MATERIAL SAFETY DATA SHEET

Date of Issue: November 27, 2003

1. IDENTIFICATION OF THE SUBSTANCE / MIXTURE AND SUPPLIER

Product name	**Bulldock® 25 EC Insecticide**
Other names	None
Product codes and pack sizes	4952765 (20 L)
Chemical group	Synthetic pyrethroid
Recommended use	Agricultural insecticide
Formulation	Emulsifiable concentrate
Supplier	Bayer CropScience Pty Ltd ABN 87 000 226 022
Address	391 - 393 Tooronga Road, East Hawthorn Victoria 3123, Australia
Telephone	(03) 9248 6888
Facsimile	(03) 9248 6800
Website	www.bayercropscience.com.au
Contact	Development Manager (03) 9248 6888
Emergency Telephone Number	1800 033 111 – Orica SH&E Shared Services

2. HAZARDS IDENTIFICATION

EMERGENCY OVERVIEW

HAZARDOUS SUBSTANCE (see Risk phrases below) – DANGEROUS GOOD

Flammable liquid. Contact with skin or eyes may be painful. Dangerous to aquatic organisms and bees.

Hazard classification Hazardous (National Occupational Health and Safety Commission - NOHSC)

Risk phrases
R20/22 – Harmful by inhalation and if swallowed.
R38 – Irritating to skin.
R41 - Risk of serious damage to eyes.

Safety phrases See Sections 4, 5, 6, 7, 8, 10, 12, 13

ADG classification Classified as "Dangerous goods" for transport by road or rail according to the Australian Code for the Transport of Dangerous Goods by Road and Rail, FLAMMABLE LIQUID, N.O.S. (contains xylene), Class 3, Packing Group III, UN1993.

SUSDP classification Schedule 6 (Standard for the Uniform Scheduling of Drugs and Poisons)

3. COMPOSITION / INFORMATION ON INGREDIENTS

Ingredients	CAS Number	Concentration (g/L)
Beta-cyfluthrin	[68359-37-5]	25
Xylene	[1330-20-7]	775
Other ingredients (surfactants/emulsifiers)	(non hazardous)	90

4. FIRST AID MEASURES

If poisoning occurs, immediately contact a doctor or Poisons Information Centre (telephone 13 11 26), and follow the advice given. Remove person from contaminated area. Apply artificial respiration if not breathing. Show this Material Safety Data Sheet to the doctor.

Inhalation

If inhaled, remove to fresh air and keep at rest. Obtain medical advice if at all worried. If breathing stops or shows signs of failing, start artificial respiration.

Skin contact

Carefully remove contaminated clothing and footwear. Wash affected areas with soap and water. Apply Vitamin E cream, toilet milks or local anaesthetic creams to reduce pain. Seek medical advice if at all worried. Launder contaminated clothing before re-use.

Eye contact

Rinse eyes immediately with clean water for at least 15 minutes and obtain urgent medical aid.

Ingestion

Wash out mouth with water. DO NOT induce vomiting. Give a glass of water. Do not give anything by mouth if the patient is semi-conscious or unconscious. Keep patient at rest and seek medical advice as above. Do not apply mouth-to-mouth resuscitation if the material has been ingested.

First Aid Facilities

Ensure eyewash and safety shower facilities are available in the workplace.

Medical attention

Bulldock 25 EC contains beta-cyfluthrin, which is a synthetic pyrethroid. It also contains xylene as the solvent.

Symptoms

Local: Skin irritation and severe eye irritation. Skin and eye paraesthesiae, which may be severe. Usually transient with resolution within 24 hours. Irritation of mucous membranes.

Systemic: Dizziness, headache, drowsiness, listlessness, nausea, anorexia and vomiting, epigastric pain, muscular fasciculation of limbs, anaesthesia or other CNS effects; also, blurred vision, tremors, shallow and rapid breathing, pulmonary oedema, unconsciousness, convulsions, coma with very high doses/exposures.

Treatment

Local: Skin – apply Vitamin E cream or simple toilet milks.

Eyes - Instil local anaesthetic drops e.g. 1% amethocaine hydrochloride eye drops. Give analgesics as necessary.

Systemic: Monitor respiratory and cardiac functions. Observe electrocardiograph, and check for pulmonary oedema in event of inhalation.

Gastric lavage and charcoal administration. (Paraesthesiae of mouth, tongue, larynx and pharynx may be present.) As this product contains the hydrocarbon liquid, xylene, 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.

Endotracheal intubation, and artificial respiration, as necessary.

Anti-convulsant therapy with diazepam i.v.

No specific antidote.

Contraindications – adrenergic compounds, atropine. (Must not be confused with organophosphorous compounds.)

Recovery should be spontaneous.

5. FIRE FIGHTING MEASURES

Extinguishing media Foam, dry agent, carbon dioxide, sand, water spray.

Hazards from combustion products In a fire, formation of hydrogen chloride, hydrogen cyanide, hydrogen fluoride, carbon monoxide and nitrogen oxides can be expected.

Precautions for fire fighters The product is a flammable liquid – flash point > 28° C. Liquid and vapour of xylene are flammable and the vapour will form explosive mixtures with air. The vapour is heavier than air and may travel along the ground so that distant ignition is a possibility.
Firefighters should wear full protective gear, including self-contained breathing apparatus (AS/NZS 1715/1716). Keep unnecessary people away. If it can be done safely, remove intact containers from the fire. Otherwise, use water spray to cool them. Avoid spraying directly into containers due to danger of boilover. Bund area with sand or earth to prevent contamination of drains or waterways. Dispose of fire control water or other extinguishing agent and spillage safely later. Do not release contaminated water into the environment.

Hazchem code 3[Y]

6. ACCIDENTAL RELEASE MEASURES

Avoid contact with the spilled material or contaminated surfaces. Extinguish or remove all possible sources of ignition. When dealing with spills do not eat, drink or smoke and wear protective clothing and equipment as described in Section 8 - PERSONAL PROTECTION. Keep people and animals away. Prevent spilled material from entering drains or watercourses. Contain spill and absorb with earth, sand, clay, or other absorbent material. Collect and store in properly labelled, sealed drums for safe disposal. Deal with all spillages immediately. If contamination of drains, streams, watercourses, etc. is unavoidable, warn the local water authority.

7. HANDLING AND STORAGE

Handling Keep out of reach of children. Will damage eyes and skin. Avoid contact with eyes and skin. Avoid inhaling vapour or spray mist. If product in eyes, wash it out immediately with water. If clothing becomes contaminated with product, remove clothing immediately. 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, face shield and contaminated clothing.

Storage Store in the closed, original container in a cool, well-ventilated area. Do not store for prolonged periods in direct sunlight. Keep away from excessive heat, open flames and other sources of ignition.

Flammability Flammable liquid.

8. EXPOSURE CONTROLS / PERSONAL PROTECTION

Exposure standards

The NOHSC Occupational Exposure Limits for xylene are:
TWA: 80 ppm, 350 mg/m^3
STEL: 150 ppm, 655 mg/m^3

Definitions:
Exposure standard – Time Weighted Average (TWA) means the average airborne concentration of a particular substance when calculated over a normal eight-hour working day, for a five-day working week.
Exposure standard – Short term exposure limit (STEL) means a 15 minute TWA exposure which should not be exceeded at any time during the working day.

Biological limit values

None allocated

Engineering controls

Control process conditions to avoid contact. Use local exhaust ventilation during manufacture and spark proof equipment. Use in a well-ventilated area only.

Personal Protective Equipment

It is important to protect eyes and skin, as contact with this product may cause pain.

- Wear face shield
- Wear cotton overalls buttoned to the neck and wrist and a washable hat.
- Wear elbow-length PVC or nitrile gloves.
- If working in a poorly ventilated area or if occupational exposure levels are likely to be exceeded, wear a respirator suitable for organic vapours - AS/NZS 1715/1716 approved.

9. PHYSICAL AND CHEMICAL PROPERTIES

Appearance:	Clear yellow liquid
Odour:	Aromatic chemical
pH:	5.5 to 6.5 (1% in water)
Vapour pressure:	1 kPa at 20° C (xylene)
Vapour density:	3.7 – xylene (air = 1)
Boiling point:	138 - 142° C (boiling point range of xylene)
Freezing/melting point:	Not available
Solubility:	Forms an emulsion in water
Specific Gravity:	0.89 at 20° C
Flash Point:	> 28º C (Pensky-Martens Closed Cup)
Flammability (explosive) limits:	LEL: 1.1; UEL: 6.6 Vol. % (xylene)
Auto-ignition temperature:	500° C (xylene)
Partition coefficient (octanol/water):	*Xylene*: Log P_{ow} = 3.12 – 3.2 *Beta-cyfluthrin:* K_{ow} log P = 6.18 (22° C)

10. STABILITY AND REACTIVITY

Chemical stability	Stable under normal conditions of use.
Conditions to avoid	Avoid sources of ignition and extreme heat.
Incompatible materials	Avoid oxidising agents, strong acids and strong alkalis.
Hazardous decomposition products	In a fire, formation of hydrogen chloride, hydrogen cyanide, hydrogen fluoride, carbon monoxide and nitrogen oxides can be expected.
Hazardous reactions	None

11. TOXICOLOGICAL INFORMATION

POTENTIAL HEALTH EFFECTS

Inhalation	Inhalation of product vapour may cause transient irritation of mucous membranes (nose, throat and respiratory tract), may cause headaches, nausea, dizziness, drowsiness, could be anaesthetic, and may have other central nervous system effects lasting up to 24 hours.
Skin contact	Irritating. Contact with the skin, especially the face, may result in initial stinging, burning or tingling sensations (fingertips, nose), followed by numbness or pain which may persist up to 24 hours. Xylene may cause defatting of the skin which can lead to dermatitis.
Eye contact	Risk of serious damage to eyes.
Ingestion	Poisonous if swallowed. Symptoms include burning sensations and numbness in the mouth and throat, headache, dizziness, drowsiness, nausea, vomiting, listlessness, stomach pain, muscular twitching of arms or legs, unconsciousness, convulsions, and coma (very high doses). Bulldock 25 EC also contains xylene, a hydrocarbon liquid. Small amounts aspirated into the respiratory system during ingestion or from vomiting may cause bronchopneumonia or pulmonary oedema.

ANIMAL TOXICITY DATA – *PRODUCT*

Acute:

Oral toxicity	LD_{50} rat: 630 - 757 mg/kg
Dermal toxicity	LD_{50} rat: > 5000 mg/kg
Inhalation toxicity	LC_{50} rat: approx. 3 mg/L (4 h) aerosol
Skin irritation	Severely irritating (rabbit)
Irritation of mucous membranes	Severely irritating (rabbit)
Sensitisation	Non-sensitising (guinea pig) (*Beta-cyfluthrin)*

11. TOXICOLOGICAL INFORMATION - continued

Chronic:
Beta-cyfluthrin is not mutagenic, carcinogenic or teratogenic and did not cause reproductive effects in animal studies. There was no evidence of delayed neurotoxicity.
Repeated over-exposure to xylene may cause liver and kidney damage. Xylene is not mutagenic, not carcinogenic and does not impair fertility.

12. ECOLOGICAL INFORMATION

Beta-cyfluthrin is very toxic to aquatic organisms. It is dangerous to bees. It has a low toxicity to birds, mammals and earthworms. DO NOT contaminate streams, rivers or waterways with Bulldock 25 EC or the used containers.

Ecotoxicity

Beta-cyfluthin:
Fish toxicity: LC_{50} (96 h): 0.33 µg/L; golden orfe (*Leuciscus idus*)
LC_{50} (96 h): 0.068 µg/L; rainbow trout (*Oncorhynchus mykiss*)
Daphnia toxicity: EC_{50} (48 h): 0.29 µg/L; water flea (*Daphnia magna)*
Algal toxicity:
Growth rate: IC_{50} (72 h): > 10 µg/L; green algae (*Desmodesmus subspicatus)*
Toxicity to bacteria: EC_{50}: > 10000 mg/L; activated sludge
Bird toxicity: Acute oral LD_{50}: > 2000 mg/kg; Japanese quail
Xylene:
Fish toxicity: LC_{50}: > 1 – < 10 mg/L
Aquatic invertebrate toxicity: EC_{50}: > 1 – < 10 mg/L
Algae toxicity: IC_{50}: > 1 – < 10 mg/L
Bacteria toxicity: EC_{50}: > 10 - < 100 mg/L

Environmental fate, persistence and degradability, mobility

The degradation of beta-cyfluthrin is rapid in different soils. Leaching behaviour can be classified as immobile. The bioconcentration factor (BCF) of beta-cyfluthrin is 506. It is readily biodegradable.
Xylene is readily biodegradable, and oxidises rapidly in air by photochemical reactions. It is considered to be slightly bioaccummulative – BCF < 30.

13. DISPOSAL CONSIDERATIONS

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 no landfill is available, bury the containers below 500 mm in a disposal pit specifically marked and set up for this purpose clear of waterways, desirable vegetation and tree roots. Empty containers and product should not be burnt.

Dispose of waste product through a reputable waste contractor.

14. TRANSPORT INFORMATION

UN number	1993
Proper shipping name	FLAMMABLE LIQUID, N.O.S. (contains xylene)
Class and Subsidiary Risk	3 No subsidiary risk
Packing Group	III
EPG	Guide 14 - Dangerous Goods - Initial Emergency Response Guide
Hazchem code	3[Y]
Marine Pollutant	Yes (xylene)

15. REGULATORY INFORMATION

Registered according to the Agricultural and Veterinary Chemicals Act 1988

Australian Pesticides and Veterinary Medicines Authority approval number: 40422

See also Section 2.

16. OTHER INFORMATION

Trademark information	Bulldock® is a Registered Trademark of Bayer.
Preparation information	Replaces August 1, 2002 MSDS. Reasons for revision: 16 heading format, risk phrases, First Aid, Medical Advice.

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.

Our responsibility for products sold is subject to our standard terms and conditions, a copy of which is sent to our customers and is also available on request.

END OF MSDS