STARANE* HERBICIDE

Emergency Phone: 800-992-5994
Dow AgroSciences LLC
Indianapolis, IN 46268
Effective Date: 5/25/99
Product Code: 20982
MSDS: 006301

1. PRODUCT AND COMPANY IDENTIFICATION:

PRODUCT: Starane* Herbicide
COMPANY IDENTIFICATION:
Dow AgroSciences
9330 Zionsville Road
Indianapolis, IN 46268-1189

2. COMPOSITION/INFORMATION ON INGREDIENTS:

Fluroxypyr 1-Methylheptyl Ester	CAS # 081406-37-3	26.2%
Inert ingredients, total, including:		73.8%
1-Methyl-2-pyrrolidinone	CAS # 000872-50-4	
Petroleum Solvent	CAS # 064742-94-5	
(Contains Naphthalene)	CAS # 000091-20-3	

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 brown liquid with no odor. May cause moderate eye irritation and slight corneal injury. Vapors may irritate the eyes. Prolonged or repeated exposure may cause skin irritation, even a burn. Repeated contact may cause drying or flaking of the skin. LD_{50} for skin absorption in rabbits is >2000 mg/kg. Oral LD_{50} for rats is 3738 mg/kg (males) and 3162 mg/kg (females). Inhalation LC_{50} for rats is >6.2 mg/L for 4 hours.
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 and slight corneal injury. Vapors may irritate eyes.
SKIN: Short single exposure is not likely to cause significant skin irritation. Prolonged or repeated exposure may cause skin irritation, even a burn. Repeated contact may cause drying or flaking of skin. A single prolonged exposure is not likely to result in the material being absorbed in harmful amounts. The LD_{50} for skin absorption in rabbits is >2000 mg/kg. Did not cause allergic skin reactions when tested in guinea pigs.
INGESTION: Single dose oral toxicity is low. The oral LD_{50} for rats is 3738 mg/kg (males) and 3162 mg/kg (females). Small amounts swallowed incidental to normal handling operations are not likely to cause injury; however, swallowing larger amounts may cause injury. If aspirated (liquid enters the lungs), may cause lung damage or even death due to chemical pneumonia.
INHALATION: Single exposure to vapors is not likely to be hazardous. The LC_{50} for rats is >6.2 mg/L for 4 hours. Excessive exposure to solvent may cause respiratory irritation and central nervous system depression. Signs and symptoms of excessive exposure may be nausea and/or vomiting.
SYSTEMIC (OTHER TARGET ORGAN) EFFECTS:
Effects have been reported on the following organs: bone marrow, kidney, liver and respiratory tract.
CANCER INFORMATION: Fluroxypyr did not cause cancer in laboratory animals.
TERATOLOGY (BIRTH DEFECTS): 1-Methyl-2-pyrrolidinone caused toxic effects to the fetus in laboratory animals at high dose levels with either mild or undetectable maternal toxicity. Fluroxypyr did not cause birth defects; however, in laboratory animals, other toxic effects to the fetus have been seen.
REPRODUCTIVE EFFECTS: Fluroxypyr did not interfere with reproduction in laboratory animals studies.

4. FIRST AID:

EYES: Irrigate with flowing water immediately and continuously for 15 minutes.
SKIN: Wash off in flowing water or shower.
INGESTION: Do not induce vomiting. Call physician and/or transport to emergency facility immediately.
INHALATION: Remove to fresh air. If not breathing, give artificial respiration. If breathing is difficult, oxygen should be administered by qualified personnel. Call a physician or transport to a medical facility.
NOTE TO PHYSICIAN: The decision of whether to induce vomiting or not should be made by an attending 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. If burn is present, treat as any thermal burn, after decontamination. 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: 145˚F (63˚C)
METHOD USED: PMCC
FLAMMABLE LIMITS
LFL: Not determined
UFL: Not determined
EXTINGUISHING MEDIA: Foam, CO_2, dry chemical.
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 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):
1-Methyl-2-pyrrolidinone: AIHA WEEL is 10 ppm, Skin.
Naphthalene: ACGIH TLV and OSHA PEL are 10 ppm TWA, 15 ppm STEL. ACGIH classification is A4.
Fluroxypyr: Dow AgroSciences Industrial Hygiene Guideline is 10 mg/M^3.
PELs are in accord with those recommended by OSHA, as in the 1989 revision of PELs.
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 or positive-pressure supplied-air respirator depending on the potential airborne concentration.
SKIN PROTECTION: When prolonged or frequently repeated contact could occur, use protective Clothing impervious to this material. Selection of specific items such as faceshield, gloves, boots, apron, or full-body suit will depend on the operation.
EYE/FACE PROTECTION: Use chemical goggles. If vapor exposure causes eye discomfort, use a full-face respirator.
APPLICATORS AND ALL OTHER HANDLERS: Please refer to the product label for personal protective clothing and equipment.

9. PHYSICAL AND CHEMICAL PROPERTIES:

BOILING POINT: 182F (202C)
VAPOR PRESSURE: Not determined
DENSITY: 0.984-0.995 @ 20C
SOLUBILITY IN WATER: Not determined
SPECIFIC GRAVITY: 0.99 @ 25C
APPEARANCE: Dark brown liquid
ODOR: None
FREEZE POINT: −10C
pH: 5.5 (as 1% aqueous sol)

10. STABILITY AND REACTIVITY:

STABILITY: (CONDITIONS TO AVOID) None known.
INCOMPATIBILITY: (SPECIFIC MATERIALS TO AVOID) Reacts with acids and alkalis.
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: For the solvent: in-vitro mutagenicity studies were negative in some cases and positive in other cases. For fluroxypyr: in-vitro and animal mutagenicity studies were negative.

12. ECOLOGICAL INFORMATION:

ENVIRONMENTAL DATA:
ECOTOXICOLOGY: Material is practically non-toxic to birds on an acute basis (LD_{50} >2000 mg/kg). Acute oral LD_{50} for bobwhite (Colinus virginianus) is >2250 mg/kg.

13. DISPOSAL CONSIDERATIONS:

DISPOSAL METHOD: Do not contaminate food, feed, or water by storage or disposal. Pesticide wastes are toxic. Improper disposal of excess pesticide, spray mixture, or rinsate is a violation of federal law. Pesticide, spray mixture, or rinse water that cannot be used according to label instructions, must be disposed of in accordance with 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
Naphthalene	000091-20-3	59.7%
1-methyl-2-Pyrrolidinone	000872-50-4	5%

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
Naphthalene	000091-20-3	NJ2 NJ3 PA1 PA3
1-methyl-2-Pyrrolidinone	000872-50-4	NJ2 PA1
Proprietary Ingredient	Proprietary	NJ3 PA1

NJ2=New Jersey Environmental Hazardous Substance (present at > or = to 1.0%).
NJ3=New Jersey Workplace Hazardous Substance (present at > or = or equal to 1.0%).
PA1=Pennsylvania Hazardous Substance (present at > or = to 1.0%).
PA3=Pennsylvania Environmental Hazardous Substance (present at > or = 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.
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
Proprietary Ingredient	Proprietary	1000	5.5%
Naphthalene	000091-20-3	100	59.7%

RCRA Categorization: USEPA Hazardous Waste # Naphthalene = U165

16. OTHER INFORMATION:

MSDS STATUS:
Revised Section 8
Reference: DR-0360-6620
Replaces MSDS Dated: 2/15/99
Document Code: D03-075-001
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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