Monsanto Company, Lawn & Garden Products

Safety Data Sheet
Commercial Product

1. PRODUCT AND COMPANY IDENTIFICATION

Product name

Roundup® Concentrate Extended Control Weed & Grass Killer Plus Weed Preventer

EPA Reg. No.
71995-40
Chemical name
Not applicable.
Synonyms
None.
Company
Monsanto Company, Lawn & Garden Products, P.0. Box 418, Marysville, OH, 43041
Telephone: 1-800-246-7219
E-mail: TS-SAFETYDATASHEET@DOMINO.MONSANTO.COM
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. HAZARDS IDENTIFICATION

Emergency overview
Appearance and odour (colour/form/odour): Amber / Liquid / 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.
Single ingestion
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.

3. COMPOSITION/INFORMATION ON INGREDIENTS

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

Ammonium salt of 2-[4,5-dihydro-4-methyl-4-(1-methyl)-5-oxo-1H-imidazol-2-yl]-5-methyl-3-pyridinecarboxylic acid; {Ammonium salt of imazapic}

Composition

COMPONENT	CAS No.	% by weight (approximate)
Isopropylamine salt of glyphosate	38641-94-0	18
Diquat dibromide	85-00-7	0.73
Ammonium salt of imazapic	104098-49-9	0.3
Other ingredients		80.97

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

4. FIRST AID MEASURES

Use personal protection recommended in section 8.

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.
Wash clothes and clean shoes before re-use.
If there are persistent symptoms, obtain medical advice.

Inhalation

Remove to fresh air.

Ingestion

Rinse mouth thoroughly with water.
Immediately offer water to drink.
Never give anything by mouth to an unconscious person.
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), 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
Minimise spread.
Contain spillage with sand bags or other means.
Keep out of drains, sewers, ditches and water ways.
Do NOT contaminate water when disposing of rinse waters.

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.
Use handling recommendations in Section 7 and personal protection recommendations in Section 8.

7. HANDLING AND STORAGE

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

Handling
Do NOT taste or swallow.
Avoid contact with eyes, skin and clothing.
Avoid breathing vapour or mist.
When using do not eat, drink or smoke.
Wash hands thoroughly after handling or contact.
Wash contaminated clothing before re-use.
Thoroughly clean equipment after use.
Do not contaminate drains, sewers and water ways when disposing of equipment rinse water.
Refer to section 13 of the safety data sheet for disposal of rinse water.
Emptied containers retain vapour and product residue.
FOLLOW LABELLED WARNINGS EVEN AFTER CONTAINER IS EMPTIED.

Storage
Minimum storage temperature: -15 °C
Maximum storage temperature: 50 °C
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.
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

Airborne exposure limits

Components	Exposure Guidelines
Isopropylamine 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.
Ammonium salt of imazapic	No specific occupational exposure limit has been established.
Other ingredients	No specific occupational exposure limit has been established.

Engineering controls
Provide adequate ventilation to keep airborne concentration below exposure limits.

Eye protection
If there is significant potential for contact:
Wear chemical 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:	Amber
Odour:	Slight
Form:	Liquid
Physical form changes (melting, boiling, etc.):	
Melting point:	Not applicable.
Boiling point:	No data.

Flash point:	Does not flash.
Explosive properties:	No explosive properties
Auto ignition temperature:	No data.
Specific gravity:	1.078 @ 20 °C
Vapour pressure:	No significant volatility; aqueous solution.
Vapour density:	Not applicable.
Evaporation rate:	No data.
Dynamic viscosity:	No data.
Kinematic viscosity:	No data.
Density:	1.078 g/cm3 @ 20 °C
Solubility:	Water: Completely miscible.
pH:	5.0
Partition coefficient:	log Pow: -3.2 @ 25 °C (glyphosate)
Partition coefficient:	log Pow: -4.6 @ 20 °C (diquat dibromide)
Partition coefficient:	log Pow: 0.393 25 °C (imazapic)

10. STABILITY AND REACTIVITY

Stability
Stable under normal conditions of handling and storage.

Oxidizing properties
No data.

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

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

Self-accelerating decomposition temperature (SADT)
No data.

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: > 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. Not hazardous for transportation.

Skin irritation

Rabbit, 3 animals, OECD 404 test:
Days to heal: 1
Primary Irritation Index (PII): 0.3/8.0
Essentially non irritating.
FIFRA category IV.

Eye irritation

Rabbit, 3 animals, OECD 405 test:
Days to heal: 7
Moderate irritation.
FIFRA category III.

Skin sensitization

Guinea pig, 3-induction 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:
NOAEL toxicity: ~ 5,000 mg/kg diet
Target organs/systems: liver
Other effects: decrease of body weight gain, histopathologic effects
NOEL tumour: > 30,000 mg/kg diet
Tumours: none

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

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

Mouse, oral, 2 years:
NOAEL toxicity: 3.56 mg/kg body weight/day
Target organs/systems: kidneys
Other effects: decrease of body weight gain, organ weight change
NOEL tumour: > 37.8 mg/kg body weight/day
Tumours: none

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.

Ammonium salt of imazapic

Mutagenicity

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

Repeated dose toxicity

Rabbit, dermal, 21 days:
NOAEL toxicity: 1,000 mg/kg body weight/day
Target organs/systems: none

Rat, oral, 13 weeks:
NOAEL toxicity: 1,640 mg/kg body weight/day
Target organs/systems: none
Other effects: none

Chronic effects/carcinogenicity

Dog, oral, 1 years:
NOAEL toxicity: < 158 mg/kg body weight/day
Target organs/systems: skeletal muscle
Other effects: histopathologic effects, blood biochemistry effects

Rat, oral, 2 years:
NOAEL toxicity: 1,133 mg/kg body weight/day
Target organs/systems: none
Other effects: none
NOEL tumour: 1,133 mg/kg body weight/day
No tumours.

Mouse, oral, 18 months:
NOAEL toxicity: 1,288 mg/kg body weight/day
Target organs/systems: none
Other effects: none
NOEL tumour: 1,288 mg/kg body weight/day
No tumours.

Toxicity to reproduction/fertility

Rat, oral, 2 generations:
NOAEL toxicity: 1,344 mg/kg body weight/day
NOAEL reproduction: 1,344 mg/kg body weight/day
Target organs/systems in parents: none

Target organs/systems in pups: none

Developmental toxicity/teratogenicity

Rat, oral, days of gestation:
NOAEL toxicity: 1,000 mg/kg body weight/day
NOAEL development: 1,000 mg/kg body weight/day
Target organs/systems in mother animal: none
Developmental effects: none

Rabbit, oral, days of gestation:
NOAEL toxicity: 350 mg/kg body weight/day
NOAEL development: 500 mg/kg body weight/day
Target organs/systems in mother animal: none
Other effects in mother animal: decrease of body weight gain, decrease of food consumption
Developmental effects: none

12. ECOLOGICAL INFORMATION

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

Data obtained on a similar glyphosate formulation and/or glyphosate are summarized below. The minor active ingredients are not predicted to significantly contribute to the ecological toxicity of this formulation.

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.

Similar formulation

Aquatic toxicity, algae/aquatic plants

Green algae (Selenastrum capricornutum):
Acute toxicity, 72 hours, static, EbC50 (biomass): 3.77 mg/L

Moderately 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 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.

Use handling recommendations in Section 7 and personal protection recommendations in Section 8.

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.

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.

	Health	Flammability	Instability	Additional Markings
NFPA	1	1	1	

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)

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