

MATERIAL SAFETY DATA SHEET



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

CURTAIL* HERBICIDE

Effective Date: 8/1/01
Product Code: 08103
MSDS: 003053

1. PRODUCT AND COMPANY IDENTIFICATION:

PRODUCT: Curtail* Herbicide

COMPANY IDENTIFICATION:

Dow AgroSciences
9330 Zionsville Road
Indianapolis, IN 46268-1189

2. COMPOSITION/INFORMATION ON INGREDIENTS:

| | | |
|---|------------------|-------|
| 2,4-Dichlorophenoxyacetic acid, Triisopropanolamine salt | CAS# 000094-75-7 | 39.0% |
| Clopyralid Monoethanolamine salt | CAS# 057754-85-5 | 5.1% |
| Other Ingredients, Total, Including Triisopropanolamine ¹⁾ | CAS# 000122-20-3 | 55.9% |
| Ethylenediaminetetraacetic Acid | CAS# 000060-00-4 | |

¹⁾ Listed as 2-Propanol, 1,1',1"-nitrilotris by the Pennsylvania Right-to-Know Law.

This document is prepared pursuant to the OSHA Hazard Communication Standard (29 CFR 1910.1200). In addition, other substances not 'Hazardous' per this OSHA Standard may be listed. Where proprietary ingredient shows, the identity may be made available as provided in this standard.

3. HAZARDOUS IDENTIFICATIONS:

EMERGENCY OVERVIEW

Hazardous chemical. Dark, amber liquid with a phenolic odor. May cause severe eye irritation with corneal injury. May cause skin irritation. The LD₅₀ for skin irritation in rabbits is >4000 mg/kg. Oral LD₅₀ for rats is 3730 mg/kg (males) and 2830 mg/kg (females). Toxic to aquatic organisms.

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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 irritation with corneal injury, which may result in permanent impairment of vision, even blindness.

SKIN: Prolonged or repeated exposure may cause skin irritation. May cause more severe response if skin is abraded (scratched or cut). A single prolonged exposure is not likely to result in the material being absorbed through skin in harmful amounts. The LD₅₀ for skin absorption in rabbits is >4000 mg/kg.

INGESTION: Single dose oral toxicity is low. The oral LD₅₀ for rats is 3730 mg/kg (males) and 2830 mg/kg (females). Small amounts swallowed incidental to normal handling operations are not likely to cause injury; however, swallowing larger amounts may cause injury.

INHALATION: Single exposure to vapors is not likely to be hazardous.

SYSTEMIC (OTHER TARGET ORGAN) EFFECTS: In animals, effects have been reported on the following organs: gastrointestinal tract, kidney, liver, and muscular system. Signs and symptoms of excessive exposure may be nausea and/or vomiting, abdominal cramps and/or diarrhea. Lethargy may be a sign or symptom of excessive exposure.

CANCER INFORMATION: Clopyralid did not cause cancer in laboratory animals. Various animal cancer tests have shown no reliably 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.

TERATOLOGY (BIRTH DEFECTS): Has caused birth defects in lab animals only at doses producing severe toxicity in the mother (2,4-D TIP). Clopyralid caused birth defects in test animals, but only at greatly exaggerated doses that were severely toxic to the mothers. No birth defects were observed in animals given clopyralid at doses several times greater than those expected during normal exposure. The chelating agent component has been reported to cause birth defects in laboratory animals only at exaggerated doses that were toxic to the mother. These effects are likely associated with zinc deficiency due to chelation. Exposures having no effect on the mother should have no effect on the fetus.

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REPRODUCTIVE EFFECTS: In animal studies, clopyralid and the chelating agent have been shown not to interfere with reproduction. Excessive dietary levels of 2,4-D acid have caused decreased weight and survival in offspring in a rat reproduction study.

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, then continue rinsing eyes. Call a poison control center or doctor for treatment advice.

SKIN: Take off contaminated clothing. Rinse skin immediately with plenty of water for 15-20 minutes. Call a poison control center or doctor for treatment advice.

INGESTION: Call a 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. Do not give anything by mouth to an unconscious person.

INHALATION: Move person to fresh air. If person is not breathing, call 911 or ambulance, then give artificial respiration, preferably by mouth to mouth. Call a poison control center or doctor for further treatment advice.

NOTE TO PHYSICIAN: No specific antidote. Supportive care. Treatment based on judgment of the physician in response to reactions of the patient.

5. FIRE FIGHTING MEASURES:

FLASH POINT: >200°F (93°C)

METHOD USED: SCC

FLAMMABLE LIMITS

LFL: Not determined

UFL: Not determined

HAZARDOUS COMBUSTION PRODUCTS: Under fire conditions some components of this product may decompose. The smoke may contain unidentified toxic and/or irritating compounds. Hazardous combustion products may include and are not limited to nitrogen oxides, hydrogen chloride, carbon monoxide, and carbon dioxide.

OTHER FLAMMABILITY INFORMATION: This material will not burn until the water has evaporated. Residue can burn.

EXTINGUISHING MEDIA: To extinguish combustible residues of this product use water fog, carbon dioxide, dry chemical, or foam.

FIREFIGHTING INSTRUCTIONS: Keep people away. Isolate fire area and deny unnecessary entry. To extinguish combustible residues of this product use water fog, carbon dioxide, dry chemical, or foam. Contain firewater run-off if possible. Fire water run-off, if not contained may cause environmental damage. Review the "Accidental Release Measures" and "Ecological Information" sections of this MSDS.

PROTECTIVE EQUIPMENT FOR FIREFIGHTERS: Wear positive-pressure self-contained breathing apparatus (SCBA) and protective fire fighting clothing (includes fire fighting helmet, coat, pants, boots, and gloves). If protective equipment is not available or not used, fight fire from a protected location or safe distance.

6. ACCIDENTAL RELEASE MEASURES:

ACTION TO TAKE FOR SPILLS: Absorb small spills with materials such as Zorball or sand. Dike area in case of large spills and report to 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. Harmful if swallowed, inhaled, or absorbed through skin. Causes eye irritation. Avoid contact with eyes, skin and clothing. Users should wash hands before eating, drinking, chewing gum, using tobacco or using the toilet.

STORAGE: Do not store below temperature of 40°F (7°C). If frozen (crystallized), warm to 80-90°F (27-32°C) and re-dissolve before using by rolling or shaking the container. Store in a safe manner. Store in cool, dry place in original container only. Keep container tightly closed when not in use. Reduce stacking height where local conditions can affect packaging strength. Avoid elevated temperatures and direct sunlight.

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8. EXPOSURE CONTROLS/PERSONAL PROTECTION:

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

EXPOSURE GUIDELINE(S):

2,4-D: ACGIH TLV and OSHA PEL are 10 mg/M³.

ACGIH classification is A4.

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

Diethanolamine: ACGIH TLV is 2 mg/M³, Skin; OSHA PEL is 3 ppm.

PELs are in accord with those recommended by OSHA, as in the 1989 revision of PELs.

A "skin" notation following the 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: Provide general and/or local exhaust ventilation to control airborne levels below the exposure guideline.

RECOMMENDATIONS FOR MANUFACTURING, COMMERCIAL BLENDING, AND PACKAGING WORKERS:

RESPIRATORY PROTECTION: Atmospheric levels should be maintained below the exposure guideline. When respiratory protection is required for certain operations, use a NIOSH approved air-purifying respirator for organic vapors.

SKIN PROTECTION: Use gloves impervious to this material when prolonged or frequently repeated contact could occur. If hands are cut or scratched, use gloves impervious to this material even for brief exposures.

EYE/FACE PROTECTION: Use chemical goggles. Eye wash fountain should be located in immediate work area.

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

9. PHYSICAL AND CHEMICAL PROPERTIES:

BOILING POINT: 212°F (100°C) (water)

VAPOR PRESSURE: Not determined

VAPOR DENSITY: Not determined

SOLUBILITY IN WATER: Miscible

SPECIFIC GRAVITY: 1.154 (68/68)

FREEZING POINT: 10°F (-12°C)

APPEARANCE: Dark amber liquid

ODOR: Phenolic

10. STABILITY AND REACTIVITY:

STABILITY: Stable under recommended storage conditions.

CONDITIONS TO AVOID: Some components of this product can decompose at elevated temperatures.

HAZARDOUS DECOMPOSITION: Hazardous decomposition products depend upon temperature, air supply and the presence of other materials. Hazardous decomposition products may include and are not limited to chlorinated pyridine, hydrogen chloride, or nitrogen oxides.

INCOMPATIBLE MATERIALS: Avoid contact with metals such as brass, copper, aluminum, acids, halogenated organics, and oxidizers.

HAZARDOUS POLYMERIZATION: Not known to occur.

11. TOXICOLOGICAL INFORMATION:

MUTAGENICITY (EFFECTS ON GENETIC MATERIAL):

In-vitro and animal mutagenicity studies were negative for clopyralid. In-vitro and animal mutagenicity studies for 2,4-Dichlorophenoxyacetic acid were predominantly negative.

12. ECOLOGICAL INFORMATION:

ENVIRONMENTAL FATE:

MOVEMENT AND PARTITIONING:

Based largely or completely on component information. Bioconcentration potential is low (BCF <100 or Log Pow <3).

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DEGRADATION & PERSISTENCE: Based largely or complete on information for 2,4-D. Biodegradation under aerobic static laboratory conditions is high (BOD20 or BOD28/ThOD is greater than 40%). Based largely or completely on information for clopyralid. Biodegradation under aerobic laboratory conditions is below detectable limits (<2.5%).

ECOTOXICOLOGY: Based largely or completely on information for 2,4-D. Material is moderately toxic to aquatic organisms on an acute basis (LC₅₀/EC₅₀ is between 1 and 10 mg/L in most sensitive species). Based largely or completely on information for clopyralid. Materials is practically non-toxic to aquatic organisms on an acute basis (LC₅₀/EC₅₀ is >100 mg/L in most sensitive species).

13. DISPOSAL CONSIDERATIONS:

DISPOSAL METHOD: Improper disposal of excess product 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.

14. TRANSPORT INFORMATION:

United States DOT Information:

For 2x2-1/2 and 4x1/2 gallon containers:

Land: Not regulated

Air: Not regulated

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

30 gallon containers:

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

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

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

Bulk containers:

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

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

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

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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 ACID | 000094-75-7 | 39% |

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

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-Propanol, 1,1',1''-Nitrilotris-Ethylenediamine- | 000122-20-3 | PA1 |
| tetraacetic Acid | 000060-00-4 | NJ3 PA1 PA3 |
| 2,4-D Acid | 000094-75-7 | NJ2 NJ3 PA1 PA3 |

NJ2=New Jersey Environmental Hazardous Substance (present at greater than or equal to 1.0%).
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 3
Flammability 1
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:

| Chemical Name | CAS NUMBER | RQ | % in Product |
|----------------------------------|-------------|------|--------------|
| 2,4-D Acid | 000094-75-7 | 100 | 39% |
| Ethylenediamine-tetraacetic Acid | 000060-00-4 | 5000 | 2% |

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16. OTHER INFORMATION:

MSDS STATUS: Revised Section: 4 & 14
Reference: DR-0158-0821
Replaces MSDS dated: 7/27/00
Document Code: D03-033-005
Replaces Document Code: D03-033-004

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