

MATERIAL SAFETY DATA SHEET



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

Effective Date: 2/28/01
Product Code: 77838
MSDS: 006409

STARANE* + ESTERON* HERBICIDE

1. PRODUCT AND COMPANY IDENTIFICATION:

PRODUCT: Starane* + Esteron* Herbicide

COMPANY IDENTIFICATION:

Dow AgroSciences
9330 Zionsville Road
Indianapolis, IN 46268-1189

2. COMPOSITION/INFORMATION ON INGREDIENTS:

Fluroxypyr 1-Methyl-heptyl Ester	CAS # 081406-37-3	12.1%
2,4-Dichlorophenoxy acetic acid 2-ethylhexyl ester	CAS # 001928-43-4	50.8%
Inert Ingredients, Total		37.1%

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. Orange/yellow liquid with an aromatic odor. May cause moderate eye irritation. Prolonged exposure may cause slight skin irritation and drying or flaking of the skin. The LD₅₀ for skin absorption in rabbits is >5000 mg/kg. The oral LD₅₀ for rats is 1414 mg/kg (males) and 1605 mg/kg (females). The LC₅₀ for rats is >5.52 mg/L for 4 hours. Toxic to aquatic organisms.
EMERGENCY PHONE NUMBER: 800-992-5994

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.

SKIN: Prolonged exposure may cause slight skin irritation. May cause drying or flaking of the skin. A single prolonged exposure is not likely to result in the material being absorbed through the skin in harmful amounts. The LD₅₀ for skin absorption in rabbits is >5000 mg/kg. Has caused allergic skin reactions when tested in guinea pigs.

INGESTION: Single dose oral toxicity is low. The oral LD₅₀ for rats is 1414 mg/kg (males) and 1605 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. The LC₅₀ for rats is >5.52 mg/L for 4 hours.

SYSTEMIC (OTHER TARGET ORGAN) EFFECTS:

Repeated excessive exposures may cause kidney, gastrointestinal, liver and muscular effects. Signs and symptoms of excessive exposure may be nausea and/or vomiting and abdominal cramps and/or diarrhea. Minor component(s) present in this material in small amounts, when tested separately, caused central nervous system and hematopoietic effects.

CANCER INFORMATION: 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): Birth defects are unlikely. In laboratory animals, however, exposures having no adverse effects on the mother had other harmful effects on the fetus.

REPRODUCTIVE EFFECTS: 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: Irrigate with flowing water immediately and continuously for 15 minutes. Consult medical personnel.

SKIN: Wash off in flowing water or shower.

INGESTION: If swallowed, seek medical attention. Do not induce vomiting unless directed to do so by medical personnel.

INHALATION: Remove to fresh air if effects occur. Consult a physician.

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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: 73°C
METHOD USED: TCC

FLAMMABLE LIMITS

LFL: Not determined
UFL: Not determined

EXTINGUISHING MEDIA: Foam, CO₂, dry chemical, water spray or fog.

FIRE & EXPLOSION HAZARDS: Foam fire-extinguishing system is preferred because uncontrolled water can spread possible contamination. Toxic irritating gases and fumes will be formed.

FIRE-FIGHTING EQUIPMENT: Wear positive pressure self-contained breathing apparatus.

6. ACCIDENTAL RELEASE MEASURES:

ACTION TO TAKE FOR SPILLS/LEAKS: Absorb small spills with dry material such as clay, sand, ZORBALL, or dirt. Wash thoroughly after handling. Contain large spills by diking to keep out of sewers. Report large spills to Dow AgroSciences at 800-992-5994.

7. HANDLING AND STORAGE:

PRECAUTIONS TO BE TAKEN IN HANDLING AND STORAGE: See product label. Keep out of reach of children. Do not swallow. Avoid skin and eye contact. Avoid breathing mist or vapors. Store in original container with the lid tightly closed. Handle concentrate in ventilated area. Keep away from food, feedstuffs, and domestic water supplies. Wash thoroughly after handling.

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):

Fluroxypyr 1-methylheptyl ester: Dow AgroSciences Industrial Hygiene Guide is 10 mg/M³.
2,4-D isooctyl ester: none established; ACGIH TLV and OSHA PEL are 10 mg/M³ for the acid.

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 guideline. When respiratory protection is required, use a NIOSH approved air-purifying respirator for organic vapors.

SKIN PROTECTION: Use gloves impervious to this material when prolonged or repeated contact could occur.

EYE/FACE PROTECTION: Use chemical goggles.

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

9. PHYSICAL AND CHEMICAL PROPERTIES:

BOILING POINT: Not determined
VAPOR PRESSURE: Not determined
DENSITY: 1.06 g/mL
SOLUBILITY IN WATER: Not determined
SPECIFIC GRAVITY: Not determined
APPEARANCE: Orange/yellow liquid
ODOR: Aromatic
pH: 3.9 @ 1% w/v in purified water

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10. STABILITY AND REACTIVITY:

STABILITY: (CONDITIONS TO AVOID) Stable under normal conditions.

INCOMPATIBILITY: (SPECIFIC MATERIALS TO AVOID)
None known.

HAZARDOUS DECOMPOSITION PRODUCTS: Under fire conditions, oxides of nitrogen, hydrogen chloride, and hydrogen fluoride may be produced.

HAZARDOUS POLYMERIZATION: Not known to occur.

11. TOXICOLOGICAL INFORMATION:

MUTAGENICITY: Contains a component, which has been shown to be negative in some in-vitro mutagenicity studies and positive in others. Animal mutagenicity studies were inconclusive.

12. ECOLOGICAL INFORMATION:

ENVIRONMENTAL FATE

MOVEMENT & PARTITIONING:

Based on information for fluroxypyr methylheptyl ester. Bioconcentration potential is low (BCF is <100 or Log Pow <3).

Based on information for 2,4-D ethylhexyl ester. Bioconcentration potential is high (BCF is >3000 or Log Pow between 5 and 7).

DEGRADATION & PERSISTENCE:

Based on information for fluroxypyr methylheptyl ester. The hydrolysis half-life is 12.8 – 16.5 hours. Under aerobic soil conditions the half-life is 7 days. Under anaerobic soil conditions the half-life is 7 days. Based on information for 2,4-D ethylhexyl ester. Biodegradation under aerobic static laboratory conditions is high (BOD 20 or BOD28/ThOD is >40%).

ECOTOXICOLOGY:

Based on information for fluroxypyr methylheptyl ester. The EC₅₀ is above the water solubility.

Based on information for 2,4-D ethylhexyl ester.

Material is slightly toxic to aquatic organisms on an acute basis (LC₅₀/EC₅₀ is between 10 and 100 mg/L in most sensitive species).

13. DISPOSAL CONSIDERATIONS:

DISPOSAL METHOD: Do not contaminate food, feed, or water by storage or disposal. Wastes are toxic. Improper disposal of excess waste is a violation of federal law. If wastes cannot be used according to the label directions, dispose of in accordance with all applicable local, state or federal requirements. Contact your state pesticide or environmental control agency, or the hazardous waste representative at the nearest EPA regional office for guidance.

14. TRANSPORT INFORMATION:

For DOT regulatory information, if required, consult transportation regulations, product-shipping papers or contact your Dow AgroSciences representative.

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 2-Ethylhexyl Ester	001928-43-4	50.8%

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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.

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

COMPREHENSIVE ENVIRONMENTAL RESPONSE COMPENSATION AND LIABILITY ACT (CERCLA, or SUPERFUND): To the best of our knowledge, this product contains no chemical subject to reporting under CERCLA.

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>
2,4-D 2-EHE	001928-43-4	NJ2

NJ2=New Jersey Environmental Hazardous Substance (present at > or = to 1.0%).

16. OTHER INFORMATION:

MSDS STATUS: Revised Sections: 3, 8 & 12
Reference: DR-0359-0338
Replaces MSDS Dated: 3/10/99
Document Code: D03-119-004
Replaces Document Code: D03-119-003

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