

MATERIAL SAFETY DATA SHEET



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

Effective Date: 9-Jul-07
Product Code: 01662
MSDS: 001715

CROSSBOW* HERBICIDE

1. PRODUCT AND COMPANY IDENTIFICATION:

PRODUCT: Crossbow* Herbicide

COMPANY IDENTIFICATION:

Dow AgroSciences
9330 Zionsville Road
Indianapolis, IN 46268-1189

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.

2. HAZARDOUS IDENTIFICATIONS:

EMERGENCY OVERVIEW

Reddish brown liquid with sweet odor. May cause eye and skin irritation. Flash Point: 148°F (64C). Toxic to aquatic organisms.

EMERGENCY PHONE NUMBER: 800-992-5994

5. FIRE FIGHTING MEASURES:

FLASH POINT: 148°F (64.4C)

METHOD USED: Setaflash

FLAMMABLE LIMITS

LFL: Not determined

UFL: Not determined

3. COMPOSITION/INFORMATION ON INGREDIENTS:

COMPONENT	CAS NUMBER	W/W%
2,4-D BEE	1929-73-3	34.4
Triclopyr BEE	64700-56-7	16.5
Kerosene	8008-20-6	41.5
Balance		7.6

EXTINGUISHING MEDIA: Water fog, foam, CO₂, dry chemical.

FIRE & EXPLOSION HAZARDS: Combustible. Noxious fumes under fire conditions. Contain water from fire fighting to prevent entry to surface and ground water.

FIRE-FIGHTING EQUIPMENT: Use positive pressure self-contained breathing apparatus and full protective clothing.

4. FIRST AID:

EYES: Flush eyes thoroughly with water for several minutes. Remove contact lenses after initial 1-2 minutes and continue flushing for several additional minutes. If affects occur, consult a physician, preferably an ophthalmologist.

SKIN: Wash skin with plenty of water.

INGESTION: Do not induce vomiting. Call a physician and/or transport to emergency facility immediately.

INHALATION: Move person to fresh air. If not breathing, give artificial respiration; if by mouth to mouth use rescuer protection (pocket mask, etc.). If breathing is difficult, oxygen should be administered by qualified personnel. Call a physician or transport to a medical facility.

6. ACCIDENTAL RELEASE MEASURES:

ACTION TO TAKE FOR SPILLS/LEAKS: Use appropriate safety equipment. Use non-combustible absorbent material, such as sand or Zorbball, and shovel into suitable container for disposal. Dike area in case of large spills and report to Dow AgroSciences at 800-992-5994. Do not use water for clean up.

7. HANDLING AND STORAGE:

PRECAUTIONS TO BE TAKEN IN HANDLING AND STORAGE:

HANDLING: Keep out of reach of children. Harmful if swallowed, inhaled, or absorbed through skin. Avoid contact with eyes, skin and clothing. Users should wash hands before eating, drinking, chewing gum, using tobacco, or using the toilet.

STORAGE: Keep product away from open flame. Do not exceed 140°F. Do not store with acids, bases or oxidizing materials. See product label for handling/storage precautions relative to the end use of this product.

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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(S):

Triclopyr, butoxyethyl ester: Dow AgroSciences Industrial Hygiene Guide is 2 mg/M³ as acid equivalent, D-SEN.

Kerosene: Dow AgroSciences Industrial Hygiene Guide is 10 mg/M³.

2,4-Dichlorophenoxyacetic acid, butoxyethyl ester: none established for the ester; ACGIH TLV and OSHA PEL are 10 mg/M³ for the acid.

A D-SEN notation following the exposure guideline refers to the potential to produce dermal sensitization, as confirmed by human or animal data.

ENGINEERING CONTROLS: Provide general and/or local exhaust ventilation to control airborne levels below the exposure guidelines.

RECOMMENDATIONS FOR MANUFACTURING, COMMERCIAL BLENDING, AND PACKAGING WORKERS:

RESPIRATORY PROTECTION: Atmospheric levels should be maintained below the exposure guidelines. When respiratory protection is required for certain operations, use an approved air-purifying respirator. The following should be effective types of air-purifying respirators: organic vapor cartridge.

SKIN PROTECTION: Use gloves chemically resistant to this material.

EYE PROTECTION: Use chemical goggles.

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

9. PHYSICAL AND CHEMICAL PROPERTIES:

BOILING POINT: >175C (kerosene)
VAP PRESS: 0.1mm @ 37.8C (kerosene)
VAP DENSITY: 4.7 (kerosene)
SOL. IN WATER: Forms an emulsion
SP. GRAVITY: 1.013 @ 20C/20C
APPEARANCE: Reddish brown liquid.
ODOR: Sweet odor.

10. STABILITY AND REACTIVITY:

STABILITY: (CONDITIONS TO AVOID) Avoid temperatures above or near flash point.

INCOMPATIBILITY: (SPECIFIC MATERIALS TO AVOID) Acid, base and oxidizing materials.

HAZARDOUS DECOMPOSITION PRODUCTS: Noxious fumes, nitrogen oxide, hydrogen chloride and phosgene may result under fire conditions.

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 moderate eye irritation. Corneal injury is unlikely.

SKIN: Brief contact may cause slight 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. Prolonged skin contact is unlikely to result in absorption of harmful amounts. The LD₅₀ for skin absorption in rabbits is >5,000 mg/kg.

INGESTION: Low toxicity if swallowed. The oral LD₅₀ for rats is 1,000-2,589 mg/kg (males) and 1,000-2,398 mg/kg (females). Small amounts swallowed incidentally as a result of 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.

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INHALATION: Excessive exposure may cause irritation to upper respiratory tract (nose and throat). May cause central nervous system effects. The LC₅₀ for rats is ~ 5 mg/L (males) and >5 mg/L (females).

SYSTEMIC (OTHER TARGET ORGAN) EFFECTS: Effects have been reported on the following organs: blood, gastrointestinal tract, kidney, liver, muscle, and respiratory tract.

CANCER INFORMATION: Triclopyr did not cause cancer in laboratory animals. Various animal cancer tests have shown no reliable positive association between 2,4-D exposure and cancer. Epidemiology studies on herbicide use have been both positive and negative with the majority being negative. 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. This 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.

TERATOLOGY (BIRTH DEFECTS): Did not cause birth defects; other fetal effects occurred only at doses toxic to the mother.

REPRODUCTIVE EFFECTS. Triclopyr, laboratory animal studies, effects on reproduction have been seen only at doses that produced significant toxicity to the parent animals. Excessive dietary levels of 2,4-D acid have caused decreased weight and survival in offspring in a rat reproduction study.

MUTAGENICITY: For the components tested, in-vitro and animal genetic toxicity studies were predominantly negative.

12. ECOLOGICAL INFORMATION:

ENVIRONMENTAL FATE:

MOVEMENT & PARTITIONING:

Based largely or completely on information for triclopyr and 2,4-D.

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

DEGRADATION & PERSISTENCE:

Based largely or completely on information for triclopyr and 2,4-D.

Chemical degradation (hydrolysis) is expected in the environment within minutes to hours.

Based largely or completely on information for kerosene.

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

ECOTOXICOLOGY:

Based largely or completely on information for triclopyr and 2,4-D.

Material is 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).

Based largely or completely on information for kerosene.

EC₅₀ is above the water solubility.

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 INFORMATION:

FOR 4 OUNCE, 12x1 QUART, 4x1 GALLON, AND 2x2.5 GALLON

BY LAND OR AIR:

Not regulated for transportation.

BY VESSEL:

ENVIRONMENTALLY HAZARDOUS SUBSTANCE, LIQUID, N.O.S. (2,4-D ACID)/9/UN3082/PGIII/MARINE POLLUTANT

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FOR 55 GALLON DRUMS

BY LAND OR AIR:

ENVIRONMENTALLY HAZARDOUS SUBSTANCE,
LIQUID, N.O.S. (2,4,D ACID)/9/UN3082/PGIII/RQ
(2,4-D ACID)

BY VESSEL:

ENVIRONMENTALLY HAZARDOUS SUBSTANCE,
LIQUID, N.O.S. (2,4-D ACID)/9/UN3082/PGIII/RQ
(2,4,D ACID)/MARINE POLLUTANT

FOR BULK SHIPMENTS

BY DOMESTIC OR VESSEL:

COMBUSTIBLE LIQUID, N.O.S./(3,5,6-TRICHLORO-
2-PYRIDINYLOXY-ACETIC ACID ETHYL ESTER)/
COMBUSTIBLE LIQUID/NA1993/PG III/RQ (2,4-D
ACID)/MARINE POLLUTANT

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:

Chemical Name	CAS Number	Concentration
2,4-D ESTERS	1929-73-3	34.4%

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

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.

CHEMICAL NAME	CAS NUMBER	LIST
2,4-D ESTERS	1929-73-3	PA3 NJ3 PA1
KEROSENE	8008-20-6	NJ3 PA1

NJ3=New Jersey Workplace Hazardous Substance (present at greater than or equal to 1.0%).
PA1=Pennsylvania Hazardous Substance (present at greater than or equal to 1.0%).
PA3=Pennsylvania Environmental Hazardous Substance (present at greater than or equal to 1.0%).

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:

Health	1
Flammability	2
Reactivity	0

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**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:
Category:

Chemical Name	CAS Number	RQ	% in Product
2,4-D BEE -	1929-73-3	100 lbs.	34.4

16. OTHER INFORMATION:

MSDS STATUS: Revised Section: 2,3,4,8,11,12,13
Reference: DR-0224-8411
Replaces MSDS dated: 12/23/03
Document Code: D03-032-004
Replaces Document Code: D03-032-003

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

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