



Novagen Innovations (Pty) Ltd. t/a Agri Novagenix
Company registration number: 2020/891524/07 ; VAT: 4150295469
PO Box 1224, Isando, 1600, South Africa

SAFETY DATA SHEET

ENDZONE

Reg. No. / Nr L11745 Act No. 36 of 1947 / Wet Nr 36 van 1947

Section 1. Identification of the material and the supplier

Product: **ENDZONE**
Product Use: Herbicide
Restriction of Use: Refer to Section 15

Supplier: **Novagen Innovations (Pty) Ltd t/a Agri Novagenix**
PO Box 1224
Isando, 1600
South Africa
www.novagenag.co.za

Emergency No: POISON INFORMATION HELPLINE 0861 555 777
GRIFFON POISON CENTRE 082 446 8946
POISON CENTRE (UNITAS HOSPITAL) 012 664 1100
TYGERBERG 021 931 6129
RED CROSS 021 689 5227
RAPID SPILL RESPONSE 0800 775 3305

Date of SDS Preparation: 5 February 2025

Section 2. Hazards Identification

Classification of the substance or mixture

Globally Harmonised System, EU (GHS) and according to regulation EC No 1272/2008 [CLP]

Skin Irritation Category 2; H315
Skin Sensitization Category 1; H317
Serious Eye Damage Category 1; H318
Long term (Chronic) hazard Category 3; H412

For the full text of the H-Statements mentioned in this Section, see Section 16.

Label elements

Globally Harmonised System, EU (GHS) and according to regulation EC No 1272/2008 [CLP]

Pictograms



Signal Word: **DANGER**

Hazard statement(s)

H315: Causes skin irritation.

H317: May cause an allergic skin reaction.

H318: Causes serious eye damage.

H412: Harmful to aquatic life with long lasting effects.

Precautionary statement(s)

General:

P101 - If medical advice is needed, have product container or label at hand.

P102 - Keep out of reach of children.

P103 - Read carefully and follow all instructions.

Prevention:

P261 – Avoid breathing dust/fume/mist/vapours/spray.

P264 + P265 – Wash hands and skin thoroughly after handling. Do not touch eyes.

P272 - Contaminated work clothing should not be allowed out of the workplace.

P273 - Avoid release to the environment.

P280 - Wear protective gloves.

Response:

P302 + P352 - IF ON SKIN: Wash with plenty of water and non-abrasive soap.

P305 + P354 + P338 – IF IN EYES: Immediately rinse with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing.

P317 – Get medical help.

P321 - Specific treatment (see First Aid on this label).

P333 + P317 - If skin irritation or rash occurs: Get medical help.

P362 + P364 - Take off contaminated clothing and wash it before reuse.

Storage:

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Disposal:

P501 - Dispose of contents/container in accordance with national regulations.

Supplemental Hazard Statements: none

2.3 Other

Other hazards

No other hazards known

Section 3. Composition / Information on Hazardous Ingredients
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Mixture

Soluble concentrate
Bentazone 480 g/L

Globally Harmonised System, EU (GHS) and according to regulation EC No 1272/2008 [CLP]

Ingredients	Concentration of hazardous ingredient	CAS NUMBER.	Classification
Bentazone (also known as Bendioxide, Bentazon)	48%	25057-89-0	Acute Tox. Oral Cat. 4; H302 Eye Irrit. Cat. 2; H319 Skin Sens. Cat. 1; H317 Aquatic Chronic Cat. 3; H412
Sodium hydroxide solution	>1-<5%	1310-73-2	Skin Corr. Cat. 1A; H314
Alkyl polyglucoside solution	>1-<5%	68515-73-1	Skin Irrit. Cat. 2; H315 Ser. Eye Dam. Cat. 1; H318

For the full text of the H-Statements mentioned in this Section, see Section 16.

Section 4. First Aid Measures

Remove patient from exposed area. Never give fluids or induce vomiting if patient is unconscious or is having convulsions.

Routes of Exposure:

If in Eyes	Immediately flush eyes with plenty of water for at least 15 minutes holding the eyelids open. Remove contact lenses, if present, after the first five minutes. Seek medical assistance if irritation occurs.
If on Skin	Immediately flush body and clothes with large amounts of water and soap. Remove contaminated clothing and footwear. Wash affected areas with soap and water. Do not rub skin. Persons providing first aid must wear gloves to avoid self-contamination. Seek medical assistance if irritation occurs.
If Swallowed	Never give anything by mouth to an unconscious person. Do not induce vomiting unless instructed to do so by a physician. Have the patient sip a glass of water if they are alert and able to swallow. For advice, contact the National Poisons Centre. If the patient is alert and able, rinse mouth thoroughly with water. Seek medical assistance immediately.
If Inhaled	Remove victim to fresh air. Keep patient calm. Monitor for respiratory distress. If a cough or breathing difficulty develops, evaluate for respiratory tract irritation, bronchitis, or pneumonitis. Apply artificial respiration and oxygen if required. If mouth to mouth resuscitation is given use rescuer protection (pocket mask etc.) Seek medical attention if irritation develops or persists.

Most important symptoms and effects, both acute and delayed

Acute poisoning of Bentazone/Bendioxide is unlikely, unless large amounts have been ingested. Human ingestion of high doses of Bentazone/Bendioxide has caused vomiting, diarrhoea, trembling, weakness, and irregular breathing.

Treatment:

No specific antidote known. Treat symptomatically and supportively.

Section 5. Fire Fighting Measures

Hazards from products	Hazardous combustion products: Under fire conditions some components of this product may decompose. The smoke may contain unidentified toxic and/or irritating compounds. Combustion products may include and are not limited to: Nitrogen oxides, Carbon monoxide, Carbon dioxide, sulphur oxides.
Suitable Extinguishing media	Fine water spray, alcohol foam, carbon dioxide, or dry chemical. Do not use high volume water jet. Water spray can be used for cooling of unaffected stock but avoid water coming in contact with the product. Use as little water as possible. Use spray or fog. Solid stream may cause spreading. Contain water used for firefighting for later disposal. Avoid the accumulation of polluted run-off from the site.
Recommended protective clothing & Precautions for firefighters	Wear positive-pressure self-contained breathing apparatus (SCBA) and protective fire-fighting clothing (includes fire-fighting helmet, coat, trousers, boots, and gloves). Avoid contact with this material during fire-fighting operations. If contact is likely, change to full chemical resistant fire-fighting clothing with self-contained breathing apparatus. If this is not available, wear full chemical resistant clothing with self-contained breathing apparatus and fight fire from a remote location. For protective equipment in post-fire or non-fire clean-up situations, refer to the relevant sections. Remove spectators from surrounding area. Isolate the fire area and evacuate downwind. Use a recommended extinguishing agent for the type of surrounding fire. Fight fire from maximum distance and use unmanned hose holder or monitor nozzles. Contain fire control agents for later disposal. Avoid inhaling hazardous vapours and fumes from burning materials. Keep upwind. Remove container from fire area if possible and without risk. Water can be used to cool unaffected containers but must be contained for later disposal. Dike fire control water for later disposal. Do not scatter the material. Avoid pollution of waterways. Do not use high volume water jet, due to contamination risk. Contain water used for firefighting for later disposal. Avoid the accumulation of polluted run-off from the site. Contain water used for firefighting for later disposal. Avoid the accumulation of polluted run-off from the site. Eliminate all ignition sources in the immediate area.

Section 6. Accidental Release Measures**Personal precautions:**

All personnel handling this material must be thoroughly trained on how to handle spills and releases. Avoid contact with skin and eyes. Do not breathe in spray or fumes. For personal protection see Section 8.

Wash hands before breaks and immediately after handling the product. When using, do not eat, drink, or smoke. Wash contaminated clothing before re-use.

Environmental precautions:

Do not contaminate waterways, drains and groundwater. If contamination of waterways, drains, rivers, or lakes is unavoidable, warn the local authorities (Police and Department of Water/Environmental affairs) immediately. Do not discharge into the subsoil/soil.

Spill and Disposal procedures:

Cleaning procedure:

Wear protective clothing. Clear area of unprotected persons and animals.

Do not touch any spilled material, stop the leak if it is safe to do so and without risk.

Contain and absorb liquid spills with inert material, remove by scoop or vacuum. Use approved industrial vacuum cleaner for removal and place in waste containers. Place the material into a clean dry container and seal for subsequent disposal in accordance with local and national regulations. Wash the area with water and detergent and absorb with further inert material. Collect the contaminated water for later disposal in accordance with local and national regulations.

Label all waste drums according to their content and dispose of in accordance with local and national regulations.

For large spills: Dike spillage and pump off product.

DO NOT flush spilled material into drains. Decontaminate all tools and equipment following clean-up. Keep spectators away and upwind. Open burning or dumping of this material is prohibited.

Heavily contaminated soil layers have to be dug out down to clean soil. If spill does enter waterways, contact the local authority. Spilled product cannot be re-used and must be disposed of in accordance with local and national regulations.

If containers cannot be recycled, they should be disposed of together with the waste chemical.

Open burning or dumping of this material is prohibited.

Do not get water inside containers.

Waste Disposal: In accordance with local and national regulations. Cover drains. Collect, bind, and pump off spills. Observe possible material restrictions (see sections 7 and 10). Take up dry. Dispose of properly. Clean up affected area. Avoid generation of dusts.

Container Disposal: Refer to the product label for instructions. **DO NO REUSE THE CONTAINER FOR ANY OTHER PURPOSE.** Do not transport if this container is damaged or leaking.

Reference to other sections

Information regarding safe handling, see section 7.

Information regarding personal protective equipment, see section 8.

Information regarding waste disposal, see section 13.

Section 7. Handling and Storage

Precautions for Handling:

Keep out of reach of children and animals.

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.

All personnel handling this product must be thoroughly trained regarding its hazards.

Harmful if swallowed.
Use with adequate ventilation.

Wash hands after use and before eating, drinking, chewing gum, smoking, or using the toilet. Operators must change and wash clothing daily. Remove clothing immediately if the pesticide gets inside. Thereafter, wash skin thoroughly with plenty of water and a 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. All water used to clean equipment must be disposed of correctly in order to avoid contamination.

Precautions for Storage:

Store in original container tightly closed and in a locked, dry, cool, well-ventilated area away from heat, open flame, water supplies, foodstuffs, fertilisers, and seeds.

Keep away from children, animals, or unauthorised persons.

Avoid extreme temperatures.

Do not store in or around the home.

Never transfer this product to another container for storage.

Do not permit prolonged storage in areas where the temperature frequently exceeds 46°C.

Store in compliance with local regulations.

Specific end use(s): Use only according to the label.

Section 8 Exposure Controls / Personal Protection

Occupational exposure limits:

None.

Follow safe industrial engineering/laboratory practices when handling any chemical. Install a closed system or local exhaust as possible so that workers should not be exposed directly. Also install safety shower and eye bath.

All atmospheric contamination should be kept to as low a level as is workable. These workplace exposure standards should not be used as fine dividing lines between safe and dangerous concentrations of chemicals. They are not a measure of relative toxicity.

Engineering Controls / Industrial Hygiene

Comply with occupational safety, environmental, fire and other applicable regulations.

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.

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

Personal Protection Equipment

Eyes	Safety glasses with side-shields (frame goggles) (e.g., EN 166)
Hands	Suitable chemical resistant safety gloves (EN 374) also with prolonged, direct contact (Recommended: Protective index 6, corresponding > 480 minutes of

	permeation time according to EN 374): E.g., nitrile rubber (0.4 mm), chloroprene rubber (0.5 mm), butyl rubber (0.7 mm) etc.
Skin	Body protection must be chosen depending on activity and possible exposure, e.g., apron, protecting boots, chemical-protection suit (according to EN 14605 in case of splashes or EN ISO 13982 in case of dust).
Respiratory	Suitable respiratory protection for higher concentrations or long-term effect: Combination filter for gases/vapours of organic, inorganic, acid inorganic and alkaline compounds (e.g., EN 14387 Type ABEK).
General	The statements on personal protective equipment in the instructions for use apply when handling crop-protection agents in final-consumer packing. Wearing of closed work clothing is recommended. Store work clothing separately. Keep away from food, drink, and animal feeding stuffs. 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	Liquid
Colour	Brown coloured liquid
Odour	No data available
Odour Threshold	No data available
pH	6.5 - 8.5 (1 % aqueous dilution)
Boiling/Melting Point	No data available
Freezing Point	No data available
Flash Point	No data available
Flammability	Not flammable
Upper and Lower Explosive Limits	Not explosive
Vapour Pressure	No data available
Vapour Density	No data available
Density	No data available
Water Solubility	Soluble in water
Partition Coefficient:	Bendioxide: log Kow 2.34
Ignition Temperature	No data available
Decomposition Temperature	Based on a similar product: 160 °C, 350 kJ/kg,
Viscosity	Based on a similar product: approx. 9 mPa.s (20 °C, 100 1/s) (OECD 114) 5.3 mPa.s (40 °C, 100 1/s)
Particle Characteristics	No data available
Surface tension	No data available

Section 10. Stability and Reactivity

Stability of Substance	Stable under normal use and standard conditions. Stable for 24 months. Avoid storage under extreme temperatures and conditions. Store below 50°C, preferably below 30°C, and not for prolonged periods in direct sunlight. When stored appropriately this product should show no significant degradation for 2 years from the date of manufacture. Avoid temperature extremes.
Possibility of hazardous reactions	None known.

Conditions to Avoid	Protect from extreme temperatures, direct sunlight.
Incompatible Materials	Avoid contact with strong oxidizing agents, strong bases and strong acids. Store only in the original container.
Hazardous Decomposition Products	No decomposition if stored and handled as indicated.

Section 11 Toxicological Information

Acute Effects:

Oral	GHS: Not classified
Dermal	GHS: Not classified
Inhalation	GHS: Not classified
Eye	GHS: Ser. Eye Dam. Cat. 1
Skin	GHS: Skin Irrit. Cat. 2 GHS: Skin Sens. Cat. 1

Chronic Effects:

Carcinogenicity	GHS: Not classified
Reproductive Toxicity	GHS: Not classified
Germ Cell Mutagenicity	GHS: Not classified
Aspiration	GHS: Not classified
STOT/SE	GHS: Not classified
STOT/RE	GHS: Not classified

Section 12. Ecotoxicological Information

Ecological effects information	GHS: Aquatic Chronic Cat. 3
Persistence and degradability	Information based on Bendioxide active: Plants: 6-Hydroxybentazone and 8-hydroxybentazone are major plant metabolites of bentazone. Because crops of treated plants can be consumed by humans, farm animals or pets, an exposure to both of these compounds might be expected in principle. Although both metabolites have been demonstrated to be formed in mammals and therefore can be regarded as included in toxicological testing of the parent compound, specific toxicological studies were performed. It has been shown that the 8-hydroxy and 6-hydroxy metabolites of bentazone are of comparable toxicity by the oral route of administration and are both less toxic than the parent compound. Additionally, both metabolites were negative in the Ames assay for the potential to induce point mutations in bacteria. As it is unlikely that a hydroxy group shift in the bentazone ring system dramatically changes the toxicity, it was decided to perform further investigations on 8-hydroxybentazone as a reference substance. Therefore, 8-hydroxybentazone was investigated in a sub chronic feeding study, in several mutagenicity studies and in a prenatal developmental study. These investigations revealed that the metabolites have no mutagenic or teratogenic potential and are less toxic than the parent substance.

Environment:

Bentazone has known environmental transformation products that include 2-amino-N-isopropylbenzamide, 6-OH-bentazone, 6-bromo-bentazone, 6-chloro-bentazone, 8-OH-bentazone, 8-bromo-bentazone, 8-chloro-bentazone, and N-methyl Bentazone. If released to air, a vapor pressure of 4.05×10^{-8} mm Hg at 20 °C indicates bentazon will exist solely in the particulate phase in the atmosphere. Particulate-phase bentazon will be removed from the atmosphere by wet or dry deposition. Bentazon absorbs light at wavelengths >290 nm and, therefore, is expected to be susceptible to direct photolysis by sunlight. If released to soil, bentazon is expected to have very high to high mobility based upon experimental Koc values ranging from 0 to 46. The pKa of bentazon is 3.3, indicating that this compound will exist almost entirely in the anion form in the environment and anions generally do not adsorb more strongly to soils containing organic carbon and clay than their neutral counterparts. Volatilization from moist soil is not expected because the compound exists as an anion and anions do not volatilize. Bentazon is not expected to volatilize from dry soil surfaces based upon its vapor pressure. In aerobic soils, reported degradation half-lives of 6.7 to 50 days suggest that under certain conditions biodegradation may be an important environmental fate process in soil. If released into water, bentazon is not expected to adsorb to suspended solids and sediment based upon the Koc values. Bentazon was not degraded in biodegradation experiments anaerobic aquifer conditions, but the available soil studies would suggest that biodegradation may be an important environmental fate process in water. A pKa of 3.3 indicates bentazon will exist almost entirely in the anion form at pH values of 5 to 9 and, therefore, volatilization from water surfaces is not expected to be an important fate process. A BCF of 3.7 suggests the potential for bioconcentration in aquatic organisms is low. Hydrolysis is not expected to be an important environmental fate process since bentazon was stable to hydrolysis in pH 5, 7, and 9 buffer solutions.

AEROBIC: Bentazon can be rapidly utilized by bacteria and fungi. Bentazon was degraded in 8 soils with half-lives ranging from 6.7 to 15 days, and 38 to 50 days, for soils with and without a history of bentazon application, respectively, which suggests acclimation. In aerobic soil incubation experiments, approximately 80% of the initial bentazon applied remained after 28 days in sandy clay loam soil, in clay soil there was no significant conversion of bentazon after 30 days incubation. Rapid degradation in soil proceeds via the formation of short-lived hydroxy compounds which rapidly undergo further degradation. Bentazon has low soil persistence based on dissipation half-lives of 11-14 days in freshly collected field soils at 20 °C under aerobic conditions. In laboratory degradation studies, with soils of proven biological activity, a DT₅₀ (average) of 17.8 days was reported; DT₅₀ (field, average) was approximately 12 days; corresponding DT₉₀ was 44 days. The average half-life of bentazon in laboratory soils was about 46 days.

	Animals: Toxicokinetic studies performed on mice, rats and rabbits indicate that bentazone is rapidly and almost completely absorbed via the oral route. Administration of bentazone either as the <u>sodium</u> salt or as the free acid did not result in any significant differences in absorption. There was no evidence of penetration into the central nervous system or spinal cord, and elimination from other tissues was rapid, with no indication of bioaccumulation. Elimination was almost exclusively via the urine (approximately 91% within 24 hours); 5 days after dosing, less than 2% was found in feces and less than 0.02% in expired air. Biliary excretion of radioactivity was minimal. No significant differences were found in absorption and elimination among the different species investigated (rat, rabbit, mouse). The metabolism of bentazone was investigated in a number of toxicokinetic studies following oral (rat and rabbit) or intravenous administration (mouse) Bentazone was only poorly metabolized, with the parent compound being the predominant excretion product. Only small amounts of 6-hydroxybentazone and 8-hydroxybentazone could be detected. In rats, rabbits and mice, no conjugated products were found.
Bioaccumulation	Estimated Bioconcentration Factor (BCF): 3.7 (fish). Log Kow 4.73. A BCF of 3.7 suggests the potential for bioconcentration in aquatic organisms is low.
Mobility in Soil	If released to soil, bentazon is expected to have very high to high mobility based upon experimental Koc values ranging from 0 to 46.
Other adverse effects	This substance / mixture contains no ingredients that are on the Montreal Protocol list of substances that deplete the ozone layer.
Precautions:	Do not allow to enter waterways.

Section 13. Disposal Considerations

Disposal Method:

In accordance with local and national regulations. This product and its container must be disposed of by a waste treatment facility authorised to destroy waste in terms of the National Environmental Management: Waste Act, 2008 (Act No. 59 of 2008) and the relevant waste management regulations. Do not dispose into, or allow contact with, municipal sewerage systems or open water bodies. Do not bury.

Contaminated packaging:

Containers and packages must be completely emptied before disposal. Rinse empty container three times with a volume of water equal to a minimum of 30% of that of the container. Add the rinsings to the contents of the spray tank before destroying the empty container. Destroy the empty container by perforation and flattening and do not use for any other purpose. Store appropriately until it can be taken to a waste treatment facility authorised to destroy waste in terms of the National Environmental Management: Waste Act, 2008 (Act No. 59 of 2008) and the relevant waste management regulations for disposal. Empty containers and product should not be burnt.

Special precautions during disposal:

Waste resulting from the use of this product 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. Triple rinse containers, add rinsate to the spray tank, then offer the container for recycling/reconditioning, or puncture top, sides and bottom and take to a waste treatment facility authorised to destroy waste in terms of the National Environmental Management: Waste Act, 2008 (Act No. 59 of 2008) and the relevant waste management regulations for disposal.

If on-site container disposal is necessary, triple rinse empty container with water, add rinsate to the spray tank. Puncture top, sides and bottom, crush, and store appropriately until it can be taken to a waste treatment facility authorised to destroy waste in terms of the National Environmental Management: Waste Act, 2008 (Act No. 59 of 2008) and the relevant waste management regulations for disposal.

Empty containers and product should not be burnt.

Section 14 Transport Information

Rail/road (RID/ADR):

Proper shipping name	Not regulated for transport
UN number	-
Class	-
Packing group	-
Environm. Haz. Mark	-

Sea (IMDG code):

Proper shipping name	Not regulated for transport
UN number	-
Class	-
Packing group	-
Marine pollutant	-

Air (ICAO/IATA):

Proper shipping name	Not regulated for transport
UN number	-
Class	-
Packing group	-
Environm. Haz. Mark	-

Section 15 Regulatory Information

Safety, health and environmental regulations/legislation specific for the substance or mixture

This safety data sheet complies with the requirements of Regulation (EC) No. 1907/2006., EC1272/2008 (EU-GHS/CLP), OSHA 1993 Regulations for Hazardous Chemical Substances

Chemical Safety Assessment

For this product a chemical safety assessment was not carried out.

Section 16 Other Information

Full text of H-Statements referred to under sections 2 and 3.

H302: Harmful if swallowed
H314: Causes severe skin burns and eye damage
H315: Causes skin irritation
H317: May cause an allergic skin reaction
H318: Causes serious eye damage

H319: Causes serious eye irritation

H412: Harmful to aquatic life with long lasting effects

Abbreviations and acronyms

ADR European Agreement concerning the International Carriage of Dangerous Goods by Road

CAS-Nr. Chemical Abstracts Service number

CLP Classification, Labelling and Packaging

EU European Union

GHS Globally Harmonized System

IATA International Air Transport Association

ICAO International Civil Aviation Organization

IMDG International Maritime Dangerous Goods

RID Regulations concerning the International Carriage of Dangerous Goods by Rail

STOT SE Specific target organ toxicity single exposure.

STOT RE Specific target organ toxicity repeated exposure.

UN United Nations

For proper and safe use of this product, please refer to the approval conditions laid down on the product label. The data contained in this safety data sheet is based on our current knowledge and describes the product only with regard to safety requirements. The data does not describe the products properties. Neither should any agreed property nor the suitability of the product for any specific purpose be deduced from the data contained in the safety data sheet. It is the responsibility of the recipient of the product to ensure any existing laws and legislation are observed.

The information herein is given in good faith, but no warranty, express or implied is made.

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