

FARM-AG INTERNATIONAL (Pty) Ltd

P.O. Box 1523, Durban 4000

Head Office : 61 Marshall Dr., Old Mill Industrial Park, Mount Edgecombe South Africa

Registration Number: 2005/011761/07

Tel + 27 31 003 3486 • Fax + 27 31 502 5825

1. PRODUCT & COMPANY IDENTIFICATION

Substance: Benomyl
Trade Name: FarmAg Benomyl 500
Fungicide
UN No.: 3077
Creation Date: February 2016
Revision Date: August 2017

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

2. COMPOSITION / INFORMATION ON INGREDIENTS

Common Name: benomyl
Chemical Name: methyl 1-(butylcarbamoyl)benzimidazol-2-ylcarbamate (IUPAC)
CAS No.: 17804-35-2
Chemical family: Benzimidazole
Chemical formula: C₁₄H₁₈N₄O₃ (Mol. Wt. 290.3)
Use: Systemic fungicide with protective and curative action
Formulation: Benomyl 500g/kg, Wettable powder
Hazardous ingredients: Benomyl
SYMBOL: Xi
Indication of danger: Irritant.
RISK PHRASES: R22, R36/37, R40, R51

3. HAZARD IDENTIFICATION**Toxicity Class:**

WHO U ; EPA III

Possible Routes of exposure:

Ingestion, Inhalation, Skin and eye contact.

Ingestion:

Very low toxicity

Inhalation:

Mild irritant to the nose, throat and respiratory system. Low to moderate toxicity.

Skin contact:

Mild irritant. Low toxicity by contact. Moderate sensitizer. Continuous exposure may result in allergic skin reaction.

Eye contact:

Mild eye irritant

4. FIRST AID MEASURES AND PRECAUTIONS**Inhalation:**

Remove source of contamination, or leave contaminated area to fresh air as rapidly as possible. Healing occurs spontaneously. Administer supplementary oxygen. Seek medical attention if necessary.

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Skin contact:

If irritation occurs, remove contaminated clothing, shoes and leather goods (e.g. watchbands, belts). Gently wipe off excess chemical. Wash skin gently and thoroughly with water and non-abrasive soap. If irritation persists, seek medical advice immediately. Allergic skin reaction should be treated as an allergic contact dermatitis with anti-inflammatory agents or cortisone-containing emulsions. Wash contaminated clothing thoroughly.

Eye contact:

Immediately flush eyes with gently flowing lukewarm water for 15 minutes, holding the eyelids open. Seek medical attention.

Ingestion:

In case of deliberate ingestion, have victim rinse mouth thoroughly with water and give a glass of water to drink. Do not induce vomiting. Seek medical advice immediately.

Advice to physicians:

No specific antidotes. Treat symptomatically. If Benomyl has been ingested, and copious vomiting has not occurred, the stomach must be emptied and steps taken to limit gastrointestinal absorption.

Note the nature of this product.

5. FIRE-FIGHTING MEASURES

Fire and explosion hazard:

The material does not burn or burns with difficulty. It is not explosive. Product is not flammable. Dust particles may form explosive mixtures in the air.

Special Hazards:

Fire may produce poisonous gases of combustion, namely n-butylisocyanate.

Lower explosive limit:

0.08 g/l

Extinguishing media:

Carbon dioxide, dry chemical powders, foam and water spray. Avoid water coming into contact with the product.

Fire fighting:

Remove spectators from area. Evacuate downwind. Fire fight from a maximum distance. Contain fire control agents for disposal later. Keep upwind. Remove containers from fire area. Water can be used to cool off unaffected containers. Avoid pollution of waterways.

Personal protective equipment:

Wear self-contained breathing apparatus with full face-piece and full-length protective clothing, boots and chemical impermeable gloves, should the chemical be involved in a general fire. Toxic fumes may be given off in fire. No unprotected person should be allowed in the vicinity. Avoid contamination of surrounding vegetation. The product is toxic to fish and wildlife.

6. ACCIDENTAL RELEASE MEASURES (SPILLAGE)

Occupational spill:

Keep spectators away. Isolate hazard area and deny entry. Stay upwind, out of low-lying areas, and ventilate closed spaces before entering. Cover spill with absorbent material. Sweep into disposal container. Wash area with detergent and water and follow with clean water rinse. Do not allow spill to contaminate water supplies. Dike far ahead of liquid spills for later disposal.

Personal precautions:

Chemical protective clothing usage is advised, i.e. wear neoprene gloves, cotton overalls, safety goggles, boots and adequate respiratory protection as indicated by circumstances. Report incident to emergency personnel in the event of a large spill.

Environmental:

Prevent contamination of sewers, waterways, drinking water, grazing, crops and low areas. Spillage or uncontrolled discharge into water courses is to be reported immediately to the Police and to the Department of Water/Environmental Affairs.

Prevention of secondary hazard:

Inspect for damaged containers and take the necessary precautions.

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7. HANDLING AND STORAGE REQUIREMENTS**Handling:**

Read and observe precautions on product label. Relatively safe to handle. Handle with the care and caution due to crop protection chemicals. Avoid spillage. Poisonous by inhalation, skin, eyes and ingestion. Never repack from this container.

Storage:

Read and observe precautions on product label. Store in a dry, cool covered warehouse in well-labeled containers. Store under lock and key, out of reach of children, uninformed persons and animals. Store away from food, feedstuffs, fertilizers, seed and agricultural chemicals. Local regulations should be complied with.

Storage Stability:

Considered stable for a period of 2 years in normal air, warehouse and light conditions, if kept in closed container.

Cleaning of equipment:

Clean protective clothing, used protective clothing and workers personal clothing shall be kept apart. All protective clothing and respirators shall be decontaminated, washed, rinsed and dried at the end of each day. Wash equipment after use with wetting agent. Extra care must be taken when cleaning equipment after use not to contaminate all sources of drinking water, rivers, dams and other crops.

8. EXPOSURE CONTROL/PERSONAL PROTECTION**Exposure limits:**

OSHA PEL: 15 mg/m³ - Total dust.

ACGIH TLV: 10 mg/m³

Effective ventilation to be maintained while handling the product.

Engineering control measures:

It is essential to provide adequate ventilation to keep airborne concentrations of **FARMAG BENOMYL 500** dust below permissible exposure levels. The measures appropriate for particular work sites depends on how this material is used and on the extent of exposure. Ensure that control systems are properly maintained and designed. Only spark-resistant equipment should be used. Comply with occupational safety, environmental, fire and other applicable regulations.

Personal protective equipment:

Wear protective equipment during manufacturing, mixing of concentrate and application.

Respiratory: In case of insufficient ventilation, wear adequate respiratory protection.

Hand: Gloves of synthetic material.

Eye: Safety goggles or safety shield.

Emergency eye wash:

If there is any possibility that the employees' eyes would be exposed to this substance, the employee should provide a water fountain in the work area for emergency use

Skin and body: Wear suitable protective clothing, e.g. cotton overalls and boots. Wash exposed skin areas, face and hands after handling.

9. PHYSICAL AND CHEMICAL PROPERTIES

Appearance:	Off white powder
Odour:	Weak chemical odour.
Flash point:	Not applicable
Auto-ignition temperature:	220°C
Solubility in water:	Wettable powder formulation – dispersible.
pH:	Not available
Partition-coefficient in n-octanol/	
Water:	Kow (logPow) = 2.63 at 25°C (data for 500 SC)
Melting point:	84 - 86°C

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10. STABILITY AND REACTIVITY

Storage stability:	Stable at elevated temperatures and at low temperatures. Do not store near crop protection chemicals, feed, fertilizers or seed.
Moisture sensitivity:	Decomposes slowly in the presence of moisture.
Dilution stability:	Decomposes in strong acidic and strong basic media.
Incompatibility:	Compatible with most other pesticides, except those with a strong alkaline nature. However a compatibility test is required before using with other products. Do not physically mix concentrate directly with other herbicides or pesticides concentrates; always dilute first.
Hazardous decomposition products:	Toxic n-buthyl isocyanate is released when the product decomposes on heating. High humidity or moisture levels and/or high temperatures can also lead to generation of n-buthyl isocyanate.

11. TOXICOLOGICAL INFORMATION

Data for technical material

Acute oral LD₅₀:	> 10 000 mg/kg (rat)
Acute dermal LD₅₀:	> 10 000 mg/kg (rabbit)
Acute inhalation LC₅₀:	4 mg/ℓ air (4 hours) (rat)
Acute skin irritation:	Mild irritant to skin.
Acute eye irritation:	Mild irritant to eyes.
Dermal sensitization:	Causes no dermal sensitization. Repeated
Teratogenicity:	Very high doses of benomyl can cause birth defects in test animals. However the route of exposure makes a difference. In the teratogenicity. US EPA listed benomyl as a criteria of concern.
Carcinogenicity:	Not listed as carcinogen by NTP, IARC, ACGIH or OSHA. However, due to conflicting results in studies, it is not possible to determine the carcinogenicity of Benomyl.
Mutagenicity:	Due to conflicting results in numerous assays, no conclusion can be drawn. US EPA classified benomyl as a criteria of concern.
Fate in Humans and Animals:	Benomyl's metabolism has been studied in mouse, rat, rabbit, dog, sheep and cow. Benomyl is rapidly broken down to carbendazim, further to other compounds, such as 5-hydroxy-2-benzimidazole carbamate (5 HBC), and then eliminated. Benomyl and its metabolites do not accumulate in tissues over long-term exposure periods.
ADI:	0.02 mg/kg body weight.

12. ECOLOGICAL INFORMATION**Degradability:**

Benomyl is strongly bound to soil and does not dissolve in water to any significant extent. It is highly persistent. Half life is 6 to 12 months in bare soil. In water it completely degrades to carbendazim. Half life of carbendazim is 2 months in water. Benomyl is systemic and absorbed by plants. Once in the plant it accumulates in veins and at the leaf margins. Residues are stable; with 48 to 97% remaining as the parent compound 21 to 23 days after application.

13. ECOTOXICOLOGY

Birds:	Moderately toxic to birds.		
	LD ₅₀ (Acute Oral)	Redwing blackbird	100 mg/kg
	LC ₅₀ (8 day diet)	Mallard duck	> 10 000 mg/kg
		Bobwhite quail	> 10 000 mg/kg
Fish:	Toxic to fish		
	LC ₅₀ (96 hr)	Rainbow trout	0.27 mg/ℓ
		Goldfish	4.2 mg/ℓ
	LC ₅₀ (48hr)	Guppy	3.4 mg/ℓ
Bees:	Not toxic to bees.		
	LD ₅₀ (contact):		> 50µg/bee.
Daphnia:	may not be toxic to <i>Daphnia magna</i> .		

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Algae:	LC ₅₀ (48hr)	640 µg/l
	Toxic to algae	
	Eb ₅₀ (72hr)	2.0 mg/l
Earthworms:	Eb ₅₀ (120hr)	3.1 mg/l
	Very toxic to all species of earthworms.	
	LC ₅₀ (14 days)	0.4 mg/kg

14. DISPOSAL CONSIDERATION**Pesticide disposal:**

Open dumping or burning of this pesticide is prohibited as well as 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.

Package product wastes:

Invert the empty container over the spray or mixing tank and empty thoroughly. Combustible containers should be disposed of in pesticide incinerators or in specified landfill sites. Non-combustible containers must be punctured and disposed of in specified landfill areas. Do not re-use container for any other purpose. Comply with any local legislation applying to disposal.

15. TRANSPORT INFORMATION

UN NUMBER:	3077
ADR/IRD:	
Shipping name:	Environmentally hazardous substance, solid, n.o.s. (benomyl 50%)
IMDG/IMO:	
Packaging group:	III
Class:	9
Shipping name:	Environmentally hazardous substance, solid, n.o.s. (benomyl 50%)
ICAO/IATA:	
Class:	9
Hazard Label:	Miscellaneous
Packaging Group:	III
Passenger Aircraft:	Y911 (max 30 kg), 911 (no limit)
Cargo Aircraft:	911 (no limit)

MARINE POLLUTANT**16. REGULATORY INFORMATION**

Symbol:	Xn
Risk phrases:	
R22	Harmful if swallowed.
R36/37	Irritating to eyes / respiratory system
R40	Limited evidence of carcinogenic effect.
R51	Toxic to aquatic organisms.
Safety phrases:	
S1/2	Keep locked up and out of reach of animals and children.
S23	Do not breathe dust and/or spray.
S24/25	Avoid contact with skin and eyes.
S36/37/39	Wear suitable protective clothing, gloves and eye/face protection.
Indication of danger:	Harmful.

17. OTHER INFORMATION

Packed in 1 kg and 25 kg woven bags or 3 ply paper bags and labeled according to South African regulations and guidelines.

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Read the label before use or buying: Use pesticides safely.

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