

Telone* C-17

EPA Reg. No. 62719-12

Proposed Label Amendment: Current label text based on EPA copy dated 04/01/94 (Engineering Control Statements), EPA-accepted WPS copy with comments dated 06/29/94, and as per EPA correspondence dated 12/19/94 (see below).

Proposed Revisions:

1. Ingredients Statement Revised in Accordance with CSF Amendment EPA-accepted 11/18/93.

[Editor's note: Added text underlined and deleted text denoted by ~~strike-through~~.]

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ACCEPTED

MAY 15 1995

Under the Federal Insecticide,
Fungicide, and Rodenticide Act,
as amended, for the pesticide
registered under
EPA Reg. No. 62719-12

Restricted Use Pesticide

Due to high acute inhalation toxicity and carcinogenicity.

For retail sale to and use only by Certified Applicators or persons under their direct supervision and only for those uses covered by the Certified Applicator's certification.

Telone* C-17

A multi-purpose liquid fumigant for preplant treatment of soil to control nematodes, symphylans, wireworms and certain soil borne diseases in cropland.

Not for use in greenhouses or other enclosed areas.

Active Ingredients:

1,3-dichloropropene	77.9 78.3%
chloropicrin	16.5%
Inert Ingredients	5.6 5.2%
Total	100%

One gallon of Telone C-17 weighs about 10.6 lb. Contains 8.2 pounds of 1,3-dichloropropene and 1.7 pounds of chloropicrin per gallon.

Precautionary Statements**Hazards to Humans and Domestic Animals**

Keep Out of Reach of Children

DANGER PELIGRO

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.)

First Aid

If inhaled: Remove to fresh air. If not breathing, give artificial respiration, preferably mouth-to-mouth. If breathing is difficult, give oxygen. Call a physician.

If on skin: Immediately flush skin with plenty of water for at least 15 minutes while removing contaminated clothing and shoes. Call a physician. If water is not immediately available, remove excess chemical from skin with adsorbent material such as towel or dry soil, then proceed at once to a location where water is available and thoroughly wash contaminated skin with plenty of water. Call a physician.

If in eyes: Immediately flush eyes with plenty of water for at least 15 minutes. Call a physician.

If swallowed: Do not induce vomiting. Call a physician or Poison Control Center immediately. Never give anything by mouth to an unconscious person.

Note to physician: Because rapid absorption may occur through lungs if product is aspirated and cause systemic effects, the decision to induce vomiting or not should be made by a physician. If lavage is performed, endotracheal and/or esophageal control is suggested. Danger from lung aspiration must be weighed against toxicity when considering emptying the stomach.

Environmental Hazards

Do not apply directly to water, to areas where surface water is present or to intertidal areas below the mean high water mark. Do not contaminate water by disposal of equipment washwaters. See "Storage, Shipment and Disposal" section. In case of spills properly dispose of contaminated materials.

Ground water advisory: 1,3-dichloropropene is known to move through soil and under certain conditions has the potential to reach ground water as a result of agricultural use. Application in areas where soils are permeable and ground water is near the surface, or in karst geology, could result in ground water contamination.

(Label Booklet)

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Agricultural Use Requirements

Use this product only in accordance with its labeling and with the Worker Protection Standard, 40 CFR part 170. Refer to the label booklet under "Agricultural Use Requirements" in the Directions for Use section for information about this standard.

Refer to inside of label booklet for additional precautionary information including Personal Protective Equipment (PPE), User Safety Requirements User Safety Recommendations, and Engineering Controls Statements, and Directions for Use including Storage and Disposal.

Notice: Read the entire label. Use only according to label directions. Before buying or using this product, read "Warranty Disclaimer" and "Limitation of Remedies" inside label booklet.

In case of an emergency endangering health or the environment involving this product, call collect 817-636-4400.

Agricultural Chemical: Do not ship or store with food, feeds, drugs or clothing.

EPA Reg. No. 62719-12

EPA Est. 464-MI-1; 464-CA-1; 54686-WA-1

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Soil Fungicide and Nematicide

Physical or Chemical Hazards

Flammable - Do not use, pour, spill or store near heat or open flame. Do not cut or weld container.

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Notice: Read the entire label. Use only according to label directions. Before buying or using this product, read "Warranty Disclaimer" and "Limitation of Remedies" inside label booklet.

In case of an emergency endangering health or the environment involving this product, call collect 517-636-4400.

Agricultural Chemical: Do not ship or store with food, feeds, drugs or clothing.

EPA Reg. No. 62719-12

EPA Est. 464-MI-1; 464-CA-1; 54686-WA-1

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Soil Fungicide and Nematicide Net Contents ___ gallons

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(Label Booklet)

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EPA Reg. No. 62719-12

EPA Est. 454-MI-1; 464-CA-1; 54686-WA-1

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Soil Fungicide and Nematicide

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Precautionary Statements

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Hazardous Liquid And Vapor

- Do not swallow any of this product. May be fatal if swallowed.
- Do not get in eyes. Causes severe eye injury.
- Do not get on skin. May be fatal if absorbed through the skin. Causes skin burns. May cause allergic skin reaction.
- Do not breathe vapor. May be fatal if inhaled. May cause lung, liver, and kidney damage and respiratory system irritation upon prolonged contact.
- The use of this product may be hazardous to your health. This product contains 1,3-dichloropropene, which has been determined to cause tumors in laboratory animals. Risks can be reduced by exactly following directions for use, precautionary statements, and by wearing the personal protective equipment specified in this labeling.
- This fumigant has the capacity to cause marked irritation to the upper respiratory tract. A strong lachrymator (tear-producing eye irritant). Low concentrations are capable of causing painful eye irritation. The effect may be so powerful that a person may become temporarily blinded and panic-stricken. That, in turn, may lead to accidents.

Air Concentration Level

The acceptable air concentration level for persons exposed to chloropicrin is 0.1 ppm (0.7 mg/M³). The air concentration level is measured by a direct reading detection device, such as a Matheson-Kitagawa, Draeger, or Sensidyne.

Personal Protective Equipment (PPE)

Chemical-Resistant Materials: Some materials that are chemical-resistant to this product are listed below. If you want more options, follow the instructions for Category H on an EPA 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 when contact with this product is possible. Coveralls must be loose-fitting and constructed of woven fabrics (e.g. tight knot cotton or cotton/polyester), non-woven fabrics (e.g. Tyvek or Sorbara), or fabrics containing microporous Teflon.

1. Handlers Performing Direct Contact Tasks

Direct contact tasks are tasks performed outdoors or in a well-ventilated area. They include:

- equipment calibration or adjustment
- equipment clean-up and repair
- product sampling
- any activity less than 6 feet from an unshielded pressurized hose containing this product
- removal of tarp or plastic film
- rinsate disposal
- fumigant transfer
- clean-up of small spills
- preparing containers for aeration
- any other task not otherwise listed in (2), (3), (4) or (5) below

Handlers performing direct-contact tasks must wear:

- Coveralls over short-sleeved shirt and short pants
- Chemical-resistant gloves, such as barrier laminate (EVAL) or viton
- Chemical-resistant footwear plus socks

- Chemical-resistant headgear for overhead exposure
- Chemical-resistant apron
- Full-face respirator with either an organic-vapor-removing cartridge with a prefilter approved for pesticides (MSHA/NIOSH approval number prefix TC-23C) or canister approved for pesticides (MSHA/NIOSH approval number prefix TC-14G). See further respirator requirements in the "User Safety Requirements" section on this label.

2. Handlers in Enclosed Cabs

Applicators and other handlers in enclosed cabs must wear:

- Coveralls
- Shoes and socks
- Plus, if odor or irritation from this product can be detected inside the enclosed cab or if the air concentration level of chloropicrin exceeds 0.1 ppm inside the enclosed cab, handlers in the cab must wear a full-face respirator with either an organic-vapor-removing cartridge with a prefilter approved for pesticides (MSHA/NIOSH approval number prefix TC-23C) or canister approved for pesticides (MSHA/NIOSH approval number prefix TC-14G). See further respirator requirements in the "User Safety Requirements" section on this label.
- In addition, the PPE specified in (1) for direct-contact activities must be immediately available in the enclosed cab and must be worn if the handler leaves the enclosed cab to perform any direct-contact activity.

The enclosed cab must meet the requirements listed in the Worker Protection Standard (WPS) for agricultural pesticides -- 40 CFR 170.240(d)(5).

3. Applicators Outside an Enclosed Cab

Applicators applying Telone C-17 (or sealing the soil following application of Telone C-17) who are not inside an enclosed cab that meets WPS requirements must wear:

- Coveralls over short-sleeved shirt and short pants
- Chemical-resistant gloves, such as barrier laminate (EVAL) or viton
- Chemical-resistant footwear plus socks
- Chemical-resistant headgear for overhead exposure
- Plus, if odor or irritation from this product can be detected or if the air concentration level of chloropicrin exceeds 0.1 ppm, handlers must wear a full-face respirator with either an organic-vapor-removing cartridge with a prefilter approved for pesticides (MSHA/NIOSH approval number prefix TC-23C) or canister approved for pesticides (MSHA/NIOSH approval number prefix TC-14G). See further respirator requirements in the "User Safety Requirements" section on this label.

4. Handlers in Treated Area within 72 Hours After Application

Only the following handler tasks may be performed in the treated area within 72 hours after the application is complete:

- Assessing/adjusting the soil seal
- Assessing pest control, application technique, or application efficacy
- Sampling air or soil for this product

All other tasks are prohibited until the 72-hour period has expired.

Unless in an enclosed cab as described in (2) above, handlers performing the above tasks in the treated area within 72 hours after application must wear:

- Coveralls
- Chemical-resistant gloves, such as barrier laminate (EVAL) or viton
- Chemical-resistant footwear and socks
- Plus if odor or irritation from this product can be detected or if the air concentration level of chloropicrin exceeds 0.1 ppm, handlers must wear a full-face respirator with either an organic-vapor-removing cartridge with a prefilter approved for pesticides (MSHA/NIOSH approval number prefix TC-23C) or canister approved for pesticides (MSHA/NIOSH approval number prefix TC-14G). See further respirator requirements in the "User Safety Requirements" section on this label.

5. Handlers Exposed to High Concentrations

Handlers exposed to high airborne concentrations of this product, such as cleanup following large spills and exposure to this product in poorly ventilated areas must wear:

- Chemical-resistant suit
- Chemical-resistant gloves, such as barrier laminate (EVAL) or viton
- Chemical-resistant footwear plus socks
- Chemical-resistant headgear
- Supplied-air respirator with MSHA/NIOSH approval number prefix TC-19C or self-contained breathing apparatus (SCBA) with MSHA/NIOSH approval number prefix TC-13F. See further respirator requirements in the "User Safety Requirements" section on this label.

Note: In-tank cleaning of bulk tanks must be performed only by persons who have been specifically trained for this activity. Refer to OSHA 29 CFR Part 1910.146 and the Telone User's Guide section on Storage Tanks.

User Safety Requirements

1. **Respirator Requirements:** When a respirator is required for use with this product, the following criteria must be met:
 - a. Full-face respirators must be worn.
 - b. Cartridges or canisters must be replaced daily or when odor or irritation from this product becomes apparent, whichever is sooner.
 - c. Respirators must be fit-tested and fit-checked using a program that conforms to OSHA's requirements (described in 29 CFR Part 1910.134).
 - d. Respirator users must be trained using a program that conforms to OSHA's requirements (described in 29 CFR Part 1910.134).
 - e. Respirator users must be examined by a qualified medical practitioner to ensure physical ability to safely wear the style of respirator to be worn.
2. **Never fumigate alone.** It is imperative to always have an assistant and proper protective equipment in case of accidents.
3. **Driver's Responsibilities:** 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 safely work with the tractor and driver while fumigating.
4. **Dispose of Contaminated Clothing:** Discard clothing and other absorbent materials that have been drenched or heavily contaminated with liquid from this product. Do not reuse them.
5. **Clean and Maintain PPE:** Follow manufacturer's instructions for cleaning/maintaining PPE. If no such instructions for washables, use detergent and hot water. Keep and wash PPE separately from other laundry. Wash PPE after each day's use.
6. **Contact With Mouth:** Never siphon this product by mouth or use mouth to blow out clogged lines, nozzles, etc.
7. **Heat Illness Avoidance:** Use measures to avoid or minimize heat illness while using this product. These measures include gradual adjustment to heat and respirator stress, fans for cooling, cooling vests, frequent breaks to cool down, frequent intake of drinking water, and maintaining weight from day to day.

User Safety Recommendations

Users should:

- Wash hands before eating, drinking, chewing gum, using tobacco, or using the toilet.
- Remove clothing immediately if pesticide gets inside. Then wash thoroughly and put on clean clothing.
- Remove PPE immediately after handling this product. Wash the outside of gloves before removing. As soon as possible, wash thoroughly and change into clean clothing.

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Engineering Controls Requirements

Mechanical Transfer System: Personal protective equipment specified for "Direct Contact Activities" must be worn by the operator of the mechanical transfer system. The operator of the mechanical transfer system must follow instructions on proper operation of the system found in the "Field Transfers" section of the Telone User's Guide, which must be available on site. Contact your Telone C-17 distributor for more information or these materials.

End-Row Spillage Control: The dispensing system must shut off the feed stream when chisels are raised out of the ground. Do not stop or park near any area where dribble from chisel tips has fallen. The applicator must follow instructions on proper operation and maintenance of the system found in the "Application" section of the Telone User's Guide, which must be available on site. Contact your Telone C-17 distributor for more information or these materials.

- A flow shutoff device must be placed as close as is technically feasible to the fluid discharge point. This can be a ball, poppet, or diaphragm check valve, or full flow shutoff device such as an electric or pneumatically actuated valve.
- Check valves must be replaced immediately if continuous drip occurs.
- Place check valves above the orifice.
- Isolate the check valve from upstream pressure by installing a main line shut off or bypass valve prior to the manifold.
- Do not exceed 1/4 inch diameter tubing.
- Do not use any method of end-row spillage control other than that stated on this label.
- An alternative to shutoff devices is a purge system which clears the line of all liquid. Consult your DowElanco representative for purge system description. Do not use any method of end-row spillage control other than that stated on this label.

With all bulk and mini-bulk containers, Telone C-17 must be transferred through connecting hoses, pipes, and/or couplings sufficiently tight to prevent workers or other persons from coming in contact with liquid Telone C-17.

1. All hoses, piping, and tanks used in connection with Telone C-17 shall be of type appropriate for use under the pressure and vacuum conditions to be encountered.
2. External sight gauges shall be equipped with valves so that pipes to sight gauge can be shut off in case of breakage or leakage.
3. The mechanical transfer system must be adequate to make necessary measurements of the pesticide being used.
4. Shut-off devices must be installed on the exit end of all hoses and at all disconnect points to prevent leakage of Telone product when the transfer is stopped and hose is removed or disconnected. A dry coupler that will minimize pesticide leakage must be installed at the disconnect point.
5. The pressure in hoses used to move Telone C-17 beyond a pump must not exceed the manufacturer's maximum pressure specification.

First Aid

If inhaled: Remove to fresh air. If not breathing, give artificial respiration, preferably mouth-to-mouth. If breathing is difficult, give oxygen. Call a physician.

If on skin: Immediately flush skin with plenty of water for at least 15 minutes while removing contaminated clothing and shoes. Call a physician. If water not immediately available, remove excess chemical from skin with sorbent material such as towel or dry soil, then proceed at once to location where water is available and thoroughly wash contaminated skin with plenty of water. Call a physician.

If in eyes: Immediately flush eyes with plenty of water for at least 15 minutes. Call a physician.

If swallowed: Do not induce vomiting. Call a physician or Poison Control Center immediately. Never give anything by mouth to an unconscious person.

Note to physician: Because rapid absorption may occur through lungs if product is aspirated and cause systemic effects, the decision to induce vomiting or not should be made by a physician. If lavage is performed, endotracheal and/or esophageal control is suggested. Danger from lung aspiration must be weighed against toxicity when considering emptying the stomach.

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Environmental Hazards

Do not apply directly to water, to areas where surface water is present or to intertidal areas below the mean high water mark. Do not contaminate water by disposal of equipment washwaters. In case of spills properly dispose of contaminated materials.

Ground water advisory: 1,3-dichloropropene is known to move through soil and under certain conditions has the potential to reach ground water as a result of agricultural use. Application in areas where soils are permeable and ground water is near the surface, or in karst geology, could result in ground water contamination.

Physical or Chemical Hazards

Flammable - Do not use, pour, spill or store near heat or open flame. Do not cut or weld container.

Directions for Use

It is a violation of federal law to use this product in a manner inconsistent with its labeling. Read all Directions for Use carefully before applying.

Do not apply this product in a way that will contact workers or other persons, either directly or through drift. Only protected handlers may be in the area during application. For any requirements specific to your state or tribe, consult the agency responsible for pesticide regulation.

Agricultural Use Requirements

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. It also contains specific instructions and exceptions pertaining to the statements on this label about personal protective equipment (PPE), restricted entry intervals, and notification to workers. The requirements in this box only apply to uses of this product that are covered by the Worker Protection Standard (WPS).

Entry Restriction:

Entry (including early entry that would otherwise be permitted under the WPS) by any person -- other than a correctly trained and equipped handler who is performing a handling task permitted on this labeling -- is prohibited from the start of application until 72 hours after application. In addition, if tarps are used for the application, non-handler entry is prohibited while tarps are being removed.

Notification:

Notify workers of the application by warning them orally and by posting fumigant warning signs at entrances to treated areas. The sign must bear the skull and crossbones symbol and state: (1) "DANGER/PELIGRO," (2) Areas under fumigation, DO NOT ENTER/NO ENTRE," (3) the date and time of fumigation, (4) "Telone C-17 Fumigant in use," and (5) name, address, and telephone number of the applicator." Post the fumigant warning sign instead of the WPS sign for this application, but follow all WPS requirements pertaining to location, legibility, size and timing of posting and removal.

PPE For Reentry During The Entry-Restricted Period:

PPE for entry that is permitted by this labeling is listed in the "Hazards to Humans and Domestic Animals" section of this labeling.

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Storage, Shipment and Disposal

Shipment: Do not ship or store with food, feeds, drugs, or clothing.

Storage: Store in tightly-closed original container in a cool place away from dwellings. Do not allow contamination of seeds, plants, fertilizers, or other pesticide chemicals. Do not contaminate food, feedstuffs, drugs, or domestic water supplies.

Disposal: Pesticide wastes are toxic. Improper disposal of excess pesticide and rinsates 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.

Because Telone C-17 is corrosive under certain conditions, flush all application equipment with fuel oil, kerosene or a similar type of petroleum solvent immediately after use. Fill pumps and meters with new motor oil or a 50% motor oil/fuel oil mixture before storing. Do not use water. Dispose of rinsate by applicable Federal, state and local regulations. Never introduce rinsate or unused Telone C-17 into surface or underground water supplies.

Metal Container Disposal: To dispose of container emptied during application operation, remove bungs, invert container in the field just treated and ensure that the container is free of liquid. Orient container such that ventilation of bung holes is not restricted. Allow containers to aerate for at least 14 days. Replace bungs prior to transport. After aeration, offer container to qualified reconditioner or dispose of as directed by State or local regulations.

Refillable Containers: Follow cleaning and handling directions in Telone User's Guide.

Bulk Product Transfers: Dry break or dry disconnect couplings are required for all product transfers involving bulk containers for Telone C-17 as of September 30, 1993.

General Information

Telone C-17 is a multi-purpose liquid fumigant for preplant treatment of soil to control nematodes, symphylans, wireworms and certain soil borne diseases in cropland

Telone C-17 soil fungicide and nematicide may be applied as a preplant soil treatment to control or to aid in reducing the damaging effects of certain soil borne diseases [soil rot (soil pox) of sweet potatoes; Granville (bacterial) wilt, black root rot, black shank diseases of tobacco; Verticillium wilt of white potatoes and mint, pink root of onions, pod rot of peanuts]; plant parasitic nematodes [root-knot, root lesion, citrus, cyst formers (golden, sugar beet, soybean), burrowing, lance, reniform, ring, spiral, sting, pin, stubby root, styllet, dagger and certain others]; symphylans (garden centipedes) and wireworms.

Before fumigation, soil sampling for the type and number of pests present is recommended. In fields where pre-treatment soil samples indicate the presence of high population levels of nematodes, a successful fumigation cannot be expected to eradicate entire populations. Therefore, post-treatment sampling is recommended to determine the need for additional pest management practices.

Consult State Agricultural Experiment Station or Extension Service specialists for information on other practices such as post-harvest destruction of crop residues, weed control or other cultural practices, and use of nematode resistant crop varieties that may aid in reducing crop losses from soil borne pests.

General Use Precautions

Soil fumigation using Telone C-17 should be conducted only according to directions and conditions of use described in this labeling.

Formulator use of Telone C-17: Labeling for end use products containing Telone C-17 that are prepared and sold by formulators must comply with all precautionary statements, use precautions, environmental hazards, handling and protective equipment requirements, maximum application rates and other exposure mitigation measures specified in this product labeling.

Recontamination prevention: Telone C-17 will control pests that are present in the soil treatment zone at time of fumigation. It will not control pests that are introduced into soil after fumigation. To avoid reinfestation of treated soil do not use irrigation water, transplants, seed pieces, or equipment that could

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carry soil borne pests from infested land. Avoid contamination from moving infested soil onto treated beds through cultivation, movement of soil from below the treated zone, dumping contaminated bare soil in treated fields and soil contamination from equipment or crop remains. Clean equipment carefully before entering treated fields.

Bulk Product Transfers: Dry break or dry disconnect couplings are required for all product transfers involving bulk containers for Telone C-17.

End-Row Spillage Control: End-row spillage controls are required for all soil applications of Telone C-17 by June 30, 1994.

Do not use containers, pumps or other transfer equipment made of aluminum, magnesium or their alloys, as under certain conditions Telone C-17 may be severely corrosive to such metals.

Equipment Clean-up: Because Telone C-17 is corrosive under certain conditions, flush all application equipment with fuel oil, kerosene or a similar type of petroleum solvent immediately after use. Fill pumps and meters with new motor oil or a 50% motor oil/fuel oil mixture before storing. Do not use water. Dispose of rinsate by incorporation into field just treated or by other approved means. Never introduce rinsate or unused Telone C-17 into surface or underground water supplies.

Chemigation: Do not apply Telone C-17 through any type of irrigation system.

Fertility Interactions: 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 certain crops including red beets, carrots, corn, radishes, cole crops, legumes (beans), lettuce, onions, and sugar beets, fertilize as indicated by soil tests made after fumigation. To avoid ammonia injury or nitrate starvation (or both) to crops grown on high organic soils, do not use fertilizers containing ammonium salts. Use only fertilizers containing nitrates until after the crop is well established and the soil temperature is above 65°F. In mineral soils, do not apply more than 2/3 of the nitrogen requirements from fertilizers containing ammonium salts until the crop is well established and the soil temperature is above 65°F.

When using high rates of Telone C-17 as required by certain state nursery regulations, liming of highly acid soils before fumigation may stimulate nitrification and reduce the possibility of ammonia toxicity. Certain nursery crops such as citrus seedlings, *Comus* sp., *Crataegus* sp., spruce, and vegetable crops such as cauliflower have shown evidence of phosphorus deficiency following fumigation. To avoid this possible effect, additional phosphate fertilizer (follar applied) is recommended where experience indicates a deficiency may occur.

Application Directions

Application Timing

Telone C-17 can be applied at any time of the year when soil conditions permit. Conditions that allow rapid diffusion of the fumigant as a gas through the soil normally give best results. Because Telone C-17 does not provide residual control of soil pests, it should be used as a preplant application before planting each crop. The following soil temperature and moisture conditions should exist at time of treatment. Failure to meet these conditions may result in unsatisfactory product performance:

Soil Conditions

Soil temperature at the depth of application must be between 40°F and 80°F. In areas where the soil temperature in the spring may not reach 40°F in time to allow application of Telone C-17 prior to planting, late summer or early fall treatment is recommended.

Soil moisture throughout the desired treatment zone should be at or near the permanent wilting point to allow optimum dispersion of the fumigant, which moves as a gas through the soil air spaces. The permanent wilting point varies with soil texture and organic matter content. 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.

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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 you do not know how to determine the soil moisture content of the area to be treated, consult your local extension service or soil conservation service specialist or pest control advisor (ag consultant) for assistance.

In general, no irrigation should immediately precede subsoiling or fumigation; however, when surface soil moisture conditions are not likely to provide an adequate seal against fumigant loss, a very light sprinkler irrigation to wet the top 1 to 2 inches of soil may be useful.

Soil Preparation

The soil should be free of clods. Large clods can prevent effective soil sealing and reduce effectiveness of Telone C-17. Plant residues should be thoroughly incorporated into the soil prior to treatment to avoid interfering with application. Undecomposed plant material may harbor pests that will not be controlled by fumigation. Little or no crop residue should be present on the soil surface. Crop residue that is present should lie flat to permit the soil to be sealed effectively. Compacted soil layers within the desired treatment zone should be fractured before or during application of the fumigant. Deviation from the above conditions may result in unsatisfactory results.

Placement of Fumigant

Telone C-17 may be applied as either a broadcast (overall) or row treatment. It must be placed at least 10 inches below the final soil surface. When soil conditions allow, placement a minimum of 12 inches below the final soil surface is recommended. Deeper placement is recommended when fumigating soil to be planted to deep-rooted plants, such as perennial fruit and nut crops, or to control deeply distributed pests.

Application Methods and Equipment

Broadcast Application: Use chisel (shank), Nobel (sweep) plow or plow-sole application equipment. For best results when using chisel equipment, use ripper-type, forward-swept shanks. Nobel plow equipment is particularly useful for fall fumigation when the soil still contains some standing undecomposed plant material. Subsoiling may be necessary before application as described under "Soil Preparation". Choose application equipment which allows the deepest application and best soil seal under existing conditions.

The fumigant outlet spacing varies with the type of application equipment used.

With chisel equipment a fumigant shank spacing of 12 to 24 inches is recommended. The outlet spacing for this equipment may be up to 1 1/2 times the application depth but generally should be equal to the application depth and should not exceed the soil-shattering capability of the chisels. The maximum outlet spacing should not exceed 24 inches.

With plow-sole equipment a 12-inch outlet spacing is recommended. Do not exceed an outlet spacing of 18 inches.

With Nobel (sweep) plow equipment use an outlet spacing of 9-12 inches along the sweeps.

Broadcast application can be made in the same direction or at an angle to the direction of row planting.

Row Application: Use chisel equipment to treat a band of soil where the crop is to be planted, i.e. the plant row. One or two chisels per plant row is recommended. In general, when one chisel is used, apply Telone C-17 at the flow rates given. When two chisels per plant row are used, space the chisels (fumigant outlets) 8 to 12 inches apart and divide the flow rates equally between the two outlets. Regardless of the number of chisels used, the amount of fumigant applied per 1000 feet of plant row should remain the same. With certain deeper rooted crops such as potatoes and sugar beets, higher flow rates may be necessary to ensure adequate treatment of the zone of soil where primary root growth occurs; however, in no case should the amount of fumigant applied per acre exceed the gallons per acre rates for broadcast treatment.

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To prevent seed germination problems caused by improper seed-to-soil contact or improper seeding depth, do not place the seed directly over the furrow left by the applicator chisel(s). When one chisel is used per plant row, place the seed about 4 inches to one side of the chisel furrow. When two chisels are used per plant row, plant the seed offset from the chisel trace.

Sealing the Soil After Application

Immediately after chisel application of Telone C-17 the soil should be "sealed" to prevent fumigant loss and ensure that an effective concentration of fumigant is maintained within the soil for a period of several days. For broadcast treatment (flat fumigation), sealing can be accomplished with equipment that will uniformly mix the soil to a depth of 3 to 4 inches to effectively eliminate chisel or plow traces which can allow direct escape of the fumigant. A tandem disc or similar equipment may be used for this purpose. To maximize sealing, steps should also be taken to compact the soil surface to further retard the rate of fumigant loss by following with a ring roller, cultipacker or roller in combination with tillage equipment. Compaction of the soil surface alone may give the appearance of adequate sealing without effectively disrupting chisel or plow traces.

For row treatment, forming the beds at the time of application should be accomplished in a manner that places the fumigant at least 12 inches from the nearest soil/air interface. The closest soil/air interface could be the furrow for multiple knife applications or the top of the bed for single knife applications. Row treatments into preformed beds should be sealed by disrupting the chisel trace using press sealers, ring rollers or by reforming the beds and following with such equipment.

Sealing can also be improved by applying non-perforated plastic film, such as polyethylene, over the entire area or in strips. Use of a film to seal the soil surface does not eliminate the need to eliminate chisel traces prior to application of the plastic film.

Proper soil conditions at the time of application (see Soil Preparation section) are important to ensure proper placement of fumigant (see Placement of Fumigant section) and obtaining adequate sealing. Prior tillage should be adequate to eliminate clods and thoroughly mix crop residues into the soil.

Soil Fumigation Interval

Leave the soil undisturbed and unplanted for at least 7 days after application of the fumigant. A longer undisturbed interval is required if the soil becomes cold or wet, and for deep-rooted tree, shrub and vine planting sites.

After the fumigation interval, to prevent phytotoxicity, allow the fumigant to dissipate completely before planting the crop. Under optimum soil conditions for dissipation, 1 week for each 10 gallons/acre is recommended. For fruit, nut, and nursery crops at least three months should elapse between treatment and planting. To hasten dissipation, especially if heavy rains or low temperatures occur during the treatment period, till the soil to the depth of fumigant application. Use a knife-like chisel without turning the soil to reduce the possibility of recontaminating the treated soil. Dissipation is usually complete when the odor of Telone C-17 is no longer evident at the application depth. Seed may be used as a bioassay to determine if Telone C-17 is present in the soil at concentrations sufficient to cause plant injury. Do not plant if the odor of Telone C-17 is present within the zone of fumigation.

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Approved Uses

Control of Nematodes

Telone C-17 is recommended for control of nematodes, symphylans and wireworms in soils to be planted to various crops including those listed below.

Vegetable crops:

asparagus	corn	melons	rutabaga
beans	cowpeas	mustard greens	salsify
beets, red	cucumbers	okra	shallots
black-eyed peas	egg plant	onions	spinach
broccoli	endive	parsnips	squash (summer)
Brussels sprouts	garlic	peas	squash (winter)
cabbage	horseradish	peppers	sweet potatoes
cantaloupe	kale	pimentos	Swiss chard
carrots	kohlrabi	potatoes	tomatoes
cauliflower	leeks	pumpkins	turnips
celery	lettuce	radishes	watermelons
collards			

Field crops:

alfalfa	flax	mint	sorghum
barley	grasses	oats	soybeans
birdsfoot trefoil	hops	pasture grass	sugar beets
buckwheat	kenaf	peanuts	sugarcane
clover	lespedeza	popcorn	tobacco ¹
corn	millet	rye	vetch
cotton	milo	safflower	wheat

Fruit and nut crops:

almonds	currants	lemons	plums
apples	dates	limes	pomegranates
apricots	dewberries	loganberries	prunes
bananas	figs	nectarines	quince
blackberries	gooseberries	olives	raspberries
blueberries	grapefruit	oranges	strawberries
boysenberries	grapes	peaches	tangerines
cashew nuts	hazelnuts (filberts)	pears	tangelos
cherries	hickory nuts	pecans	youngberries
chestnuts	huckleberries	persimmons	walnuts
cranberries	kumquats	pineapple	

¹ For soil borne disease control in tobacco, do not apply more than 20 gallons of Telone C-17 per acre.

Nursery crops:

Floral plants, ornamentals, shrubs and bushes; forest, shade, fruit and nut trees; and vine and bramble fruits of all types.

Application Rates and Use Information for Control of Nematodes, Symphylan†, Wireworm† and Certain Soil Borne Diseases in Soils Planted to Crops Listed

Crops (Consult list of individual crops listed above)	Type of Treatment	Soil Type	Application Rates			
			Gallons per Acre ¹	Fl oz/1000 ft of Row per Chisel		
Shallow rooted plants: field crops floral crops grasses and turf small fruits vegetables ⁶ ornamentals	42" row ²	mineral	5.1 to 6.9	52.5 to 71		
		muck or peat	10.3 to 13.7	106 to 141		
	broadcast	mineral	10.3 to 17.1 ³	30.3 to 50.2		
		muck or peat	27.4 ³ to 41.1	80.5 to 120.8		
strawberries	broadcast	mineral	27.4 to 41.1	80.5 to 120.8		
sugarbeets root knot nematode	42" row	mineral	6	61.7		
	broadcast		12.8 to 17.1	37.8 to 50.2		
sugar beet nematode	42" row	mineral	10.3	106		
	broadcast		12.8 to 21.4	37.8 to 62.9		
pineapple	Row	mineral	25.7 to 51.4	-		
citrus - Florida ⁴	broadcast	mineral	34.2	100.5		
Nursery and field grown: citrus fruit trees deciduous fruit trees forest trees grapes nut trees ornamentals (deep rooted)	Broadcast: gallons per acre to penetrate to specified depth					
	Mineral Soils		3 ft	4 ft	5 ft	6 ft
	sand		17.1	23.9	30.8	37.6
	sandy loam		30.8	34.2	41.1	54.7
	silt loam		47.9	58.1	71.8	85.5
	clay loam		61.6	78.7	95.8	116.3

¹ Use the higher rates in heavier soil.

² For cyst-forming nematodes increase dosage to 21.4 gallons/acre (62.9 fl oz/1000 ft row per chisel).

³ For muck soils containing less than 30% organic matter use 21.4 gallons/acre.

⁴ For burrowing nematode in citrus inject on 18-inch centers, 12 inches deep. Keep free of plants susceptible to burrowing nematodes for 2 years before replanting to citrus.

⁵ Row treatment is not recommended for potatoes in irrigated areas of western and northwestern states.

⁶ In Idaho, Nevada, Oregon and Washington, refer to Telone C-17 supplemental labeling entitled: "For Nematode and Wireworm Control in Potatoes" for directions for use.

†Note: To control symphylans (garden centipedes) use only overall at 21.4 or more gallons per acre, and apply during late summer or early fall when the soil is warm.

To control wireworms use dosages recommended for nematodes; in overall or broadcast treatments. For wireworm control in soils to be planted to potatoes in Idaho, Nevada, Oregon and Washington, refer to supplemental labeling referenced in footnote 6 above.

Application Rates and Use Recommendations to Control Soil Borne Diseases†

Crop	Type of Treatment	Application Rate	
		Gallons Per Acre	Fl oz per 1000 ft of Row Per Chisel
sweet potatoes	42" row	8.5 to 10.5	88 ^{fl} to 106 ^{fl}
	broadcast	24 to 27.5	70 to 81
tobacco ^{†††}	42" row	8.5 to 10.5	88 ^{fl} to 106 ^{fl}
	broadcast	15 to 20	44 to 59
peanuts	42" row	2.5 to 5	26 ^{fl} to 52 ^{fl}
white potatoes	broadcast	24 to 27.5	70 to 81
mint	broadcast	24 to 27.5	70 to 81
onions	broadcast	24 to 27.5	70 to 81

†Note: Consult "General Information" to determine diseases controlled in crops listed. Nematodes also will be controlled.

††Use the same flow rate per chisel for other single chisel row spacings. As the distance between rows increases, the gallons required per acre will decrease and vice versa.

†††Use the higher rate in the rate range when high disease pressure is anticipated, when planting varieties susceptible to Granville wilt, or where tobacco was planted the previous year. The lower rate in the rate range may be used where low to moderate disease pressure is anticipated, where tobacco was not planted the previous year, and when planting a variety resistant to Granville wilt.

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- (1) Refund of purchase price paid by buyer or user for product bought, or
- (2) Replacement of amount of product used

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