

For Chemical Emergency, Spill, Leak, Fire, Exposure, or Accident,  
Call CHEMTREC Day or Night: 1-800-424-9300.  
For Medical Emergencies Only, Call 1-877-325-1840.

### 1. CHEMICAL PRODUCT AND COMPANY IDENTIFICATION

**Product Name:** Rhino® Extreme Herbicide  
**Synonyms:** Herbicide Mixture of Bromoxynil Octanoate and 2,4-D 2EHE  
**EPA Reg. No.:** 71368-39

**Company Name:** Nufarm, Inc.  
 150 Harvester Drive, Suite 200  
 Burr Ridge, IL 60527

**Date of Issue:** March 17, 2006      **Supersedes:** October 6, 2005  
**Sections Revised:** Masthead Change and Section 1

### 2. HAZARDS IDENTIFICATION

**Emergency Overview:**

**Appearance and Odor:** Brown colored liquid with aromatic odor.

**Warning Statements:** Keep out of reach of children. CAUTION. Harmful if swallowed or absorbed through skin. Causes moderate eye damage. Avoid contact with skin, eyes or clothing.

**Potential Health Effects:**

**Likely Routes of Exposure:** Inhalation, eye and skin contact.

**Eye Contact:** Causes moderate eye damage. Vapors and mist can cause irritation.

**Skin Contact:** Minimally irritating. Overexposure by skin absorption may cause irritation, redness, swelling, and symptoms similar to those for ingestion.

**Ingestion:** Harmful if swallowed. Overexposure by ingestion may cause nausea, vomiting, abdominal pain, decreased blood pressure, muscle weakness, muscle spasms. The petroleum hydrocarbon component, if aspirated into the respiratory system during ingestion or vomiting may cause mild or severe pulmonary injury, possibly progressing to death.

**Inhalation:** May cause upper respiratory tract irritation, coughing, wheezing, nausea, headache and incoordination. Overexposure to petroleum hydrocarbon component may cause irritation to respiratory tract, headaches, anaesthesia, drowsiness, unconsciousness and other central nervous system effects, possibly including death.

**Medical Conditions Aggravated by Exposure:** Inhalation of product may aggravate existing chronic respiratory problems such as asthma, emphysema or bronchitis. Skin contact may aggravate existing skin disease.

See Section 11: TOXICOLOGICAL INFORMATION for more information.

**Potential Environmental Effects:**

This product is toxic to wildlife, fish and aquatic invertebrates.

See Section 12: ECOLOGICAL INFORMATION for more information.

### 3. COMPOSITION / INFORMATION ON INGREDIENTS

COMPONENT	CAS NO.	% BY WEIGHT
Octanoic acid ester of bromoxynil	1689-99-2	30.1
Isooctyl (2-ethylhexyl) Ester of 2,4-Dichlorophenoxyacetic Acid	1928-43-4	31.2
Other Ingredients Including		38.7

Aromatic Solvent  
(Contains Naphthalene)

64742-94-5  
91-20-3

#### 4. FIRST AID MEASURES

**If in Eyes:** Hold eye open and rinse slowly and gently with water for 15 to 20 minutes. Remove contact lenses, if present, after the first 5 minutes, then continue rinsing eye. Call a poison control center or doctor for treatment advice.

**If Swallowed:** 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.

**If on Skin:** Take off contaminated clothing. Rinse skin immediately with plenty of water for 15 to 20 minutes. Call a poison control center or doctor for treatment advice.

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

**Note to Physician:** May pose an aspiration pneumonia hazard. Contains petroleum distillates.

#### 5. FIRE FIGHTING MEASURES

**Flash Point:** 216°F (102°C) Setaflash

**Autoignition Temperature:** Not determined

**Flammability Limits:** Not determined

**Extinguishing Media:** Recommended for large fires: foam or water spray. Recommended for small fires: dry chemical or carbon dioxide.

**Special Fire Fighting Procedures:** Firefighters should wear NIOSH/MSHA approved self-contained breathing apparatus and full fire-fighting turn out gear. Dike area to prevent runoff and contamination of water sources. Dispose of fire control water later.

**Unusual Fire and Explosion Hazards:** If water is used to fight fire or cool containers, dike to prevent runoff contamination of municipal sewers and waterways. Under fire conditions, toxic, corrosive fumes are emitted. Containers will burst from internal pressure under extreme fire conditions.

**Hazardous Decomposition Materials (Under Fire Conditions):** May produce gases such as hydrogen chloride, other chlorine compounds, hydrogen bromide, nitrogen oxides, and carbon oxides.

**National Fire Protection Association (NFPA) Hazard Rating:**

**Rating for this product: Health: 2    Flammability: 1    Reactivity: 0**

Hazards Scale: 0 = Minimal    1 = Slight    2 = Moderate    3 = Serious    4 = Severe

#### 6. ACCIDENTAL RELEASE MEASURES

**Personal Precautions:** Wear appropriate protective gear for the situation. See Personal Protection information in Section 8.

**Environmental Precautions:** Prevent material from entering public sewer systems or any waterways. Do not flush to drain. Large spills to soil or similar surfaces may necessitate removal of topsoil. The affected area should be removed and placed in an appropriate container for disposal.

**Methods for Containment:** Dike spill using absorbent or impervious materials such as earth, sand or clay. Collect and contain contaminated absorbent and dike material for disposal.

**Methods for Clean-Up and Disposal:** Pump any free liquid into an appropriate closed container. Collect washings for disposal. Decontaminate tools and equipment following cleanup. See Section 13: DISPOSAL CONSIDERATIONS for more information.

**Other Information:** Large spills may be reportable to the National Response Center (800-424-8802) and to state and/or local agencies.

**7. HANDLING AND STORAGE**

**Handling:**

Avoid contact with skin, eyes or clothing. Users should wash hands before eating, drinking, chewing gum, using tobacco or using the toilet. Remove clothing immediately if pesticide gets inside. Then wash thoroughly and put on clean clothing. Remove Personal Protective Equipment (PPE) immediately after handling this product. Wash outside of gloves before removing. As soon as possible, wash thoroughly and change into clean clothing.

**Storage:**

Do not store near fertilizers or seed. Store at temperatures above 32°F. If allowed to freeze, remix before using. Do not contaminate water, food or feed by storage or disposal.

**8. EXPOSURE CONTROLS / PERSONAL PROTECTION**

**Engineering Controls:**

Where engineering controls are indicated by specific use conditions or a potential for excessive exposure, use local exhaust ventilation at the point of generation.

**Personal Protective Equipment:**

**Eye/Face Protection:** To avoid contact with eyes, wear chemical goggles or shielded safety glasses. An emergency eyewash should be readily accessible to the work area.

**Skin Protection:** To avoid contact with skin, wear long pants, long-sleeved shirt, socks, shoes and chemical-resistant gloves. When cleaning equipment, mixing, or loading, also wear a chemical-resistant apron. An emergency shower should be readily accessible to the work area.

**Respiratory Protection:** Not normally required. If vapors or mists exceed acceptable levels, wear NIOSH approved air-purifying respirator with cartridges/canisters approved for use against pesticides.

**General Hygiene Considerations:** Personal hygiene is an important work practice exposure control measure and the following general measures should be taken when working with or handling this material: 1) Do not store, use and/or consume foods, beverages, tobacco products, or cosmetics in areas where this material is stored. 2) Wash hands and face carefully before eating, drinking, using tobacco, applying cosmetics or using the toilet.

**Exposure Guidelines:**

Component	OSHA		ACGIH		Unit
	TWA	STEL	TWA	STEL	
Bromoxynil Octanoate	NE	NE	NE	NE	
2,4-D 2-ethylhexyl ester	10*	NE	10*	NE	mg/m <sup>3</sup>
Naphthalene	10	NE	10 (Skin)	15 (Skin)	ppm

\*Based on adopted limit for 2,4-D

NE = Not Established

**9. PHYSICAL AND CHEMICAL PROPERTIES**

**Appearance and Odor:** Brown colored liquid with aromatic odor.

<b>Boiling Point:</b>	Not determined	<b>Solubility in Water:</b>	Soluble
<b>Density:</b>	9.68 pounds/gallon	<b>Specific Gravity:</b>	1.16
<b>Evaporation Rate:</b>	Not determined	<b>Vapor Density:</b>	Not determined
<b>Freezing Point:</b>	Not determined	<b>Vapor Pressure:</b>	Not determined
<b>pH:</b>	3.24 (1% solution)	<b>Viscosity:</b>	25.3 cps @ 25°C

**Note:** Physical data are typical values, but may vary from sample to sample. A typical value should not be construed as a guaranteed analysis or as a specification.

<b>10. STABILITY AND REACTIVITY</b>
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**Chemical Stability:** This material is stable under normal handling and storage conditions.

**Conditions to Avoid:** Excessive heat. Do not store near heat or flame.

**Incompatible Materials:** Strong oxidizing agents: bases and acids.

**Hazardous Decomposition Products:** Under fire conditions, may produce gases such as hydrogen chloride, other chlorine compounds, hydrogen bromide, nitrogen oxides, and carbon oxides.

**Hazardous Reactions:** Hazardous polymerization will not occur.

<b>11. TOXICOLOGICAL INFORMATION</b>
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**Toxicological Data:**

Data from laboratory studies on this product are summarized below:

**Oral:** Rat LD<sub>50</sub>: 606 mg/kg (female); FIFRA Category III

**Dermal:** Rat LD<sub>50</sub>: >2,000 mg/g; FIFRA Category III

**Inhalation:** Rat 4-hr LC<sub>50</sub>: >2.04 mg/L; FIFRA Category IV

**Eye Irritation:** Rabbit: Slightly irritating; FIFRA Category III

**Skin Irritation:** Rabbit: Mildly irritating; FIFRA Category IV

**Skin Sensitization:** Not a contact sensitizer in guinea pigs following repeated skin exposure.

**Subchronic (Target Organ) Effects:** Repeated overexposure to phenoxy herbicides may cause effects to liver, kidneys, blood chemistry, and gross motor function. Rare cases of peripheral nerve damage have been reported, but extensive animal studies have failed to substantiate these observations, even at high doses for prolonged periods. Repeated overexposure to bromoxynil may cause effects to liver, kidney and central nervous system.

**Carcinogenicity / Chronic Health Effects:** The International Agency for Research on Cancer (IARC) lists exposure to chlorophenoxy herbicides as a Class 2B carcinogen, the category for limited evidence for carcinogenicity in humans. However, more current 2,4-D lifetime feeding studies in rats and mice did not show carcinogenic potential. The U.S. EPA has given 2,4-D a Class D classification (not classifiable as to human carcinogenicity). The U.S. EPA has classified bromoxynil as a Class C carcinogen (a possible human carcinogen). The hydrocarbon component may contain naphthalene, which is listed by IARC as a class 2B and the U.S. National Toxicology Program as reasonably anticipated to be a human carcinogen.

**Reproductive Toxicity:** No impairment of reproductive function attributable to 2,4-D have been noted in laboratory animal studies. Animal tests with bromoxynil have not demonstrated reproductive effects.

**Developmental Toxicity:** Studies in laboratory animals with 2,4-D have shown decreased fetal body weights and delayed development in the offspring at doses toxic to mother animals. Based upon the results of rat and rabbit teratogenicity studies, bromoxynil is considered to be a developmental toxicant. Women of childbearing age should be particularly careful when handling this product to avoid ingestion and skin contact.

**Genotoxicity:** There have been some positive and negative studies, but the weight of evidence is that 2,4-D and bromoxynil are not mutagenic. Neither *in vitro* nor *in vivo* tests on bromoxynil octanoate demonstrated mutagenic effects.

**Assessment Carcinogenicity:**

This product contains substances that are considered to be probable or suspected human carcinogens as follows:

Component	Regulatory Agency Listing As Carcinogen			
	ACGIH	IARC	NTP	OSHA
Chlorophenoxy Herbicides	No	2B	No	No
Naphthalene	No	2B	Yes*	No

\*Reasonably anticipated to be a human carcinogen

See Section 2: HAZARDS IDENTIFICATION for more information.

<b>12. ECOLOGICAL INFORMATION</b>
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**Ecotoxicity:**Data on 2,4-D EHE

96-hour LC <sub>50</sub> Bluegill:	>5 mg/l	Bobwhite Quail Oral LD <sub>50</sub> :	>5,620 mg/kg
96-hour LC <sub>50</sub> Rainbow Trout:	7.2 mg/l	Mallard Duck 8 day Dietary LC <sub>50</sub> :	>5,620 ppm
48 hour EC <sub>50</sub> Daphnia:	>5 mg/l		

Data on Bromoxynil Octanoate

96-hour LC <sub>50</sub> Bluegill:	0.53 mg/l	Bobwhite Quail Acute Oral LD <sub>50</sub> :	148 mg/kg
96-hour LC <sub>50</sub> Rainbow Trout:	0.1 mg/l	Mallard Duck Acute Oral LD <sub>50</sub> :	2,050 mg/kg
48-hour EC <sub>50</sub> Daphnia:	0.096 mg/l		

**Environmental Fate:**

In laboratory and field studies, 2,4-D 2-ethylhexyl ester rapidly de-esterified to parent acid in the environment. The typical half-life of the resultant 2,4-D acid ranged from a few days to a few weeks. Bromoxynil octanoate rapidly degrades to bromoxynil phenol. The typical half-life of bromoxynil phenol ranged from a few days to a few weeks.

<b>13. DISPOSAL CONSIDERATIONS</b>
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**Waste Disposal Method:**

Improper disposal of excess pesticide 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.

**Container Handling and Disposal:**

**Plastic Bottles and Non-Returnable Plastic Drums:** Triple rinse (or equivalent). Then offer for recycling or reconditioning, or puncture and dispose of in a sanitary landfill, or by incineration, or, if allowed by state and local authorities, by burning. If burned, stay out of smoke.

**Returnable/Refillable Containers:** After use, return the container to the point of purchase or designated locations. The container must only be refilled with this product. DO NOT REUSE THE CONTAINER FOR ANY OTHER PURPOSE. Prior to refilling, inspect thoroughly for damage such as cracks, punctures, abrasions and damaged or worn out threads on closure devices. Do not refill or transport damaged or leaking containers. Check for leaks after refilling and before transportation. If the container is not being refilled, return it to the point of purchase.

<b>14. TRANSPORTATION INFORMATION</b>
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Follow the precautions indicated in Section 7: HANDLING AND STORAGE of this MSDS.

For Department of Transportation (DOT) regulatory information, if required, consult transportation regulations, product shipping papers or call Nufarm's DOT Manager at 708-755-2104, Monday through Friday, 8:00 AM to 5:00 PM Central Time.

<b>15. REGULATORY INFORMATION</b>
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**U.S. Federal Regulations:**

**TSCA Inventory:** This product is exempted from TSCA because it is solely for FIFRA regulated use.

**SARA Hazard Notification/Reporting:**

**Hazard Categories Under Criteria of SARA Title III Rules (40 CFR Part 370):**

Immediate, Delayed

**Section 313 Toxic Chemical(s):**

2,4-D 2-ethylhexyl ester (CAS No. 1928-43-4)- 31.2% by weight in product  
Acetic Acid, (2,4-Dichlorophenoxy)- (CAS No. 94-75-7), 20.69% equivalent by weight in product  
Bromoxynil Octanoate (CAS No. 1689-99-2), 30.1% by weight in product  
Naphthalene (CAS No. 91-20-3), 3.8% by weight in product

**Reportable Quantity (RQ) under U.S. CERCLA:**

Acetic Acid, (2,4-Dichlorophenoxy)- (CAS No. 94-75-7) 100 pounds  
Naphthalene (CAS No. 91-20-3) 100 pounds

**RCRA Waste Code:**

Acetic Acid, (2,4-Dichlorophenoxy)- (CAS No. 94-75-7) U240  
Naphthalene (CAS No. 91-20-3) U165

**State Information:**

Other state regulations may apply. Check individual state requirements.

**California Proposition 65:** WARNING. This product contains chemicals known to the State of California to cause cancer or birth defects or other reproductive harm.

<b>16. OTHER INFORMATION</b>
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This Material Safety Data Sheet (MSDS) serves different purposes than and DOES NOT REPLACE OR MODIFY THE EPA-ACCEPTED PRODUCT LABELING (attached to and accompanying the product container). This MSDS provides important health, safety and environmental information for employers, employees, emergency responders and others handling large quantities of the product in activities generally other than product use, while the labeling provides that information specifically for product use in the ordinary course.

Use, storage and disposal of pesticide products are regulated by the EPA under the authority of the Federal Insecticide, Fungicide, and Rodenticide Act (FIFRA) through the product labeling, and all necessary and appropriate precautionary, use, storage, and disposal information is set forth on that labeling. It is a violation of federal law to use a pesticide product in any manner not prescribed on the EPA-accepted label.

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