

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

## 1. PRODUCT AND COMPANY IDENTIFICATION

**Product name**

**QuikPRO[TM] Herbicide**

**EPA Reg. No.**

524-535

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

## 2. COMPOSITION/INFORMATION ON INGREDIENTS

**Active ingredient**

Ammonium salt of N-(phosphonomethyl)glycine; {Ammonium salt of glyphosate}  
6,7-Dihydrodipyrido(1,2-a:2',1'c) pyrazinedium dibromide; {Diquat dibromide}

**Composition**

COMPONENT	CAS No.	% by weight (approximate)
Ammonium salt of glyphosate	114370-14-8	73.3
Diquat dibromide	85-00-7	2.9
Other ingredients		23.8

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):** Whitish - Brown / Granules / Slight

CAUTION!  
HARMFUL IF SWALLOWED  
HARMFUL IF INHALED  
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**

Harmful by inhalation.

**Single ingestion**

Harmful if swallowed.

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**

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

**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.  
Never give anything by mouth to an unconscious person.  
QUICK TREATMENT IS ESSENTIAL TO COUNTERACT POISONING and should be initiated before signs and symptoms of injury appear.  
Get medical advice from a poison control center or doctor.

**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**

Not applicable.

**Extinguishing media**

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

**Unusual fire and explosion hazards**

None.  
Environmental precautions: see section 6.

**Hazardous products of combustion**

Carbon monoxide (CO), nitrogen oxides (NO<sub>x</sub>), phosphorus oxides (P<sub>x</sub>O<sub>y</sub>), hydrogen bromide (HBr)

**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 breathing dust.

Avoid contact with eyes, skin and clothing.

Wash contaminated clothing before re-use.

Wash hands thoroughly after handling or contact.

Observe all labelled safeguards until container is cleaned, reconditioned or destroyed.

### 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
Ammonium salt of glyphosate	No specific occupational exposure limit has been established.
Diquat dibromide	TLV (ACGIH): 0.5 mg/m <sup>3</sup> : inhalable fraction, skin, No specific occupational exposure limit has been established., The exposure limit indicated is for the diquat cation. TLV (ACGIH): 0.1 mg/m <sup>3</sup> : respirable fraction, skin, No specific occupational

	exposure limit has been established., The exposure limit indicated is for the diquat cation. PEL (OSHA): No specific occupational exposure limit has been established.
Other ingredients	No specific occupational exposure limit has been established.

**Engineering controls**

Provide local exhaust ventilation.

**Eye protection**

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

**Skin protection**

No special requirement when used as recommended.  
 If repeated or prolonged contact:  
 Wear chemical resistant gloves.

**Respiratory protection**

If airborne exposure is excessive:  
 Wear respirator.  
 Full facepiece/hood/helmet respirator replaces need for chemical goggles.

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:	Whitish - Brown
Form:	Granules
Odour:	Slight
Flash point:	Not applicable.
Density:	36 lb/ft <sup>3</sup> ; (pour density)
	42.6 lb/ft <sup>3</sup> ; (tap density)
pH:	3.7 - 10 g/l

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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 product and components are summarized below.

**Acute oral toxicity**

**Rat, LD50:** 4,443 mg/kg body weight  
Slightly toxic.  
FIFRA category III.

**Acute dermal toxicity**

**Rat, LD50:** > 5,000 mg/kg body weight  
Slightly toxic.  
FIFRA category IV.

**Acute inhalation toxicity**

**Rat, LC50, 4 hours, aerosol:**  
Slightly toxic.  
FIFRA category III.  
No 4-hr LC50 at the maximum achievable concentration.

**Skin irritation**

**Rabbit, 3 animals, OECD 404 test:**  
Days to heal: 2  
Primary Irritation Index (PII): 0.5/8.0  
Slight irritation.  
FIFRA category IV.

**Eye irritation**

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

**Skin sensitization**

**Guinea pig, Buehler test:**  
Positive incidence: 0 %  
Negative.

**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

**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

#### **Diquat dibromide**

#### **Mutagenicity**

##### **Ames test(s):**

Not mutagenic without metabolic activation.

##### **Micronucleus test(s):**

Not mutagenic.

##### **Dominant lethal test(s):**

Not mutagenic.

##### **In vitro chromosomal aberration test(s):**

Not mutagenic.

##### **Mammalian cell mutagenicity test(s):**

Mutagenic with and without metabolic activation.

##### **In vitro chromosomal aberration test(s):**

Mutagenic.

#### **Repeated dose toxicity**

##### **Rat, inhalation, 3 weeks:**

NOEL toxicity: 0.1 mg/m<sup>3</sup>  
Target organs/systems: lung  
Other effects: organ weight change, histopathologic effects, local irritation

#### **Carcinogenicity**

##### **Dog, oral, 52 weeks:**

NOAEL toxicity: 0.5 mg/kg body weight/day  
Target organs/systems: eyes, adrenals  
Other effects: organ weight change

##### **Rat, oral, 2 years:**

NOEL tumour: 2.91 mg/kg body weight/day  
NOAEL toxicity: 0.58 mg/kg body weight/day  
Tumours: bone marrow (sarcoma)  
Target organs/systems: eyes  
Tumours not related to treatment.

##### **Mouse, oral, 2 years:**

NOEL tumour: > 37.8 mg/kg body weight/day  
NOAEL toxicity: 3.56 mg/kg body weight/day

Tumours: none  
Target organs/systems: kidneys  
Other effects: decrease of body weight gain, organ weight change

**Toxicity to reproduction/fertility**

**Rat, oral, 2 generations:**

NOEL toxicity: 0.8 mg/kg body weight/day  
NOEL reproduction: 4 mg/kg body weight/day  
Target organs/systems in parents: eyes  
Other effects in parents: decrease of body weight gain, decrease of food consumption  
Other effects in pups: decrease of body weight gain, decrease of litter survival  
Effects on offspring only observed with maternal toxicity.

**Developmental toxicity/teratogenicity**

**Rat, oral, 7 - 16 days of gestation:**

NOEL toxicity: < 4 mg/kg body weight/day  
NOEL development: 12 mg/kg body weight/day  
Other effects in mother animal: decrease of body weight gain, decrease of food consumption  
Developmental effects: weight loss, skeletal variations, visceral malformations, delayed ossification  
Effects on offspring only observed with maternal toxicity.

**Rabbit, oral, 7 - 19 days of gestation:**

NOEL toxicity: 1 mg/kg body weight/day  
NOEL development: 3 mg/kg body weight/day  
Other effects in mother animal: decrease of body weight gain, decrease of food consumption  
Developmental effects: visceral variations, delayed ossification  
Effects on offspring only observed with maternal toxicity.

**Mouse, oral, 6 - 15 days of gestation:**

NOEL toxicity: 1 mg/kg body weight/day  
NOEL development: 2 mg/kg body weight/day  
Other effects in mother animal: decrease of body weight gain, breathing irregularities, neurotoxic signs, decrease of survival  
Developmental effects: weight loss, skeletal variations  
Effects on offspring only observed with maternal toxicity.

**Acute neurotoxicity**

**Rat, oral, single dose, gavage:**

NOEL: 25 mg/kg body weight  
Other effects: neuromuscular effects  
Not neurotoxic.

**Repeated dose neurotoxicity**

**Rat, oral, 14 weeks, dietary:**

NOAEL: 8 mg/kg body weight/day  
Target organs/systems: eyes  
Other effects: decrease of body weight gain  
Not neurotoxic.

**Surfactant**

**Mutagenicity**

**Micronucleus test(s):**

Not mutagenic.

**Repeated dose toxicity**

**Rat, oral, 14 days:**

NOAEL toxicity: 250 mg/kg body weight/day  
Target organs/systems: liver  
Other effects: organ weight change

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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**

##### **Rainbow trout (*Oncorhynchus mykiss*):**

Acute toxicity, 96 hours, static, LC50: 5.4 mg/L  
Moderately toxic.

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

Acute toxicity, 96 hours, static, LC50: 7.3 mg/L  
Moderately toxic.

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

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

Acute toxicity, 48 hours, static, EC50: 11 mg/L  
Slightly toxic.

#### **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.

#### **Arthropod toxicity**

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

Oral/contact, 48 hours, LD50: > 100 µg/bee  
Practically non-toxic.

#### **Soil organism toxicity, invertebrates**

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

Acute toxicity, 14 days, LC50: > 1,250 mg/kg soil  
Practically non-toxic.

### **Isopropylamine salt of glyphosate (62%)**

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

##### **Green algae (*Scenedesmus subspicatus*):**

Acute toxicity, 72 hours, static, ErC50 (growth rate): 166 mg/L  
Practically non-toxic.

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

#### **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 packages retain product residue and dust.  
Observe all labelled safeguards until container is cleaned, reconditioned or destroyed.  
Empty packaging completely.  
Store for collection by approved waste disposal service.  
Ensure packaging cannot be reused.  
Do NOT re-use containers.  
Recycle if appropriate facilities/equipment available.  
Bury in approved landfill.  
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.

**US DOT basic description and technical name**

ENVIRONMENTALLY HAZARDOUS SUBSTANCE, SOLID, N.O.S. (diquat dibromide), 9, UN3077, III

**Note**

Applies ONLY to packages which contain an RQ.

**US DOT Reportable quantity**

RQ Component	RQ	Minimum package size containing RQ
diquat	1,000 lb	34,483 lb

**IMDG Code**

See US DOT

**IATA/ICAO**

See US DOT

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**15. REGULATORY INFORMATION**

**TSCA Inventory**

Exempt

**OSHA Hazardous Components**

Diquat dibromide  
Surfactant

**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**

RQ Component	RQ	Minimum package size containing RQ
diquat	1,000 lb	34,483 lb

Release of more than any reportable quantity to the environment in a 24 hour period requires notification to the National Response Center (800-424-8802 or 202-426-2675).

**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.

	Health	Flammability	Instability	Additional Markings
NFPA	2	1	2	

0 = Minimal hazard, 1 = Slight hazard, 2 = Moderate hazard, 3 = Severe hazard, 4 = Extreme hazard

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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