

**CAUTION**  
KEEP OUT OF REACH OF CHILDREN  
READ SAFETY DIRECTIONS BEFORE OPENING OR USING

QUANTUM

# Glyphosate 450 SL

## HERBICIDE

**ACTIVE CONSTITUENT: 450 g/L GLYPHOSATE**  
present as the ISOPROPYLAMINE SALT

**GROUP 9 HERBICIDE**

A non-selective foliar herbicide for the control of a wide range of annual, perennial and woody weeds as per the Directions For Use Table.

**APVMA Approval No.: 95615/146525**

**SL** Formulation Type  
**Soluble Liquid  
Concentrate**

**BE PROUDLY  
AUSTRALIAN**

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 **QUANTUM  
AGROSCIENCES**

## DIRECTIONS FOR USE

### RESTRAINTS:

DO NOT spray if rainfall is expected as rainfall within 6 hours of treatment may reduce the effectiveness of this product. Heavy rainfall within 2 hours of treatment may wash the product from the leaf surface and retreatment may be necessary.

DO NOT disturb treated weeds by grazing, cultivation, sowing etc., after treatment for 1 day for annual weeds and 7 days for perennial weeds to ensure complete uptake of the herbicide.

DO NOT treat weeds under stress from frost, cold, waterlogging, lack of moisture or disease. Plants must be actively growing to ensure optimum uptake of the product.

### SPRAY DRIFT RESTRAINTS

Specific definitions for terms used in this section of the label can be found at [apvma.gov.au/spraydrift](http://apvma.gov.au/spraydrift)

DO NOT allow bystanders to come into contact with the spray cloud.

DO NOT apply in a manner that may cause an unacceptable impact to native vegetation, agricultural crops, landscaped gardens and aquaculture production, or cause contamination of plant or livestock commodities, outside the application site from spray drift. The buffer zones in the relevant buffer zone table/s below provide guidance but may not be sufficient in all situations. Wherever possible, correctly use application equipment designed to reduce spray drift and apply when the wind direction is away from these sensitive areas.

DO NOT apply unless the wind speed is between 3 and 20 kilometres per hour at the application site during the time of application.

DO NOT apply if there are hazardous surface temperature inversion conditions present at the application site during the time of application. Surface temperature inversion conditions exist most evenings 1 to 2 hours before sunset and persist until 1 to 2 hours after sunrise.

ANNUAL WEED CONTROL – ALL STATES				
WEEDS CONTROLLED	RATE			CRITICAL COMMENTS
Amaranth ( <i>Amaranthus</i> spp.), Barley Grass ( <i>Hordeum leporinum</i> ), Barnyard Grass ( <i>Echinochloa crus-galli</i> ), Brome Grass ( <i>Bromus</i> spp.), Caltrop ( <i>Tribulus terrestris</i> ), Canary Grass ( <i>Phalaris</i> spp.), Capeweed ( <i>Arctotheca calendula</i> ), Cereals Volunteer, Chickweed ( <i>Stellaria media</i> ), Cobbler's Peg ( <i>Bidens pilosa</i> ), Deadnettle ( <i>Lamium amplexicaule</i> ), Double Gee ( <i>Emex australis</i> ), Fumitory ( <i>Fumaria officinalis</i> ), Ground Cherry ( <i>Physalis angulata</i> ), Lesser Swinecress ( <i>Coronopus didymus</i> ), Liverseed Grass ( <i>Urochloa panicoides</i> ), Mintweed ( <i>Salvia relexa</i> ), Paradox grass ( <i>Phalaris paradoxa</i> ), Paterson's Curse /Salvation Jane ( <i>Echium plantagineum</i> ), Pigweed ( <i>Portulaca oleracea</i> ), Potato weed ( <i>Galinsoga parviflora</i> ), Ryegrass Annual ( <i>Lolium rigidum</i> ), Saffron Thistle ( <i>Carthamus lanatus</i> ), Silver grass ( <i>Vulpia</i> spp.), Sow Thistle ( <i>Sonchus oleraceus</i> ), Spear Thistle ( <i>Cirsium vulgare</i> ), Spiny Burrgrass ( <i>Cenchrus</i> spp.), Spurge ( <i>Euphorbia</i> spp.), Sub Clover ( <i>Trifolium subterraneum</i> ), Thornapple ( <i>Datura</i> spp.), Wild Mustard ( <i>Sisymbrium officinale</i> ), Wild Oats ( <i>Avena</i> spp.), Wild Turnip ( <i>Brassica tournefortii</i> ), Winter Grass ( <i>Poa annua</i> ), Variegated Thistle ( <i>Silybum marianum</i> )	<p><b>Boom:</b> 1.6-2.4 L/ha</p> <p><b>Handgun:</b> 400-560 mL per 100 L of water</p> <p><b>Knapsack:</b> 60-80 mL per 15 L of water</p> <p><b>Wiper equipment</b> – see Application Section of this label</p>	<p><b>All weeds.</b></p> <p>Spray actively growing plants. Use the lower rate on weeds up to 15cm tall; increase to the higher rate when weeds are over 15 cm tall.</p> <p>If residual activity is required, this product may be mixed with certain residual herbicides – see section titled 'Compatibility'.</p>		
PERENNIAL WEED CONTROL				
WEEDS CONTROLLED	RATE			CRITICAL COMMENTS
	Boom L/ha	Knapsack mL/15 L	Handgun vol/100 L	
Bamboo ( <i>Bambusa</i> spp.)	–	120	800 mL	<p>Apply to actively growing foliage and/or regrowth, which is between 1 m and 2 m tall.</p> <p><b>Cut Stump:</b> Dilute (1:6 i.e. mix 1 part of this product with 6 parts water). Cut stems back to 20cm high, pour mixture down hollow stem or wet the cut.</p>

WEEDS CONTROLLED	RATE			CRITICAL COMMENTS
	Boom L/ha	Knapsack mL/15 L	Handgun vol/100 L	
Bent grass ( <i>Agrostis tenuis</i> )	2	60	400 mL	Apply to actively growing plants in late spring when they have some seed head development but before summer drought stress. Bent grass should NOT be grazed heavily at spraying. Follow-up management is required to limit seedling re-establishment. Full disturbance with tined implement should follow 10-21 days after spraying. Application of this product should be followed by a summer crop and/or by re-seeding pasture or crop the following autumn.
Blady grass ( <i>Imperata cylindrica</i> )	7.2	160	1 L	Spray at head stage while plants are in active growth stage.
Bracken ( <i>Pteridium esculentum</i> )	7.2	175	1.2 L	For boom application, always add an organosilicone penetrant (200 mL per 100 L spray) otherwise reduced results will occur. Addition of organosilicone penetrant may improve control with handgun application. Wiper application is recommended, (see Wiper Equipment section of this label). Double pass application is required for ropewick equipment. Bracken should be slashed in Winter/Spring prior to treatment. Apply this product to fully unfurled actively growing fronds but prior to frosts. Visible symptoms may not be fully apparent until the next season. Complete control will not be achieved from one application. Repeat treatment is recommended, preferably associated with pasture improvement.
Carpet grass ( <i>Axonopus</i> spp.)	2.4	60	400 mL	Spray at early head stage while in active growth stage.
Cocksfoot ( <i>Dactylis glomerata</i> )	2.4	80	560 mL	Spray at early head stage while in active growth stage.
Couch ( <i>Cynodon dactylon</i> )	7.2	160	1 L	Spray at early head stage (late Spring).
Flatweed (Cat's Ear) ( <i>Hypochaeris radicata</i> )	2.4	80	560 mL	Spray at early flowering to fully developed rosettes.
Glyceria ( <i>Glyceria maxima</i> )	4.8	120	800 mL	Apply to actively growing plants at mature head stage in late summer, autumn. Add a non-ionic surfactant (50-60%ai) at 200-250 mL/100 L. <b>Note:</b> Control of Glyceria is only allowed in dry drains and channels and margins of dams, lakes and streams. DO NOT apply to weeds growing in or over water. DO NOT spray across open bodies of water and do NOT allow spray to enter the water. DO NOT allow water to return to dry channels or drains within 4 days of application.
Guinea grass ( <i>Panicum maximum</i> )	7.2	160	1 L	Spray at early head stage. Refer to 'Application Equipment' section of the label 'Wiper Equipment' as it can also be used.
Hoary Cross ( <i>Cardaria draba</i> )	1.2	60	400 mL	Spray at late rosette to flowering stage, late July to September. At this time of year ensure frosts, waterlogging or possibly drought stress are not a restraint as plants need to be in active growth stage. Refer to 'Wiper Equipment' section of this booklet, if this use technique can be applied to this situation.
Johnson grass ( <i>Sorghum halepense</i> )	4.8	120	800 mL	Spray at early head stage when plants are actively growing or refer to 'Wiper Equipment' section of this booklet, if that application technique is to be used on Johnson grass.

WEEDS CONTROLLED	RATE			CRITICAL COMMENTS
	Boom L/ha	Knapsack mL/15 L	Handgun vol/100 L	
Kangaroo grass ( <i>Themeda australis</i> )	4.8	120	800 mL	Spray at early head stage when plants are actively growing.
Kikuyu grass ( <i>Pennisetum clandestinum</i> )	4.8	120	800 mL	Spray at early head stage when plants are actively growing.
Lovegrass, African	4.8	120	800 mL	Apply to actively growing plants. Re-treatment and/or pasture improvement is recommended to restrict seedling re-establishment.
<i>Ludwigia peruviana</i>	–	120	800 mL	Apply when actively growing and at or beyond the early bloom stage of growth, but before Autumn colour changes occur. Thorough coverage is necessary for best control.
Nutgrass ( <i>Cyperus rotundus</i> )	4.8	120	800 mL	Non-cultivated situations. Apply to actively growing plants in the late summer/autumn (Feb/April) when at least 20% have reached the head stage.
Nutgrass ( <i>Cyperus rotundus</i> )	2.4 followed by 2.4	80mL followed by 80mL	560 mL followed by 560 mL	If spraying is to be done on crop growing land, apply first spray in February, which is about the time that 20-25% of plants have reached heading stage. Then a second application is necessary about 2 months later, which gives adequate time for full emergence to occur. Because underground runners are broken up by cultivation, individual nuts may spring up and repeat treatments may be needed to obtain a total control situation. On land that is primarily grazing or urban, spray in February/April period, so long as correct growing conditions are present. Again, ensure that 20-25% of plants have reached the head stage.
Pampas grass	–	120-150	800 mL-1 L	Apply to actively growing plants during spring, summer or autumn. Ensure complete coverage of the foliage. For best results apply after flowering. For easier access, large plants may be cut or burnt prior to spraying, but first allow regrowth to reach 1m. Use the higher rate on plants over 1m high.
Paragrass ( <i>Brachiaria Mutica</i> )	7.2	160	1 L	Apply to actively growing plants at the early head stage.
Paspalum ( <i>Paspalum dilatatum</i> )	4.8	120	800 mL	Spray at early head stage when plants are in active growth.
Pellitory ( <i>Parietaria judaica</i> )	–	120	750 mL	Apply to actively growing plants prior to seeding. Repeat applications may be necessary to control seedlings and/or regrowth.
Phalaris ( <i>Phalaris aquatica</i> )	2.4-4.8	60-120	400 mL to 1 L	For medium to longer term control, use the high rates while plants are in active growth phase during Winter/Spring. The lower rates may be used in conjunction with burning (fire breaks). This will give a brown out and better burning conditions. Leave for 2-3 weeks after spraying before burning.
Plantains ( <i>Plantago</i> spp.)	2.4	80	560 mL	Spray when plants have reached the early head stage. Bear in mind that Plantain ( <i>Plantago</i> spp.) are slow to develop toxicity symptoms.
Prairie grass ( <i>Bromus unioloides</i> )	4.8	120	800 mL	Spray at early head stage while plants are in active growth phase.
Old Blue grass ( <i>Dichanthium sericium</i> )	4.8	120	800 mL	Spray at early head stage while plants are in active growth phase.
Redleg grass ( <i>Bothriochloa macra</i> )	4.8	120	800 mL	Spray at early head stage while plants are in active growth phase.

WEEDS CONTROLLED	RATE			CRITICAL COMMENTS
	Boom L/ha	Knapsack mL/15 L	Handgun vol/100 L	
Rhodes grass ( <i>Chloris gayana</i> )	4.8	120	800 mL	Spray at early head stage while plants are in active growth phase.
Rope Twitch ( <i>Agropyron repens</i> )	4.8	120	800 mL	Leave ground in a dormant state for 8 months prior to spraying in late Summer/Autumn, so that the foliage to uptake the product is fully available (at least 20cm in height). Ensure drought stress conditions do not exist at time of spraying.
Silverleaf Nightshade ( <i>Solanum elaeagnifolium</i> )	–	240	1.6 L	Spray actively growing plants when good soil moisture is present. Spray when plants are in the late flowering to berry stage. Follow-up sprays will be required to maximise control.
Sorrel ( <i>Rumex acetosella</i> )	4.8	120	800 mL	Spray at bud stage so long as plants are in an active growth phase. See also 'Conservation Tillage' section of this booklet.
Soursob ( <i>Oxalis pes-caprae</i> )	1.2	60	400 mL	Best results can be obtained by late Winter/early Spring sprays. Ensure foliage is in a healthy, actively growing stage at time of spraying. See also 'Conservation Tillage' section of this booklet.
St John's Wort ( <i>Hypericum perforatum</i> )	2.4	60	400 mL	Spray at the flowering to post-flowering stage in Summer/Autumn period. As spraying is only part of the total management concept of pasture improvement, follow-up sprays may be needed.
Thistle Artichoke ( <i>Cynara cardunculus</i> )	2.4	60	400 mL	Spray when plants have reached rosette/early heading stage. Plants should be free of soil deposits, particularly when spraying along roadsides.
Thistle Californian ( <i>Cirsium arvense</i> )	4.8	120	800 mL	Spray at the flowering stage, as spraying is only part of the total management concept of pasture improvement, follow-up sprays may be needed.
Yorkshire fog ( <i>Holcus lanatus</i> )	2.4	80	560 mL	Spray when plants have reached the early heading stage and are in an active growth phase.
<b>WOODY WEEDS AND BRUSH</b>				
<b>Weeds Controlled</b>	<b>Handgun/Knapsack Vol/1 Litre</b>			<b>CRITICAL COMMENTS</b> <b>Read Application Checklist before using</b>
Bitou bush/ Boneseed ( <i>Chrysanthemoides monillifera</i> )	4 or 8 mL			Apply to actively growing plants. DO NOT treat plants that are stressed, particularly drought stressed. Spray to wet all foliage. Best results are achieved when treated during the winter at peak flowering. Use the higher rate on bushes over 1.5 m. Follow-up treatment may be required to prevent the establishment of germinating weeds.
Blackberry ( <i>Rubus fruticosus</i> )	8 or 10 mL			Apply from January to May (flowering to leaf fall). Spray plants which are not under stress due to high temperatures, drought or frost. Spray to thoroughly wet all foliage. Use the higher rate for dense old stands over 2 m high. Further treatment may be needed to control seedlings and regrowth. Symptoms may be slow to appear and may not be apparent until the next season. Burning (after complete brownout), pasture improvement and/or further treatment are recommended to control seedlings and/or re-growth. <b>TAS only:</b> DO NOT spray bushes bearing mature fruit.

WEEDS CONTROLLED	Handgun/Knapsack Vol/1 Litre	CRITICAL COMMENTS
Boxthorn, African ( <i>Lycium ferocissimum</i> )	6-8 mL	Spray to wet all foliage. Use the lower rate for young bushes and the higher rate for bigger mature bushes. DO NOT spray if conditions are hot and dry. Burning (after complete brownout), pasture improvement and/or further treatment are recommended to control seedlings and/or re-growth.
Crofton Weed ( <i>Eupatorium adenophorum</i> )	4 mL	Apply to plants with full foliage, which are actively growing. Spray to wet all foliage. Further treatment and/or pasture improvement are recommended to restrict seedling re-establishment.
Goose (Furze)	8 mL plus organosilicone penetrant 2 mL	May be applied at any time of the year, but plants must be actively growing. Always add an organosilicone penetrant to ensure good results. Spray to wet all foliage. Burning (after complete brownout), pasture improvement and/or further treatment are recommended to control seedlings and/or re-growth.
Groundsel Bush ( <i>Baccharis halimifolia</i> )	6-8 mL	Apply to actively growing plants using the higher rate for plants over 2 m tall. DO NOT spray during summer drought conditions or in winter. Spray to wet all foliage. Further treatment and/or pasture improvement are recommended to control seedlings and/or regrowth.
Hawthorn ( <i>Crataegus</i> spp.)	8-10 mL	Spray from flowering to leaf fall when plants are actively growing. Use the higher rate on plants over 2 m tall. Spray to thoroughly wet all foliage. Burning (after complete brownout), pasture improvement and/or further treatment are recommended to control seedlings and/or re-growth.
Lantana ( <i>Lantana camara</i> )	8 mL	Apply to plants with full foliage, which are actively growing. Spray to thoroughly wet all foliage and individual plants. DO NOT spray during periods of summer drought stress. Burning (after complete brownout), pasture improvement and/or further treatment are recommended to control seedlings and/or re-growth. Addition of organosilicone penetrant (200 mL/100 L) may improve control.
Mistflower ( <i>Eupatorium riparium</i> )	4 mL	Apply to plants with full foliage, which are actively growing. Spray to thoroughly wet all foliage and individual plants. Further treatment and/or pasture improvement are recommended to restrict seedling re-establishment.
Sifton Bush/Chinese Scrub ( <i>Cassubua arcuata</i> )	8 or 10 mL	Apply to actively growing plants ensuring complete coverage of the bush. Further treatment and/or pasture improvement are recommended to restrict seedling re-establishment and/or regrowth. For high volume application use the higher rate when bushes over 1 m. For Wiper Application, a double pass application is required. Best results are achieved if bushes are less than 1m tall and green at the time of application.
Sweet Briar ( <i>Rosa rubiginosa</i> )	12-16 mL	Apply from late flowering to leaf fall to actively growing plants. Spray to thoroughly wet all foliage. Use the higher rate for bushes over 1.5 m high. Burning (after complete brownout), pasture improvement and/or further treatment are recommended to control seedlings and/or re-growth.

**DIRECTIONS FOR USE – Conservation Tillage situations****RESTRAINTS:**

DO NOT spray if rainfall is expected as rainfall within 6 hours of treatment may reduce the effectiveness of this product. Heavy rainfall within 2 hours of treatment may wash the product from the leaf surface and retreatment may be necessary.

DO NOT disturb treated weeds by grazing, cultivation, sowing etc., after treatment for 1 day for annual weeds and 7 days for perennial weeds to ensure complete uptake of the herbicide.

DO NOT treat weeds under stress from frost, cold, waterlogging, lack of moisture or disease. Plants must be actively growing to ensure optimum effectiveness of the product.

SITUATION	WEEDS CONTROLLED	STATE	RATE VOL/HA
SOUTHERN AUSTRALIA  Before sowing a crop or pasture  For weed control prior to sowing a crop or pasture with full soil disturbance by cultivation or sowing with a tined implement	Barley Grass ( <i>Hordeum leporinum</i> ), Brome Grass ( <i>Bromus unioloides</i> ), Volunteer cereals, Wild Oats ( <i>Avena</i> spp.)	NSW, VIC, Southern WA, SA only	400-800 mL pre-tillering 800 mL-1 L post-tillering
	Annual Phalaris ( <i>Phalaris canariensis</i> ), Annual Ryegrass ( <i>Lolium rigidum</i> ), Silvergrass ( <i>Vulpia</i> spp.), Winter Grass ( <i>Poa annua</i> )		800-1 L pre-tillering 1 L-1.2 L post-tillering
	Calomba daisy ( <i>Pentzia suffruticosa</i> ), Capeweed ( <i>Arctotheca calendula</i> ), Spiny Emex / Doublegee ( <i>Emex australis</i> )		400-800 mL less than 8 cm diameter 800 mL-1 L greater than 8 cm diameter
	Amsinckia ( <i>Amsinckia</i> spp.), Fumitory ( <i>Fumaria officinalis</i> , <i>F. muralis</i> ), Paterson's Curse / Salvation Jane ( <i>Echium plantaginium</i> ), Saffron Thistle ( <i>Carthamus lanatus</i> ), Scotch Thistle ( <i>Onopordum acanthium</i> ), Spear Thistle ( <i>Cirsium vulgare</i> ), Variegated Thistle ( <i>Silybum marianum</i> ), Volunteer Lupins ( <i>Lupinus angustifolius</i> ), Wild Turnip ( <i>Brassica tournefortii</i> )		800-1 L less than 12 cm diameter 1 L-1.2 L greater than 12 cm diameter
	Dock – seedling ( <i>Rumex</i> spp.)		800 mL-1.2 L
	Seasonal suppression of: Perennial phalaris (Phalaris), Sorrel ( <i>Rumex acetosella</i> ), Sub Clover ( <i>Trifolium subterraneum</i> ), Soursob ( <i>Oxalis pes-caprae</i> ), Skeleton Weed ( <i>Chondrilla juncea</i> ) fully emerged rosettes (NSW only)	1.2 L	
	All the above weeds	Tas only	1.2-2.4 L
	Barley Grass ( <i>Hordeum leporinum</i> ), Volunteer cereals, Wild Oats ( <i>Avena</i> spp.)	NSW, VIC, Southern WA, SA only	800 mL-1.2 L
	Brome Grass ( <i>Bromus unioloides</i> ), Canary Grass ( <i>Phalaris</i> spp.), Capeweed ( <i>Arctotheca calendula</i> ), Variegated Thistle ( <i>Silybum marianum</i> ), Winter Grass ( <i>Poa annua</i> )		1-1.6 L
	Annual Ryegrass ( <i>Lolium rigidum</i> ), Paterson's Curse/Salvation Jane ( <i>Echium plantaginium</i> ), Saffron Thistle ( <i>Carthamus lanatus</i> ), Scotch Thistle ( <i>Onopordum acanthium</i> ), Silvergrass ( <i>Vulpia</i> spp.), Spear Thistle ( <i>Cirsium vulgare</i> ), Wild Mustard ( <i>Sisymbrium officinale</i> ), Wild Radish ( <i>Raphanus raphanistrum</i> ), Wild Turnip ( <i>Brassica tournefortii</i> )		1.2-1.6 L
Erodium ( <i>Erodium cicutarium</i> ), Perennial phalaris ( <i>Phalaris aquatica</i> ), Plantain ( <i>Plantago</i> spp.), Sorrel ( <i>Rumex acetosella</i> ), Sub Clover ( <i>Trifolium subterraneum</i> ), Yorkshire fog ( <i>Holcus lanatus</i> )	1.5-2 L		
Dock ( <i>Rumex</i> spp.), Flatweed ( <i>Hypochoeris radicata</i> )	2 L		
All the above weeds	Tas only	1.2-2.4 L	

CRITICAL COMMENTS
<p>Treat only actively growing weeds not under stress from low moisture, frost, cold, disease or waterlogging. If heavy grazing has occurred allow regrowth to 6-8 cm before spraying and use the higher rate.</p> <p><b>Rate Selection:</b> Increase to higher rates late in the season or when treating under cold/overcast conditions.</p> <p><b>Full Disturbance</b> using cultivation or sowing with a tined implement may start 1 day after treatment (7 days if Dock, Phalaris, Skeleton Weed, Soursob or Sorrel are present) and should occur within 21 days after treatment. Where cultivation or sowing does not occur within 21 days, new weed growth may require further treatment. When treating light infestations of seeding annual grasses (pre-tillering) and annual broadleaved weeds (less than 8 cm dia/height) cultivation or sowing may start 6 hours after treatment and should occur within 21 days.</p> <p><b>Crop Establishment:</b> Sowing should not proceed until conditions allow the formation of a satisfactory seedbed. See Crop Establishment for directions.</p> <p><b>Annual Ryegrass, Silvergrass and Perennial Grasses:</b> Addition of a suitable wetter may improve control. When treating dense infestations of Silvergrass (<i>Vulpia</i> spp.), use of low volume nozzles (e.g. SS 11001, Hardi No 10) and a spray volume of 70 L/ha or more are recommended to improve plant spray coverage.</p> <p><b>Tank Mixtures:</b> For improved control of clover add dicamba. Always read and follow all label directions, restraints, plant back periods, withholding periods, regional use restrictions and safety directions for the tank mix products. See Tank Mixtures for directions</p> <p><b>Perennial Weeds:</b> For Perennial phalaris, Soursob, Skeleton Weed and Sorrel, this product will provide knockdown, seasonal suppression and reduction in treated plant numbers.</p>
<p><b>TAS ONLY:</b> Use 1.2 L on annual weeds and 2.4 L on perennial weeds. The product may also be tank mixed with dicamba to improve control of sorrel, dock and white clover. Observe dicamba label directions and plant back periods.</p>
<p><b>Rate Selection:</b> Use the higher rate when treating under cold/overcast conditions, when using late in the season. Use the lower rate on young weeds and the higher rate on mature weeds, i.e. fully tillered grasses or broadleaf weeds at budding or stem elongation.</p> <p>If weeds have been grazed heavily remove stock prior to spraying to ensure regrowth to 6-8cm before treatment and use the higher rate.</p> <p><b>Annual Ryegrass (<i>Lolium rigidum</i>), Silvergrass (<i>Vulpia</i> spp.) and Perennial Grasses:</b> Addition of a suitable wetter may improve control. It is recommended to use water volumes of 70 L/ha or more with low volume nozzles (e.g. SS 11001, Hardi No 10) to improve control.</p> <p><b>Aerial Application:</b> May be applied by air if a good seedbed has been established. Always use the higher rates. See also Aerial equipment.</p> <p><b>Tank Mixtures:</b> For improved control of Dock (<i>Rumex</i> spp.), Sorrel and Sub Clover add dicamba. Read and follow all label directions, for the tank mix product. See Tank Mixtures for directions. Addition of Ammonium Sulphate, 2 L/100 L, may improve control when treating under adverse environmental conditions.</p> <p><b>Pasture or Crop Establishment:</b> DO NOT sow into excessive trash. Trash may be removed by grazing after treatment. Grazing may commence one day after treatment of annual weeds (small) and 7 days for perennial weeds. Delay grazing for 3 days where annual weeds are large. Sowing may proceed when excessive trash is removed, but not sooner than one day after treatment of annual weeds and 7 days for perennial weeds. See also Crop Establishment</p> <p><b>Aerial (Or Surface) Seeding:</b> Delay seeding until trash is completely removed by grazing and/or plant decay. When establishing pasture, ensure application of fertilizer and insecticides and follow-up management is undertaken as required.</p>
<p><b>TAS only:</b> Use 1.2 L on annual weeds and 2.4L on perennial weeds. The product may also be tank mixed with dicamba to improve control of sorrel, dock and white clover. Observe dicamba label directions and plant back periods.</p>

SITUATION	WEEDS CONTROLLED	STATE	RATE VOL/HA
SOUTHERN AUSTRALIA  For weed control to commence a fallow	Barley Grass ( <i>Hordeum leporinum</i> ), Volunteer cereals, Wild Oats ( <i>Avena</i> spp.)	NSW, VIC, Southern WA, SA only	800 mL-1.2 L
	Annual Ryegrass ( <i>Lolium rigidum</i> ), Brome Grass ( <i>Bromus unioloides</i> ), Capeweed ( <i>Arctotheca calendula</i> ), Paterson's Curse /Salvation Jane ( <i>Echium plantagineum</i> ) (rosette), Saffron Thistle ( <i>Carthamus lanatus</i> ), Scotch Thistle ( <i>Onopordum acanthium</i> ), Silvergrass ( <i>Vulpia</i> spp.), Spear Thistle ( <i>Cirsium vulgare</i> ), Wild Mustard ( <i>Sisymbrium orientale</i> ), Wild Radish ( <i>Raphanus raphanistrum</i> ), Wild Turnip ( <i>Brassica tournefortii</i> )		1.2-1.6 L
	Hoary cress ( <i>Cardaria draba</i> ), Soursob ( <i>Oxalis pes-caprae</i> )		1.2 L
	Couch ( <i>Cynodon dactylon</i> )		1.2-2.4 L
	All the above weeds	Tas only	1.2-2.4 L
NORTHERN AUSTRALIA  For weed control prior to sowing a summer or winter crop or in a fallow	Annual Phalaris ( <i>Phalaris canariensis</i> ), Barley Grass ( <i>Hordeum leporinum</i> ), Volunteer cereals, Wild Oats ( <i>Avena</i> spp.)	Qld, Northern NSW only	400-800 mL
	Barnyard Grass ( <i>Echinochloa crus-gali</i> ), Button Grass ( <i>Dactyloctenium radulans</i> ), Columbus grass (seedling) ( <i>Sorghum xalmun</i> ), Liverseed Grass ( <i>Urochloa</i> spp.), Stinkgrass/Lovegrass ( <i>Eragrostis cilianensis</i> ), Native Millet ( <i>Panicum decompositum</i> ), Volunteer Sorghum ( <i>Sorghum halepense</i> )		800 mL-1.6 L
	Australian bluebell (Qld only) ( <i>Wahlenbergia gracilis</i> ), Cudweed ( <i>Gnappalium luteo-album</i> ), Fumitory ( <i>Fumaria officinalis</i> , <i>F. muralis</i> ), Mexican poppy ( <i>Argemone ochroleuca</i> ), New Zealand spinach ( <i>Tetragonia tetragonoides</i> ), Saffron Thistle ( <i>Carthamus lanatus</i> ), Spear Thistle ( <i>Cirsium vulgare</i> ), Spurge ( <i>Euphorbia</i> spp.), Stinking goosefoot ( <i>Chenopodium vulgare</i> )		800 mL-1.2 L
	Black (giant) pigweed ( <i>Trianthema portulacastrum</i> ), Boggabri weed ( <i>Amaranthus macrocarpus</i> ), Caltrop ( <i>Tribulus terrestris</i> ), Indian hedge mustard ( <i>Sisymbrium orientale</i> ), Mintweed ( <i>Salvia reflexa</i> ), Summer grass ( <i>Digitaria ciliaris</i> )		400-800 mL up to 5 true leaves or 3 cm in diameter or height or 800 mL-1.2 L greater than 3 cm in diameter or height or 5 true leaves
	African turnip weed ( <i>Sisymbrium thellungi</i> ), Deadnettle ( <i>Lamium amplexicaule</i> ), Sweet summer grass ( <i>Digitaria sanguinalis</i> ), Variegated Thistle ( <i>Silybum marianum</i> ), Volunteer Sunflower ( <i>Helianthus annuus</i> )		600-800 mL up to 5 true leaves or 3 cm in diameter or height or 800 mL-1.6L greater than 3 cm in diameter or height
	Annual ground cherry ( <i>Physalis ixocarpa</i> ), Bladder Ketmia ( <i>Hibiscus trionum</i> ), Camel melon ( <i>Citrullus lanatus</i> ), False castor oil plant ( <i>Datura</i> spp.), Noogoora burr ( <i>Xanthium occidentale</i> ), Turnip weed ( <i>Rapistrum rugosum</i> ), Wild Turnip ( <i>Brassica tournefortii</i> ), Wireweed ( <i>Polygonum aviculare</i> )		800 mL-1.2 L prior to stem elongation/ budding. After that use 400 mL-1.2 L plus 500-700 mL 2,4-D ester (800 g/L) or 1.2-1.6 L of this product alone

CRITICAL COMMENTS
<p>Treat actively growing plants not under stress from low moisture, frost, cold, disease or waterlogging. If weeds have been grazed heavily, remove stock prior to spraying to ensure regrowth to 6-8cm before treatment and use the higher rate.</p> <p><b>Rate Selection:</b> Use the lower rate on young weeds, or where cultivation is to follow within 21 days. Use the higher rate where broadleaf weeds reach stem elongation/budding or where grasses reach full tillering.</p> <p><b>Soursob (<i>Oxalis pes-caprae</i>):</b> Treat at tuber exhaustion.</p> <p><b>Hoary Cress:</b> Treat from late rosette to early flowering.</p> <p><b>Couch (<i>Cynodon dactylon</i>):</b> Use the higher rate on dense infestations. Apply sequential treatments during summer and autumn, with autumn being most effective. Repeat applications will be required for full control. For improved control, use in conjunction with cultivation.</p> <p><b>Annual Ryegrass, Silvergrass and Perennial Grasses:</b> Addition of a suitable wetter may improve control. It is recommended to use water volumes of 70 L/ha or more with low volume nozzles (e.g. SS 11001, Hardi No 10) to improve control.</p> <p><b>Tank Mixtures:</b> Read and follow all label directions, restraints, plant-back periods, withholding periods, regional use restrictions and safety directions for the tank mix products. See Tank Mixtures for directions.</p> <p><b>TAS only:</b> Use 1.2 L on annual weeds and 2.4L on perennial weeds. The product may also be tank mixed with dlamba to improve control of sorrel, dock and white clover. Observe dicamba label directions and plant back periods.</p>
<p>Treat actively growing weeds not under stress from low moisture, frost, cold, disease or waterlogging. If weeds have been grazed heavily remove stock prior to spraying to ensure regrowth to 6-8cm before treatment and use higher rate. Under hot summer conditions, dense infestations of Barnyard Grass and Liverseed Grass may require follow-up treatment for complete control. In winter (cold) conditions, symptoms on Deadnettle may be slow to develop.</p> <p><b>Rate Selection:</b> Use the lower rate on young weeds or where cultivation is to take place within 21 days.</p> <p>Use the higher rate where broadleaf weeds reach stem elongation/budding or where grasses reach full tillering. At more advanced stages of growth certain broadleaf weeds require a higher rate range or the addition of 2,4-D.</p> <p><b>Aerial Application:</b> See Aerial application. DO NOT apply by air if temperature is over 30°C.</p> <p><b>Crop Establishment:</b> Sowing should not proceed until conditions allow for a formation of a satisfactory seedbed. See Crop Establishment for directions.</p> <p><b>Tank Mixtures:</b> Read and follow label directions, restraints, plant back periods, withholding periods, regional use restrictions and safety directions for the tank mix products. DO NOT tank mix with atrazine when spraying Barnyard Grass or Liverseed Grass.</p>

SITUATION	WEEDS CONTROLLED	STATE	RATE VOL/HA
<b>NORTHERN AUSTRALIA</b>  For weed control prior to sowing a summer or winter crop or in a fallow  – continued	Pigweed ( <i>Portulaca oleracea</i> )	Old, Northern NSW only	800 mL-1.6 L up to 20 cm diameter
	Sowthistle ( <i>Sonchus oleraceus</i> )		600-800 mL rosette up to 3 cm diameter 800mL-1.6 L greater than 3 cm diameter
	Couch grass ( <i>Cynodon dactylon</i> )		1.2-2.4 L
	Johnson grass ( <i>Sorghum halepense</i> )		1.6-2.4 L
	Nutgrass ( <i>Cyperus rotundus</i> )		2.4 L followed by 2.4 L
<b>PASTURE RENOVATION AND TOPPING</b>			
SITUATION	WEEDS CONTROLLED	STATE	RATE VOL/ha
<b>Pasture with Poa Tussock present as a weed</b>  For reduction of ground cover allowing pasture renovation	Most annual weeds and Poa tussock ( <i>Poa labillardieri</i> )	NSW, Tas, VIC, QLD, ACT only	2.4-3.2 L
<b>Pasture with Bent Grass present as a weed</b>  For control/suppression of grass before sowing a crop or pasture	Most annual weeds and Bent grass ( <i>Agrostis capillaries</i> )	Vic, Tas only	2 L
<b>Pasture Topping</b>  For the reduction of seed set of annual grasses, Capeweed and Calomba daisy	Annual Ryegrass ( <i>Lolium rigidum</i> ), Calomba daisy ( <i>Pentzia suffruticosa</i> ) Barley Grass ( <i>Hordeum leporinum</i> ), Brome Grass ( <i>Bromus unioloides</i> ), Capeweed ( <i>Arctotheca calendula</i> ), Silvergrass ( <i>Vulpia</i> spp.)	WA, SA, Vic, Tas, NSW only	360 mL 240-360 mL

CRITICAL COMMENTS
Use a higher rate on larger weeds. Control of Pigweed over a wide range of growth stages can be obtained with the addition of metsulfuron-methyl (600 g/kg). Observe recropping intervals.  Previously grazed plants may be difficult to control without allowing full recovery.
Use the higher rate for dense infestations. Apply sequential treatments during summer and autumn, with autumn being most effective. Repeat applications may be required for full control. For improved control use in conjunction with cultivation.
Use the higher rates on plants approaching seedhead stage. Apply to plants with a minimum of 30cm new growth. Sequential treatments will be required for long-term control.
Make first application to actively growing plants when at least 20% have reached the head stage (normally about February). After allowing maximum re-emergence to occur (normally in 6-8 weeks), it is essential to make a second application. <b>Note:</b> Follow-up treatments should be made as part of a Nutgrass control program.
CRITICAL COMMENTS
<b>Before spraying:</b> * Graze heavily * Remove stock for 14 days or more before treatment * Apply after autumn break when plants are actively growing but before frosts begin (March-May) <b>Application:</b> Increasing to the higher rate may give more effective reductions. <b>Follow-up Management:</b> Sowing of new pasture may begin 14 days after treatment. It is essential that correct follow-up pasture establishment and management occurs after treatment. Spot treatment will limit re-infestations. May be aerially applied (see Aerial Equipment).
Apply late spring when seed-heads have development, but before the onset of summer moisture stress. Remove stock prior to spraying to achieve good Bent foliage coverage. Ensure plants are actively growing <b>Follow-up Management:</b> 10-21 days after spraying, fully disturb soil with a tyned implement and then sow summer crop, and/or reseed pasture or crop the following autumn.
Use the higher rate for heavy infestations or where Annual Ryegrass ( <i>Lolium rigidum</i> ) is present. Apply before 'hay off'. <b>Annual Ryegrass (<i>Lolium rigidum</i>) and Capeweed (<i>Arctotheca calendula</i>):</b> Apply to at flowering. <b>Other grasses:</b> Apply from head to milky dough stage. Stock should be removed stock before spraying to allow regrowth. Pasture legumes may be affected. DO NOT apply to clover or medic crops intended for seed or hay.

SITUATION	WEEDS CONTROLLED	STATE	RATE VOL/ha
<b>Pasture Manipulation</b> For control / suppression of certain grasses before sowing soybeans, forage crops or Leucaena. <b>Band Spraying</b> May also be applied as a band or strip spray	Carpet grass ( <i>Xonopus</i> spp.), Kikuyu ( <i>Pennisetum clandestinum</i> ), Paspalum ( <i>Paspalum dilatatum</i> )	NSW, VIC, WA only	1.1-4.8 L
	Carpet grass, Paspalum	Qld only	1.1-4.8 L
	Kikuyu		500 mL-4.8 L
	Barbed wire grass ( <i>Cymbopogon refractus</i> ), Black Speargrass ( <i>Hederopogon confortus</i> ), Wire grasses ( <i>Anstida</i> spp.), Love grasses ( <i>Erorostis</i> spp.), Red Natal grass ( <i>Rhynchelytrum repens</i> )		2.4L
<b>COTTON</b>			
SITUATION	WEEDS CONTROLLED	STATE	RATE (L/ha)
<b>Cotton Pre-Harvest</b> DO NOT use on crops intended for seed production	Bathurst burr ( <i>X. spinosum</i> ), Noogoora burr ( <i>X. occidentale</i> ), Winter annual weeds including Sowthistle/Milkthistle ( <i>Sonchus oleraceus</i> )	Qld, NSW only	1-2
	Nutgrass (seasonal suppression only)		2 L
<b>Cotton</b> Shielded Sprayers	Refer to Weeds Controlled section Northern Australia: In fallows or prior to sowing a crop.	Qld, NSW only	
<b>SUGAR CANE (Ratoon Control) for Qld &amp; NSW only</b>			
SITUATION	VARIETY	RATE (L/ha)	
Sugar Cane Ratoon control	Q63, Q87, Q90, Q102, Q117, Q120, Q129, Q130, H56-752, Pindar, Triton	2.4-3.2	
	Q86, Q96, Q113	3.2-4.0	
	Cassius, Q115, Q122, Q94	4.0-4.8	
	NC0310, Q107	4.8-7.2	
<b>RICE – Direct Drilling for NSW only</b>			
SITUATION	WEEDS CONTROLLED	RATE (L/ha)	
Rice Direct Drilling	Annual Phalaris ( <i>Phalaris canariensis</i> ), Annual Ryegrass ( <i>Lolium rigidum</i> ), Barley Grass ( <i>Hordeum leporinum</i> ), Burr Medic ( <i>Medicago</i> spp.), Sub Clover ( <i>Trifolium subterraneum</i> ), Winter Grass ( <i>Poa annua</i> )	800 mL-1 L	

CRITICAL COMMENTS
<p><b>Rate Selection:</b> Apply the lower rate for the suppression only. The higher rate will provide control.</p> <p><b>Band Spraying:</b> Band spraying may be done immediately after the sowing operation. Mount the nozzles behind the coultter/tyne/press wheel assembly the band seeder. Adjust to spray 0.5 to 1 m strips. Ensure minimal disturbance of the pasture. Excessive dust created in the seeding operation may reduce herbicide activity. Pasture seed must be drilled at the appropriate depth and covered by soil.</p> <p><b>Leucaena (Qld only):</b> Rows should be 4m apart Use 2 L/ha with single taper fan nozzle LF1-80 mounted at the rear of the single row planter providing a 1 m swath.</p>
CRITICAL COMMENTS
<p>Use the lower rate on light infestations of small weeds, where the crop canopy allows adequate spray coverage of the weeds. Increase to the higher rate when the crop canopy may limit coverage, when treating dense infestations, or when treating larger weeds. Apply alone or in tank mixtures with Dropp or Dimethipin 600 g/L. Apply when at least 60% of bolls are open and immature bolls cannot be easily cut with a sharp knife. Where a leafy canopy limits spray coverage, reduced weed control can be expected. For better results under these conditions, delay application until canopy re-opens following initial conditioning treatment.</p> <p>Where control of Nutgrass or Noogoora burr is required, treatments should be applied prior to the onset of frosts. When tank mixed with defoliant, a slightly higher proportion of cotton leaf may be retained, particularly where the higher rate is used. Read and follow all label directions for tank mix product.</p> <p>Apply this product to weeds growing between crop rows using a shielded sprayer. DO NOT apply in crops less than 20cm high. DO NOT allow spray or spray drift to contact any part of the cotton plants as severe injury or destruction may result.</p>
CRITICAL COMMENTS
<p>Apply when ratoons are actively growing and are 60-100 cm tall. DO NOT apply if plants are under stress from waterlogging or low moisture. Use the lower rate for suppression or where control by cultivation is planned. Use the higher rate for control. Boom height must allow for correct overlap of the spray pattern at the top of the crop canopy.</p>
CRITICAL COMMENTS
<p>If plants are drought stressed a pre-watering must be applied If the site has been grazed allow plants to regrow to 6-8 cm before treatment. For control of Annual Ryegrass (<i>Lolium rigidum</i>) use the higher rate.</p> <p><b>Crop Sowing:</b> Sow 1-14 days after treatment.</p> <p>Residual control will only be achieved by adding another suitable herbicide.</p>

SORGHUM CONTROL			
SITUATION	WEEDS CONTROLLED	STATE	RATE (L/ha)
<b>Sorghum Control</b> Before harvest	Grain sorghum ( <i>Sorghum bicolor</i> )	Qld, NSW only	1.2 or 1.6 L
<b>Sorghum Control</b> Post-harvest	Sorghum stubble (grain sorghum) ( <i>Sorghum bicolor</i> )	Qld, NSW only	800 mL-1.2 L for new regrowth from slashed stubble
			1.2-1.6 L for standing green stubble
GENERAL USE SITUATIONS			
SITUATION	WEEDS CONTROLLED	APPLICATION RATES	
<b>Dry drains and channels, dry margins of dams, lakes and streams</b>	For Weeds Controlled refer to list of species under ANNUAL WEED CONTROL and PERENNIAL WEED CONTROL in this booklet	For Application rates refer to rates shown under ANNUAL WEED CONTROL and PERENNIAL WEED CONTROL in this booklet	
<b>Forestry</b>			
<b>Non-Agricultural Areas;</b> Rights-of-way, domestic and public service areas, commercial and industrial areas and around buildings.			
<b>Onions</b> Post-plant, pre-emergence application		800 mL-2.4 L/ha	

CRITICAL COMMENTS
<p>DO NOT apply to varieties intended for seed production or varieties prone to lodging.</p> <p>DO NOT apply to crop under stress from factors such as waterlogging, frost, disease, low moisture etc.</p> <p>Apply when grain moisture is less than 25%. The product can be applied when some browning has occurred.</p> <p>Use the lower rate for control of crop, late tillers and ratoon regrowth. Use the higher rate for better suppression of ratoon regrowth.</p> <p>Treatment may increase potential for crop lodging, especially if the crop has been stressed by low moisture. In this situation harvest as soon as possible after sufficient dry down to prevent lodging.</p> <p><b>CAUTION:</b> Sorghum may be naturally toxic to stock.</p>
<p>DO NOT apply if plants are stressed from such factors as waterlogging, frost, disease, low moisture etc. For slashed stubble and spring regrowth apply when regrowth is at least 20 cm high.</p> <p><b>Standing Stubble:</b> Apply only if sufficient green leaf is present. Allow regrowth of at least to 20cm if grazing has occurred.</p> <p>Use the lower rate for knockdown and regrowth suppression where cultivation is to follow. Use the higher rate for better control of regrowth.</p> <p>It is important to note that variable results can occur if the crop has been under stress or the grown under marginal conditions. The varieties Ruby, Trump, Nugget2, Goldrush 2 and Prize are particularly susceptible if growing conditions are not ideal.</p> <p><b>CAUTION:</b> Sorghum may be naturally toxic to stock.</p>
Use this rate for standing stubble if sufficiently green and for fresh spring regrowth
CRITICAL COMMENTS
See Critical Comments shown for section and individual weeds under ANNUAL WEED CONTROL and PERENNIAL WEED CONTROL in this booklet.
<p>Use Situations include;</p> <ul style="list-style-type: none"> <li>• Prior to nursery establishment</li> <li>• Site preparation prior to planting</li> <li>• In established tree areas using shielded or directed sprays or selective wiper equipment</li> </ul> <p>DO NOT allow spray or spray drift to come into contact with foliage or green bark of desirable trees as severe damage may occur</p> <p>DO NOT allow wiper surface to come into contact with any part of the tree.</p>
This product does not provide residual control.
Apply post-sowing and at least 7 days before emergence of onion shoots. DO NOT apply to emerging onion plants as severe injury will occur. For small annual weeds use the lower rate for larger annual weeds (as a guide greater than over 15 cm in height) and where perennial weeds are present, use the higher rates.

SITUATION	WEEDS CONTROLLED	APPLICATION RATES
<b>Pastures</b>	For Weeds Controlled refer to list of species under ANNUAL WEED CONTROL and PERENNIAL WEED CONTROL in this booklet	For Application rates refer to rates shown under ANNUAL WEED CONTROL and PERENNIAL WEED CONTROL in this booklet
<b>Tree &amp; Vine Crops</b> Nuts (including Almond, Pecan, Macadamia, Pistachio and Walnut), Pome fruit, Litchi, Stone fruit, Vineyards, and Citrus fruit, Avocado, Guava, Kiwifruit, Mango, Paw Paw, Bananas		
<b>Row Crops</b> Cotton, Navy Beans, Peanuts, Soybeans, Sugar Cane Where Wiper Equipment or Shielded Sprayers (Cotton only) are used to control weeds in row crops.		See Wiper Equipment section of this label

**NOT TO BE USED FOR ANY PURPOSE, OR IN ANY MANNER CONTRARY TO THIS LABEL UNLESS AUTHORISED UNDER APPROPRIATE LEGISLATION**

**WITHHOLDING PERIOD: NOT REQUIRED WHEN USED AS DIRECTED**

CRITICAL COMMENTS
<p>1. Directed (Spot) Application.            2. Selective Application (See Wiper Equipment).            3. Boom Applications are used in pasture control prior to re-seeding of improved pasture crop.            See Protection of Livestock, Wiper Equipment and Conservation Tillage sections of this label.</p> <p><b>All Trees &amp; Vines:</b> DO NOT spray near trees or vines less than 3 years old. DO NOT allow wiper contact.  <b>Avocado, Banana, Guava, Kiwifruit, Litchi, Mango, Paw Paw, and Stone Fruit:</b> Spray drift can cause damage if allowed to contact any part of the vine, palm, trunk or tree.            Be careful to avoid contact with split bark on Kiwifruit and green stems on Paw Paw.  <b>Citrus, Litchi, Olives, Pome Fruit, Nuts and Vineyards:</b> DO NOT allow spray to contact any part of the plant.</p>
<p>See section entitled 'For Wiper Equipment' in this booklet. Apply to weeds growing 15 cm above the crop canopy or weeds growing between rows.            DO NOT allow the product to come into direct contact with crops or solution to drip onto crops.            DO NOT apply in crops less than 20cm high.  <b>Shielded Sprayers (Cotton only):</b> Apply to weeds growing between crop rows using a shielded sprayer.</p>

## GENERAL INSTRUCTIONS

Quantum Glyphosate 450 SL Herbicide is a non-selective herbicide, which is effective against a wide range of annual and perennial broadleaf weeds and grasses. It is translocated throughout the plant where it kills both foliage and roots. Ideally the best time to use the product is when target species are in a state of active growth, moderate climatic conditions are present and plants are free of disease and dirt cover. The effects of the herbicide may not be visible for 3-7 days for annual weeds or 2-3 weeks for perennial weeds depending on water quality, weather conditions, weed species and rate used. While cool and cloudy conditions can sometimes delay the appearance of chemical activity, it can generally be expected that symptoms of chemical effect will appear 2-7 days after spraying annual species and 2-3 weeks after spraying perennial species. The symptoms are demonstrated by a yellowing and accompanying wilting, progressing to a brown out.

## SPRAY PREPARATION

1. Make sure the spray tank is clean and residues from previous spray usage have been removed.
2. Fill the spray tank  $\frac{1}{2}$  to  $\frac{3}{4}$  full, with clean water.
3. Where ammonium sulphate is recommended, wash 2% v/v (2 L/100 L spray solution) through a top mesh screen into the tank and mix thoroughly.
4. Add the appropriate amount of Quantum Glyphosate 450 SL Herbicide as per the Direction for Use tables.
5. Add surfactant (if required) mix well keeping the filling hose below surface to avoid foaming.
6. Add water to fill vat.
7. Remove hose from tank as soon as full to prevent back siphoning. DO NOT use mechanical agitators, as the cause excessive foaming. DO NOT add non-approved herbicides and insecticides.

Use only plastic, plastic lined, stainless steel, aluminium, copper, brass or fibreglass tanks. Galvanised steel or unlined steel spray tanks can react with the product to hydrogen, which can form a combustible gas mixture, which can be flashed by ignition sources.

## CROP ESTABLISHMENT

Quantum Glyphosate 450 SL Herbicide can be used to control of emerged weeds prior to crop establishment. Suitable cultivation and/or sowing operations are required to provide seedbed conditions satisfactory for crop germination and development. Spraying early to control young weeds will favour preparation of suitable seedbeds.

On friable soils where there is only a light cover of young weeds, sowing may proceed satisfactorily from one day after spraying. In situations of heavy weed growth, sowing should be delayed until weed decay and soil conditions allow formation of a favourable seedbed. Incorporation of green or decaying vegetation and roots into the seedbed by cultivation or sowing may cause retarded crop emergence, particularly in cold and/or wet conditions. Vegetation may be reduced by grazing and/or cultivation but trash should be left on the surface. Avoid use of pre-emergence herbicides where label directions advise a risk of retarded crop emergence and in marginal seedbed conditions pay particular attention to correct seedling depth.

## Surfactant

The addition of surfactant may improve weed control where water rates are high or product rates low. Suggested surfactant rates are 200 mL/100 L of 1000 g/L non-ionic surfactant or 250-500 mL of 700 g/L surfactant. DO NOT add spraying oils, agricultural chemicals or other materials except as directed on the label.

## Organosilicone Penetrant

In certain situations, such as for the control of brush and woody weeds (as indicated in the Directions for Use) weed control may be enhanced by the addition of an organosilicone penetrant at its label rate.

## Rainfall Effects

Heavy rainfall within 2 hours of spraying can mean that the chemical may be washed off the plant, with the result that the herbicide may not be totally effective. Re-spraying may be needed. Normal rainfall up to 6 hours after application may reduce the effectiveness. Adequate results may not be achieved if the product is applied when weeds are stressed by conditions such as drought conditions, waterlogging or frost.

## Soil Persistence

The product is not persistent in soils and is rapidly broken down by microbes present in the soil, as well as by hydrolysis caused by free standing moisture or soil moisture that may be present in soil particles. Should residual activity be needed refer to 'Compatibility Section' of this label.

## APPLICATION EQUIPMENT

The following types of equipment may be used in applying the product: Knapsack, Wiper, Handgun, Aerial, Boom

## For Knapsack and Handgun Equipment

Maximum efficiency can be achieved by using D6 spray plate and applying at a pressure of 400-700 kPa. As the product is translocated through contact points on the plant, good coverage and uniform wetting is needed to maximise uptake by the plant. The dilution rate is given as volume per litre. Adjust equipment to ensure even spray pattern.

## For Boom Equipment

Maximum efficiency can be achieved by using fan nozzles at a pressure of 240-280 kPa. Boom height should be adjusted to ensure double overlap of nozzle patterns at the top of the weed canopy. Water volumes of 75 to 200 litres of clean water per hectare are recommended. When using rates of 500 mL to 1.5 L/ha, spray volumes in the range of 25-100 L/ha are preferred.

## For Aerial Equipment

For Micronair and boom equipment a droplet size of 250-350 micron diameter is recommended in a minimum spray volume of 20 litres/ha. A swath width in the range of 15-17 metres is most appropriate for this form of spraying. When using this form of application give consideration to the fact that the product is highly non-selective and desirable if plants, trees, etc. are in the vicinity of the area to be sprayed, they could be affected by drift or targeted contact. This would limit usage via this technique to

such situations as weed control on fallows or pasture, control prior to establishment of crops or pasture. In pasture establishment situations, it may also be necessary to spray hilly terrain and gullies in both directions to ensure good spray coverage of grass and broadleaf weeds and to avoid spray shielding effects from trees.

**Hilly terrain:** As spraying height may vary on hilly terrain, to maximise target contact, increase the water volume to 30-80 litres/ha and increase the droplet size to a minimum of 300 micron average size.

**Note:** In high temperatures and dry conditions evaporation of droplets prior to reaching target species can occur. And it is therefore important to increase water volume to at least 30 litres/ha and average droplet size to 300 micron, if temperatures are in excess of 25°C.

DO NOT SPRAY if temperature is above 30°C.

## For Wiper Equipment

Wiper equipment such as rope wick applicators can be used to apply this product to weeds growing in oilseed crops, sugarcane, cotton, seed and pod vegetables, tree and vine crops, pasture and non-crop areas as specified on this label. Weeds should be at least 15cm above the crop or pasture. Operate wiper equipment a minimum of 10cm above the crop or pasture. Speed of travel should be no greater than 8 kph. Best results are achieved at lower speeds and where two applications are made in opposite directions (double pass).

Where weeds are of variable height or occur in clumps or in dense infestations some plants may not be contacted by the herbicide solution and re-treatment may be necessary. Mix only enough solution for immediate requirements. DO NOT store a mixed solution for more than a couple of days.

**Rate:** Mix 800 mL Quantum Glyphosate 450 SL Herbicide with 2 litres clean water to prepare a 33% solution. Refer to Weeds Controlled section of label for specific recommendations.

## Sprayer Clean Up

After use, clean all spray equipment by thoroughly washing with clean water, or commercial spray equipment cleaner, in order to prevent corrosion to tanks, lines and nozzles. Aircraft used in application should be thoroughly washed with particular attention to wheels and landing gear.

## COMPATIBILITY

It has been established that a wide range of products may be tank mixed with glyphosate. The following products may be mixed with glyphosate to broaden the spectrum of pests controlled, add soil residual activity and improve performance. Refer to the 'Directions for Use' section for detailed information on the tank mix situations.

**Additives:** Liquid ammonium sulphate (2 L/100 L) can be used to minimise antagonism when mixed with flowable Triazine herbicides and help minimise the adverse effects of water quality problems such as high pH and mineral content that are common in creek and bore water, that can be antagonistic with glyphosate herbicide.

**Herbicides:** Atrazine – flowable or granular (see additives above – do not apply the tank mix control of Barnyard Grass (*Echinochloa crus-galli*), dicamba, 2,4-D ester, metsulfuron.

**Insecticides:** chlorpyrifos, dimethoate, Imidan\*, Le-Mat\*, metasytox, Sumithion\*.

## Flowright Compatibility Agent

**Rate:** 200 mL/100 L spray solution.

When mixing with Goal, add to improve the compatibility in cold water (less than 15°C). Flowright must be pre-mixed with Goal before adding to the spray tank. Refer to Flowright label for full directions.

## RESISTANT WEEDS WARNING

Quantum Glyphosate 450 SL Herbicide is a member of the

**GROUP 9 HERBICIDE**

Glycine group of herbicides. Quantum Glyphosate 450 SL Herbicide has the inhibition of EPSP syntheses mode of action. For weed resistance management Quantum Glyphosate 450 SL Herbicide is a Group 9 Herbicide. Some naturally occurring weed biotypes resistant to Quantum Glyphosate 450 SL Herbicide 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. These resistant weeds will not be controlled by Quantum Glyphosate 450 SL Herbicide or other Group 9 herbicides. Since the occurrence of resistant weeds is difficult to detect prior to use, Quantum Agrosciences Holdings Pty Ltd accepts no liability for any losses that may result from the failure of Quantum Glyphosate 450 SL Herbicide to control resistant weeds. DO NOT however assume resistance without reviewing the method of application, timing, water quality and weather conditions.

## PROTECTION OF CROPS, NATIVE AND OTHER NON-TARGET PLANTS

DO NOT apply under weather conditions, or from spraying equipment that may cause spray to drift onto nearby susceptible plants/crops, cropping lands, pastures, private properties or public lands. DO NOT apply prior to transplanting tomato seedlings.

## PROTECTION OF WILDLIFE, FISH, CRUSTACEANS AND ENVIRONMENT

DO NOT contaminate dams, watercourses, rivers or streams with the product or use containers. When controlling weeds near water, refer to label directions to minimise the entry of spray into the water.

## PROTECTION OF LIVESTOCK

There is no withholding period for grazing stock, but to give the product a chance to be efficiently absorbed by sprayed vegetation, it is recommended that livestock be kept clear of treated annual weeds for one day after spraying, and for perennial weeds 7 days. For certain plants known to be toxic to stock, it is advisable to keep livestock away until complete browning occurs.

## STORAGE AND DISPOSAL

DO NOT store the product in galvanised steel or unlined steel containers, as the product may react to produce hydrogen gas, which in turn could

form a highly combustible gas that could explode if ignited by an open flame, or spark, lighted cigarette etc. Store in the closed original container in a well ventilated as cool as possible. **DO NOT** store for prolonged periods in direct sunlight. Triple-rinse containers before disposal. Add rinsings to spray tank. **DO NOT** dispose of undiluted chemicals on site. If recycling, replace cap and return clean containers to recycler or designated collection point. If not recycling, break, crush, or puncture and deliver empty packaging to an approved waste management facility. If an approved waste management facility is not available, bury the empty packaging 500 mm below the surface in a disposal pit specifically marked and set up for this purpose, clear of waterways, desirable vegetation and tree roots, in compliance with relevant local, state or territory government regulations. **DO NOT** burn empty containers or product.

**For refillable containers:** Empty contents fully into application equipment. Close all valves and return to point of supply for refill or storage.

#### **SAFETY DIRECTIONS**

Product will irritate eyes and skin. Avoid contact with eyes and skin. When using together with other products, consult their label safety directions. When opening the container and preparing spray wear cotton overalls buttoned to the neck and wrist (or equivalent clothing), elbow-length chemical resistant gloves, and face shield or goggles. When using the prepared spray wear cotton overalls buttoned to the neck and wrist (or equivalent clothing), and elbow-length chemical resistant gloves. When using controlled droplet applicator wear protective waterproof clothing and impervious footwear. After each day's use and before eating, drinking or smoking, wash hands, arms and face thoroughly with soap and water. After each day's use, wash gloves and face shield or goggles and contaminated clothing.

#### **FIRST AID**

If poisoning occurs, contact a doctor or Poisons Information Centre. Phone Australia 13 11 26.

#### **SAFETY DATA SHEET**

For further information refer to Safety Data Sheet (SDS) which can be obtained from the supplier.

**CONDITIONS OF SALE:** Quantum Agrosciences Holdings Pty Ltd shall not be liable for any loss injury damage or death whether consequential or otherwise whatsoever or howsoever arising whether through negligence or otherwise in connection with the sale supply use or application of this product. The supply of this product is on the express condition that the purchaser does not rely on Quantum Agrosciences Holdings Pty Ltd's skill or judgement in purchasing or using the same and every person dealing with this product does so at his own risk absolutely. No representative of Quantum Agrosciences Holdings Pty Ltd has any authority to add to or alter these conditions.

Additional information required under the Globally Harmonised System (GHS) classification of the substance/ mixture: Causes skin irritation. Causes serious eye damage. May cause respiratory irritation. Toxic to aquatic life with long lasting effects.



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