



MATERIAL SAFETY DATA SHEET

PRODUCT : BENOMYL 500WP
EFFECTIVE DATE : February 2006
REVISED : June 2019
REVISION NO : 2
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SUPPLIER: NOVA AGRO (HK) LTD
6th Floor Wyndham Place
44 Wyndham Street
CENTRAL HONG KONG.
Tel No.: +852 3586 2521

SPILLAGES:
Emergency telephone (+27) 83 676 1998
POISONINGS:
National Poison Centre (+27) 21 931 6129 (after hours).

1. IDENTIFICATION OF THE SUBSTANCE

Product Name BENOMYL 500WP
Common Name Benomyl
Chemical Name Of The Substance Methyl 1-(butylcarbamoyl) benzimidazol-2- carbamate (IUPAC)
CAS N°. 17804-35-2
Chemical family Benzimidazole
Chemical formula C₁₄H₁₈N₄O₃ (Mol. wt.: 290.3)
Use Systemic fungicide with protective and curative action.
UN No. Not regulated

2. COMPOSITION / INFORMATION ON INGREDIENTS

Hazardous components: Benomyl 500g/kg.
EEC classification: 241-775-7
RTECS Number: DD6475000
R Phases: Xn, R40 , Muta. Cat.3
EHC: 148 (WHO, 1993)

3. HAZARD IDENTIFICATION

Toxicity class:
WHO (a.i.) III (Table 5) EPA (formulation) IV
ADI 0.1mg/kg b.w.
NOEL >2500mg/kg (rats) - 2 year
Main Hazard: Benomyl is a bendamidazole compound which is very toxic fish and earthworms.

Fire and explosion hazard: Product is not flammable. This material may form explosive mixtures in air.
Chemical Hazard: None known.
Biological Hazard: Reactions are not likely to occur unless the absorbed dose is extraordinary.
Eye contact: The product may cause mild to moderate eye irritation.
Skin contact: Minimally toxic and may have sensitizing properties
Ingestion: Minimally toxic.
Inhalation: May be irritating to the respiratory system.
Carcinogenicity: See section 11
Mutagenicity: See section 11
Neurotoxicity: See section 11
Reproductive /Teratogenicity: See section 11

3. FIRST AID MEASURES AND PRECAUTIONS

Symptoms of exposure to the product include: itching, scratchy throat, sneezing and coughing. Accidental swallowing has caused nausea, vomiting, diarrhoea, headache, ataxia, confusion and fatigue in man.

Inhalation:
Remove source of contamination or move victim to fresh air. Monitor for respiratory distress. Seek medical attention if necessary.
Skin contact:
Remove contaminated clothing, shoes and leather goods. Gently wipe off excess chemical. Wash skin gently and thoroughly with water and non-abrasive soap. Seek medical advice if necessary. Persons who become sensitized may require specialized medical management with anti-inflammatory agents or cortisone-containing emulsions.
Eye contact:
Immediately flush the eyes with gently flowing lukewarm water or saline solution for 20 minutes. Obtain medical attention if necessary.
Ingestion:
In case of ingestion of significant quantities of the fungicide, medical advice should be sought immediately.

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Advice to physician:

No specific antidotes are available against benzimidazole poisoning. If a large amount of benomyl has been ingested in the last few hours, and if copious vomiting has not already occurred, the stomach must be emptied and steps taken to limit gastrointestinal absorption. If the patient is fully alert and nervous system depression is not anticipated, oral administration of Syrup of Ipecac is probably the best way to empty the stomach.

Dosage of Syrup of Ipecac:

Adults and children over 12 years: 30ml followed by 2-3 glasses of water

Children under 12 years: 15ml followed by 1-2 glasses of water. Children less than one year should receive only 10-15ml and should be under direct medical supervision if at all possible.

When vomiting stops after induced emesis, give activated charcoal and cathartic orally by adding sorbitol to the charcoal slurry.

Dosage of Activated Charcoal:

Adults and children over 12 years: 50-100mg in 300-800ml water.

Children under 12 years: 15-30mg in 100-300ml water.

Dosage of Sorbitol:

Adults and children over 12 years: 1-2mg/kg body weight to a maximum of 150mg per dose.

Children under 12 years: 1.0-1.5mg/kg body weight to a maximum of 50mg per dose.

If sorbitol is given separately, it should be diluted with an equal volume of water before administration.

If there are any indications of central nervous system depression, or if the patient fails to vomit within 30 minutes of Syrup of Ipecac administration, measures should be taken to protect the respiratory tract from aspiration of gastric contents, then the stomach should be emptied by gastric intubation, aspiration and lavage with a slurry of activated charcoal. Install activated charcoal following lavage. Unless diarrhoea has already commenced, include a cathartic to hasten elimination.

CAUTION: Do not instill fluid so rapidly that overloading of the stomach leads to vomiting or regurgitation, followed by aspiration. Serious electrolyte disturbances may follow catharsis, especially in young children.

If contact with the toxicant has been minimal, administration of charcoal without the cathartic followed by careful observation of the patient, probably represent optimal management.

5. FIRE FIGHTING MEASURES**Extinguishing agents:**

Extinguish small fires with carbon dioxide, dry powder, or alcohol-resistant foam. Water spray can be used for cooling of unaffected stock, but avoid water coming in contact with the product. Contain water used for fire fighting for later disposal. Avoid the accumulation of polluted run-off from the site.

Fire fighting:

Remove spectators from surrounding area. Remove container from fire area if possible. Fight fire from maximum distance. For massive fire, use unmanned hose holder or monitor nozzles. Contain fire control agents for later disposal. Use a recommended extinguishing agent for the type of surrounding fire. Water can be used to cool unaffected containers but must be contained for later disposal. Avoid inhaling hazardous vapours. Keep upwind.

Special Hazards:

Fire may produce poisonous gases of combustion, namely n-butylisocyanate. **Dust forms explosive mixture with air.**
Lower explosive limit: 0.08g/l

Personal protective equipment:

Fire fighters and others that may be exposed should wear full protective clothing and self-contained breathing apparatus.

6. ACCIDENTAL RELEASE MEASURES (SPILLAGE)**Personal precautions:**

Do not inhale fumes. Ventilate area of spill or leak, especially confined areas. Avoid contact with skin, eyes or clothes. For personal protection see Section 8.

Environmental precautions:

Do not allow entering drains or watercourses. When the product contaminates public waters, inform appropriate authorities immediately in accordance with local regulations.

Occupational spill:

For **small dry spills**, sweep up with damp earth or sand or other suitable absorbents, such as sawdust, taking care not to



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raise a dust cloud. Place the material into a clean, dry container and cover for subsequent disposal. All contaminated cleaning materials should be placed in closeable receptacles. 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 and upwind.

Large spills: Do NOT wash away into sewer. Sweep spilled substance into sealable containers; if appropriate, moisten first to prevent dusting. Carefully collect remainder, then remove to safe place (extra personal protection: P2 filter respirator for harmful particles).

7. HANDLING AND STORAGE REQUIREMENTS

Handling:

Remove sources of naked flame or sparks. Avoid contact with eyes and skin and inhalation of fumes. Use with adequate ventilation. Wash hands before eating, drinking, chewing gum, smoking or using the toilet. Operators should change and wash clothing daily. Remove clothing immediately if the insecticide gets inside. Then wash skin thoroughly using 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. Water used to clean equipment must be disposed of correctly to avoid contamination

Storage:

Store in its original container in isolated, dry, cool and well-ventilated area. Avoid cross contamination with other pesticides and fertilizers. Product is incompatible with alkaline media. Keep under lock and key out of reach of unauthorized persons, children and animals. Store away from incompatible substances. Not to be stored next to foodstuffs and water supplies. Local regulations should be complied with.

8. EXPOSURE CONTROL / PERSONAL PROTECTION

Occupational exposure limits:

OSHA PEL: 15mg/m³ Total dust, 8h
ACGIH TLV 10mg/m³, 8h

Engineering control measures:

It is essential to provide adequate ventilation. Ensure that control systems are properly designed and maintained. Only spark-resistant equipment should be used. 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 equipment including approved respiratory protection.

Respirator:

An approved full-face respirator suitable for protection from mists of pesticides is required. 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 skin contact with the substance.

Gloves:

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

Eye protection:

Employee must wear splash-proof safety goggles and face-shield to prevent contact with this substance.

Emergency eyewash: 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.

8. PHYSICAL AND CHEMICAL PROPERTIES

Appearance : Solid off-white powder.

Odour : None.

Flammability : Not flammable.

Explosive properties: Like most organic powders or crystals, under severe dusting conditions, this material may form explosive mixtures in air.

Flash point : Not flammable.

Autoignition Temperature: 220°C

Persistent foaming: 80ml max.

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

Solubility in water: This is a wettable powder formulation.

10. STABILITY AND REACTIVITY

Stability:

Stable in neutral media, but decomposes in strong acidic and strong basic media. Decomposes slowly in the presence of moisture. In some solvents, dissociates to form carbendazim and butyl isocyanate. Stable to light.

Incompatibility:

The product is compatible with most other pesticides (except strong alkaline materials) when used at normal rates. However, a compatibility test is required before using with other products. Do not physically mix concentrate directly with other herbicides or pesticide concentrates; always dilute first.

Thermal decomposition:

Toxic n-buthylisocyanate is released when the product decomposes on heating.

11. TOXICOLOGICAL INFORMATION

Acute oral LD₅₀: (*Information on the Active ingredient*)

>5 000 mg/kg in rats.

Acute dermal LD₅₀: (*Information on the Active ingredient*)

>5000mg/kg in rats.

Acute inhalation LC₅₀: (*Information on the Active ingredient*)

LC₅₀ for rats >2mg/l air

Acute skin irritation: (*Information on the Active ingredient*)

Negligible irritant to skin (rabbit).

Acute eye irritation:

Mildly irritating to eyes (rabbit).

Dermal sensitisation:

The product provokes moderate dermal sensitisation (Guinea pigs). May cause temporary allergic reaction.

Carcinogenicity:

Animal studies did not detect any carcinogenic activity. Not listed as carcinogen by NTP, IARC, or OSHA

Teratogenicity: Animal studies did not detect any teratogenic activity.

Mutagenicity: Animal studies did not detect any mutagenic activity.

12. ECOLOGICAL INFORMATION

Degradability:

Benomyl is rapidly converted to carbendazim in the environment. DT₅₀ 2 and 19h in water and in soil, respectively

Mobility:

No information currently available

Accumulation:

The product is metabolised rapidly in rats and excreted in urine and faeces within a few days. Benomyl is not expected to bio-accumulate. K_{oc} = 1900

German wkg: Not available

ECOTOXICOLOGY:

(*Information on the Active ingredient*)

Birds: Non toxic to birds.

LD₅₀ (Acute oral): >10 000mg/kg (mallard ducks and bobwhite quail).

Fish: Benomyl is highly to very highly toxic to fish.

LC₅₀ (96h): 0.27mg/λ (rainbow trout), 4.2mg/λ (goldfish).

LC₅₀ (48h): 3.4mg/λ (guppy)

Bees: Non toxic to bees. LD₅₀ (contact) >50μg/g bee.

Daphnia: May not be toxic to *Daphnia magna*. LC₅₀ (48h): 640μg/λ.

Earthworms: Toxic to all species of earthworms. Earthworm population may take more than two years to recover following field application.

13. DISPOSAL CONSIDERATION

Pesticide disposal:

Contaminated absorbents, used containers, surplus product, etc., should be burnt at >1000°C in an incinerator, preferably designed for pesticide disposal, or buried in an approved landfill. Comply with local legislation applying to waste disposal.

Package product wastes:

Emptied containers retain vapour and product residues. Observe all labelled safeguards until container is destroyed. Combustible containers should be disposed of in pesticide incinerators. Metal containers must be crushed and transported

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to a scrap metal facility for disposal or burial in a designated landfill.

14. TRANSPORT INFORMATION

UN NUMBER: 3077
ADR/RID:
Substance: Environmentally hazardous substance, solid, n.o.s (Benomyl 50%)
Substance ID no.: 3077
Hazard ID no.: 90
Label: 9
Item no.: 12⁰ (c)
IMDG/IMO:
Packaging group: III
Label of class: 9 **MARINE POLLUTANT**
Shipping name: Environmentally hazardous substance, solid, n.o.s (Benomyl 50%)
ICAO/IATA:
Proper Shipping name: Environmentally hazardous substance, solid, n.o.s (Benomyl 50%)
Class: 9
Hazard Label: Miscellaneous.
Packaging group: III
Passenger Aircraft: Y911 (max 30kg)
911 (No Limit)
Cargo Aircraft: 911 (No Limit)
Tremcard no. 90G02

15. REGULATORY INFORMATION

Symbol: Xn
Indication of danger: Harmful, Toxic, Carc 3, Mut.
Risk phrases:
R 40 Possible risk of irreversible effect
Safety phrases:
S 1/2 Keep locked up and out of reach children.
S36/37 Wear suitable protective clothing and gloves.
National Legislation: In accordance with 91/155/EEC Directive and with French standard T 01-102 and the South

African Occupational Health and Safety Act, 1993 (Act. No. 85 of 1993).

16. OTHER INFORMATION

All information and instructions provided in this Material Safety Data Sheet (MSDS) are based on the current state of scientific and technical knowledge at the date indicated on the present MSDS and are presented in good faith and believed to be correct. This information applies to the PRODUCT AS SUCH. In case of new formulations or mixes, it is necessary to ascertain that a new danger will not appear.

It is the responsibility of persons in receipt of this MSDS to ensure that the information contained herein is properly read and understood by all people who may use, handle, dispose or in any way come in contact with the product. If the recipient subsequently produces formulations(s) containing this product, it is the recipient's sole responsibility to ensure the transfer of all relevant information from this MSDS to their own MSDS.

REFERENCES

- *The Pesticide Manual*; 13th Edition; Editor Clive Tomlin; Crop Protection Publications, 2003.
- *Pestline*; Material Safety Data Sheets for Pesticides and Related Chemicals; Volume II; Occupational Health Services Inc., 1991.
- *IPCS*; Health and Safety Guide No. 22; World Health Organisation, Geneva, 1990.
- *ADR-Vol. II (Annex B)*, 1 January 1997.
- *Dangerous Goods Regulations*; IATA; International Air Transport Association, 41st Edition, Effective 1 January 2000.
- *Guidelines for personal protection when using pesticides in hot climates*. GIFAP, G8/7 5M/989/ENG/QUA.