

Roundup
UltraMAX
HERBICIDE

TECHNICAL GUIDE



NOT ALL GLYPHOSATE FORMULATIONS ARE THE SAME

With a significant number of glyphosate products in the Australian broadacre market, it can be difficult to know which glyphosate product is the best fit for the pre-sowing segment. Roundup Ultra[®]MAX is a high concentration product (570 g/L) with a premium, fully loaded surfactant package, allowing for rapid uptake and translocation within weed species. A 30 minute rainfast and one-hour spray to sow window is guaranteed³. In addition, Roundup UltraMAX is a low viscosity and low foaming product, suitable for cold spraying conditions.



	Generic 450 Glyphosate	Generic 540 Glyphosate	Knockout [®] Extreme	Roundup UltraMAX	Nufarm Crucial [®] Herbicide
Formulation	Soluble liquid	Soluble liquid	Soluble liquid	Soluble liquid	Soluble liquid
Active ingredient loading	450	540	540	570	600
Salt type	Isopropylamine	Potassium	Potassium	Potassium	Monomethylamine + Potassium + Mono-ammonium
Surfactant included	✓	✓	✓	✓✓	✓
Rainfast	6 hours	1 hour	1 hour	30 minutes ³	15 mins ⁴
Time to sow⁴	24 hours	6 hours	1 hour	1 hour	1 hour
Easy to pump in cold conditions	✗	?	✓	✓	✓
Number of compatibilities	30	30	34	47	53
Pre-harvest desiccation and weed control registrations¹	✗ – only sorghum and cotton	✓	✓	✓	✓
Pre-harvest desiccation and weed control registration in canola	✗	✗	✓	✓	✓
Pre-harvest/cutting application of annual pasture for hay/silage	✗	✗	✗	✓	✓
Key market fit	Fallow	Pre-sow	Fallow	Pre-sow and fallow	Fallow, OTT ²

¹ Pre harvest registrations in cotton, sorghum, wheat, field peas, faba beans, adzuki beans, chickpeas, cowpea, field peas, lentils, mungbean and soybean.

² OTT: Over the top applications in registered glyphosate tolerant crops.

³ Commercial Offer: Roundup UltraMAX will deliver commercially acceptable weed control when it is applied according to label directions. As a rainfast offer, Bayer will replace up to 100% of your initial use amount of Roundup UltraMAX for re-treatment if a commercially acceptable weed control result is not achieved when applied at least 20 daylight minutes prior to a moderate rainfall shower. Contact your local agent or Territory Business Manager at crop.bayer.com.au for claims. This offer is in addition to other rights available to the consumer under the law. The product label should be consulted before use of Roundup UltraMAX and where required seek professional advice.

⁴ Commercial offer – refer to supplier for further information

WHAT IS ROUNDUP ULTRAMAX AND HOW DOES IT WORK?

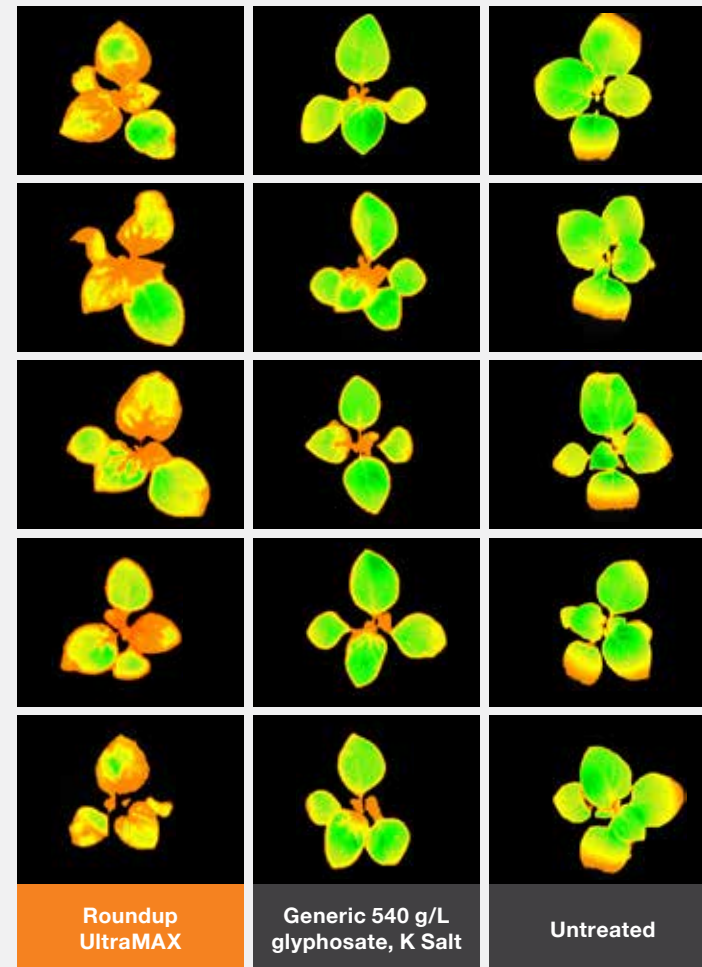
Glyphosate, the active ingredient in Roundup UltraMAX has low solubility when present in the acid form so it is reacted with a base to produce a soluble salt. Roundup UltraMAX contains the highly water-soluble potassium salt. A major benefit of the potassium salt compared to other glyphosate products, is that it allows more surfactant to be added into solution while still retaining the high concentration of glyphosate. Surfactant quality and quantity are critical factors in achieving optimum performance from a glyphosate formulation.

Roundup UltraMAX is fully loaded with the surfactant Transorb II® and is immediately ready for use. This proprietary surfactant is highly effective in transporting glyphosate into the plant by reducing droplet surface tension to increase the area of contact and the diffusion of glyphosate across the cuticle. Rapid uptake of glyphosate and faster translocation leads to faster brown-out. It is for this reason, Roundup UltraMAX is rainfast after 30 minutes³ and can be sprayed and sown after 1 hour. Roundup UltraMAX is fully loaded with market leading performance.

The blackberry nightshade treated with Roundup UltraMAX has near complete burndown 9 days after application. Note the untreated plants were large enough that peripheral leaf tissue was at the edge of the camera lens and thus appears orange/red.

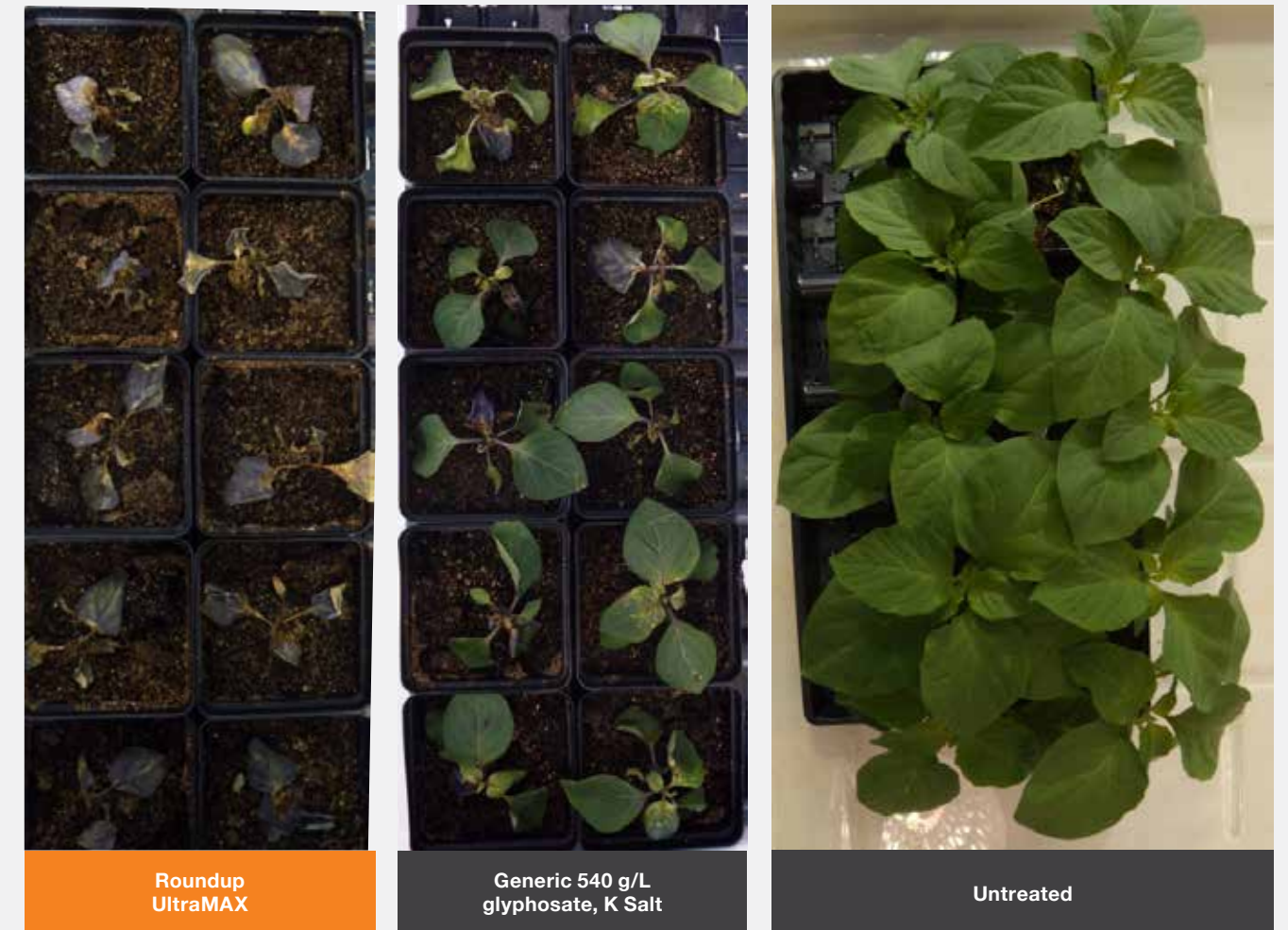
ROUNDUP ULTRAMAX MOVES MORE RAPIDLY INTO PLANTS THAN GENERIC 540 GLYPHOSATE

3 DAYS AFTER APPLICATION



Fluorescence imaging from the US laboratory showing the faster movement of Roundup UltraMAX compared to a generic 540 glyphosate into blackberry nightshade⁵, indicated by the red/orange colour. Both products sprayed at 627 g a.i./ha of glyphosate.

9 DAYS AFTER APPLICATION



Roundup UltraMAX works by interrupting the shikimic acid pathway in plants, which inhibits the production of EPSPS³. This process is necessary for the plant to produce essential amino acids, so without this, the plant dies. After spraying, Roundup UltraMAX is translocated with the sugars throughout the plant, killing all parts of the plant including the roots. Roundup UltraMAX is a non-selective and non-residual herbicide.

³ 5-enolpyruvylshikimate-3-phosphate synthase

⁵ This data is an international test on a weed not registered in Australia. For illustration purposes only to simulate effect on similar hard-to-control broadleaf species.

FEATURES AND BENEFITS OF ROUNDUP ULTRAMAX



FASTER BROWNOUT ON TOUGH TO CONTROL WEEDS

Roundup UltraMAX is a highly loaded glyphosate product (570 g/L) and contains a market leading, high quality proprietary surfactant system that provides excellent control of tough to kill weeds.



EASY TO USE IN COLD CONDITIONS

The low viscosity of Roundup UltraMAX means it is easier to pump in colder temperature.



RAINFAST IN 30 MINUTES* AND 1 HOUR SPRAY TO SOW

Transorb II surfactant provides rapid uptake and translocation throughout the plant, leading to faster weed control. No extra surfactants are required in most situations.



CONSISTENT QUALITY

Bayer controls the whole manufacturing process guaranteeing stability, consistency and quality.

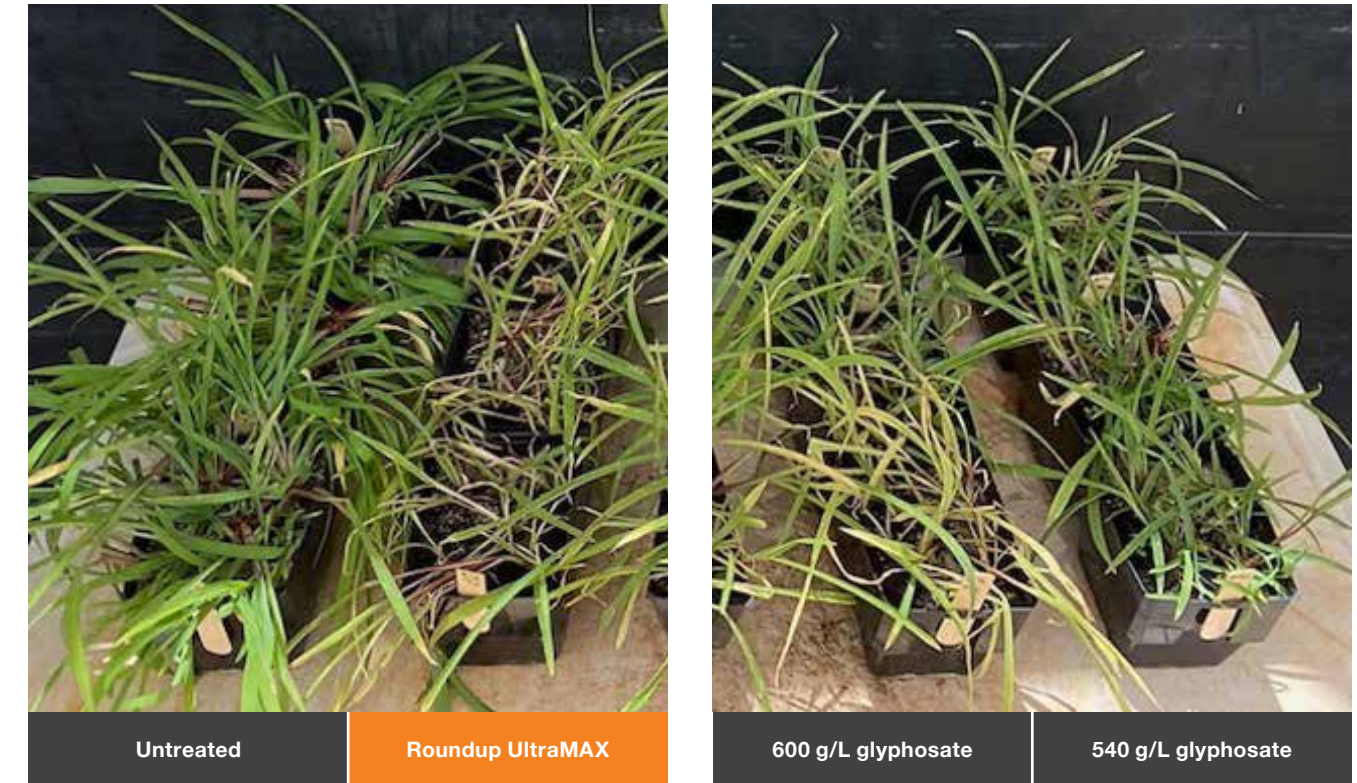
ROUNDUP ULTRAMAX – THE MARKET LEADER

Plant Science Consulting completed Trial 2055 comparing Roundup Ultra MAX against other industry standard products on the control of barnyard grass, feathertop Rhodes grass, common sowthistle and blackberry nightshade. They found Roundup UltraMAX provided the most consistent control of the four weed species.

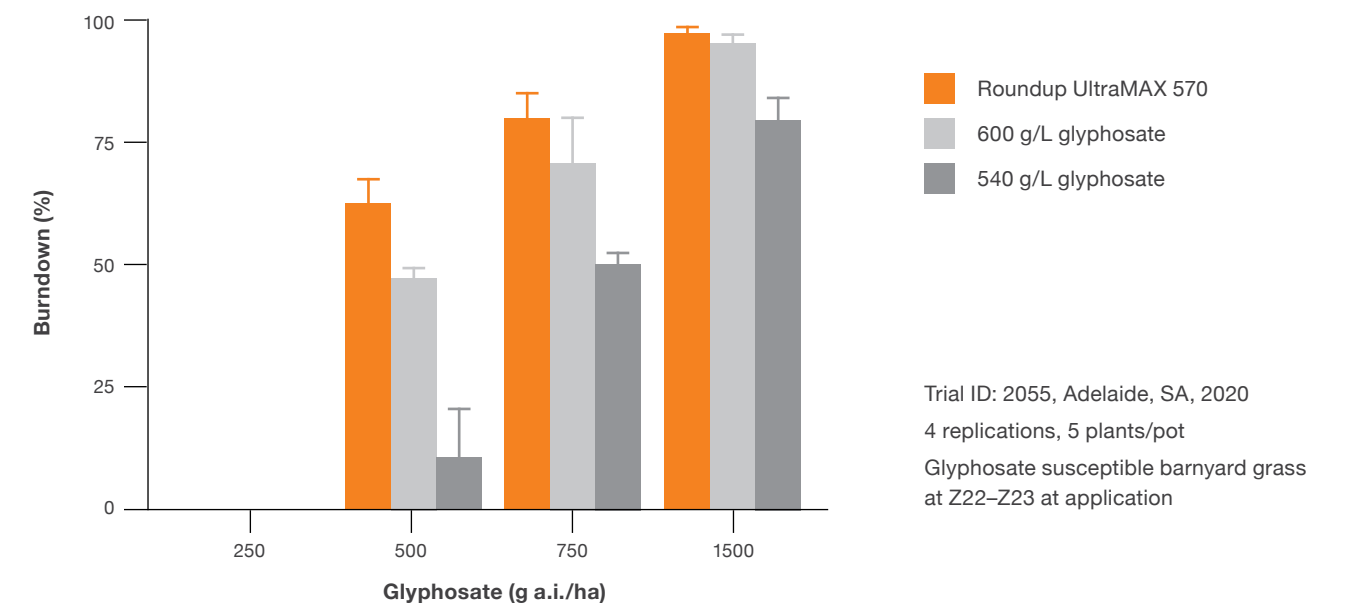
* Roundup UltraMAX will deliver commercially acceptable weed control when it is applied according to label directions. As a rainfast offer, Bayer will replace up to 100% of your initial use amount of Roundup UltraMAX for re-treatment if a commercially acceptable weed control result is not achieved when applied at least 20 daylight minutes prior to a moderate rainfall shower. Contact your local agent or Territory Business Manager at crop.bayer.com.au for claims. This offer is in addition to other rights available to the consumer under the law. The product label should be consulted before use of Roundup UltraMAX and where required seek professional advice.

ROUNDUP ULTRAMAX PROVIDED THE GREATEST LEVEL OF CONTROL AND BURNDOWN OF AWNLESS BARNYARD GRASS

Visual burndown of awnless barnyard grass (*Echinochloa colona*), 10 days after application (750 g a.i./ha)



PERCENTAGE BURNDOWN OF AWNLESS BARNYARD GRASS, 18 DAYS AFTER APPLICATION OF VARIOUS GLYPHOSATE FORMULATIONS



ROUNDUP ULTRAMAX PROVIDED THE GREATEST LEVEL OF CONTROL AND BURNDOWN OF FEATHERTOP RHODES GRASS

Visual burndown of feathertop Rhodes grass (*Chloris virgata*), 10 days after application (500 g a.i./ha)

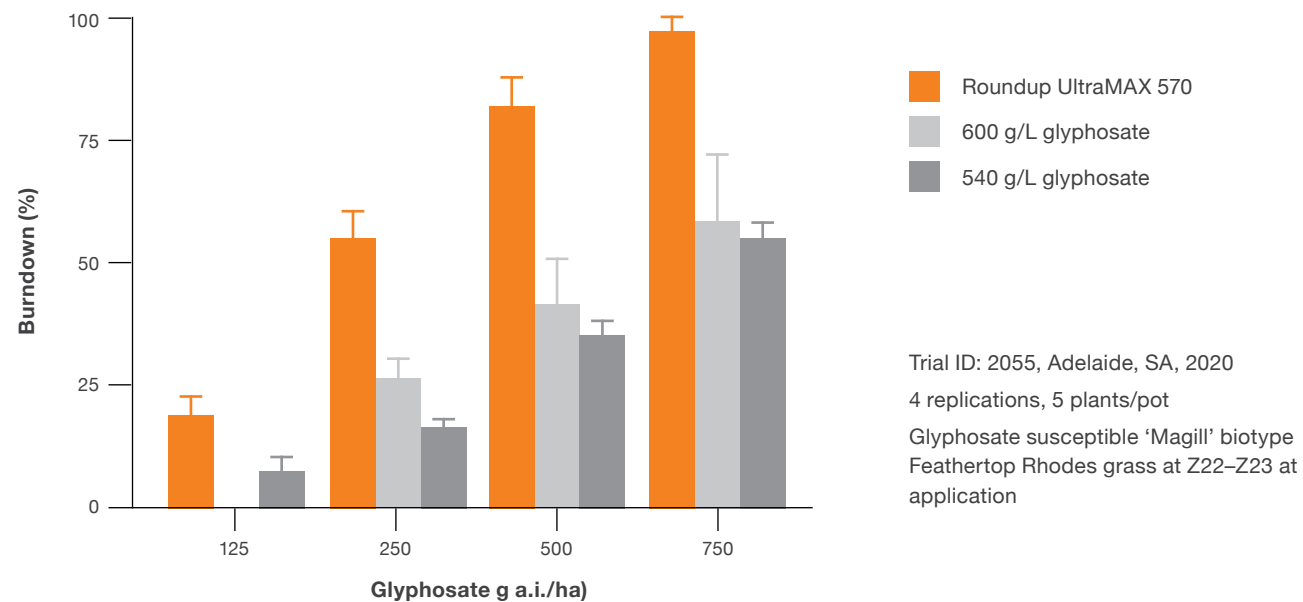


ROUNDUP ULTRAMAX PROVIDED THE GREATEST LEVEL OF CONTROL AND BURNDOWN OF GLYPHOSATE RESISTANT SOWTHISTLE

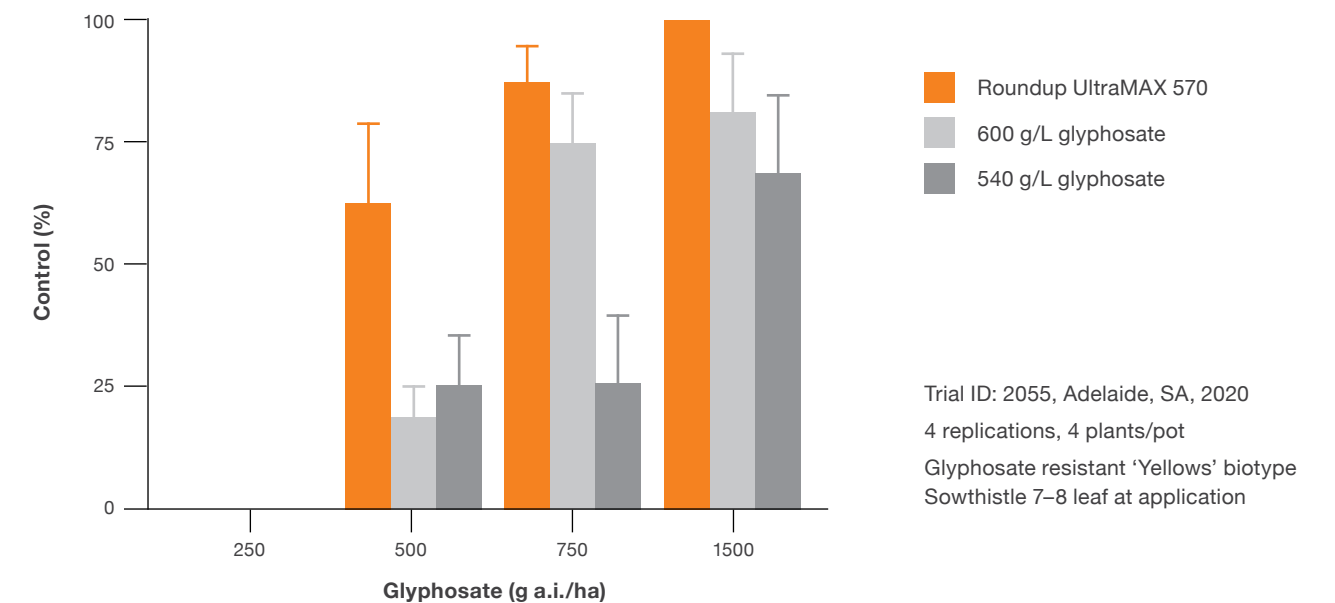
Visual burndown of sowthistle (*Sonchus oleraceus*), 18 days after application (500 g a.i./ha)



PERCENTAGE BURNDOWN OF FEATHERTOP RHODES GRASS, 7 DAYS AFTER APPLICATION OF VARIOUS GLYPHOSATE FORMULATIONS



PERCENTAGE BURNDOWN OF SOWTHISTLE, 18 DAYS AFTER APPLICATION OF VARIOUS GLYPHOSATE FORMULATIONS



Growers and advisors should target complete weed control by using the best glyphosate product available and by integrating other weed control options to ensure the sustainability of glyphosate into the future.

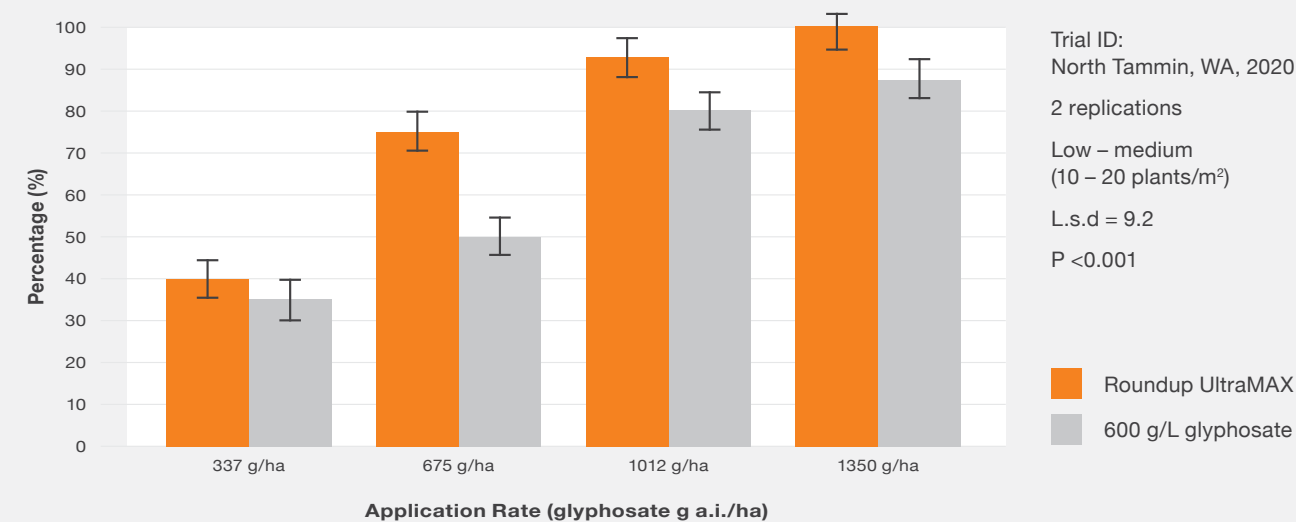
ROUNDUP ULTRAMAX IS STILL THE BEST CHOICE TO CONTROL HARD TO KILL WEEDS

Roundup UltraMAX with its high glyphosate loading and Transorb II surfactant package, enables the rapid uptake and translocation of glyphosate, resulting in the faster burndown of difficult to control weeds.

In 2020 in an annual ryegrass population, known to have levels of glyphosate resistance that is common in ryegrass populations across the grain belt of WA, SLR, an independent trial researcher, conducted a trial comparing the efficacy of Roundup UltraMAX and Crucial on this

population. The research found Roundup UltraMAX resulted in significantly superior final ryegrass control to all four equivalent rates of Nufarm Crucial Herbicide at the three highest rates used in the trial. Growers and advisors should target complete weed control by using the best glyphosate product available and by integrating other weed control options to ensure the sustainability of glyphosate into the future.

ANNUAL RYEGRASS REDUCTION IN BIOMASS (%) 15 DAYS AFTER APPLICATION AT NORTH TAMMIN IN 2020



EFFECTIVE MANAGEMENT OF BROME GRASS



Dr Peter Boutsalis, Plant Science Consulting, Adelaide, SA, investigated the burndown efficacy of three glyphosate formulations including Roundup UltraMAX in controlling susceptible and glyphosate-resistant brome grass species. Results show superior burndown control of Roundup Ultra MAX on both susceptible and resistant populations.

BAYER – T2242
Glyphosate resistant brome grass (*B. diandrus*)
Glyphosate = 1080 g a.i./ha
18 DAA

RESULTS

Figure 2. Burndown and control (%) of a susceptible brome grass biotype (Porky) treated with Roundup Ultra MAX, a 600 g/L glyphosate product and a 540 g/L glyphosate product. Treatments were applied at the Z13–Z14 growth stage (3–4 leaf). Error bars represent the standard error of the means.

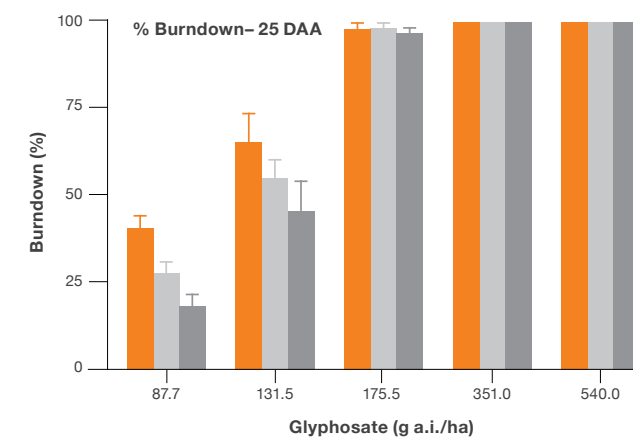
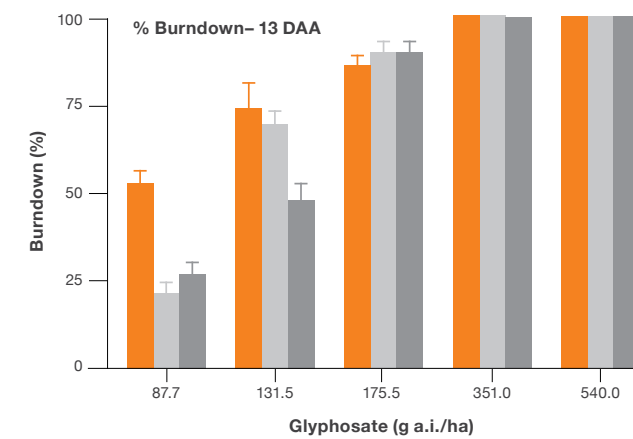
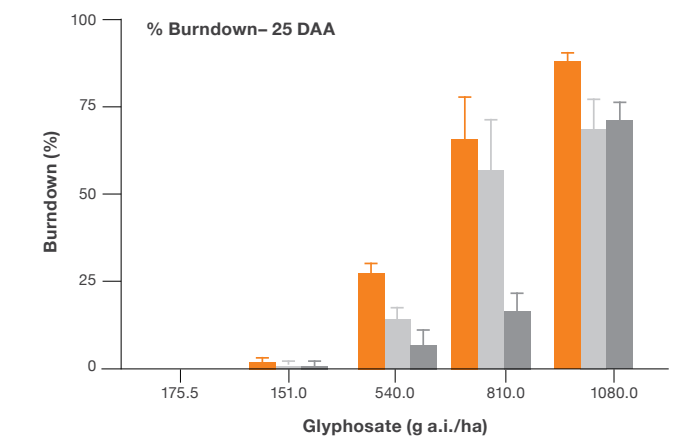
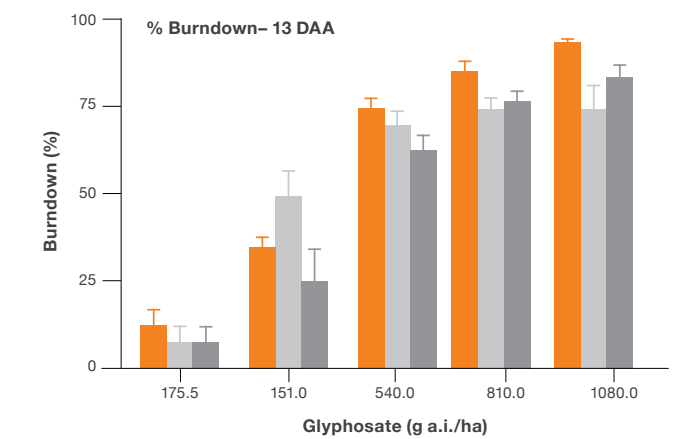


Figure 3. Burndown and control (%) of a glyphosate resistant brome grass biotype (662–21) treated with Roundup UltraMAX, a 600 g/L glyphosate product and a 540 g/L glyphosate product. Treatments were applied at the Z13–Z14 growth stage (3–4 leaf). Error bars represent the standard error of the means.



Roundup UltraMAX 600 g/L glyphosate 540 g/L glyphosate

Rates used in this pot trial were chosen to achieve a dose response curve in a controlled environment and do not directly relate to label rates.

GETTING THE MOST OUT OF ROUNDUP ULTRAMAX

TANK MIXING

1	Add ammonium sulphate to the spray solution if using Roundup UltraMAX in hard water.
2	Use the correct mixing order for effective emulsion or suspension and keep agitation running when spraying.
3	Use jar tests in the correct ratios when checking physical compatibility.
4	Wait until annual seedlings are at the 2-leaf stage because smaller weeds have limited translocation and may not be controlled.
5	Be aware of false breaks leading to an uneven germination. Some plants may appear small but they have a large root system, meaning they require more herbicide for control.
6	Slow down when spraying dusty paddocks as dust deactivates glyphosate.
7	Use high water rates with coarse droplets while traveling in the same direction the stubble was sown to maximise penetration.
8	Avoid spraying stressed weeds as this reduces the penetration and translocation of glyphosate therefore reducing its effectiveness. Only spray actively growing weeds with a rate based on weed age rather than size.
9	Use a spray volume above 70 L/ha for broadacre and 200 L/ha or less in orchards and vineyards.
10	Avoid using 'dirty' water as water containing suspended clay or organic matter may reduce performance.

USING WITH HARD WATER

Hard water contains high levels of calcium and magnesium ions which bind to glyphosate, reducing its activity. To manage hard water, add ammonium sulphate before adding Roundup UltraMAX so the calcium and magnesium ions bind to the sulphate ions, rather than the glyphosate.

MIXING INSTRUCTIONS: ROUNDUP ULTRAMAX

1	Add water to the spray tank to approximately 70% full. Commence agitation and continue throughout the mixing process.
2	Add any water conditioners (avoid dirty water). For hard water, add crystalline ammonium sulphate (980 g/kg) at 850 g/100 L spray solution into the tank. Continue agitation.
3	Add tank mix partners making sure each product is completely dispersed before adding the next product. <ol style="list-style-type: none"> Add any Water Dispersible Granule (or Dry Flowable) products. Allow at least 10 minutes for complete dispersion. Add any Suspension Concentrate products. Add any Emulsifiable Concentrate products. Add any Soluble Liquid Concentrate products.
4	Top up tank with more water to approximately 95% full, while continuing agitation.
5	Add Roundup UltraMAX Herbicide, while continuing agitation.
6	Fill the spray tank and commence spraying after the Roundup UltraMAX has adequately mixed into the spray solution.

MIXING TIPS

- Higher water volumes equal better compatibility.
- Minimise the number of products in a mix to maximise compatibility.
- Always maintain adequate agitation during application.
- Use the tank mix promptly, don't allow to stand unagitated for long periods.
- If unsure of physical compatibility, conduct a jar test with the same mix ratios.
- Clean all equipment after use by washing thoroughly with water or with a high-quality tank and boom cleaner such as ALL CLEAR® DS.

COMPATIBILITY

Roundup UltraMAX is compatible with a broad range of herbicides, insecticides and adjuvants, however if unsure seek advice. When tank mixing, follow all label and safety directions, restraints, plantback and withholding periods. Use a minimum water volume of 50 L/ha when mixing and do not allow neat tank mix partners to come into contact with each other. Always flush pump lines and mixing chambers with water between products.

At the 80 L/ha recommended water rate, Roundup UltraMAX and Amicide Advance 700 mix stays clear with no crystallisation seen 12 hours after agitation, with both deionized and hard water, comparable with Nufarm Crucial Herbicide and Amicide Advance® compatibility. Compatibility of Roundup UltraMAX + Amicide Advance, Nufarm Crucial Herbicide + Amicide Advance with deionised and hard water displaying excellent compatibility.



Roundup UltraMAX (1.3 L/ha) + Amicide Advance® (1.2 L/ha)	Roundup UltraMAX (1.3 L/ha) + Amicide Advance (1.2 L/ha)	Nufarm Crucial Herbicide (1.235 L/ha) + Amicide Advance (1.2 L/ha)	Nufarm Crucial Herbicide (1.235 L/ha) + Amicide Advance (1.2 L/ha)
80 L of water per hectare	80 L of water per hectare	80 L of water per hectare	80 L of water per hectare
Deionised water	Hard water (1000 ppm)	De-ionised water	Hard water (1000 ppm)
12 hours	12 hours	12 hours	12 hours

Source: Bayer compatibility trials, Pinkenba 2021. BA-0270

ROUNDUP ULTRAMAX COMPATIBLE TANK MIX PRODUCTS

TRADE NAME	ACTIVE INGREDIENT(S)
Herbicides	
Amine 625	625 g/L 2,4-D (present as dimethylamine and diethanolamine salts)
Nufarm Amicide Advance 700 Selective Herbicide®	700 g/L 2,4-D present as the dimethylamine and monomethylamine salts
Statesman® 720 Herbicide	720 g/L 2,4-D present as the dimethylethanolamine salt and the dimethylamine salt
Nufarm Estericide® 800	800 g/L 2,4-D present as the ethyl ester
Hotshot®	10 g/L aminopyralid present as triisopropanolamine salt + 140 g/L fluroxypyr present as methylheptyl ester
Atrazine 900	900 g/kg atrazine
Logran® B Power (ensure fully dispersed prior to addition of Roundup Ultra® MAX)	200 g/kg butafenacil + 520 g/kg triasulfuron
Hammer® 400 EC Herbicide	240 g/L carfentrazone-ethyl
Archer® 750	750 g/kg clopyralid
Nufarm Kamba® 500 (dicamba)	500 g/L dicamba present as the dimethylamine salt
Starane® Advanced	333g/L fluroxypyr present as the meptyl ester
Comet® 400	400 g/L fluroxypyr present as the methylheptyl ester
Flame®	240 g/L imazapic present as the ammonium salt
Polo® 570 LVE	570 g/L MCPA as the iso-octyl ester
Associate®	600 g/kg metsulfuron methyl
Yield®	125 g/L oryzalin + 125 g/L trifluralin
Surflan® 500 SC	500 g/L oryzalin
Striker®	240 g/kg oxyfluorfen
GoalTender®	480 g/L oxyflurofen
Stomp®	330 g/L pendimethalin
Rifle® 440	440 g/L pendimethalin
Stomp Xtra®	455 g/L pendimethalin
Rustler® 900 WG Herbicide	900 g/kg propyzamide
Boxer Gold® Herbicide	800 g/L prosulfocarb + 120 g/L S-metolachlor

TRADE NAME	ACTIVE INGREDIENT(S)
Sakura® 850WG	850 g/kg pyroxasulfone
Sakura® Flow	480 g/L pyroxasulfone
Sharpen® WG Herbicide	700 g/kg saflufenacil
Registered brands	simazine flowable or granular
Monza®	750 g/kg sulfosulfuron
Mako®	750 g/kg sulfometuron-methyl
Avadex® Xtra	500 g/L triallate
Logran® 750WG	750 g/kg triasulfuron
Grando® 600	600 g/L triclopyr (present as the butoxyethyl ester)
Garlon® 600	600 g/L triclopyr present as the butoxyethyl ester
TriflurX®	480 g/L trifluralin
Triflur® 600	600 g/L trifluralin
Insecticides	
Astound® Duo	100 g/L alpha-cypermethrin
Talstar® 250 EC	500 g/L chlorpyrifos
Lorsban® 500	500 g/L chlorpyrifos
Nufarm Dimethoate	400 g/L dimethoate
Sumitomo Sumithion® ULV	1.23 kg/L fenitrothion
Karate Zeon®	250 g/L lambda-cyhalothrin
Imidan*	150 g/L phosmet
	Other insecticides have not been tested.
Adjuvants	
Registered brands	980 g/kg crystalline ammonium sulphate
Wetter TX	1040 g/L octyl phenol ethoxylate
Pulse®	1020 g/L polyether modified polysiloxane
Brushwet organosilicone surfactant	1020 g/L polyether modified polysiloxane
Nufarm LI700® Surfactant	350 g/L soyal phospholipids+ 350 g/L propionic acid

PROTECTING GLYPHOSATE

The management of weeds is the greatest challenge Australian broadacre farmers face, with an annual cost to growers of \$146/ha or \$3.23bn.¹ This challenge increases dramatically if weed populations become resistant to herbicides, as the use of properly applied herbicides at label rates is the most consistent, effective and economical approach to control weeds.

Resistance is the inherited ability of a plant to survive and reproduce following exposure to a dose of herbicide normally lethal to the wild type. Resistance develops when the same selection pressure is applied over multiple generations. For example, glyphosate applied over multiple ryegrass generations.

Glyphosate is one of the most well-known and widely used herbicides, with over 1000 products registered globally, in over 120 countries. It is critical it is used responsibly to ensure it remains a valuable tool in the fight against weeds.

Glyphosate resistance is a challenge, but growers can take action to help prevent, or delay its development. Weedsmart (weedsmart.org.au) list 6 basic principles that growers can use to help manage herbicide resistance:

1. Rotate crops and pastures
2. Use double-knock tactics
3. Mix and rotate herbicides
4. Stop weed seed set
5. Implement crop competition strategies
6. Use harvest weed seed control

For further details, please refer to weedsmart.org.au



¹ GRDC 2016 Impact of Weeds on Australian Grain Production – The cost of weeds to Australian grain growers and the adoption of weed management and tillage practices. www.grdc.com.au/ImpactOfWeeds

Always refer to product labels for full application instructions.

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Bayer CropScience Pty Ltd ABN 87 000 226 022. Level 1, 8 Redfern Rd, Hawthorn East VIC 3123.

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