MONSANTO COMPANY

Material Safety Data Sheet
Commercial Product

1. PRODUCT AND COMPANY IDENTIFICATION

Product name
QuikPRO® 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: +1 (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.

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.

5. FIRE-FIGHTING MEASURES

Flash point
Does not flash.

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

Unusual fire and explosion hazards
None.
Environmental precautions: see section 6.

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

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
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.

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/m3: 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/m3: 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.

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:	Does not flash.
Density:	36 lb/ft3; (pour density)
	42.6 lb/ft3; (tap density)
pH:	3.7 10 g/l

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 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
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

Diquat dibromide

Mutagenicity

In vitro and in vivo mutagenicity test(s):
Equivocal response.

Repeated dose toxicity

Rat, inhalation, 3 weeks:
NOEL toxicity: 0.1 mg/m3
Target organs/systems: lung
Other effects: organ weight change, histopathologic effects, local irritation

Chronic effects/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

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, EbC50 (biomass): 72.9 mg/L
Slightly 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

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.

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

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.

Although the information and recommendations set forth herein (hereinafter "Information") are presented in good faith and believed to be correct as of the date hereof, MONSANTO Company or any of its subsidiaries makes no representations as to the completeness or accuracy thereof. Information is supplied upon the condition that the persons receiving same will make their own determination as to its suitability for the purposes prior to use. In no event will MONSANTO Company or any of its subsidiaries be responsible for damages of any nature whatsoever resulting from the use of or reliance upon information. NO REPRESENTATIONS OR WARRANTIES, EITHER EXPRESS OR IMPLIED, OF MERCHANTABILITY, FITNESS FOR A PARTICULAR PURPOSE OR OF ANY OTHER NATURE ARE MADE HEREUNDER WITH RESPECT TO INFORMATION OR TO THE PRODUCT TO WHICH INFORMATION REFERS.