

UNIVERSAL RADICAL 250 EC

MATERIAL SAFETY DATA SHEET

1. PRODUCT & COMPANY IDENTIFICATION

Product Name: Radical 250 EC
Herbicide

UN No.: 2903

Company: Universal Crop Protection (Pty) Ltd.
Co. Reg. No.: 1983/008184/07
PO Box 801,
Kempton Park, 1620, South Africa

Telephone: (011) 396 2233
Fax: (011) 396 4666
Website: www.villacrop.co.za

Emergency telephone numbers:
24 Hr Transport / Spill emergency no:
 Envirosure. +27 31 205 4918
 (Hazcall24) +27 86 044 4411
 (Client: Villa Crop Protection)
 Griffon Poison Information Centre +27 82 446 8946
 (Client: Villa Crop Protection)

Poisoning Emergency telephone numbers:
 Griffon Poison Information Centre +27 82 446 8946
 Poisons Information Centre +27 861 555 777

Villa Crop Protection Emergency number:
National Safety, Health and Environmental Manager:
 +27 63 698 0668

2. COMPOSITION/INFORMATION ON INGREDIENTS

Common Name: Flurochloridone
Chemical Name: 3RS,4RS;3RS,4SR)-3-chloro-4-chloromethyl-1-(α,α -trifluoro-m-tolyl)-2-pyrrolidinone (in ratio 3:1) (IUPAC)
CAS No.: [61213-25-0]
Chemical Family: N/A
Chemical Formula: $C_{12}H_{10}C_{12}F_3NO$ (Mol. wt.: 312.115)
Formulation: Flurochloridone 250 (w/v) Emusifiable concentrate
Use / Mode of Action: Inhibits synthesis of carotenoids (which prevent chlorophyll from undergoing photo-oxidation) by inhibition of phytoene desaturase. Selective herbicide, absorbed by the roots, stems, and coleoptiles. Uses Applied at 250-750 g/ha pre-emergence to control a wide range of weeds in sunflowers.

Hazardous Ingredient:
 Flurochloridone 25%

Inert 57%

SYMBOLS: F, Xi, Xn, N
RISK-PHRASE(S): R 10, R 36/36, R 52/53

3. HAZARD IDENTIFICATION

Toxicity class:
 WHO III. Slightly hazardous.
 Cause irritation to the skin and eyes.

May cause skin and eye irritation.

Flammable.
 Toxic to aquatic organisms. May cause long-adverse effects in the aquatic environment.

4. FIRST AID MEASURES AND PRECAUTIONS

Remove the victim from the area of exposure. Wash off remaining material with plenty of water. In the event of any complaints or symptoms, avoid further exposure. Immediately consult a doctor. Inert is irritating to respiratory system and may cause lung damage if swallowed. Vapour may cause drowsiness and dizziness. Repeated exposure may cause skin dryness and cracking.

Inhalation:
 Immediately remove source of contamination or move victim to fresh air. If breathing has stopped, perform artificial respiration and administer oxygen. Avoid mouth-to-mouth resuscitation. Keep person warm and at rest. Treat symptomatically and supportively as and when required. **Seek medical advice immediately.**

Skin contact:
 Remove contaminated clothing, shoes and leather goods immediately. Gently wipe off excess chemical. Wash skin gently and thoroughly with non-abrasive soap or mild detergent and large amounts of water until no evidence of chemical remains (approximately 15 to 20 minutes). Seek medical advice if necessary.

Eye contact:
 Flush eyes immediately with large amounts of gently flowing cold water or normal saline solution, occasionally lifting upper and lower lids, until no evidence of chemical remains (approximately 15 to 20 minutes). If irritation persists, get medical attention.

Ingestion:
 Have victim rinse mouth thoroughly with water. **Do not induce vomiting, due to the aromatic solvent. Seek medical advice immediately.** If the person is alert and respiration is not depressed, give large quantity of water to drink. Never give anything by mouth to an unconscious person. Establish and maintain airway. Treat respiratory difficulty with artificial respiration and oxygen. Qualified medical personnel should perform administration of gastric lavage or oxygen.

Advice to physician:

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Keep patient prone and quiet. Start artificial respiration immediately; if patient is breathing never give anything by mouth to an unconscious person. In serious cases, medical attention should be sought.

5. FIRE FIGHTING MEASURES

Fire/Explosion hazard:

Flammable. Fire risk

Flash point: ~61 °C

Vapour may cause drowsiness and dizziness

Extinguishing agents:

Extinguish fires with carbon dioxide, dry powder, or alcohol-resistant foam. Water spray can be used for cooling of unaffected stock, but avoid water coming in contact with the product. Use as little water as possible. Use spray or fog. Solid stream may cause spreading. Contain water used for fire fighting for later disposal. Avoid the accumulation of polluted run-off from the site.

Fire fighting:

Remove spectators from surrounding area. Isolate the fire area and evacuate downwind. Use a recommended extinguishing agent for the type of surrounding fire.

Fight fire from maximum distance and use unmanned hose holder or monitor nozzles. Contain fire control agents for later disposal. Avoid inhaling hazardous vapours and fumes from burning materials. Keep upwind.

Remove container from fire area if possible and without risk. Water can be used to cool unaffected containers but must be contained for later disposal.

Dyke fire control water for later disposal. Do not scatter the material. Avoid pollution of waterways.

Do not use high volume water jet, due to contamination risk. Contain water used for fire fighting for later disposal. Avoid the accumulation of polluted run-off from the site.

Personal protective equipment:

Fire may produce irritating or poisonous vapours or gases (oxides of chlorine and sulphur) or other products of combustion. Fire fighters and others that may be exposed should wear full protective clothing and self-contained breathing apparatus.

6. ACCIDENTAL RELEASE MEASURES (Spillage)

Personal precautions:

Avoid contact with skin and eyes. Do not breathe in fumes. For personal protection see Section 8.

Environmental precautions:

Do not apply on directly to water, to areas where surface water is present or to intertidal areas below the mean mark. Do not contaminate water by disposal of equipment washwaters. See "Storage, shipment and Disposal" section. In case of spills properly dispose of contaminated materials.

Occupational spill:

Do not touch-spilled material; stop leak if you can do it without risk. Keep out unprotected persons and animals.

For spills: Soak up with absorptive material such as damp earth or sand or other suitable non-combustible absorbent material. Place the material into a clean, dry container and cover for subsequent disposal. In situations where product comes in contact with water, contain contaminated water for later disposal. Prevent material from spreading by damming in with absorptive material. Do not flush spilled material into drains. Keep spectators away and upwind.

To decontaminate spill area, tools and equipment, wash with a suitable solution (i.e. organic solvent, detergent bleach or caustic). Add the solution to the drums already collected. Label drums with its content and dispose it in accordance with local regulations.

Open burning or dumping of this material is prohibited.

Do not get water inside containers.

7. HANDLING AND STORAGE REQUIREMENTS

Handling:

Harmful if swallowed. Avoid inhalation and contact with eyes and skin. Use with adequate ventilation. Do not handle broken packages without protective equipment. Wash hands before eating, drinking, chewing gum, smoking, or using the toilet. Remove clothing immediately if the product gets inside. Then wash skin thoroughly using a non-abrasive soap and put on clean clothing. Seek medical advice.

Do not apply directly to areas where surface water is present, or to intertidal areas below the mean high water mark. Water used to clean equipment must be disposed of correctly to avoid contamination.

Worker should shower at the end of each work day. Launder all clothing before it is re-used again.

Storage:

Store in its original container in dry, cool, well-ventilated area. Avoid excess heat. Not to be stored next to foodstuffs and water supplies.

Keep out of reach of children, uninformed persons and animals. Do not contaminate other pesticides and fertilizers.

Storage stability:

Stable for a period of 2 years under normal warehouse conditions.

8. EXPOSURE CONTROL/PERSONAL PROTECTION

It is essential to provide adequate ventilation. The measures appropriate for a particular worksite depend on how this material is used and on the extent of exposure. Ensure that control systems are properly designed and

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maintained. Comply with occupational safety, environmental, fire, and other applicable regulations.

PERSONAL PROTECTIVE EQUIPMENT:

Respirator:

An approved full-face respirator suitable for protection from spray or mists of pesticides is required. Limitations of respirator use specified by the approved agency and the manufacturer must be observed.

Clothing:

Employee must wear appropriate protective (impervious) clothing; boots, hat and equipment to prevent repeated or prolonged skin contact with this substance. Do not wear leather clothing.

Gloves:

Employee must wear appropriate chemical resistant protective gloves to prevent contact with this substance.

Eye protection:

The use of chemical resistant goggles or face shield.

Emergency eyewash: Where there is any possibility that an employee's eyes may be exposed to this substance, the employer should provide an eye wash fountain or appropriate alternative within the immediate work area for emergency use.

9. PHYSICAL AND CHEMICAL PROPERTIES

Appearance: Light yellow or brown liquid

Odour: Aromatic hydrocarbon

Relative density: 1.02 -1.05 g/mg at 25 °C.

Solubility in water: Soluble

Flash point: ~61 °C

Flammability: Flammable. Fire risk

pH: 6 to 8

pH of 1% aqueous dilution: 4 to 7

10. STABILITY AND REACTIVITY

Stability:

Considered stable. DT₅₀ 7d (pH 4, 60 °C); DT₅₀ 18d (pH 7, 60 °C); DT₅₀ 15d (pH 7, 120 °C); DT₅₀ 138d (pH 7, 100 °C); DT₅₀ 11~ 100 d in soil

Condition to avoid:

Avoid mixed with strong acids and alkalis.

Material to avoid: Oxidising agents and acids

Hazardous decomposition:

Thermal decomposition may emit toxic fumes of CO₂, NO_x and organic sulphides.

Hazardous Polymerisation: Will not occur

11. TOXICOLOGICAL INFORMATION

Formulation:

Acute oral LD₅₀: >2000 mg/kg

Acute dermal LD₅₀: >2000 mg/kg

Acute inhalation LC₅₀: 10.3 mg/ℓ/4 hours Inert is irritating to respiratory system

Acute skin irritation: Moderate skin irritant.

Acute eye irritation: Moderate eye irritation

Sensitization: Non sensitizer

Teratogenicity/ Development: Negative

Mutagenicity: Negative

Carcinogenicity: Limited evidence of carcinogenic effect

Toxicity class: WHO III

12. ECOLOGICAL INFORMATION

In animals: **Flurochloridone** is extensively metabolised and rapidly excreted in rats; >95% of orally applied dose was excreted in 90 h. Metabolism by oxidation, hydrolysis and glutathione conjugation yielded numerous metabolites in urine and faeces.

In plants: 1 **Flurochloridone** is rapidly metabolised in plants. Numerous minor metabolites are formed through oxidation and conjugation. Residue levels of **Flurochloridone** in crops are generally < 0.05 mg/kg.

In the soil: In the lab., **Flurochloridone** is readily degraded in soil, mostly forming CO₂ and a bound residue; DT₅₀ (3 soil types, aerobic, 28 °C) 4, 5 and 27 d; two metabolites were formed, which were readily degraded further. In aerobic sediment, **Flurochloridone** degraded with DT₅₀ 3-18 d (2 soils). In the field, DT₅₀ 9-70 d. K_{oc} 680-1300, K_d 8-19, indicating low potential mobility on the McCall classification scale; **Flurochloridone** does not leach because it is adsorbed and readily degraded in soil.

ECOTOXICOLOGY:

Birds:

LD₅₀: for bobwhite quail >2000 mg/kg

LC₅₀ (5 d) for mallard ducks & bobwhite quail >5000

mg/kg diet

Fish: Toxic to aquatic organisms

LC₅₀ (96 hours): For rainbow trout: 3.0 mg/ℓ

Bluegill sunfish: 6.7 mg/ℓ

Daphnia: Very toxic to Daphnia.

LC₅₀: (48 h) 5.1 mg/ℓ

Bees: Not hazardous to bees

LD₅₀: (contact and oral) >100 µg/bee

Earthworms:

LC₅₀: 691 mg/kg

13. DISPOSAL CONSIDERATION

Pesticide disposal:

Open dumping or burning of this pesticide is prohibited. Waste resulting from the use of this product cannot be

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reused or reprocessed. Never pour untreated waste or surplus products into public sewers or where there is any danger of run-off or seepage into water systems. Do not contaminate rivers, dams or any other water sources with the product or used containers.

Comply with local legislation applying to waste disposal.

Container disposal:

Emptied containers retain vapour and product residues. Observe all labelled safeguards until container is destroyed.

TRIPLE RINSE empty containers in the following manner: Invert the empty container over the spray or mixing tank and allow draining for at least 30 seconds after the flow has slowed down to a drip. Thereafter rinse the container three times with a volume of water equal to a minimum of one third of that of the container. Add the rinsing to the contents of the spray tank before destroying the container in the prescribed manner.

Do not re-use the empty container for any other purpose but destroy it by perforation and flattening and bury in an approved dumpsite. Prevent contamination of food, feedstuffs, drinking water and eating utensils.

Comply with local legislation applying to waste disposal.

14. TRANSPORT INFORMATION

UN No.: 2903
Road Transport ADR/IRD:
 Class: 6.1
 Packing group: III
 Shipping name: Pesticide, Liquid, Toxic,
Flammable, N.O.S.
Flurochloridone 250 (w/v)
Maritime Transport IMDG/IMO:
 Class: 6.1
 Packing group: III
 Shipping name: Pesticide, Liquid, Toxic,
Flammable, N.O.S.
Flurochloridone 250 (w/v)

15. REGULATORY INFORMATION

Symbol: F, Xi, Xn, N
Indication of danger: **Flammable**, Irritant, Harmful and Environmentally Hazardous Substance.

Risk phrases:

R 10 **Flammable**
R 20/22 Harmful by inhalation and if swallowed.
R 36/37/38 Irritation to eyes, respiratory system and skin.
R 51/53 Toxic to aquatic organisms, may cause long-term adverse effects in the aquatic environment.

Safety phrases:

S 1/2 Keep locked up and out of the reach of children.
S 3/7/9 Keep container tightly closed in cool, well-ventilated place
S 13 keep away from food, drinks and animal feedingstuffs.
S 15 keep away from heat
S 24/25 Avoid contact with skin and eyes.
S 29/35 Do not empty into drains; dispose of this material and its container in a safe way
S 36/37/39 Wear suitable protective clothing, gloves and eye/face protection.
S 42 During fumigation and spraying wear suitable respiratory equipment.
S 45 In case of an accident or if you feel unwell, seek for medical advice
S 60 This material and its container must be disposed of as hazardous waste.

16. OTHER INFORMATION

Packing and Labelling:

Packed in 1, 2, 5, 10, 20, 25 and 50 litres fluorinated plastic containers and labelled according to the South African regulations and guidelines.

Disclaimer:

The information on this sheet is not a specification; it does not guarantee specific properties. The information is intended to provide general guidance as to health and safety based upon our knowledge of the handling, storage use of the product. It is not applicable to unusual or non-standard uses of the product nor where instructions or recommendations are not followed. All information is given in good faith but without guarantee in respect of accuracy, and no responsibility is accepted for errors and omissions or the consequence thereof.

END OF DOCUMENT

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For detailed information on revisions, contact the Registration holder.