



DEBITÔ TMF HERBICIDE

MATERIAL SAFETY DATA SHEET

1. CHEMICAL PRODUCT AND COMPANY IDENTIFICATION

Product Name:	Nufarm Debit TMF Herbicide
Synonyms:	Glyphosate; glyphosate, isopropylamine salt; glyphosate IPA salt.
EPA Reg. No.:	71368-21
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. For additional non-emergency information, call: 1-800-852-5234.
Date:	March 12, 2002
Revisions:	New or updated information in all sections.
Reasons for Revisions:	General revision utilizing more specific data.
Supersedes:	March 31, 2000

2. COMPOSITION INFORMATION ON INGREDIENTS

COMPONENT	CAS NO.	% BY WEIGHT
Active Ingredient: Glyphosate, N-(phosphonomethyl) glycine, in the form of its isopropylamine salt	38641-94-0 (as the salt) (1071-83-6 for glyphosate acid)	53.8
Inert Ingredients*:		<u>46.2</u>
Total		100.0

*No hazardous chemicals under the criteria of the OSHA Hazard Communication Standard (29 CFR Part 1910.1200). The other major ingredient in this product is water.

3. HAZARDS IDENTIFICATION

Emergency Overview:

Appearance and Odor: Clear, viscous greenish/yellowish solution with virtually no odor

Warning Statements: Keep out of reach of children. CAUTION. Harmful if inhaled or swallowed. Avoid breathing spray mist. Avoid contact with eyes, skin and clothing. Wash thoroughly with soap and water after handling.

Potential Adverse Health Effects:

Likely Routes of Exposure: Inhalation and skin contact.

Eye Contact: No more than slightly irritating based on toxicity studies.

Skin Contact: No more than slightly toxic or irritating based on toxicity studies.

Ingestion: No more than slightly toxic based on toxicity studies. No significant adverse health effects are expected to develop if only small amounts (less than a mouthful) are swallowed.

Inhalation: No more than slightly toxic if inhaled based on toxicity studies.

Refer to Section 11 for toxicological information.

4. FIRST AID MEASURES

If inhaled: Remove individual to fresh air. If not breathing give artificial respiration, preferably mouth to mouth. Get medical attention.

If swallowed: This product will cause gastrointestinal tract irritation. Immediately dilute by swallowing water or milk. Get medical attention. Never give anything by mouth to an unconscious person.

5. FIRE FIGHTING MEASURES

Flash Point: This material is not combustible as tested by the Tag Cup Test.

Autoignition Temperature: Not determined.

Hazardous Products of Combustion: Oxides of carbon and nitrogen.

Extinguishing Media: In case of fire, use water (flood with water), dry chemical, CO₂, or alcohol foam.

Special Fire Fighting Procedures: Firefighters and others that may be exposed to vapor, mists, dusts, or products of combustion should wear full protective clothing and self contained breathing apparatus. Equipment should be thoroughly cleaned after use.

Unusual Fire or Explosion Hazards: Containers will burst from internal pressure under extreme fire conditions.

6. ACCIDENTAL RELEASE MEASURES

Observe all protection and safety precautions when cleaning up spills. See Exposure Controls/Personal Protection, Section 8.

Small Spills: For a spill less than one gallon on floor or other impervious surface, soak up with towels or other absorbent material and discard in the trash. Clean the spill area with soap and water and rinse the area thoroughly.

Large Liquid Spills: Large spills on the floor or other impervious surface should be contained or diked and then absorbed with attapulgate, bentonite or other absorbent clays. Collect the contaminated absorbent, place in a metal drum and dispose of in accordance with the instructions provided under Disposal, Section 13 of this MSDS.

Thoroughly scrub floor or other imperious surface with a strong industrial detergent and rinse with water.

Large spills that soak into the ground should be dug up, placed in metal drums and disposed of in accordance with instructions provided under DISPOSAL, Section 13 of this MSDS. Contact appropriate state agency when considering a land spreading disposal option. Leaking containers should be separated from non-leakers and either the container or its contents transferred to a drum or other non-leaking container and disposed of in accordance with instructions provided under DISPOSAL, Section 13 of this MSDS. Any recovered spilled liquid should be similarly collected and disposed of.

7. HANDLING AND STORAGE**Handling:**

Handle containers carefully to avoid damage and spills.

Storage:

STORE ABOVE 10°F (-12°C) TO KEEP FROM CRYSTALLIZING. Crystals will settle to the bottom. If allowed to crystallize, place in a warm room at 68°F (20°C) for several days to redissolve and mix well before using.

Do not contaminate water, foodstuffs, feed or seed by storage or disposal.

8. EXPOSURE CONTROLS/PERSONAL PROTECTION

Personal Protective Equipment:

Eye Protection: This product does not present significant eye irritation or eye toxicity requiring special protection. Avoid eye contact as good industrial practice.

Skin Protection: This product does not present significant skin concern requiring special protection.

Respiratory Protection: For Handling of the Undiluted Product: The undiluted product is not likely to represent an airborne exposure concern during normal handling. In the event of an accidental discharge of the material during manufacture or handling which produces a heavy vapor or mist, workers should put on respiratory protection equipment. Consult respirator manufacturer to determine appropriate type of equipment. Observe respirator use limitations specified by NIOSH/MSHA or the manufacturer. Respiratory protection programs must comply with 29 CFR Part 1910.134. For Application of Product Diluted in accordance with label instructions: Respirators are not required for applications of use dilutions of this product.

Ventilation: No special precautions are recommended.

Exposure Guidelines:

Exposure Limits:	OSHA PEL:	ACGIH TLV^â:
Glyphosate isopyramine salt	Not established	Not established

9. PHYSICAL AND CHEMICAL PROPERTIES

NOTE: These physical data are typical values based on material tested, but may vary from sample to sample. Typical values should not be construed as a guaranteed analysis of any specific lot or as specification items.

Physical Appearance:	Clear, viscous greenish/yellowish solution
Odor:	Essentially odorless
pH:	4.6 to 4.8
Specific Gravity:	1.20 to 1.21
Water Solubility:	Highly soluble.
Melting Point Range:	200° C with decomposition (data on glyphosate acid).
Boiling Point Range:	Not available. Expected to be similar to water.
Vapor Pressure:	1.8×10^{-7} mm Hg @ 45° C (data on glyphosate acid).
Molecular Weight:	228.19 (data on glyphosate IPA salt).

10. STABILITY AND REACTIVITY

Chemical Stability: Stable for at least 5 years under normal conditions of warehouse storage. Heated facilities are not required.

Conditions to Avoid: Store above 10°F (-12°C) to keep from crystallizing.

Incompatibility with Other Materials: Spray solutions of this product should be mixed, stored and applied using only stainless steel, aluminum, fiberglass, plastic and plastic-lined steel containers.

DO NOT MIX, STORE OR APPLY THIS PRODUCT OR SPRAY SOLUTIONS OF THIS PRODUCT IN GALVANIZED OR UNLINED STEEL (EXCEPT STAINLESS STEEL) CONTAINERS OR SPRAY TANKS. This product or solutions of this product react with such containers and tanks to produce hydrogen gas which may form a highly combustible gas mixture. This gas mixture could flash or explode, causing serious personal injury, if ignited by open flame, spark, welder's torch, lighted cigarette or other ignition source.

Hazardous Decomposition Products: Hydrogen gas as stated immediately above.

Hazardous Polymerization: Does not occur. This product can react with caustic (basic) materials to liberate heat. This is not a polymerization but rather a chemical neutralization in an acid-base reaction.

11. TOXICOLOGICAL INFORMATION

Toxicological Data

Data from laboratory studies conducted on this product:

Oral: Practically Non-toxic, (Rat LD₅₀: > 5,000 mg/kg)

Dermal: Practically Non-toxic, (Rat LD₅₀: > 5,000 mg/kg)

Inhalation: Slightly Toxic, (Rat 4-hr LC₅₀: > 2.07 mg/l)

Eye Irritation: Minimally irritating, (Rabbit)

Skin Irritation: Non-irritating (Rabbit)

This product did not cause dermal sensitization after repeated applications (Guinea pig).

In repeat dosing studies (6-months), dogs fed a more concentrated form of this product exhibited slight body weight changes. Following repeated skin exposure (3-weeks) to this product, skin irritation was the only effect in rabbits. No skin allergy was observed in guinea pigs following repeated skin exposure.

Additional toxicity information is available on glyphosate, the active herbicidal ingredient of this product. Following repeated exposures (90-days) to glyphosate in their feed, decreased weight gains noted at the highest test level in mice, while no treatment-related effects occurred in rats. Following repeated skin exposure (3 weeks) to glyphosate, slight skin irritation was the primary effect observed in rabbits. No skin allergy was observed in guinea pigs following repeated skin exposure. There was no evidence of effects on the nervous system, including delayed effects in chickens (repeat oral doses) or cholinesterase inhibition in rats (single oral doses). Reduced body weight gain and effects on liver tissues were observed with long-term (2-year) feeding of glyphosate to mice at high-dose levels. Reduced body weight gain and eye changes were observed at the high-dose level in one long-term (2 year) feeding study with rats, while no treatment related effects occurred in a second study. No adverse effects were observed in feeding studies with dogs. Glyphosate did not produce tumors in any of these studies.

Based on the results from the chronic studies, EPA has classified glyphosate in category E (evidence of non-carcinogenicity for humans). No birth defects were noted in rats and rabbits given glyphosate orally during pregnancy, even at amounts which produced adverse effects on the mothers. Glyphosate was fed continuously to rats at very high dose levels for 2 successive generations. Toxicity was reported in offspring from the high dose, a level which also produced adverse effects on the mothers. In a 3 generation study conducted at lower dose levels, no effects were seen on the ability of male or female rats to reproduce. Glyphosate has produced no genetic changes in a variety of standard tests using animals and animal or bacterial cells.

12. ECOLOGICAL INFORMATION

Aquatic Toxicity:

96-hr LC₅₀ Bluegill: > 1,000 mg/l, Practically Nontoxic

96-hr LC₅₀ Trout: > 1,000 mg/l, Practically Nontoxic

48-hr EC₅₀ Daphnia: 930 mg/l, Practically Nontoxic

Oral LD₅₀ Goat: 5,700 mg/kg, Practically Nontoxic

Other:

A comparable product was administered to Brahman-cross heifers by gavage, at daily dosages of 0, 540, 830, 1290 and 2000 mg/kg for 7 consecutive days. Clinical signs of toxicity, including loss of appetite, diarrhea and death (1290 and 2000 mg/kg) were observed at 830 mg/kg or above. The no-effect level was considered to be 540 mg/kg/day.

Environmental Fate:

Glyphosate is rapidly and strongly adsorbed to soil. It has a soil half-life of approximately 47 days, but the adsorptive characteristic negates herbicidal activity almost immediately.

13. DISPOSAL CONSIDERATIONS

Waste Disposal Method:

Wastes resulting from the use of this product that cannot be used or chemically reprocessed should be disposed of in a landfill approved for pesticide disposal or in accordance with applicable Federal, State and local procedures.

Container Handling and Disposal:

Emptied container retains vapor and product residue. Observe all labeled safeguards until container is cleaned, reconditioned or destroyed. Do not reuse container. If applicable, return emptied container in accordance with container return program. If not returned, triple rinse container, then 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. TRANSPORT INFORMATION

Follow the precautions indicated in the Handling and Storage Section, Section 7 of this MSDS.

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

SARA Hazard Notification:

Hazard Categories Under Criteria of SARA Title III Rules (40 CFR Part 370): Not Applicable
 Section 313 Toxic Chemical(s): Not Applicable

Hazardous Chemical(s) Under OSHA Hazard Standard Communication Standard: Not Applicable

Reportable Quantity (RQ) under U.S. CERCLA: Not Applicable

TSCA Inventory: All Components are on the US EPA's TSCA Inventory List.

16. OTHER INFORMATION

National Fire Protection Association (NFPA®) Hazard Ratings:

Ratings for This Product		Key to Ratings	
1	Health Hazard	0	Minimal
1	Flammability	1	Slight
0	Instability	2	Moderate
		3	Serious
		4	Severe

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-APPROVED 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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