

## Crossbow\* Herbicide

**Contains a Part A and Part B component packaged separately within a cardboard outer box.**

Part B is hazardous according to the criteria of the National Occupational Health & Safety Commission (NOHSC). Risk Phrases: Part B: R 36 - irritating to the eyes

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**Website:** www.dowagrosciences.com.au  
**Customer Service Toll Free Number:** 1800 700 096 (Mon-Fri, 8am–5pm EST)  
**Emergency Telephone Number:** 1800 033 882 (24 hours) (EMERGENCIES ONLY)

### IDENTIFICATION

**Product Name:** Crossbow Herbicide  
**Product Code:** 15710  
**Dangerous Goods Class:** Not classified as a Dangerous Good by the Australian Dangerous Goods Code for transport by Road and Rail  
**Hazchem Code:** 3Z  
**Poison Schedule:** Part A: not scheduled Part B: not scheduled  
**Uses:** Herbicide for the control of certain woody weeds in pastures, rights-of-way and commercial and industrial areas.

### PHYSICAL APPEARANCE & PROPERTIES

**Appearance:** Part A: tan to brown granule. Part B: amber liquid  
**Boiling point:** Part A: not applicable; Part B: 100 °C  
**Volatile materials:** Both Parts: none present  
**Flashpoint:** Both Parts: non-flammable  
**Specific gravity:** Part A: 0.53 g/mL @ 25 °C; Part B: 1.15 g/mL @ 20 °C  
**Solubility in water:** Part A: Dissolves in water, solubility (metsulfuron-methyl) 2790 ppm @ 25 °C and pH 7; Part B: miscible  
**Corrosiveness:** Both Parts: non-corrosive  
**Vapour Pressure:** Part A: (metsulfuron-methyl) 2.5 x 10<sup>-12</sup> mm Hg @ 25 °C; Part B: (picloram) 6.16 x 10<sup>-7</sup> mm Hg @ 35 °C

### INGREDIENTS

Chemical Entity	CAS No.	Proportion
<b>Part A</b>		
Metsulfuron-methyl	74223-64-6	20%
Other non-hazardous ingredients	-	80%
<b>Part B</b>		
Picloram potassium salt	2545-60-0	24.4%
Polyglycol 26-2	69029-39-6	<10%
Potassium hydroxide	1310-58-3	<10%
Water	7732-18-5	>60%
Other non-hazardous substances	-	<10%

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# HEALTH HAZARD DATA

## HEALTH EFFECTS

### Part A:

<b>Acute</b>	<b>Swallowed:</b>	Small amounts swallowed incidental to normal handling operations are unlikely to cause injury. The oral LD <sub>50</sub> for male rats is > 5000mg/kg
	<b>Eye:</b>	Not an irritant.
	<b>Skin:</b>	Prolonged skin contact is unlikely to result in absorption of harmful amounts. The dermal LD <sub>50</sub> (rabbit) is > 2000 mg/kg. Will irritate the skin.
	<b>Inhaled:</b>	No adverse effects are anticipated from a single exposure to vapour. Inhalation LC <sub>50</sub> (4 hours) for metsulfuron-methyl in rats is > 5 mg/L

**Systemic and other target organ effects:** No effects have been reported at likely levels of exposure.

**Reproductive and Chronic:** Metsulfuron-methyl 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. Metsulfuron-methyl did not cause cancer in laboratory animals.

### Part B:

<b>Acute</b>	<b>Swallowed:</b>	Small amounts swallowed incidental to normal handling operations are unlikely to cause injury. The oral LD <sub>50</sub> for male rats is > 5000mg/kg
	<b>Eye:</b>	Will irritate eyes.
	<b>Skin:</b>	Prolonged skin contact is unlikely to result in absorption of harmful amounts. The dermal LD <sub>50</sub> (rabbit) is > 2000 mg/kg. Repeated exposure may cause allergic disorders
	<b>Inhaled:</b>	No adverse effects are anticipated from a single exposure to vapour. Inhalation LC <sub>50</sub> (4 hours) for rats is > 8 mg/L

**Systemic and other target organ effects:** Effects have been reported in the livers of animals.

**Reproductive and Chronic:** Picloram acid 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. Picloram acid did not cause cancer in laboratory animals.

## PERSONAL PROTECTION AND SAFETY DIRECTIONS

- Will irritate the skin, avoid contact with the skin (Part A)
- Will irritate the eyes, Avoid contact with eyes (Part B).
- Repeated exposure may cause allergic disorders (Part B)
- Wash hands after use.
- When preparing the product for use wear cotton overalls buttoned to the neck and wrist (or equivalent clothing) and a washable hat and elbow-length PVC gloves.
- When preparing Part B for use also wear a face shield or goggles.
- When using the prepared spray, wear cotton overalls buttoned to the neck and wrist (or equivalent clothing) and elbow-length PVC gloves.
- After each day's use wash gloves, face shield or goggles and contaminated clothing.

## FIRST AID

### Part A and B

**General: Consult The Poisons Information Centre (Ph: Australia 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 Information Centre (ph: 131126) 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. Take off contaminated clothing. 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 occurs.

**Inhalation:** If affected. Move person to fresh air, if effects occur call a doctor.

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

## PRECAUTIONS FOR USE

### EXPOSURE STANDARDS

A time weighted average (TWA) concentration for an 8 hour day, and 5 day week has not been established by NOHSC for any of the major ingredients in this product. There is a blanket limit of 10mg/m<sup>3</sup> for dusts or mists when limits have not otherwise been established. The nature of this product makes it unlikely that this level will be approached in normal use. The ADI (Acceptable Daily Intake) for metsulfuron-methyl is set at 0.01 mg/kg/day and for picloram at 0.07 mg/kg/day. The corresponding NOEL (No-observable-effect-level) for metsulfuron-methyl is set at 1 mg/kg/day and for picloram at 7 mg/kg/day. Values taken from Australian ADI List, September, 2002.

### ENGINEERING CONTROLS

In industrial situations, concentrated values below the TWA 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 you believe airborne concentrations of mists, dusts or vapours are high, you are advised to modify the process or environment to reduce the problem.

## SAFE HANDLING INFORMATION

### STORAGE & TRANSPORT

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.

### SPILLS

**Wear appropriate protective equipment (see PERSONAL PROTECTION). Clear area of all unprotected personnel. Prevent entry of chemical or used/damaged containers into drains, streams or waterways.**

**Small Spill:** For clean-up of a spill from a single shipping pack apply absorbent material such as earth, sand, clay granules or cat litter to any liquid spill. Sweep up material when absorption is completed and contain in a refuse vessel for disposal (see DISPOSAL). If spilled inside a building wash contaminated surfaces with a solution of bleach (sodium hypochlorite) prepared according to the bleach label instructions. Do not use chlorine bleach with ammonia when cleaning up Part A as this will release a gas with a musty odour which can cause eye, nose, throat and lung irritation.

**Large Spill:** Place leaking containers into salvage drums. For spilled liquid apply absorbent material such as earth, sand or cat litter to the spill area. Form a barricade around spill and in front of drains or waterways in spill vicinity, using earth or other available material. Sweep up material and contain in a refuse vessel for disposal (see DISPOSAL). **Contact Emergency Services on 000 immediately and notify Dow AgroSciences Australia Limited on 1800 033 882 (24 hours) or 1800 700 096 (Mon-Fri, 8am to 5pm EST).**

### DISPOSAL

Contaminated material must be disposed of in accordance with all State and/or Local regulations.

#### **Small quantities and 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. For small quantities of undiluted material or if not recycling containers, 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.

<b>Large quantities:</b>	Contact Dow AgroSciences and seek advice.
<b>FIRE &amp; EXPLOSION HAZARD</b>	
<b>Flashpoint:</b>	<b>Both Parts:</b> non-flammable
<b>Flammability limits:</b>	<b>Both Parts:</b> Not determined
<b>Extinguishing Media:</b>	<b>Both Parts:</b> alcohol foam, CO <sub>2</sub> , dry chemical
<b>Special Fire Fighting procedures:</b>	Wear positive-pressure self-contained breathing apparatus and full protective clothing. Do not allow water from fire-fighting to enter water supplies
<b>Unusual Fire &amp; Explosion Hazards:</b>	<b>Part A:</b> like most organic powders, or crystals, under severe dusting conditions, this material may form explosive mixtures in air; <b>Part B:</b> No auto ignition temperature when tested to 550 °C.
<b>Stability:</b>	<b>Both Parts:</b> Stable under normal storage conditions
<b>Polymerisation:</b>	<b>Both Parts:</b> Not known to occur
<b>Decomposition Products:</b>	<b>Part A:</b> not known to occur; <b>Part B</b> may produce toxic irritating vapours (hydrogen chloride and nitrogen oxides) may be produced if product is involved in fire.
<b>Materials to avoid:</b>	<b>Both Parts:</b> None under normal use conditions. Under abnormal conditions avoid oxidising materials and strong acids.

## OTHER INFORMATION

### ECOTOXICITY DATA

#### Part A: metsulfuron-methyl

- **Effects on Birds:** Metsulfuron-methyl has very low avian toxicity. The oral LD<sub>50</sub> value for mallard ducks is > 2000 mg/kg, and dietary LC<sub>50</sub> values for mallard ducks and bobwhite quail are > 5000 ppm.
- **Effects on Aquatic Organisms:** Metsulfuron-methyl has very low toxicity to aquatic organisms. 96-hour LC<sub>50</sub> values are > than 150 mg/l in rainbow trout and bluegill. Forty-eight hour toxicity tests with the freshwater invertebrate *Daphnia magna* resulted in a LC<sub>50</sub> of > 150 mg/l. A 21-day life-cycle test with *Daphnia magna* also exhibited very low toxicity. The NOEL for survival and reproduction was >150 mg/L.
- **Effects on Other Animals (Non-target species):** Weight of evidence suggests that no adverse effects are likely to occur in terrestrial animals. Metsulfuron-methyl has low acute toxicity to honey bees with a topical LD<sub>50</sub> of > 25 µg/bee. The LC<sub>50</sub> for earthworms is > 1,000 mg/kg soil.

#### Part B: picloram

- **Effects on Birds:** Picloram has very low avian toxicity. The oral LD<sub>50</sub> value for mallard ducks and bobwhite quail is > 2000 mg/kg, and dietary LC<sub>50</sub> values for mallard ducks and bobwhite quail are > 10,000 ppm.
- **Effects on Aquatic Organisms:** Picloram is moderately toxic to fish. 96-hour LC<sub>50</sub> values are 5-20 mg/l in trout and catfish. Forty-eight hour toxicity tests with the freshwater invertebrate *Daphnia magna* showed slight toxicity with a LC<sub>50</sub> of about 70 mg/l. A 21-day life-cycle test with *Daphnia magna* also exhibited slight toxicity. The NOEL for survival and reproduction was about 12 mg/L. Fish do not accumulate picloram.
- **Effects on Other Animals (Non-target species):** Picloram appears to be relative non-toxic to terrestrial animals. It is practically non-toxic to honey bees with a topical LD<sub>50</sub> of > 100 µg/bee.

### ENVIRONMENTAL FATE

#### Part A: Metsulfuron-methyl

- **Breakdown of Chemical in Soil and Groundwater:** The breakdown of metsulfuron-methyl in soils is largely dependant on soil temperature, moisture content, and pH. It will degrade faster under acidic conditions, and in soils with higher moisture content and higher temperature. It has a higher mobility potential in alkaline soils than in acidic soils, as it is more soluble under alkaline conditions. Metsulfuron-methyl is stable to photolysis, but will break down in ultraviolet light. Half-life estimates for metsulfuron-methyl in soil are wide ranging from 14 - 180 days, with an overall average of reported values of 30 days.

Reported half-life values for soil include: clay - 178 days; sandy loam - 102 days; clay loam - 70 days, 14-28 days, 14-105 days; silty loam - 120-180 days.

- **Breakdown of Chemical in Surface Water:** Metsulfuron-methyl is stable to hydrolysis at neutral and alkaline pHs, and has a half-life of 3 weeks at pH 5.0, 25 °C and >30 days at 15 °C.
- **Breakdown of Chemical in Vegetation:** Metsulfuron-methyl is rapidly taken up by plants at the roots and on foliage. The chemical is translocated throughout the plant, but is not persistent. It is broken down to non-herbicidal products in tolerant plants.

#### Part B: picloram

- **Breakdown of Chemical in Soil and Groundwater** Long-term build-up of picloram in the soil generally does not occur. Picloram will dissipate more quickly in warm, wet weather as these conditions are favourable for breakdown by microbial action. Alkaline conditions, fine textured clay soils and a low density of plant roots can increase the persistence of picloram. The picloram half life in soil is 1-3 months under conditions favourable to its breakdown. In heavy clay soil, picloram has a half life of slightly over two months. Breakdown by soil micro-organisms occurs slowly, resulting in the formation of carbon dioxide (CO<sub>2</sub>) and the release of a chloride ion. The compound is mobile in soil, especially those low in organic matter content, alkaline soils and soils which are highly permeable, sandy, or light textured. Picloram typically remains in the top 30cm of the soil layer, however it does have the potential to leach into groundwater and should not be applied to any surface which would allow direct pollution of ground-water.
- **Breakdown of Chemical in Surface Water:** Picloram dissolves readily in water and is stable to hydrolysis at neutral and alkaline pHs. In water, the action of sunlight is an important mechanism leading to the breakdown of the product - the half-life varies from 1 - 40 days depending on sunlight intensity and water clarity. In shallow clear water the half-life is 3 days and will likely disappear within 7 - 22 days. The movement of picloram in run-off after heavy rainfall may occur because it mostly dissolves in water rather than be absorbed to suspended particles.
- **Breakdown of Chemical in Vegetation:** Picloram is readily absorbed by plant roots and foliage, and is readily translocated throughout plants. It remains stable and intact in plants.

## CONTACT POINT

**FOR FURTHER PRODUCT INFORMATION CALL DOW AGROSCIENCES CUSTOMER SERVICE REPRESENTATIVES TOLL FREE 1800 700 096 DURING BUSINESS HOURS.**

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. THE 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.