedness and Response Measures (if applicable)
 - Fumigant site monitoring (if applicable):
 - When and where it will be conducted
 - Response information for neighbors (if applicable):
 - List of residences and businesses informed,
 - Name and phone number of person providing information, and
 - Method of providing the information.
- State and/or tribal lead agency advance notification (if state and/or tribal lead agency requires notice, provide a list of contacts that were notified and date notified)
- Plan describing how communication will take place between the certified applicator supervising the application, the owner, and other on-site handlers (e.g., tarp perforators/removers, irrigators) for complying with label requirements (e.g., buffer zone location, buffer zone start and end times, timing of tarp perforation and removal, PPE).
 - Name and phone number of persons contacted by the certified applicator, and
 - Date contacted.
- Handler (including Certified Applicators) Information and PPE
 - Names, addresses and phone numbers of handlers
 - Names, addresses, and phone numbers for employers of handlers
 - Tasks that each handler is authorized and trained to perform
 - Date of PPE training for each handler
 - Applicable handler PPE including:
 - Long-sleeved shirts/long pants, shoes, socks
 - Chemical-resistant apron
 - Chemical-resistant footwear
 - Protective eyewear (not goggles)
 - Chemical-resistant gloves
 - Air-purifying respirators

- Respirator make, model, type, style, size, and cartridge/canister type
 - SCBAs
 - Respirator make, model, type, style, size
 - Other PPE
- For handlers: Confirmation of receipt of Fumigant Safe Handling Information.
- For certified applicator(s) supervising the application: Completion date and location of the soil fumigant training program listed on the following EPA website www.epa.gov/fumiganttraining for the active ingredient(s) in this product.
- For handlers designated to wear respirators (air-purifying respirator or SCBA):
 - date of medical qualification to wear a respirator,
 - date of respirator training, and
 - date of fit-testing for the respirator.
- Unless exempted in the *Protection of Handlers* section, verify that:
 - at minimum 2 handlers have the appropriate respirators and cartridges/canisters during handler activities, and
 - the employer has confirmed that the appropriate respirator and cartridges/canisters are immediately available for each handler who will wear one.
- Air monitoring plan
 - If sensory irritation is experienced, indicate whether operations will cease or operations will continue with use of an air-purifying respirator
 - For monitoring the breathing zone:
 - Representative handler tasks to be monitored,
 - Monitoring equipment to be used, and
 - Timing of the monitoring.
- Good Agricultural Practices (GAPs)
 - Identify (e.g., list, attach applicable label section) applicable mandatory GAPs.
- Pesticide Product Labels and Material Safety Data Sheets (MSDS)
 - Ensure that labels and MSDS are on-site and readily available for employees to review.

Record-Keeping Procedures

The owner of the application block as well as the certified applicator supervising the application 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 application blocks (e.g., applicator information, certified applicator, handlers, 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).

The certified applicator must make a copy of the FMP immediately available for viewing by handlers involved in the application. The certified applicator or the owner 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 immediately

available when requested by local/state/federal/tribal emergency response and enforcement personnel. The certified applicator supervising the application must ensure the FMP is at the application block during all handler activities.

Within 30 days after the application is complete, the certified applicator supervising the application must complete a Post-Application Summary.

Post-Application Summary

The Post-Application Summary must contain the following elements:

- Actual date and time of the application
- Application rate
- Size of application block
- Weather Conditions
 - Summary of the National Weather Service weather forecast during the application and the 48-hours after the application is complete including:
 - wind speed, and
 - air stagnation advisory (if applicable).
 - Forecast must be checked on the day of, but prior to the start of the application, and on a daily basis during the application if the time period from the start of the application until the application is complete is greater than 24 hours.
- Tarp damage and repair information (if applicable):
 - Date of tarp damage discovery,
 - Location and size of tarp damage,
 - Description of tarp/tarp seal/tarp equipment failure, and
 - Date and time of tarp repair completion.
- Tarp perforation/removal details (if applicable):
 - Date and time tarps were perforated,
 - Date and time tarps were removed, and
 - Record if tarps were perforated and/or removed early. Describe the conditions that caused early tarp perforation and/or removal.
- 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, and
 - Description of control measures or emergency procedures followed after complaint.
- Description of incidents, equipment failure, or other emergency and emergency procedures followed (if applicable).
- Air monitoring results:
 - When sensory irritation was experienced:
 - Date, time, location, and handler task/activity where irritation was observed and
 - Resulting action (e.g., implement emergency response plan, cease operations, continue operations with air-purifying respirators).
 - When using a direct read detection device:
 - Sample date(s), time(s), location(s), and concentration(s),
 - Handler task/activity monitored (if applicable), and
 - Resulting action (e.g., cease operations, continue operations with air-purifying respirators).

- Fumigant Treated Area and Buffer Zone Signs:
 - Dates of posting and removal.
- Any deviations from the FMP (e.g., changes in emergency response actions, changes in handler information, changes in handlers responsible for completing emergency tasks, changes in communication between certified applicator, owner, and other handlers).

Record-Keeping Procedures

The owner of the application block, as well as the certified applicator supervising the application, must keep a signed copy of the Post-Application Summary for 2 years from the date of application.

Spill and Leak Procedures

Evacuate everyone from the immediate area of the spill or leak. For entry into affected area to correct problems, wear the personal protective equipment specified in the *Personal Protective Equipment (PPE)* section of this labeling. 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. Dispose of contaminated material on site or at an approved disposal facility. Only correctly trained and PPE-equipped handlers are permitted to perform such cleanup. Do not permit entry into the spill or leak area by any other person until the concentration of chloropicrin is measured to be 0.15 ppm or less.

Warning Agent

TRI-CLOR FUMIGANT may be used as a warning agent prior to fumigating with an EPA-registered sulfuryl fluoride product. When used as a warning agent prior to sulfuryl fluoride fumigations, users must follow requirements on the EPA-registered sulfuryl fluoride product.

***TRI-CLOR FUMIGANT is compatible
when mixed with Chlorinated C₃ Hydrocarbons.***

Storage and Disposal

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

Pesticide Storage: Store in a dry, cool, well-ventilated area under lock and key. Post as a pesticide storage area.

Pesticide Disposal: Pesticide wastes are toxic. Improper disposal of excess pesticide, spray mixture, or rinsate 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. When a cylinder is partially full, and there is no further requirement for the product, return the cylinder to the registrant or distributor. Replace safety cap and valve protection bonnet before shipping container.

Container Handling: Store cylinders upright, secured to a rack or wall to prevent tipping. Do not subject cylinders to rough handling or mechanical shock such as dropping, bumping, dragging, or sliding. Do not use rope slings, hooks, tongs or similar devices to unload cylinders. Transport cylinders using hand truck, fork truck or other device to which the cylinder 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.

Return of Containers: Cylinders are the property of the registrant or distributor and must be returned promptly after use. Do not ship cylinders without safety caps or valve protection bonnets.

Refillable Container: Only the registrant or distributor is allowed to refill this container. This container can be refilled with pesticide only. Do not reuse this container for any other purpose. Cleaning the container before final disposal is the responsibility of the person disposing of the container. Cleaning before refilling is the responsibility of the refiller.

Container Disposal: To clean the container before final disposal, remove any remaining liquid from the container, using dry air pressure if necessary. Allow container to aerate for at least 5 days. After aeration, wash container using hot water; then offer container to qualified reconditioner or dispose of as directed by State or local regulations.

WARRANTY

Seller warrants that this product conforms to the chemical description on its label and is reasonably fit for the purposes stated on the label when used in accordance with directions under normal conditions of use. To the extent consistent with applicable law, neither this warranty nor any other warranty of MERCHANTABILITY or FITNESS FOR A PARTICULAR PURPOSE, express or implied, extends to the use of this product in a manner contrary to its label.

Tri-Clor

Fumigant

Index

Precautionary Statements

First Aid.....	1
Hazards to Humans and Domestic Animals	2
Personal Protective Equipment (PPE).....	2
User Safety Requirements	3
User Safety Recommendations.....	3

Environmental Hazards.....

Physical or Chemical Hazards

Directions for Use

Agricultural Use Requirements	4
Terms Used In This Labeling	4
Application Restrictions	5
Product Information	6
Use Precautions	6
Certified Applicator Training.....	6
Handlers	6
Protection for Handlers	7
Tarp Perforation and/or Removal.....	10
Entry Restricted Period and Notification	11
Mandatory Good Agricultural Practices (GAPs).....	12
Product Application Rates	17
Calculating the Broadcast Equivalent Application Rate	18
Buffer Zone Requirements	21
Buffer Zone Distances	23
Buffer Zone Credits	30
Buffer Zone Posting.....	30
Restrictions for Difficult to Evacuate Sites	31
Emergency Preparedness and Response Measures	31
Notice to State and Tribal Lead Agencies	33
Emergency Response Plan	33
Site-specific Fumigation Management Plan (FMP)	33
Post-Application Summary	37
Spill and Leak Procedures	38
Warning Agent Use.....	38
Storage and Disposal	39

Warranty

Distributed by:

TRICAL, INC.

8770 HIGHWAY 25 • P. O. BOX 1327 • HOLLISTER, CA 95024-1327

(831) 637-0195

EPA Reg. No. 58266-2-11220

EPA Est. 11220-CA-4; 11220-CA-8

Net Contents _____ LBS



SAFETY DATA SHEET

Tri-Clor Fumigant

1. IDENTIFICATION

PRODUCT IDENTIFIER: Tri-Clor Fumigant Date: April 17, 2013
 OTHER MEANS OF IDENTIFICATION: Chloropicrin, Trichloronitromethane SDS No.: 100-USA-TCI
 RECOMMENDED USE: Pesticide (Fumigant), warning agent

Distributor: Trical, Inc. 8770 Highway 25 Hollister, CA 95023 Business Number: (831) 637-0195	FOR CHEMICAL EMERGENCY (Spill, Leak, Fire, Exposure, or Accident), Call CHEMTREC: (800) 424-9300 (24 hours) (703) 527-3887 (if outside USA)
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NOTE TO PESTICIDE HANDLERS: If the pesticide product end-use labeling contains specific instructions or requirements that conflict with this Safety Data Sheet (SDS), **follow the instructions or requirements on the labeling.** See Section 15 of this SDS for further information.

2. HAZARDS IDENTIFICATION

GHS Classification	<ul style="list-style-type: none"> • Acute Toxicity, Category 1 (inhalation) • Acute Toxicity, Category 2 (oral) • Acute Toxicity, Category 2 (dermal) • Skin Corrosion/Irritation (1C) (liquid contact) • Eye Damage/Irritation – Category 1 (liquid contact) • Eye Irritation, Category 2A (vapor contact) • Specific Target Organ Toxicity, Single Exposure, Category 1 (respiratory) • Specific Target Organ Toxicity, Repeat Exposure, Category 1 (respiratory) • Aquatic Toxicity Acute, Category 1
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Signal Word	DANGER
GHS Hazard Statements	<ul style="list-style-type: none"> • Fatal if inhaled, swallowed, or in contact with skin. H330+H300+H310 • Causes severe skin burns and eye damage (liquid contact). H314 • Causes serious eye irritation (vapor contact). H319 • Causes damage to the respiratory tract and to lungs from single exposure or through prolonged or repeated exposure by inhalation. H370+H372 • Very toxic to aquatic life. H400
Hazards Not Otherwise Classified	<ul style="list-style-type: none"> • Closed cylinders may rupture or explode if heated by fire.



SAFETY DATA SHEET

Tri-Chlor Fumigant

GHS PRECAUTIONARY STATEMENTS

Prevention

- Do not breathe gas or vapors. P260
- Do not get in eyes, on skin, or on clothing. P262
- Wear respiratory, eye, hand, and skin protection in accordance with the product label. P284+P280
- Use only outdoors or in a well-ventilated area. P271
- Do not eat, drink, or smoke when using this product. P270
- Wash hands thoroughly after handling. P264
- Keep away from heat/sparks/open flames/hot surfaces – No Smoking. P210
- Store away from combustible materials. P220
- Avoid release to the environment. P273

Response

- IF INHALED: Remove person to fresh air and keep comfortable for breathing. Immediately call a physician or poison control center. P304
- IF IN EYES: Hold eyes open and rinse slowly and gently with water for 15-20 minutes. Remove contact lenses, if present, after the first five minutes, then continue rinsing eyes. Immediately call a physician or poison control center if liquid contact. For vapor contact, if eye irritation persists, get medical advice or attention. P305
- IF ON SKIN: Take off contaminated clothing immediately. Wash with plenty of water and soap. Immediately call a physician or poison control center. P302+P361+P352+P310
- IF SWALLOWED, immediately call a physician or poison control center. Rinse mouth. Do NOT induce vomiting. P310+P330+P331
- Get medical advice if you feel unwell or if eye irritation persists. P314+P337
- Wash contaminated clothing before reuse. P363:
- In case of fire, evacuate area. Fight fire remotely due to the risk of cylinder explosion. Use water, dry chemical, or any other conventional media. P370+P380+P375+P378:

Storage

- Protect from sunlight, store in well-ventilated place away from other materials, store locked up, keep container or cylinder valve tightly closed. P410+P403+P405+P233
- Store at temperatures not exceeding 55 °C (131 °F). P411

Disposal

- Collect spillage. P391
- Dispose of contents and container in accordance with government regulations. (See Section 13). P501

Additional Information:

At lower concentrations (73-150 ppb), chloropicrin behaves as mild sensory irritant. At concentrations above 150 ppb, cough, headache, nausea, and vomiting may occur. These symptoms are temporary and reversible following termination of exposure. See Section 11 Toxicology Section for more information.

3. COMPOSITION / INFORMATION ON INGREDIENTS

Components	Synonyms	CAS #	Concentration
Chloropicrin	Trichloronitromethane	76-06-2	99.0%*
Impurities			Balance**

* % Active ingredient nominal. For reporting imports and exports pursuant to Chemical Weapons Convention, use 100% Chloropicrin.

** The impurities do not contribute to the classification of this product.



SAFETY DATA SHEET

Tri-Clor Fumigant

4. FIRST AID MEASURES

Inhalation	Remove victim to fresh air and keep at rest in a position comfortable for breathing. Qualified persons should administer oxygen, if available. If breathing has stopped, call 911 or an ambulance; then give artificial respiration. Use mouth-to-mouth method or use a pocket mask equipped with a one-way valve or other proper respiratory medical device. Symptoms of lung edema (shortness of breath) may develop up to 24 hours after exposure. Immediately call an ambulance if any breathing difficulty persists after removal from exposure area. Call a physician or poison control center for further treatment advice.
Eyes	Hold eyes open and rinse slowly and gently with water for 15-20 minutes. Remove contact lenses, if present, after the first five minutes; then continue rinsing eyes. Immediately call a physician or poison control center if liquid contact occurs. For vapor contact, if eye irritation persists, get medical advice or attention.
Skin	Remove and isolate contaminated clothing and shoes, and other items covering the skin. Rinse skin immediately with plenty of water for 15-20 minutes. Call a physician or Poison Control Center for treatment advice. Aerate and then wash any contaminated clothing or shoes separately before reuse. Dispose of heavily contaminated clothing and shoes.
Ingestion	IF SWALLOWED: Immediately call a Poison Control Center or physician. Have victim rinse mouth thoroughly with water. Never give anything by mouth to a victim who is unconscious or is having convulsions. Do not induce vomiting without advice from Poison Control Center or physician. If vomiting occurs, keep head low to minimize aspiration of stomach contents.
Most Important Symptoms/Effects, Acute and Delayed	Chloropicrin is a volatile liquid and a potent lachrymator (eye tearing). Early symptoms of overexposure are lachrymation, respiratory distress, and vomiting. Pulmonary edema and pulmonary symptoms may be delayed. Treat symptomatically.
Indication of Immediate Medical Attention or Special Treatment.	Obtain medical assistance at once in case of illness or burn after exposure, or if irritation to eyes and respiratory tract persist. Do not allow conditions that could cause further exposure until recovery is complete.
General Advice	Have the product package or label with you when calling a poison control center or doctor, or going for treatment. Do not give anything by mouth to an unconscious person. Ensure that medical personnel are aware of the material involved, and that they take precautions to protect themselves from exposure to chloropicrin vapor from victim's clothing or stomach contents.

5. FIRE FIGHTING MEASURES

Flash Point (°C)	No flash point determined below 100 °C (212 °F)
Suitable Extinguishing Media	All conventional fire extinguishing media are suitable: water spray, dry chemical, carbon dioxide, alcohol-resistant foam.
Unsuitable Extinguishing Media	None



SAFETY DATA SHEET

Tri-Clor Fumigant

<p>Specific Hazards Arising from the Chemical</p>	<ul style="list-style-type: none"> • Non-combustible. Substance itself does not burn but may decompose upon heating to produce corrosive, toxic, and/or irritating gases or vapors. • Vapors are not explosive. • Vapors are heavier than air. They can spread along the ground and collect in low or confined areas. • Closed cylinders may rupture or explode if heated by fire. Explosive decomposition may occur in closed containers under fire conditions. • NOTE: Cylinders containing Chloropicrin are not equipped with relief valves or fusible overpressure devices.
<p>Hazardous Combustion Products</p>	<ul style="list-style-type: none"> • Carbon monoxide, chlorine, hydrogen chloride, phosgene, nitrosyl chloride, and nitrogen oxides.
<p>Special Protective Equipment and Precautions for Fire Fighters</p>	<ul style="list-style-type: none"> • Wear self-contained breathing apparatus and full turnout gear for fire situations.
<p>Fire Fighting/Equipment Instructions</p>	<ul style="list-style-type: none"> • Stay upwind. • DO NOT approach containers suspected to be hot. • Fight fire from maximum distance or use unmanned hose holders or monitor nozzles. • Evacuate area at least 150 meters (500 feet), initially. • If tank, rail car or tank truck is involved in a fire, ISOLATE for 800 meters (1/2 mile) in all directions; also consider initial evacuation for 800 meters (1/2 mile) in all directions. • Move containers from fire area if you can do it without risk. • Cool containers with flooding quantities of water until well after fire is out. • For massive fire in cargo area, use unmanned hose holder or monitor nozzles, if possible. If not, withdraw and let fire burn out.

6. ACCIDENTAL RELEASE MEASURES

<p>Personal Precautions, Protective Equipment, and Emergency Procedures</p>	<ul style="list-style-type: none"> • Use proper personal protective equipment (PPE) as indicated in Section 8. • Do not touch damaged containers or spilled material unless wearing appropriate PPE. • Avoid breathing vapors and contact with skin and eyes. • Keep unnecessary personnel away. • Eliminate all sources of ignition in immediate area. • Avoid low places, ventilate closed spaces before entering, and work upwind if possible. • Do not permit entry into the spill or leak area by any person not wearing proper PPE until Chloropicrin is measured to be 0.15 ppm or less. • After clean-up operations, decontaminate and launder all protective clothing and equipment before storing and re-using.
<p>Methods and Materials for Containment</p>	<ul style="list-style-type: none"> • Stop leak if you can do so without risk. • Dike the spilled material where possible with sand, earth, or vermiculite.



SAFETY DATA SHEET

Tri-Clor Fumigant

<p>Methods for Cleaning Up Small Liquid Spills</p> <p>55 gallons or less</p>	<ul style="list-style-type: none"> • Evacuate everyone from the immediate area of the spill or leak. • Wear recommended PPE. • Chloropicrin readily vaporizes so ensure area is well-ventilated. • Move leaking or damaged cylinders outdoors to an isolated location, if safe to do so. Position container to minimize potential for liquid to leak out. • Allow spilled fumigant to evaporate or cover spill with water, soil, or plastic tarp to reduce vapors. • Absorb onto inert material such as vermiculite, dry sand, or dirt, and deposit spill into a sealable polyethylene or steel container that is labeled properly. • Ventilate area before allowing re-entry and until the concentration of Chloropicrin is measured to be 0.15 ppm or less.
<p>Methods for Cleaning Up Large Liquid Spills</p> <p>> 55 gallons</p>	<ul style="list-style-type: none"> • Isolate at least 500 feet (150 m) in all directions, initially. • Wear self-contained breathing apparatus (SCBA) and recommended PPE (see Section 8) • Contain with dike and cover diked area with plastic sheeting or with water to reduce vapors.
<p>Environmental Precautions</p>	<ul style="list-style-type: none"> • Prevent entry into waterways, sewers, basements, or confined areas. • Contact local authorities in case of spillage to drain/aquatic environment.
<p>Other Information</p>	<ul style="list-style-type: none"> • For disposal, see Section 13.

7. HANDLING AND STORAGE

PRECAUTIONS FOR SAFE HANDLING

This product is a highly hazardous material and must be handled with care only by certified pesticide applicators or persons under their direct supervision who are trained with its proper use. IF THE INFORMATION IN THIS SDS DIFFERS FROM THAT ON THE END USE LABELING FOR THIS PRODUCT, THE HANDLER MUST FOLLOW THE PRECAUTIONARY STATEMENTS ON THE END USE LABELING (See Section 15, FIFRA).

- Wear PPE in accordance with Section 8. Leather or other abrasion resistant gloves can be worn when handling or moving closed and capped cylinders.
- Wash hands and face before eating, drinking, or smoking after handling material. Handle in accordance with good industrial hygiene and safety practice.
- Store cylinders upright, secured to a rack or wall to prevent tipping.
- Do not drop, drag, slide or roll cylinders on their sides.
- Ropes, slings, hooks, tongs, and similar handling devices should not be used for unloading cylinders. A suitable hand truck, fork truck, or similar device to which the cylinders can be firmly secured should be used for transporting the heavier cylinders.
- Keep valves closed and secured with the valve cap, when the cylinder is not in use or is empty. Only hand-tighten valves and caps. Leaving an empty cylinder valve open can introduce moisture and thereby increase the potential for internal corrosion.
- Use an adjustable strap wrench to remove caps that are over-tightened or rusted. Never insert an object (e.g. wrench, screw driver) into cap openings.
- Ventilation: When possible, open cylinder (slowly) only in a well-ventilated area with the operator “upwind” from the container or provide ventilation to control airborne levels below the permissible exposure limit.
- NOTE: Passing vapors through activated carbon effectively removes Chloropicrin.
- Do not allow to spill.
- 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.



SAFETY DATA SHEET

Tri-Chlor Fumigant

- Avoid contact with incompatible materials. See Section 10 for specific materials to avoid.
- Do not get in eyes, on skin, on clothing.
- Always have adequate clean water available to wash the skin.
- If product splashes or spills on shoes or clothing, remove them at once. Vapors from contaminated area will be an intolerable source of irritation. If liquid contacts skin where rings or bandages are worn, remove them and wash exposed skin with soap and water. Air expose shoes or clothing outside and do not wear until free of all traces of fumigant. Keep and wash PPE and work clothing separately from other laundry. Discard clothing and other absorbent materials that have been drenched or heavily contaminated with this product.
- Keep away from heat, sparks, or open flame.
- Do not use water to clean equipment. Flush with nitrogen, compressed air, or solvent (ex: diesel oil).
- Do not use containers or application equipment made of magnesium, aluminum, or their alloys, or alkali metals as under certain conditions, chloropicrin may be severely corrosive to such metals.
- Containers should never be refilled by the consumer or used for any other product or purpose.
- Use only dry nitrogen gas to pressurize cylinders. Polyethylene or Teflon® tubing may be used to transfer Chloropicrin at low pressures. Regulator must be operated with a secondary pressure relief valve. **DO NOT** use high pressure hose connection (such as stainless steel braided hose) between nitrogen cylinder and Chloropicrin cylinder.

CONDITIONS FOR SAFE STORAGE

- Keep containers tightly closed and stored in a cool, dry, well-ventilated area under lock and key (secured).
- Keep flammable/combustible liquids, oxidizers, and combustible solid materials away from containers.
- Store at temperatures not exceeding 55 °C (131 °F).
- Post as a pesticide storage area.
- Do not contaminate water, food, or feed by storage or disposal.

8. EXPOSURE CONTROLS / PERSONAL PROTECTION

OCCUPATIONAL EXPOSURE LIMITS FOR CHLOROPICRIN (CAS 76-06-2)

SOURCE OF EXPOSURE LIMIT	TYPE	VALUE	
US OSHA, Table Z-1 Limits for Air Contaminants, 29 CFR 1910.1000	TWA	0.1 ppm	0.7 mg/m ³
US ACGIH, Threshold Limit Values	TWA	0.1 ppm	0.67 mg/m ³
US NIOSH, Recommended Exposure Limits	TWA	0.1 ppm	0.7 mg/m ³
US NIOSH, Immediately Dangerous to Life or Health Concentration	IDLH	2 ppm	

ENGINEERING CONTROLS

General Hygiene:	<ul style="list-style-type: none"> • Wash hands and face before breaks and immediately after handling product. • Handle in accordance with good industrial hygiene and safety practice. • Use personal protective equipment as required. • Keep working clothes separate.
Equipment	Provide easy access to adequate water supply for eye flushing or skin decontamination in the work area. For field handling and application situations, refer to the pesticide end-use label for emergency water requirements.
Ventilation	For indoors, use process enclosures, local exhaust ventilation, or other engineering controls to control airborne levels below recommended exposure limits. Lethal concentrations may exist in areas with poor ventilation.



SAFETY DATA SHEET

Tri-Chlor Fumigant

INDIVIDUAL PROTECTION MEASURES

Minimum Protection	<p>When performing tasks with NO potential for liquid contact, handlers and applicators must wear:</p> <ul style="list-style-type: none"> • Long-sleeved shirt and long pants, and • Shoes and socks
Eyes, Face, Skin	<p>When performing tasks with potential for liquid contact, handlers and applicators must wear:</p> <ul style="list-style-type: none"> • Long-sleeved shirt and long pants, and • Chemical-resistant gloves <ul style="list-style-type: none"> - Butyl, Nitrile, or Neoprene are acceptable for incidental contact (<10 minutes) • Chemical-resistant apron <ul style="list-style-type: none"> - Saranex, neoprene, or chlorinated polyethylene provide short-term contact or splash protection against liquid product • Protective eyewear as follows: <ul style="list-style-type: none"> - Safety glasses with front, brow, and temple protection, or - Face shield, or - Full-facepiece respirator - NOTE: Eye goggles are NOT to be worn • Chemical-resistant footwear with socks <p>Longer-term protection is provided by PPE constructed of viton, Teflon, and EVAL barrier laminates (for example, responder suits manufactured by Life-guard or silvershield gloves manufactured by North). For more options, refer to the EPA Label Review Manual, EPA Chemical Resistance Category Selection Chart, Category H.</p> <p>Where chemical-resistant materials are required, leather, canvas, or cotton materials offer no protection from this product and must not be worn as the sole article of protection when contact with this product is possible.</p>
Respiratory <small>NOTE: Only NIOSH certified respirators may be used for Respiratory Protection</small>	<p>If working in an environment where the eyes are stinging and watery due to exposure to this product, or when taking air samples, or when an air-purifying respirator is required under this product label's <i>Directions for Use, Protection for Handlers, Respiratory Protection and Stop Work Triggers</i> sections, handlers must wear at a minimum either:</p> <ul style="list-style-type: none"> • A NIOSH certified full facepiece air-purifying respirator equipped with an organic vapor (OV, NIOSH approval prefix TC-23C) cartridge and a particulate pre-filter (Type N, R, P, or HE, NIOSH approval number prefix TC-84A), or • A gas mask with a canister approved for organic vapor (NIOSH approval number prefix TC-14G). <p>For emergency response, wear a self-contained breathing apparatus (SCBA) as follows:</p> <ul style="list-style-type: none"> • A full facepiece pressure demand SCBA certified by NIOSH for a minimum service life of thirty minutes. <p>IMPORTANT: An SCBA is not permitted for routine handler tasks. If responding to an emergency when corrective action is needed to reduce air concentrations to acceptable levels, wear an SCBA. Escape-only SCBA respirators must not be used by handlers for responding to emergencies. In addition, wear PPE required for potential contact with liquid fumigant.</p>
Measurement	<p>Air concentration can be measured with a direct reading detection device, such as a Dräger, Sensidyne or Kitigawa pump, using its Chloropicrin detector tube.</p>



SAFETY DATA SHEET

Tri-Clor Fumigant

PERSONAL PROTECTION FOR SPILLS/EMERGENCY

Fire	If fire only, use normal fire-fighting equipment. If chemical releases and fire involved, wear recommended chemical protective clothing in conjunction with fire-fighting gear.
Spills	Minimum PPE: Full facepiece air-purifying respirator with organic vapor cartridge and chemical resistant gloves. Upgrade respiratory protection in accordance with the "Respiratory" section above.
Chemical Protective Clothing	<ul style="list-style-type: none"> For small cleanup where liquid splash is unlikely, loose-fitting or well ventilated long-sleeved shirt, long pants or coveralls, socks with shoes may be worn. If contact occurs, remove contaminated clothing immediately to prevent skin irritation or burn. For cleanup where liquid splash is likely, a liquid impervious chemical coverall with booties and head cover may be worn, for example, Tyvek® QC or Saranex™ SL. In confined areas or areas where substantial vapor levels exist, wear a vapor-tight suit made of a material such as Tychem® TK or Kappler CPF 3. Use a Dupont™ Responder® level suit or equivalent for use against permeation by Chloropicrin for periods greater than 8 hours. Teflon® withstands permeation from 4 to 8 hours.

9. PHYSICAL AND CHEMICAL PROPERTIES

Appearance	Clear, colorless liquid in normal storage. Pale yellow if aged or exposed to air.
Odor	Strong, sharp, irritating (pungent). Chloropicrin is readily identifiable by smell.
Odor Threshold	700 ppb in 2-5 seconds
pH	Not applicable
Melting Point	-69.2 °C (-92.56 °F)
Freezing Point	-69.2 °C (-92.56 °F)
Boiling Point	112 °C (233.6 °F) (757 mm Hg, 100.925kPa)
Boiling Point range	Not available
Flash Point (°C)	No flash point determined below 100 °C (212 °F)
Flammability	Not flammable
Flammability Limits in air, Upper % by volume	Not applicable
Flammability Limits in air, Lower % by volume	Not applicable
Autoignition Temperature	No ignition occurred when tested up to 402 °C (755 °F)
Evaporation Rate	Fast 0.00017 lbs/sec/ft ² at 15.5 °C (60 °F) and 8.5 MPH wind 0.00008 lbs/sec/ft ² at 15.5 °C (60 °F) and 3.3 MPH wind
Vapor Pressure	18.3 mm Hg @ 20 °C (68 °F) Volatile 2.2610 kPa @ 20 °C 5.77 mmHg @ 0 °C, 79 mmHg @ 50 °C
Vapor Density	5.7 (air = 1)
Relative Density (Specific Gravity)	1.6558 @ 20 °C (68 °F) H ₂ O = 1 1.69225 g/cm ³ @ 0 °C
Density @ 20 °C	13.88 lbs. / gal.
Solubility	Slightly in water. 0.16 grams/100 ml (0.016%) in water, 1.6 g/L Soluble in acetone, alcohols, hydrocarbon solvents
Partition Coefficient (n-octanol/water)	2.38 log K _{ow}



SAFETY DATA SHEET

Tri-Chlor Fumigant

Decomposition Temperature	127 °C (261 °F) At its boiling point, chloropicrin slowly decomposes
Viscosity	0.73 centistokes @ 20 °C
% Volatile	100
Molecular Formula	CCl ₃ NO ₂
Molecular Weight	164.37
Critical Pressure	640 psia
Critical Temperature	145 °C (293 °F)
Saturated Vapor Density	0.0068 gm/cc @20 °C/Air=1
Liquid Surface Tension	32.3 dynes/cm = 0.0323 N/m at 20 °C (not considered to be surface active) 71.0 mN m ⁻¹
Ratio of Specific Heats of Vapor (Gas)	1.0991
Latent Heat of Vaporization	103 Btu/lb = 57.3 cal/g = 2.4 X 10 ⁵ J/kg
Heat of Fusion	48.16 cal/g
Henry's Law Constant	43.84 Pa.m ³ .mol ⁻¹ Moderately volatile 2.15 E-03 atm-M3 mole (estimated)

Conversion

To convert inhalation results for Chloropicrin:

mg/m ³ to ppm	x 0.14875 (NTP)	x 0.13628 (STP)
ppm to mg/m ³	x 6.72 (NTP)	x 7.3380 (STP)

10. STABILITY AND REACTIVITY

Reactivity	<ul style="list-style-type: none"> Hazardous polymerization is not known to occur. Cylinders containing chloropicrin can explode when subjected to fire or temperatures above 60 °C (140 °F).
Chemical Stability	<ul style="list-style-type: none"> Product is stable under normal temperatures and pressures.
Possibility of Hazardous Reactions	<ul style="list-style-type: none"> Contact with oxidizing and reducing agents, strong acids or bases may cause fires or explosions.
Conditions to Avoid	<ul style="list-style-type: none"> Incompatible materials. Contamination with water can lead to the generation of corrosive constituents over time. Unstable under fire conditions. Avoid temperatures above 60 °C (140 °F).
Incompatible Materials	<ul style="list-style-type: none"> Do not use with aluminum and its alloys, organic amines, aniline in presence of heat, sodium methoxide, magnesium and its alloys, or alkali metals. Degrades PVC, dissolves rubber compounds, and is mildly corrosive to carbon steel in presence of moisture.
Hazardous Decomposition Products	<ul style="list-style-type: none"> Phosgene, hydrogen chloride, carbon monoxide, chlorine, nitrosyl chloride, and nitrogen oxides at high temperatures.



SAFETY DATA SHEET

Tri-Clor Fumigant

11. TOXICOLOGICAL INFORMATION

Likely Routes of Exposure:	<ul style="list-style-type: none"> • Eyes (mainly due to vapors in air) • Respiratory Tract (by inhalation of vapors) • Skin (mainly by contact with liquid) • Ingestion
Signs & Symptoms of Exposure	<p>Vapor Contact:</p> <ul style="list-style-type: none"> • Eye irritation, stinging, tearing at low concentrations • Throat irritation, coughing • Dripping nasal mucous • Nausea, vomiting, abdominal pain, headache • Dizziness, drowsiness, unconsciousness • Breathing difficulty, cyanosis (bluish looking skin/lips) • Pulmonary edema, and death due to pulmonary edema <p>Liquid Contact:</p> <ul style="list-style-type: none"> • Skin blistering • Skin, eye, and portal tissue burns

SHORT TERM (ACUTE, IMMEDIATE) OR DELAYED EFFECTS:

Inhalation	<ul style="list-style-type: none"> • At 73-150 ppb, chloropicrin behaves as a mild sensory irritant. Above 150 ppb, cough, headache, nausea, and vomiting may occur. These symptoms are temporary and reversible following termination of exposure. • At levels above 300 ppb, respiratory symptoms may increase in severity and include difficulty in breathing. • At levels above 580 ppb for 8 hours or 2000 ppb for 10 minutes, life-threatening effects including pulmonary edema (fluid in lungs) can occur. • Severe pulmonary responses can be delayed following onset of exposure.
Eyes	<ul style="list-style-type: none"> • Exposure to vapor concentrations from 73-150 ppb can produce mild eye irritation or tearing but stops following termination of exposure. • Exposure to higher concentrations will produce an increase in severity and earlier onset of irritation and tearing. Vision may be temporarily impaired. • Direct contact with liquid chloropicrin can cause burns to the eyes and produce permanent damage.
Skin	<ul style="list-style-type: none"> • Direct contact with liquid chloropicrin can cause irritation, blistering, or burns. • Burns can produce permanent damage to the skin. • Prolonged or widespread skin contact may result in absorption of amounts which could cause death.
Ingestion	<ul style="list-style-type: none"> • Ingestion of liquid chloropicrin can cause burns to and produce permanent damage to the mouth, throat, esophagus and stomach.

CHRONIC EFFECTS FROM LONG-TERM EXPOSURE:

Chronic Effects	Long-term overexposure to inhalation of chloropicrin could result in inflammatory damage to the respiratory tract.
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SAFETY DATA SHEET

Tri-Clor Fumigant

Specific Target Organ Toxicity	<p>Repeated-Dose Toxicity: Subchronic inhalations studies in mice and rats established that respiratory tissue is the target for chloropicrin inhalation toxicity and that portal-of-entry effects occur in the upper respiratory tissue of animals inhaling chloropicrin vapor for 90 days at concentrations at or above 0.1ppm (0.67mg/m³).</p> <p>Long-term Toxicity: Chronic inhalation studies in mice and rats established that the respiratory tissue is the target for chloropicrin inhalation toxicity and that tissue of the entire respiratory is subject to inflammatory damage. The NOAEL for respiratory system changes in chronic inhalation bioassays is 0.1 ppm for rats and mice.</p>
Respiratory or Skin Sensitization	No data available
Carcinogenicity	<p>IARC: Not listed NTP: Not listed OSHA: Not listed ACGIH A4 – Not classifiable as a human carcinogen</p> <p>At least six long-term bioassays have been completed with chloropicrin to evaluate the potential of this compound to cause chronic and/or carcinogenic effects. Neoplasms were not seen in chloropicrin-treated animals at an incidence greater than concurrent or historic control animals.</p>
Mutagenicity	<i>In vitro</i> studies produced mixed and contradictory results for genetic toxicity and mutation. <i>In vivo</i> studies are negative for mutation, DNA damage and chromosome damage.
Reproductive Toxicity	Inhalation exposure to chloropicrin of male and female rats in a 2-generation reproductive function study produced an NOAEL of 1.0ppm for systemic toxicity and greater than 1.5ppm for developmental toxicity and reproductive parameters. These data indicate that reproduction fitness is not adversely affected by chloropicrin inhalation even at systemically toxic levels.
Developmental Toxicity	Developmental toxicity studies in rats and rabbits conducted by the inhalation route of exposure showed that the NOAEL for maternal toxicity in rats was 0.4ppm and 1.2ppm for fetal toxicity. In rabbits NOAEL for maternal toxicity was 0.4ppm and 1.2ppm for fetal toxicity indicating that the developing fetus is not a target tissue for chloropicrin toxicity.
Neurotoxicity	Data not available
Aspiration Hazard	Data not available
Toxicological Synergistic Materials	Data not available
Confirmation of exposure	There is no biological indicator for exposure to Chloropicrin.

HUMAN AND ANIMAL TOXICOLOGY STUDIES:

73 ppb	Human sensory irritation threshold (eye irritation).
73 ppb to 150 ppb	Human response - mild irritant to eyes and throat.
> 150 ppb	Human response - headache, nausea, and vomiting may occur. These symptoms are temporary and reversible following termination of exposure.



SAFETY DATA SHEET

Tri-Chlor Fumigant

> 300 ppb	Human response - respiratory symptoms may increase in severity and include difficulty in breathing.
> 580 ppb (8 hrs) or 2000 ppb (10 minutes)	Human response - life-threatening effects including pulmonary edema can occur.
18.9 ppm (126.6 mg/m ³)	Acute Inhalation LC ₅₀ Rat: 4 Hour (for both sexes with 95% confidence limits of 16.5 to 21.6 ppm (110.6 - 144.7 mg/m ³))
2.34 ppm (15.7 mg/m ³)	Acute Inhalation RD ₅₀ mice: with 95% confidence limits of 1.84 to 2.58 ppm (12.2 – 17.3 mg/m ³)
37.5 mg/kg	Acute Oral LD ₅₀ Rat

12. ECOLOGICAL INFORMATION

Ecotoxicity	Toxic to aquatic life
Aquatic Toxicity	<ul style="list-style-type: none"> Daphnia: EC₅₀ = 120 µg/L, 48 Hr, acute Mysid: EC₅₀ = 40 µg/L, 96 Hr Sheepshead Minnow: EC₅₀ = 100 µg/L; 96 Hr Trout: EC₅₀ = 11 µg/L; 96 Hr Bluegill/Sunfish: EC₅₀ = 50 µg/L; 96 Hr Eastern Oyster: EC₅₀=6.4µg/L, 96 Hr Aquatic plant growth (Lemna): NOEC=11µg/L, 7 day
Terrestrial Toxicity	<ul style="list-style-type: none"> Honeybee dermal LD₅₀ > 100 µg/L, 48 Hr Acute avian inhalation NOEC = 96 ppb, 4 hours per day for 5 days Terrestrial seedling emergence and vegetative vigor NOEC = 100 µg/L air. Exposure 6 hours per day for two days.
Persistence and Biodegradability (Environmental Fate)	<ul style="list-style-type: none"> Atmospheric half-life estimated to be 1 day. Initial photolysis products include phosgene and nitrosyl chloride and chlorine; subsequently nitrogen dioxide and dinitrogen tetraoxide. Aquatic photolysis half-life = 1.3 days Aerobic soil metabolism half-life = 4.5-10 days; major degradate is carbon dioxide. Evaporation half- life of chloropicrin in water (light) = 4.8- 9.4 minutes; (dark) 4.1- 15.7 minutes).
Bioaccumulation	<ul style="list-style-type: none"> Due to low log Po/w (<5.0) chloropicrin is not expected to bioaccumulate
Mobility in Soil	Data not available
Other Adverse Effects (i.e. ozone)	Data not available
Partition Coefficient (n-octanol/water)	2.38 log K _{ow}

13. DISPOSAL CONSIDERATIONS

Cylinder Management	<ul style="list-style-type: none"> Cylinders should be returned according to instructions on the cylinder. Close the valve when the cylinder is empty and install the safety cap(s) and bonnet. Do not ship cylinders without safety caps or valve protection bonnets. When a cylinder is partially full and there is no further requirement for the product, contact the registrant or distributor for return instructions.
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SAFETY DATA SHEET

Tri-Clor Fumigant

Refillable Container	<ul style="list-style-type: none"> Only the registrant or distributor is allowed to refill pesticide into containers. Do not reuse this container for any other purpose.
Railcar Management	<ul style="list-style-type: none"> An extra seal is provided in the railcar dome and is to be used when returning the railcar. Contact the distributor for specific return instructions, if necessary.
Discharge	<ul style="list-style-type: none"> Do not discharge effluent containing this product into lakes, streams, ponds, estuaries, oceans or other waters unless in accordance with the requirements of a national pollutant discharge elimination system (NPDES) permit. Do not discharge effluent containing this product to sewer systems.
Disposal of Product	<ul style="list-style-type: none"> Do not contaminate water, food, or feed by storage or disposal. Pesticide wastes are toxic. Improper disposal of excess pesticide, spray mixture, or rinsate 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, the Hazardous Waste representative at the nearest EPA Regional Office, or the product manufacturer or distributor for guidance.
Container Disposal	<ul style="list-style-type: none"> Containers are the property of the registrant or distributor and must be returned promptly after use for refilling or for cleaning before disposal. To clean the container before final disposal, remove any remaining liquid, using dry air pressure if necessary. Allow container to aerate for at least 5 days. After aeration, wash container using hot water; then offer container to qualified reconditioner or dispose of as directed by State or local regulations.

14. TRANSPORT INFORMATION

US DOT, TDG, IMDG

UN Number	UN1580
Proper Shipping Name	Chloropicrin
Transport Hazard Class(es)	6.1
Packing Group	I
Toxic-Inhalation Hazard	Yes
Hazard Zone	B
Environmental Hazards	Aquatic
Marine Pollutant	Yes
Hazardous Substance	No RQ listed for Chloropicrin
Transport in Bulk per MARPOL	Not applicable
Labels/Placards	US DOT Class 6.1, Poison Inhalation Hazard IMDG, TDG, ADR, United Nations Class 6.1, Toxic Substances
Air Transport (IATA/ICAO)	Forbidden for any amount
Emergency Guide	154 (NAERG – North American Emergency Response Guide)
IMDG EmS	F-A, S-A (General Fire Schedule, Spillage Schedule Toxic Substances)
Special Precautions	Packages must be secured against all movement during transport. Keep markings, labels or placards on package until cleaned and purged of residue including bulk and non-bulk packages. For cylinders, ensure valve is closed and safety cap(s) and valve protection are in place prior to transport.



SAFETY DATA SHEET

Tri-Clor Fumigant

15. REGULATORY INFORMATION

U.S FEDERAL

OSHA	This product is a "Hazardous Chemical" as defined by the OSHA Hazard Communication Standard, 29 CFR 1910.1200.
DEA	Drug Enforcement Administration – 21 CFR 1308.11-15 – Not controlled.
CWC	Chemical Weapons Convention – Chloropicrin is listed as a Schedule 3 substance subject to declaration and reporting.

FIFRA

This chemical is a pesticide product registered by the U.S. Environmental Protection Agency and is subject to certain labeling requirements under US federal pesticide law. These requirements differ from the classification criteria and hazard information required for safety data sheets, and for workplace labels of non-pesticide chemicals. Following is the hazard information as required on the pesticide label.

POISON DANGER

Chloropicrin fumigant has the capacity to cause marked irritation to the upper respiratory tract, and is a strong lachrymator (tear producing eye irritant). Low concentrations, below those necessary to cause serious systemic intoxication, are capable of causing severely painful eye irritation, hence will not be voluntarily tolerated. However, the effect may be so powerful that a person may become temporarily blinded and panic-stricken and that in turn may lead to accidents.

- Poisonous liquid and vapor.
- Inhalation may be fatal.
- Chloropicrin is readily identifiable by smell.
- Exposure to very low concentrations of vapor will cause irritation of eyes, nose, and throat.
- Continued exposures after irritation is evident, or higher concentrations, may cause painful irritation to the eyes or temporary blindness.
- Liquid will cause chemical burns to skin or eyes.
- Do not get on skin, in eyes, or on clothing.
- Harmful or fatal if swallowed.
- This pesticide is toxic to mammals and birds.
- Chloropicrin has certain properties and characteristics in common with chemicals that have been detected in groundwater (chloropicrin is highly soluble in water and has low adsorption to soil).
- For untarped applications of chloropicrin, leaching and runoff may occur if there is heavy rainfall after soil fumigation.

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. Consult your dealer representative or the distributor for correct procedure before using. Read and follow all label directions and product literature specific to your requirements.



SAFETY DATA SHEET

Tri-Clor Fumigant

CERCLA (SARA Title III)

Section 302.4 (RQ)	Chloropicrin is not listed with an RQ (Reportable Quantity)						
Section 302, EHS (TPQ)	Chloropicrin does not have a TPQ (Threshold Planning Quantity)						
Section 311/312 (Tier II)	Yes						
Sara Hazard Codes	Chloropicrin, CAS# 76-06-2 Immediate Hazard - Yes						
Section 313	This product contains the following EPCRA section 313 chemicals subject to the reporting requirements of EPCRA section 313 of the Emergency Planning and Community Right-To-Know Act of 1986 (40 CFR 372): <table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th style="text-align: left;"><u>CAS Registry Number</u></th> <th style="text-align: left;"><u>Chemical Name</u></th> <th style="text-align: left;"><u>% by Weight</u></th> </tr> </thead> <tbody> <tr> <td>76-06-2</td> <td>Chloropicrin</td> <td>99.0%+</td> </tr> </tbody> </table>	<u>CAS Registry Number</u>	<u>Chemical Name</u>	<u>% by Weight</u>	76-06-2	Chloropicrin	99.0%+
<u>CAS Registry Number</u>	<u>Chemical Name</u>	<u>% by Weight</u>					
76-06-2	Chloropicrin	99.0%+					

RCRA (Hazardous Wastes)

Listed U or P	Chloropicrin is not specifically listed; however, prior to disposal of waste Chloropicrin or Chloropicrin-contaminated materials, the generator will need to evaluate if its waste characteristics are hazardous or non-hazardous.
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TSCA

TSCA Inventory List, Section 8(b):	Chloropicrin, CAS# 76-06-2 is listed
Health & Safety Reporting List, Section 8(d)	Not listed
Chemical Test Rules, Section 4	Not listed under these rules
Export Notification, Section 12b	Not listed under this section
TSCA Significant New Use Rule, Section 5(a)	Not listed under this rule

Clean Air Act

Hazardous Air Pollutants	Not listed
Class 1 or 2 Ozone depletors	Not listed

Clean Water Act / Oil Pollution Act of 1990

Section 311	Not listed
Hazardous Substances	Not listed
Priority Pollutants	Not listed
Toxic Pollutants	Not listed

STATE

Chloropicrin can be found on the following state right-to-know lists: California, New Jersey (Reportable threshold 500 lbs), Florida, Pennsylvania, Minnesota, Massachusetts
California Proposition 65 – Not listed.



SAFETY DATA SHEET

Tri-Clor Fumigant

16. OTHER INFORMATION

Hazard Rating Systems`

	NFPA 704*	ACA-HMIS**
Category	Chloropicrin	Chloropicrin
Health	4	4
Flammability	0	0
Reactivity	3	3

Hazard Key
4 - Severe
3 - Serious
2 - Moderate
1 - Slight
0 - Minimal

* NFPA 704– National Fire Code Standard No. 704)

Standard System for the Identification of the Hazards of Materials for Emergency Response

** ACA - HMIS – American Coatings Association, Hazardous Material Information System

ABBREVIATIONS:

ACGIH	American Conference of Governmental Industrial Hygienists
BCF	Bioconcentration Factor
CAS	Chemical Abstracts Service
CBRN	Chemical, Biological, Radiological, and Nuclear
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act (Superfund)
CFR	Code of Federal Regulations
CHEMTREC	Chemical Transportation Emergency Center
DOT	Department of Transportation (USA)
EC ₅₀	Half Maximal Effective Concentration - concentration of a material in water, a single dose which is expected to cause a biological effect on 50% of a group of test species.
EPCRA	Emergency Planning and Community Right-to-Know
IARC	International Agency for Research on Cancer
IDLH	Immediately Dangerous to Life and Health - the maximum airborne concentration from which one could escape [within 30 minutes] without any escape-impairing symptoms or any irreversible health effects.
IMDG	International Maritime Dangerous Goods
LC ₅₀	Lethal Concentration - median dose at which 50% of test animals die from inhalation
LD ₅₀	Lethal Dose - median dose at which 50% test animals die from oral or dermal exposure
NFPA	National Fire Protection Association
NOAEL	No Observable Adverse Effect Level
NOEC	No Observed Effect Concentration
NTP	Normal Temperature and Pressure: 760 mmHg and 20 °C or 1 atm and 68 °F
NTP	National Toxicology Program
OEL	Occupational Exposure Limit
OSHA	Occupational Health and Safety Administration
ppb	part per billion
ppm	part per million
PPE	Personal Protective Equipment
RCRA	Resource Conservation and Recovery Act
RD ₅₀	Respiratory Distress in 50% of test animals
RQ	Reportable Quantity



SAFETY DATA SHEET

Tri-Chlor Fumigant

RTECS	Registry of Toxic Effects of Chemical Substances
SARA	US EPA Superfund Amendments and Reauthorization Act
STEL	Short Term Exposure Limit Workers can be exposed to a maximum of four STEL periods per 8 hour shift, with at least 60 minutes between exposure periods.
STEV	Short Term Exposure Value: the maximum airborne concentration of a chemical agent to which a worker may be exposed in any 15 minute period, provided the TWAEV is not exceeded.
STP	Standard Temperature and Pressure: 760 mmHg and 0 °C or 1 atm and 32 °F
TDG	Transport of Dangerous Goods (Canada)
TLV	Threshold Limit Value
TPQ	Threshold Planning Quantity
TSCA	Toxic Substances Control Act
TWA	Time Weighted Average airborne concentration for a worker in an 8 hour day
TWAEV	Time-Weighted Average Exposure Value: Average airborne concentration of a chemical agent to which a worker may be exposed in a work day.
US DOT	United States Department of Transportation
WHMIS	Workplace Hazardous Materials Identification System (Canada)

REVISION DATE: April 17, 2013

SDS NUMBER: 100-USA-TCI

Revision 03-15-13

Section 14 – Replaced Poison – Inhalation Hazard with Toxic – Inhalation Hazard

Revised 04-17-13

Section 9 – Corrected decomposition temperature

Section 14 – Modified Labels/Placards information for clarity

WARRANTY

Notice: The information above is believed to be accurate and represents the best information currently available to us. Seller warrants that this product conforms to its chemical description on its label and is reasonably fit for the purposes stated on the label when used in accordance with directions under normal conditions of use.

Neither this warranty nor any other warranty of MERCHANTABILITY or FITNESS FOR A PARTICULAR PURPOSE, express or implied, extends to the use of this product contrary to label instructions, or under abnormal conditions, or under conditions not reasonably foreseeable to seller, and buyer assumes the risk of any such use. In no way shall the company be liable for any claims, losses, or damages of any third party or for lost profits or any special, indirect, incidental, consequential, or exemplary damages, howsoever arising, even if the company has been advised of the possibility of such damages.