

AUG 05 1997

MONSANTO PRODUCT NAME
ROUNDUP® Herbicide

MONSANTO COMPANY
800 N. LINDBERGH BLVD.
ST. LOUIS, MO 63167
Emergency Phone No. (Call Collect) 314-694-4000
DATE PREPARED: AUGUST, 1989

PRODUCT IDENTIFICATION

EPA Reg. No.: 524-308
Synonyms: None
Chemical Name: Not Applicable, Formulated Product
Active Ingredient: *Glyphosate, N-Phosphonomethylglycine, in the form of its isopropylamine salt..... 41.0%
..... 59.0%
..... 100.0%
Inert Ingredients:
*Contains 480 grams per liter or 4 pounds per gallon of the active ingredient glyphosate in the form of its isopropylamine salt. Equivalent to 356 grams per liter or 3 pounds per U.S. gallon of the acid, glyphosate.

CAS Reg. No. : Not Applicable
CAS Reg. No. Active Ingredient: 1071-83-6
DOT Proper Shipping Name: Not Applicable
DOT Hazard Class/I.D. No.: Not Applicable
DOT Label: Not Applicable
Reportable Quantity (RQ)
Under U.S. CERCLA: Not Applicable
U.S. Surface Freight Classification: Weed Killing Compound, N.O.I.B.N.

SARA Hazard Notification

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

Immediate

Section 313 Toxic Chemical(s):

Not Applicable

Hazardous Chemical(s) Under OSHA Hazard Communication Standard:

This product contains, as components, the substances listed below which are identified as hazardous chemicals under the criteria of the OSHA Hazard Communication Standard (29 CFR 1910.1200):
Ethoxylated Tallowamines, CAS Reg. No. 61791-26-2

WARNING STATEMENTS

Keep out of reach of children

WARNING!

CAUSES EYE IRRITATION

HARMFUL IF SWALLOWED OR INHALED

MAY CAUSE SKIN IRRITATION

REFORMULATION IS PROHIBITED

SEE INDIVIDUAL CONTAINER LABEL FOR REPACKAGING LIMITATIONS.

PRECAUTIONARY MEASURES

Do not get in eyes, on skin or on clothing.

Wash thoroughly after handling. Avoid breathing vapor or spray mist.

Do not apply directly to water or wetland (swamps, bogs, marshes or potholes).

Do not contaminate water when disposing of equipment washwaters.

EMERGENCY AND FIRST AID PROCEDURES

FIRST AID:

- IF IN EYES:** Immediately flush with plenty of water for at least 15 minutes. Get medical attention.
- IF ON SKIN:** Immediately flush with plenty of water. Remove contaminated clothing. Wash clothing before reuse.
- IF SWALLOWED:** This product will produce gastrointestinal irritation. Immediately dilute by swallowing water or milk. Get medical attention.
- IF INHALED:** Remove individual to fresh air. Get medical attention if breathing difficulty develops.

NOTE: For additional human emergency first aid or treatment guidance call collect, anytime, day or night (314) 694-4000.

OCCUPATIONAL CONTROL PROCEDURES

- EYE PROTECTION:** Wear chemical splash goggles during mixing/pouring operations or other activities in which eye contact with undiluted ROUNDUP® herbicide is likely to occur.
- SKIN PROTECTION:** In cases in which prolonged or repeated skin contact with ROUNDUP herbicide may occur, long-sleeved shirt, long pants, and chemical protective (e.g. rubber) gloves are recommended. Wash hands and contaminated skin after handling. Clothing soaked with a solution of ROUNDUP herbicide should be promptly removed and laundered before reuse.
- RESPIRATORY PROTECTION:** Respiratory protection should not be required for normal use and handling. During periods of abnormal exposure to heavy spray or mist, use NIOSH/MSHA approved equipment for pesticide vapor/mist is recommended. The respirator use limitations specified by NIOSH/MSHA or the manufacturer must be observed.
- VENTILATION:** No special precautions are recommended.

AIRBORNE EXPOSURE LIMITS:

Product: ROUNDUP® Herbicide - 100% by wt.

OSHA PEL: None established
ACGIH TLV: None established

Ethoxylated Tallowamine

OSHA PEL: None established
ACGIH TLV: None established

FIRE PROTECTION INFORMATION

- Flash Point:** > 200°F Method: Tag Closed Cup
- Extinguishing Media:** Water spray, foam, dry chemical or CO₂, or any Class B extinguishing agent.
- Special Fire Fighting Procedures:** Fire fighters and others who may be exposed to vapors or products of combustion should wear a self-contained breathing apparatus and full protective clothing. Equipment should be thoroughly cleaned after use.
- Unusual Fire and Explosion Hazards:** None.

REACTIVITY DATA

- Stability:** Stable for at least 5 years under normal conditions of warehouse storage. Heated facilities are not required.
- Incompatibility:** Spray solutions of this product should be mixed, stored or applied only in stainless steel, aluminum, fiberglass, plastic and plastic-lined 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 spray 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:** None.
- 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.

HEALTH EFFECTS SUMMARY

The following information summarizes human experience and results of scientific investigations reviewed by health professionals for hazard evaluation of ROUNDUP® herbicide and development of Precautionary Statements and Occupational Control Procedures recommended in this document.

EFFECTS OF EXPOSURE

Dermal contact and inhalation are expected to be the primary routes of occupational exposure to ROUNDUP herbicide. Direct contact with this material may cause temporary eye irritation and conjunctivitis. Prolonged contact with ROUNDUP may cause skin irritation. Ingestion of ROUNDUP has been reported to produce gastrointestinal discomfort with irritation of the mouth, nausea, vomiting and diarrhea. Oral ingestion of large quantities of concentrated product has been reported to result in hypotension and pulmonary edema.

TOXICOLOGICAL DATA

Data from laboratory studies conducted by Monsanto with ROUNDUP® herbicide are summarized below:

Single exposure (acute) studies indicate:

- Oral - Slightly Toxic (Rat LD₅₀ - 5,000 mg/kg)
- Oral - Practically Nontoxic (Mouse LD₅₀ - >5,000 mg/kg)
- Dermal - Practically Nontoxic (Rabbit LD₅₀ - >5,000 mg/kg)
- Inhalation - Slightly Toxic (Rat LC₅₀ - 3.18 mg/l)
- Eye Irritation - Moderately Irritating (Rabbit)
- Skin Irritation - Slightly Irritating (Rabbit, 4-hr exposure)
- DOT Skin Corrosion - Not Corrosive (Rabbit, 4-hr exposure)

No skin irritation, allergy or photoallergy was reported in human volunteers following repeated skin exposure; no skin irritation or photoirritation was reported with single skin exposure. No skin allergy was observed in guinea pigs following repeated skin exposure.

Following repeated skin exposure (3-week) to ROUNDUP® herbicide at 5 times the intended use concentration, severe skin irritation and systemic toxic effects (death, reduced food consumption, body weight loss and testicular effects) were observed in rabbits. Slight to moderate skin irritation was the only effect in rabbits treated with 3 times the intended use concentration. Systemic toxic effects at 5 times use concentration were considered to be a secondary response to the stress of severe skin irritation, to which rabbits are particularly sensitive, rather than the result of direct systemic toxicity. There was no evidence of cholinesterase inhibition in dogs (single oral doses). Minor nasal irritation was observed following repeated inhalation (4-weeks) of a 33% ROUNDUP herbicide solution by rats. When ROUNDUP herbicide was applied to skin of rhesus monkeys, an extremely low amount (1.8%) of the active ingredient was absorbed.

COMPONENTS

Data from laboratory studies conducted by Monsanto and from the scientific literature on components of ROUNDUP herbicide:

Isopropylamine Salt of Glyphosate

Data from studies with a formulation comprised of 62% isopropylamine salt of glyphosate (MON 0139) indicate the following:

MON 0139 was practically nontoxic orally (rats) or after skin application (rabbits). It was nonirritating to rabbit eyes and practically nonirritating to rabbit skin. In repeat dosing studies (6-month), dogs fed MON 0139 exhibited slight body weight changes. Following repeated skin exposure (3 week) to MON 0139, skin irritation was the primary effect in rabbits. Additional toxicity information is available on glyphosate, the active herbicidal ingredient of MON 0139, which has been tested in mutagenicity, teratogenicity, reproductive, acute, subchronic and chronic toxicity studies.

Surfactant

The surfactant component of ROUNDUP herbicide is reported to cause irritation to the eyes and skin and may contribute to the irritation potential reported for this herbicide. Ingestion may produce gastrointestinal irritation, nausea, vomiting and diarrhea.

PHYSICAL DATA

Appearance: Clear, viscous amber-colored solution.
Odor: Practically odorless to slight amine-like odor.

pH: 4.4 - 4.9
Specific Gravity (Water = 1): 1.17

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.

SPILL, LEAK & DISPOSAL INFORMATION

SPILL/LEAK:

Observe all protective and safety precautions when cleaning up spills – See Occupational Control Procedures.

Liquid spills on floor or other impervious surfaces should be contained or diked, and should be absorbed with attapulgite, bentonite or other absorbent clays. Collect contaminated absorbent, place in plastic-lined metal drum and dispose of in accordance with instructions provided under DISPOSAL. Thoroughly scrub floor with a strong industrial type detergent solution and rinse with water.

Liquid spills that soak into the ground should be dug-up, placed in plastic-lined metal drums and disposed of in accordance with instructions provided under DISPOSAL.

SPILL, LEAK & DISPOSAL INFORMATION (Continued)

Leaking containers should be separated from non-leakers and either the container or its contents transferred to a plastic-lined drum or other non-leaking container. Dispose of leaking container in accordance with instructions provided under DISPOSAL. Any recovered spilled liquid should be similarly collected and disposed of.

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

DISPOSAL:

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 or local procedures.

Emptied container retains vapor and product residue. Observe all labeled safeguards until container is cleaned, reconditioned or destroyed. DO NOT CUT OR WELD ON OR NEAR THIS CONTAINER.

Metal Drums: Triple rinse container. Then offer for recycling or reconditioning, or puncture and dispose of in a sanitary landfill, or by other procedures approved by state and local authorities.

Plastic Jugs: Do not reuse container. 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.

Metal Bulk: Triple rinse emptied bulk containers. Then offer for recycling or reconditioning or disposal in a manner approved by state and local authorities.

Plastic Drums and Mini-Bulk: Do not reuse container. Return container per the Monsanto 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.

ENVIRONMENTAL EFFECTS

ENVIRONMENTAL TOXICITY INFORMATION:

Oral LD ₅₀ Dog:	>5.0 ml/kg, Practically Nontoxic
Oral LD ₅₀ Goat:	4,860 mg/kg, Slightly Toxic
48-hr Oral LD ₅₀ Honeybee:	>100µg/bee
48-hr Dermal LD ₅₀ Honeybee:	>100µg/bee
48-hr EC ₅₀ <i>Daphnia magna</i> (With Aeration):	37 mg/l, Slightly Toxic
48-hr EC ₅₀ <i>Daphnia magna</i> (Without Aeration):	24 mg/l, Slightly Toxic
48-hr EC ₅₀ <i>Gammarus pseudolimnaeus</i> :	42 mg/l, Slightly Toxic
96-hr TL ₅₀ Carp:	19.7 ppm, Slightly Toxic
96-hr LC ₅₀ Bluegill sunfish (Static):	14 mg/l, Slightly Toxic
96-hr LC ₅₀ Bluegill sunfish (Flow-Through):	5.8 mg/l, Moderately Toxic
96-hr LC ₅₀ Rainbow trout (Static):	15-26 mg/l, Slightly Toxic
96-hr LC ₅₀ Rainbow trout (Flow-Through):	8.2 mg/l, Moderately Toxic
96-hr LC ₅₀ Channel catfish:	16 mg/l, Slightly Toxic
96-hr LC ₅₀ Fathead minnow:	9.4 mg/l, Moderately Toxic
96-hr LC ₅₀ Crayfish:	>1,000 ppm, Practically Nontoxic
96-hr LC ₅₀ Coho salmon:	22 mg/l, Slightly Toxic
96-hr LC ₅₀ Chinook salmon:	20 mg/l, Slightly Toxic

Carp contained in a static pond were unaffected at any time during a 90-day observation period following exposure by aerial application of ROUNDUP® herbicide at the normal use concentration. Tissue residue analyses indicated that glyphosate, the active ingredient in ROUNDUP herbicide will not bioaccumulate.

Exposure to ROUNDUP herbicide in freshwater at concentrations of 0, 10, 103 and 990 µg/l for 10 days did not impair the ability of salmon smolts to adapt to seawater.

Immersion of chicken eggs at four different embryo ages (0, 6, 12 and 18 days) for about five seconds in 1 or 5% vol/vol ROUNDUP herbicide in water solutions was reported to have no adverse effects on the hatchability or time to hatch of the eggs.

Brahman-cross heifers were given ROUNDUP herbicide, by gavage, at daily dosages of 0, 400, 500, 630 790 and 1000 mg/kg for 7 consecutive days. Clinical signs of toxicity, including loss of appetite, diarrhea and death (790 and 1000 mg/kg) were observed at 500 mg/kg or above. The no-effect level was considered to be 400 mg/kg/day.

DATE: August, 1989

SUPERSEDES: November, 1985

MSDS NUMBER: M00007588

FOR ADDITIONAL NON-EMERGENCY INFORMATION, CALL : 314-694-4000

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