PM22 62719-32 1 of 2

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY

WASHINGTON, D.C. 20460

AUG 12 1993

OFFICE OF
PREVENTION, PESTICIDES
AND TOXIC SUBSTANCES

Mr. Douglas M. Roby
Product Registration Manager
DowElanco
9002 Purdue Road
Indianapolis, IN 46268-1189

Dear Mr. Roby:

SUBJECT: Review of Final Printed Labeling
Telone C-17
EPA Reg. No. 62719-12
Telone II
EPA Reg. No. 62719-32 ✓
Your Letter Dated 06/08/93

The labeling referred to above, submitted in connection with registration under the Federal Insecticide, Fungicide, and Rodenticide Act, as amended, is acceptable subject to the comments listed below. Five copies of the finished labeling must be submitted prior to releasing the product for shipment.

1. This acceptance of your label does not relieve you of any obligation to comply with the Worker Protection Standard (WPS). Under the WPS labeling regulations at 40 CFR part 156, subpart K, §156.200(c)(3), you are prohibited from distributing or selling any product within the scope of the WPS requirements after April 21, 1994, without amended labeling accepted by the Agency.

2. On the Telone C-17 (EPA Reg. No. 62719-12) and Telone II (EPA Reg. No. 62719-32) labels, modify references to "MSHA" to read "OSHA" instead.

Sincerely yours,

(S)

Cynthia Giles-Parker
Product Manager (22)
Fungicide-Herbicide Branch
Registration Division (H7505C)

Enclosure

cc: Lisa Engstrom
Special Review Branch
Special Review and Reregistration Division (H7508W)

ACCEPTED
with COMMENTS
In EPA Letter Dated:

AUG 1 2 1993

Under the Federal Insecticide Fungicide and Rodenticide Act for the pesticide registered under EPA Reg. No. 62719-32;

OK

DowElanco

RESTRICTED USE PESTICIDE
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 II

A liquid fumigant for preplant treatment of soil to control plant parasitic nematodes and certain other soil pests in cropland

Active Ingredient:	(By weight)
1,3-dichloropropene	94%
Inert Ingredients	6%

1 gallon of Telone weighs 10.1 lb at 70°F

Keep Out of Reach of Children

WARNING AVISO

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.)

Refer to inside of label booklet for detailed additional precautionary information and Directions for Use including STORAGE, SHIPMENT 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 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. 62719-32

EPA Est. 464-TX-1, 62719-IN-1

Superscripts correspond to places 7 & 8 of lot number

85456 900-001985

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Soil Fumigant

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(If you do not understand the label, find someone to explain it to you in detail.)

Hazardous Liquid And Vapor • May Be Fetal If Inhaled, Absorbed Through Skin Or Swallowed • Causes Substantial But Temporary Eye Injury • Causes Skin Irritation And, If Confined, Skin Burns • May Cause Allergic Skin Reaction • 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 • Telone II Contains 1,3-Dichloropropene, Which Has Been Determined To Cause Tumors In Laboratory Animals • Risks Can Be Reduced By Closely Following Directions For Use And Precautions, And By Wearing Protective Clothing Specified In This Booklet

Personal Protective Equipment Requirements (PPE)

The chemical resistance selection category for this product is H. For more information about PPE materials that are resistant to this product for various lengths of time, consult an EPA chemical-resistance selection chart. Wearers of PPE should practice heat illness mitigation techniques such as gradual adjustment to heat and respirator stress, fans for cooling, cooling vests, frequent breaks, frequent intake of drinking water, and maintaining weight from day-to-day.

NOTE: Respiratory Protection
When using respiratory protection, chemical cartridges or canisters must be replaced daily or when the odor or irritation of Telone II becomes apparent, whichever is sooner. The following respiratory protection is acceptable for use with Telone II:

- **A MSHA/NIOSH approved half-face/full-face tight-fitting respirator or loose-fitting powered air purifying (PAPR) respirator with cartridge or canister specified below and only when all of the following criteria have been met:**
  - **a. Respirator fit-testing and fit-checking program conforming to OSHA's as described in 29 CFR Part 1910.134.**
  - **b. Training for respirator user conforming to OSHA's training requirement as described in 29 CFR Part 1910.134.**
  - **c. Examination of the respirator user by a qualified medical practitioner to ensure physical ability to safely wear that style of respirator.**

NOTE: Chemical Protective Clothing (CPC)
There are no protective clothing materials that are completely impervious to penetration by liquid Telone II. CPC constructed of SARANEX, neoprene and chlorinated polyethylene provide short-term liquid contact and splash protection. CPC constructed of EVAL laminate barriers (for example, RESPONDER suits manufactured by Life-guard or SILVERSHIELD gloves manufactured by North), Viton and Teflon provide longer-term protection. Leather gloves and shoes offer no protection from Telone II and if contaminated cannot be made safe to wear. Render unusable and dispose of contaminated leather goods, including shoes.

1. **Direct Contact Activities**
   The following personal protective equipment (PPE) must be worn by individuals performing tasks that may involve direct contact with liquid Telone II or from direct venting of 1,3-dichloropropene vapor to the atmosphere. These tasks, which must be conducted outdoors or in a well-ventilated area, include but are not limited to:

- **equipment calibration or adjustment**
- **equipment clean-up and repair**
- **product sampling**
- **any activity less than 6 feet from an unshielded pressurized hose containing Telone II**
- **rinsate disposal**
- **fumigant transfer**
- **clean-up of small spills**
- **preparing containers for aeration**

a. An approved half face or full-face tight-fitting respirator or loose-fitting powered air purifying (PAPR) respirator equipped with organic vapor cartridges (MSHA/NIOSH approval TC-23C) or canister approved for pesticides (MSHA/NIOSH approval TC-14G).
b. Chemical goggles must be worn when using a half face respirator.
c. Coveralls.
d. Chemical resistant apron.
e. Headgear if there is a potential for contact with liquid Telone II from an overhead source.
f. Chemical resistant gloves and footwear (e.g., EVAL or neoprene).

2. **Application - Persons operating application equipment for Telone II must wear:**

a. Coveralls
b. Shoes and socks

In addition, the following PPE must be worn whenever the odor or irritation of Telone II can be detected:

a. An approved half face or full-face tight-fitting respirator or loose-fitting powered air purifying (PAPR) respirator equipped with organic vapor cartridges (MSHA/NIOSH approval TC-23C) or canister approved for pesticides (MSHA/NIOSH approval TC-14G)

Note: The PPE specified above for "Direct Contact Activities" must be readily available at all times and worn if it is necessary to leave the vehicle applying Telone II to perform any direct contact activity.

3. **Early Entry Activities: Persons entering the treated area to perform soil sealing or any other early entry activity within 72 hours after application must wear:**
   a. Coveralls or a long-sleeved shirt and pants
   b. Shoes and socks

   In addition, the following PPE must be readily available at all times and worn under the conditions indicated:
   a. An approved half face or full-face tight-fitting respirator or loose-fitting powered air purifying (PAPR) respirator equipped with organic vapor cartridges (MSHA/NIOSH approval TC-23C) or canister approved for pesticides (MSHA/NIOSH approval TC-14G) whenever the odor or irritation of Telone II can be detected.
   b. Chemical resistant gloves and footwear (e.g., EVAL or neoprene) whenever there is direct contact with soil treated with Telone II.
4. **Special Activities: The following personal protective equipment must be worn by persons exposed to high airborne concentrations of Telone II, such as clean-up following large spills, exposure to Telone II in poorly ventilated areas and bulk tank cleaning:**
   a. Body protection providing gas tight protection (level A) is required to prevent possible skin effects.
   b. A positive pressure atmosphere supplying respirator (MSHA-NIOSH approval number prefix TC-19C or TC-13F) must be worn.

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 have available to him the manufacturer's written instructions for operation of the system and must read and understand (or have explained to him in detail) the proper operation and maintenance of the system.

With all bulk and mini-bulk containers, Telone II 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 II.

1. All hoses, piping, and tanks used in connection with Telone II 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 II beyond a pump must not exceed the manufacturer's maximum pressure specification.

User Safety Recommendations

READ LABEL VERY CAREFULLY

1. **Do not get in eyes**
2. **Do not breathe the vapor**
3. **Do not get on skin**
4. **Do not swallow any Telone II**
5. **Never siphon Telone II by mouth or use mouth to blow out clogged lines, nozzles, etc.**

Do not eat, drink, smoke, or chew gum or tobacco while handling this product or before washing hands and face thoroughly with soap and water. Do not use the toilet before thoroughly washing hands.

If this product penetrates through your clothing or personal protective equipment, stop handling this product immediately, remove the clothing and equipment, wash your body thoroughly, and put on clean clothing and equipment before resuming the handling activity. Never wear protective gear having the odor of 1,3-dichloropropene.

After handling this product, remove personal protective equipment immediately. Wash the outside of gloves before taking them off. Shower or wash thoroughly and change into clean clothing as soon as possible.

Discard clothing and personal protective equipment that cannot be reused, including clothing or other absorbent materials that have been drenched or thoroughly contaminated with this product. Otherwise, wash clothing and personal protective equipment (including both the inside and outside of gloves) before each day of reuse according to manufacturer's directions or, if no such directions, in detergent and hot water. Keep and wash them separately from other laundry.

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 absorbent 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 contaminate water when cleaning equipment or disposing of wastes. 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.

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.

Agricultural Use Requirements

Use this product only in accordance with its labeling. For any requirements specific to your State, consult the agency in your state responsible for pesticide regulation.

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

The restricted entry interval (REI) following application of Telone II is 72 hours.

The following Personal Protective Equipment must be worn for early entry into treated areas that involves contact with treated soil:

a. An approved half face or full face tight-fitting respirator or loose-fitting powered air purifying (PAPR) respirator equipped with organic vapor cartridges (MSHA/NIOSH approval TC-23C) or canister approved for pesticides (MSHA/NIOSH approval TC-14G) whenever the odor of Telone II can be detected.

b. Chemical resistant gloves and footwear. This footwear must be worn when walking on treated soil within 72 hours after application.

Notify workers of the application by providing oral or written warnings. Written or oral warning must be given to workers who are expected to be in a treated area or in any area about to be treated with this product. These oral warnings shall inform workers of areas or fields that may not be entered without protective equipment until 72 hours after treatment. In case of accidental exposure, follow directions as shown by the First Aid section on this label. When oral warnings are given, warnings shall be given in a language customarily understood by workers. Written warnings must include the following information: **WARNING.** Area treated with Telone II soil fumigant on (insert date of application). Do not enter without protective equipment until 72 hours after treatment.

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 II 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 II 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 or Minibulk Product Transfers: Dry break or dry disconnect couplings are required for all product transfers involving bulk or minibulk containers for Telone II as of September 30, 1993.

General Information

Telone II is a liquid fumigant for preplant treatment of soil to control plant parasitic nematodes and certain other soil pests and plant diseases in cropland.

Telone II may be applied as a preplant soil treatment to control the following types of plant parasitic nematodes: burrowing, citrus, cyst (golden, sugar beet, soybean, carrot and wheat), dagger, lance, pin, needle, reniform, ring, root knot, root lesion, spiral, sting and stubby root. Telone II can also be used to control garden centipedes (Symphylans) and wireworms. Suppress Sugar beet Rhizomania disease, *Fusarium* wilt of cotton and *Verticillium* wilt of mint and potatoes and aid in the control of bacterial canker of peaches.

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 II should be conducted only according to directions and conditions of use described in this labeling.

Formulator use of Telone II: Labeling for end use products containing Telone II 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 II 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 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 tare soil in treated fields and soil contamination from equipment or crop remains. Clean equipment carefully before entering treated fields.

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

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

Equipment Clean-up: Because Telone II 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 II into surface or underground water supplies.

Chemigation: Do not apply Telone II 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.

When using high rates of Telone II 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, *Cornus* 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 (foliar applied) is recommended where experience indicates a deficiency may occur.

Application Directions

Application Timing

Telone II 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 II 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 II 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. 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 II. 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 be 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 II 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 nipper-type, forward-swept shanks. Nobel plow equipment is particularly useful for fall fumigation when the soil still contains some undecomposed standing 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 1½ 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. Refer to Table 1 for broadcast treatment rates for various crops.

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 II at the flow rates given in Table 2. When two chisels per plant row are used, space the chisels (fumigant outlets) 8 to 12 inches apart and divide the flow rates given in Table 2 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 given in Table 1. To determine the amount (gallons) of Telone II required per acre for various plant row spacings and flow rates, refer to Table 3. Note that as the distance between the plant rows increases the amount of fumigant required decreases and vice versa.

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 II 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 II is no longer evident at the application depth. Seed may be used as a bioassay to determine if Telone II is present in the soil at concentrations sufficient to cause plant injury. Do not plant if the odor of Telone II is present within the zone of fumigation.

Approved Uses

Control of Nematodes

Telone II is recommended for control of nematodes in soils to be planted to various crops including those listed below. Refer to Tables 1 and 2 below for broadcast and row treatment application rates and specific use requirements. Refer to table 3 to determine flow rates for specific row spacings.

Note: For crops identified by footnotes 1, 2, 3 or 4, do not exceed maximum broadcast application rates for nematode control in mineral soils for species other than cyst nematode.

Vegetable crops:

asparagus	egg plant	pimentos
beans	endive	potatoes
beets, red	garlic	pumpkins[1]
black-eyed peas	horseradish	radishes[1]
broccoli[1]	kale	rutabaga
Brussels sprouts[1]	kohlrabi	salsify
cabbage[1]	leeks	shallots
canteloupe[1]	lettuce	spinach
carrots	melons[1]	squash (summer)
cauliflower[1]	mustard greens[1]	squash (winter)
celery	okra	sweet potatoes[2]
collards	onions	Swiss chard
corn	parsnips	tomatoes
cowpeas	peas	turnips[1]
cucumbers[1]	peppers	watermelons[1]

Field crops:

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

Fruit and nut crops:

almonds[4]	gooseberries	pears
apples	grapefruit[4]	pecans
apricots	grapes[4]	persimmons
bananas	hazelnuts (filberts)	pineapple[1]
blackberries	hickory nuts	plums[4]
blueberries	huckleberries	pomegranates
boysenberries	kumquats	prunes[4]
cashew nuts	lemons[4]	quince
cherries	limes[4]	raspberries
chestnuts	loganberries	strawberries
cranberries	nectarines	tangerines[1]
currants	olives	tangelos[4]
dates	oranges[4]	youngberries
dewberries	peaches[4]	walnuts[1]
figs		

Maximum broadcast application rates for nematode control (except cyst nematode) in mineral soils for specified crops listed above:

	(Gallons/acre)
(crop)[1]	12
(crop)[2]	15
(crop)[3]	42
(crop)[4]	55

Nursery crops:

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

When used according to state nursery regulations, Telone II may be used in the production of certified nursery stock.

Table 1. Broadcast Treatment Rates for Nematode Control†

Crop	Soil Type or Texture	Recommended Rate: Broadcast Gal/Acre	Recommended Rate: Fl Oz/ 1000 Ft of Row/Outlet[1]
Vegetable crops [2]	Mineral[3] Muck or Peat	9 - 18[4] 24 - 36	26 - 53 71 - 106
Field crops	Mineral Muck or Peat	9 - 18[4] 24 - 36	26 - 53 71 - 106
Fruit, nut and nursery crops[5,7,8,9,10]	Sand Sandy Loam Silt Loam Clay Loam	27 - 33 36 - 48 63 - 75 84 - 102	79 - 97 106 - 141 185 - 220 247 - 300

† For crops identified by footnotes 1, 2, 3, or 4 in the list above, do exceed specified maximum broadcast application rate.

[1] Flow rates are based on 12-inch outlet spacing. Flow rates for alternate spacings can be calculated using the following formula: fl oz/1000 ft of row/outlet = 2.94 x rate in gallons/acre x outlet spacing in feet. For row treatment refer to Tables 2 and 3.

[2] Potatoes:
Before fumigation, soil sampling for the type and number of pests present is recommended and can help to determine the need for additional treatment with a contact nematicide. Preharvest tuber sampling for nematodes also is recommended. If the nematode population is high enough to damage the crop, potatoes can be harvested early. Do not store potatoes with a detectable nematode infestation.
In Idaho, Nevada, Oregon and Washington, and in Modoc and Siskiyou counties of California refer to Telone II supplemental labeling entitled: "For Nematode and Wireworm Control in Potatoes" for directions for use.
In all other areas, use 9 to 18 gallons of Telone II per acre to control the northern root knot nematode *Meloidogyne hapla* in mineral soil and 24 to 36 gallons per acre in muck soil. For high populations of this species use the higher recommended rate. For more difficult-to-control root knot nematodes such as the Columbia root knot nematode *Meloidogyne chitwoodi*, apply 20 gallons per acre (59 fl oz/1000 ft of row/outlet based on

12-inch centers) in mineral soil. For best results apply the fumigant at least 18 inches below the final soil surface.

[3] Mineral soil includes sand, sandy loam, silt, and clay loam. Use the higher rates for finer textured (heavier) soils.

[4] For cyst-forming nematodes use 18 gallons per acre (53 fl oz/1000 ft/outlet).

[5] Greater than 20% organic matter content.

[6] Pineapple: Application may be made at the time of planting. For best results, seal the soil with polyethylene film, which acts as a gas permeability barrier.

[7] Strawberries: For broadcast fumigation of mineral soils only, apply 24 to 36 gallons per acre.

[8] Tree Planting Sites: Use 24 fl oz (1.5 pints) of Telone II by application of the fumigant at a single point in the center of each planting site at a depth of 5 feet below the final soil surface. Sites prepared by backhoeing to break up restrictive soil layers that may retard fumigant movement should be dug in the approximate dimensions of 10 x 10 x 10 feet. The hole should then be backfilled to a depth of 5 feet, the fumigant applied using a closed-system application tube and the remainder of the soil previously removed immediately added to the hole. For sites where no restrictive soil layers are present, the fumigant can be applied to a depth of 5 feet using an injection auger. For best results, prepare and treat planting sites in the fall and plant in the spring.

[9] For shallow-rooted plants grown only one year, use 15 to 27 gallons per acre (44 to 79 fl oz/1000 ft of row/outlet).

[10] Citrus: For burrowing nematode control, inject Telone II on 18-inch centers at least 12 inches deep. For buffers within existing groves or for tree planting sites within existing groves, do not apply within 5 feet of living trees. Keep the field free of plants susceptible to this nematode at least two years before planting to citrus.

Table 2. Row Treatment Rates for Nematode Control Using a Single Chisel per Row[1]

Crops	Soil Texture[2]	Recommended Rate Fl Oz/1000 Ft of Row[3]
Vegetable	Mineral	52 - 106
	Muck and Peat	142 - 212
Field [4,5]	Mineral	52 - 106
	Muck and Peat	142 - 212
Fruit, Nut and Nursery[6]	Mineral	52 - 106
	Muck and Peat	142 - 212

[1] For row spacing of 24 inches or less apply Telone II as a broadcast treatment (See Table 1 for rates)

[2] For a description of soil textures see footnote 3 under Table 1.

[3] To determine actual gallons per acre needed for various row spacings see Table 3

[4] Sugar Beets: To control sugar beet cyst nematode, use 93 fl oz/1000 ft of row

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

[6] Pineapples: To control reniform nematodes use 230 fl oz/1000 ft of row.

Table 3. Gallons of Telone II Required per Acre for Various Row Spacings and Fumigant Flow Rates[1]

Note: In no case should the amount of fumigant applied per acre exceed the gallons per acre rates for broadcast treatment given in Table 1.

Fl Oz/ 1000 Ft of Row	Plant Row Spacing (Inches)												
	36	38	38	32	34	36	38	40	42	44	46	48	50
	(Gallons per Acre)												
52	8.2	7.8	7.1	6.8	6.2	5.9	5.6	5.3	5.1	4.8	4.6	4.4	4.2
60	9.4	8.8	8.2	7.7	7.2	6.8	6.4	6.1	5.8	5.6	5.3	5.1	4.9
68	10.7	9.9	9.3	8.7	8.2	7.7	7.3	6.9	6.6	6.3	6.0	5.8	5.5
76	11.9	11.1	10.3	9.7	9.1	8.6	8.2	7.8	7.4	7.0	6.7	6.5	6.2
84	13.2	12.3	11.4	10.7	10.1	9.5	9.0	8.6	8.2	7.8	7.5	7.1	6.9
92	14.4	13.4	12.5	11.7	11.0	10.4	9.9	9.4	8.9	8.5	8.2	7.8	7.5
100	15.7	14.6	13.6	12.8	12.0	11.3	10.7	10.2	9.7	9.3	8.9	8.5	8.2
108	17.0	15.8	14.7	13.8	13.0	12.2	11.6	11.0	10.5	10.2	9.6	9.2	8.8
116	18.2	16.9	15.8	14.8	13.9	13.2	12.5	11.8	11.3	10.8	10.3	9.9	9.5
124	19.5	18.1	16.9	15.8	14.9	14.1	13.3	12.7	12.1	11.5	11.0	10.5	10.1
132	20.7	19.3	18.0	16.8	15.8	15.0	14.2	13.5	12.8	12.2	11.7	11.2	10.8
140	22.0	20.4	19.1	17.9	16.8	15.9	15.0	14.3	13.6	13.0	12.4	11.9	11.4
148	23.2	21.8	20.1	18.9	17.8	16.8	15.9	15.1	14.4	13.7	13.1	12.6	12.1
156	24.5	22.8	21.2	19.9	18.7	17.7	16.8	15.9	15.2	14.5	13.8	13.3	12.7
164	25.8	23.9	22.3	20.9	19.7	18.6	17.6	16.7	15.9	15.2	14.6	13.9	13.4
172	27.0	25.1	23.4	21.9	20.7	19.5	18.5	17.6	16.7	16.0	15.3	14.6	14.0
180	28.3	26.3	24.5	23.0	21.6	20.4	19.3	18.4	17.5	16.7	16.0	15.3	14.7
188	29.5	27.4	25.6	24.0	22.6	21.3	20.2	19.2	18.3	17.4	16.7	16.0	15.3
196	30.8	28.6	26.7	25.0	23.5	22.2	21.1	20.0	19.1	18.2	17.4	16.7	16.0
204	32.0	29.9	27.8	26.0	24.5	23.1	21.9	20.8	19.8	18.9	18.1	17.4	16.7
212	33.3	30.9	28.9	27.0	25.5	24.0	22.8	21.6	20.6	19.7	18.8	18.0	17.3

[1]Refer to Table 2 for the rate needed for a specific crop and/or soil texture. To obtain the gallons per acre used for a row spacing not shown in this table, use the following equation:

$$\frac{\text{fl oz/1000 ft of row}}{\text{row spacing (inches)}} \times 4.08^{*} = \text{gallons per acre}$$

$$^{*}4.08 = \frac{\text{12 inches} \times \text{43.56 (no. 1000 ft/acre)}}{\text{128 (fl oz per gallon)}}$$

Plant Diseases

Bacterial Canker of Peaches: Telone II can be used as an aid in the control of this disease by application as a preplant, overall treatment of light (sandy) soils at the rate of 36 gallons per acre (106 fl oz/1000 ft row per outlet) preferably in the fall when the soil is warm (55 to 80°F at injection depth) and moist. Inject the fumigant at a depth of 10 to 12 inches with chisels mounted on 12-inch centers.

***Fusarium* Wilt of Cotton:** The effects of this disease can be suppressed by controlling the root knot nematodes associated with this disease/nematode complex. Use Telone II as a row treatment at the rate of 46 to 106 fl oz/1000 ft of row. The lower rate is suitable for mineral soils whereas the higher rate should be used for heavier soils.

Sugar Beet *Rhizomania* Disease: Use Telone II to suppress the effects of this disease by preplant application at the rate of at least 73.5 fl oz/1000 ft of plant row but not more than 132 fl oz/1000 ft of plant row. These flow rates are equivalent to 10 to 18 gallons per acre for sugar beets planted in 30-inch beds with one plant per bed. For beets planted in 40-inch beds with two plant rows per bed the recommended flow rates are equivalent to 15 to 27 gallons per acre. Use the higher rates for heavier (finer textured) soils and/or for higher levels of disease infestation. Telone II is believed to reduce the activity of *Polymyxa beta*, which has been identified as the vector of the Rhizomania disease virus. The fumigant should be placed at least 12 inches below the final soil surface. Immediately after application, mechanically compact (seal) the soil surface to prevent fumigant loss. Sealing can be accomplished by forming the beds during application or, when fumigating pre-formed beds, re-list the beds or use a ring roller, cultipacker, bed shaper, press sealer or similar device.

***Verticillium* Wilt of Mint and Potatoes:** To aid in the control of this disease, apply Telone II as a broadcast treatment. For mint, use 59 gallons per acre (173 fl oz/1000 ft row/outlet) in the spring or, preferably, in the fall. For potatoes, use 17 to 25 gallons per acre (50 to 73 fl oz/1000 ft row/outlet) in the spring, or 25 to 34 gallons per acre (73 to 100 fl oz/1000 ft row/outlet) in the fall.

Soil Insects

Symphylans (Garden Centipedes): Use Telone II for treatment of soil to be planted to crops where these pests have been shown to be a problem. Apply the fumigant only as a broadcast treatment at the rate of 18 to 36 gallons per acre (53 to 106 fl oz/1000 ft row/outlet) when soil temperature is warm (55 to 80°F) at the application depth.

Wireworms: Use Telone II for treatment of soil to be planted to crops where these pests have been shown to be a problem. Apply the fumigant as a broadcast treatment at the rates recommended for nematode control (Table 1) by injection at least 14 inches below the final soil surface.

For wireworm control in Idaho, Nevada, Oregon and Washington, and in Modoc and Siskiyou counties of California refer to Telone II supplemental labeling entitled: "For Nematode and Wireworm Control in Potatoes" for directions for use.

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