1. PRODUCT AND COMPANY IDENTIFICATION

Product name
Roundup® Weed & Grass Killer Ready-To-Use Plus

EPA Reg. No.
71995-33

Product use
Herbicide

Chemical name
Not applicable.

Synonyms
None.

Company
Monsanto Company, Lawn & Garden Products, P.O. Box 418, Marysville, OH, 43041

Telephone: 1-800-246-7219

Emergency numbers
FOR CHEMICAL EMERGENCY, SPILL LEAK, FIRE, EXPOSURE, OR ACCIDENT Call CHEMTREC - Day or Night: 1-800-424-9300 toll free in the continental U.S., Puerto Rico, Canada, or Virgin Islands. For calls originating elsewhere: 703-527-3887 (collect calls accepted).

FOR MEDICAL EMERGENCY - Day or Night: 1-800-246-7219

2. COMPOSITION/INFORMATION ON INGREDIENTS

Active ingredient
Isopropylamine salt of N-(phosphonomethyl)glycine; {Isopropylamine salt of glyphosate}
Pelargonic and related fatty acids; {Pelargonic and related fatty acids}

Composition

<table>
<thead>
<tr>
<th>COMPONENT</th>
<th>CAS No.</th>
<th>% by weight (approximate)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Isopropylamine salt of glyphosate</td>
<td>38641-94-0</td>
<td>2</td>
</tr>
<tr>
<td>Pelargonic and related fatty acids</td>
<td>112-05-0</td>
<td>2</td>
</tr>
<tr>
<td>Water and minor formulating ingredients</td>
<td></td>
<td>96</td>
</tr>
</tbody>
</table>

The specific chemical identity is being withheld because it is trade secret information of Monsanto Company.

OSHA Status
This product is hazardous according to the OSHA Hazard Communication Standard, 29 CFR 1910.1200.

3. HAZARDS IDENTIFICATION

Emergency overview
Appearance and odour (colour/form/odour): Hazy / Liquid / Musky, Slight

CAUTION!
CAUSES MODERATE EYE IRRITATION

Potential health effects
Likely routes of exposure
Skin contact, eye contact, inhalation
Eye contact, short term
  May cause temporary eye irritation.

Skin contact, short term
  Not expected to produce significant adverse effects when recommended use instructions are followed.

Inhalation, short term
  Not expected to produce significant adverse effects when recommended use instructions are followed.

Refer to section 11 for toxicological and section 12 for environmental information.

4. FIRST AID MEASURES

Eye contact
  Immediately flush with plenty of water.
  If easy to do, remove contact lenses.

Skin contact
  Take off contaminated clothing, wristwatch, jewellery.
  Wash affected skin with plenty of water.
  Wash clothes and clean shoes before re-use.

Inhalation
  Remove to fresh air.

Ingestion
  Immediately offer water to drink.
  Do NOT induce vomiting unless directed by medical personnel.
  If symptoms occur, get medical attention.

Advice to doctors
  This product is not an inhibitor of cholinesterase.

Antidote
  Treatment with atropine and oximes is not indicated.

5. FIRE-FIGHTING MEASURES

Flash point
  Does not flash.

Extinguishing media
  Recommended: Water, foam, dry chemical, carbon dioxide (CO2)

Unusual fire and explosion hazards
  Minimise use of water to prevent environmental contamination.
  Environmental precautions: see section 6.

Hazardous products of combustion
  Carbon monoxide (CO), phosphorus oxides (PxOy), nitrogen oxides (NOx)

Fire fighting equipment
  Self-contained breathing apparatus.
  Equipment should be thoroughly decontaminated after use.

6. ACCIDENTAL RELEASE MEASURES

Personal precautions
Use personal protection recommended in section 8.

**Environmental precautions**

**SMALL QUANTITIES:**
- Low environmental hazard.

**LARGE QUANTITIES:**
- Minimise spread.
- Keep out of drains, sewers, ditches and water ways.

**Methods for cleaning up**

**SMALL QUANTITIES:**
- Flush spill area with water.

**LARGE QUANTITIES:**
- Absorb in earth, sand or absorbent material.
- Dig up heavily contaminated soil.
- Collect in containers for disposal.
- Refer to section 7 for types of containers.
- Flush residues with small quantities of water.
- Minimise use of water to prevent environmental contamination.

Refer to section 13 for disposal of spilled material.

7. **HANDLING AND STORAGE**

Good industrial practice in housekeeping and personal hygiene should be followed.

**Handling**

- When using do not eat, drink or smoke.
- Wash hands thoroughly after handling or contact.
- Thoroughly clean equipment after use.
- Do not contaminate drains, sewers and water ways when disposing of equipment rinse water.
- Emptied containers retain vapour and product residue.
- FOLLOW LABELLED WARNINGS EVEN AFTER CONTAINER IS EMTIED.

**Storage**

- Minimum storage temperature: 5 °C
- Maximum storage temperature: 50 °C
- Compatible materials for storage: stainless steel, glass lining, fibreglass, aluminium, plastic
- Incompatible materials for storage: galvanised steel, unlined mild steel, see section 10.
- Keep out of reach of children.
- Keep away from food, drink and animal feed.
- Keep only in the original container.
- Protect from frost.
- Partial crystallization may occur on prolonged storage below the minimum storage temperature.
- If frozen, place in warm room and shake frequently to put back into solution.

8. **EXPOSURE CONTROLS/PERSONAL PROTECTION**

<table>
<thead>
<tr>
<th>Components</th>
<th>Exposure Guidelines</th>
</tr>
</thead>
<tbody>
<tr>
<td>Isopropylamine salt of glyphosate</td>
<td>No specific occupational exposure limit has been established.</td>
</tr>
<tr>
<td>Pelargonic and related fatty acids</td>
<td>No specific occupational exposure limit has been established.</td>
</tr>
<tr>
<td>Water and minor formulating ingredients</td>
<td>No specific occupational exposure limit has been established.</td>
</tr>
</tbody>
</table>
Engineering controls
No special requirement when used as recommended.

Eye protection
If there is significant potential for contact:
Wear chemical goggles.

Skin protection
No special requirement when used as recommended.

Respiratory protection
No special requirement when used as recommended.

When recommended, consult manufacturer of personal protective equipment for the appropriate type of equipment for a given application.

9. PHYSICAL AND CHEMICAL PROPERTIES

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 specifications for the product.

<table>
<thead>
<tr>
<th>Colour/colour range:</th>
<th>Hazy</th>
</tr>
</thead>
<tbody>
<tr>
<td>Form:</td>
<td>Liquid</td>
</tr>
<tr>
<td>Odour:</td>
<td>Musky, Slight</td>
</tr>
<tr>
<td>Flash point:</td>
<td>Does not flash.</td>
</tr>
<tr>
<td>Specific gravity:</td>
<td>1.0252 @ 20 °C / 15.6 °C</td>
</tr>
<tr>
<td>Solubility:</td>
<td>Water: Completely miscible.</td>
</tr>
<tr>
<td>pH:</td>
<td>~ 7.2 - 7.4</td>
</tr>
</tbody>
</table>

10. STABILITY AND REACTIVITY

Stability
Stable under normal conditions of handling and storage.

Hazardous decomposition
Thermal decomposition: Hazardous products of combustion: see section 5.

Materials to avoid/Reactivity
Reacts with galvanised steel or unlined mild steel to produce hydrogen, a highly flammable gas that could explode.

11. TOXICOLOGICAL INFORMATION

This section is intended for use by toxicologists and other health professionals.

Data obtained on similar products and on components are summarized below.

Skin irritation
Rabbit, 3 animals, OECD 404 test:
Days to heal: 3
Primary Irritation Index (PII): 0.8/8.0
Slight irritation.
FIFRA category IV.

Eye irritation
Rabbit, 3 animals, OECD 405 test:
Days to heal: 10
Moderate irritation.
FIFRA category III.

**Similar formulation**

**Acute oral toxicity**
- Rat, LD50: > 5,000 mg/kg body weight
  - Practically non-toxic.
  - FIFRA category IV.
  - No mortality.

**Acute dermal toxicity**
- Rat, LD50: > 5,000 mg/kg body weight
  - Practically non-toxic.
  - FIFRA category IV.
  - No mortality.

**Acute inhalation toxicity**
- Rat, LC50, 4 hours, aerosol:
  - Practically non-toxic.
  - FIFRA category IV.
  - No mortality. No 4-hr LC50 at the maximum tested concentration.

**Skin sensitization**
- Guinea pig, Buehler test:
  - Positive incidence: 0%

**N-(phosphonomethyl)glycine; {glyphosate}**

**Mutagenicity**
- In vitro and in vivo mutagenicity test(s):
  - Not mutagenic.

**Repeated dose toxicity**
- Rabbit, dermal, 21 days:
  - NOAEL toxicity: > 5,000 mg/kg body weight/day
  - Target organs/systems: none
  - Other effects: none

- Rat, oral, 3 months:
  - NOAEL toxicity: > 20,000 mg/kg diet
  - Target organs/systems: none
  - Other effects: none

**Chronic effects/carcinogenicity**
- Mouse, oral, 24 months:
  - NOEL tumour: > 30,000 mg/kg diet
  - NOAEL toxicity: ~ 5,000 mg/kg diet
  - Tumours: none
  - Target organs/systems: liver
  - Other effects: decrease of body weight gain, histopathologic effects

- Rat, oral, 24 months:
  - NOEL tumour: > 20,000 mg/kg diet
  - NOAEL toxicity: ~ 8,000 mg/kg diet
  - Tumours: none
  - Target organs/systems: eyes
  - Other effects: decrease of body weight gain, histopathologic effects

**Toxicity to reproduction/fertility**
- Rat, oral, 3 generations:
  - NOAEL toxicity: > 30 mg/kg body weight
  - NOAEL reproduction: > 30 mg/kg body weight
  - Target organs/systems in parents: none
Other effects in parents: none
Target organs/systems in pups: none
Other effects in pups: none

**Developmental toxicity/teratogenicity**

**Rat, oral, 6 - 19 days of gestation:**
- NOAEL toxicity: 1,000 mg/kg body weight
- NOAEL development: 1,000 mg/kg body weight
- Other effects in mother animal: decrease of body weight gain, decrease of survival
- Developmental effects: weight loss, post-implantation loss, delayed ossification
  Effects on offspring only observed with maternal toxicity.

**Rabbit, oral, 6 - 27 days of gestation:**
- NOAEL toxicity: 175 mg/kg body weight
- NOAEL development: 175 mg/kg body weight
- Target organs/systems in mother animal: none
- Other effects in mother animal: decrease of survival
- Developmental effects: none

**Pelargonic and related fatty acids**

**Repeated dose toxicity**

**Rat, oral, 4 weeks:**
- Dosage: 2,090 mg/kg body weight/day
- Target organs/systems: none
- Other effects: none

### 12. ECOLOGICAL INFORMATION

This section is intended for use by ecotoxicologists and other environmental specialists.

Data obtained on similar products and on components are summarized below.

**Similar formulation**

**Aquatic toxicity, fish**
- Rainbow trout (*Oncorhynchus mykiss)*:
  - Acute toxicity (limit test), 96 hours, static, LC50: > 100 mg/L
  - Practically non-toxic.

**Aquatic toxicity, invertebrates**
- Water flea (*Daphnia magna)*:
  - Acute toxicity (limit test), 48 hours, static, EC50: > 100 mg/L
  - Practically non-toxic.

**Aquatic toxicity, algae/aquatic plants**
- Green algae (*Scenedesmus subspicatus)*:
  - Acute toxicity, 72 hours, static, EC50: > 87.7 mg/L
  - No more than slightly toxic.

**Arthropod toxicity**
- Honey bee (*Apis mellifera)*:
  - Oral, 48 hours, LD50: > 9,742 µg/bee
  - Practically non-toxic.
- Honey bee (*Apis mellifera)*:
  - Contact, 48 hours, LD50: 8,309 µg/bee
  - Practically non-toxic.

**Soil organism toxicity, invertebrates**
- Earthworm (*Eisenia foetida)*:
  - Acute toxicity, 14 days, LC50: > 1,000 mg/kg dry soil
  - Practically non-toxic.
N-(phosphonomethyl)glycine; [glyphosate]

Avian toxicity

Bobwhite quail (Colinus virginianus):
  Dietary toxicity, 5 days, LC50: > 4,640 mg/kg diet
  No more than slightly toxic.

Mallard duck (Anas platyrhynchos):
  Dietary toxicity, 5 days, LC50: > 4,640 mg/kg diet
  No more than slightly toxic.

Bobwhite quail (Colinus virginianus):
  Acute oral toxicity, single dose, LD50: > 3,851 mg/kg body weight
  Practically non-toxic.

Bioaccumulation

Bluegill sunfish (Lepomis macrochirus):
  Whole fish: BCF: < 1
  No significant bioaccumulation is expected.

Dissipation

Soil, field:
  Half life: 2 - 174 days
  Koc: 884 - 60,000 L/kg
  Adsorbs strongly to soil.

Water, aerobic:
  Half life: < 7 days

Pelargonic and related fatty acids

Avian toxicity

Mallard duck (Anas platyrhynchos):
  Dietary toxicity, 5 days, LC50: > 5,620 mg/kg diet
  Practically non-toxic.

Bobwhite quail (Colinus virginianus):
  Dietary toxicity, 5 days, LC50: > 5,620 mg/kg diet
  Practically non-toxic.

Bobwhite quail (Colinus virginianus):
  Acute oral toxicity, LD50: > 2,250 mg/kg body weight
  Practically non-toxic.

13. DISPOSAL CONSIDERATIONS

Product

Keep out of drains, sewers, ditches and water ways.
Recycle if appropriate facilities/equipment available.
Burn in proper incinerator.
Follow all local/regional/national/international regulations.

Container

See the individual container label for disposal information.
Emptied containers retain vapour and product residue.
Observe all labelled safeguards until container is cleaned, reconditioned or destroyed.
Empty packaging completely.
Triple or pressure rinse empty containers.
Do NOT contaminate water when disposing of rinse waters.
Ensure packaging cannot be reused.
Do NOT re-use containers.
Store for collection by approved waste disposal service.
Recycle if appropriate facilities/equipment available.
Follow all local/regional/national/international regulations.

14. TRANSPORT INFORMATION

The data provided in this section is for information only. Please apply the appropriate regulations to properly classify your shipment for transportation.

Not hazardous under the applicable DOT, ICAO/IATA, IMO, TDG and Mexican regulations.

15. REGULATORY INFORMATION

TSCA Inventory
Exempt

OSHA Hazardous Components
Surfactant(s)

SARA Title III Rules
Section 311/312 Hazard Categories
Immediate
Section 302 Extremely Hazardous Substances
Not applicable.
Section 313 Toxic Chemical(s)
Not applicable.

CERCLA Reportable quantity
Not applicable.

16. OTHER INFORMATION

The information given here is not necessarily exhaustive but is representative of relevant, reliable data.
Follow all local/regional/national/international regulations.
Please consult supplier if further information is needed.
In this document the British spelling was applied.

Full denomination of most frequently used acronyms. BCF (Bioconcentration Factor), BOD (Biochemical Oxygen Demand), COD (Chemical Oxygen Demand), EC50 (50% effect concentration), ED50 (50% effect dose), I.M. (intramuscular), I.P. (intraperitoneal), I.V. (intravenous), Koc (Soil adsorption coefficient), LC50 (50% lethality concentration), LD50 (50% lethality dose), LLoD (Lower limit of lethal dosage), LEL (Lower Explosion Limit), LOAEC (Lowest Observed Adverse Effect Concentration), LOAEL (Lowest Observed Adverse Effect Level), LOEC (Lowest Observed Effect Concentration), LOEL (Lowest Observed Effect Level), MEL (Maximum Exposure limit), MTD (Maximum Tolerated Dose), NOAEC (No Observed Adverse Effect Concentration), NOAEL (No Observed Adverse Effect Level), NOEC (No Observed Effect Concentration), NOEL (No Observed Effect Level), OEL (Occupational Exposure Limit), PEL (Permissible Exposure Limit), PII (Primary Irritation Index), Pow (Partition coefficient n-octanol/water), S.C. (subcutaneous), STEL (Short-Term Exposure Limit), TLV-C (Threshold Limit Value-Ceiling), TLV-TWA (Threshold Limit Value - Time Weighted Average), UEL (Upper Explosion Limit)

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-approved label.

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