

Material Safety Data Sheet



Release™ Silvicultural Herbicide

™Trademark of Dow AgroSciences LLC

In case of emergency Call CANUTEC at 613 996 6666

1. Product Identification:**Product name:** Release Silvicultural Herbicide**Product use:** Intended for the control of undesirable woody plants and annual and perennial broadleaved weeds in forest and woodland management areas.**Product code number:** 28174**GMID numbers:** 251066, 251067, 283116**Effective date:** March 20, 2009**Supplier:**Dow AgroSciences Canada Inc.
Suite 2100, 450 - 1st Street SW,
Calgary, Alberta,
Canada, T2P 5H1
www.dowagro.ca

This product is regulated under authority of the Pest Control Products Act

2. Composition:

| Component | CAS Number | % (w/w) |
|---|------------|-------------------|
| Triclopyr (as butoxy ethyl ester)(BEE) | 64700-56-7 | 61.6 |
| Kerosene | 8008-20-6 | >= 18.6 - <= 31.0 |
| Ethylene glycol monobutyl ether | 111-76-2 | 0.5 |
| Solvent naphtha (petroleum), light aromatic | 64742-95-6 | 0.2 |
| Balance | | >= 6.7 - <= 19.1 |

3. Hazard Identification:**Emergency Overview:**

A yellow liquid with a gasoline-like odor. May cause eye and skin irritation. May cause allergic skin reaction.

Potential Health Effects:**Eyes:** May cause eye irritation. Corneal injury is unlikely. May cause pain disproportionate to the level of irritation to eye tissues.**Skin contact:** Brief contact may cause moderate skin irritation with local redness. Prolonged or repeated contact may cause moderate skin irritation with local redness. May cause drying or flaking of the skin.**Skin absorption:** Prolonged skin contact is unlikely to result in absorption of harmful amounts. Repeated skin contact may result in this product being absorbed in harmful amounts.**Skin sensitization:** Has caused allergic skin reactions when tested in guinea pigs. With the dilute mix, no allergic skin reaction is expected.**Ingestion:** Low toxicity if swallowed. Small amounts swallowed incidental to normal handling operations are not likely to cause injury; however, swallowing larger amounts may cause injury. Aspiration into the lungs may occur during ingestion or vomiting, causing lung damage or even death due to chemical pneumonia.**Inhalation:** Prolonged excessive exposure to mist may cause adverse effects. Mist may cause irritation of upper respiratory tract (nose and throat).**4. First - Aid Measures:****Consult a physician in every case of suspected chemical poisoning. Never give fluids or induce vomiting if a patient is unconscious or convulsing regardless of cause of injury. If breathing difficulties occur seek medical attention at once.****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, 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:** Immediately call a poison control center or doctor. Do not induce vomiting unless told to do so by a poison control center or doctor. Do not give any liquid to the person. Do not give anything by mouth to an unconscious person.

Material Safety Data Sheet



Release™ Silvicultural Herbicide

™Trademark of Dow AgroSciences LLC

In case of emergency Call CANUTEC at 613 996 6666

Inhalation: Move person to fresh air. If person is not breathing, call an emergency responder or ambulance, 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.

Note to physician:

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. No specific antidote. Treatment of exposure should be directed at the control of symptoms and the clinical condition of the patient. Have the Safety Data Sheet, and if available, the product container or label with you when calling a poison control center or doctor, or going for treatment.

Medical conditions aggravated by exposure:

Skin contact may aggravate preexisting dermatitis.

5. Fire-fighting Measures:

Auto-ignition temperature: Not available

Flash point: 64°C (TCC)

Flammability limits: Not determined

Extinguishing media: Water fog or fine spray, CO₂, dry chemical or foam. Alcohol resistant foams (ATC type) are preferred. General purpose synthetic foams (including AFFF) or protein foams may function, but will be less effective.

Fire fighting procedures: Keep people away. Isolate fire and deny unnecessary entry. Consider feasibility of a controlled burn to minimize environment damage. Foam fire extinguishing system is preferred because uncontrolled water can spread possible contamination. Use water spray to cool fire exposed containers and fire affected zone until fire is out and danger of reignition has passed. Fight fire from protected location or safe distance. Consider the use of unmanned hose holders or monitor nozzles. Immediately withdraw all personnel from the area in case of rising sound from venting safety device or discoloration of the container. Burning liquids may be extinguished by dilution with water. Do not use direct water stream. May spread fire.

Move container from fire area if this is possible without hazard. Burning liquids may be moved by flushing with water to protect personnel and minimize property damage. Contain fire water run-off if possible. Fire water run-off, if not contained, may cause environmental damage. Review the "Accidental Release Measures" and the "Ecological Information" sections of this (M)SDS.

Special protective equipment for firefighters:

Wear positive-pressure self-contained breathing apparatus (SCBA) and protective fire fighting clothing (includes fire fighting helmet, coat, trousers, boots, and gloves). Avoid contact with this material during fire fighting operations. If contact is likely, change to full chemical resistant fire fighting clothing with self-contained breathing apparatus. If this is not available, wear full chemical resistant clothing with self-contained breathing apparatus and fight fire from a remote location. For protective equipment in post-fire or non-fire clean-up situations, refer to the relevant sections.

Unusual fire and explosion hazards:

Container may rupture from gas generation in a fire situation. Violent steam generation or eruption may occur upon application of direct water stream to hot liquids. Dense smoke is produced when product burns.

Hazardous combustion products: During a fire, smoke may contain the original material in addition to combustion products of varying composition which may be toxic and/or irritating. Combustion products may include and are not limited to: phosgene, nitrogen oxides, hydrogen chloride, carbon monoxide and carbon dioxide.

6. Accidental Release Measures:

Steps to be Taken if Material is Released or Spilled: Contain spilled material if possible.

Small spills: Absorb with materials such as: clay, dirt or sand. Sweep up. Collect in suitable and properly labeled containers. Large spills: contact CANUTEC at 613 996 6666 and local authorities.

Personal Precautions: Use appropriate safety equipment. For additional information, refer to Section 8, Exposure Controls and Personal Protection.

Material Safety Data Sheet



Release™ Silvicultural Herbicide

™Trademark of Dow AgroSciences LLC

In case of emergency Call CANUTEC at 613 996 6666

Environmental Precautions: Prevent from entering into soil, ditches, sewers, waterways and/or groundwater. See Section 12, Ecological Information.

7. Handling and Storage:**Handling**

General Handling: Containers, even those that have been emptied, can contain vapors. Do not cut, drill, grind, weld, or perform similar operations on or near empty containers. Spills of these organic materials on hot fibrous insulations may lead to lowering of the autoignition temperatures possibly resulting in spontaneous combustion. Keep out of reach of children. Do not swallow. Avoid breathing vapor or mist. Avoid contact with eyes, skin and clothing. Use with adequate ventilation. Wash thoroughly after handling.

Storage

Store in a dry place. Store in original container. Keep container tightly closed. Do not store near food, foodstuffs, drugs or potable water supplies.

8. Exposure Controls, Personal Protection and Exposure limits:**Exposure Limits:**

| Component | List | Type | Value |
|--------------------------------------|------------|---|--|
| Kerosene (petroleum) | Dow IHG | TWA as total hydrocarbon vapor | 10 mg/m ³ SKIN |
| | CAD BC OEL | TWA Non-aerosol, as total hydrocarbon vapor | 200 mg/m ³ SKIN |
| | ACGIH | TWA Non-aerosol as total hydrocarbon vapor | 200 mg/m ³ P: Application restricted to conditions in which there are negligible aerosol exposures. |
| | CAD ON OEL | TWA as total hydrocarbon vapor | 200 mg/m ³ SKIN |
| Triclopyr-2-butoxyethyl ester | Dow IHG | TWA | 2 mg/m ³ D-SEN |

A "skin" notation following the inhalation exposure guideline refers to the potential for dermal absorption of the material. It is intended to alert the reader that inhalation may not be the only route of exposure and that measures to minimize dermal exposures should be considered.

Engineering controls: Use engineering controls to maintain airborne level below exposure limit requirements or guidelines. If there are no applicable exposure limit requirements or guidelines, use only with adequate ventilation. Local exhaust ventilation may be necessary for some operations.

Respiratory Protection: Respiratory protection should be worn when there is a potential to exceed the exposure limit requirements or guidelines. If there are no applicable exposure limit requirements or guidelines, wear

Material Safety Data Sheet



Release™ Silvicultural Herbicide

™Trademark of Dow AgroSciences LLC

In case of emergency Call CANUTEC at 613 996 6666

respiratory protection when adverse effects, such as respiratory irritation or discomfort have been experienced, or where indicated by your risk assessment process. In misty atmospheres, use an approved particulate respirator. The following should be effective types of air-purifying respirators: organic vapor cartridge with a particulate pre-filter.

Skin Protection: Use protective clothing chemically resistant to this material. Selection of specific items such as face-shield, boots, apron or full body suit will depend on the task. Remove contaminated clothing immediately, wash skin 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.

Hand Protection: Use gloves chemically resistant to this material. Examples of preferred glove barrier materials include: chlorinated polyethylene, neoprene, nitrile/butadiene rubber (nitrile or NBR), polyethylene, and ethyl vinyl alcohol laminate (EVAL). Examples of acceptable glove barrier materials include: butyl rubber, natural rubber (latex), polyvinyl chloride (PVC or vinyl) and viton. NOTICE: The selection of a specific glove for a particular application and duration of use in a workplace should also take into account all relevant workplace factors such as, but not limited to: other chemicals which may be handled, physical requirements (cut/puncture protection, dexterity, thermal protection), potential body reactions to glove materials, as well as the instructions/specifications provided by the glove supplier.

Eyes: Use safety glasses

9. Physical and Chemical Properties:

Boiling point: $\geq 150^{\circ}\text{C}$

Vapor pressure: 0.1 mm Hg at 37.8°C (as kerosene)

Vapor density: 1

pH: 6.4

Appearance: Yellow liquid

Odor: Gasoline-like

Coefficient of water/oil distribution: Not available

Specific gravity: 1.08

Evaporation rate: Not available

Solubility in water: Emulsifies

Freezing point: No test data available

Odor threshold: No test data available

10. Stability and Reactivity:

Stability: Thermally stable at typical use temperatures.

Conditions to Avoid: Active ingredient decomposes at elevated temperatures. Generation of gas during decomposition can cause pressure in closed systems.

Incompatible Materials: Avoid contact with: acids, bases, and oxidizers.

Hazardous decomposition products:

Decomposition products depend upon temperature, air supply and the presence of other materials. Decomposition products can include and are not limited to: carbon monoxide, carbon dioxide, hydrogen chloride, nitrogen oxides and phosgene. Toxic gases are released during decomposition.

Hazardous polymerization: Will not occur

11. Toxicological Information:

Skin absorption: LD50 (rabbit) is >2000 mg/kg.

Ingestion: LD50 (rat) is 1581 mg/kg (male) and 1338 mg/kg (female).

Inhalation: LC50, 4 h, aerosol (rat) is >5.2 mg/l.

Sensitization Skin: Has caused allergic skin reactions when tested in guinea pigs. With the dilute mix, no allergic skin reaction is expected.

Repeated Dose Toxicity: In animals, effects have been reported on the following organs: skin. Repeated excessive exposure may cause adverse effects.

Chronic Toxicity and Carcinogenicity: Active ingredient did not cause cancer in laboratory animals. In a lifetime animal dermal carcinogenicity study, an increased incidence of skin tumors was observed when kerosene was applied at doses that also produced skin irritation. The response was similar to that produced in skin by other types of chronic chemical/physical irritation. No increase in tumors was observed when non-irritating dilutions of kerosene were applied at equivalent doses, indicating that kerosene is unlikely to cause skin cancer in the absence of long-term continued skin irritation. In long-term animal

Material Safety Data Sheet



Release™ Silvicultural Herbicide

™Trademark of Dow AgroSciences LLC

In case of emergency Call CANUTEC at 613 996 6666

studies with ethylene glycol butyl ether, small but statistically significant increases in tumors were observed in mice but not rats. The effects are not believed to be relevant to humans. If the material is handled in accordance with proper industrial handling practices, exposures should not pose a carcinogenic risk to man.

Developmental Toxicity: The active ingredient has been toxic to the fetus in laboratory animals at doses toxic to the mother. Active ingredient did not cause birth defects in laboratory animals. For the minor component(s), has caused birth defects in lab animals only at doses producing severe toxicity in the mother. Has been toxic to the fetus in laboratory animals at doses toxic to the mother. Kerosene did not cause birth defects or any other fetal effects in laboratory animals.

Reproductive Toxicity: For similar active ingredient, triclopyr, and for the minor component(s), in laboratory animal studies, effects on reproduction have been seen only at doses that produced significant toxicity to the parent animals. For kerosene, limited data in laboratory animals suggest that the material does not affect reproduction.

Genetic Toxicology: For the active ingredient and for kerosene, in-vitro genetic toxicity studies were negative. For the active ingredient and for the minor component(s) tested, animal genetic toxicity studies were negative.

12. Ecological Information: **ENVIRONMENTAL FATE**

Data for component: Triclopyr-2-butoxyethyl ester.

Movement & Partitioning

Bioconcentration potential is moderate (BCF between 100 and 3000 or Log Pow between 3 and 5).

Based largely or completely on information for a similar material, potential for mobility in soil is medium (Koc between 150 and 500).

Persistence & Degradability

Chemical degradation (hydrolysis) is expected in the environment.

Fails to pass OECD/EEC tests for ready biodegradability.

Data for component: Kerosene (petroleum)

Movement & Partitioning

Based largely or completely on component information. Bioconcentration potential is high (BCF >3000 or Log Pow between 5 and 7).

Persistence & Degradability

Biodegradation under aerobic static laboratory conditions is high (BOD20 or BOD28/ThOD >40%).

Data for component: Ethylene glycol monobutyl ether

Movement & Partitioning

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

Potential for mobility in soil is high (Koc between 50 and 150).

Persistence & Degradability

Material is readily biodegradable.

Passes OECD test(s) for ready biodegradability.

Material is ultimately biodegradable (reaches >70% mineralization in OECD test(s) for inherent biodegradability).

Data for component: Solvent naphtha (petroleum), light aromatic

Movement & Partitioning

For the major component(s), bioconcentration potential is moderate (BCF between 100 and 3000 or Log Pow between 3 and 5).

Potential for mobility in soil is low (Koc between 500 and 2000).

For the minor component(s), bioconcentration potential is low (BCF <100 or Log Pow <3).

Persistence & Degradability

For the major component(s), biodegradation under aerobic static laboratory conditions is high (BOD20 or BOD28/ThOD >40%). For some component(s), biodegradation under aerobic static laboratory conditions is low (BOD20 or BOD28/ThOD between 2.5 and 10%).

ECOTOXICITY

Material Safety Data Sheet



Release™ Silvicultural Herbicide

™Trademark of Dow AgroSciences LLC

In case of emergency Call CANUTEC at 613 996 6666

Material is highly toxic to aquatic organisms on an acute basis (LC50 or EC50 between 0.1 and 1 mg/L in the most sensitive species tested). Material is slightly toxic to birds on an acute basis (LD50 between 501 and 2000 mg/kg).

Fish Acute & Prolonged Toxicity

LC50, fathead minnow (*Pimephales promelas*), static, 96 h: 2.2 – 6.3 mg/l

LC50, rainbow trout (*Oncorhynchus mykiss*), flow-through, 96 h: 0.1 – 8.98 mg/l

Aquatic Invertebrate Acute Toxicity

LC50, water flea *Daphnia magna*, static, 48 h, survival: 1.7 – 18.8 mg/l

LC50, water flea *Daphnia magna*, flow-through, 48 h, survival: 0.43 mg/l

Aquatic Plant Toxicity

EC50, green alga *Pseudokirchneriella subcapitata* (formerly known as *Selenastrum capricornutum*), biomass growth inhibition, 5 d: 13.3 mg/l

Toxicity to Non-mammalian Terrestrial Species

Oral LD50, bobwhite (*Colinus virginianus*): 1,350 mg/kg

Oral LD50, Honey bee (*Apis mellifera*): >100 micrograms/bee

Contact LD50, Honey bee (*Apis mellifera*): >100 micrograms/bee

Toxicity to Soil Dwelling Organisms

LC50, Earthworm *Eisenia foetida*, adult, 7 d: 910 mg/kg

13. Disposal Considerations:

Unused unwanted product: Contact Dow AgroSciences or your provincial regulatory agency for disposal information.

Container disposal: Refer to the product label for instructions regarding cleaning and disposal of empty pesticide containers. If these instructions are missing or not understood, contact Dow AgroSciences at 800 667 3852 or your provincial regulatory agency for direction.

14. Transport Information:

TDG Small container

NOT REGULATED

TDG Large container

NOT REGULATED

IMDG

Proper Shipping Name: ENVIRONMENTALLY HAZARDOUS SUBSTANCES, LIQUID, N.O.S.

Technical Name: Contains Triclopyr-2-butoxyethyl Ester, KEROSENE

Hazard Class: 9 ID Number: UN3082

Packing Group: PG III

EMS Number: f-a,s-f

Marine Pollutant: Yes

IACO/IATA

NOT REGULATED

15. Regulatory Information:

Pest Control Products Act registration number: 22093

For information phone: 800 667 3852

Master reference: 004788

MSDS status: Revised Sections: 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12 & 14

Replaces MSDS dated: November 17, 2006

16. Other Information:

National Fire Code classification: Class IIIA

NFPA ratings: Health: 2; Flammability: 2; Reactivity: 1.

Notice: The information contained in this Material Safety Data Sheet ("MSDS") is current as of the effective date shown in Section 1 of this MSDS and may be subject to amendment by Dow AgroSciences Canada Inc. ("DASCI") at any time. DASCI accepts no liability whatsoever which results in any way from the use of MSDS, which are not published by DASCI, or have been amended without DASCI express written authorization. Users of this MSDS must satisfy themselves that they have the most recent and authorized version of this MSDS and shall bear all responsibility and liability with respect thereto. Any conflict or inconsistencies as to the contents of this MSDS shall be resolved in favor of DASCI by the most recent version of the MSDS published by DASCI.