



# RADIATE

Reg. No./Nr. L 9569, Act/Wet No./Nr. 36 Of/Van 1947  
N-AR 1540

**GROUP O HERBICIDE**

READ THE LABEL BEFORE USE  
KEEP OUT OF REACH OF CHILDREN AND ANIMALS

A residual, water soluble, systemic herbicide acting through the leaves, roots and cut surfaces, for the control of certain woody plants as listed, in grazing, conservation areas and on non-crop land.

'n Nawerkende, wateroplosbare, sistemiese onkruidodder wat deur blare, wortels en gesnyde oppervlaktes werk, vir die beheer van sekere houtagtige plante, soos aangetoon, in weidings, bewaringsgebiede en op lande waarop gewasse nie verbou word nie.



## WARNING

### Hazard Statements

May be harmful if swallowed and enters airways  
Causes severe skin burns and eye damage  
Causes serious eye irritation  
May cause respiratory irritation  
May cause damage to organs  
Toxic to aquatic life with long lasting effects

### Precautionary Statements

Do not breathe fumes/gas/mist/vapours/spray.  
- IF SWALLOWED - Get emergency medical help immediately.  
IF ON SKIN - Take off immediately all contaminated clothing. Immediately rinse with water for several minutes.  
IF IN EYES - Immediately rinse with water for several minutes. Remove contact lenses if present and easy to do – continue rinsing

### Active ingredient/Aktiewe bestanddeel

240 g/l Picloram (as the Potassium salt) 240 g/l Pikloram (As die kalium sout)

Net volume 1 l Netto volume

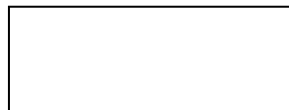
### REGISTRATION HOLDER / REGISTRASIEHOUER:

Agritech Bioscience (Pty) Ltd / (Edms) Bpk t/a Carabiner  
Reg. No. 2008/004392/07  
PO Box / Posbus 1224  
Isando  
1600

Batch No. ....



Date of Manufacture .....  
Expiry date (< 2 years).....



..... Lot Nr.

..... Datum van Vervaardiging  
..... (< 2 jr) Vervaldatum



UN No. Not regulated

### In case of poisoning, call the following number:

Poison centre (Unitas hospital): Emergency Number: 012 664 1100  
TYGERBERG: Emergency Number: 021 931 6129  
RED CROSS: Emergency Number: 021 689 5227  
RAPID SPILL RESPONSE: Emergency Number: 0800 775 3305  
GRIFFON POISON CENTRE: Emergency Number: 082 446 8946

## WARNINGS

- GHS Hazard statements

May be harmful if swallowed and enters airways  
Causes severe skin burns and eye damage  
Causes serious eye irritation  
May cause respiratory irritation  
May cause damage to organs  
Toxic to aquatic life with long lasting effects

- Handle with care.
- Poisonous when swallowed. May cause eye and skin irritation.
- Store under lock and key in a cool, dry place away from food, feed, fertilizer, and other agricultural products.
- Keep out of reach of children, uninformed persons, and animals.
- **Re-entry** – Do not enter treated area until the spray deposit has dried unless wearing protective clothing.
- **Aerial application:** Notify all inhabitants in the immediate vicinity of the area to be sprayed and issue the necessary warnings. Do not apply over water bodies and ensure that spray drift will not contaminate areas not under treatment.

### Grazing Restrictions:

- Meat animals grazing up to two weeks after treatment must be removed from the treated area three days prior to slaughter.
- Do not graze any lactating dairy animals on treated area within two weeks after treatment.

**Grazing poisonous plants:** Herbicide application may increase the palatability of certain poisonous plants. Do not graze the treated areas until the poisonous plants are dry and no longer palatable to livestock.

## DISCLAIMER

**Although this remedy has been extensively tested under a large variety of conditions, the registration holder does not warrant that it will be effective under all conditions. The activity and effect thereof may be affected by factors such as abnormal soil, climatic and storage conditions, quality of dilution water, compatibility with other substances not indicated on the label and the occurrence of resistance of the weed against the remedy, as well as by the method, time, and accuracy of application. The registration holder furthermore does not accept responsibility for damage to crops, vegetation, the environment or harm to man or animal, or for lack of performance of the herbicide concerned due to failure by the user to follow the label instructions, or to the occurrence of conditions which could not have been foreseen in terms of the registration. Consult the supplier in the event of any uncertainty.**

## PRECAUTIONS

- GHS Precautionary statements

If medical advice is needed, have product container or label at hand.  
Keep out of reach of children.  
Read carefully and follow all instruction.  
Do not breathe dust/fumes/gas/mist/vapours/spray.

Avoid breathing dust/fumes/gas/mist/vapours/spray.  
 P264 + P265 - Wash hands thoroughly after handling. Do not touch eyes.  
 Use only outdoors or in a well-ventilated area.  
 Avoid release to the environment.  
 Wear eye protection/face protection.  
 IF SWALLOWED - Rinse mouth. Do NOT induce vomiting. Get emergency medical help immediately.  
 IF ON SKIN - Take off immediately all contaminated clothing. Immediately rinse with water for several minutes.  
 IF INHALED - Remove person to fresh air and keep comfortable for breathing.  
 IF IN EYES - Immediately rinse with water for several minutes. Remove contact lenses if present and easy to do – continue rinsing.  
 Get emergency medical help immediately.  
 Specific treatment (see first aid on this label).  
 Do NOT induce vomiting.  
 If eye irritation persists, get medical help.  
 Wash contaminated clothing before reuse.  
 Absorb spillage to prevent material-damage.  
 Collect spillage.  
 Store in a well-ventilated place. Keep container tightly closed. P405 - Store locked up.  
 Store locked up.  
 Dispose of contents/container in accordance with local / regional / national / international regulations.

- Do not inhale fumes or spray mist.
- Avoid eye contact.
- In case of accidental eye contact, flush with plenty of clean water for at least 15 minutes and get medical attention if irritation persists.
- Wash with soap and water immediately after use and accidental skin contact.
- Wash contaminated clothing daily.
- Do not eat, drink, or smoke while mixing or applying the product, or before washing hands and face and changing clothes.
- Avoid drift of spray onto other crops, grazing, rivers, dams, and areas not under treatment.
- Clean the applicator after use with a 1% household ammonia solution before using it with other material. Let the solution stand for several hours or, more preferably, overnight. Rinse at least twice with clean water. The applicator must not be used for applying chemicals other than herbicides. Dispose of the rinsate where it will not contaminate crops, grazing, rivers, dams, and boreholes.
- Prevent contamination of food, feeds, drinking water and eating utensils.
- Invert the empty container over the spray or mixing tank and allow draining for at least 30 seconds after the flow has slowed to a drip. Thereafter, rinse the empty container three times with a volume of water equal to a minimum of 10% of that of the container. Add the rinsate to the contents of the spray tank.
- Destroy the empty container by perforation and flattening and **DO NOT** use the empty container for any other purpose.

## RELEVANT SUBSTANCES

Chemical name	Composition	Classification according to Regulation EC 1272/2008 (CLP)
Picloram	≤ 25%	Eye Irrit. Cat. 2A STOT-SE Cat. 3 respiratory tract STOT-RE Cat. 2 Aspiration Hazard Cat. 2 Aquatic Acute Cat. 1.

		Aquatic Chronic Cat. 1.
Potassium hydroxide	≥ 7 - <8%	Acute Oral Tox. 4 Skin corrosion / irritation Cat. 1A

## FIRST AID

Provide medical personnel with the container label, product name or safety data sheet (SDS) when seeking medical attention.

General Information: Remove patient from exposed area. Never give fluids or induce vomiting if patient is unconscious or is having convulsions.

Inhalation: Remove patient to fresh air. Loosen clothing around neck. Lie down and keep warm and rested. If breathing is shallow or has stopped ensure airway is clear and apply resuscitation. **Seek medical assistance immediately.**

Skin contact: Immediately flush body and clothes with large amounts of water and soap. Remove contaminated clothing and footwear. Wash affected areas with soap and water. Do not rub skin. Persons providing first aid must wear gloves to avoid self-contamination. Seek medical assistance if irritation occurs.

Eye contact: Flush eyes with plenty of clean, room temperature water for at least 15 minutes holding eyelids open. Remove contact lenses. Call a doctor for treatment advice. Obtain medical attention immediately if irritation persists. If symptoms (e.g., redness, irritation, pain etc) persist after 15 minutes of irrigation, refer the patient to an ophthalmologist for an eye examination.

Ingestion: Never give anything by mouth to an unconscious person or to a person having convulsions. Do not induce vomiting. For advice, contact the National Poisons Centre. Seek medical assistance immediately. The decision of whether to induce vomiting or not must be made by an attending physician.

Treat symptomatically and supportively.

## NOTICE TO USER

This agricultural remedy is to be used only in accordance with the instructions on this label. It is an offence under the Act to use this product in a manner contrary with the directions on the label.

## RESISTANCE MANAGEMENT WARNING STATEMENT

For resistance management, **RADIATE** is a group code O herbicide. Any weed population may contain individuals naturally resistant to **RADIATE** and other group code O herbicides. The resistant individuals can eventually dominate the weed population if these herbicides are used repeatedly. These resistant weeds may not be controlled by **RADIATE** or any other group code o herbicide.

### To delay herbicide resistance:

- Avoid exclusive repeated use of herbicides from the same herbicide group code. Alternate or tank mix with registered products from different herbicide group codes.
- Integrate other control methods (chemical, cultural, biological) into weed control programmes.

For specific information on resistance management, contact the registration holder of this product.

## MODE OF ACTION

**RADIATE** is a selective, systemic herbicide, which is absorbed rapidly by the roots and leaves and translocated both acropetally and basipetally, accumulating in new growth.

## **USE RESTRICTIONS**

**RADIATE** is toxic to some plants at very low concentrations, therefore, the precautions which must be followed in order to avoid injury to non-target plants are:

- **Do not apply RADIATE in any way contrary to this label.**
- **Do not permit the spray mist to drift** or to come into contact with sensitive broadleaf crops including, but not limited to, lucerne, beans, melons, potatoes, soyabeans, sunflowers, tobacco, tomatoes, cotton, fruit trees, grape vines, ornamentals, soil containing roots of these plants, soil in which such plants are to be grown, grain varieties in a susceptible stage of growth or grazing, or any other area not under treatment.
- **Do not contaminate water which is intended for irrigation or domestic purposes.** In order to avoid injury to crops or other desirable plants, do not treat or allow the spray, spray drift or spray run-off, to fall onto the banks or the bottoms of irrigation ditches, canals, streams, dams, rivers, either dry or containing water, that may be used for irrigation or domestic purposes or may carry water to an irrigation facility.
- **Do not make any application when the circumstances favour movement from the treatment site.**
- **Do not apply to any areas that may be rotated to any broadleaf crop.**
- **Do not use any manure** from animals grazing treated areas on land used for growing already established, or yet to be established, broadleaf crops, ornamentals, orchards, or other susceptible crops. The manure may contain enough picloram to cause injury to susceptible plants.
- **Do not use grass or sprayed plants** from a treated area for composting or mulching of susceptible broadleaf plants or crops.
- **Do not transfer livestock** from any treated grazing areas (or feeding of treated grass), onto sensitive broadleaf crop areas without first allowing 7 days of grazing of an untreated grass pasture. Otherwise, the urine or faeces may contain enough picloram to cause injury to sensitive broadleaf plants.
- **Do not use on flood-irrigated lands or fields.**
- **Do not apply if the loss of forage legumes, including clover, cannot be tolerated.** Any new legume seedlings may take years to re-establish.
- **Do not move any treated soil** to areas other than sites for which **RADIATE** is registered for use.
- **Do not apply through a mist-blower.**
- **Do not apply to land nearby to desirable broadleaved plants** or land onto which such plants are to be grown, or grain varieties in a susceptible stage of growth. May, however, be applied in the **VICINITY** of desirable broadleaved plants, or soil or land onto which such plants are to be grown, or

grain varieties in a susceptible stage of growth, **PROVIDED THAT ADEQUATE PRECAUTIONS ARE TAKEN IN ORDER TO AVOID SPRAYDRIFT** (See the wind speed table below) **OR CONTAMINATION OF RUN-OFF AREAS.**

- Apply the product strictly according to the application directions.

**Do not apply by air in KwaZulu Natal.**

**The wind speed and direction at the time of application will determine the distance which must separate the closest edge of the area to be sprayed from susceptible plants and crops.**

WIND SPEED km/h	GROUND APPLICATION	AERIAL APPLICATION
2 - 15	2.0 km downwind 2.0 km crosswind 1.0 km upwind	5.0 km downwind 5.0 km crosswind 2.0 km upwind
Above 15	Prohibited	Prohibited

Do not apply this product in combination or tank mixture with any other product or agricultural remedy which is not specifically listed on this label. Agritech Bioscience (Pty) Ltd. accepts no responsibility for any negative effects experienced if the instructions on this label are not adhered to, unless an Agritech Bioscience representative was consulted beforehand.

**DIRECTIONS FOR USE - Use only as directed.**

#### **TIMING OF APPLICATION**

##### **POISON LEAF:**

For optimum control apply **RADIATE** only when the **CURRENT SEASON'S GROWTH IS FULLY DEVELOPED**, but before the leaves start to turn yellow in the early autumn.

In this respect, it is recommended that spraying should not be done before November, by which time most of the new stems will have emerged and would have produced mature leaves.

Spraying earlier in the spring (when most of the new growth present consists of recently emerged stems with immature leaves) will result in unsatisfactory control.

Do not apply **RADIATE** if more than 25% of the foliage has been destroyed by caterpillars or other insects.

Any re-growth which is found in the second season after application should be re-sprayed.

When spraying old stems that have not yet produced leaves, also spray the surrounding soil for at least 30 cm from the stem.

##### **OTHER SPECIES:**

Apply **RADIATE** only on actively growing plants and when the soil moisture is favourable for plant growth.

Apply only when the trees are in the correct growth stage as indicated below:

- ♣ Only spray trees where the leaves have fully developed.
- ♣ Spray only onto healthy and vigorously growing trees.
- ♣ Spray only onto trees with full foliage cover.
- ♣ Do not apply onto wet foliage.
- ♣ Do not spray after a late frost.
- ♣ Deciduous plants may drop their leaves when stressed. Do not spray target plants showing signs of stress or when signs of drought are evident. Caution must be exercised when applying foliar applications to deciduous plants during autumn, in order to prevent rapid leaf drop as a combination of stress and herbicide application. Should this happen, provision should be made for follow-up treatments.

## **MIXING INSTRUCTIONS**

Mix **RADIATE** with water and add an adjuvant such as Actipron Super according to the instructions for the different plants. Once the spray mixture has been mixed, no further agitation is needed.

## **METHODS OF APPLICATION**

### **A. AERIAL**

Aerial application may only be done by a registered aerial application operator using a registered and correctly calibrated aircraft according to the instructions of SANS Code 10118 (Aerial Application of Agricultural Remedies). It is important to ensure that the spray mixture is distributed evenly over the target area and that the loss of spray material during application is restricted to a minimum. It is, therefore, essential that the following criteria be met:

#### **Equipment**

- Use suitable atomising equipment (hydraulic nozzles or rotary atomisers) that will produce the desired droplet size and coverage of the target area and will ensure the minimum loss of product through drift.
- The operator must use a nozzle set-up that will produce a droplet spectrum with the lowest possible relative span.
- All nozzles and atomisers should be positioned within the inner 60-75% of the wingspan to prevent droplets from entering the wingtip vortices.

#### **Application Parameters**

- A minimum volume of 30 – 35 l spray mixture per ha is recommended. As this product has not been evaluated at a reduced volume rate, the registration holder cannot guarantee efficacy nor be held responsible for any adverse effects if this product is applied aerially at a lower volume rate than recommended.
- A droplet coverage of 30 – 40 droplets per square cm must be recovered at the target.
- A droplet spectrum with a VMD of 300 – 350 microns is recommended. Ensure that the production of fine droplets, with a VMD less than 150 microns, is restricted to a minimum.
- The height of the spray boom should be maintained at between 3 and 4m above the target.
- Do not spray when the aircraft is in a climb, at the top of a turn, or during a dive, or when banking.

#### **Meteorological Conditions**

- The difference between the wet and dry bulb readings as determined by a whirling hygrometer must not exceed 8 °C.
- Do not spray under turbulent, unstable conditions nor during the heat of the day when rising thermals and downdraughts occur.
- Do not spray under temperature inversion conditions (spraying in or above the inversion layer) as this may lead to the following:

1. Reduced efficacy due to suspension and evaporation of small droplets in the air (leading to inadequate coverage).
  2. Damage to other sensitive crops and/or non-target areas via the movement of the suspended spray cloud away from the target area.
- Do not spray when the wind speed exceeds 15 km per hour.

### General

- Ensure that fields are accurately marked and that the aerial spray operator knows exactly which fields to spray.
- Obtain an assurance from the aerial spray operator that the above requirements will be met, and that the relevant data will be compiled in a logbook and kept.

### B. GROUND\_

Ensure that the equipment is correctly calibrated and is checked regularly during application to ensure even and accurate application. Only clean water should be used

#### a) Knapsack & Tractor Application

**Knapsack:** Avoid fine droplet size - use a knapsack sprayer with a solid cone nozzle, e.g., Spraying Systems TG1 (or an equivalent type) that will ensure even coverage of the target area.

Maintain a constant pressure of between 200 - 250 kPa.

Maintain a distance of approximately 50 cm from the target for the best coverage.

**Knapsack or Tractor:** For linear application with a knapsack or tractor and boom, apply in sufficient water per hectare to ensure even coverage. This will be 250 – 350 litres spray mix per hectare depending on the plant height and weed species. Consult your local distributing agent for further advice.

#### b) High Volume Application (Only with a foaming agent)

Use a motorized pump that is capable of applying pressures of 1000 - 1200 kPa - use a Spraying Systems Foam jet FJ 0006 aspirating nozzle, (or an equivalent type.) Add a commercially available foaming agent as a temporary spray application marker.

#### c) General

Apply **RADIATE** as a complete cover spray to leaves and stems.

Use **RADIATE** only on actively growing plants, up to 2 metres in height, with full leaf cover.

Apply sufficient spray mixture to wet the foliage until just before the point of run-off.

Do not apply if it is likely to rain within 3 hours of application.

Do not apply to wet foliage.

Do not apply if the wind velocity exceeds 15 km/h (as measured by handheld wind recorder approved by the Registrar: Act No. 36 of 1947). The difference between the wet and dry bulb readings on a whirling hygrometer must not exceed 8 °C.

### CUT STUMP TREATMENT

- ❖ Preferably apply immediately after felling but definitely within 3 hours.
- ❖ **RADIATE** should not be applied to the stump if the surface is wet from rain or dew.
- ❖ Apply **RADIATE** with a knapsack, as a coarse spray using solid cone nozzle tips (e.g., Spraying Systems TG-1, Delavan CE 1, or equivalent type) at 100 kPa, low pressure.



- ❖ Do not exceed a spray height of 20 cm above the target. Do not apply if the wind velocity exceeds 15 km/h (as measured by handheld wind recorder). The difference between the wet and dry bulb readings on a whirling hygrometer must not exceed 8 °C.
- ❖ Apply **RADIATE** according to directions in the table below.

## FRILL METHOD

Using an axe, make horizontal, downward angled cuts through the bark in order to penetrate, but not go deeper, than into the sapwood. Immediately apply the spray mixture into every cut, taking care that it is not wasted on the bark. The cuts should be connected and made around the entire circumference of the trunk as close to the soil surface as possible. Re-treat as necessary.

### Warning:

If top kill is obtained but re-growth occurs from the crown, apply **TRIMAX E** (Reg. No. L 7666, Act No. 36 of 1947) or **RADIATE** as a foliar spray.

- In the case of trees with multiple stems, treat each stem separately.
- Check for adequate sap flow and bleeding.

## RECOMMENDATIONS

### A. AERIAL APPLICATION

Bush / shrub species	Rate / ha	Remarks
<i>Dichrostachys cinerea</i> (Sickle bush)	2.0 ℓ	See DIRECTIONS FOR USE above. Apply <b>RADIATE</b> in 30 ℓ water per hectare.
	2.0 ℓ	<u>CDA application:</u> Mix 2.0 ℓ <b>RADIATE</b> with 2.0 ℓ Actipron Super and 6.0 ℓ water. Apply 10 ℓ of the spray mixture per hectare.

### B. FOLIAR TREATMENT – GROUND APPLICATION

#### Note:

For foliar application using a knapsack sprayer, Actipron Super should be added at a rate of 500 ml / 100 ℓ spray mix (0.5% mixture).

Alien bush / shrub species	Rate / 100 ℓ Water	Remarks
<i>Eucalyptus grandis</i> (Saligna gum)	375 ml	<b>Coppice Application:</b> When coppice is between 1 – 1.5 m in height apply <b>RADIATE</b> to leaves and stems ensuring thorough wetting. Limited re-growth may occur which requires a follow up treatment.
<i>Lantana camara</i> (Lantana)	0.75 – 1.0 ℓ	Use the higher rate for older, previously slashed, plants with big stumps.
<i>Rubus cuneifolius</i> (Bramble)	500 ml	<u>High Volume Application</u> Add a foaming agent at 500 ml / 100 ℓ of spray solution.

Indigenous bush / shrub species	Rate / 100 ℓ Water	Remarks
<i>Dichapetalum cymosum</i> (Poison leaf)	1.0 ℓ	See DIRECTIONS FOR USE above.
<i>Dichrostachys cinerea</i> (Sickle bush)	350 mℓ	<b>Knapsack Application</b> Add Actipron Super at a rate of 500 mℓ / 100 litre of spray solution. <b>High Volume Application</b> Add a foaming agent at a rate of 500 mℓ /100 litre of spray solution.
<i>Acacia tortillis</i> (Umbrella thorn)	500 mℓ	

### C. CUT STUMP

Alien bush / shrub species	Rate / 100 ℓ Water	Remarks
<i>Acacia mearnsii</i> (Black wattle)	1.5 ℓ	See DIRECTIONS FOR USE above. <b>Add 500 mℓ Actipron Super / 100 litre spray mix.</b>
<i>Chromolaena odorata</i> (Paraffin bush)	1.0 ℓ	Apply the spray mix to low cut stumps (10 – 20 cm high), preferably with a single cut surface. Apply to the completely cut surface of stumps with a diameter of less than 10 cm. Where multiple stumps are present, all cut surfaces must be treated. For larger stumps apply to the cambial region (sapwood) of the cut surface. In all cases, apply to the point of run-off.  A follow-up spray as a coppice application may be needed.
<i>Eucalyptus grandis</i> (Saligna gum)	1.5 ℓ	
<i>Lantana camara</i> (Lantana)	1.0 ℓ	
<i>Solanum mauritianum</i> (Bugweed)	1.0 ℓ	

Indigenous bush / shrub species	Rate / 100 ℓ Water	Remarks
<i>Colophospermum mopane</i> (Mopane)	2.5 ℓ	<b>Add 2.0 ℓ Actipron Super / 100 litre spray mix.</b>
<i>Dichrostachys cinerea</i> (Sickle bush)	2.0 ℓ	Apply the spray mix to low cut stumps (10 – 20 cm high). Apply to the completely cut surface of stumps until the point of run-off. Also apply to the root collar area and to the soil immediately in contact with the stump.  A follow-up spray as a coppice application may be needed.

### D. FRILL APPLICATION

Alien bush / shrub species	Rate / 10 ℓ Water	Remarks

<i>Acacia mearnsii</i> (Black wattle)	600 ml <b>RADIATE</b> + 200 ml Actipron Super	See DIRECTIONS FOR USE above.  Apply enough spray mixture to fill the frill without any unnecessary wastage down the bark.
<i>Eucalyptus grandis</i> (Saligna gum)	200 ml <b>RADIATE</b> + 50 ml Actipron Super	

**RADIATE** controls trees and shrubs. Other trees and shrubs that were not present during the development trials of this product may also be controlled to a certain degree. The registration holder does not accept responsibility for unlisted trees and shrubs.

**ACKNOWLEDGEMENT OF TRADEMARKS**  
**Actipron Super (L 5506)**

H & R GSP (Pty) Ltd.