

**KEEP OUT OF REACH OF CHILDREN
READ LABEL BEFORE USE.**



CRUCIAL®

ADVANCED TECHNOLOGY HERBICIDE

SCAN ME



FREE RECYCLING



www.agrecovery.co.nz

ACTIVE INGREDIENT:

600g/L GLYPHOSATE

**AS THE POTASSIUM, MONOMETHYLAMINE
AND AMMONIUM SALTS IN THE FORM OF
A SOLUBLE CONCENTRATE**

A non-residual, non-selective herbicide for
weed control prior to planting crops and
pasture, prior to harvesting some crops and
for general weed control in horticulture,
agriculture, and forestry



Grow a better tomorrow

READ ENTIRE BOOKLET BEFORE USING**GHS CLASSIFICATION**

Hazardous to the aquatic environment chronic Category 2,

This product must not be used for any purpose, or in any manner, contrary to this label unless authorized under appropriate legislation.

- Toxic to aquatic life with long-lasting effects.
 - Non-selective herbicide – toxic to plants. Take all reasonable steps to ensure that the substance does not cause any significant adverse effects to the environment beyond the application area.
- Beware: Spray drift hazard. Apply this product carefully. Spray drift may cause serious damage to other desirable plants.** Do not allow drift to occur outside the target area.

HANDLING PRECAUTIONS

Any application of CRUCIAL when used as an aquatic herbicide, must be under the personal control of a “Qualified Loader”, “Qualified Contractor” or a “Qualified Person”.

STORAGE

- Store in original container tightly closed in a locked, dry, cool area away from foodstuffs, seeds & fertilisers. Store in accordance with NZS 8409 Management of Agrichemicals.
- Solutions of CRUCIAL should be mixed, stored and applied only in stainless steel, aluminum, brass, copper, fiberglass, plastic or plastic lined containers. Do not mix or store this product in galvanized or unlined steel (except stainless steel) containers or spray tanks. CRUCIAL or solutions of CRUCIAL react with such containers to produce hydrogen gas which may form a highly combustible gas mixture which can flash or explode if ignited.
- Stores containing 1000 litres of CRUCIAL require secondary containment and signage, and more than 1000 litres require emergency response plans.

PERSONAL PROTECTION

- Avoid contact with skin and eyes and avoid breathing spray mist.
- When using wear waterproof gloves, suitable boots and cotton overalls.
- Remove protective clothing and wash hands and face thoroughly after handling.

EQUIPMENT

- Apply using well maintained spray equipment that is accurately calibrated.
- Spray tanks, lines and nozzles should be thoroughly rinsed with clean water following application.

DISPOSAL

- Triple rinse empty container and add rinsate to the spray tank. Recycle empty container. Otherwise crush and bury in a suitable landfill.
- Dispose of product only by using according to the label, or at an approved landfill.

FIRST AID: If medical advice is needed, have the product container or label at hand. If swallowed, DO NOT induce vomiting. Contact the National Poisons Centre 0800 POISON (0800 764 766) or a doctor immediately. If skin or hair contact occurs remove contaminated clothing and flush skin and hair with running water. IF INHALED: Call a doctor if you feel unwell.

SPILLAGE: Collect spillage. Wear appropriate protective clothing and prevent material from entering waterways. Contain and absorb spills with inert material and place in waste containers. Wash area with water and absorb with further inert material. Dispose of waste safely in an approved landfill.

TRANSPORT: Do not carry more than 10 litre of CRUCIAL on a passenger service vehicle.

MIXING AND COMPATIBILITY: CRUCIAL mixes readily with clean water. Reduced results may occur if dirty water (e.g. from ponds), hard water containing calcium salts, or water containing metal ions (e.g. iron) is used. Ensure the spray tank is free of any residue of previous spray materials. Half fill the spray tank with water. Add the required amount of CRUCIAL, agitate and continue filling the tank. Avoid foaming by keeping the filler nozzle below water level. Do not store mixed solutions for longer than 5 days. Do not use with Baton®. If adding other herbicides, ensure these are fully dispersed before adding the CRUCIAL. Use tank mixtures promptly.

GENERAL INFORMATION

Glyphosate is classified as non-carcinogenic by many international regulatory agencies. In 2015, the International Agency for Research on Cancer (IARC) classified glyphosate as “probably carcinogenic to humans” (Group 2A). In maintaining their position that glyphosate is non-carcinogenic, the regulatory agencies have taken the IARC classification into account.

CRUCIAL is a broad spectrum, non-selective, non-residual herbicide that is not volatile and may be used in agriculture, horticulture, drains, aquatic areas, forestry and for other uses including general weed control. CRUCIAL is recommended prior to sowing pasture, crops and for the control of a wide range of brushweeds.

CRUCIAL is absorbed by plant foliage and green stems. It is inactivated immediately upon contact with the soil and does not provide residual weed control. CRUCIAL moves from the point of foliage or stem contact into the root system controlling the plant above and below the ground. Visible effects may take up to 14 days or even longer depending on growing conditions. These effects are a gradual wilting and yellowing of the foliage which advances to deterioration of above and below ground parts.

Apply CRUCIAL only to healthy, actively growing plants with adequate leaves for herbicide uptake. Avoid treating plants that are silt laden or affected by drought, frost, water logging, grazing or previous herbicide application.

Rainfall occurring up to 2 hours after application may reduce effectiveness. When Pulse® Penetrant is added commercially acceptable results should be obtained if light rain occurs after 20 minutes. If CRUCIAL is applied to wet plants, efficacy may be reduced due to runoff.

After application of CRUCIAL a withholding period for grazing stock is not required (except where ragwort or other toxic weeds are present.) However, it is recommended that grazing or cultivating is delayed for 1 day after treatment of annual weeds or 3 days if perennial weeds are present to ensure absorption of CRUCIAL.

With brushweeds wait for stem dehydration to occur prior to burning or slashing.

RESISTANCE MANAGEMENT

Resistance to this herbicide could develop from excessive use. CRUCIAL contains a **GROUP 9 Herbicide** and belongs to the glycine group of herbicides. CRUCIAL has the inhibition of EPSP synthase mode of action. Some naturally occurring weed biotypes resistant to CRUCIAL and other Group 9 herbicides may exist through normal genetic variability in any weed population. The resistant individuals can eventually dominate the weed population if these herbicides are used repeatedly. Consult www.resistance.nzpps.org/ for alternative modes of action and the details of resistance management strategies (if any) for the weeds listed on the label.

USE RECOMMENDATIONS:

It is an offence for users of this product to cause residues exceeding the relevant MRL in the Food Notice: Maximum Residue Levels for Agricultural Compounds.

Withholding period: Wheat, Barley, and oat grain

For human consumption- only to be used prior to sowing

For animal feed- 7 days

Refer to "Weeds Controlled" section for rates of application.

- **General Weed Control**

Handgun – mix 600ml of CRUCIAL with 100 litres of water (0.60% solution).

Knapsack - mix 90ml of CRUCIAL with 15 litres of water.

Small sprayers – mix 6ml of CRUCIAL with every 1 litre of water.

Apply to completely wet the foliage but not to run-off.

- **Brushweed Control**

CRUCIAL may be used to control a wide range of brushweeds and woody plants.

- **Agricultural Areas**

CRUCIAL may be used for the control of annual and perennial weeds as directed in agricultural land prior to sowing any edible or non-edible crop or pasture.

Where white clover control is required, tank mix with a suitable white clover herbicide and observe recommended plant back periods prior to planting legumes or sensitive crops. Cultivation may start from 3 days after spraying perennial weeds and 1 day for annual weeds.

- **Pasture – Direct (Spot) Application**

CRUCIAL is non-selective and may damage or kill any plant in the sprayed area. Apply as a directed low-pressure spray. Retreatment and/or pasture improvement may be necessary to restrict seedling re-establishment.

- **Pasture – Selective Wiper Application**

For the control of erect weeds in pastures.

- **Pasture Renewal**

CRUCIAL may be used to control existing pasture species (pasture grasses, clovers, forage herbs, broadleaf weeds and grass weeds) prior to re-seeding pasture or establishing crops. Clovers and some broadleaf weeds are not completely controlled by CRUCIAL and a suitable companion herbicide may need to be added.

- **Pasture Seedhead Suppression (Unimproved Pasture)**

Use in unimproved pasture to delay onset of flowering and to maintain pasture grasses in a vegetative growth phase.

Treat spring pasture at early grass seedhead emergence with 160-180 ml CRUCIAL/ha. Temporary pasture brownout will occur. **Do not use Pulse Penetrant or any other surfactant.** Accurate spray calibration is important. Grazing can be carried out at any time after 3 days from treatment, but for optimum results graze from 21 days after treatment.

DO NOT USE ON RYEGRASS OR OTHER IMPROVED PASTURES AS YIELD SUPPRESSION MAY OCCUR. IT IS ADVISABLE NOT TO TREAT MORE THAN 10-15% OF THE FARM IN ANY ONE YEAR. DO NOT USE WHEN SOIL MOISTURE LEVELS ARE INADEQUATE FOR PASTURE GROWTH FOLLOWING APPLICATION.

- **Spraying of Silage Before Cutting**

Where paddocks are to be used for cropping after silage, CRUCIAL may be applied before the silage is cut. Use 1.8-2.4 L/ha plus Pulse Penetrant 100mL/100 litres of water in 100-200 litres of water per hectare. Use the high rate on perennial ryegrass or if the silage is rank or lodged. Refer to higher label rates on other specific weeds. After spraying wait at least 4 days before cutting. Grass quality is maintained for 7-10 days after the initial planned cutting date, even into the early stages of brown-out.

- **Spraying of Silage or Hay Paddocks After Cutting**

Before spraying ensure that there is at least 5-10 cm of actively growing green leaf on all tillers. Typically this takes three weeks or more after cutting. Refer to application rates in the table. Always use Pulse Penetrant.

- **Pre-Harvest weed control: Wheat, Barley and Oats**

Not for use on crops intended for human consumption.

For wheat, barley and oats – apply 2.4L/ha of CRUCIAL, 7-12 days prior to harvest when the grain moisture content is less than 30%.

Do not harvest within 7 days after treatment to allow time for the herbicide to translocate into the weed roots.

Do not apply to undersown crops including clovers as they may be severely damaged.

Do not apply to crops which will be harvested for seed. Avoid treating drought stressed plants.

- **Orchards/Vines: Citrus, Apples, Pears, Stonefruit, Kiwifruit, Grapevines**

Apply as a directed or shielded spray or with wiper equipment. For long term control of annual weeds CRUCIAL may be tank mixed with a suitable residual herbicide.

Do not apply near unprotected trees less than 3 years old. Do not allow spray or spray drift to contact any part of stonefruit trees, or green bark, suckers, buds, foliage or fruit of other trees. Do not allow wiper surfaces to contact any part of the trees. Weed foliage coated in copper or calcium based compounds may reduce the activity of CRUCIAL.

- **Market Gardens**

CRUCIAL can be applied before or after seeding and prior to crop emergence. CRUCIAL can be applied prior to transplanting or as a post harvest clean-up for longer term control of seedling weeds. CRUCIAL may be tank mixed with Ramrod® or other suitable residual herbicides.

Use in accordance with the label recommendations for these products.

Do not allow spray or spray drift to contact any part of a seed potato crop as reduced viability and damage will result.

- **Asparagus**

CRUCIAL can be applied:

- Following the final harvest and immediately after removal of all spears but before crop regrowth occurs.
- Prior to planting or crop emergence. Do not treat emerging spears.
- In established ferns as a directed or shielded spray or with wiper equipment.

Do not allow spray, spray drift or the wiper surface to contact any part of the asparagus plants.

- **Industrial and Non-Agricultural Areas**

CRUCIAL can be used for the control of annual and perennial weeds as directed. For residual control CRUCIAL can be tank mixed with Simazine or another suitable residual herbicide.

Exercise caution when using residual herbicides prior to planting trees, shrubs or other ornamental plants.

- **Turfgrass and Recreational Areas**

Apply before establishing lawns, parks, reserves and ornamentals. CRUCIAL can be applied around the base of established trees as a directed or shielded spray or by wiper equipment. Do not allow spray or spray drift or the wiper surface to contact any part of the tree. In mown areas, allow sufficient re-growth before spraying.

- **Aquatic Areas: Drains and Waterways**

Ensure that 75% of the weed to be treated is above water level or efficacy may be reduced. Following spray application do not submerge the treated plant as this will cause the herbicide to be washed off. Avoid treating silt laden plants.

- **Forestry**

CRUCIAL can be applied for the control of grasses and a wide range of brushweeds. The addition of Pulse Penetrant is required for the control of bracken and gorse.

Do not allow spray, spray drift or the wiper surface to contact the foliage or green bark of desirable trees as severe injury can occur.

APPLICATION INSTRUCTIONS

- **Broadcast boom application** flat fan, wide angle nozzles (e.g. 110°) using pressures of 200-280kPa are preferred. Set boom height to ensure a double overlap of the spray pattern at the top of the weed canopy. Apply in 100-200 litres of clean water per hectare. For orchard application wide angle, even spray nozzles are preferred.
- **Knapsack or handgun applications** adjust equipment to apply a medium spray. Use the minimum spray volume necessary to achieve uniform and complete coverage. Handgun spraying pressures of 1,000-2,000 kPa and No. 4 to No. 6 spray tips are recommended.
- **Wiper Application** – pre-mix 1 part of CRUCIAL and 2 parts of clean water to prepare a 33% solution. Mix only enough herbicide for immediate needs and allow the wiping area to become fully saturated before commencing. The wiping area must remain moist and clean otherwise reduced results will occur. In heavy weed infestations or when treating perennial weeds such as Californian thistle or multi-crown ragwort, a double pass in opposite directions on the same day will give the best results. As weed density increases, decrease ground speed.
- **Aircraft Application** – CRUCIAL may be applied by aircraft in forestry and non-cropping areas only. Aerial application of CRUCIAL is not recommended on cropping land or near desirable plant species as even slight drift may cause severe injury or destruction. Do not apply in gusty or windy conditions or in other conditions conducive to drift, e.g. still air and inversion conditions.
- **Mistblower Application** – Use a solution of 180 ml of CRUCIAL in 10 litres of water. For the micron attachment increase to 1.2 litres of CRUCIAL in 10 litres of water. Provide complete coverage and spray to wet but not to runoff.

WEEDS CONTROLLED

BRUSHWEEDS					
Weed	Boom or Aerial L/ha	Handgun vol/ 100 L	Knapsack ml/ 10 L	Mistblower ml/ 10 L	Critical Comment
BARBERRY	-	600ml	60	180	Apply Jan. to April from flowering to late fruit. Where bushes have been cut, regrowth should be 1.5 metres tall before spraying
BLACKBERRY	5.4-12	600-900	60	180	Apply to healthy plants from blossom to ripe fruit stage prior to Autumn frosts (Dec. to Apr). Only bushes with a well developed canopy of leaves should be treated. Early treatment (Dec. to Jan.) may be preferred in drought prone areas. Leave sprayed blackberry for 40-60 days before burning or slashing and oversow the area. Where treatment has been carried out under marginal conditions some regrowth can be expected within 1-2 years. For aerial application of hard to kill blackberry or where no follow-up pasture management is anticipated, use the higher rate.
BOXTHORN	-	750ml	-	-	Apply Nov. to Apr to actively growing plants. Avoid salt damaged plants. Spray to ensure complete coverage of dense thickets. Do NOT use additional surfactant as poor results may occur.
BRACKEN PULSE MUST BE USED	5.4 + Pulse 250ml/100L (min 500ml/ha)	600ml + Pulse 200ml/100L	60 + Pulse 20ml	-	Apply when fronds are unfurled (mid Jan. to June.) but prior to frost browning. DENSE VIRGIN BRACKEN WITH HIGH TRASH CONTENT AND LOW LEAF TO ROOT RATIO SHOULD BE BURNT IN SPRING AND THE UNFURLED FROND REGROWTH SPRAYED THE FOLLOWING MARCH TO JUNE
BROOM PULSE MUST BE USED	5.4 + Pulse 250ml/100L (min 500ml/ha)	600ml + Pulse 200ml/100L	60 + Pulse 20ml	180 + Pulse 20ml	Aerial Application – Best results are obtained when plants are in full leaf. Handgun Application – Apply all year round. Ensure full coverage.
BUDDLEJA	5.4	600	60	-	Handgun – If actively growing treat all year. Aerial – Treat buddleja up to 2 metres high during Feb. to Apr.

BRUSHWEEDS Cont.					
Weed	Boom or Aerial litres/ha	Handgun vol/ 100 litres	Knapsack ml/ 10 litres	Mistblower ml/ 10 litres	Critical Comment
GORSE PULSE MUST BE USED	-	600ml + Pulse 200ml/100L	-	-	Apply all year round. Spray to ensure complete coverage.
OLD MAN'S BEARD	-	600ml – 1.2L	120	-	Apply Nov. to Mar. prior to leaf senescence. Vines too high for complete coverage should be cut at ground level in winter or spring and the regrowth sprayed in Mar. when plants are at least 0.5 metres long. Follow-up treatment will be necessary to control seedlings. Use the low rate for small vines.
PAMPAS GRASS / TOETOE	-	600	60	-	Apply Spring-Autumn. Ensure complete coverage. Best results are achieved when applied after flowering.
RING FERN	600-1.8L	180	21	-	Control: Apply 1.8 litres/ha in Jan. to Apr. Pasture Manipulation: Apply 600ml – 1.2 L/ha Dec. to Apr. Use the high rate for dense infestations. Burn 4-6 weeks after treatment and oversow with pasture.
SWEET BRIER PULSE MUST BE USED	7.2 + Pulse 250ml/100L (min 500ml/ha)	600ml + Pulse 200ml/100L	60+ Pulse 20ml	-	Apply from late flowering to early leaf yellowing. Best results achieved with full coverage.
WILLOW	8.1-11 + Pulse 250ml/100L (min 500ml/ha)	600ml + Pulse 200ml/100L	-	-	Apply from Jan. to Apr. before leaf fall begins. Total spray coverage is essential for best results. Use the high rate for pussy willow control.

ANNUAL WEEDS					
Weed	Boom or Aerial L/ha	Handgun vol/ 100 L	Knapsack ml/ 10 L	Mistblower ml/ 10 L	Critical Comment
ANNUAL WEEDS (Seedlings)	600ml-1.2L	120ml	12	36	Use higher rate for larger weeds
BARLEY GRASS	600	120	12	36	
CLEAVERS	900ml	300ml	30	90ml	
RYEGRASS - short rotation (Annual, Italian, Hybrid)					Ensure plants are actively growing and have at least 5-10 cm of green leaf. Add Pulse at all times.
Established < 8 months	1.8-2.4 + Pulse 100ml/100L	600 ml + Pulse 100ml/100L	60 + Pulse 10ml	180 + Pulse 10ml	
Established > 8 months	2.4 + Pulse 100ml/100L	600 ml + Pulse 100ml/100L	60 + Pulse 10ml	180 + Pulse 10ml	

PERENNIAL WEEDS					
Weed	Boom or Aerial L/ha	Handgun vol/ 100 L	Knapsack ml/ 10 L	Mistblower ml/ 10 L	Critical Comment
AUSTRALIAN SEDGE	3.6 Aerial 5.4	600ml	60	180	Apply from Nov. to Mar. Where rank growth is present the area should be burnt 12-18 months prior to aerial application to ensure adequate spray coverage.
BROWNTOP	3.6	600ml	60	180	Apply to 5-10cm high actively growing plants. Some regrowth may occur. Longterm control requires a pasture renewal programme utilizing annual crops and repeat applications of CRUCIAL before re-establishing perennial pasture.
CALIFORNIAN THISTLE	2.4	600	60	180	Apply after flower bud development but before autumn browning. To ensure maximum shoot emergence do not cultivate for 6 months prior to treatment. Wiper – a double pass at low speed is recommended in heavy infestations. Mowing thistles 10 days after treatment may assist control. Retreatment may be necessary in the following season.
CHICORY	2.4-3.6	-	-	-	Ensure the chicory is actively growing and has sufficient leaf area at spraying. Allow a minimum of 2-3 weeks growth following grazing before spraying. Use the high rate if less than 3 weeks growth has elapsed after grazing. Some chicory re-growth may still occur.
COUCH	1.8-3.6	600	60	180	For suppression use 1.8 litres/ha, for control use 2.4-3.6 litres/ha when growing conditions are satisfactory. Autumn treatment is preferable. Use the high rate in late spring. Apply to plants with at least 4-5 leaves (at least 10 – 15 cm leaf length) and active shoot and root growth. Do not cultivate for 6 months prior to application to ensure maximum shoot emergence. Some regrowth may occur. Longterm control requires a pasture renewal programme utilizing annual crops and repeat applications of CRUCIAL before re-establishing perennial pasture. See the Use Recommendations section for control of couch in a pre-harvest situation.

PERENNIAL WEEDS Cont.					
Weed	Boom or Aerial L/ha	Handgun vol/ 100 L	Knapsack ml/ 10 L	Mistblower ml/ 10 L	Critical Comment
CHEWINGS FESCUE or RED FESCUE	5.4 + Pulse 100ml/ 100L	600ml + Pulse 100ml/ 100L	-	-	Apply to healthy actively growing plants with 10 – 15 cm leaf length. Spring treatment gives best results. Some regrowth may occur. Longterm control requires a pasture renewal programme utilizing annual crops and repeat applications of CRUCIAL before re-establishing perennial pasture.
DOCK	2.4-5.4	600	60	-	Treat plants in spring or summer when actively growing and in full leaf. Use low rate for seedlings and young plants. Use high rate for control of established plants.
FLOATING SWEET GRASS or REED SWEET GRASS	3.6	600	60	180	Apply to actively growing plants when most have reached early seedhead.
INDIAN DOAB	5.4	600	60	-	Apply when most plants have reached early seedhead.
JOHNSON GRASS or KIKUYU MERCER GRASS Aquatic Non-Aquatic	3.6 5.4 3.6	600ml 900ml 600ml	60 90ml 60ml	180 270ml 180ml	Apply to actively growing plants. Under dense growth conditions mulch and allow at least 10 – 15 cm of regrowth before treatment. Longterm control requires a pasture renewal programme utilizing annual crops and repeat applications of CRUCIAL before re-establishing perennial pastures.
NODDING THISTLE	3.6	600	60	-	Wiper Application (see Application Instructions). Apply when actively growing when at least 10cm of the weed can be wiped. In heavy infestations a double pass is recommended.
PASPALUM	2.4-3.6	600	60	180	Use the low rate from Jan. to Apr. (early seedhead) prior to frosts. Use 4 litres/ha on vegetative plants.
POTATO (SELF SET)	1.8	300	30	90	
PRAIRIE GRASS	900ml	-	-	-	

PERENNIAL WEEDS Cont.					
Weed	Boom or Aerial L/ha	Handgun vol/ 100 L	Knapsack ml/ 10 L	Mistblower ml/ 10 L	Critical Comment
RAGWORT	3.6	600	60	-	Apply when actively growing. Wiper – apply when plants are 10-15cm above the pasture. In heavy infestations a double pass is recommended. Caution: Ragwort plants may become more palatable following spraying and stock should be removed until the treated plants brown out.
RATSTAIL	3	-	-	-	Apply to actively growing plants in Autumn.
RAUTAHİ (CUTTY GRASS) or RUSHES	3.6	600	60	180	Apply to actively growing plants from Jan. to Mar. Burning or slashing may take place from 30 days after treatment following brownout. Wiper (Rushes only). Apply Nov. to May.
RYEGRASS PERENNIAL (<i>Lolium perenne</i>)	2.4 + Pulse 100ml/ 100L	600ml + Pulse 100ml/ 100L	60 + Pulse 10ml	-	Ensure plants are actively growing and have at least 5 – 10 cm of green leaf. Add Pulse at all times.
TALL FESCUE	3.6	600	60	180	Apply to actively growing plants Jan. to Mar.
YARROW	1.8-3.6	-	-	-	Apply to plants with 5-10cm of leaf. Cultivate with a minimum of 2 grubblings from 10 days after treatment. Use the 1.8 litre rate when a competitive crop to yarrow is to be drilled. Use the 3.6L litre rate when the crop to be drilled is a poor competitor.

Registered pursuant to the ACVM Act 1997 No. P9595

See www.foodsafety.govt.nz for registration conditions.

Approved pursuant to the HSNO Act 1996 Approval Code HSR101362

See www.epa.govt.nz for approval controls.



UN 3082
ENVIRONMENTALLY
HAZARDOUS SUBSTANCE,
LIQUID, N.O.S (glyphosate)
Class 9, PG III, Marine Pollutant

Marketed by:

Nufarm Ltd

Central Park, Building 3, Level 4,

666 Great South Road, Ellerslie, Auckland 1051

Tel 0-9-270 4157

www.nufarm.co.nz

Nufarm Emergency Phone link: 0800 651 911 toll free 24 hours