

MATERIAL SAFETY DATA SHEET



Emergency Phone: 800-992-5994
Dow AgroSciences LLC
Indianapolis, IN 46268

CURFEW* SOIL FUMIGANT

Effective Date: 3/30/04
Product Code: 72690
MSDS: 000405

1. PRODUCT AND COMPANY IDENTIFICATION:

PRODUCT: Curfew* Soil Fumigant

COMPANY IDENTIFICATION:

Dow AgroSciences LLC
9330 Zionsville Road
Indianapolis, IN 46268-1189

2. COMPOSITION/INFORMATION ON INGREDIENTS:

1,3-Dichloropropene	CAS# 000542-75-6	97.5%
Cis isomer	CAS# 010061-01-5	
Trans isomer	CAS# 010061-02-6	
Balance, total, including:		2.5%
1,3,3-trichloropropene		
Cis isomer	CAS# 002953-50-6	
Trans isomer	CAS# 002598-01-8	

3. HAZARDOUS IDENTIFICATIONS:

EMERGENCY OVERVIEW

Colorless to straw colored liquid. Pungent, sweet, penetrating odor. Highly toxic and irritating fumes are released in fire situations. May cause eye irritation or corneal injury. May be absorbed through the skin and causes skin irritation. Potential skin sensitizer. Toxic to aquatic organisms and avian.

EMERGENCY PHONE NUMBER: 800-992-5994

4. FIRST AID:

EYES: Hold eyes open and rinse slowly and gently with water for 15-20 minutes. Remove contact lenses, if present, after the first 5 minutes, and then continue rinsing eyes. Call a poison control center or doctor for treatment advice.

SKIN: Take off contaminated clothing. Wash skin with soap and plenty of water for 15-20 minutes. Call a poison control center or doctor for treatment advice. Wash clothing before reuse. Shoes and other leather items which cannot be decontaminated should be disposed of properly.

INGESTION: Call poison control center or doctor immediately for treatment advice. Have person sip a glass of water if able to swallow. Do not induce vomiting unless told to do so by the poison control center or doctor. Never give anything by mouth to an unconscious person.

INHALATION: Move person to fresh air. If person is not breathing, call 911 or an ambulance, and then give artificial respiration; if by mouth to mouth use rescuer protection (pocket mask, etc.). Call a poison control center or doctor for treatment advice. If breathing is difficult, oxygen should be administered by qualified personnel.

NOTE TO PHYSICIAN: Because rapid absorption may occur through lungs if aspirated and cause systemic effects, the decision of whether to induce vomiting or not should be made by a physician. If lavage is performed, suggest endotracheal and/or esophageal control. Danger from lung aspiration must be weighed against toxicity when considering emptying the stomach. Respiratory symptoms, including pulmonary edema, may be delayed. Persons receiving significant exposure should be observed 24-48 hours for signs of respiratory distress. Maintain adequate ventilation and oxygenation of the patient. Repeated excessive exposure may aggravate preexisting lung, liver, and kidney disease. If burn is present, treat as any thermal burn, after decontamination. Animal data indicates that this material is a potential skin sensitizer. However, skin sensitization has not been encountered among employees involved in the manufacture of this material. Treatment of exposure should be directed at the control of symptoms and the clinical condition of the patient.

5. FIRE FIGHTING MEASURES:

FLASH POINT: 81.5°F (27.5°C)

METHOD USED: TCC

FLAMMABLE LIMITS

LFL: 5.5% @ 80°C (176°F)

UFL: 14.5% @ 80°C (176°F)

EXTINGUISHING MEDIA: Water fog, foam, CO₂, dry chemical. For large-scale fires, straight or direct water streams may be ineffective to extinguish fire, but copious fine water spray will help control situation by its cooling action. General purpose foams are preferred if available. Alcohol resistant foams may function also. Water fog, applied gently, may be used as a blanket for fire extinguishing. If possible, contain fire run-off water.

MATERIAL SAFETY DATA SHEET



Emergency Phone: 800-992-5994
Dow AgroSciences LLC
Indianapolis, IN 46268

CURFEW* SOIL FUMIGANT

Effective Date: 3/30/04
Product Code: 72690
MSDS: 000405

FIRE & EXPLOSION HAZARDS: Keep unnecessary people away; isolate hazard area and deny unnecessary entry. Highly toxic and irritating fumes are released in fire situations. Keep product vapors away from possible ignition sources. Vapors can form flammable mixtures at ordinary temperatures. Static electricity may accumulate and create a fire ignition. Vapors are heavier than air and may travel a considerable distance where they may linger and/or find an ignition source and flash back. Stay upwind; keep out of low areas.

FIRE-FIGHTING EQUIPMENT: Use NIOSH or MSHA approved positive-pressure, self-contained breathing apparatus and special protective clothing, including heavy neoprene or rubber boots and neoprene gloves.

6. ACCIDENTAL RELEASE MEASURES:

ACTION TO TAKE FOR SPILLS/LEAKS: (FOR FURTHER INFORMATION ON SPILLS, LEAKS, AND DISPOSAL, REFER TO EMERGENCY PROCEDURES IN THE USER'S GUIDE FOR THIS PRODUCT).

PERSONAL PROTECTIVE EQUIPMENT FOR SMALL SPILLS:

For small spills outdoors or in well ventilated areas, wear a NIOSH approved half-face or full-face tight fitting respirator or loose fitting powered air-purifying respirator equipped with organic vapor cartridges (MSHA/NIOSH approval TC-23°C) or canister approved for pesticides (MSHA/NIOSH approval TC-14G). Chemical goggles must be worn when using a half-face respirator. In addition to respiratory protection, wear coveralls; chemical resistant gloves such as barrier laminate (EVAL) or viton; chemical resistant footwear and socks; chemical resistant headgear for overhead exposure; and chemical apron.

PERSONAL PROTECTIVE EQUIPMENT FOR LARGE SPILLS:

For clean up of large spills, or small spills in a confined area, wear a NIOSH positive-pressure, atmosphere-supplying respirator (MSHA/ NIOSH approval number prefix TC-19°C or TC-13°F). In addition, body protection providing gas-tight protection is required to prevent possible skin effects (read product label).

CLEAN-UP FOR SMALL SPILLS:

If it can be done safely, invert or reposition the leaking container of product so that the area with the leak is up and the flow is reduced. If possible, put the container into an overpak. Cover or confine the leakage with an absorbent such as diatomaceous earth, clay, sand, or other non-combustible absorptive material. Collect the spent absorbent material in a disposal drum. If the spill is on the ground, dig up enough of the soil to eliminate the contamination and place the soil in a disposal drum.

CLEAN UP FOR LARGE SPILLS:

Contact Dow AgroSciences at 800-992-5994.

7. HANDLING AND STORAGE:

PRECAUTIONS TO BE TAKEN IN HANDLING AND STORAGE:

HANDLING: Keep out of reach of children. Hazardous liquid and vapor. May be fatal if swallowed. Causes substantial but temporary eye injury. May be fatal if absorbed through the skin. Causes skin irritation, and, if confined, skin burns. May cause allergic skin reaction. May be fatal if inhaled. May cause lung, liver, and kidney damage and respiratory system prolonged contact. Do not swallow any of this product. Do not get in eyes, on skin, or on clothing. Do not breathe vapor. Users should remove clothing immediately if pesticide gets inside. Then wash thoroughly and put on clean clothing. Users should remove personal protective equipment (PPE) immediately after handling this product. Wash the outside of gloves before removing. As soon as possible, wash thoroughly and change into clean clothing. Follow manufacturer's instructions for cleaning/maintaining PPE. If there are no such instructions for washables, use detergent and hot water. Keep and wash PPE separately from other laundry. Wash PPE after each days use. Discard clothing and other absorbent materials that have been drenched or heavily contaminated with this product. Do not reuse them. Users should wash hands before eating, drinking, chewing gum, using tobacco, or using the toilet.

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.

*Trademark of Dow AgroSciences LLC

MATERIAL SAFETY DATA SHEET



Emergency Phone: 800-992-5994
Dow AgroSciences LLC
Indianapolis, IN 46268

Effective Date: 3/30/04
Product Code: 72690
MSDS: 000405

CURFEW* SOIL FUMIGANT

8. EXPOSURE CONTROLS/PERSONAL PROTECTION:

These precautions are suggested for conditions where a potential for exposure exists. Emergency conditions may require additional precautions.

EXPOSURE GUIDELINE: 1,3-Dichloropropene: ACGIH TLV is 1 ppm, Skin.

ENGINEERING CONTROLS: Provide general and/or local exhaust ventilation to control airborne levels below the exposure guideline. Lethal concentrations may exist in areas with poor ventilation.

RECOMMENDATIONS FOR MANUFACTURING, COMMERCIAL BLENDING, & PACKAGING WORKERS:

RESPIRATORY PROTECTION: Atmospheric levels should be maintained below the exposure guideline. When respiratory protection is required use a NIOSH approved self-contained breathing apparatus or positive pressure airline with auxiliary self-contained air supply. For emergency and other conditions where the exposure guideline may be exceeded, use a NIOSH approved positive-pressure self-contained breathing apparatus or positive-pressure airline with auxiliary self-contained air supply. In confined or poorly ventilated areas, use a NIOSH approved self-contained breathing apparatus or positive pressure airline with auxiliary self-contained breathing apparatus or positive pressure airline with auxiliary self-contained air supply.

SKIN PROTECTION: Use protective clothing chemically resistant to this material. Selection of specific items such as faceshield, gloves, boots, and apron or full-body suit will depend on operation. Safety shower should be located in immediate work area. Remove contaminated clothing immediately, wash skin area with soap and water, and launder clothing before reuse or dispose of properly. Items, which cannot be decontaminated, such as shoes, belts and watchbands, should be removed and disposed of properly.

EYE/FACE PROTECTION: Use chemical goggles. If vapor exposure causes eye discomfort, use a NIOSH approved full-face respirator.

APPLICATORS AND ALL OTHER HANDLERS: Refer to the product label for personal protective clothing and equipment.

9. PHYSICAL AND CHEMICAL PROPERTIES:

BOILING POINT: Approximately 220°F (104°C)

VAPOR PRESSURE: 28 mm Hg at 25°C (77°F)

VAPOR DENSITY: Not applicable

SOLUBILITY IN WATER: Approximately 0.1%

SPECIFIC GRAVITY: 1.211 at 20°C (68°F)

APPEARANCE: Colorless to straw colored liquid

ODOR: Pungent, sweet, penetrating odor

10. STABILITY AND REACTIVITY:

STABILITY: (CONDITIONS TO AVOID) May form explosive mixtures with air when confined.

INCOMPATIBILITY: (SPECIFIC MATERIALS TO AVOID)

Corrosive to some metals. Do not use containers or equipment containing aluminum, magnesium, zinc, cadmium, or their alloys. Avoid strong bases.

HAZARDOUS DECOMPOSITION PRODUCTS: Hydrogen chloride and other toxic, irritating gases may be formed if product is involved in fire.

HAZARDOUS POLYMERIZATION: Not known to occur.

11. TOXICOLOGICAL INFORMATION:

POTENTIAL HEALTH EFFECTS: This section includes possible adverse effects, which could occur if this material is not handled in the recommended manner.

EYE: May cause severe eye irritation and slight corneal injury. Vapor may cause lacrimation (tears). Vapor may cause eye irritation experienced as mild discomfort and redness.

SKIN: Prolonged or widespread skin contact may result in absorption of harmful amounts. The LD₅₀ for skin absorption in rabbits is 333 mg/kg. Prolonged or repeated exposure may cause skin irritation, even a burn. Animal data indicate that 1,3-dichloropropene is a potential skin sensitizer.

*Trademark of Dow AgroSciences LLC

MATERIAL SAFETY DATA SHEET



Emergency Phone: 800-992-5994
Dow AgroSciences LLC
Indianapolis, IN 46268

CURFEW* SOIL FUMIGANT

Effective Date: 3/30/04
Product Code: 72690
MSDS: 000405

INGESTION: Moderate toxicity if swallowed. The oral LD₅₀ for rats is 300 mg/kg (males) and 224 mg/kg (females). Small amounts swallowed incidental to normal handling operations is not likely to cause injury; however, swallowing larger amounts may cause serious injury, even death. Aspiration into the lungs may occur during ingestion or vomiting, resulting in rapid absorption and injury to other body systems.

INHALATION: Easily attainable vapor concentrations may cause serious adverse effects, even death. Excessive exposure may cause irritation to upper respiratory tract (nose and throat) and lungs. The vapor LC₅₀ for rats is 855-1035 ppm for 4 hours (males) and 904 ppm for 4 hours (females).

SYSTEMIC (OTHER TARGET ORGAN) EFFECTS: In animals, effects have been reported on the following organs: bladder, kidney, liver, lungs, stomach, and upper respiratory tract.

CANCER INFORMATION: Has been shown to cause cancer in laboratory animals by the oral route. Inhalation exposure resulted in an increase in the normal occurrence of benign lung tumors in male mice. For hazard communications purposes under OSHA Standard 29 CFR Part 1910.1200, this chemical is listed as a potential carcinogen by IARC and NTP.

TERATOLOGY (BIRTH DEFECTS): Birth defects are unlikely. Even exposures having an adverse effect on the mother should have no effect on the fetus.

REPRODUCTIVE EFFECTS: In animal studies, has been shown not to interfere with reproduction.

MUTAGENICITY: In-vitro mutagenicity studies were negative in some cases and positive in other cases. Animal mutagenicity studies were negative.

12. ECOLOGICAL INFORMATION:

ENVIRONMENTAL FATE:

MOVEMENT & PARTITIONING:

Based largely or completely on information for a similar material.

Potential for mobility in soil is very high (Koc between 0 and 50).

Bioconcentration potential is low (BCF is <100 or Log Pow <3).

DEGRADATION & PERSISTENCE:

Based largely or completely on information for a similar material.

Degradation is expected in the atmospheric environment within minutes to hours.

Degradation is expected in the atmospheric environment within days to weeks.

Degradation is expected in the soil environment within days to weeks.

1,3-Dichloropropene has a stratospheric ozone depletion potential (ODP) of 0.002, relative to CFC 12 (ODP=1).

ECOTOXICOLOGY:

Material is very highly toxic to aquatic organisms on an acute basis (LC₅₀ or EC₅₀ is between 0.1 and 1 mg/L in most sensitive species tested).

Acute LC₅₀ in bluegill (*Lepomis macrochirus*) is 3.84-6.82 mg/L.

Acute LC₅₀ in rainbow trout (*Oncorhynchus mykiss*) is 2.78-4.63 mg/L.

Acute LC₅₀ in saltwater mysid (*Mysidopsis bahia*) is 0.70 mg/L.

Acute LC₅₀ in sheepshead minnow (*Cyprinodon variegatus*) is 0.91 mg/L.

Acute EC₅₀ for shell deposition inhibition in Eastern oyster (*Crassostrea virginica*) is 0.67 mg/L.

Maximum acceptable toxicant concentration (MATC) in water flea (*Daphnia magna*) is 0.0892 mg/L.

Maximum acceptable toxicant concentration (MATC) in fish early life-stage study is 0.154 mg/L.

Material is moderately toxic to birds on an acute basis (LD₅₀ is between 51 and 500 mg/kg).

MATERIAL SAFETY DATA SHEET



Emergency Phone: 800-992-5994
Dow AgroSciences LLC
Indianapolis, IN 46268

Effective Date: 3/30/04
Product Code: 72690
MSDS: 000405

CURFEW* SOIL FUMIGANT

Material is practically non-toxic to birds on a dietary basis (LC₅₀ is >5000 ppm).

Acute oral LD₅₀ in bobwhite (*Colinus virginianus*) is 152 mg/kg.

Dietary LC₅₀ in bobwhite (*Colinus virginianus*) is >5620 ppm.

Dietary LC₅₀ in mallard (*Anas platyrhynchos*) is >5620 ppm.

Growth inhibition EC₅₀ in marine diatom (*Skeletonema costatum*) is 13.2 mg/L.

Growth inhibition EC₅₀ in diatom (*Navicula sp.*) is 0.29 mg/L.

Growth inhibition EC₅₀ in blue-green alga (*Anabaena flos-aquae*) is 16.1 mg/L.

Growth inhibition EC₅₀ in duckweed (*Lemna sp.*) is 3.60 mg/L.

Growth inhibition EC₅₀ in green alga (*Selenastrum capricornutum*) is 15.8 mg/L.

13. DISPOSAL CONSIDERATIONS:

DISPOSAL METHOD: If wastes and/or containers cannot be disposed of according to the product label directions, disposal of this material must be in accordance with your local or area regulatory authorities.

This information presented below only applies to the material as supplied. The identification based on characteristic(s) or listing may not apply if the material has been used or otherwise contaminated. It is the responsibility of the waste generator to determine the toxicity and physical properties of the material generated to determine the proper waste identification and disposal methods in compliance with applicable regulations.

If the material as supplied becomes a waste, follow all applicable regional, national and local laws and regulations.

14. TRANSPORT INFORMATION:

U.S. DEPARTMENT OF TRANSPORTATION (DOT) INFORMATION:

FOR SAMPLE SHIPMENTS BY AIR:

PESTICIDES, LIQUID, TOXIC, FLAMMABLE, N.O.S.
(1,3-DICHLOROPROPENE)/6.1(3)/UN2903/PGII
Authorization: DOT-9168; Packing Inst: 609

FOR 1 GALLON CONTAINERS SHIPPED BY LAND:

PESTICIDES, LIQUID, TOXIC, FLAMMABLE, N.O.S.
(1,3-DICHLOROPROPENE)/6.1(3)/UN2903/PGII

FOR QUANTITIES OF 102 POUNDS OR MORE SHIPPED BY LAND OR WATER:

PESTICIDES, LIQUID, TOXIC, FLAMMABLE, N.O.S.
(1,3-DICHLOROPROPENE)/6.1(3)/UN2903/PGII/RQ
(1,3-DICHLOROPROPENE)

MATERIAL SAFETY DATA SHEET



Emergency Phone: 800-992-5994
Dow AgroSciences LLC
Indianapolis, IN 46268

CURFEW* SOIL FUMIGANT

Effective Date: 3/30/04
Product Code: 72690
MSDS: 000405

15. REGULATORY INFORMATION:

NOTICE: The information herein is presented in good faith and believed to be accurate as of the effective date shown above. However, no warranty, express or implied, is given. Regulatory requirements are subject to change and may differ from one location to another; it is the buyer's responsibility to ensure that its activities comply with federal, state or provincial, and local laws. The following specific information is made for the purpose of complying with numerous federal, state or provincial, and local laws and regulations.

U.S. REGULATIONS

SARA 313 INFORMATION: This product contains the following substances subject to the reporting requirements of Section 313 of Title III of the Superfund Amendments and Reauthorization Act of 1986 and 40 CFR Part 372:

<u>CHEMICAL NAME</u>	<u>CAS NUMBER</u>	<u>CONCENTRATION</u>
1,3-Dichloropropene	000542-75-6	97.5%
TRANS-1,3-D	010061-02-6	45%

NOTE: CAS# 000542-75-6 includes both the cis and trans isomers of 1,3-dichloropropene (also known as 1,3-dichloropropylene), and it is on the SARA 313 list. The CAS number for the trans isomer, 010061-02-6, is also on the SARA 313 list, but the CAS# for the cis isomer, 010061-01-5, is not on the SARA 313 list.

CONSENT ORDER FOR PMN (UNITED STATES)

In the United States, a component of this material, cis-1,3-dichloropropene (DR-0019-3180), was reviewed by the Environmental Protection Agency under PMN 88-608. There was no resulting consent order. However, the EPA is concerned that, based on an analogous chemical structure, this PMN material may cause oncogenicity, mutagenicity, neurotoxicity, and developmental toxicity and may present an unreasonable risk to unprotected workers. The EPA strongly recommends that, to mitigate inhalation exposure, workers should wear a NIOSH-approved respirator and, to mitigate dermal exposure, should wear adequate protective clothing which covers any exposed parts of the body, impervious gloves, and chemical safety goggles or equivalent.

SARA HAZARD CATEGORY: This product has been reviewed according to the EPA "Hazard Categories" promulgated under Sections 311 and 312 of the Superfund Amendment and Reauthorization Act of 1986 (SARA Title III) and is considered, under applicable definitions, to meet the following categories:

An immediate health hazard
A delayed health hazard
A fire hazard

CALIFORNIA PROPOSITION 65: The following statement is made in order to comply with the California Safe Drinking Water and Toxic Enforcement Act of 1986: This product contains a chemical(s) known to the State of California to cause cancer. The chemical is 1,3-Dichloropropene (CAS # 000542-75-6)

TOXIC SUBSTANCES CONTROL ACT (TSCA): All ingredients are on the TSCA inventory or are not required to be listed on the TSCA inventory.

STATE RIGHT-TO-KNOW: The following product components are cited on certain state lists as mentioned. Non-listed components may be shown in the composition section of the MSDS.

<u>CHEMICAL NAME</u>	<u>CAS NUMBER</u>	<u>LIST</u>
1,3-Dichloropropene	000542-75-6	NJ3, NJ2, NJ1 PA3, PA2, PA1

NJ1=New Jersey Special Health Hazard Substance (present at > or = to 0.1%).
NJ2=New Jersey Environmental Hazardous Substance (present at > or = to 1.0%).
NJ3=New Jersey Workplace Hazardous Substance (present at > or = to 1.0%).
PA1=Pennsylvania Hazardous Substance (present > or = to 1.0%).
PA2=Pennsylvania Special Hazardous Substance (present at > or = to 0.01%).
PA3=Pennsylvania Environmental Hazardous Substance (present at > or = to 1.0%).

*Trademark of Dow AgroSciences LLC

MATERIAL SAFETY DATA SHEET



Emergency Phone: 800-992-5994
Dow AgroSciences LLC
Indianapolis, IN 46268

CURFEW* SOIL FUMIGANT

Effective Date: 3/30/04
Product Code: 72690
MSDS: 000405

OSHA HAZARD COMMUNICATION STANDARD: This product is a "Hazardous Chemical" as defined by the OSHA Hazard Communication Standard, 29 CFR 1910.1200.

NATIONAL FIRE PROTECTION ASSOCIATION (NFPA) RATINGS:

<u>Category</u>	<u>Rating</u>
Health	3
Flammability	3
Reactivity	0

COMPREHENSIVE ENVIRONMENTAL RESPONSE COMPENSATION AND LIABILITY ACT (CERCLA, or SUPERFUND): This product contains the following substance(s) listed as "Hazardous Substances" under CERCLA, which may require reporting of releases:

<u>Chemical Name</u>	<u>CAS Number</u>	<u>RQ</u>	<u>% in Product</u>
1,3-Dichloropropene	000542-75-6	100	97.5%

16. OTHER INFORMATION:

MSDS STATUS: Revised Sections: 3, 4, 11 & 13
Reference: DR-0166-7465
Replaces MSDS dated: 2/9/04
Document Code: D03-089-006
Replaces Document Code: D03-089-005

The Information Herein Is Given In Good Faith, But No Warranty, Express or Implied, Is Made. Consult Dow AgroSciences for Further Information.