

# A NEW ERA OF WEED CONTROL HAS BEGUN





**WARNING • ECOTOXIC**

KEEP OUT OF REACH OF CHILDREN • READ THE LABEL BEFORE USE  
IF NECESSARY WE advise you to wear the protective equipment on label of tank

**Mufarm**

**CRUCIAL™**

ADVANCED TECHNOLOGY HERBICIDE

ACTIVE INGREDIENT:

600g/L GLYPHOSATE

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INTRODUCING WORLD FIRST  
TECHNOLOGY...

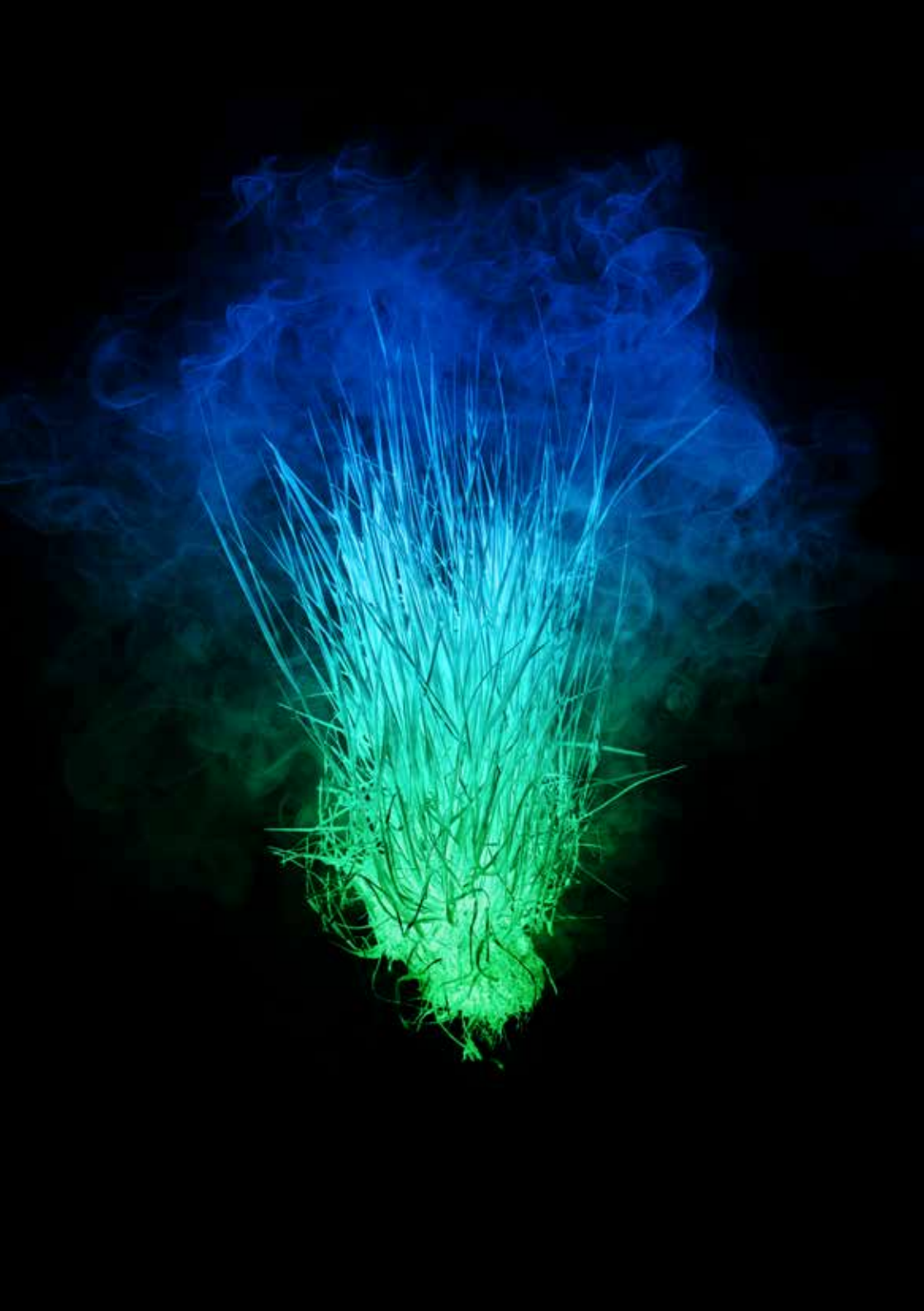


World first 600g/L high strength liquid glyphosate formulation powered by triple salt, triple surfactant technology.

## KEY BENEFITS

- Fast knockdown, quicker turnaround + excellent efficacy
- 15 minute rainfast with Pulse® Penetrant\*
- Free flowing + low foam, outstanding tank mix compatibility
- Backed by Nufarm New Zealand's performance guarantee





## WORLD FIRST FORMULATION

Eight years in the making, CRUCIAL® is a breakthrough herbicide. It is the only liquid formulation in the world which combines three glyphosate salts – potassium, monomethylamine and ammonium. That means more weed killing power per litre, using less product per hectare.

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## TRIPLE SURFACTANT TECHNOLOGY

To make sure this unprecedented load of active ingredient that equals or exceeds best in class standards of performance every time, we've created the ultimate mix of complementary on-board surfactants. This mix of surfactants allows the glyphosate molecules to stick and spread rapidly through the plant, giving you the ultimate kill.

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## RESULTS YOU CAN TRUST

With rapid brownout, excellent efficacy against target plants and a new benchmark in rainfastness, CRUCIAL is purpose-built for consistent results in our unique and often challenging conditions.

## EASY HANDLING

The world's most advanced glyphosate makes no compromise when it comes to handling and mixing. CRUCIAL pours easily with minimal foam, and tank mixes superbly with other products. You also told us you wanted a lighter, safer pack size, so we made that too – CRUCIAL comes in the all-new OHS-friendly 15L pack plus 20L, 110L, 200L, 640L and 1000L. All packs can be recycled through Agrecovery.

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## TECHNICALLY SUPERIOR

No-one in New Zealand knows glyphosate like Nufarm. We've been in this space for over 30 years, with a proud record of local R&D and product development. CRUCIAL comes fully supported by an experienced in field team of Technical Specialists and Territory Managers, there to support you no matter what.

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## SHORT DOWNTIME

With CRUCIAL, you can graze, cultivate or drill just one day after treatment for annual weeds, and three days for perennial weeds. Fast turnaround means less downtime between spraying and sowing, and more flexibility especially during spring and autumn. (Refer to label for silage).

# WHERE CAN CRUCIAL BE USED?

Refer to the CRUCIAL label for specific use recommendations.

- General weed control
- Brushweed control
- Agricultural areas
- Pasture renewal
- Pasture seedhead suppression (unimproved pastures only)
- Spraying silage before cutting
- Spraying hay or silage paddocks after cutting
- Pre-harvest – wheat, barley, oats, peas
- Orchards/vines – citrus, apples, pears, stonefruit, kiwifruit, grapevines
- Industrial and non-agricultural areas
- Turfgrass and recreational areas
- Aquatic areas – drains and waterways
- Forestry
- Market Gardens
- Asparagus
- Spraying out pre and post cropping





Nufarm

**PRIORITY  
PARTNERSHIP®**



**PRIORITY  
PARTNERSHIP®**

# HOW TO GET THE BEST OUT OF CRUCIAL

- Identify target plant species and choose the required rate of CRUCIAL – for recommended rates refer to the CRUCIAL label.
- Choose an appropriate tank mixing partner if required.
- Ensure target plants are healthy and actively growing, with plenty of leaf area present. CRUCIAL is not absorbed as effectively when plants are stressed. It also needs plant tissue to land on to do its job.
- Half fill the spray tank with clean water, add the required quantity of CRUCIAL, mix and fill the tank. See the CRUCIAL label for recommended water rates.
- Add Pulse Penetrant to the full tank, and complete mixing.
- Apply as a medium even spray to completely cover target plants.
- Refer to the product label if using tank mix partners.

# RAPID TRANSLOCATION FROM LEAF TO ROOT

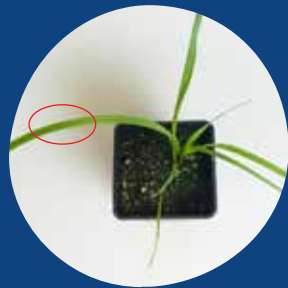
For superior control, glyphosate must stick to the surface of the leaf, penetrate rapidly, then move quickly into the leaves and roots of the plant. If the plant goes into defensive mode and shuts down before the herbicide is translocated through its tissue, it can survive being sprayed.

CRUCIAL beats this natural defense system through good adhesion and absorption, fast uptake and excellent translocation. A lethal dose is delivered to the foliage, stem and root system even under challenging conditions.

## UPTAKE AND TRANSLOCATION STUDY

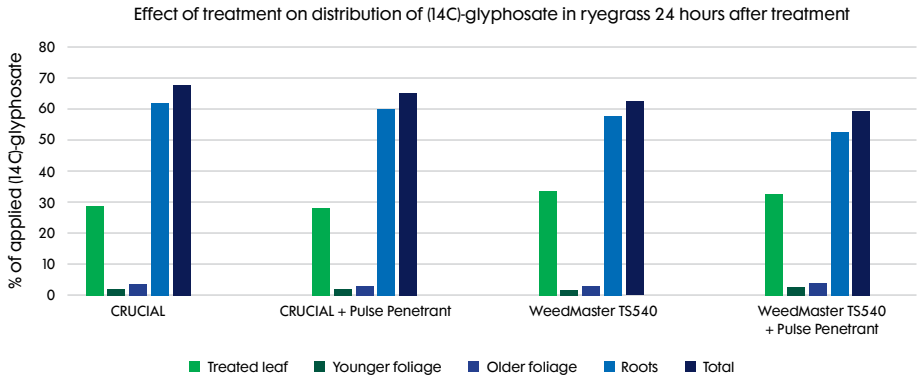
**Trial NUNZ1867; conducted by  
Plant Protection Chemistry New Zealand**

- CRUCIAL 2.4L, WeedMaster® TS540 2.7L
  - 1440g glyphosate/100L – droplets applied to simulate 100L mix/ha
  - ± Pulse Penetrant 100ml/100L
- Tabu ryegrass grown from seed, 5 replicates/treatment
- Uptake measured 30mins, 2, 6 and 24 hours after application
- Translocation measured 24 hours after application
- Autoradiograph images of plants to show distribution of glyphosate 24hours after treatment



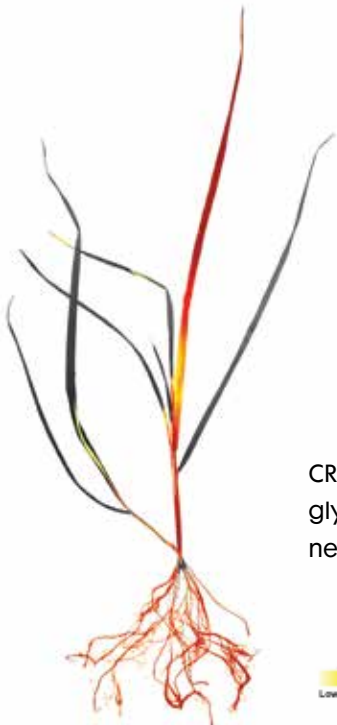
Droplet application site  
(10 x 0.24µl) on adaxial surface of  
the youngest fully-expanded leaf.

# TRANSLOCATION



Both CRUCIAL and WeedMaster TS540 exhibited equivalent translocation throughout the plant. The addition of Pulse Penetrant had no effect on translocation.

# AUTORADIOGRAPH IMAGE



CRUCIAL: Translocation of glyphosate into the roots and new tillers after 24 hours.

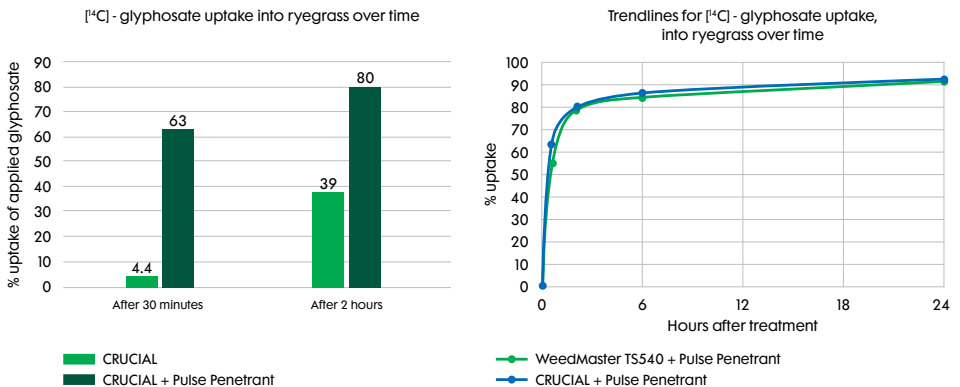
Amount of Radiolabel  
Low → High

# THE POWER OF PULSE PENETRANT

Adding Pulse Penetrant to CRUCIAL significantly speeds herbicide uptake in ryegrass. Pulse Penetrant reduces the surface tension of the spray solution to such a low level that it flows easily through stomata (tiny pores in the leaf).

In spring, the waxy cuticle on the ryegrass leaf surface thickens. Without Pulse Penetrant glyphosate cannot effectively penetrate this thick waxy layer. Uptake is reduced which then results in poor control.

## THE EFFECT OF PULSE PENETRANT ON UPTAKE:



All treatments 1440g glyphosate in 100L/ha. Pulse Penetrant 100ml/100L. Tabu ryegrass.

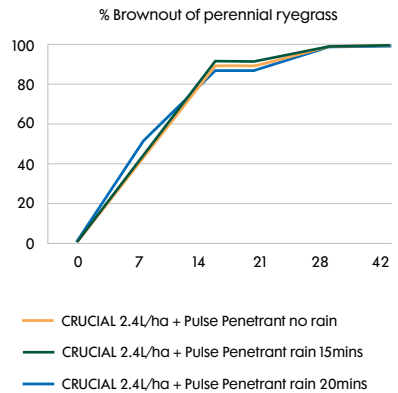


# RAINFAST IN 15 MINUTES WITH PULSE PENETRANT

CRUCIAL tank mixed with Pulse Penetrant should deliver commercially acceptable weed control even if light rain occurs just 15 minutes after spraying. No other glyphosate can match this standard. If it fails with our commercial performance guarantee, Nufarm will replace up to 100% of your initial use rate of CRUCIAL for re-treatment.

## RAINFAST STUDY

- CRUCIAL 2.4L ± Pulse Penetrant 100ml/L
- Mature well-filled perennial ryegrass plants in pots
- Rainfastness measured 15 minutes and 20 minutes after application
- Sprayed 30 April 2019
- 10cm of leaf at spraying
- Foliage dry at application
- 8-10mm of simulated rain applied by sprinkler over 15 minute period



Agresearch, Ruakura (Trial NUNZI904)



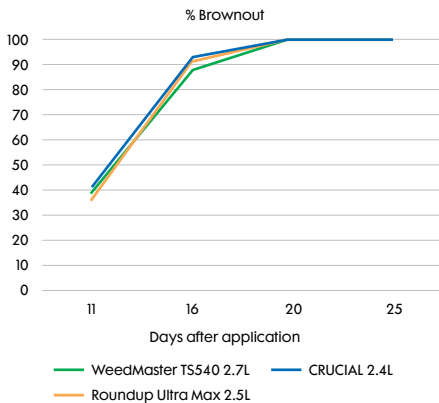
## 14 DAYS AFTER TREATMENT

**From L – R on image:**  
Untreated, WeedMaster TS540 + Pulse Penetrant - rain 20 minutes, CRUCIAL + Pulse Penetrant 20 minutes, CRUCIAL + Pulse Penetrant 15 minutes & Roundup Ultra® Max + Li 1000 20 minutes.

# HIGH STRENGTH EFFICIENCY

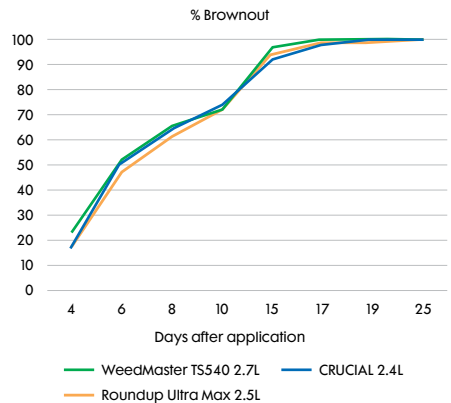
CRUCIAL's high strength formulation means lower application rates per hectare; smaller volumes to purchase, transport and store; and fewer empty containers to recycle. After mixing, CRUCIAL remains stable in the tank for five days with good water quality so you don't have to start again with a new mix if the weather interferes with spraying. Note: Pulse Penetrant will break down in water, so if the mixture contained Pulse Penetrant and it has been stored overnight or longer Pulse Penetrant will need to be re-added. Tank mixes of CRUCIAL and other products should be used promptly.

## CRUCIAL: EFFICACY – PERENNIAL RYEGRASS IN SPRING



### Trial NUNZ1749

- No re-growth in any plot
- All with Pulse Penetrant 100ml/100L
- Established perennial ryegrass pasture, sprayed 23 Sep 2017
- Grazed 3 days after spraying



### Trial NUNZ1750

- No re-growth in any plot
- All with Pulse Penetrant 100ml/100L
- Established perennial ryegrass pasture, sprayed 14 Oct 2017
- Not grazed after spraying

# RESISTANCE MANAGEMENT

CRUCIAL is a Group G herbicide. Resistance to this herbicide could develop from excessive use. Consult [resistance.nzpps.org](http://resistance.nzpps.org) for further information about herbicide modes of action and appropriate resistance management strategies for weeds listed on the label.



# CRUCIAL GLYPHOSATE CONVERSION TABLE

WeedMaster G360	WeedMaster TS470	WeedMaster TS540	Roundup Ultra MaX 570g/L	CRUCIAL
3.0L	2.3L	2.0L	1.9L	1.8L
4.0L	3.0L	2.7L	2.5L	2.4L
6.0L	4.6L	4.0L	3.8L	3.6L
9.0L	6.9L	6.0L	5.7L	5.4L



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# POWERFUL REWARDS FOR LOYALTY

Every purchase of CRUCIAL earns you valuable reward points in Priority Partnership®, the loyalty rewards programme for New Zealand growers. Reward points can be redeemed on a wide range of items for the whole family.



If you are not a member yet, find out more and join online at [nufarm.co.nz](http://nufarm.co.nz)

## OUR PROMISE

### \*COMMERCIAL PERFORMANCE GUARANTEE:

We are so confident about the superior performance of CRUCIAL, that we guarantee commercially acceptable results when it is used according to the label directions. If it fails Nufarm NZ will replace up to 100% of your initial use rate of CRUCIAL for re-treatment.



## MORE INFORMATION

Please contact your local Nufarm Territory Manager or visit us online at [nufarm.co.nz](http://nufarm.co.nz)



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