

UNIVERSAL FUNGARREST

MATERIAL SAFETY DATA SHEET

1. IDENTIFICATION OF THE SUBSTANCE

Product name: FUNGARREST
 Fungicide
UN No.: 3077
Company: Universal Crop Protection (Pty) Ltd.
Co. Reg. No.: 1983/008184/07
 PO Box 801,
 Kempton Park, 1620, South Africa
Telephone: (011) 396 2233
Fax: (011) 396 4666
Website: www.villacrop.co.za

Emergency telephone numbers:
24 Hr Transport / Spill emergency no:
 Envirosure. +27 31 205 4918
 (Hazcall24) +27 86 044 4411
 (Client: Villa Crop Protection)
 Griffon Poison Information Centre +27 82 446 8946
 (Client: Villa Crop Protection)
Poisoning Emergency telephone numbers:
 Griffon Poison Information Centre +27 82 446 8946
 Poisons Information Centre +27 861 555 777
Villa Crop Protection Emergency number:
National Safety, Health and Environmental Manager:
 +27 63 698 0668

2. COMPOSITION / INFORMATION ON INGREDIENTS

Common name: 1) Cymoxanil + 2) Mancozeb
Chemical Name: 1) 1-(2-cyano-2-methoxyiminoacetyl)-3-ethylurea (IUPAC);
 2) manganese ethylenebis (dithiocarbamate) (polymeric) complex with zinc salt (IUPAC)
CAS No.: 1) 57966-95-7;
 2) 8018-01-7
Chemical Family: 1) cyanoacetamide oxime;
 2) alkylenebis (dithiocarbamate)
Chemical Formula: 1) C₇H₁₀N₄O₃;
 2) Non defined
Molecular weight: 1) 198.2;
 2) Non defined
Use: Fungicide with a systemic compound for protective and curative action.
Formulation: cymoxanil: 60 g/kg plus
 mancozeb: 700 g/kg
 Wettable Powder
Hazardous ingredients of toxicological concern:

<u>Inert:</u>	<u>concern:</u>	<u>% present:</u>
cymoxanil,	harmful	6 %
mancozeb,	harmful	70 %
other inerts	damage to eyes	2 %

Symbol: Xn
Indication of danger: Harmful substance.
Risk-phrase(s): R36, R43

3. HAZARD IDENTIFICATION

Toxicity class:
 WHO (cymoxanil a.i & mancozeb a.i.): III
 A low toxicity fungicide.
Likely routes of exposure:
 Skin and eye contact. Slightly hazardous by ingestion.
Environmental Hazard:
 Product is very toxic to fish and aquatic organisms.
Eye contact:
 Mild irritant. Product may pose a slight risk of serious damage to eyes, due to inert.
Skin contact:
 Minimally toxic and prolonged skin contact can cause possible skin irritation. Mild irritant.
Ingestion:
 Minimally toxic.
Inhalation:
 Inhalation of the dust may be irritating to the nose, throat and lungs.
Delayed effects:
 At high levels mancozeb has caused hindleg paralysis in test animals and an increased incidence of retinal degeneration. It has caused thyroid tumors and birth defects in test animals, resulting from ethylenethiourea (ETU) formation. ETU, a trace contaminant and breakdown product of mancozeb, primarily affects the thyroid and liver. It has also caused other endocrine and blood effects, tumors and birth defects in test animals.

4. FIRST AID MEASURES AND PRECAUTIONS

Inhalation:
 Move the victim to fresh air or remove source of contamination. Monitor for respiratory distress. Keep person warm and at rest. Treat symptomatically and supportively as and when required. Administration of oxygen should be performed by qualified personnel. Get medical attention immediately if necessary.
Skin contact:
 Move the victim to fresh air and remove all contaminated clothing, shoes and leather goods. Gently wipe off excess chemical. Wash affected skin areas gently and thoroughly with water and non-abrasive soap. Do not rub the skin. If irritation persists, seek medical advice. Persons who become sensitized may require specialized medical management with anti-inflammatory agents or cortisone-containing emulsions.
Eye contact:

UNIVERSAL FUNGARREST

MATERIAL SAFETY DATA SHEET

Immediately flush the contaminated eyes with gently flowing clean water for 15 to 20 minutes, occasionally lifting the upper and lower lids. If irritation persists, seek medical advice.

Ingestion:

Seek medical advice immediately. Do not induce vomiting without medical advice. Give 2 glasses of water to drink. Never give anything by mouth to an unconscious person. Administration of gastric lavage or oxygen should be performed by qualified medical personnel.

Advice to physician:

No specific antidotes are available. Treat supportively and symptomatically.

If a large amount 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.

5. FIRE FIGHTING MEASURES

Fire and explosion hazard:

Slight fire hazard when exposed to heat or flame. Dust-air mixtures may ignite or explode.

Special Hazards:

Combustion products are toxic and/or irritant.

Hazardous Combustion Products:

Combustion/fire generates products of hydrogen sulfide, carbon dioxide, carbon monoxide, nitrogen oxides, sulfur dioxide and carbon disulfide.

Extinguishing agents:

Extinguish small fires with carbon dioxide, dry powder, or alcohol-resistant foam. Water spray can be used for cooling of unaffected stock. Do not use direct jet of water. 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. 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. 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.

Dyke 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 fire fighting for later disposal. Avoid the accumulation of polluted run-off from the site.

Personal protective equipment:

Fire-fighters and others that may be exposed should wear full chemical protective clothing and self-contained breathing apparatus. See section 8 for recommendations regarding Exposure Controls/Personal Protection. Fire may produce irritating or poisonous vapours (toxic oxides of carbon, nitrogen and sulphur) of combustion.

Procedures:

Transfer spilled material to suitable containers for recovery or disposal. Keep dust to a minimum. Keep spills and cleaning runoff out of municipal sewers and open bodies of water.

6. ACCIDENTAL RELEASE MEASURES

Personal precautions:

Do not breathe in dust or fumes. Avoid contact with skin and eyes. For personal protection see Section 8 and see section 4 regarding First Aid Measures when exposed to material during clean-up operations.

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 dry spills, shovel up and sweep up with damp earth or sand or other suitable absorbents, taking care not to raise a dust cloud. Place the material into a labelled, clean, dry container and cover for subsequent disposal; and store in a safe place to await proper disposal. All contaminated cleaning materials should be placed in closable receptacles.

In situations where product comes in contact with water, contain contaminated water for later disposal. Do not flush spilled material into drains. Do not contaminate water while cleaning equipment or disposing of wastes. Keep spectators away and upwind.

7. HANDLING AND STORAGE REQUIREMENTS

Handling:

Wear appropriate protective equipment when handling the product. Do not handle material near food, feed or drinking water. Avoid contact with eyes, prolonged contact with skin, and inhalation of dust and vapour. Avoid high concentrations of dust in air and accumulation of dust on equipment. An airborne dust of this material can create a dust explosion. Use with adequate ventilation to control dust and reduce exposure to vapours. Protect all equipment from explosions.

UNIVERSAL FUNGARREST

MATERIAL SAFETY DATA SHEET

Wash hands before eating, drinking, chewing gum, smoking, or using the toilet. Remove clothing immediately if the product 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. Local regulations should be complied with.

Storage:

Store the product in its original labelled container in cool, dry, well-ventilated area, away from heat, sparks and other sources of ignition. No smoking is allowed. Protect the product from temperatures below 0°C and above 49°C. Product is combustible, do not ignite. Do not allow the product to become wet or overheated in storage, decomposition, impaired activity or fire may result. Check for hot containers and immediately remove to open areas for disposal. Do not store next to food, feed and water supplies. Keep out of reach of unauthorized persons, children and animals. Avoid breaking the containers, spillage or leaks. Comply with the local regulations.

8. EXPOSURE CONTROL / PERSONAL PROTECTION

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.

Acceptable exposure limit for mancozeb:

AEL (8 hour TWA, total dust): 2 mg/m³;

AEL (12 hour TWA, total dust): 1,5mg/m³;

PERSONAL PROTECTIVE EQUIPMENT:

Respirator:

Wear an approved full-face respirator suitable for protection from dusts and mists of pesticides is required. Limitations of respirator use specified by the approving agency and the manufacturer must be observed.

Clothing:

Wear appropriate chemical-resistant protective clothing or other impervious clothing. Wear boots, hat and equipment to prevent repeated or prolonged skin contact with this substance. Do not wear leather clothing. Wash clothing after use.

Gloves:

Wear appropriate chemical-resistant protective gloves whenever the product is handled to prevent contact with this substance. Wash gloves after use.

Eye protection:

Use safety goggles and face-shield which is compatible with respiratory equipment.

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

9. PHYSICAL AND CHEMICAL PROPERTIES

Appearance:

Light grey homogeneous fine wettable powder.

Odour:

Chemical odour.

Explosive properties:

Dust-air mixtures may explode when in contact with moist.

Flash point:

Not highly flammable

Combustible.

Combustible.

pH:

8.4 (1% aqueous solution)

Solubility in water:

Wettable powder – miscible in water.

10. STABILITY AND REACTIVITY

Stability:

Considered stable in unopened original packages, under normal, dry storage conditions. Reacts with acids and oxidizing agents.

Storage stability:

Stable for 2 years under normal, dry storage conditions in unopened packages.

Incompatibility:

Avoid contact with oxidizing agents and acids. Keep away from moisture, heat or flame. Compatible with most commonly used fungicides and insecticides, used at recommended rates. Always perform a compatibility test before using with other products. Do not physically mix concentrate directly with other pesticide concentrates, always dilute first.

Thermal decomposition:

May yield toxic oxides of carbon, nitrogen and sulphur. Avoid temperatures above 49 °C.

Hazardous decomposition products:

Products of hydrogen sulphide, carbon dioxide, carbon monoxide, nitrogen oxides, sulphur dioxide and carbon disulfide form on heating. During processing, dust may form explosive mixture in air. Decomposition by contact with water may generate vapours which can be ignited by heat or open flame.

UNIVERSAL FUNGARREST

MATERIAL SAFETY DATA SHEET

11. TOXICOLOGICAL INFORMATION

Acute oral LD₅₀:

Cymoxanil: 960 g/kg in rats.
Mancozeb: > 5000 mg/kg in rats
 Formulation, calculated: > 4000 mg/kg

Acute dermal LD₅₀:

Cymoxanil: > 2000 g/kg in rabbits.
Mancozeb: > 4000 mg/kg in rats.
 Formulation, calculated: > 4000 mg/kg

Acute inhalation LC₅₀ (4 hours):

Cymoxanil: >5.06 mg/ℓ in rats.
Mancozeb: 5.14 mg/ℓ in rats.

Skin irritation:

The product may cause slight irritation to the skin.

Eye irritation:

Mild irritant. The product may pose a serious risk of damage to the eyes, due to inert.

Dermal sensitization:

Mancozeb causes skin sensitization in guinea pigs. Cymoxanil is not sensitizing. Consequently, the product may have a weak potential for skin sensitization in humans.

Carcinogenicity:

Cymoxanil: There was no evidence of carcinogenic potential at levels tested.

Mancozeb: In long-term studies with mice no evidence of carcinogenicity was observed. A two-year feeding study of mancozeb indicated thyroid tumors in rats at a dietary concentration level of 750 ppm.

ETU: Two-year feeding studies of ETU produced increased incidence of thyroid and pituitary tumors in rats at dietary concentrations of 83 ppm and higher and also thyroid, pituitary and liver tumors in mice at 330 ppm and higher. Information on the mechanism of these tumors establishes a threshold for the thyroid and pituitary tumors, and indicates that none of these tumor types is relevant for human risk assessment at likely exposure levels.

Mutagenicity:

Cymoxanil: Gene mutation assays were negative. Chromosome aberrations assay in humans were positive. However, the negative results from the bone marrow assay support the lack of carcinogenic effect in long term feeding studies.

Mancozeb: Animal *in vitro* and *in vivo* studies with mancozeb and ETU suggest that mancozeb and ETU are not mutagenic in mammalian systems.

Teratogenicity:

Mancozeb: In two-generation reproduction studies of mancozeb and ETU not any teratogenic effects were detected.

In developmental studies, exposure to maternally toxic levels of mancozeb produced developmental effects including malformations in rats. There was no evidence of developmental toxicity in rats below adult toxic levels or in

rabbits at any dose. The NOAEL of developmental toxicity was 128 mg/kg bw/day in rats and > 80 mg/kg bw/day (highest dose tested) in rabbits.

The NOAEL for maternal toxicity was 30 to 32 mg/kg bw/day in both species.

ETU: In developmental toxicity studies with ETU, malformations were produced at thyroid-inhibiting levels in studies with rats and hamsters. Embryofetotoxicity, but no malformations were produced in mice and rabbits, and there was no evidence of developmental toxicity in guinea pigs or cats. The overall NOEL is 5 to 15 mg/kg bw/day in rats.

Acceptable Daily Intake (ADI):

Cymoxanil: 0,012 mg/kg bw/day.

Mancozeb: 0.05 mg/kg bw/day.

Ethylenebisdithiocarbamates as a group: 0.03 mg/kg bw/day.

ETU: 0.002 mg/kg bw/day.

12. ECOLOGICAL INFORMATION

Degradability:

Cymoxanil: Cymoxanil is rapidly degraded in the environment by hydrolyzes and photolysis. Half-live in bare soil is 0.9 to 9 days. Though cymoxanil has low K_d values and would be expected to leach to ground and surface water, the chemical degrades rapidly and not likely to pose a threat to ground and surface waters.

Mancozeb: Mancozeb is rapidly degraded in the environment by hydrolysis, oxidation, photolysis, and metabolism. Is strongly adsorbed to soil, and half life in soil is 3 to 11 days (clay and loam soil).

Mobility:

Cymoxanil: The product appeared to be mobile, however it is not likely to pose a threat.

Mancozeb: The product has low mobility and is not likely to leach.

Accumulation:

Cymoxanil: The low K_{ow} for cymoxanil (3.9 to 4.7) indicates a very low potential to bio-accumulate in fish.

Mancozeb: The product shows little tendency to bioaccumulate. Bioaccumulation: $\log P_{ow} = 0.66$ (pH 7).

ECOTOXICOLOGY:

Birds: Cymoxanil & Mancozeb are not toxic.

Cymoxanil:

LD ₅₀ : 8 day dietary:	Bobwhite quail:	> 5620 mg/kg
	Mallard duck:	> 5620 mg/kg

Mancozeb:

LD ₅₀ : 10 day dietary:	Japanese quail:	3200 mg/kg
	Mallard duck:	6400 mg/kg

Fish:

Cymoxanil: **Slightly toxic.**

UNIVERSAL FUNGARREST

MATERIAL SAFETY DATA SHEET

LC ₅₀ (96hrs):	Rainbow trout:	61 mg/ℓ
	Common carp:	91 mg/ℓ
Mancozeb: Highly toxic to fish and aquatic organisms.		
LC ₅₀ (48hrs)	Rainbow trout:	2.2 mg/ℓ
	Catfish:	5.2 mg/ℓ
	Carp:	4.0 mg/ℓ
Honeybees: Cymoxanil & Mancozeb not toxic.		
Cymoxanil:	LD ₅₀ (oral)	269.3 µg/bee
Mancozeb:	LC ₅₀ :	0.193 mg/bee.

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.

Package product wastes:

Emptied containers retain vapour and product residues. Observe all labelled safeguards until container is destroyed. Empty the container of excess product into the container of the applicator. Destroy the emptied containers by perforation and flattening. Bury in an approved, designated landfill. Do not re-use the empty container for any other purpose. Do not burn the empty container.

Comply with any local legislation applying to disposal.

14. TRANSPORT INFORMATION

UN NUMBER:	3077
ADR/IRD:	
Class:	9
Hazard ID no.:	90
Label:	9
ITEM:	12(c)
TREM-CARD:	90G02-B
Shipping Name:	Thiocarbamate Pesticide, solid, Toxic. (contains mancozeb) 9, 12(c), ADR
IMDG/IMO:	
Packaging group:	III
Label of class:	9
Shipping name:	Thiocarbamate Pesticide, solid, Toxic. (contains mancozeb) 9, 12(c), ADR
Shipping Name:	Thiocarbamate Pesticide, solid, Toxic. (contains mancozeb) 9, 12(c), ADR

15. REGULATORY INFORMATION

Symbol:	Xn
Indication of danger:	Harmful
Risk phrases:	
R 36	May cause eye irritation
R 43	May cause sensitization by skin contact.

Safety phrases:

S 2	Keep out of the reach of children
S 8	Keep container dry.
S 13	Keep away from food, drink and animal feeding stuffs.
S 22	Do not breathe dust.
S 24/25	Avoid contact with skin and eyes.
S 36/37	Wear suitable protective clothing and gloves.
S 46	If swallowed, seek medical advice immediately and show this container and label.

16. OTHER INFORMATION:

Packing and Labeling

Packed in 1, 2, 5 & 10 kg plastic containers and in 5, 10, 20, 25 & 50 kg 3-ply paper bags or polyprop woven bags. Labelled according to South African regulations and guidelines.

Declaration:

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 believed to be correct. This information applies to the PRODUCT AS SUCH. In case of 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 formulation(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.

END OF DOCUMENT

Compiled:	August 1998
Revised:	March 2019
Revision no:	(3)
Next revision:	March 2024

For detailed information on revisions, contact the Registration holder.