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| <p align="center">Monsanto Company, Lawn & Garden Products Material Safety Data Sheet Commercial Product</p> |
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1. PRODUCT AND COMPANY IDENTIFICATION

Product name

Roundup® Concentrate Poison Ivy & Tough Brush Killer Plus

EPA Reg. No.

71995-37

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}

Triethylamine salt of 3,5,6-trichloro-2-pyridinyloxyacetic acid; {Triethylamine salt of triclopyr}

Composition

| COMPONENT | CAS No. | % by weight (approximate) |
|-----------------------------------|------------|---------------------------|
| Isopropylamine salt of glyphosate | 38641-94-0 | 18 |
| Triethylamine salt of triclopyr | 57213-69-1 | 2 |
| Other ingredients | | 80 |

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): Yellow / Liquid / Mild

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.
Continue for at least 15 minutes.
If easy to do, remove contact lenses.
If there are persistent symptoms, obtain medical advice.

Skin contact

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

Inhalation

Remove to fresh air.

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 (NO_x), phosphorus oxides (P_xO_y), hydrogen chloride (HCl)

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 contact with eyes.

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.

Emptied packages retain product residue and dust.

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 |
|-----------------------------------|--|
| Isopropylamine salt of glyphosate | No specific occupational exposure limit has been established. |
| Triethylamine salt of triclopyr | TLV (ACGIH): No specific occupational exposure limit has been established. PEL (OSHA): No specific occupational exposure limit has been established. Manufacturer suggested exposure limit: 2 mg/m ³ : skin, The exposure limit indicated is for triclopyr. |
| 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.

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: | Yellow |
| Form: | Liquid |
| Odour: | Mild |
| Flash point: | Does not flash. |
| Density: | 1.0768 g/cm ³ |
| Solubility: | Water: Soluble |
| pH: | 4.9 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 (limit test): > 5,000 mg/kg body weight
Practically non-toxic.
FIFRA category IV.
No mortality.

Acute dermal toxicity

Rat, LD50 (limit test): > 5,000 mg/kg body weight
Practically non-toxic.
FIFRA category IV.

No mortality.

Acute inhalation toxicity

Rat, LC50 (limit test), 4 hours, aerosol: > 2.95 mg/L

Practically non-toxic.

FIFRA category IV.

No mortality.

Skin irritation

Rabbit, 3 animals, OECD 404 test:

Days to heal: 3

Primary Irritation Index (PII): 0.7/8.0

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 %

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

Triethylamine salt of triclopyr

Mutagenicity

In vitro and in vivo mutagenicity test(s):

Not mutagenic with and without metabolic activation.

Repeated dose toxicity

Rat, oral, 13 weeks:

NOEL toxicity: 5 mg/kg body weight/day

Target organs/systems: kidneys

Other effects: histopathologic effects

Carcinogenicity

Dog, oral, 228 days:

NOAEL toxicity: 10 mg/kg body weight/day

Target organs/systems: liver

Other effects: histopathologic effects, blood biochemistry effects, haematological effects, decrease of body weight gain, decrease of food consumption

Mouse, oral, 95 weeks:

NOAEL toxicity: 26.5 mg/kg body weight/day

Other effects: decrease of body weight gain

Rat, oral, 2 years:

NOEL tumour: 12 mg/kg body weight/day

NOAEL toxicity: 12 mg/kg body weight/day

Tumours: mammary gland (adenoma) (adenocarcinoma)

Target organs/systems: kidneys

Other effects: histopathologic effects

Toxicity to reproduction/fertility

Rat, oral, 2 generations:

NOEL toxicity: 5 mg/kg body weight/day

NOEL reproduction: 25 mg/kg body weight/day

Target organs/systems in parents: kidneys

Other effects in parents: histopathologic effects, weight loss, decrease of body weight gain

Other effects in pups: decrease of litter size, weight loss, decrease of body weight gain, decrease of litter survival

Developmental toxicity/teratogenicity

Rat, oral, 6 - 15 days of gestation:

NOEL toxicity: 100 mg/kg body weight/day

NOEL development: 100 mg/kg body weight/day

Other effects in mother animal: decrease of survival

Developmental effects: weight loss, skeletal variations, delayed ossification

Effects on offspring only observed with maternal toxicity.

Rabbit, oral, 6 - 18 days of gestation:

NOEL toxicity: 30 mg/kg body weight/day

NOEL development: 30 mg/kg body weight/day

Target organs/systems in mother animal: liver, kidneys
Other effects in mother animal: decrease of body weight gain, organ weight change
Developmental effects: pre-implantation loss, post-implantation loss
Effects on offspring only observed with maternal toxicity.

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 glyphosate 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.

Triethylamine salt of triclopyr

Aquatic toxicity, fish

Rainbow trout (*Oncorhynchus mykiss*):

Acute toxicity, 96 hours, static, LC50: 552 mg/L
Practically non-toxic.

Bluegill sunfish (*Lepomis macrochirus*):

Acute toxicity, 96 hours, static, LC50: 891 mg/L

Practically non-toxic.

Aquatic toxicity, invertebrates

Water flea (*Daphnia magna*):

Acute toxicity, 48 hours, static, EC50: 132.9 mg/L

Practically non-toxic.

Aquatic toxicity, algae/aquatic plants

Green algae (*Selenastrum capricornutum*):

Acute toxicity, 120 hours, static, EC50: 39.1 mg/L

Slightly toxic.

Diatom (*Skeletonema costatum*):

Acute toxicity, 120 hours, static, EC50: 14.9 mg/L

Slightly toxic.

Avian toxicity

Mallard duck (*Anas platyrhynchos*):

Acute oral toxicity, 14 days, LD50: 3,176 mg/kg body weight

Practically non-toxic.

Mallard duck (*Anas platyrhynchos*):

Dietary toxicity, 5 days, LC50: > 10,000 mg/kg diet

Practically non-toxic.

Bobwhite quail (*Colinus virginianus*):

Dietary toxicity, 5 days, LC50: 11,622 mg/kg diet

Practically non-toxic.

Arthropod toxicity

Honey bee (*Apis mellifera*):

Contact, 48 hours, LD50: > 100 µg/bee

Practically non-toxic.

Bioaccumulation

Bluegill sunfish (*Lepomis macrochirus*):

Edible portion: BCF: < 1

No significant bioaccumulation.

Dissipation

Soil, aerobic, 25 °C:

Half life: < 50 days

Koc: 15 - 78

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.
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

Triethylamine salt of triclopyr
Surfactant

SARA Title III Rules

Section 311/312 Hazard Categories
Immediate
Section 302 Extremely Hazardous Substances
Not applicable.
Section 313 Toxic Chemical(s)
Triclopyr, triethylammonium salt

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), 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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