

MATERIAL SAFETY DATA SHEET



Date of Issue: July 26, 2004

1. IDENTIFICATION OF THE MATERIAL AND SUPPLIER

Product name Jaguar® Selective Herbicide
Other names None
Product codes and pack sizes 4207679 (5 L), 4207938 (20 L)
Chemical group Benzonitrile + nicotinamide
Recommended use Agricultural herbicide
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) – NON DANGEROUS GOOD
Combustible liquid. Dangerous to the aquatic environment.

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

Risk phrases R21/22 - Harmful in contact with skin and if swallowed
R36/38 - Irritating to eyes and skin
R63 – Possible risk of harm to the unborn child

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

ADG classification Not a “Dangerous good” for transport by road or rail according to the Australian Code for the Transport of Dangerous Goods by Road and Rail. For transport by sea, Jaguar is a MARINE POLLUTANT.

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

3. COMPOSITION / INFORMATION ON INGREDIENTS

Ingredients	CAS Number	Concentration (g/L)
Bromoxynil octanoate	[1689-99-2]	364 (≡ 250 g/L bromoxynil)
Diflufenican	[83164-33-4]	25
N-Methyl-2-pyrrolidone	[872-50-4]	150
Hydrocarbon solvent	[90438-79-2]	416
Other ingredients	(non hazardous)	123

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4. FIRST AID MEASURES

If poisoning occurs, immediately contact a doctor or Poisons Information Centre (telephone 13 11 26), and follow the advice given. 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. Call for prompt medical attention.
Skin contact	Carefully remove contaminated clothing. Wash affected areas with soap and water. Seek medical aid if at all worried.
Eye contact	Rinse eyes immediately with clean water for at least 15 minutes and obtain medical aid.
Ingestion	Wash out mouth with water. Do NOT induce vomiting. Give a glass of water. Keep patient at rest and seek medical advice. DO NOT attempt to give anything by mouth to a semi-conscious or unconscious person.
First Aid Facilities	Provide eyewash and safety shower facilities in the workplace.
Medical attention	Diflufenican has a low order of toxicity. Bromoxynil octanoate is a phosphorylation uncoupler with high acute oral toxicity. Symptoms of systemic poisoning with bromoxynil include nausea, vomiting, hyperventilation, sweating and salivation. There are reports of hyperthermia and convulsions, probably due to phosphorylation uncoupling. This product contains a hydrocarbon solvent , which will irritate nose and throat, may cause headaches, dizziness, drowsiness, could be anaesthetic, and may have other central nervous system effects. 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. For bromoxynil poisoning: Initial treatment should be symptomatic and supportive. If a mouthful or more has been ingested, the following measures should be considered: Monitor respiratory and cardiac functions and body temperature. Keep respiratory passages free, administer artificial respiration as necessary. Gastric lavage and charcoal administration, and if necessary further treatment. Ensure constant oxygen supply and wash or spray with cold water. Absolute quiet is necessary. It is essential to cool the person down and to maintain complete rest. Anticonvulsant therapy: Diazepam i.v. is the drug of choice; barbiturates, e.g. phenobarbital and calcium gluconate may also be used. There is no specific antidote. Antipyretics such as Aspirin are contraindicated and could even increase hyperthermia.

5. FIRE FIGHTING MEASURES

Extinguishing media	Foam, dry agent, carbon dioxide, water spray
Hazards from combustion products	Compounds of fluorine, bromine and oxides of carbon and nitrogen may be generated under extreme heat conditions or in a fire.

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5. FIRE FIGHTING MEASURES - continued

Precautions for fire fighters Combustible liquid. Fire fighters should wear full protective gear, including self-contained breathing apparatus (AS/NZS 1715/1716). Toxic decomposition products may be produced in a fire. If possible and without risk, remove intact containers from exposure to fire. Otherwise, spray unopened containers with water to keep cool. Avoid spraying directly into containers. Keep unnecessary people away. Bund area to prevent contamination of water sources. Dispose of fire control water and spillage safely later.

Hazchem code Not applicable

6. ACCIDENTAL RELEASE MEASURES

Avoid contact with spilled material or contaminated surfaces. Extinguish or remove 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 and upwind. 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. Product is harmful if inhaled or swallowed. Will irritate eyes, nose, throat and skin. Avoid inhaling spray mist. If product in eyes, wash it out immediately with water. After handling 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. Keep away from all ignition sources.

Storage Store in the closed, original container in a cool, well-ventilated area. Do not store for prolonged periods in direct sunlight.

Flammability Combustible liquid, Class C1 – flashpoint between 61° C and 150° C.

8. EXPOSURE CONTROLS / PERSONAL PROTECTION

Exposure standards Bayer CropScience recommends the following exposure standards:
Bromoxynil 0.4 mg/m³ – *Skin*
Diflufenican 2.3 mg/m³
Skin notation – Absorption through the skin may be a significant source of exposure.

Biological limit values None allocated

Engineering controls Control process conditions to avoid contact. Use local exhaust ventilation during manufacturing operations. Use in a well-ventilated area only.

Personal Protective Equipment

- Face-shield
- Cotton overalls buttoned to the neck and wrist and a washable hat.
- Elbow-length PVC gloves
- If inhalation exposure is likely to exceed the exposure levels above, an AS/NZS 1715/1716 approved respirator suitable for organic vapours should be worn.

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9. PHYSICAL AND CHEMICAL PROPERTIES

Appearance:	Clear yellow to dark brown liquid
Odour:	Distinctive strong ester odour
pH:	Not available
Vapour pressure:	1.9 x 10 ⁻¹ mPa (bromoxynil octanoate) at 25° C 4.25 x 10 ⁻³ mPa (diflufenican) at 25° C
Vapour density:	Not available
Boiling point:	Not available
Freezing/melting point:	Not available
Solubility:	Emulsifies in water
Density:	1.078 g/mL at 20° C
Flash Point:	66° C
Flammability (explosive) limits:	Not available
Auto-ignition temperature:	Not available
Partition coefficient (octanol/water):	<i>Bromoxynil octanoate:</i> Log P _{ow} = 5.9 <i>Diflufenican:</i> Log P _{ow} = 4.2 <i>N-methyl-2-pyrrolidone:</i> Log P _{ow} = - 0.46

10. STABILITY AND REACTIVITY

Chemical stability	Stable under normal conditions of use.
Conditions to avoid	Avoid sources of ignition and extremes of temperature.
Incompatible materials	Incompatible with strong acids and bases, oxidizing agents. The rubber components present in some spraying units may be affected by exposure to the solvents in Jaguar.
Hazardous decomposition products	Compounds of fluorine, bromine and oxides of carbon and nitrogen may be generated under extreme heat conditions or in a fire.
Hazardous reactions	None

11. TOXICOLOGICAL INFORMATION

POTENTIAL HEALTH EFFECTS

Inhalation	Harmful if inhaled. Will irritate nose and throat, may cause headaches, dizziness, drowsiness, could be anaesthetic, and may have other central nervous system effects.
Skin contact	Harmful in contact with skin. Will irritate the skin. Repeated exposure may cause skin dryness or cracking.

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11. TOXICOLOGICAL INFORMATION - continued

Eye contact	Will irritate the eyes.
Ingestion	Harmful if swallowed. Will irritate the throat. Symptoms of bromoxynil poisoning include nausea, vomiting, hyperventilation, sweating and salivation. There were reports of hyperthermia and convulsions. Small amounts of liquid 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: 1113 mg/kg
Dermal toxicity	LD ₅₀ rat: > 2000 mg/kg
Inhalation toxicity	Inhalation LC ₅₀ rat: 0.72 - 0.81 mg/L (4 h) (<i>bromoxynil octanoate</i>) Inhalation LC ₅₀ rat: > 5.12 mg/L (4 h) (<i>diflufenican</i>)
Skin irritation	Non irritating (rabbit)
Eye irritation	Irritating (rabbit)
Sensitisation	Slightly sensitising (guinea pig) (<i>bromoxynil octanoate</i>) Not sensitising (guinea pig) (<i>diflufenican</i>)

Chronic:

Bromoxynil is classified by the EC as a category 3 teratogen – substances which cause concern for man owing to possible teratogenic effects but in respect of which the information is not adequate for making a satisfactory assessment. Bromoxynil octanoate is not carcinogenic or mutagenic. Diflufenican was not mutagenic, carcinogenic and did not show reproductive effects in animal studies.

12. ECOLOGICAL INFORMATION

Dangerous to fish and aquatic organisms. Low hazard to bees.
DO NOT contaminate streams, rivers or waterways with Jaguar or used containers.

Ecotoxicity	<u>Bromoxynil octanoate:</u> <i>Fish toxicity:</i> LC ₅₀ (96 h) bluegill sunfish 0.029 mg/L <i>Bird toxicity:</i> Acute oral LD ₅₀ bobwhite quail 170 mg/kg; mallard duck 2350 mg/kg <i>Other:</i> EC ₅₀ (48 h) <i>Daphnia magna</i> 0.046 mg/L EC ₅₀ (72 h) Algae (<i>Navicula pelliculosa</i>) 0.12 mg/L Non toxic to bees.
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12. ECOLOGICAL INFORMATION - continued

Ecotoxicity (continued)

Diflufenican:

Fish toxicity:

LC₅₀ (96 h) rainbow trout > 109 µg/L

Bird toxicity

LC₅₀ (96 h) bobwhite quail > 2150 mg/kg

LC₅₀ (96 h) mallard duck > 4000 mg/kg

Other:

EC₅₀ (48 h) *Daphnia magna* > 240 µg/L

EC₅₀ (72 h) Algae (*Scenedesmus subspicatus*) 0.25 µg/L

Low hazard to bees and earthworms.

Environmental fate, persistence and degradability, mobility

Bromoxynil:

In soil DT₅₀ is < 1 day, in laboratory test. Degraded by hydrolysis and debromination. Not readily biodegradable.

Diflufenican:

DT₅₀ varies from 15 to 30 weeks depending on soil type and water content.

N-methyl-2-pyrrolidone is readily biodegradable.

13. DISPOSAL CONSIDERATIONS

When returnable container is empty or contents no longer required return it to the point of purchase. For non-returnable containers, triple or (preferably) pressure rinse them 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 or product should not be burnt. Dispose of waste material via a reputable waste disposal contractor.

14. TRANSPORT INFORMATION

UN number Not applicable

Proper shipping name Not applicable

Class and Subsidiary Risk Not applicable

Packing Group Not applicable

EPG Not applicable

Hazchem code Not applicable

Marine Pollutant Yes – Bromoxynil is a Marine Pollutant, Class "P" (on IMDG list). Diflufenican is classified as a Marine Pollutant. For sea transport, Jaguar is ENVIRONMENTALLY HAZARDOUS SUBSTANCE, LIQUID, N.O.S (contains bromoxynil, diflufenican), Class 9, UN 3082, Packing Group III.

15. REGULATORY INFORMATION

Registered according to the Agricultural and Veterinary Chemicals Act 1988.
Australian Pesticides and Veterinary Medicines Authority approval number: 40383
See also Section 2.

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16. OTHER INFORMATION

Trademark information Jaguar® is a Registered Trademark of Bayer.

Preparation information Replaces August 1, 2002 MSDS.
Reasons for revision: Adjusted amount of liquid hydrocarbons, 16 heading format, product codes, expanded ecological information.

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