

# Muscle-Up®

## K 500 SL



HERBICIDE



Reg. No. L8698 Act No. 36 of 1947

Reg. No. N-F 2267 Act No. 36 of 1947

**READ LABEL BEFORE USE**

**KEEP OUT OF REACH OF CHILDREN AND ANIMALS**

**HRAC HERBICIDE GROUP 9**

Muscle-Up® K 500 SL is a water-soluble concentrate non-selective, foliar applied systemic herbicide for the control of a wide range of annual and perennial weeds in agricultural, non-crop and industrial areas. May be used on glyphosate tolerant maize, soybean and cotton.



**WARNING**

### ACTIVE INGREDIENT

**GLYPHOSATE (GLYCINE)** 500 g/l  
(Glyphosate potassium salt) 615 g/l

#### HAZARD STATEMENTS:

Causes mild skin irritation.  
May cause allergic skin reaction.  
Causes serious eye irritation.

#### PRECAUTIONARY STATEMENTS:

Wash affected area thoroughly after handling.  
Do not touch eyes.  
Wear protective gloves, goggles and face protection.

Registered and Manufactured by: Rolfes Agri (Pty) Ltd.  
(Reg. No. 1998/013411/07) • 288 Mundt Street, Waltloo, 0184  
Gauteng, RSA. • Tel: (012) 803-0145

#### Emergency contact details

Office Hour Poisoning Helpline  
Rolfes Agri (Pty) Ltd.  
Tel: +27 (12) 803 0145

#### Spill Response and Spill incidents

Spill Tech, Oil and chemical pollution control  
Tel: +27 (86) 100 0366 / +27 (83) 253 6618  
[www.spilltech.co.za](http://www.spilltech.co.za)

Shake well before use • Store at room temperature  
Keep out of direct sunlight • Keep container closed when not in use



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## WARNINGS:

- Waiting period: Allow 7 - 10 days after last application and transplanting seedlings. Application on soils with a low clay content (< 10 % clay) can lead to significantly reduced germination and growth of small, seeded crops (i.e. onions) for up to 8 weeks after application.

## Glyphosate tolerant crops:

Minimum number of days between last application and harvest.

Maize : Grazing 28 days

Green Maize 42 days

Soybean: 14 days

- Re-entry interval: **DO NOT** enter treated area until spray deposit has dried unless wearing protective clothing.
- Avoid contact with leaves, green or immature bark and fruit of desired plants, whether direct or by spray drift. Always make sure that **ONLY UNDESIRE**D plants are treated.

## DISCLAIMER:

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

## PRECAUTIONS:

- If medical advice is needed, have container or label at hand.
- Keep out of reach of children.
- Read carefully and follow all instructions.
- Avoid breathing Mist/ Vapours/ Spray.
- Wash affected area thoroughly after handling.
- Contaminated work clothing should not be allowed out of the workplace.
- Wear safety goggles when handling this product.
- If skin irritation occurs, get medical help.
- If eye irritation persists, get medical help.
- **IF IN EYES:** Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing.
- **IF ON SKIN:** Wash with plenty of water. Specific treatment: Rinse with running water. If skin irritation or rash occur:
- Take off contaminated clothing and wash it before reuse.
- Empty all contents from the container by placing it upside down over the spray tank and holding it there for at least 30 seconds. Puncture the rinsed container to render it useless and send to a recycler.

## RELEVANT SUBSTANCES:

This product contains cocamidopropyl betaine <10% and glyphosate potassium salt 48%.

## RESISTANCE WARNING:

For resistance management, **MUSCLE-UP® K 500 SL** is a group code 9 herbicide. Any weed population may contain individuals naturally resistant to **MUSCLE-UP® K 500 SL** and other

group code 9 herbicides. The resistant individuals can eventually dominate the weed population if these herbicides are used repeatedly. These resistant weeds may not be controlled by **MUSCLE-UP® K 500 SL** or any other group code 9 herbicides.

To delay herbicide resistance:

- Avoid exclusive repeated use of herbicides from the same herbicide group code. Alternate or tank mix with registered products from different herbicide group codes.
- Integrate other control methods (chemical, cultural, biological) into weed control programs.
- Inconsistent control of certain grass populations and other weeds such as *Lolium* species, *Phalaris* species, *Avena* species (reported known resistance), *Chenopodium* species (plants with waxy leaves), *Coryza* species (Flax-leaf fleabane), *Commelina benghalensis* (Benghal wandering Jew), *Ipomoea* species (natural resistance) occur, due to resistance against Glyphosate.
- Due to the fact that these resistance populations vary in size and localities and are difficult to ascertain, it is essential that each land must be inspected annually to identify possible resistance early.
- If the above-mentioned preventative measures are not strictly adhered to, the registration holder cannot be held responsible for the failure of **MUSCLE-UP® K 500 SL** to control resistant weeds.

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

## DIRECTIONS FOR USE: Use only as directed.

- The efficacy of **MUSCLE-UP® K 500 SL** is significantly improved when used in combination with **POWER-UP®**. Use only clean water in spray mixture and add **POWER-UP®** according to label recommendations before adding **MUSCLE-UP® K 500 SL** to the spray water.
- The visible effect of **MUSCLE-UP® K 500 SL** on treated foliage usually only appears after 10 -14 days of treatment but may vary depending on weather conditions and weed species.
- **MUSCLE-UP® K 500 SL** is a non-selective systemic herbicide and is only active when applied to the green foliage and bark of plants.
- **MUSCLE-UP® K 500 SL** is actively absorbed through leaves and immature bark of most plants and trees. Contact with immature bark, such as in trees younger than three years, can result in serious localized or translocated damage. Therefore, contact with leaves, green or immature bark and fruit of **DESIRE**D plants, whether direct or by spray drift must be **AVOIDED**. Always make sure that **ONLY UNDESIRE**D plants are treated.
- **DO NOT** spray onto pruned vines or fruit trees until wounds have sealed completely.
- **MUSCLE-UP® K 500 SL** has limited pre-emergence activity (sandy soils, see below); therefore, repeat applications are necessary when applied on its own to control weeds germinating from seed. Target weeds must be fully exposed to the **MUSCLE-UP® K 500 SL** spray for optimum efficacy.
- **MUSCLE-UP® K 500 SL** should be applied to actively growing weeds that are not dormant or under temperature or moisture stress. Ensure full and even coverage onto target weeds.
- **DO NOT** spray whilst weeds are wet, dormant, under stress or covered in a layer of dust or silt or when damaged by frost.
- Rain or irrigation within 4 -6 hours of application can reduce the effectiveness of **MUSCLE-UP® K 500 SL**.
- **DO NOT** apply **MUSCLE-UP® K 500 SL** under less favourable weather conditions (i.e. ground-level temperature inversions, wind speeds of > 1 0 km/h or humidity < 40 %).
- **DO NOT** apply other pesticides within 12 hours of a **MUSCLE-UP® K 500 SL** application, as it may adversely affect the product's efficacy.

- When applied in a tank mix with other chemicals, follow the label recommendations of all products.
- Pre-plant weed control on sandy soil (<10 % clay) should take place at least 14 days before transplanting seedlings or sowing.

#### MIXING INSTRUCTIONS:

Half fill the spray tank with clean water. Add the required quantity of **POWER-UP®** and then **MUSCLE-UP® K 500 SL** while agitating. Fill spray tank to the required volume with clean water. When using tank mixes, follow the respective manufacturers' label recommendations. It is recommended that **MUSCLE-UP® K 500 SL** be added before the additional products if tank mixtures are used. Tank mixtures **must** be sprayed out immediately and not allowed to stand in the spray tank overnight. Spraying equipment must be thoroughly flushed out at the end of the spraying operation.

#### COMPATIBILITY:

The compatibility of **MUSCLE-UP® K 500 SL** with other products depends on the formulations of the respective products, as well as the quality of the spray water to be used. As formulations change from time to time it is recommended that a physical compatibility test be done prior to the tank mixture being made.

#### GLYPHOSATE TOLERANT CROPS:

##### GLYPHOSATE TOLERANT SOYBEAN:

Broadcast application:

**MUSCLE-UP® K 500 SL** may be applied post-emergent to Glyphosate tolerant soybeans from the ground cracking stage through to flowering.

Do not exceed the following **MUSCLE-UP® K 500 SL** application volumes per hectare:

- Cumulative total per season for all applications: 7.2 ℓ / ha
- Pre-plant, burndown applications: 2.2 ℓ / ha
- Total in-crop applications from cracking to flowering: 5.1 ℓ / ha
- Maximum pre-harvest application rate: 1.4 ℓ / ha

Refer to recommendations under “**Ground application**”.

##### GLYPHOSATE TOLERANT MAIZE:

**Broadcast (over the top) application:**

Broadcast application of **MUSCLE-UP® K 500 SL** can only be done after the ground cracking stage up to the V8 stage (V8 stage = when the first plants in the field have 8 leaves with closed collars around the main stem; however, the actual number of leaves may be more). Do **NOT** apply broadcast applications if the spray equipment will cause mechanical crop damage. Broadcast application after the V8 stage may cause yield loss or delayed maturity. Flat fan or twin jet nozzles, suitable for low water volume deliveries, are recommended. If follow-up applications are required to control specific weed species, e.g. *Cyperus esculentus*, the second application should not be made within 10 days of the first application. If the maize has grown beyond the V8 stage at this time, a directed follow-up application will be necessary (refer below).

**Directed application:**

Directed **MUSCLE-UP® K 500 SL** applications can be made after the V8 stage, if row spacing permits the movement of the sprayer without causing mechanical damage to the crop. Row spacing of 150 cm and 210 cm are recommended for conventional tractor

mounted spray rigs. For the control of certain broadleaf weeds mentioned above, **MUSCLE-UP® K 500 SL** can be mixed with either **2,4-D Amine** or **MCPA SL** at 500 mL / ha. Refer to **2,4-D Amine** or **MCPA SL** label for use restrictions.

#### GLYPHOSATE TOLERANT COTTON:

**Broadcast application:**

This product may be applied to control annual grasses and broadleaf weeds listed on this label in glyphosate tolerant cotton.

**MUSCLE-UP® K 500 SL** herbicide may be applied over-the-top beyond the 4th **TRUE LEAF/NODE COTTON GROWTH STAGE** in glyphosate tolerant cotton. For best results, make applications while weeds are small (less than 100 mm high). Where sequential applications are necessary to control specific weed species (e.g. *Cyperus esculentus*) the second application should not occur within 10 days of the first application. The second application can be delayed beyond the 4th **TRUE LEAF/NODE COTTON GROWTH STAGE**.

Maximum allowable **MUSCLE-UP® K 500 SL** application volumes:

- Combined total per season for all applications 13.4 ℓ / ha
- Pre-plant, applications 8.3 ℓ / ha
- Total in-crop applications from emergence throughout to 60% open balls 10 ℓ / ha
- Maximum pre harvest application rate from 60% open bolls to 7 days before harvest 3.5 ℓ / ha

Refer to recommendations under “**Ground application**”.

#### GROUND APPLICATION:

- Always ensure that spray equipment is clean, and correctly calibrated under field conditions before spraying to ensure even and accurate application.
- Use low spray pressure (100 - 200 kPa) to avoid spray drift.
- Apply **MUSCLE-UP® K 500 SL** at a maximum volume rate of 200 ℓ spray mixture per hectare. Where the volume rate is less than 120 ℓ per hectare, the application must be done with purpose designed low volume spray equipment (e.g. self-drive “high boy” sprayers).
- The application speed of low volume sprayers must not exceed 25 km per hour on an even soil bed. Where the soil bed is more uneven (e.g. due to clods) a maximum application speed of 15 km per hour must be used.
- Constant agitation throughout the spray operation is essential.
- Avoid the use of hard or muddy water, or water with a high colloidal content derived from soils high in organic matter.
- Ensure a medium-sized even droplet distribution and thorough coverage of target weeds.
- Conventional ground equipment such as knapsack sprayers, tractor-mounted booms or hand-held spray guns may be used.

GRASSES	APPLICATION RATE		RECOMMENDATIONS
	PER HA	SOLUTION	
Common couch <i>Cynodon dactylon</i>	4 ℓ	-	<b>Summer rainfall area:</b> Apply to actively growing grasses in autumn or summer. If regrowth occurs, spray with 1,65 % solution. <b>Winter rainfall area:</b> Apply as directed above in autumn.
	6 ℓ	-	
Weeping love grass <i>Eragrostis curvula</i>	1,3 ℓ	1 %	Apply to actively growing grasses in autumn or summer.
Common paspalum <i>Paspalum dilatatum</i>	4 ℓ	2 %	Apply in summer at flower, but before seed drop. If regrowth occurs, spray with 1% solution.
<i>Couch paspalum</i> <i>Paspalum paspalodes</i>	5,3 – 6 ℓ	-	Apply in summer at flowering but before seed drop. If regrowth occurs, spray with 1,3 % solution or 2,6 ℓ/ ha. Apply the higher rate in the winter rainfall area.
Common buffalo grass <i>Panicum maximum</i>	4 ℓ	2 %	Apply to actively growing grasses in early growth stage. If regrowth occurs, spray with 1% solution.
<i>Kikuyu</i> <i>Pennisetum clandestinum</i>	2,6 ℓ	1,3 %	Apply in summer to actively growing grasses. If regrowth occurs, spray with 1 % solution.
<i>Bush buffalo grass</i> <i>Setaria megaphylla</i>	4 ℓ	2 %	Apply to actively growing grasses in autumn or summer. If regrowth occurs, spray with 1% solution.
<i>Johnson grass</i> <i>Sorghum halepense</i>	2,6 ℓ	1,3 %	Apply in autumn or summer. If regrowth occurs, spray with 1 % solution.
<i>Common wild sorghum</i> <i>Sorghum verticilliflorum</i>	1,3 ℓ	1%	Apply to actively growing grasses in autumn or summer.

#### SEDGES:

BOTANICAL NAME	COMMON NAME	APPLICATION RATE	
		PER HA	PER 100 ℓ WATER
<i>Cyperus esculentus</i>	Yellow nutsedge	4	2 %

For best results apply February/March before flowering. If regrowth occurs, spray with 2 ℓ/ha or 1 % solution.

#### INDUSTRIAL WEED CONTROL:

##### Annual broadleaf weeds:

BOTANICAL NAME	COMMON NAME	APPLICATION RATE	
		PER HA	PER 100 ℓ WATER
<i>Amaranthus hybridus</i>	Common pigweed	2,6 - 4	1,3 - 2 %
<i>Richardia brasiliensis</i>	<i>Tropical Richardia</i>		
<i>Schkuhria pinnata</i>	<i>Dwarf marigold</i>		

##### Annual grasses:

BOTANICAL NAME	COMMON NAME	APPLICATION RATE	
		PER HA	PER 100 ℓ WATER
<i>Digitaria sanguinalis</i>	Crab fingergrass	2,6 - 4	1,3 - 2 %
<i>Eleusine coracana</i>	<i>African goose grass</i>		

**CONTROL OF ANNUAL WEEDS:**

**Broadleaf weeds:**

BOTANICAL NAME	COMMON NAME	APPLICATION RATE		
		1 -12 LEAF	12 LEAF PREBLOOM	FLOWERING
<i>Alternanthera pungens</i>	<i>Khaki burweed</i>	0,5 - 0,7 £ / ha	0,7 - 1 £ / ha	1 - 1,3 £ / ha
<i>Amaranthus hybridus</i>	<i>Common pigweed</i>			
<i>Amaranthus spinosus</i>	<i>Thorny pigweed</i>			
<i>Amaranthus thunbergii</i>	<i>Red pigweed</i>			
<i>Arctotis venusta</i>	<i>Free State daisy</i>			
* <i>Argemone subfusiformis</i>	<i>Mexican poppy</i>			
<i>Bidens pilosa</i>	<i>Black jack</i>			
* <i>Chenopodium album</i>	<i>White goosefoot</i>			
* <i>Chenopodium ambrosioides</i>	<i>American goosefoot</i>			
* <i>Chenopodium carinatum</i>	<i>Green goosefoot</i>			
* <i>Chenopodium murale</i>	<i>Nettle-leaved goosefoot</i>			
<i>Cirsium arvense</i>	<i>Canada thistle</i>			
<i>Citrullus lanatus</i>	<i>Bitter apple</i>			
<i>Cucumis spp.</i>	<i>Wild cucumber</i>			
<i>Datura ferox</i>	<i>Large thorn apple</i>			
<i>Datura stramonium</i>	<i>Thorn apple</i>			
<i>Galinsoga parviflora</i>	<i>Gallant soldier</i>			
* <i>Gisekia pharnaceoides</i>	<i>Gisekia</i>			
<i>Physalis angulata</i>	<i>Wild gooseberry</i>			
** <i>Portulaca oleracea</i>	<i>Purslane</i>			
<i>Pseudognaphalium luteoalbum</i>	<i>Cudweed</i>			
<i>Pseudognaphalium undulatum</i>	<i>Undulate cudweed</i>			
<i>Schkuhria pinnata</i>	<i>Dwarf marigold</i>			
<i>Spergula arvensis</i>	<i>Corn spurry</i>			
<i>Tribulus terrestris</i>	<i>Dubbeltjie</i>			

\*Alternate with herbicides from different classes as recommended under “RESISTANCE WARNING” to avoid development of resistance in these weed populations.

\*\*Variable control even at high rates has been recorded. Apply a follow-up application in the case of unsatisfactory control.

## Grasses:

BOTANICAL NAME	COMMON NAME	APPLICATION RATE		
		1 - 12 LEAF	12 LEAF PRE-BLOOM	FLOWERING
* <i>Avena fatua</i>	Common wild oats	0,5 - 0,7 ℓ / ha	0,7 - 1 ℓ / ha	1 - 1,3 ℓ / ha
* <i>Avena spp.</i>	Wild oats			
<i>Briza maxima</i>	Quaking grass			
<i>Bromus diandrus</i>	Ripgut brome			
<i>Eleusine coracana</i>	African goose grass			
<i>Ehrharta longiflora</i>	Oat-seed grass			
<i>Hordeum murinum</i>	Wild barley			
* <i>Lolium multiflorum</i>	Italian ryegrass			
* <i>Lolium temulentum</i>	Darnel			
<i>Panicum schinzii</i>	Sweet buffalo grass			
<i>Poa annua</i>	Winter grass			
<i>Rhynchelytrum repens</i>	Natal red-top			
<i>Secale cereale</i>	Rye			
<i>Sorghum bicolor</i>	Wild grain sorghum			
<i>Tragus racemosus</i>	Large carrot-seed grass			
** <i>Zea mays</i>	Volunteer maize			

\*Alternate with herbicides from different classes as recommended under “**RESISTANCE WARNING**” to avoid development of resistance in *Lolium* species. Under cold, stress conditions the rates might have to be increased to 2, 2,3 and 2,5 ℓ / ha according to the growth stage.

\*\* Apply a follow-up application in the case of unsatisfactory control and adjust the rates according to weed size and density. Will not control glyphosate-tolerant varieties.

## Recommended MUSCLE-UP® K 500 SL rates for annual broadleaf weeds:

Application rate	1,0 – 2,0 ℓ / ha	2,0 ℓ / ha	2,0 ℓ / ha
Growth stage	1 – 12 leaf stage	12 leaf stage – pre -bloom	Flowering
Musk heron's bill		<i>Erodium moschatum</i>	

## Recommended MUSCLE-UP® K 500 SL rates for annual broadleaf weeds:

Application rate	0,5 – 2,0 ℓ / ha	2,0 ℓ / ha	Do not spray
Growth stage	1 – 12 leaf stage	12 leaf stage to pre -bloom	Flowering
Small mallow		<i>Malva parviflora</i>	

## Recommended MUSCLE-UP® K 500 SL rates for annual broadleaf weeds:

Application rate	5,0 – 6,0 ℓ / ha	5,0 – 6,0 ℓ / ha	5,0 – 6,0 ℓ / ha
Growth stage	1 – 12 leaf stage	12 leaf stage to pre -bloom	Flowering
Sheep sorrel		<i>Rumex angiocarpus</i>	

## NOTES:

- Not recommended for *Malva parviflora* (small mallow) control at flowering.
- For problem *Erodium moschatum* (Musk heron's bill) (low growing type) control in grapevines and deciduous fruit: Apply 1,0 ℓ **MUSCLE-UP® K 500 SL** prior to budburst. Regrowth must be sprayed 4 to 6 weeks later with **PARAQUAT** and **SIMAZINE SC**. Refer to **PARAQUAT** and **SIMAZINE SC** labels for rates and details.

## ACKNOWLEDGEMENT OF TRADEMARKS:

**MUSCLE-UP®** and **POWER-UP®** are registered trademarks of Rolfes Agri (Pty) Ltd.

## PRODUCT REGISTRATION:

**POWER-UP®**, Reg. No. L6463 Act No. 36 of 1947

Registration holder: Rolfes Agri (Pty) Ltd