



HERBICIDE

Muscle-Up[®] K 500 SG

Reg. No. L7641 Act No. 36 of 1947

HRAC HERBICIDE GROUP CODE G

A water-soluble granule, non-selective systemic herbicide with little or no soil activity, for use as a post-emergent treatment on annual and perennial weeds.

Active Ingredient:

| | |
|--------------------------|----------------|
| Glyphosate (glycine) | 500 g a.e. /kg |
| (Glyphosate sodium Salt) | 588 g/kg |

Rolfes 
Formulating Sustainable Growth **Agri**

Registered, Manufactured and Distributed by:

Rolfes Agri (Pty) Ltd.

(Reg. No. 1998/013411/07)

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MUSCLE UP[®] 500 SG IS A REGISTERED TRADEMARK OF ROLFES AGRÍ (PTY) LTD.

SEE CONTAINER FOR BATCH DETAILS

COUNTRY OF ORIGIN: REPUBLIC OF SOUTH AFRICA

VERSION ROLFES AGRÍ: 07/2020



CAUTION



LIFT HERE

WARNINGS:

- Harmful if inhaled or swallowed.
- Causes irritation of skin and eyes.
- Store away from food, feeds, fertilizers and other chemicals.
- Keep out of reach of children, uninformed persons and animals.
- Re-entry interval: Do not enter treated area until spray deposit has dried unless wearing protective clothing.

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:

- Wear rubber gloves and face shield protection when handling the concentrate.
- Do not inhale the spray mist.
- Avoid contact with the spray as much as you can.
- Avoid spray drift onto other crops, grazing, rivers, dams and areas not under treatment.
- Prevent contamination of food, feeds, drinking water and eating utensils.
- Wash immediately with water after application or accidental skin contact.
- Do not smoke, eat or drink during use or before washing hands.
- Clean applicator thoroughly after use and dispose of wash water where it will not contaminate crops, grazing, rivers or dams.
- Rinse the container three times. For each rinse add clean water, to the volume of a quarter of the container, close the cap and agitate or shake well. Decant the rinse water into the spray tank.
- Puncture the container. Keep caps separate and hand over to one of the CropLife South Africa approved collectors or recyclers
- Change and wash your work clothes. Wash yourself.

Resistance Warning:

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

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

Important notes regarding resistant weeds in South Africa:

- Sub-optimal and variable control of certain grass and broadleaf weed populations have been reported / confirmed for *Lolium* species, *Phalaris* species, *Avena* species, (reported known resistance), *Chenopodium* species (plants with waxy leaves), *Conyza bonariensis* (Flax-leaf fleabane), *Commelina benghalensis* (Benghal wandering Jew), *Ipomoea* species (natural resistance) occur, due to resistance against the active ingredient Glyphosate.
- Some of these populations might also show resistant against the herbicide active ingredients Paraquat and Diquat, as well as the aryloxyphenoxy propionates, cyclohexanediones and sulfonylureas.
- Due to the fact that such populations vary in size and localities and are difficult to ascertain, it is essential that each land must be inspected seasonally to identify possible resistance problems early.
- If the preventative measures, listed below under USE RESTRICTIONS, are not adhered to, the registration holder cannot accept responsibility for sub-optimal or failure to control resistant weeds with **MUSCLE-UP® K 500 SG**.

USE RESTRICTIONS

1. **MUSCLE-UP® K 500 SG** is a non-selective systemic herbicide and is only active when applied to the green foliage and bark of plants. The visible effect of **MUSCLE-UP® K 500 SG** on treated foliage usually appears at 10–14 days after treatment but may vary depending on weather conditions.
2. **MUSCLE-UP® K 500 SG** should be applied to actively growing weeds that are not dormant or under temperature or moisture stress.
3. Rain or irrigation a few days prior to **MUSCLE-UP® K 500 SG** application ensures that weeds are actively growing, resulting in optimum efficacy. Rain or irrigation within 6 hours of application can reduce **MUSCLE-UP® K 500 SG**'s efficacy.
4. Do not spray on weed foliage covered with a layer of dust. In these situations apply after recent rain.
5. **MUSCLE-UP® K 500 SG** has NO pre-emergence activity in general (Refer to point 7 below) ; therefore, repeat applications are necessary when applied on its own to control weeds germinating from seed. Ensure that target weeds are fully exposed to the **MUSCLE-UP® K 500 SG** spray.
6. **MUSCLE-UP® K 500 SG** 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 localised or translocated damage. Therefore, contact with leaves, green or immature bark and fruit of DESIRED plants, whether direct or by spray drift must be AVOIDED. Always make sure that ONLY UNDESIRE plants are treated. Do not spray onto pruned vines or fruit trees until wounds have sealed properly.
7. Pre-plant weed control on sandy soil (<10% clay) should take place at least 14 days before transplanting tomato or tobacco seedlings.
8. Do not apply when temperature inversions exist (calm wind conditions with cooler air trapped at ground level below warmer air higher up. Smoke or fog will hang close to ground under such conditions). This may lead to damage to non target plants up to a few kilometres away from the site of application.

DIRECTIONS FOR USE: Use only as indicated.

1. The efficacy of **MUSCLE-UP® K 500 SG** is significantly improved when used in combination with **POWER-UP®** (Reg. No. L6463 Act No. 36 of 1947). Use only clean water in spray mixture and add **POWER-UP®** according to label recommendations before adding **MUSCLE-UP® K 500 SG** to the spray water.

2. Always ensure that the spray equipment is clean and correctly calibrated before spraying.
3. Use low spray pressure (100 – 200 kPa) to avoid spray drift.

MIXING INSTRUCTIONS:

Half fill the spray tank with clean water and add the required quantity of **POWER-UP®** and then **MUSCLE-UP® K 500 SG**. Finish filling spray tank to the required volume with clean water ensuring thorough agitation. When using tank mixtures, the additional herbicide should be added after **MUSCLE-UP® K 500 SG**. Continuous agitation before and during spraying is required.

APPLICATION:

- Remove sediments, e.g. residues of WP pesticides, from spray tanks before adding **MUSCLE-UP® K 500 SG**.
- Always ensure that spray equipment is clean and free of rust and dust.
- Avoid the use of hard or muddy water, or water with high colloidal content derived from soils high in organic matter. Where only hard water, or water with high levels of dissolved salts is available, **Power Up®** must be added to the spray mixture as per label instructions.
- Correctly calibrate all sprayers under field conditions prior to application and ensure spray equipment is in good working order.
- It is not necessary to spray to the point of run-off, but it is essential to ensure complete coverage of the target weed.
- Even application is essential for good results.
- **MUSCLE-UP® K 500 SG** can be applied with conventional ground equipment i.e. tractor-mounted booms, knapsack, etc.
- Optimum spray deposits are obtained with ground equipment calibrated to spray from 100 l /ha with suitable nozzles to ensure adequate coverage. Use higher water volumes (200 l /ha plus) where weeds have grown initial under adverse conditions (e.g. hot and dry).
- Use only the pressure recommended for specific nozzles to avoid drift.
- Do not use hollow cone nozzles which tend to produce a high percentage of fine driftable droplets. The use of drift reduction nozzles (e.g. air induction) is recommended. However, do not spray at too low water volumes with such nozzles as droplet coverage on the target foliage is reduced. Where drift is a problem with conventional flat fan nozzles, do not exceed 2 bar (pressure).

APPLICATION RATES:

MUSCLE-UP® K 500 SG will control most emerged annual weeds germination from seed in situations such as fallow land, pre-plant of crops, reduced or conservation tillage, perennial vine and tree crops. The dosage rate applies will depend on the weed growth stage – the higher recommended dosage rate should be used on older and more established weeds.

CONTROL OF PERENNIAL WEEDS

| NOXIOUS WEEDS | DOSAGE RATE | | REMARKS |
|---|-------------|-----------------------|---|
| | PER HA | PER 100 l WATER | |
| Red Sesbania <i>Sesbania punicea</i> | 2,2 kg | 1,5 kg 1,5 – 2,0kg | Seedling plants less than 1 m high: Use 1,5% solution Tall shrubs: Slash, spray regrowth with 1,5 – 2 % solution at 1m high. |
| Bugweed <i>Solanum mauritianum</i> | 1,5 kg | 1,5 kg | Apply in spring or summer. Large trees: Cut to 50cm, allow new growth of at least 50 cm before application. |

| NOXIOUS WEEDS | DOSAGE RATE | | REMARKS |
|---------------|-------------|-----------------|-------------------------------------|
| | PER HA | PER 100 l WATER | |
| | | 0,5 kg | Saplings: Apply directly to foliage |

CONTROL OF PERENNIAL GRASSES:

| GRASSES | DOSAGE RATE | | REMARKS |
|---|------------------|-----------------|---|
| | PER HA | PER 100 l WATER | |
| Common couch <i>Cynodon dactylon</i> | 4,3 kg 6,5 kg | - - | Summer rainfall area: Apply to actively growing grasses in autumn or summer. If re-growth occurs, spray with 2,5 % solution. Winter rainfall area: As above in autumn. |
| Weeping love grass <i>Eragrostis curvula</i> | 2,2 kg | 1,5 kg | Apply to actively growing grasses in autumn or summer. |
| Common paspalum <i>Paspalum dilatatum</i> | 4,3 kg | 3,0 kg | Apply in summer at flower, but before seed drop. If re-growth occurs, spray with 1,5 % solution. |
| <i>Couch paspalum</i> <i>Paspalum paspalodes</i> | 5,8 – 6,5 kg | - | Apply in summer at flowering but before seed drop. If re-growth occurs, spray with 2 % solution or 2,9 kg/ha. Apply the higher rate in the winter rainfall area. |

| GRASSES | DOSAGE RATE | | REMARKS |
|---|-------------|-----------------|--|
| | PER HA | PER 100 ℓ WATER | |
| <i>Common buffalo grass Panicum maximum</i> | 4,3 kg | 3,0 kg | Apply to actively growing grasses in the early growth stage. If re-growth occurs, spray with 1,5 % solution. |
| <i>Kikuyu Pennisetum clandestinum</i> | 2,9 kg | 1,5 kg | Apply in summer to actively growing grasses. If re-growth occurs, spray with 1,5 % solution. |
| <i>Bush buffalo grass Setaria megaphylla</i> | 4,3 kg | 3,0 kg | Apply to actively growing grasses in autumn or summer. If re-growth occurs, spray with 1,5 % solution. |
| <i>Johnson grass Sorghum halepense</i> | 2,9 kg | 2,0 kg | Apply in summer or autumn. If re-growth occurs, spray with 1,5 % solution. |
| <i>Common wild sorghum Sorghum verticilliflorum</i> | 1,5 kg | 1,5 kg | Apply to actively growing grasses in summer or autumn. |

CONTROL OF PERENNIAL SEDGES:

| SLEDGES | DOSAGE RATE | | REMARKS |
|---|-------------|-----------------|--|
| | PER HA | PER 100 ℓ WATER | |
| <i>Yellow nutsedge Cyperus esculentus</i> | 4,3 kg | - | Apply in summer at pre-flowering stage. If regrowth occurs, spray with 1,5% solution or 2,2 kg/ha. The best results will be obtained when applied in February/March. |
| <i>Purple nutsedge Cyperus rotundus</i> | 4,3 kg | - | |

CONTROL OF ANNUAL WEEDS (Important – refer to RESISTANCE WARNING above): Recommended MUSCLE UP® K 500 SG rates for annual broadleaf weeds:

| Dosage rate | 0,75 – 1,5 kg/ha | 1,5 kg/ ha | 2,2 kg/ha |
|---------------|------------------------------|-----------------------------|-----------|
| Growth stage | 1 – 12 leaf stage | 12 leaf stage – pre – bloom | Flowering |
| Khaki burweed | <i>Alternanthera pungens</i> | | |
| Cape pigweed | <i>Amaranthus hybridus</i> | | |

| | |
|-------------------------|-------------------------------------|
| Thorny pigweed | <i>Amaranthus spinosus</i> |
| Red pigweed | <i>Amaranthus thunbergii</i> |
| Free State daisy | <i>Arctotis venusta</i> |
| Mexican poppy | <i>Argemone subfusiformis</i> |
| Black jack | <i>Bidens pilosa</i> |
| White goosefoot | <i>Chenopodium album</i> |
| American goosefoot | <i>Chenopodium ambrosioides</i> |
| Green goosefoot | <i>Chenopodium carinatum</i> |
| Nettle-leaved goosefoot | <i>Chenopodium murale</i> |
| Canada thistle | <i>Cirsium arvense</i> |
| Bitter apple | <i>Citrullus lanatus</i> |
| Tall fleabane* | <i>Conyza albida*</i> |
| Wild cucumber | <i>Cucumis spp.</i> |
| Large thorn apple | <i>Datura ferox</i> |
| Thorn apple | <i>Datura stramonium</i> |
| Gallant soldier | <i>Galinsoga parviflora</i> |
| Gisekia | <i>Gisekia pharnaceioides</i> |
| Wild gooseberry | <i>Physalis angulata</i> |
| Jersey cudweed | <i>Pseudognaphalium luteo-album</i> |
| Cudweed | <i>Pseudognaphalium undulatum</i> |
| Tropical Richardia | <i>Richardia brasiliensis</i> |
| Karoo bush | <i>Pentzia grandiflora</i> |
| Corn spurry | <i>Spergula arvensis</i> |

* These weeds may be controlled sub-optimally or variably. Refer to RESISTANCE WARNING above.

Recommended MUSCLE UP® K 500 SG rates for annual broadleaf grasses:

Recommended MUSCLE UP® K 500 SG rates for annual broadleaf grasses:

| Dosage rate | 1,0 – 1,5 kg/ ha | 2,2 kg/ha |
|-------------------------|-----------------------------|-----------|
| Growth stage | 1 leaf stage to pre-bloom | Flowering |
| Common wild oats | <i>Avena fatua</i> | |
| Oats | <i>Avena spp.</i> | |
| Quaking grass | <i>Briza maxima</i> | |
| Ripgut brome | <i>Bromus diandrus</i> | |
| Goose grass | <i>Eleusine indica</i> | |
| Weeping love grass | <i>Eragrotis curvula</i> | |
| Oat-seed grass | <i>Ehrharta longiflora</i> | |
| Wild barley | <i>Hordeum murinum</i> | |
| Cress | <i>Lepidium africanum</i> | |
| Rye grass* | <i>Lolium spp*</i> | |
| Sweet buffalo grass | <i>Panicum schinzii</i> | |
| Winter grass | <i>Poa annua</i> | |
| Natal red-top | <i>Rhynchelytrum repens</i> | |
| Rye | <i>Secale cereale</i> | |
| Wild grain sorghum | <i>Sorghum bicolor</i> | |
| Large carrot-seed grass | <i>Tragus racemosus</i> | |

* These weeds may be controlled sub-optimally or variably. Refer to RESISTANCE WARNING above.

Recommended MUSCLE UP® K 500 SG rates for annual broadleaf weeds and grasses:

| Dosage rate | 1,0 – 1,5 kg/ha | 1, 5 - 2,2 kg/ ha | 2,2-2,9 kg/ha |
|--------------------------|---------------------------------|---------------------------|---------------|
| Growth stage | 1 – 12 leaf stage | 12 leaf stage – pre-bloom | Flowering |
| Cape Marigold | <i>Arctotheca calendula</i> | | |
| Red milkweed | <i>Chamaesyce hirta</i> | | |
| Smooth creeping milkweed | <i>Chamaesyce inaequilatera</i> | | |
| Feathertop chloris | <i>Chloris virgat</i> | | |

| | |
|----------------------------|--------------------------------------|
| Wandering jew* | <i>Commelina benghalensis*</i> |
| Fleabane* | <i>Conyza canadensis*</i> |
| Tall Fleabane* | <i>Conyza albida*</i> |
| Swine cress | <i>Caronopus didymus</i> |
| Miellie crotolaria | <i>Crotalaria sphaerocarpa</i> |
| Spine Emex | <i>Emex australis</i> |
| Fumitory | <i>Fumaria muralis</i> |
| Kanaf | <i>Hibiscus cannabinus</i> |
| Bladderweed | <i>Hibiscus trinum</i> |
| Common morning glory | <i>Ipomoea purpurea</i> |
| Tall purslane | <i>Paspalum urvillei (seedlings)</i> |
| Wild radish | <i>Raphanus raphanistrum</i> |
| Little seeded canary grass | <i>Phalaris minor</i> |
| Dwarf marigold | <i>Schkuhria pinnata</i> |
| Molton disease senecio | <i>Senecio burchelli</i> |
| Wild sesame | <i>Sesamum triphyllum</i> |
| Red bristle grass | <i>Setaria pallida-fusca</i> |
| Sticky bristle grass | <i>Setaria verticillate</i> |
| Common sow thistle | <i>Sonchus oleraceus</i> |
| Tall khaki weed | <i>Tagetes minuta</i> |
| Common dubbeltjie | <i>Tribulus terrestris</i> |
| Speedwell | <i>Veronica spp</i> |
| Volunteer maize | <i>Zea mays</i> |
| Volunteer wheat | <i>Triticum spp.</i> |

* These weeds may be controlled sub-optimally or variably. Refer to RESISTANCE WARNING above.

Recommended MUSCLE-UP® K 500 SG rates for annual broadleaf grasses:

| Dosage rate | 1,8 – 2,2 kg/ha | 2,2, -3,6 kg/ ha | 3,6 - 4,3 kg/ha |
|-----------------------|-------------------------------|----------------------------|-----------------|
| Growth stage | 1 – 12 leaf stage | 12 leaf stage – pre -bloom | Flowering |
| Wisp | <i>Leome gynandra</i> | | |
| Crab finger grass | <i>Digitaria sanguinalis</i> | | |
| Barnyard grass | <i>Echinochloa crus-galli</i> | | |
| Patterson's curse | <i>Echium lycopsis</i> | | |
| Hairy wild lettuce | <i>Hypochoeris radicata</i> | | |
| Common buffalo grass | <i>Panicum maximum</i> | | |
| Narrow leaved ribwort | <i>Plantago lanceolate</i> | | |
| Prostrate knotweed | <i>Polygonum aviculare</i> | | |
| Tall paspalum | <i>Paspalum urvillei</i> | | |
| Heartload sida | <i>Sida cordifolia</i> | | |
| Nightshade | <i>Solanum nigrum</i> | | |
| European verbena | <i>Verbena officinolis</i> | | |
| Garden urochloa | <i>Urochloa panicoides</i> | | |

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

| Dosage rate | 1,0 – 4,3 kg/ha | 4,3 kg/ ha | 4,3 kg/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 SG rates for annual broadleaf weeds:

| Dosage rate | 4,3 kg/ha | 4,3 kg/ ha | 4,3 kg/ha |
|------------------|--------------------------|----------------------------|-----------|
| Growth stage | 1 – 12 leaf stage | 12 leaf stage – pre -bloom | Flowering |
| Small mallow | <i>Malva parviflora</i> | | |
| Evening primrose | <i>Oenothera stricta</i> | | |

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

| Dosage rate | 3,6 - 4,3 kg/ha | 3,6 - 4,3 kg/ ha | 3,6 - 4,3 kg/ha |
|--------------|--------------------------|----------------------------|-----------------|
| Growth stage | 1 – 12 leaf stage | 12 leaf stage – pre -bloom | Flowering |
| Sheep sorrel | <i>Rumex angiocarpus</i> | | |

NOTES:

- For *Malva parviflora* (small mallow) and *Oenothera stricta* (evening primrose) control, spray **MUSCLE-UP® K 500 SG** at 2,2 kg/ha in combination with recommended simazine SC rate for the soil type.
- For problem *Erodium moschatum* (Musk heron's bill) (low growing type) control in grapevines and deciduous fruit: Apply 1,5 kg **MUSCLE-UP® K 500 SG** 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.

SPECIFIC RECOMMENDATIONS:

| CROP | REMARKS |
|--|---|
| Almonds, Aloes, Apples, Apricots, Avocados, Bananas, Blackberry, Cherries, Citrus, Coffee, Granadilla, Guava, Hops, Kiwi fruit, Litchies, Macadamia nuts, mangoes, Nectarines, Olives, Pawpaw, Peaches, Pears, Pecan nuts, Pineapples, Plums, Cactus pears, Prunes, Quinces, Tea | See weed tables for dosage rate of Protect young trees with green bark from direct spray. |
| Vines and Fruit trees | Apply before budburst to vines older than 2 years. Younger vines with green bark should be shielded. Spray should be directed onto weeds. Do not spray onto pruned vines of fruit trees until wounds have sealed properly. COVER CROP DESTRUCTION IN GRAPEVINES: Apply MUSCLE-UP® K 500 SG at 1,0 – 2,2 kg/ha. Apply 10 days or more after pruning and before budburst. |
| Sisal | Applications can be made to nursery and mature plants |
| Arable land | Use MUSCLE-UP® K 500 SG after harvesting of previous crop. Do not disturb target plants before 6 hours after application (before planting crops) and prior to emergence of new crop. |

FORESTRY USAGE:

| SITUATION | WEED SPECIES | Dosage Rate | | REMARKS |
|---|---|-------------|--|--|
| | | kg/ha | % Solution (kg MUSCLE-UP® 500 SG in 100 ℓ water) | |
| MAINTENANCE IN ESTABLISHED FORESTS | Black wattle <i>Acacia mearnsii</i> | 2,2 | 1,5 | Apply to young trees up to 1 m high |
| | Bugweed <i>Solanum mauritianum</i> | 1,5 | 1,5 | Large trees: Cut to 50 cm, allow re-growth of at least 50 cm before application |
| | | | 0,5 | Saplings: Apply directly to foliage. |
| | American bramble <i>Rubus spp</i> | 4,3 | 3,0 | Slash rank growth in winter. Apply when new growth is more than 0,5 m high. If re-growth occurs, spray with 1,5% solution. |
| 1. FIREBREAKS Either tracer belts or total area 2. BAND PREPARATION FOR TREE SEEDLINGS Situations suitable for such treemnets include: a) Virgin veld b) Clear felled forest | In both situations weed population would include perennials and annuals. Refer to above lists for some of the weed control. | 2,9 | 2,0 | A minimum of 200 ℓ spray mixture per hectare must be applied when using the 2% solution A follow-up treatment may be necessary to control some hardy perennials, using a 2% solution on a spot spray basis. |

| CROP | DOSAGE | REMARKS |
|--|--------------|--|
| Bluegum <i>Eucalyptus grandis</i> | 5 % solution | Single stem stumps: Apply 50 ml solution to clean cambium area immediately after felling. |
| | 7% solution | Multistem stumps: Apply 100 mℓ solution to a clean, fully exposed cambium layer immediately after felling. If re-growth occurs, spray with 2% solution. |