

Pinnacle

SAFETY DATA SHEET

1. PRODUCT & COMPANY IDENTIFICATION

Product Name: Pinnacle
Pesticide Classification: Herbicide
UN No.: 3082

Supplier

Enviro Bio-Chem (Pty) Ltd
Co. Reg. No.: 2013/194774/07
44 Kerk Street, Lichtenburg
North West, South Africa 2740

Registration Holder

Enviro Industries (Pty) Ltd t/a Enviro Weed Control Systems
Co. Reg. No.: 199/006136/07
44 Kerk Street, Lichtenburg
North West, South Africa 2740

Telephone: +27 87 231 7261
Fax: 086 541 7948
Website: www.envirobiochem.co.za

24 Hr Emergency Number: Bateleur: +27 83 123 3911

In case of Poisoning:

Poison Information Centre: +27 82 446 8946
Tygerberg Hospital: (+27 21) 931 6129
Poison Emergency Enquiries: (+27 21) 689 5227

Common Name: Terbutylazine 250g/l + Simazine 250g/l SC
Chemical Name: Terbutylazine: N²-tert-butyl-6-chloro-N⁴-ethyl-1,3,5-triazine-2,4-diamine (IUPAC)
Simazine: 6-chloro-N², N⁴-diethyl-1,3,5-triazine-2,4-diamine (IUPAC)
Chemical Formula: Terbutylazine: C₉H₁₆CℓN₅
Simazine: C₇H₁₂CℓN₅
CAS No.: Terbutylazine: 5915-41-3 and Simazine: 122-34-9
RSA Reg. No.: L6485 Act/Wet No. 36 of/van 1947

2. COMPOSITION / INFORMATION ON INGREDIENTS

<u>Ingredient Name</u>	<u>Concentration</u>
Terbutylazine	250 g/l
Simazine	250 g/l

3. HAZARD IDENTIFICATION

Hazard Class: WHO Class III -Slightly hazardous.

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): 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 – 16 days. Symptoms exhibited by poisoned sheep include lower food intake, higher water intake, incoordination, tremors, and weakness, especially in the hindquarters. Sheep show liver damage.

Chemical Hazard (Terbuthylazine): Harmful if swallowed.

Biological Hazard: Highly toxic to algae.

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 of Human Poisoning: The triazine herbicides (simazine and terbuthylazine) disturb energy metabolism (thiamin and riboflavin functions). Toxicity symptoms include difficulty in walking, tremors, convulsions, paralysis, cyanosis, slowed respiration, miosis (pin point pupils), gut pain, diarrhea and impaired adrenal function.

Some triazines are mildly irritating to skin, and upper respiratory tract. Systemic toxicity is unlikely unless very large amounts have been ingested. Symptoms of simazine poisoning include incoordination, tremor and weakness, cyanosis and clonic convulsions. 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.

First Aid Measures:

Skin Contact: Wash skin for at least 15 minutes with fresh running water and soap, including hair and under fingernails. Remove contaminated clothing and wash before re-use. If irritation persists, seek medical advice immediately. Persons who become sensitized may require specialized medical management with anti-inflammatory agents.

Eye Contact: Flush immediately with clear clean running water for about 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 eyes.

Ingestion: Seek medical advice immediately. Rinse mouth thoroughly with water. The patient should be kept under observation for at least 72 h. Treat symptomatically. Ingestions of small amounts (less than 10 mg/kg body weight) occurring less than an hour before treatment, probably best treated by Syrup of Ipecac (e.g. Lennon Ipekakuanha), followed by 1 or 2 glasses of water. The dose for adults and children over 12 years must be 30 ml. The dose for children under 12 years must be 15 ml.

Inhalation: 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.)

Advice to Physician: No cases of poisoning from the final product have been recorded. 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.

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

- 1) Intubate stomach and aspirate contents.
- 2) Lavage stomach with slurry or activated charcoal in 0.9% saline. Leave 30-50 mg activated in the stomach before withdrawing tube.
- 3) Sodium sulfate, 0.25 gm/kg in tap water, as a cathartic.

Caution: Hydrocarbons (kerosene, petroleum distillates) are 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 directed above.

Antidote: 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.

5. FIRE FIGHTING MEASURES

Flammability: Water based product, non-flammable.

Extinguishing Agents: Dry chemical, foam or 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.

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

Special Hazards: Generates 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.

6. ACCIDENTAL RELEASE MEASURES (SPILLAGE)

Personal Precautions: Wear protective clothing. Avoid breathing vapours or spray drift. If necessary, wear a self-contained breathing apparatus.

Environmental Precautions: Do not contaminate ponds, waterways or ditches with chemical or used container. Do not allow product to enter drainage systems, surface or ground water. If the product enters watercourses or sewers or contaminate soil or plants, inform competent authority.

Small Spills: Soak up with sand or other suitable non-combustible absorbent material, such as sawdust, and place into containers for subsequent disposal. Wash the spill area with a strong detergent and water. Flush the spill area with water to remove any residue.

Large Spills: Contain spillage and contaminated water for subsequent disposal. Do not flush spilled material into drains. Keep spectators away.

7. HANDLING AND STORAGE REQUIREMENTS

Suitable Material: This product should only be stored or applied using stainless steel, aluminium, fiberglass or plastic lined containers. Do not mix, store or apply in galvanized or unlined mild steel containers or spray tanks. The product can react with such containers and tanks or produce hydrogen gas which may form a highly combustible mixture that can flash or explode if ignited by open flame, spark, welder's torch, lighted cigarette or other ignition source.

Handling: Harmful if swallowed. Avoid contact with skin, eyes and clothing. Do not leave the product in the applicator for long period. 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 non-abrasive soap and put on clean clothing. 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 original sealed containers in a well-ventilated and dry storehouse. Keep away from direct sunlight, open flames, food, seed, animals, children and uninformed persons. Store at temperature not exceeding 40 °C. Do not leave in applicators for extended periods.

8. EXPOSURE CONTROL / PERSONAL PROTECTION

Acceptable Daily Intake (ADI): 0.005 mg/kg human body weight (Simazine). 0.0035 mg/kg human body weight (Terbutylazine).

Engineering Controls: Use outdoors in a well-ventilated area. Comply with occupational safety, environmental, fire and other applicable regulations. Wear suitable personal protective equipment. Following application clean sprayer parts by flushing with water.

Personal Protective Equipment:

Clothing: Long-sleeved shirt, long pants, shoes plus socks and protective (impermeable) gloves must be worn. Employee must wear appropriate protective clothing and equipment to prevent prolonged skin contact with this product. Clothing soaked with Enviro Orchards solution should be promptly removed and laundered before re-use.

Gloves: Protective waterproof (impermeable) rubber or plastic gloves are recommended.

Eye Protection: Wear eye protection. During mixing or pouring operations or other activities in which eye contact with undiluted Enviro Orchards is likely to occur, splash goggles should be worn. 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.

Respiratory: Avoid inhaling fumes or spray drift. Respiratory protection is not required for normal use and handling. During periods of abnormal exposure to heavy spray or mist, use a NIOSH approved dust/mist respirator. Limitations of respirator use specified by the approving agency and the manufacturer must be observed.

Other Protection: Do not eat, drink or smoke while handling this product. Prevent contamination of food, feeds, drinking water and eating utensils. After using this product wash hands and face before eating. Take extreme care to avoid dust. Wash accurately (preferably a shower) after work shift. Wash hands during breaks and at the end of the work with soap and water.

9. PHYSICAL AND CHEMICAL PROPERTIES

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

Odor: No data available.

pH: 6.0 – 7.0

Flash Point: Final product > 100 °C and Terbutylazine > 150 °C. Water-based, non- flammable.

Explosive Properties: Not explosive.

Density: 1.11 – 1.14 g/ml

Solubility in Water: 5 mg/l (Simazine) and 8.5 mg/l (Terbutylazine) at 20 °C.

Solubility in Solvent (Simazine): 900 mg/l chloroform; 300 mg/l diethyl ether; 2 mg/l light petroleum; 400 mg/l methanol.

Solubility in Solvent (Terbutylazine): 100 g/l dimethylformamide; 40 g/l ethyl acetate; 14.3 g/l octan-1-ol.

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

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

10. STABILITY AND REACTIVITY

Stability: The product is stable when stored under normal storage conditions at normal temperatures.

Conditions to Avoid: Avoid sources of heat, free flames or spark generating equipment.

Incompatible Materials: Spray solutions containing this product should be mixed, stored or applied using stainless steel, aluminium, fiberglass or plastic lined containers. Do not mix, store or apply in galvanized or unlined mild steel containers or spray tanks. The product can react with such containers and tanks or produce hydrogen gas which may form a highly combustible mixture that can flash or explode if ignited. Do not mix with other herbicides or pesticide except for products mentioned on the product label. Do not physically mix concentrate directly with other herbicides or pesticide concentrates, always dilute first.

Decomposition Products: Thermal decomposition of the product may include toxic and corrosive fumes of chlorides and toxic oxides of carbon and nitrogen.

11. TOXICOLOGICAL INFORMATION

Acute toxicity based on the active ingredient toxicity.

Toxicity of Terbutylazine:

Acute Oral LD₅₀ (rat): 1 590 to 2 000 mg/kg.

Acute Dermal LD₅₀ (rat): > 2 000 mg/kg.

Acute Inhalation LC₅₀ (rat, 4 hr): > 3.51 mg/l air.

Skin and Eye Irritation (rabbit): No skin or eye irritation.

Skin Sensitization (guinea pig): Not a skin sensitizer.

Chronic Effects: No data available.

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

Mutagenicity: No mutagenic in a series of tests using bacteria, cultured mammalian cells and whole animals. No human information available.

Reproductive Hazard: No data available.

Toxicity of Simazine:

Acute Oral LD₅₀ (rat): 950 mg/kg. Moderately toxic if ingested. It is possible that 0.5-5 g/kg would kill a 70 kg person if eaten.

Acute Dermal LD₅₀ (rat): >3 100 mg/kg. Slightly toxic via dermal exposure.

Acute Inhalation LC₅₀ (rat, 4 hr): > 2 mg/l air. Highly toxic if inhaled.

Skin and Eye Irritation (rabbit): Simazine is slightly irritating to the skin and moderately irritating to the eyes of rabbit.

Skin Sensitization (guinea pig): Not a skin sensitizer.

Chronic Effects: NOEL in 2 year feeding trails found no ill-effects in rats receiving 10 mg/kg diet (0.7 mg/kg daily) and for dogs 20 mg/kg diet (0.7 mg/kg daily). NOEL (12 months) for dogs is 0.4 mg/kg daily. NOEL (lifetime) for rats is 0.35 mg/kg daily. NOEL (2 years) for mouse is 16.8 mg/kg daily.

Carcinogenicity: 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 µg/l set by EPA includes an additional margin of safety. Simazine did not produce tumours in mice given 215 mg/kg/day, the highest dose tolerated, for 18 months. Simazine produce thyroid and mammary tumours in female rats fed 5 mg/kg, the highest dietary dose tested.

Mutagenicity: Animals studies did not detect any mutagenic effects. No human information available.

Reproductive Hazards: No adverse effects on reproductive capacity or development were observed in a three-generation study of rats fed 5 mg/kg/day simazine.

12. ECOLOGICAL INFORMATION

Ecotoxicity is based on the active ingredient toxicity.

Ecotoxicity of Terbutylazine:

Aquatic Toxicity Fish LC₅₀ (96 hr): 3.8-4.6 mg/l (rainbow trout); 52 mg/l (bluegill sunfish); 7 mg/l (carp and catfish).

Aquatic Toxicity Daphnia LC₅₀ (48 hr): 21.2 mg/l.

Aquatic Toxicity Algae EC₅₀ (72 hr): Highly toxic to algae.

Avian Toxicity LD₅₀ (9 days): No data available.

Bee Toxicity LD₅₀: No data available.

Biodegradability: Microbial degradation proceeds mainly by de-ethylation and hydroxylation, with eventual ring cleavage. DT₅₀ 30 – 60 days in biologically active soil.

Bio-accumulation: The product shows little or no tendency to bio accumulate and poses no long-term threat to wildlife.

Mobility: Leaches only slightly. Adsorption on soils is strong: $K_d = 2.2-25$, $K_{oc} = 162-278$ 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.

Ecotoxicity of Simazine:

Aquatic Toxicity Fish LC₅₀ (96 hr): >100 mg/l (rainbow trout); 90 mg/l (bluegill sunfish); >100 mg/l (crusian carp); 40 mg/l (guppies). Simazine has very low toxicity to all aquatic species reviewed.

Aquatic Toxicity Daphnia LC₅₀: >100 mg/l (48 h) and 0.29 mg/l (21 days). Simazine has very low toxicity to all aquatic species reviewed.

Aquatic Toxicity Algae EC₅₀ (72 hr): Highly toxic to algae.

Avian Toxicity LD₅₀ (9 days): No data available.

Bee Toxicity LD₅₀: No data available.

Biodegradability: In soil, microbial activity accounts for degradation of a significant amount of simazine. Loss by photodecomposition or volatilization is significant. DT₅₀ is 70 – 110 days. Residual activity remains for 2-7 months (2-4 kg simazine/ha) after application. Simazine absorbs to clays and mucks.

Bio-accumulation: The product shows little or no tendency to bio accumulate. 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 – 6 days after administration.

Mobility: 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 5 cm of soil. $K_d = 0.37-4.66$, $K_{oc} = 103-337$, median c. 150. The product is of low mobility in soils and is unlikely to result in contamination of ground water.

13. DISPOSAL CONSIDERATION

Pesticide Disposal: Do not contaminate crops, grazing, rivers or dams with chemical or used container. Contaminated absorbents, used containers, surplus product etc. should be burnt in an incinerator, preferably designed for pesticide disposal. Hydrolysis under alkaline conditions (10%NaOH) is a suitable method to dispose of small quantities of the product. Heating speeds up the process. The product is relatively stable and characterized by high terbutylazine mobility in some soils and should not be buried in dump sites, landfills, etc. Comply with any local legislation apply to waste disposal.

Package Product Wastes: Emptied containers retain vapor and product residues. Observe all labelled safeguards until container is cleaned, reconditioned or destroyed. Rinse empty container three times with a volume of water equal to at least one tenth of that of the container. Add the rinsings to the spray tank before perforating and flattening the container. Dispose of in approved landfill or preferably in a pesticide incinerator. Do not contaminate ponds, waterways or ditches with chemical or used containers. Containers that are in a good condition may be returned to a drum re-conditioner for re-use with the same type of pesticide product. Do not re-use empty container for any other purpose.

14. TRANSPORT INFORMATION

UN No.: 3082

Class: 9

Packaging Group: III

Proper Shipping Name: Environmentally Hazardous Substance; Liquid; N.O.S. (contains Simazine & Terbutylazine).

15. REGULATORY INFORMATION

Risk Phrases: R 20/22- Harmful by inhalation or if swallowed.

R 36- Irritating to eyes.

R40- Possible risks of irreversible effects.

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.

Safety Phrases: S2- Keep out of reach of children.

S25/26- Avoid contact with eyes. In case of accidental contact with eyes, rinse immediately with plenty of warm water and seek medical advice.

S36/37- Wear suitable protective clothing and gloves.

S46- If swallowed, seek medical advice immediately and show this container and label.

National Legislation: This product is registered under Act 36 of 1947 of the Republic of South Africa. It is a violation of South African law to use this product in any manner inconsistent with its approved labelling. Read and follow all label directions.

16. OTHER INFORMATION

Note: Read and understand all the information on the product label before using the product.

Emergency and First Aid Procedures: The chemical information provided has been condensed from original source documents, primarily from: "Morgan, D.P. 1982 Recognition and management of pesticide poisonings, 3rd ed. U.S. Environmental Protection Agency, Washington, DC. 120 pp". This information has been provided in this form for your convenience and general guidance only. In specific cases, further consultation and reference may be required and is recommended.

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 and 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.

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