MATERIAL SAFETY DATA SHEET

SECTION 1  IDENTIFICATION OF THE MATERIAL AND SUPPLIER

Product Name:  Apparent Fenamiphos 400 Nematicide and Insecticide

Other Names:  An organophosphorus pesticide, Group 1B Insecticide.
Use:  A liquid broad spectrum agricultural Nematicide and Insecticide.
Company:  Apparent Pty Ltd
Address:  Suite G.08, 762 Toorak Rd, Glen Iris, Vic 3146.
            PO Box 3092, Cotham PO, Kew, Vic 3101
ACN/ABN:  143 724 136
Telephone Number:  03 9822 1321
Fax Number:  03 9817 7845
Emergency Contact:  0411 227 338
Email:  wwardell@bigpond.net.au

SECTION 2  HAZARDS IDENTIFICATION

Classified as hazardous according to criteria of Safe Work Australia.
Classified as a Dangerous Good according to the ADG Code

Risk Phrases:  R24 Toxic in contact with the skin.
              R26/28 Very toxic by inhalation and if swallowed.
              R65 Harmful: may cause lung damage if swallowed.
              R33 Danger of cumulative effects

Safety Phrases:  S1/2 Keep locked up and out of reach of children.
                 S13 Keep away from food, drink and other animal foodstuffs.
                 S23 Do not breathe vapour or spray.
                 S24/25 Avoid contact with skin and eyes.
                 S36/37/39 Wear suitable protective clothing, gloves and eye/face protection.

SECTION 3  COMPOSITION/INFORMATION ON INGREDIENTS

Ingredients:

<table>
<thead>
<tr>
<th>CHEMICAL</th>
<th>CAS NUMBER</th>
<th>PROPORTION</th>
</tr>
</thead>
<tbody>
<tr>
<td>Fenamiphos</td>
<td>22224-92-6</td>
<td>400 g/L</td>
</tr>
<tr>
<td>Hydrocarbon liquid</td>
<td>64742-94-5</td>
<td>10-30%</td>
</tr>
<tr>
<td>Other ingredients determined not to be hazardous</td>
<td>Balance</td>
<td></td>
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</tbody>
</table>

SECTION 4  FIRST AID MEASURES

FIRST AID
Ingestion:  If swallowed do NOT induce vomiting. Wash mouth with water. If poisoning occurs, contact a Doctor or Poisons Information Centre. Phone 131 126. If swallowed, activated charcoal may be advised. Give atropine if instructed. DO NOT induce vomiting.
Skin contact:  IMMEDIATELY remove contaminated clothing. Wash skin with soap and water to remove chemical. Seek medical advice immediately. Persons assisting must protect themselves from contamination. Atropine tablets may be administered if advised by a doctor or Poisons Information Centre.
SECTION 4  FIRST AID MEASURES (Continued)

Eye contact: Immediately hold eyes open and flood gently with clean water. Ensure irrigation under eyelids by occasionally lifting them. Do not try to remove contact lenses unless trained. Seek medical advice immediately.

Inhalation: Remove to fresh air and observe until recovered. Seek urgent medical advice. Artificial respiration may be required if breathing stops. Avoid being contaminated by the patent.

Advice to Doctor: Fenamiphos is an anti-cholinesterase compound. Atropine by injection, is the preferred antidote. If exposed, plasma and red blood cell cholinesterase tests may indicate significance of exposure (baseline data are useful). Treatment of exposure should be directed at the control of symptoms and the clinical condition of the patient. This product also contains aromatic solvents which may produce a chemical pneumonitis; therefore, vomiting is not recommended, and lavage requires intubation. Activated charcoal and cathartics will assist gastrointestinal tract evacuation.

Symptoms of poisoning due to cholinesterase inhibition:
Mild intoxication causes headache, blurred vision, weakness, sweating, mild chest pain, nausea and vomiting. Severe intoxication causes cyanosis (blueness of the skin, as from lack of oxygen), muscular twitching, spasms, miosis (pinpoint pupils) and respiratory paralysis. Onset of symptoms may be delayed. Cholinesterase inhibition sometimes persists for several weeks.

Symptoms of exposure to the solvent:
Headache, dizziness, anaesthesia and other central nervous system effects, skin dryness or cracking from repeated exposure.

Treatment - Basic aid: Decontamination, symptomatic treatment and if necessary administration of antidote.

Antidote: Atropine sulphate. In severe cases pralidoxime may be administered as well, if given within 24 hours after exposure. Atropine should not be given to a cyanosed patient. Monitor respiratory, cardiac and central nervous system function. Monitor red blood cell and plasma cholinesterase levels. Administer oxygen if necessary. Watch for pulmonary oedema and delayed neurological symptoms. As this product contains a hydrocarbon liquid, care should be taken to prevent pulmonary aspiration. Small amounts of liquid aspirated into the respiratory system during ingestion or from vomiting may cause bronchopneumonia or pulmonary oedema.

Contraindications:
Adrenergic derivatives. Never give patient morphine, theophylline or theophyllineethylenediamine. Large amounts of intravenous fluids are generally contraindicated because of the threat of pulmonary oedema.

SECTION 5  FIRE FIGHTING MEASURES

Extinguishing media: Combustible liquid (C1). Flash point > 62°C. Extinguish fire using carbon dioxide, foam or dry agent. If not available, use waterfog or fine water spray but ensure all runoff is contained. Contain all runoff.

Hazards from combustion products: Firefighters must wear full protective equipment and self-contained breathing apparatus if risk to of exposure to vapour or smoke. On heating will emit toxic fumes consisting hydrogen cyanide, carbon monoxide, phosphorus pentoxide, sulphur dioxide and nitrogen oxides may be formed.

Precautions for fire-fighters and special protective equipment: Isolate fire area. Evacuate downwind residents. Wear full protective clothing and self contained breathing apparatus. Do not breathe smoke or vapours generated.

SECTION 6  ACCIDENTIAL RELEASE MEASURES

Emergence procedures / Material and methods for containment and cleanup procedures: Extinguish all sources of ignition. Wear protective equipment to prevent skin/eye contamination. In the case of spillage, contain and absorb spilled material with absorbent material such as sand, clay, cat litter or material such as vermiculite and dispose of waste as indicated in section 13 or according to the Australian Standard 2507 - Storage and Handling of Pesticides. Wear full prescribed protective clothing and equipment. Keep out animals and unprotected persons.
SECTION 7  HANDLING AND STORAGE

Precautions for Safe Handling: Very dangerous, particularly the concentrate. Poisonous if absorbed by skin contact, inhaled or swallowed. Repeated minor exposure may have a cumulative poisoning effect. Avoid contact with eyes and skin. Do not inhale spray mist. Obtain an emergency supply of atropine tablets 0.6 mg. When opening the container, preparing the spray and using the prepared spray, wear cotton overalls buttoned to the neck and wrist and washable hat, elbow-length PVC gloves and full facepiece respirator with combined dust and gas cartridge or canister. If product on skin, immediately wash area with soap and water. After use and before eating, drinking or smoking wash hands, arms and face thoroughly with soap and water. After each day's use wash gloves, goggles, contaminated clothing and respirator. If respirator is rubber, wash with detergent and warm water..

Conditions for Safe Storage: No smoking, eating or drinking should be allowed where material is used or stored. Keep out of reach of children. Classified as a Dangerous Good. This product is a Schedule 7 Poison (S7) and must be stored, transported and sold in accordance with the relevant Health Department regulations. This product is classified as a C1 (Combustible Liquid) for the purpose of storage and handling, in accordance with the requirements of AS 1940. Refer to state regulations for storage and transport requirements.

Store in the closed, original container in a well ventilated area away from children, animals, food, feedstuffs, seed and fertilisers. Do not store for prolonged periods in direct sunlight.

SECTION 8  EXPOSURE CONTROLS / PERSONAL PROTECTION

Exposure Guidelines:
Exposure guidelines have been established for this product by Safe Work Australia.

<table>
<thead>
<tr>
<th>Atmospheric Contaminant</th>
<th>Exposure Standard (TWA)</th>
<th>STEL (mg/m³)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Fenamiphos</td>
<td>0.1 mg/m³</td>
<td>Not set</td>
</tr>
</tbody>
</table>

TWA = Time-Weight Average

Biological Limit Values:
This is an organophosphate pesticide and the Safe Work Australia ‘Guidelines for Health Surveillance’ should be consulted for the requirements for Health Surveillance for organophosphate pesticides. Health surveillance includes Occupational and medical history; Physical examination; Baseline estimation of red cell; and plasma cholinesterase activity levels by the Ellman or equivalent method, estimation of red cell and plasma cholinesterase activity towards the end of the working day.

Engineering controls:
Use in ventilated areas adequate to keep exposure below the TWA. Keep containers closed when not in use.

Personal Protective equipment (PPE):
When opening the container, preparing the spray and using the prepared spray, wear cotton overalls buttoned to the neck and wrist and washable hat, elbow-length PVC gloves and full facepiece respirator with combined dust and gas cartridge or canister. After use and before eating, drinking or smoking wash hands, arms and face thoroughly with soap and water. After each day's use wash gloves, goggles, contaminated clothing and respirator. If respirator is rubber, wash with detergent and warm water.

SECTION 9  PHYSICAL AND CHEMICAL PROPERTIES

Appearance: Brown coloured liquid.
Odour: Mercaptan odour (characteristic organophosphorus type odour).
Boiling point: No data.
Freezing point: No data.
Specific Gravity: 1.0 g/L.
Solubility in Water: Emulsifies in water.
pH: 4 – 8 (10% in water).
Flammability: Combustible liquid.
Flashpoint (°C): > 62°C.
Poisons Schedule: S7.
SECTION 10  
STABILITY AND REACTIVITY

Chemical Stability: Product is considered stable in ambient conditions for a period of at least 2 years after manufacture.

Conditions to avoid: Do not store for prolonged periods in direct sunlight. Store away from sources of ignition.

Incompatible materials: Strong oxidising agents and strong bases.

Hazardous decomposition products: When involved in a fire will emit toxic and noxious fumes.

Hazardous reactions: No particular reactions to avoid.

SECTION 11  
TOXICOLOGICAL INFORMATION

No specific data is available for this product as no toxicity tests have been conducted on this product. Information presented is our best judgement based on similar products and/or individual components. As with all products for which limited data is available, caution must be exercised through the use of protective equipment and handling procedures to minimise exposure.

Excessive exposure may produce organophosphate type cholinesterase inhibition. Signs and symptoms of excessive exposure to fenamiphos may be headache, dizziness, in-coordination, muscle twitching, tremors, nausea, abdominal cramps, diarrhea, sweating, pinpoint pupils, blurred vision, salivation, tearing, tightness in chest, excessive urination, convulsions. These symptoms commence from one to three hours after excessive exposure.

Potential Health Effects:

ACUTE EFFECTS

Swallowed: VERY TOXIC if swallowed. Acute oral LD$_{50}$ for similar products 10 - 26 mg/kg. Small amounts of liquid aspirated into the respiratory system during ingestion from vomiting may cause bronchopneumonia or pulmonary oedema.

Eye: This product may cause eye irritation.

Skin: TOXIC in contact with the skin. A single exposure may result in material being absorbed in large amounts. Repeated minor exposure may have a cumulative poisoning effect. Acute dermal LD$_{50}$ for similar products 160 - 210 mg/kg.

Inhaled: VERY TOXIC by inhalation. Probably an inhalation irritant. Acute inhalation LC$_{50}$ for similar products 0.132 – 0.198 mg/L/4 hours.

Long Term Exposure:

Chronic toxicity: Repeated or prolonged exposure to organophosphates may result in the same effects as acute exposure including the delayed symptoms. Other effects reported in workers repeatedly exposed include impaired memory and concentration, disorientation, severe depression, irritability, confusion, headache, speech difficulties, delayed reaction times, nightmares, sleepwalking, and drowsiness or insomnia.

Reproductive effects: Current evidence indicates that fenamiphos does not adversely affect reproduction.

Teratogenic effects: Available evidence suggests that fenamiphos is not teratogenic.

Mutagenic effects: There is no evidence that fenamiphos is mutagenic.

Carcinogenic effects: There is no evidence that fenamiphos is carcinogenic.

SECTION 12  
ECOLOGICAL INFORMATION

Environmental Toxicology: Fenamiphos is highly toxic to birds. Acute oral LD$_{50}$ = 0.7 to 1.6 mg/kg (bobwhite quail) and 0.9 to 1.2 mg/kg (mallard ducks). Fenamiphos is very toxic to aquatic organisms and may cause long term adverse effects in the aquatic environment. The 96-hour LC$_{50}$ = 0.072 mg/L (rainbow trout) and 0.009 mg/L (bluegill sunfish). Due to its high acute toxicity and its persistence in sediments, fenamiphos may represent a hazard to sea bottom dwellers. Fenamiphos is not expected to bioaccumulate appreciably in aquatic organisms.
SECTION 12  

ECOLOGICAL INFORMATION (Continued)

Environmental Fate:

Breakdown in soil and groundwater: Fenamiphos is of moderate persistence in the soil environment, with a reported soil half-life of about 50 days. Fenamiphos appears to have no effect on the activity of soil bacteria. Aerobic processes are most important for breakdown of the compound. Fenamiphos is not strongly adsorbed to soils, but neither it nor its breakdown products have been found in over 1200 wells tested in six states of America.

Breakdown in water: Fenamiphos disappears quickly from water in acidic and alkaline water, but it is stable in neutral water when held in the dark. The compound, when in the presence of artificial light, disappears very rapidly. In a neutral solution, half of the initial amount of the compound degraded within 4 hours.

Breakdown in vegetation: In plants, the compound is absorbed through the roots and translocated to the leaves. It is broken down within the plant. The products of its breakdown are relatively persistent and can also inhibit cholinesterase.

SECTION 13  

DISPOSAL CONSIDERATIONS

Spills and Disposal: Persons involved in cleanup require complete skin protection - see section 8. In case of spillage, contain and absorb spilled material with absorbent material such as clay, sand or cat litter and dispose of waste as indicated below or in accordance to the Australian Standard 2507- Storage and Handling of Pesticides. Keep out animals and unprotected persons. Keep material out of streams and sewers. Vacuum, shovel or pump waste into an approved drum. To decontaminate spill area, tools and equipment, wash with detergent and water and add the solution to the drums of wastes already collected and label contents. Dispose of drummed wastes, including decontamination solution in accordance with the requirements of Local or State Waste Management Authorities.

Disposal of empty containers: Triple or preferably pressure rinse containers before disposal. Add rinsings to spray tank. Do not dispose of undiluted chemicals on-site. If recycling, replace cap and return clean containers to recycler or designated collection point. If not recycling, break, crush, or puncture and bury empty containers in a local authority landfill. If an approved waste management facility is not available bury the empty packaging 500 mm below the surface in a disposal pit specifically marked and set up for this purpose clear of waterways, desirable vegetation and tree roots, in compliance with relevant Local, State or Territory government regulations. DO NOT burn empty containers or product.

SECTION 14  

TRANSPORT INFORMATION

Road & Rail Transport: This product is classified as a Dangerous Goods under the Australian Code for the Transport of Dangerous Goods by Road and Rail. UN 3018 PESTICIDES, ORGANOPHOSPHORUS, LIQUID. TOXIC. Packaging Group III. Class 6. Hazchem 2X. Hazard Identification number 60. This product is a Combustible Liquid (C1).

This product is a Schedule 7 Poison (S7) and must be stored, transported and sold in accordance with the relevant Health Department regulations.

SECTION 15  

REGULATORY INFORMATION

Under the Standard for Uniform Scheduling of Medicines and Poisons (SUSMP), this product is a schedule 7 poison.

This product is registered under the Agricultural and Veterinary Chemicals Code Act 1994. Product Registration No. 66007.

This product is classified as a Hazardous Substance under the criteria of Safe Work Australia. T*: very toxic, Xn: harmful.

This product is classified as a Dangerous Good according to the ADG Code (7th Ed).
SECTION 16  OTHER INFORMATION

Issue Date: 14 April 2011. (First issue).

Key to abbreviations and acronyms used in this MSDS:

ADG Code  Australian Dangerous Goods Code (for the transport of dangerous goods by Road and Rail).
Carcinogen  An agent which is responsible for the formation of a cancer.
Genotoxic  Capable of causing damage to genetic material, such as DNA.
OCS  Office of Chemical Safety.
PPE  Personal protective equipment.
Teratogen  An agent capable of causing abnormalities in a developing foetus.
TWA  The Time Weighted Average airborne concentration over an eight-hour working day, for a five day working week over an entire working life.

Safe Work Australia:  Formally known as Australian Safety & Compensation Council (ASCC) which was formally known as the National Occupational Health & Safety Commission (NOHSC).

References

This MSDS summarises our best knowledge of the health and safety hazard information of the product and how to safely handle and use the product in the workplace. Each user should read this MSDS and consider the information in the context of how the product will be handled and used in the workplace including in conjunction with other products.

If clarification or further information is needed to ensure that an appropriate risk assessment can be made, the user should contact this company.

End MSDS