

Dow AgroSciences LLC  
9330 Zionsville Road  
Indianapolis, IN 46268-1054



## **MATERIAL SAFETY DATA SHEET**

ForeFront™ R&P

62719-524

**Effective Date:** 4-26-06

**Comments:**

Attached is a revised Material Safety Data Sheet.

™Trademark of Dow AgroSciences LLC

# MATERIAL SAFETY DATA SHEET



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

Effective Date: 26-Apr-06  
Product Code: 103320  
MSDS: 007886

## FOREFRONT\* R&P HERBICIDE

### 1. PRODUCT AND COMPANY IDENTIFICATION:

**PRODUCT:** ForeFront\* R&P Herbicide

#### COMPANY IDENTIFICATION:

Dow AgroSciences LLC  
9330 Zionsville Road  
Indianapolis, IN 46268-1189

### 2. HAZARDOUS IDENTIFICATIONS:

#### EMERGENCY OVERVIEW

Amber liquid with a mildly sweet odor. May cause eye irritation with corneal injury. May cause skin irritation. Toxic to avian and aquatic organisms.

**EMERGENCY PHONE NUMBER:** 800-992-5994

### 3. COMPOSITION/INFORMATION ON INGREDIENTS:

2,4-D	CAS # 000094-75-7	27.3%
Aminopyralid	CAS # 150114-71-9	3.4%
Balance, Total, Including Polyglycol 26-2	CAS # 069029-39-6	69.3%
Triisopropanolamine	CAS # 000122-20-3	

### 4. FIRST AID:

**EYE:** Wash immediately and continuously with flowing water for at least 30 minutes. Remove contact lenses after the first 5 minutes and continue washing. Obtain prompt medical consultation, preferably from an ophthalmologist.

**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. Never give anything by mouth to an unconscious person.

**INHALATION:** Move person to fresh air. If person is not breathing, call an emergency responder or ambulance, and 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:** Chemical eye burns may require extended irrigation. Obtain prompt consultation, preferably from an ophthalmologist. No specific antidote. Treatment of exposure should be directed at the control of symptoms and the clinical condition of the patient. Have the MSDS, and if available, the product container or label with you when calling a poison control center or doctor, or going for treatment.

### 5. FIRE FIGHTING MEASURES:

**FLASH POINT:** >200°F (>93°C)

#### FLAMMABLE LIMITS

LFL: Not determined  
UFL: Not determined

**EXTINGUISHING MEDIA:** Foam, CO<sub>2</sub>, or Dry chemical

**FIRE AND EXPLOSION HAZARDS:** Foam fire extinguishing system is preferred because uncontrolled water can spread possible contamination. Toxic irritating gases may be formed under fire conditions.

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

### 6. ACCIDENTAL RELEASE MEASURES:

**ACTION TO TAKE FOR SPILLS:** Absorb small spills with non-reactive materials such as sand, sawdust, Zorball, or dirt. Wash exposed body areas thoroughly after handling. Report large spills to Dow AgroSciences at 800-992-5994.

### 7. HANDLING AND STORAGE:

**PRECAUTIONS TO BE TAKEN IN HANDLING AND STORAGE:** Keep out of reach of children. Do not swallow. Avoid contact with eyes, skin, and clothing. Avoid breathing vapors and spray mist. Handle concentrate in ventilated area. Wash thoroughly with soap and water after handling and before eating, chewing gum, using tobacco, using the toilet or smoking. Keep away from food, feedstuffs, and water supplies. Store in original container in a well-ventilated area.

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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 GUIDELINES:

2,4-D: ACGIH TLV and OSHA PEL are 10 mg/M<sup>3</sup>. ACGIH classification is A4.

Polyglycol 26-2: Dow AgroSciences Industrial Hygiene Guide is 2 mg/M<sup>3</sup>.

Triisopropanolamine: Dow AgroSciences Industrial Hygiene Guide is 10 mg/M<sup>3</sup>.

**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:

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

**SKIN PROTECTION:** Wear clean, body-covering clothing.

**HAND PROTECTION:** Use gloves chemically resistant to this material when prolonged or frequently repeated contact could occur. Examples of preferred glove barrier materials include: Chlorinated polyethylene, Polyethylene, Ethyl vinyl alcohol laminate (EVAL). Examples of acceptable glove barrier materials include: Butyl rubber, Natural rubber (Latex), Neoprene, Nitrile/butadiene rubber (Nitrile or NBR), Polyvinyl chloride (PVC or vinyl), Viton. Avoid gloves made of: Polyvinyl alcohol (PVA). 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.

**RESPIRATORY PROTECTION:** Atmospheric levels should be maintained below the exposure guideline. 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 with a particulate pre-filter.

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

### 9. PHYSICAL AND CHEMICAL PROPERTIES:

**APPEARANCE:** Amber liquid

**ODOR:** Mildly sweet

**DENSITY:** 1.169 g/mL @20°C

**BOILING POINT:** Not determined

**SOLUBILITY IN WATER:** Not determined

### 10. STABILITY AND REACTIVITY:

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

**INCOMPATIBILITY: (SPECIFIC MATERIALS TO AVOID)** Not determined.

**HAZARDOUS DECOMPOSITION PRODUCTS:** Not determined.

**HAZARDOUS POLYMERIZATION:** Not known to occur.

### 11. TOXICOLOGICAL INFORMATION:

**EYE:** May cause severe eye irritation with corneal injury, which may result in permanent impairment of vision, even blindness. Chemical burns may occur.

**SKIN:** Brief contact is essentially non-irritating to skin. May cause drying and flaking of the skin. Prolonged contact is unlikely to result in absorption of harmful amounts. The LD<sub>50</sub> for skin absorption in rats is >5000 mg/kg. Did not cause allergic skin reactions when tested in guinea pigs.

**INGESTION:** Low toxicity if swallowed. Small amounts swallowed incidentally as a result of normal handling operations are not likely to cause injury; however, swallowing larger amounts may cause injury. The oral LD<sub>50</sub> for female rats is 1098 mg/kg.

**INHALATION:** Prolonged exposure is not expected to cause adverse effects. The aerosol LC<sub>50</sub> for rats is >5.54 mg/L for 4 hours.

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**SYSTEMIC (OTHER TARGET ORGAN) EFFECTS:** For the active ingredients, in animals, effects have been reported on the following organs: gastrointestinal tract, kidney, liver, muscles, and eye. For the minor components, in animals, effects have been reported on the following organs: kidney and liver.

**CANCER INFORMATION:** 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. Aminopyralid did not cause cancer in laboratory animals.

**TERATOLOGY (BIRTH DEFECTS):** 2,4-D TIPA has caused birth defects in laboratory 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. Aminopyralid did not cause birth defects or other effects in the fetus even at doses, which caused toxic effects in the mother.

**REPRODUCTIVE EFFECTS:** 2,4-D Acid, in laboratory animals, excessive doses toxic to the parent animals caused decreased weight and survival of offspring. Aminopyralid, in animal studies, did not interfere with reproduction.

**MUTAGENICITY:** In-vitro and animal genetic toxicity studies were negative.

### 12. ECOLOGICAL INFORMATION:

#### ENVIRONMENTAL FATE:

#### MOVEMENT & PARTITIONING:

Based largely or completely on information for 2,4-D.  
Potential for mobility in soil is high (Koc between 50 and 150).

Based largely or completely on data for major component(s).

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

#### DEGRADATION & PERSISTENCE:

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

Biodegradation under aerobic static laboratory conditions is high (BOD<sub>20</sub> or BOD<sub>28</sub>/ThOD is >40%).

Based largely or completely on information for Polyglycol 26-2.

Biodegradation under aerobic laboratory conditions is below detectable limits (BOD<sub>20</sub> or BOD<sub>28</sub> is <2.5%).

Based largely or completely on information for aminopyralid. Based on stringent OECD test guidelines, this material cannot be considered as readily biodegradable; however, these results do not necessarily mean that the material is not biodegradable under environmental conditions.

#### ECOTOXICOLOGY:

Material is slightly toxic to fish on an acute basis (LC<sub>50</sub> is between 10 and 100 mg/L).

Material is practically non-toxic to aquatic invertebrates on an acute basis (LC<sub>50</sub> or EC<sub>50</sub> is >100 mg/L).

Material is slightly toxic to birds on an acute basis (LD<sub>50</sub> is between 501 and 2000 mg/kg).

Acute oral LD<sub>50</sub> in honey bee (*Apis mellifera*) is >103 µg/bee.

Acute contact LD<sub>50</sub> in honey bee (*Apis mellifera*) is >100 µg/bee.

The LC<sub>50</sub> in earth worm (*Eisenia foetida*) is 1600 mg/kg.

Growth inhibition EC<sub>50</sub> in diatom (*Navicula sp.*) is 17 mg/L.

### 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.

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### 14. TRANSPORT INFORMATION:

#### U.S. DEPARTMENT OF TRANSPORTATION (DOT) INFORMATION:

Dow AgroSciences does not recommend shipment by air unless it is small samples.

For non-bulk packages of less than 366 pounds by all modes of transportation:

This material is not regulated for transport.

For non-bulk packages of at least 366 pounds by all modes of transportation:

ENVIRONMENTALLY HAZARDOUS SUBSTANCES,  
LIQUID N.O.S./(CONTAINS 2,4-D ACID)/9/UN3082/  
PG III/RQ (2,4-D ACID)

For bulk packages by all modes of transportation:

COMBUSTIBLE LIQUID, N.O.S./(CONTAINS 2,4-D  
ACID)COMBUSTIBLE LIQUID/NA1993/PG III/RQ  
(2,4-D ACID)

### 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:

<u>CHEMICAL NAME</u>	<u>CAS NUMBER</u>	<u>CONCENTRATION</u>
2,4-Dichlorophenoxy Acetic Acid	000094-75-7	27.3%

**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.

**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-Dichlorophenoxy Acetic Acid	000094-75-7	PA1 PA3 NJ2 NJ3
Triisopropanolamine	000120-20-3	PA1

NJ2=New Jersey Environmental Hazardous Substance (present at > or = to 1.0%).  
NJ3=New Jersey Workplace Hazardous Substance (present at > or = to 1.0%).  
PA1=Pennsylvania Hazardous Substance (present at > or = to 1.0%).  
PA3=Pennsylvania Environmental Hazardous Substance (present at > or = to 1.0%).

**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:

<u>Chemical Name</u>	<u>CAS Number</u>	<u>RQ</u>	<u>% in Product</u>
2,4-Dichlorophenoxy Acetic Acid	000094-75-7	100	27.3%

**RCRA Categorization Hazardous Code:**  
2,4-Dichlorophenoxyacetic Acid = U240

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### NATIONAL FIRE PROTECTION ASSOCIATION (NFPA) RATINGS:

Health	3
Flammability	1
Reactivity	0

### 16. OTHER INFORMATION:

**MSDS STATUS:** Revised Section: 4, 8, 11 & 12  
Reference: DR-0379-9799  
Replaces MSDS Dated: 14-Feb-06  
Document Code: D03-881-003  
Replaces Document Code: D03-881-002

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