Entrust* Naturalyte* Insect Control

SECTION 1: Identification of the substance and supplier

Product name:	Entrust Naturalyte Insect Control
Recommended Use:	Organic insecticide for the control of various pests of fruit & vegetable crops as per the label.
Company:	Dow AgroSciences Australia Ltd
Address:	Level 5, 20 Rodborough Road, Frenchs Forest NSW 2086
Website:	www.dowagrosciences.com.au
E-mail:	auscustomerservice@dow.com
Telephone Toll Free Number:	1 800 700 096 (Mon-Fri, 8.30am–4.30pm***)***
Emergency Telephone Number:	1 800 033 882 (24 hours) ***(EMERGENCIES ONLY)***
Date of Issue:	July 31 2003

SECTION 2: Hazards Identification

NOHSC Classification: Non-hazardous

SECTION 3: Composition/information on ingredients

Chemical Entity	CAS No.	Proportion
Spinosad	**131929-60-6 & 131929-63-0**	**80%**
Non hazardous filler & other ingredients		**20%**

SECTION 4: First Aid Measures

Symptoms of exposure: Based on animal studies with spinosad, exposure to Entrust by inhalation, ingestion or contact with skin or eyes may result in minor irritation to eyes, skin or throat. It is highly unlikely that exposure occurring during normal use will produce any toxic effects as the product is of low toxicity. There are no specific first aid measures required for this product. Wash off skin or irrigate eyes if irritation occurs.

Consult The National Poisons Information Centre, (Phone: 13 11 26), or a Doctor in every case of suspected chemical poisoning. Never give fluids or induce vomiting if a patient is unconscious or convulsing regardless of cause of injury. If breathing difficulties occur seek medical attention immediately.

Swallowed: If swallowed, call the Poisons Centre or a Doctor. Do not induce vomiting unless told to do so by the Poisons Centre or a Doctor.

Skin: If present on the skin, wash-off immediately. Call a doctor if irritation occurs.

Eyes: If in eyes, hold open eyes and rinse slowly with plenty of water. Remove contact lenses, if present. Call a doctor if irritation persists.

Inhalation: If affected, move person to fresh air. Call a doctor if any symptoms of concern arise.

Advice to Doctor: No specific antidote. Treatment of exposure should be directed at the control of symptoms and clinical condition of the patient.

Workplace facilities (manufacturing): Emergency shower and eyewash facility should be provided**.**

SECTION 5: Fire Fighting Measures

Flammable properties:	Not flammable.
Polymerisation:	Not known to occur
Decomposition Products:	Not known to occur
Fire & Explosion Hazards:	Not a fire or explosion hazard. Like most organic powders under severe dusting conditions, this material may form explosive mixtures in air.
Special Fire Fighting procedures:	Evacuate personal to a safe area. If the product is on fire wear positive-pressure self-contained breathing apparatus and full protective clothing. Do not allow water from fire-fighting to enter water supplies, or drainage systems.
Extinguishing Media:	Foam, CO_2 or dry chemical.

SECTION 6: Accidental Release Measures

Wear appropriate protective equipment (see Section 8). Clear area of all unprotected personnel. Prevent entry of chemical or used/damaged containers into sewers, drains, streams or waterways. If necessary, inform the police and the local council.

Small Spill: For clean-up of a spill from a single shipping pack, sweep up material and contain in a refuse vessel for disposal.

Large Spill: Stop further release or spread of spilled material. For clean up of multiple shipping packs, sweep up material into a salvage drum for disposal. On soils, skim off the upper contaminated layer and collect it for disposal. If further information is required, telephone the emergency contact number.

SECTION 7: Handling and Storage

Handling
Keep out of reach of children and animals. After work, wash hands before eating, smoking, drinking or using the toilet. Clean up spilled material immediately, and wash clothes and equipment after use. Avoid contact with eyes. Do not inhale dust.

Storage
Keep out of reach of children and animals. Store in tightly closed original containers in a cool, well-ventilated area, out of direct sunlight. Do not store with food, feedstuffs, fertilisers and seeds.

SECTION 8: Exposure Control/Personal Protection

EXPOSURE STANDARDS
Workplace Exposure Standards have not been set for Entrust Naturalyte Insect Control. In the absence of WES the default limit of 10 mg/m^3 (Acceptable Exposure Limit) for dusts or mists should be followed. The nature of this product makes it unlikely that this level will be approached in normal use. The ADI (Acceptable Daily Intake) for spinosad is set at 0.02 mg/kg/day. The corresponding NOEL (No-observable-effect-level) for spinosad is set at 2.4 mg/kg/day. ADI and NOEL values are taken from Australian ADI List, September 2002.

ENGINEERING CONTROLS
In industrial situations, concentrated values below the AEL value should be maintained. Values may be reduced by process modification, use of local exhaust ventilation, capturing substances at the source, or other methods. If airborne concentrations of mists, dusts or vapours are high, modification of the process or environment to reduce the problem is advised.

Personal Protection

Respiratory: Respiratory protection should not be required for normal use and handling. During abnormal exposures or when there is a chance that Acceptable Exposure Limit will be exceeded, use an approved dust respirator.

Eye: No specific eye protection is required for normal handling and use. For manufacturing situations, wear safety glasses.

Skin/body: When there is potential for skin contact wear, as appropriate, PVC gloves and cotton coveralls, or long-sleeved shirt and long pants, waterproof shoes plus socks.

Personal hygiene: After use and before eating, drinking or smoking, wash hands, arms and face thoroughly with soap and water.

SECTION 9: Physical and Chemical Properties

Appearance:	Off-white to light tan powder
Odour	Latex-like odour
Bulk density:	0.23 g/cc
pH (1%w/v solution in water)	9-9.5
Solubility in water:	Insoluble but miscible with water, requires regular agitation
Corrosiveness:	Non-corrosive
Vapour Pressure:	Not volatile
Volatile materials:	None present
Flammability/combustibility:	Not flammable or combustible

See also Section 5 and 10

SECTION 10: Stability and Reactivity

Stability:	Stable under normal storage conditions
Materials to avoid:	None under normal use conditions. Under abnormal conditions, avoid oxidising materials and strong acids.
Hazardous Decomposition Products:	Not known to occur
Hazardous polymerisation:	Not known to occur

SECTION 11: Toxicological Information

Based on the individual components present in the formulation.

Health effects: See symptoms of Exposure in Section 4

Acute

Swallowed: Small amounts swallowed incidental to normal handling operations are unlikely to cause injury.

Eye: Product dust or splashes of spray mix in the eye may irritate the eyes; no corneal damage is likely.

Skin: Prolonged skin contact is unlikely to result in absorption of harmful amounts or cause allergic reactions. Based on the spinosad component Entrust Naturalyte Insect Control may be a skin irritant.

Inhaled: No adverse effects are anticipated form a single exposure to spray mist, although inhalation of dust from product may cause irritation of the throat & upper respiratory tract.

Mutagenicity: Spinosad did not produced genetic damage in a wide range of *in vitro* and *in-vivo* tests. The weight of evidence suggests that spinosad does not cause genetic damage. No information was found for the other components.

Reproductive and Developmental Toxicity: Spinosad did not interfere with reproduction in laboratory animals. Birth defects are unlikely. Even exposures having an adverse effect on the mother should have no effect on the foetus. No information was found for the other components.

Carcinogenicity: Spinosad did not cause cancer in laboratory animals. No information was found for the other components.

Systemic and other target organ effects: In animals, spinosad has been shown to cause vacuolation of cells in various tissues. Dose levels producing these effects were many times higher than any dose levels expected from exposure due to use.

SECTION 12: Ecotoxicity Information

Ecotoxicity

Terrestrial vertebrates: Spinosad is relatively non-toxic to birds and mammals.
Mallard ducks oral LD_{50} is > 2000 mg/kg
Mallard duck and bobwhite quail dietary LC_{50} is > 5000 ppm.
No information was found for the other components.

Aquatic Organisms: Spinosad is slightly (LC_{50} is between 10 and 100 mg/L) to moderately (LC_{50} is between 1 and 10 mg/L). toxic to fish on an acute basis. Acute LC_{50} in common carp *(Cyprinus carpio)* is 3.49-4.99 mg/L. Acute LC_{50} in bluegill *(Lepomis macrochirus)* is 5.94 mg/L. Acute LC_{50} in sheepshead minnow *(Cyprinodon variegatus)* is 7.87 mg/L. Acute LC_{50} in rainbow trout *(Oncorhynchus mykiss)* is 30 mg/L.
Bioconcentration potential is low (BCF <100 or Log Pow <3).
Spinosad is slightly toxic to aquatic invertebrates on an acute basis (LC_{50} or EC_{50} is between 10 and 100 mg/L). Acute LC_{50} in water flea *(Daphnia magna)* is 92.7 mg/L. Acute immobilization EC50 in water flea *(Daphnia magna)* is 14 mg/L. Acute LC_{50} in grass shrimp *(Palaemonetes pugio)* is >9.76 mg/L. Growth inhibition EC_{50} in marine diatom *(Skeletonema costatum)* is 0.227 mg/L. Growth inhibition EC_{50} in blue-green *alga (Anabaena flos-aquae)* is 8.09 mg/L. Growth inhibition EC_{50} in diatom *(Navicula sp.)* is 0.107 mg/L.
No information was found for the other components.

Terrestrial non-vertebrates: Weight of evidence for spinosad suggests that no adverse effects are likely to occur in terrestrial animals. However honeybees are sensitive to spinosad. Topical LD_{50} is 0.06 µg/bee. Do not spray when bees are actively foraging. The earthworm LC_{50} is > 1,000 mg/kg soil.
Bioconcentration potential is low (BCF <100 or Log Pow <3).
No information was found for the other components.

ENVIRONMENTAL FATE

Soil and Groundwater: The breakdown of spinosad in soils is largely dependent on photolysis. The photolysis half-life in soil is 8 - 9 days. It will degrade faster in soils with higher moisture content and higher temperature. Half-life estimates for spinosad in soil under aerobic conditions are from 9 -17days. Spinosad is stable to heat but will break down in ultraviolet light. No information was found for the other components.
Surface Water: Spinosad is stable to hydrolysis at acid and neutral pHs in the absence of UV light. At high pH (≥ 9) the half-life in water is approximately 200 days. However in the presence of light, spinosad hydrolyses in water rapidly (half-life < 1day). No information was found for the other components.
Vegetation: Spinosad is not taken up significantly by plants at the roots and on foliage. No information was found for the other components.

SECTION 13: Disposal Considerations

Contaminated material must be disposed of in accordance with all local authority requirements.

Do not contaminate water, food or feed by storage or disposal.

Triple rinse the container before disposal. Add rinsings to the 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 containers in an approved local authority landfill.

If disposing of unwanted product, contact Dow AgroSciences or your local council.

SECTION 14: Transport Information

UN No.:	None
Dangerous Goods Class:	Not classified as a Dangerous Good under the Transport of Dangerous Goods by Road or Rail.
Hazchem Code	None

SECTION 15: Regulatory Information

Entrust Naturalyte Insect Control is a registered product under the Agricultural & Veterinary Chemicals Code Act, 1994. Registration product number is 56881.

SECTION 16: Other Information

Glossary

ADI - Acceptable daily intake, the level of intake of a chemical that can be ingested daily over an entire lifetime without appreciable risk to health. It is calculated by dividing the overall NOEL for animal studies by a safety factor.

K_{oc} - the organic carbon partition coefficient (mL soil water /g organic carbon)**.**

LC_{50} - Lethal Concentration 50%. A concentration of chemical in air or water that will kill 50% of the test organisms. inhaling or ingesting it.

LD_{50} - Lethal Dose-50%. The dose of a chemical that will kill 50% of the test animals receiving it.

NOEL - No-observable-effect-level, the highest administered dose which doe not cause any detectable (usually adverse) effect in the study. The overall NOEL for a chemical determined in the most sensitive species is used to estimate the ADI.

pH - Measure of how acidic or alkaline a material is using a 1 - 14 scale. pH 1 is strongly acidic and pH 14 strongly alkaline.

Polymerisation - a chemical reaction in which small molecules 9monomers) combine to form much larger molecules (polymers). A hazardous polymerisation reaction is one that occurs at a fast rate and releases large amounts of energy.

P_{ow} - The octanol-water partition coefficient is the ratio of the concentration of a chemical in octanol and in water at equilibrium and at a specified temperature. Octanol is an organic solvent that is used as a surrogate for natural organic matter. This parameter is used in many environmental studies to help determine the fate of chemicals in the environment.

This information in this Safety Data Sheet is based upon current knowledge and experience. It is subject to revision as additional knowledge and experience is gained.

FOR FURTHER PRODUCT INFORMATION CALL A DOW AGROSCIENCES CUSTOMER SERVICE REPRESENTATIVE (TOLL FREE) ON 1 800 700 096 DURING BUSINESS HOURS.