Nufarm® Rhomene MCPA Broadleaf Herbicide

MATERIAL SAFETY DATA SHEET

1. CHEMICAL PRODUCT AND COMPANY DESCRIPTION

Product Name: Nufarm Rhomene MCPA Broadleaf Herbicide
Synonyms: MCPA DMA salt; 2-methyl-4-chlorophenoxyacetic acid.
EPA Reg. No.: 228-143-71368
Company Name: Nufarm Americas, Inc.
Burr Ridge, IL 60521

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

Date: March 12, 2002
Revisions: New or updated information in all sections.
Reasons for Revisions: General revision utilizing more specific data.
Supersedes: December 1, 2000

2. COMPOSITION/INFORMATION ON INGREDIENTS

<table>
<thead>
<tr>
<th>COMPONENT</th>
<th>CAS REG. NO.</th>
<th>% BY WEIGHT</th>
</tr>
</thead>
<tbody>
<tr>
<td>2-methyl-4-chlorophenoxyacetic acid, dimethylamine salt *</td>
<td>2039-46-5</td>
<td>48.58</td>
</tr>
<tr>
<td>Inert ingredients (trade secret)</td>
<td></td>
<td>51.42</td>
</tr>
</tbody>
</table>

*OSHA hazard
The other major ingredient in this product is water.

3. HAZARDS IDENTIFICATION

Emergency Overview:

Appearance and Odor: Brown liquid, organic amine odor.
Warning Statements: DANGER-PELIGRO. Keep out of reach of children. Corrosive. Causes irreversible eye damage. Harmful if swallowed or absorbed through skin. Do not get in eyes or on clothing. Avoid contact with skin. Avoid breathing vapors or spray mist.

Potential Adverse Health Effects:

Likely Routes of Exposure: Inhalation, eye and skin contact.
Eye Contact: Severely irritating.
Skin Contact: Slightly irritating. Over exposure by skin absorption may cause headache, dizziness, nausea, vomiting, gastrointestinal irritation, weakness and central nervous system depression.

Inhalation: Low inhalation toxicity.

Ingestion: Harmful if swallowed. May cause headache, dizziness, nausea, vomiting, gastrointestinal irritation, weakness and central nervous system depression.

Medical Conditions Possibly 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.

Subchronic (Target Organ) Effects: (An adverse effect with symptoms that develop slowly over a long period of time): Repeated overexposure may cause effects to liver, kidneys, blood chemistry, testes 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.

Chronic Effects/Carcinogenicity: 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. Newer rat and mouse lifetime feeding studies did not show carcinogenic potential for MCPA.

Reproductive Toxicity: Testicular effects and lower male fertility have been noted in animal studies.

Developmental Toxicity: MCPA studies in laboratory animals have shown decreased fetal body weights and delayed development in the offspring at doses toxic to mother animals.

Genotoxicity: There have been some positive and some negative studies, but the weight of evidence is that MCPA is not mutagenic.

4. FIRST AID MEASURES

If swallowed: Call a physician or Poison Control Center. If patient is conscious and alert, give 1 to 2 glasses of water to drink. Do not induce vomiting. Get medical attention.

If on skin: Wash with plenty of soap and water. Get medical attention.

If inhaled: Remove to fresh air. If not breathing, give artificial respiration. Administer oxygen if necessary. Get medical attention.

If in eyes: Hold eyelids open and flush with a steady, gentle stream of water for at least 15 minutes. Get medical attention, preferably an ophthalmologist.

Note to Physician: No specific antidote is available. All treatments should be based on observed signs and symptoms of distress in the patient. Overexposure to materials other than this product may have occurred. This product is irritating to mucous membranes. If large amounts (greater than 1 ml/kg body weight) of the product have been ingested, the stomach should be evacuated by gastric intubation with the aid of a cuffed endotracheal tube to prevent exposure of the esophagus. After removal of stomach contents, wash stomach by instilling 30 to 50g of activated charcoal in 3 to 4 ounces of water through the stomach tube and again remove stomach contents. Avoid oily laxatives. This product contains a phenoxy herbicide. Myotoxic effects may include muscle fibrillations, myotonia, and muscular weakness. Ingestion of massive doses may result in persistent fall of blood pressure. Myoglobin and hemoglobin may be found in urine. Elevations in lactate dehydrogenase (LDH), SGOT, SGPT and aldolase indicate the extent of muscle damage.

5. FIRE FIGHTING MEASURES

Flash Point: >230°F (110°C) by Seta flash method.

Autoignition Temperature: Not determined.

Flammability Limits: Not determined.

Extinguishing Media: Recommended (large fire): foam, water spray. Recommended (small fires): dry chemical, carbon dioxide.

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

Unusual Fire and Explosion hazards: Under fire conditions, toxic, corrosive fumes are emitted. Containers will burst from internal pressure under extreme fire conditions.

Hazardous Decomposition Materials (Under Fire Conditions): Hydrogen chloride, other chlorine compounds, carbon dioxide, carbon monoxide, oxides of nitrogen and other potentially toxic combustion products may be present.
6. ACCIDENTAL RELEASE MEASURES

Evacuation Procedures and Safety: Wear appropriate protective gear for the situation. See Personal Protection information in Section 8.

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

Cleanup and Disposal of Spill: Pump any free liquid into an appropriate closed container. Collect washings for disposal. Decontaminate tools and equipment following cleanup. (See Section 13.)

Environmental and Regulatory Reporting: Prevent material from entering public sewer system or any waterways. Do not flush to drain. Large spills to soil or similar surfaces may necessitate removal of top soil. The affected area should be removed and placed in an appropriate container for disposal. Spills may be reportable to federal, state and/or local agencies.

7. HANDLING AND STORAGE

Handling:
Handle containers carefully to avoid damage and spills.

Storage:
Keep from freezing. Store at temperatures above 45°F (7°C). Frozen material may be thawed in a warm room, but should be mixed thoroughly before use. Store in original container in a dry, secured storage area. Do not contaminate water, food or feed by storage or disposal. Avoid storage in close proximity to insecticides, fungicides, fertilizers and seeds. Keep container tightly closed when not in use.

8. EXPOSURE CONTROLS/PERSONAL PROTECTION

General:
These recommendations provide general guidance for handling this product. Because specific work environments and material handling practices vary, safety procedures should be developed for each intended usage, including maintenance and repair of equipment. Contact personal protective equipment manufacturers for assistance with selection, use and maintenance of such equipment.

Personal Protective Equipment:

Respiratory Protection: When respirators are required, select NIOSH/MSHA approved equipment based on actual or potential airborne concentrations and in accordance with the appropriate regulatory standards and/or industrial recommendations. Under normal conditions, in the absence of other airborne contaminants, the following devices should provide protection from this material up to the conditions specified by the appropriate OSHA or ANSI standard(s): Air-purifying (half-mask/full-face) respirator with cartridges/canister approved for use against pesticides. Under conditions immediately dangerous to life or health, or emergency conditions with unknown concentrations, use a full-face positive pressure air-supplied respirator equipped with an emergency escape air supply unit or use a self-contained breathing apparatus unit.

Eye/Face Protection: Eye and face protection requirements will vary dependent upon work environment conditions and material handling practices. Appropriate ANSI Z87 approved equipment should be selected for the particular use intended for this material. Eye contact should be prevented through use of protective eyewear such as chemical safety glasses with side shields or splash proof goggles. An emergency eye wash should be readily accessible to the work area.

Skin Protection: Skin contact should be avoided through the use of permeation resistant clothing, gloves and footwear, selected with regard for use conditions and exposure potential. An emergency shower should be readily accessible to the work area. Consider both durability and permeation resistance of clothing.
Work Practice Controls: 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:

<table>
<thead>
<tr>
<th>Exposure Limits: 2-methyl-4-chlorophenoxyacetic acid, dimethylamine salt</th>
<th>OSHA PEL*</th>
<th>ACGIH TLV®*</th>
<th>STEL</th>
<th>Units</th>
</tr>
</thead>
<tbody>
<tr>
<td>Not Established</td>
<td>Not Established</td>
<td>Not Established</td>
<td>Not Applicable</td>
<td></td>
</tr>
</tbody>
</table>

*8-hour TWA unless otherwise noted.

Ventilation:

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

9. PHYSICAL AND CHEMICAL PROPERTIES

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.

Physical Appearance: Brown liquid.
Odor: Characteristic organic amine and phenolic.
pH: 7.5 to 10
Specific Gravity: Approximately 1.133
Water Solubility: MCPA DMA: 866,000 mg/l. Product Soluble.
Melting Point Range: Not Applicable
Boiling Point Range: Not Applicable. Based on components, expected to be > 100°C
Vapor Pressure: MCPA negligible. Product expected to be similar to water.
Molecular Weight: 245.7 (data on MCPA DMA salt)

10. STABILITY AND REACTIVITY

Chemical Stability: This material is stable under normal handling and storage conditions described in Section 7.
Conditions To Be Avoided: Excessive heat.
Incompatibility With Other Materials: Strong oxidizing agents: bases, acids.
Hazardous Decomposition Products:
  Decomposition Type: Thermal
  Decomposition Products: Hydrogen chloride, other chlorine compounds, carbon dioxide, carbon monoxide, oxides of nitrogen and other potentially toxic combustion products may be present.
Hazardous Polymerization: Does not occur.

11. TOXICOLOGICAL INFORMATION

Toxicological Data:
Data on this product:
Eye Irritation: Severely irritating based on potential for irreversible damage. (Rabbit).
Skin Irritation: Slightly irritating (Rabbit).
Dermal: Slightly toxic. (Rabbit LD₅₀ > 2020 mg/kg).
Inhalation: Slightly toxic. (Rat 4-hr LC₅₀ > 7.3 mg/L)
Oral: Slightly toxic. (Rat LD₅₀ 935 to 1550 mg/kg).
This product contains substances that are considered to be probable or suspected human carcinogens as follows:

<table>
<thead>
<tr>
<th>Ingredients Name</th>
<th>Regulatory Agency Listing As Carcinogen</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>OSHA</td>
</tr>
<tr>
<td>Chlorophenoxy herbicides</td>
<td>No</td>
</tr>
</tbody>
</table>

(Also see Section 3.)

12. ECOLOGICAL INFORMATION

Aquatic Toxicity:
Data on this product:

- 96-hr LC₅₀ Bluegill: >310 mg/l
- 96-hr LC₅₀ Rainbow Trout: 230 mg/l
- 48-hr EC₅₀ Daphnia: 190 mg/l

Avian Toxicity:
Bobwhite Quail Oral LD₅₀: 478 mg/kg (data on MCPA dimethylamine salt)
Mallard Duck 8-day Dietary LC₅₀: >5620 ppm (data on MCPA dimethylamine salt)

Environmental Fate:
MCPA dimethylamine salt rapidly dissociates to parent MCPA acid. In soil, MCPA is microbially degraded with typical half-life of approximately 10 to 14 days.

13. DISPOSAL CONSIDERATIONS

Waste Disposal Method:
Pesticide wastes are acutely hazardous. Improper disposal of excess pesticide is a violation of Federal Law and may contaminate ground water. 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:
Do not reuse empty container. Triple rinse (or equivalent) adding rinsate to application equipment. Then offer empty container 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.

14. TRANSPORTATION INFORMATION

NOTE: Information is for surface transportation of package sizes generally offered and does not address regulatory variations due to changes in package size, mode of shipment or other conditions.

DOT Proper Shipping Name: Not Applicable.
DOT Hazard Class / I.D. No.: Not Applicable.
DOT Label: Not Applicable.
U.S. Surface Freight Classification: Weed killing compound, N.O.I.B.N.
15. REGULATORY INFORMATION

Federal Regulations:

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

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

<table>
<thead>
<tr>
<th>Fire:</th>
<th>Reactive:</th>
<th>Release of Pressure:</th>
<th>Acute Health:</th>
<th>Chronic Health:</th>
</tr>
</thead>
<tbody>
<tr>
<td>No</td>
<td>No</td>
<td>No</td>
<td>Yes</td>
<td>Yes</td>
</tr>
</tbody>
</table>

Section 313 Toxic Chemical(s): Not Applicable

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

<table>
<thead>
<tr>
<th>Ingredient</th>
<th>RQ</th>
</tr>
</thead>
<tbody>
<tr>
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<td>Not Applicable</td>
</tr>
</tbody>
</table>

Selected State Regulations:

This product contains the following components that are regulated under California Proposition 65:

<table>
<thead>
<tr>
<th>Ingredient Name</th>
<th>Cancer List</th>
<th>Reproductive List</th>
<th>Risk Level (ug/day)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Not Applicable</td>
<td>Not Applicable</td>
<td>Not Applicable</td>
<td>Not Applicable</td>
</tr>
<tr>
<td>Nufarm</td>
<td>Not Applicable</td>
<td>Not Applicable</td>
<td>Not Applicable</td>
</tr>
</tbody>
</table>

16. OTHER INFORMATION

National Fire Protection Association (NFPA®) Hazard Ratings:

<table>
<thead>
<tr>
<th>Ratings for This Product</th>
<th>Key to Ratings</th>
</tr>
</thead>
<tbody>
<tr>
<td>2 Health Hazard</td>
<td>0 Minimal</td>
</tr>
<tr>
<td>1 Flammability</td>
<td>1 Slight</td>
</tr>
<tr>
<td>0 Instability</td>
<td>2 Moderate</td>
</tr>
<tr>
<td></td>
<td>3 Serious</td>
</tr>
<tr>
<td></td>
<td>4 Severe</td>
</tr>
</tbody>
</table>

Abbreviations and Acronyms Not Defined Elsewhere:

ACGIH American Conference of Governmental Industrial Hygienists
ANSI American National Standards Institute
CERCLA Comprehensive Environmental Response, Compensation and Liability Act
DOT Department of Transportation
FIFRA Federal Insecticide, Fungicide and Rodenticide Act
IARC International Agency for Research on Cancer
MSHA Mine Safety and Health Administration
NIOSH National Institute for Occupational Safety and Health
NTP National Toxicology Program
OSHA Occupational Safety and Health Administration
PEL Permissible Exposure Limit
SARA Superfund Amendments and Reauthorization Act of 1986
STEL Short Term Exposure Limit
TLV Threshold Limit Value
TSCA Toxic Substances Control Act
TWA Time Weighted Average
USEPA U.S. Environmental Protection Agency
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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