VILLA CARBOTERR 100 GR MATERIAL SAFETY DATA SHEET

1. IDENTIFICATION OF THE SUBSTANCE

Product Name: **CARBOTERR 100 GR**
Insecticide
Common Name: **CARBOFURAN**
Chemical Name: 2,3-dihy-2,2-dimethylbenzofuran-7-yl methylcarbamate (**IUPAC**)
CAS Nº.: 1563-66-2
Chemical family: Carbamate
Chemical formula: $C_{12}H_{15}NO_3$ (Mol. wt.: 221.26)
Use: Systemic insecticide, nematicide and acaricide with predominantly contact and stomach action.
Formulation: **CARBOFURAN** 100 g/kg Granules
UN No.: 2757
NIOSH/RTECS no. FB 9450000

Supplier: **Villa Crop Protection (Pty) Ltd.**
PO Box 10413,
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

Hazardous component: **CARBOFURAN**
Symbols T+
Risk-Phrases R26/28, R50
EEC No. 216-353-0

3. HAZARD IDENTIFICATION

Toxicity class: WHO Ib
Main hazard: **CARBOFURAN** is a carbamate compound which inhibits cholinesterase. It is of very high toxicity. Contact with skin, inhalation of dust or granules, or swallowing may be fatal.
Toxic to fish.
Toxic to bees (the active but not in a granular form).
Flammability: Not flammable.
Biological hazards: May be absorbed from the gastrointestinal tract, through the intact skin, and through inhalation of dust.

4. FIRST AID MEASURES AND PRECAUTIONS

Proper care should be taken during occupational use to avoid any inhalation of dust and granule particles, and to prevent accidental contamination of food products and water.
Inhalation: Carbamate: Cholinesterase inhibitor.
Acute exposure: When inhaled, the first effects of cholinesterase inhibition are usually respiratory and may include nasal hyperaemia and watery discharge, chest discomfort, dyspnea and wheezing due to increased bronchial secretions and bronchoconstriction. Other systemic effects may begin within a few minutes or several hours of exposure. Symptoms may include nausea, vomiting, diarrhoea, abdominal cramps, headache, vertigo, ocular pain, ciliary muscle spasm, blurring or dimness of vision, miosis, or in some cases mydriasis, lacrimation, salivation, sweating, and confusion. Other reported central nervous system or neuromuscular effects include ataxia, slurred speech, weakness, fatigue, twitching, fasciculation, tremor, and eventually paralysis of the extremities and possibly of the respiratory muscles. In severe cases, there may also be involuntary defecation and urination, bradycardia, hypotension, pulmonary oedema, convulsions, coma, and death from respiratory failure or cardiac arrest. **CARBOFURAN** does not accumulate in mammalian tissue and the cholinesterase inhibition reverses rather rapidly. In non-fatal cases, the illness generally lasts less than 24 hours.
Chronic exposure: Prolonged or repeated exposure may cause effects as described in acute exposure.
First aid: Remove from exposure area to fresh air immediately. If breathing has stopped, give mechanical artificial respiration (not direct mouth-to-mouth). Maintain airway and blood pressure and administer oxygen if available. Keep affected person warm and at rest. Treat symptomatically and supportively. Administration of oxygen should be performed by qualified personnel. Get medical attention immediately.
Skin contact: Carbamate: Cholinesterase inhibitor.
Acute exposure: Some compounds may cause irritation. Localised sweating and fasciculation may occur at the site of contact. If sufficient amounts are absorbed through the skin, other effects of cholinesterase inhibition may occur as described in acute inhalation. Symptoms may be delayed for 2 to 3 hours, usually no more than 8 hours.
Chronic exposure: Repeated or prolonged exposure may cause effects as described in acute exposure.

First aid: Remove contaminated clothing immediately. Wash contaminated areas with soap and water followed by alcohol. Emergency personnel should wear gloves and avoid contamination. Treat respiratory difficulty with mechanical artificial respiration. Get medical attention immediately.

Eye contact: Carbamate: Cholinesterase inhibitor.

Acute exposure: Direct contact may cause pain, hyperaemia, lacrimation, twitching of the eyelids, miosis, and ciliary muscle spasm with loss of accommodation, blurred or dimmed vision and browache. Sometimes mydriasis may occur instead of miosis. With sufficient exposure, other symptoms of cholinesterase inhibition may occur as described in acute inhalation.

Chronic exposure:

Prolonged exposure may cause effects as described in acute exposure. Some compounds have caused toxic effects on the crystalline lens, conjunctival thickening and obstruction of nasolacrimal canals when used as miotic eye drops.

First aid: Irrigate eyes with water or saline solution. If symptoms of poisoning occur, treat respiratory difficulty with mechanical artificial respiration and oxygen. Observe patient for at least 24 to 36 hours. Get medical attention immediately. Oxygen should be administered by qualified medical personnel.

Ingestion: Carbamate: Cholinesterase inhibitor.

Acute exposure: When ingested, the first effects may be nausea, vomiting, anorexia, abdominal cramps, and diarrhoea. With absorption from the gastrointestinal tract, the other effects of cholinesterase inhibition as described in acute inhalation may occur. Symptoms may begin within minutes or be delayed several hours.

Chronic exposure: Repeated ingestion may cause effects as described in acute exposure.

First aid: If person is alert and respiration is not depressed, give syrup of Ipecac followed by water (if vomiting occurs, keep head below hips to prevent aspiration). If consciousness level declines or vomiting has not occurred in 15 minutes empty stomach by gastric lavage with the aid of cuffed endotracheal tube using isotonic saline or 5 % sodium bicarbonate follow with activated charcoal. Establish and maintain airway. Treat respiratory difficulty with artificial respiration and oxygen.

Do not give morphine, aminophylline, phenothiazines, reserpine, furosemide, or ethacrynic acid. Drugs like 2 PAM are not effective in poisoning with CARBOFURAN AND SHOULD NOT BE USED.

Treat symptomatically and supportively. Administration of oxygen and gastric lavage must be performed by qualified medical personnel. Get medical attention immediately.

Advice to physician:

Antidote: The following antidote has been recommended. However, the decision as to whether the severity of poisoning requires administration of any antidote and actual dose required should be made by qualified medical personnel.

For cholinesterase inhibitors: Establish clear airway and tissue oxygenation by aspiration of secretions, and if necessary, by assisted pulmonary ventilation with oxygen. Improve tissue oxygenation as much as possible before administrating atropine to minimise the risk of ventricular fibrillation. Administer atropine sulphate intravenously or intramuscularly if iv injection is not possible. In moderately severe poisoning administer atropine sulphate, 0.4 to 2.0 mg repeated every 15 minutes, until atropinization is achieved (tachycardia, flushing, dry mouth, mydriasis). Maintain atropinization by repeated doses for 2 to 12 hours, or longer, depending on the severity of poisoning. The appearance of rales in the lung bases, miosis, salivation, nausea, bradycardia, are all indications of inadequate atropinization. Severely poisoned individuals may exhibit remarkable tolerance to atropine. Two or more times the dosages suggested above may be needed. Persons not poisoned or only slightly poisoned, however, may develop signs of atropine toxicity from such large dosages: fever, muscle fibrillations, and delirium are main signs of atropine toxicity. If these signs appear while the patient is fully atropinized, atropine administration should be discontinued, at least temporarily. Observe treated patients closely at least 24 hours to ensure that symptoms (possibly pulmonary oedema) do not recur as atropinization wears off. In very severe poisonings, metabolic disposition of toxicant may require several hours or days during which atropinization must be maintained. Markedly lower levels of urinary metabolites indicate that atropine dosage can be tapered off. As the dosage is reduced, check the lung bases frequently for rales. If rales are heard or other symptoms return, re-establish atropinization promptly.

5. FIRE FIGHTING MEASURES

Fire and explosion hazard: Not flammable. Toxic dust and irritating fumes may be produced during fires.

Extinguishing agents: Extinguish **small fires** with carbon dioxide, dry chemical, water spray or standard foam. For **larger fires**, use dry chemical, "alcohol" foam, Halon, or carbon dioxide to fight fire.

Personal protective equipment: Fire may produce irritating or poisonous vapours (toxic oxides of nitrogen), mists or other products of combustion. 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: Avoid contact with skin and eyes. Do not breathe in dust or fumes. For personal protection see Section 8.

Environmental precautions: Do not allow to enter drains or water courses. When the product contaminates public waters, inform appropriate authorities immediately in accordance with local regulations.

Occupational spill:

Small spills: Do not touch spilled material. Stop leak if you can do so without risk. Use water spray to reduce vapours (contain any water used). Neutralise with sodium hydroxide and allow standing for 4 hours. Sweep up with sand or other suitable absorbent material and place into containers for later disposal. Move containers from spill area.

Larger spills: Contain material far ahead of spill for later disposal. Keep spectators away. Isolate hazard area and deny entry. Ventilate closed spaces before entering.

7. HANDLING AND STORAGE REQUIREMENTS

Handling: Highly toxic if swallowed. Avoid contact with eyes, prolonged contact with skin, and inhalation of dust and vapour. Use with adequate ventilation. Wash hands before eating, drinking, chewing gum, smoking, or using the toilet. 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: The product must be kept under lock and key. Keep out of reach of unauthorised persons, children and animals. Store in its original labelled container in shaded, well-ventilated area, away from heat, sparks and other sources of ignition. Not to be stored next to foodstuffs and water supplies. Local regulations should be complied with.

8. EXPOSURE CONTROL/PERSONAL PROTECTION

Occupational exposure limits:

NIOSH: REL-air: 10H TWA 0.1 mg/m^3.

ACGIH 1993-1993: TLV: ppm; 0.1 mg/m^3

Engineering control measures:

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, then wear suitable personal protective equipment including approved respiratory protection.

Personal protective equipment:

Respirator: An approved respirator suitable for protection from dusts and mists of pesticides is adequate. Limitations of respirator use specified by the approved agency and the manufacturer must be observed.

Clothing: Employee must wear appropriate protective (impervious) clothing and equipment to prevent repeated or prolonged skin contact with the substance.

Gloves: Employee must wear appropriate synthetic protective gloves to prevent contact with this substance.

Eye protection: The use of full face protection is recommended.

***Emergency eye wash*:** 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.

9. PHYSICAL AND CHEMICAL PROPERTIES

Appearance: Free-flowing granules.

Odour: Odourless to very faint phenolic odour.

Bulk density: 135 to 140 g/100 mℓ at 20^o C.

Storage stability: Considered stable for a period of 2 years from date of manufacture when stored under normal warehouse conditions in normal air and light conditions.

Explosive properties: Non-explosive.

Solubility in organic solvents:

(All solubility figures in g/ℓ at 20^{o}C for active material)

dichloromethane:	> 200
isopropanol:	20 to 50
toluene:	10 to 20

Solubility in water: NIL *for formulated product*

10. STABILITY AND REACTIVITY

Stability: Stable in acidic and neutral media, but rapidly hydrolysed in alkaline media. The rate of decomposition increases at higher temperatures. **CARBOFURAN** is stable to light. Stable up to 130 ^{o}C.

Efficacy may be adversely affected when used in alkaline, brackish soils or in soils of pH above pH 7.

Incompatibility: The product is incompatible with alkaline products.

Thermal decomposition: Toxic oxides of nitrogen are released when the product decomposes on heating.

11. TOXICOLOGICAL INFORMATION

Acute oral LD_{50}: 82 mg/kg in rats.

Acute dermal LD_{50}: >2 000 mg/kg in rats.

Acute inhalation LC_{50}: Due to low volatility study was not conducted.

Acute skin irritation: Non-irritating to skin (rabbit).

Acute eye irritation: Non-irritant (rabbit)

Allergic sensitization: None significant

Carcinogenicity: No a carcinogen.

Teratogenicity: Not teratogenic.
Mutagenicity: Animal studies did not detect any mutagenic activity. No human information available.

12. ECOLOGICAL INFORMATION

ECOTOXICOLOGY:
Data as for technical material:
Birds: Extremely toxic to birds.
LD_{50} (Acute oral): 2.5 to 5 mg/kg (Japanese quail).
Fish: Moderately toxic to fish.
LC_{50} (96 h): 22 to 29 mg/ℓ (Rainbow trout).
Bees: Toxic to bees – except granular formulations.
Daphnia: May pose a hazard to *Daphnia magna*.
LC_{50} (48 h): 38.6 µg/ℓ
Degradability: In soil and water, the product degrades in 30 to 60 days. Degradation takes place primarily through microbial activity, with CO_2 as the principal end product. The degradation process is affected by temperature and soil pH (degradation is accelerated under alkaline conditions). A small degree of hydrolysis may take place in moist soils.
Mobility: **CARBOFURAN** is not resistant to leaching. K_{oc} = 22
Accumulation: The product is not expected to bio-accumulate. Log P_{ow} = 1.7.

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 designated landfill. Hydrolysis under alkaline conditions (e.g. sodium hydroxide) is a suitable method to dispose of small quantities of the product. After hydrolysis, dilute and dispose of via the sewage system. 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 to a scrap metal facility for disposal or burial in a designated landfill.

14. TRANSPORT INFORMATION

UN NUMBER:	2757
ADR/RID:	
Substance ID no.	2757
Hazard ID no.	66
Label:	6.1
IMDG/IMO:	
Packaging group:	III
Label of class:	6.1 **Marine pollutant**
Shipping name:	Carbamate pesticide, solid, toxic (**CARBOFURAN**)
AIR/IATA:	
Shipping name	Carbamate pesticide, solid, toxic (**CARBOFURAN**)
Class	6.1
Hazard Label	Toxic
Packaging Group	III
Passenger Aircraft	613 (max 25 kg) Y613 (max 1 kg)
Cargo Aircraft	615 (max 100 kg)

15. REGULATORY INFORMATION

Symbol: T +
Indication of danger: Very toxic.
Risk phrases:

R26/28	Very toxic by inhalation and if swallowed.
R50	Very toxic to aquatic organisms.

Safety phrases:

S 1/2	Keep locked up and out of reach children.
S 13	Keep away from food, drink and animal feeding stuffs.
S 20/21	When using do not eat, drink or smoke.
S 22	Do not breathe dust.
S 24/25	Avoid contact with skin and eyes.
S 28	After contact with skin, wash immediately with plenty water.
S 36/37/39	Wear suitable protective clothing, gloves and eye/face protection.
S45	In case of accident or if you feel unwell, seek medical advice immediately (show the label where possible).

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

Packing and Labelling: Packed in 10 kg, 15 kg, 20 kg and 25 kg aluminium foil lined and plastic bag containers within 3 ply paper box and labelled according to South African regulations and guidelines.
Disclaimer: 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 transfers of all relevant information from this MSDS to their own MSDS.

7. References

- Applicable to own physical and chemical, toxicity and ecotoxicity research studies.
- *The Pesticide Manual*; Tenth Edition; Editor Clive Tomlin; Crop Protection Publications, 1994.
- *Pestline*; Material Safety Data Sheets for Pesticides and Related Chemicals; Volume II; Occupational Health Services Inc., 1991.
- Florida Agricultural Information Retrieval System: University of Florida.

END OF DOCUMENT

Compiled: October 2001
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For detailed information on revisions, contact the Registration holder.