

SECTION 1 - PRODUCT & COMPANY IDENTIFICATION

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Substance: glyphosate + terbuthylazine + simazine.
Product Name: **TWO STEP**
Product Use: Herbicide
Creation Date: April 2011
Revision Date: January 2011

24 Hr Emergency Number: 082 771 2712
In case of Poisoning:
Poison Information Centre 082 446 8946
Tygerberg Hospital: (021) 931 6129
Poison Emergency Enquiries (021) 689 5227
In case of Spillage:
HAZMAT: 0800 147 112

SECTION 2 - COMPOSITION / INFORMATION ON INGREDIENTS

- 1.** Common Name: Glyphosate
Chemical Name: N- (phosphonomethyl)glycine (IUPAC)
CAS No.: 38641-94-0
Chemical family: Phosphanoglycine
Chemical formula: C₆H₁₇N₂O₅P
Molecular weight: 228.2
- 2.** Common name: simazine
Chemical Name: 6-chloro-N2,N4-diethyl-1,3,5-triazine-2,4-diamine (IUPAC)
CAS No.: 122-34-9
Chemical Family: triazine
Chemical Formula: C₇H₁₂CℓN₅
Molecular weight: 201.7
- 3.** Common name: terbuthylazine
Chemical Name: N2-tert-butyl-6-chloro-N4-ethyl-1,3,5-triazine-2,4-diamine (IUPAC)
CAS No.: 5915-41-3
Chemical Family: triazine
Chemical Formula: C₉H₁₆CℓN₅
Molecular weight: 229.7

Formulation: Glyphosate Isopropylammonium salt 167 g/l (acid equivalent 125 g/l)
Simazine 175 g/l
Terbuthylazine 175 g/l
Other related triazines 1.8 g/l
Suspension concentrate

Symbol: Xn
Indication of danger: Harmful if swallowed
Risk Phrases: R 36, R 52, R 54

SECTION 3 - HAZARD IDENTIFICATION**MATERIAL SAFETY DATA SHEET**

Main hazard:

A relatively low toxicity herbicide. Poisonous if swallowed. Irritating to eyes and respiratory system.

Flammability: Water based product, non-flammable.

Chemical hazard:

Simazine: R 40. Possible risks of irreversible effects. Most mammals tend to be insensitive to simazine. For unknown reasons, sheep and cattle are especially susceptible to poisoning by simazine. Doses of 500 mg/kg were fatal in sheep with death delayed for 5 to 16 days. Symptoms exhibited by poisoned sheep include lower food intake, higher water intake, in coordination, tremors, and weakness, especially in the hindquarters. Sheep show liver damage. (see also section 12: Bio-accumulation);
Terbuthylazine: R 22. Harmful if swallowed. Glyphosate: Irritating to eyes. (Risk of serious damage to eyes).

Biological hazard:

Highly toxic to algae. Dangerous to fish.

Reproductive hazard:

Glyphosate: Most of the field and laboratory evidence shows that glyphosate produces no reproductive changes in test animals. It is unlikely that the compound would produce any reproductive effects in humans. It did not cause any teratogenic effects (birth defects).
Simazine: No adverse effects on reproductive capacity or development were observed in a three generation study of rats fed 5mg/kg/day simazine.

Eye effects: eyes:

Glyphosate: Irritating to eyes.

Simazine: Non-irritating to skin and eyes (rabbits).

Terbuthylazine: No skin or eye irritation; not a skin sensitizer.

Health effects: skin:

Glyphosate: Non-irritating to skin (rabbits); Glyphosate – Dermal LD50 (rat) > 5000 mg/kg.

Simazine: Dermal LD50 (rat) > 3100 mg/kg; (Non-irritating to skin and eyes (rabbits). Simazine is slightly toxic via dermal exposure.

Terbuthylazine: Dermal LD50 (rat) > 3000 mg/kg; (Non-irritant to eyes and slightly to skin of rabbits).

Health effects: ingestion:

Seek medical advice immediately.

Glyphosate: Oral LD50 (rat) > 5000 mg/kg.

Simazine: Oral LD50 (rat) > 5000 mg/kg. Irritating to respiratory system. Avoid inhalation of vapour or spray mist. Simazine is moderately toxic if ingested. No cases of poisoning in humans have been reported from ingestion of simazine.

Terbuthylazine: Oral LD50 (rat) = 2000 mg/kg.

Health effects: inhalation:

Glyphosate: LC50 (4h) for rats > 12.2 mg/ℓ air.

Simazine: LC50 (4h) for rats > 2 mg/ℓ air. Simazine is highly toxic if inhaled (especially important at manufacturing sites). The final product is relatively safe if all the precautions and personal protections related to the pesticide are followed.

Terbuthylazine: LC50 (4h) for rats > 3.51 mg/ℓ air.

Carcinogenicity:

Simazine: - Carcinogenic category 3: Substance which may cause concern for man owing to possible carcinogenic effects but in respect of which the available information is not adequate for making a satisfactory assessment. Because simazine in drinking water may possibly increase the risk of cancer in humans, the Lifetime Health Advisory level (LHA = 1 g/ℓ) set by EPA includes an additional margin of safety. Simazine did not produce tumors in mice given 215 mg/kg/day, the highest dose tolerated, for 18 months. Simazine produced thyroid and mammary tumors in female rats fed 5 mg/kg, the highest dietary dose tested.

Glyphosate: US EPA has stated that there is sufficient evidence to conclude that glyphosate is not carcinogenic in humans.

Mutagenicity:

Simazine: Animal studies did not detect any mutagenic effects. No human information available.

Terbuthylazine: Not mutagenic in a series of tests using bacteria, cultured mammalian cells and whole animals. No human information available.

Glyphosate: Does not cause mutations in microbes. The compound poses little mutagenic risk to humans.

Neurotoxicity:

Simazine: In case of heavy intoxication, symptoms of excitement and depression of the central nervous system may appear.

Terbuthylazine: In case of heavy intoxication, symptoms of excitement and depression of the central nervous system may appear.

Glyphosate: Hens fed massive amounts over three days and again 21 days later showed no nerve related effects.

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SECTION 4 - FIRST AID MEASURES AND PRECAUTIONS

If poisoning is suspected, do not wait for symptoms to develop. Contact a physician, the nearest hospital, or the nearest Poison Control Centre.

Symptoms:

Some triazines are mildly irritating to skin, eyes, and upper respiratory tract. Systemic toxicity is unlikely unless very large amounts have been ingested.

Simazine: Symptoms of simazine poisoning include:

In coordination, tremor and weakness, cyanosis and chronic convulsions.

Terbuthylazine: The acute toxicity to terbuthylazine for man is thought to be low, and no adverse health effects from exposure to this herbicide have been reported. Glyphosate: Symptoms of Glyphosate poisoning include: headache, dizziness, weakness, in-coordination, muscle twitching, tremor, nausea, abdominal cramps, diarrhea, and sweating. Blurred or dark vision, confusion, tightness in the chest, wheezing, productive cough, and pulmonary oedema may occur. Incontinence, unconsciousness and convulsions may indicate severe poisoning. Slow heartbeat and salivation may occur. Slowing of the heartbeat rarely progresses to complete sinus arrest. Respiratory depression may be fatal.

Advice to physician:

No signs and symptoms of triazine poisoning are known or expected in humans. There is no specific antidote. Treat symptomatically and supportively as and when required. When large amounts have been ingested, gastric lavage or the administration of activated charcoal with water may be indicated. Remove by gastric lavage and catharsis, but not if victim is unconscious. Give oxygen if respiration is depressed.

Product in eye:

Flush immediately with clear clean running water for least 15 minutes. Hold eyelids apart to rinse the entire surface of the eye and lids. If eye symptoms (redness, irritation or pain) persist refer patient to ophthalmologist for examination of eye.

Product on skin:

Wash skin with fresh running water and soap, including hair and under fingernails. Remove contaminated clothing and wash before reuse. If irritation persists, seek medical advice immediately. Persons who become sensitized may require specialized medical management with anti-inflammatory agents.

Product ingested:

Seek medical advice immediately. Rinse mouth thoroughly with water. The patient should be kept under observation for at least 72 hours.

Treat symptomatically. Ingestions of small amounts (less than 10mg glyphosate / kg body weight) occurring less than an hour before treatment, are probably best treated by: Syrup of Ipecac (e.g. Lennon Ipekakuanha), followed by 1-2 glasses of water.

Dose for adults and children over 12 years: 30 ml. Dose for children under 12 years: 15 ml.

Notes to physician:

No cases of poisoning from the final product have been recorded. Glyphosate: There is no specific antidote. Treat symptomatically and supportively as and when required. Remove by gastric lavage and catharsis, but not if victim is unconscious. Give oxygen if respiration is depressed.

INGESTION of LARGE amounts (more than 10 mg glyphosate / kg) occurring less than an hour before treatment, should probably be treated by gastric lavage:

A. INTUBATE stomach and ASPIRATE contents.

B. LAVAGE stomach with slurry of ACTIVATED CHARCOAL in 0.9% saline. Leave 30-50 gm activated charcoal in the stomach before withdrawing tube.

C. SODIUM SULFATE, 0.25 gm/kg in tap water, as a cathartic.

CAUTION: Hydrocarbons (kerosene, petroleum distillates) may be included in the formulation.

Ingestion of very LARGE AMOUNTS may cause CNS depression. In this case, IPECAC IS CONTRAINDICATED. Also, gastric intubation incurs a risk of HYDROCARBON PNEUMONITIS. For this reason observe the following precautions:

(1) If the victim is unconscious or obtunded and facilities are at hand, insert an ENDOTRACHEAL TUBE (cuffed, if available) prior to gastric intubation.

(2) Keep victim's HEAD BELOW LEVEL OF STOMACH during intubation and lavage (Trendelenburg, or left lateral decubitus, with head of table tipped downward). Keep victim's head turned to the left.

(3) ASPIRATE PHARYNX as regularly as possible to remove gagged or vomited stomach contents.

INGESTIONS occurring MORE THAN an HOUR before treatment are probably best treated only by ACTIVATED CHARCOAL, 30-50 gm, and SODIUM or MAGNESIUM SULFATE, 0.25 gm/kg, as described above. There are no specific antidotes for these chemicals. Because manifestations of toxicity do occasionally occur in peculiarly predisposed individuals, MAINTAIN CONTACT with victim for at least 72 hours so that unexpected adverse effects can be treated promptly.

Product inhaled:

Move victim from contaminated area to fresh air. Irritating to respiratory system. Get medical advice if symptoms appear or after significant exposure. Apply artificial respiration if necessary. Treat symptomatically. (Simazine is highly toxic if inhaled, but no fatalities from the final product have been reported).

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SECTION 5 - FIRE-FIGHTING MEASURES

Fire and explosion hazard:

Flash point: None; water based. This material is not flammable.

Extinguishing media:

Dry chemical, carbon dioxide, standard foam. Water can be used for larger fires or cooling of unaffected stock, but avoid the accumulation of polluted run-off from the site. Contain fire control water for later disposal.

Special hazards:

Generating poisonous and corrosive fumes containing: carbon monoxide, nitrogen oxides and hydrochloric acid. Keep upwind. Keep product out of sewers and water sources. Use of contaminated buildings, area and equipment must be prevented until they are properly decontaminated.

Protective clothing:

Fire may produce irritating or poisonous vapours, mists or other products of combustion. Fire-fighters and others that may be exposed should wear full protective clothing and self-contained breathing apparatus.

SECTION 6 - ACCIDENTAL RELEASE MEASURES (SPILLAGE)

Personal precautions:

Do not breathe in mist or fumes. Avoid contact with skin and eyes. For personal protection see Section 8.

Environmental precautions:

Do not allow entering drains or watercourses. Spillage or uncontrolled discharges into water courses (or public waters) to be reported immediately to the Police and to the Department of Water/Environmental Affairs.

Occupational spill:

Remove all sources of flames and sparks. For small liquid spills, soak up with lime, damp earth or sand, or other non-combustible absorbent material and place into containers for later disposal. For large liquid spills, contain the liquid for later disposal. In situations where product comes in contact with water, contain contaminated water for later disposal. Do not flush spilled material into drains. Keep spectators away.

SECTION 7 - HANDLING AND STORAGE REQUIREMENTS

Handling:

Avoid contact with eyes, prolonged contact with skin, and inhalation of spray and fumes. Handle product with caution. Use with adequate ventilation. Wash hands before eating, drinking, chewing gum, smoking or using the toilet. Remove clothing immediately if the herbicide gets inside. Then wash skin thoroughly using a non-abrasive soap and put on clean clothing. Operators should change and wash clothing after use. Do not apply directly to areas where surface water is present, or to intertidal areas below the mean high water mark. Water used to clean equipment must be disposed of correctly to avoid contamination.

Storage:

Store in its original, labelled and closed container in dry, cool, shaded, well-ventilated area, away from heat, sparks and other sources of ignition. Do not store with other pesticides, fertilizer, seeds, foodstuffs and water supplies. Store away from incompatible substances. Product is incompatible with galvanized steel or unlined mild steel. Keep out of reach of unauthorized persons, children and animals. Local regulations should be complied with.

SECTION 8 - EXPOSURE CONTROL/PERSONAL PROTECTION

It is essential to provide adequate ventilation. The measures appropriate for a particular work site depend on how this material is used and on the extent of exposure. Ensure that control systems are properly designed and maintained. Comply with occupational safety, environmental, fire and other applicable regulations.

PERSONAL PROTECTIVE EQUIPMENT:

If engineering controls and work practices are not effective in controlling exposure to this material, then wear suitable personal protective equipment including approved respiratory protection.

Respirator:

It is usually safe to use the product without a mask or respirator. If the product is used in dusty or confined conditions, a mask or respirator suitable for protection from dusts and mists of pesticides is adequate. Limitations of respirator use specified by the approving agency and the manufacturer must be observed.

Clothing:

Employee must wear appropriate protective (impervious) clothing and equipment to prevent repeated or prolonged skin contact with this substance.

Gloves:

Employee must wear appropriate synthetic protective gloves to prevent contact with this substance.

Eye protection:

Wear safety goggles or face shield.

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Emergency eye wash: Where there is any possibility that an employee's eyes may be exposed to this substance, the employer should provide an eye wash fountain or appropriate alternative within the immediate work area for emergency use.

SECTION 9 - PHYSICAL AND CHEMICAL PROPERTIES

Appearance: Thick, whitish, free-flowing suspension concentrate that forms a fine suspension on dilution with water.

Odour: Slight esotery odour.

pH: 5.2 – 5.6

Boiling point: Not Available

Auto flammability: Not Applicable

Melting point: Not Applicable

Explosive properties: Not explosive

Flash point: > 100°C. Water-based, non flammable. Terbutylazine > 150°C.

Oxidizing properties: Corrosive to iron, steel and aluminium.

Flammability: Not Applicable.

Vapour pressure: No data available

Density: Not available

Solubility – water: Glyphosate: 12 g/l (25°C); Very soluble in water.

Simazine: 3.5 mg/l at 20°C or 5 ppm at 20-22°C.

Terbutylazine: 8.5 mg/l at 20°C.

Solubility – solvent: Glyphosate: Insoluble in common organic solvents, e.g. acetone, ethanol and xylene;

Terbutylazine: 100 g/l dimethylformamide; 40 g/l ethyl acetate; 14.3 g/l octan-1-ol;

Simazine: 900 mg/l chloroform; 300 mg/l diethyl ether; 2 mg/l light petroleum; 400 mg/l methanol.

Solubility – coefficient: Not Available

Neurotoxicity: Simazine: In case of heavy intoxication, symptoms of excitement and depression of the central nervous system may appear.

Terbutylazine: In case of heavy intoxication, symptoms of excitement and depression of the central nervous system may appear.

Glyphosate: Hens fed massive amounts over three days and again 21 days later showed no nerve related effects.

SECTION 10 - STABILITY AND REACTIVITY

Stability:

Stable under normal temperatures and pressures. Glyphosate reacts strongly (possibly violent exothermic reaction) with strong alkalis. Photodecomposition is negligible. Is stable to light and also stable up to 60 °C. Product is unlikely to spontaneously polymerise or decompose. Decompose only after heating to dryness followed by further heating.

Glyphosate may be photolabile in natural waters, with calcium or other metal ions acting as catalysts for the process.

Dilution stability:

Stable in aqueous solutions at 20 °C.

Storage stability:

Stable for 2 years under normal warehouse conditions. Store at temperatures below 50 °C and above –15 °C. Stable to light. Partial crystallization may occur on prolonged storage below –15 °C.

Incompatibility:

Product is relatively stable in neutral, weakly acidic and weakly alkaline media, but reacts strongly (and possibly violently) with strong alkalis. Mixing with other products may reduce the activity of glyphosate. Incompatible with galvanized steel and unlined mild steel materials for storage.

Thermal decomposition:

Toxic oxides of carbon, nitrogen and phosphorus are released when the product decomposes on heating.

SECTION 11 - TOXICOLOGICAL INFORMATION

Acute toxicity:

Glyphosate:

Acute oral LD50 for rats 5600 mg/kg;

Acute dermal LD50 for rabbits > 5000 mg/kg;

Acute inhalation (4h) for rats > 1.3 mg/l air.

Glyphosate is a moderately toxic herbicide. Even though the LD50 values show the compound to be relatively non-toxic it can cause significant eye irritation. The triazine herbicides (simazine and terbutylazine) disturb energy metabolism (thiamin and riboflavin functions).

Toxicity symptoms include difficulty in walking, tremor, convulsions, paralysis, cyanosis, slowed respiration, miosis (pin point pupils), gut pain, diarrhea and impaired adrenal function.

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Terbutylazine: Skin and eye –
acute dermal LD50 for rats > 2000 mg/kg;
Acute oral LD50 for rats 1590 - > 2000 mg/kg.

Simazine: Skin and eye –
Acute oral LD50 for rats 950 mg/kg;
acute dermal LD50 for rats > 3100 mg/kg,
rabbits > 10200 mg/kg.

Simazine is highly toxic if inhaled, moderately toxic if ingested, and slightly toxic via dermal exposure. No cases of poisoning in humans have been reported from ingestion of simazine. No systemic toxicity was observed in a 21 day dermal study with rabbits exposed to doses of up to 1 gm/kg. The lethal concentration fifty, or LC50, is that concentration of a chemical in air or water that kills half of the experimental animals exposed to it for a set time period. The 4-hour inhalation LC50 in rats is 2 mg/m³, and the 1-hour LC50 in rats is 9800 mg/m³. The LClo in rats is 580 mg/m³. An LClo is the lowest concentration which causes death in test animals.

Simazine is considered to be moderately toxic. It is possible that 0.5-5 g/kg would kill a 70 kg person if eaten.

Skin and eye contact:

Glyphosate: Mild eye irritant; non-irritating to skin (rabbits); LD50 for rabbits > 5000 mg/kg. Contact and non-contact re-entry: When fully dry.

Simazine: Non-irritating to skin and eyes (rabbits). Rashes and dermatitis from occupational exposure to simazine have occurred. Simazine is slightly irritating to the skin and moderately irritating to the eyes of rabbit. Patch tests on humans have shown that simazine is not a skin irritant, fatiguing agent or sensitizer. Large amounts of simazine may cause dermatitis (rashes). This kind of exposure may be gotten in manufacturing settings. In rabbits, 80 mg of simazine produced irritation in the eye.

Terbutylazine: No skin and eye irritation; not a skin sensitizer.

Chronic toxicity:

Glyphosate: NOEL (no observable effect level) – In 2 year feeding trials, no ill-effects were observed in rats and dogs receiving 300 mg/kg diet (highest dose treated); ADI (acceptable daily intake) for man 0.3 mg/kg body weight.

Simazine: NOEL (no observable effect level) – In 2 year feeding trials, no illeffects were observed in rats receiving 10 mg/kg diet (0.7 mg/kg daily), for dogs 20 mg/kg diet (0.7 mg/kg daily); ADI (acceptable daily intake) 0.005 mg/kg body weight daily. When rats were given repeated doses of 15mg/kg/day, some liver cells degenerated during the first 3 days, but the condition did not progress.

Instead, the liver adapted and the compound was metabolized. The US EPA has set a Lifetime Health Advisory (LHA) for Simazine in drinking water at 1 ug/l. EPA believes that water containing simazine at or below this level is acceptable for drinking every day over the course of one's lifetime, and does not pose any health concerns. Rats and guinea pigs fed 100 mg/kg daily for 6 months had decreased weight gain, increased white blood cell counts, decreased blood cholinesterase activity and deterioration and inflammation of the stomach. In a 28- day study, oral doses of 2,500 mg/kg/day to rats resulted in stomach ulcers, damage to the small intestine, and death.

Terbutylazine: NOEL (12 months) for dogs 0.4 mg/kg daily; (lifetime) for rats 0.35 mg/kg daily; 2 year for mouse 16.8 mg/kg daily; ADI 0.0035 mg/kg.

Carcinogenicity:

Simazine: The product is classified as a probable human carcinogen. While the information is adequate for animal studies it is incomplete for human risks of cancer. Despite the incomplete record of human carcinogenicity due to the product, the EPA has required the DANGER signal word on product labels based on the product's potential to cause tumours in rats.

Terbutylazine: Long-term animal studies did not show carcinogenic activity. No human information available.

Glyphosate: The US EPA has stated that there is sufficient evidence to conclude that glyphosate is not carcinogenic in humans.

Mutagenicity:

Simazine: Animal studies did not detect any mutagenic effects. No human information available.

Terbutylazine: Not mutagenic in a series of tests using bacteria, cultured mammalian cells and whole animals. No human information available.

Glyphosate: The product was not clastogenic when tested with Chinese Hamster ovary cells, and is not mutagenic in mouse lymphoma cells.

Reproductive hazards:

Glyphosate: Most of the field and laboratory evidence shows that glyphosate produces no reproductive changes in test animals. It is unlikely that the compound would produce any reproductive effects in humans. It did not cause any teratogenic effects (birth defects).

Simazine: No adverse effects on reproductive capacity or development were observed in a three generation study of rats fed 5 mg/kg/day simazine. Chronic inhalation of a cumulative dose of 17 mg/m³ for 2 hr/day for 8 days in pregnant rats resulted in toxic effects on the fetuses and developmental abnormalities. Decreased weights and increased skeletal abnormalities were noted in the fetuses of pregnant rabbits fed 200 mg/kg/day.

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SECTION 12 - ECOLOGICAL INFORMATION**Aquatic toxicity – fish:**

Glyphosate: LC50 (96h) for trout 86 mg/ℓ;
Bluegill sunfish 120 mg/ℓ.
Simazine: LC50 (96h) for rainbow trout > 100 mg/ℓ;
Blue gill sunfish 90 mg/ℓ;
Crucian carp > 100 mg/ℓ;
Guppies 49 mg/ℓ.
Simazine has very low toxicity to all aquatic species reviewed.
Terbuthylazine: LC50 (96h) for rainbow trout = 3.8 – 4.6 mg/ℓ;
Bluegill sunfish 52 mg/ℓ;
Carp and catfish 7.0 mg/ℓ.

Aquatic toxicity – daphnia:

Glyphosate: LC50 (48h) > 780 mg/ℓ.
Simazine: LC50 (48h) > 100 mg/ℓ; 21 Days 0.29 mg/ℓ.
Simazine has very low toxicity to all adequate species reviewed.
Terbuthylazine: LC50 (48h) 21.2 mg/ℓ.

Aquatic toxicity – algae: Highly toxic to algae.

Biodegradability:

Glyphosate: Microbial degradation is the major cause of loss from soil, with liberation of carbon dioxide. The principle metabolite is aminomethylphosphonic acid.
Terbuthylazine: Microbial degradation proceeds mainly by de-ethylation and hydroxylation, with eventual ring cleavage. DT50 30-60 days in biologically active soil.
Simazine: In soil, microbial activity accounts for degradation of a significant amount of simazine. Loss by photo decomposition or volatilization is significant.
DT50 70 – 110 days. Residual activity remains for 2 – 7 months (2-4 kg simazine/ha) after application. Simazine adsorbs to clays and mucks.

Bio-accumulation:

Simazine: The product shows little or no tendency to bio-accumulation. Simazine stimulates its own breakdown in the liver. Some accumulation occurs in the fat. Anywhere from 67-97% of the simazine in the body is excreted through the urine within 24 hours. When a cow was fed 5 ppm for 3 days, no simazine was found in the cow's milk during the next 3 days. It has been reported that simazine residues were present in the urine of sheep for up to 12 days after administration of a single oral dose. The maximum concentration in the urine occurred from 2 to 6 days after administration. Plants that are sensitive to simazine accumulate it unchanged. It is possible that livestock or wildlife grazing on these plants could be poisoned.
Terbuthylazine: The product shows little or no tendency to bio-accumulation and poses no long term threat to wildlife.
Glyphosate: The product shows little or no tendency to bio-accumulate and poses no long term threat to wildlife.

Mobility:

Glyphosate: Strongly adsorbed to soil and therefore becomes practically immobile.
Simazine: Downward movement or leaching is limited by the low water solubility of simazine. Several months after application, the greatest portion is found in the surface 2 inches of soil. Kd 0.37-4.66, Koc 103-377, median c.150. The product is of low mobility in soils and is unlikely to result in contamination of ground water.
Terbuthylazine: Leaches only slightly. Adsorption on soils is strong: Kd 2.2-2.5, Koc 162-278 are typical values for light agricultural soils. The product is relatively mobile in soil and can result in the contamination of surface and ground water.

German wqk: Not available.

SECTION 13 - DISPOSAL CONSIDERATION**Pesticide disposal:**

Open dumping or burning of this pesticide is prohibited. Waste resulting from the use of this product that cannot be reused or reprocessed. Never pour untreated waste or surplus products into public sewers or where there is any danger of run-off or seepage into water systems. Do not contaminate rivers, dams or any other water sources with the product or used containers. Comply with local legislation applying to waste disposal.

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Container disposal:

Emptied containers retain vapour and product residues. Observe all labelled safeguards until container is destroyed.

TRIPLE RINSE empty containers in the following manner: Invert the empty container over the spray or mixing tank and allow to drain for at least 30 seconds after the flow has slowed down to a drip. Thereafter rinse the container three times with a volume of water equal to a minimum of 10 % of that of the container. Add the rinsings to the contents of the spray tank before destroying the container in the prescribed manner.

Do not re-use the empty container for any other purpose but destroy it by perforation and flattening and bury in an approved dump site.

Prevent contamination of food, feedstuffs, drinking water and eating utensils.

Comply with local legislation applying to waste disposal.

SECTION 14 - TRANSPORT INFORMATION

UN NUMBER: 3082

Road Transport ADR/IRD:

Class: 9

Packing group: III

Shipping name: Environmentally hazardous substance, liquid, N.O.S. (herbicide – glyphosate+simazine+terbuthylazine)

Maritime Transport IMDG/IMO:

Class: 9

Packing group: III

Shipping name: Environmentally hazardous substance, liquid, N.O.S. (herbicide - glyphosate+simazine+terbuthylazine)

Considered a Marine Pollutant.

SECTION 15 - REGULATORY INFORMATION

Symbol: N

Indication: Environmentally dangerous substance.

Risk phrases:

R 36 Irritating to eyes.

R 52 Harmful to aquatic organisms.

R 54 Toxic to flora.

Safety phrases:

S 2 Keep out of reach children.

S 2425 Avoid contact with skin and eyes.

S 36/37/39 Wear suitable protective clothing, gloves and eye/face protection.

S 45 In case of accident or if you feel unwell, seek medical advice immediately (show the label where possible).

S 61 Avoid release to the environment

SECTION 16 - OTHER INFORMATION**Packaging and Labelling:**

Packed in 200 mℓ, 500 mℓ & 1, 2, 5, 10, 20 and 25 ℓ plastic containers and labelled according to South African regulations and guidelines.

Disclaimer:

The information on this sheet is not a specification; it does not guarantee specific properties. The information is intended to provide general guidance as to health and safety based upon our knowledge of the handling, storage use of the product. It is not applicable to unusual or non-standard uses of the product nor where instructions or recommendations are not followed.

All information is given in good faith but without guarantee in respect of accuracy, and no responsibility is accepted for errors and omissions or the consequence thereof.

MATERIAL SAFETY DATA SHEET