

**MONSANTO COMPANY**  
Material Safety Data Sheet  
Commercial Product

## 1. PRODUCT AND COMPANY IDENTIFICATION

**Product name**

**Roundup Original MAX® Herbicide**

**EPA Reg. No.**

524-539

**Product use**

Herbicide

**Chemical name**

Not applicable.

**Synonyms**

None.

**Company**

MONSANTO COMPANY, 800 N. Lindbergh Blvd., St. Louis, MO, 63167

**Telephone:** 800-332-3111, **Fax:** 314-694-5557

**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 (314) 694-4000 (collect calls accepted).

## 2. COMPOSITION/INFORMATION ON INGREDIENTS

**Active ingredient**

Potassium salt of N-(phosphonomethyl)glycine; {Potassium salt of glyphosate}

**Composition**

COMPONENT	CAS No.	% by weight (approximate)
Potassium salt of glyphosate	70901-12-1	49
Other ingredients		51

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):** Amber / Liquid / Odourless, 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.

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## 4. FIRST AID MEASURES

**Eye contact**

If in eyes, hold eye open and rinse slowly and gently for 15-20 minutes. Remove contact lenses, if present, after first 5 minutes, then continue rinsing.

**Skin contact**

Take off contaminated clothing, wristwatch, jewellery.  
Wash affected skin with plenty of water.  
Continue for at least 15 minutes.

**Inhalation**

If inhaled, move person to fresh air. If person is not breathing, call emergency number or ambulance, then give artificial respiration, preferably mouth-to-mouth, if possible.

**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.

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## 5. FIRE-FIGHTING MEASURES

**Flash point**

Does not flash.

**Extinguishing media**

Recommended: Water, foam, dry chemical, carbon dioxide (CO<sub>2</sub>)

**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 (P<sub>x</sub>O<sub>y</sub>), nitrogen oxides (NO<sub>x</sub>)

**Fire fighting equipment**

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

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## 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.

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## 7. HANDLING AND STORAGE

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

### Handling

Avoid contact with eyes, skin and clothing.

When using do not eat, drink or smoke.

Wash hands thoroughly after handling or contact.

Do not contaminate drains, sewers and water ways when disposing of equipment rinse water.

Thoroughly clean equipment after use.

Refer to section 13 of the safety data sheet for disposal of rinse water.

Wash contaminated clothing before re-use.

Emptied containers retain vapour and product residue.

**FOLLOW LABELLED WARNINGS EVEN AFTER CONTAINER IS EMPTIED.**

### Storage

Compatible materials for storage: stainless steel, aluminium, fibreglass, plastic, glass lining

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.

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## 8. EXPOSURE CONTROLS/PERSONAL PROTECTION

### Airborne exposure limits

Components	Exposure Guidelines
Potassium salt of glyphosate	No specific occupational exposure limit has been established.
Other ingredients	No specific occupational exposure limit has been established.

### Engineering controls

No special requirement when used as recommended.

### Eye protection

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

#### **Skin protection**

Wear chemical resistant gloves.  
If there is significant potential for contact:  
Wear face shield.  
Wear chemical resistant clothing/footwear.  
Applicators and other handlers must wear:  
Wear long sleeved shirt, long pants and shoes with socks.  
Follow manufacturer's instructions for cleaning/maintaining Personal Protective Equipment.  
If no such instructions for washables, use detergent and hot water.

#### **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.

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## **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.

Colour/colour range:	Amber
Form:	Liquid
Odour:	Odourless, Slight
Flash point:	Does not flash.
Specific gravity:	1.36
Solubility:	Water: Soluble
pH:	4.4 - 4.8 10 g/l
Partition coefficient (log Pow):	-3.2 @ 25 °C (glyphosate)

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## **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.

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## **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.

#### **Similar formulation**

#### **Acute oral toxicity**

Rat, LD50: > 5,000 mg/kg body weight

Practically non-toxic.

FIFRA category IV.

**Acute dermal toxicity**

**Rat, LD50:** > 5,000 mg/kg body weight

Practically non-toxic.

FIFRA category IV.

**Eye irritation**

**Rabbit, 3 animals, OECD 405 test:**

Days to heal: 7

Moderate irritation.

FIFRA category III.

**Acute inhalation toxicity**

**Rat, LC50, 4 hours, aerosol:**

Practically non-toxic.

FIFRA category IV.

No 4-hr LC50 at the maximum tested concentration.

**Skin sensitization**

**Guinea pig, Buehler test:**

Positive incidence: 0 %

**Similar formulation**

**Skin irritation**

**Rabbit, 3 animals, OECD 404 test:**

Days to heal: 7

Primary Irritation Index (PII): 2.3/8.0

Moderate irritation.

FIFRA category III.

**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, 2 generations:**

NOAEL toxicity: 10,000 mg/kg diet  
NOAEL reproduction: > 30,000 mg/kg diet  
Target organs/systems in parents: none  
Other effects in parents: decrease of body weight gain  
Target organs/systems in pups: none  
Other effects in pups: decrease of body weight gain  
Effects on offspring only observed with maternal toxicity.

**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

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## 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**

**Bluegill sunfish (*Lepomis macrochirus*):**

Acute toxicity, 96 hours, static, LC50: 5.2 mg/L  
Moderately toxic.

**Common carp (*Cyprinus carpio*):**

Acute toxicity, 96 hours, static, LC50: 4.0 mg/L  
Moderately toxic.

#### **Aquatic toxicity, invertebrates**

**Water flea (*Daphnia magna*):**

Acute toxicity, 48 hours, static, EC50: 8.0 mg/L  
Moderately toxic.

### **Similar formulation**

#### **Aquatic toxicity, algae/aquatic plants**

**Green algae (*Selenastrum capricornutum*):**

Acute toxicity, 72 hours, static, EC50: 0.46 mg/L  
Highly toxic.

#### **Avian toxicity**

**Bobwhite quail (*Colinus virginianus*):**

Acute oral toxicity, single dose, LD50: > 2,250 mg/kg body weight  
Practically non-toxic.

#### **Arthropod toxicity**

**Honey bee (*Apis mellifera*):**

Oral, 48 hours, LD50: > 281 µg/bee  
Practically non-toxic.

**Honey bee (*Apis mellifera*):**

Contact, 48 hours, LD50: > 273 µg/bee  
Practically non-toxic.

**Soil organism toxicity, invertebrates**

**Earthworm (*Eisenia foetida*):**

Acute toxicity, 14 days, LC50: > 10,000 mg/kg dry soil  
Practically non-toxic.

**Soil organism toxicity, microorganisms**

**Nitrogen and carbon transformation test:**

29.5 kg/ha, 28 days: Less than 25% effect on nitrogen or carbon transformation processes in soil.

**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

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## 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.

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## 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.

This product is not hazardous under the applicable DOT, ICAO/IATA, or IMDG regulations.

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## 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.

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## 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), LDLo (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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