

Read the label before opening the container.

For Full particulars, see enclosed leaflet.

TumbleWeed



South Africa Reg.No: L 4781 Act No. 36 of 1947

Namibia Reg. No: N-AR 0699 Act no 36 of 1947

A high surfactant, non-selective soluble liquid herbicide with systemic action for the post-emergence control of annual and perennial weeds in agricultural and non-agricultural areas.

HRAC HERBICIDE GROUP CODE: G

ACTIVE INGREDIENT:

Glyphosate isopropylamine salt..... 324 g/l
(acid equivalent..... 240 g/l)

Product Information Tel no: 082 801 6759

In case of poisoning: 082 446 8946

www.enviro-crop.co.za



Batch No:

Date of Manufacture:

UN No. 3082

Registration holder:

Enviro Industries (Pty) Ltd t/a Enviro Weed Control Systems

Reg No. 1999/006136/07

10 Ninth Avenue, Industria, Kroonstad, 9500

Tel: 056 213 1967

11042000-11/12



CAUTION
VERSIGTIG

TumbleWeed

Reg. No. L4781 Act/Wet No. 36 of/van 1947

Namibia Reg. No. N-AR 0699 Act/Wet No. 36 of/van 1947

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'n Nie-selektiewe, sistemiese oplosbare onkruidodder, met 'n hoë bevorderingsmiddel inhoud, in vloeibare vorm, vir die na-opkomsbeheer van een- en meerjarige onkruid in verboude en onverboude gebiede.

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CAUTION / VERSIGTIG

WARNINGS

- When using **TumbleWeed** as a land preparation for transplanted tomatoes, or any other transplanted crop with green, soft stems, allow a minimum of 14 days between application and transplanting of seedlings.
- Poisonous if swallowed.
- Irritating to eyes and skin.
- Keep out of reach of children and uninformed persons.
- Store away from food, feedstuffs, seed, fertilizers and other agricultural chemicals.
- The product should be mixed, stored and applied only in stainless steel, aluminium, fibreglass, plastic or plastic lined containers.
- Do not mix, store or apply the product or solutions in galvanised steel or unlined steel (except stainless steel) containers or spray tanks. The product can react with such containers and tanks or produce hydrogen gas which may form a highly combustible gas mixture that can flash or explode if ignited by open flame, spark, welder's torch, lighted or other ignition source.
- Re-entry: Do not enter treated area, until spray deposit has dried unless wearing protective clothing.

Aerial application: Notify all inhabitants in the immediate vicinity of the area to be sprayed and issue the necessary warnings. Do not spray over or allow drift to contaminate water or adjacent areas.

Glyphosate is a highly active herbicide that in very small quantities can cause serious damage to crop seedlings and deciduous fruit trees and grapevines during budding and early season growth stages. Under the following conditions it can cause serious damage as far as 3 to 5 kilometers from the nearest flight path of the aircraft: cloudy weather with relative humidity above 80% and low air movement of less than 5 km per hour. Where such conditions prevail aerial application should not be carried out where crop seedlings or deciduous fruit and grapevines in budding or early development stages are present within 5 kilometers of the nearest flight path of the aircraft.

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 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

For your own safety take the following precautions:

- Do not eat, drink or smoke while handling this product.
- Prevent contamination of food, feeds, drinking water and eating utensils.
- After using the product wash hands and face before eating.

When mixing:

- Wear eye protection and impermeable gloves.
- In the case of contact with skin, wash immediately with plenty of water.
- In the case of eye contamination, flush out at once for five minutes and get medical attention if necessary.

When Spraying:

- Do not inhale fumes or spray mist.
- Avoid contact with spray solution as much as possible.
- Wear suitable protective clothing.

After spraying:

- Clean applicator thoroughly after use and dispose of rinsings where it will not contaminate crops, grazing, rivers or dams.
- Rinse empty container three times with a volume of water equal to at least one tenth of that of the container, add the rinsings to the spray tank before perforation and flattening the container. Do not use for any other purpose.
- Change and wash your work clothes.
- Wash your exposed skin area with soap and water.

Use Precautions:

- Ensure that the person assigned to apply the product is properly trained in its use.
- Prevent spray drift onto susceptible or edible crops, grazing, green or immature bark and fruit of non-target plants, which can result in serious localised or translocated damage.

USAGE

TumbleWeed may be used:

- As a **broadcast spray** to control weeds pre-planting in arable agriculture, forestry and sugarcane to reduce tillage;
- As a **directed spray** to control annual and perennial weeds in forests, fruit and ornamental plantings in sugarcane culture.
- For the control of **unwanted trees and semi-woody plants** on farmland, parkland, road reserves, forest plantations and similar areas.
- For the **non-selective control** of weeds in non-cultivated areas such as roadsides, railway lines and electrical yards and the like.
- For the creation of the **fire breaks**.

RESISTANCE WARNING

For resistance management **TumbleWeed** is a group code **G** herbicide. Any weed population may contain individuals naturally resistant to **TumbleWeed** 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 **TumbleWeed** or any other group code **G** herbicide. To delay herbicide resistance:

- Avoid exclusive repeated use of herbicides from the same herbicide group code. Alternate or tank mix with 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.

DIRECTIONS FOR USE: Use Only As Directed**GENERAL**

- **TumbleWeed** is a non-volatile, water soluble liquid product with non-selective herbicidal activity against a wide range of annual and broadleaf weeds and grasses in crops and non-crops situations.
- It is absorbed by plant foliage, green stems and immature bark and is inactivated immediately in the soil and does not provide residual weed control.

- Visible effects on annual weeds may take up to 7 days, while on perennial weeds effects may take 2 to 3 weeks or longer to become evident. Results are quicker under warm conditions.
- Weeds are best treated when growing vigorously, and prior to seed formation. Do not treat plants which are dormant or which have been frosted, or growing poorly due to drought, water-logging or are covered with dust or silt. Diminished result may occur when spraying is done when weeds are covered with dew.
- Perennial weeds are best treated when peak growth achieved in midsummer. Weeds having underground rootstocks may require a second application to control growth from buds which survived the initial application. Top growth of perennial bunch grasses may be removed by mowing prior to application and the herbicide applied after a few days. Plant residues should be raked away from the area to be treated so as to expose the green foliage to the spray.
- **TumbleWeed** is rainfast within 3 hours after application. Rainfall within this period may cause diminished results on hard to kill weeds. For best results, use a minimum of 2,5 l **TumbleWeed** in 100 to 200 total spray solution per ha. Always adhere to the recommended dosage ml/ha for the weeds in question. Where higher volumes of spray are required to treat dense weeds, do not use less than 1% concentration by volume.

APPLICATION

- **TumbleWeed** must be diluted with water and applied as a fine spray to the vegetation. Volumes between 12 and 600 l/ha may be used, provided the recommended quality of product is applied on a hectare basis, and that a minimum concentration of 1% product by volume is maintained. Best results are obtained if a minimum volume of 200 l/ha is used. Spray apparatus must always be calibrated under field conditions, to determine the quantity of product to be added to the spray tank.
- Avoid spray drift. Extreme care must be taken when applying this product to prevent injury to desirable plants and crops.
- Do not spray under conditions when spray drift to desirable vegetation may occur.
- Do not drench weeds or spray beyond the point of run-off. Apply to the product the minimum quantity of water to achieve an even coverage of the leaf surface.

Boom equipment using standard nozzles

- The optimum volume using standard nozzles is 100 to 200 l/ha.
- A nozzle giving “fine” to “medium” droplets is preferred to “coarse” droplets to ensure adequate coverage of the leaf surface.
- Boom height must be set to ensure correct overlap of nozzle pattern at the top of the weed canopy.
- Standard flat fan nozzles may be used at pressures of 200 to 300 kPa. Alternatively low drift nozzles may be used at 100 to 200 kPa.
- The nozzle size to be used will depend on the speed of travel and pressure. Higher pressures than those specified will result in the production of finer droplets increasing the risk of drift.

Knapsack Equipment

Standard or low-drift flat fan nozzles, or anvil (TK series) or hollow or solid cone nozzles may be used. For a spray swath of 500 mm a standard flat fan such as 8002 at 200 to 300 kPa, or the low drift 8002 LP at 100 to 200 kPa, walking at 1,0 m/second (3,6 km/hr) will apply approximately 200 l/ha. A 20 l sprayer will treat 2,0 km, or 0,1 ha.

Maintain the band width, walking speed and pressure used in the initial calibration. The use of the “Weedmaster” spray management valve will ensure a constant output from the nozzle.

- For a 1,0 metre swath width an anvil or TK 2,5 tip at 150 kPa will deliver approximately 200 l/ha. 20 l will then treat 1,0 km.
- For spot spraying or treating shrubs up to 2,0 metres high, a hollow or solid cone nozzle is recommended. A D3 or D4 disc with a No. 25 core will produce a hollow cone pattern with fine droplets. For a solid cone pattern with coarser droplets, a TG 0,5 or 1,0 tip may be used. Pressures of 200 to 300 kPa are satisfactory. Spray operators should be trained to achieve the correct dosage.

Pressure Sprayers – Hand Gun Equipment

- This equipment is used to treat tall growth of dense stands of weeds.
- Adjust equipment to achieve a fine spray pattern to give complete foliar coverage but do not spray to the point of run-off. Use the minimum spray volume needed to achieve uniform wetting of all foliage.

LOW VOLUME CONTROLLED DROPLET APPLICATION EQUIPMENT (CDA) (SPINNING DISC)

Spinning disc equipment is ideal for the application of **TumbleWeed** in various situations. The spray droplets produced are sized to produce optimum coverage at volumes of 15 to 30 l/ha while at the same time the quantity of driftable particles is significantly reduced. Care must however be taken to ensure that the spray swath is not displaced by wind to reach non-target plants.

The type of equipment available is as follows:

1. Hand held battery operated units applying a 1,2 metres wide swath, or adjustable from 300 to 750 mm.
2. ATV, tractor or utility mounted equipment for swaths from 1,8 metres to 7,2 metres wide.

HAND HELD APPLICATORS

The tables below are a guide to application rates and dilutions when Miron Herbi (1,2 metres swath) or Herbaflex (adjustable swath) applicators are used.

Always check the flow rate before adding **TumbleWeed** to the tank.

Walking speed 1,0 metre/second (3,6 km/hour).

Model	Swath width	TumbleWeed Dosage l/ha	Qty TumbleWeed in 5 l spray mix
Micron Herbi Yellow nozzle at 160 ml/minute 22 ml/ha 5l covers 2,0 km	1,2 m	3,0	700 ml
		4,5	1,0 l
		6,0	1,36 l
		7,5	1,7 l
Herbaflex Narrow Cone A 90 White nozzle at 50 ml/minute 18l/ha 5l covers 6,0 km	450 mm	3,0	830 ml
		4,5	1,25 l
		6,0	1,67 l
		7,5	2,0 l
Herbaflex Wide Cone B 120 Brown nozzle at 68 ml/minute 15l/ha 5l covers 4,5 km	750 mm	3,0	1,0 l
		4,5	1,5 l
		6,0	2,0 l
		7,5	2,5 l

Consult your supplier for additional information on hand held and mounted units.

AERIAL APPLICATION

- Use only correctly calibrated aircraft suitable for the required application.
- A spray volume of between 20 to 50 l/ha is suitable provided the following constraints are observed.
- **TumbleWeed** is a non-selective translocated herbicide. Direct spray contact, or even slight drift may cause severe injury or complete destruction of any growing crop or other desirable plants including trees.
- Droplets with an average size (VDM) of 300 to 400 micron diameter are recommended. The Micronair AU7000 is suitable when mounted on an approved microlight aircraft.
- Do not spray when winds exceed 8 km/hour or when wind direction is toward nearby desirable vegetation.
- Do not spray on a windless day with hot rising air conditions as fine droplets may move with the air current and cause damage elsewhere.

- Do not spray under inverted temperature conditions.
- Do not spray in the heat of the day.
- Do not spray when temperatures exceed 35°C or when relative humidity is below 40%, or when the difference between wet and dry readings as determined by a whirling hygrometer exceeds 8°C.
- Obtain an assurance from the aerial spray operator that the above specifications will be met before using the product.

MIXING INSTRUCTIONS

- Ensure that the spray tank is free of any residue from previous spray materials.
- Fill the spray tank with half the required amount of clean water, add the proper amount of **TumbleWeed** and ensure thorough mixing before adding the remaining water.
- Position the filling hose below the surface of the spray solution to prevent excessive foaming. Position the outlet of any return hoses at the bottom of the tank to reduce foaming. After mixing agitation is not required with this product.
- Reduced results may occur if water containing soil is used, e.g. from dams or rivers, or if hard water containing calcium is used.

WATER QUALITY – SPRAY WATER MODIFIERS

- For optimum results a minimum of 1,0% **TumbleWeed** solution in the total spray volume is recommended.
- The addition of ammonium sulphate at 1 to 2 kg per 100 l water, or **Bladbuff 5** (Reg. L 3351) may improve the action when hard waters are used. The addition of herbicidal sprays oils is not recommended with the combination mixtures.

HERBICIDE INJECTION INTO SPRAY LINES

In order to avoid the necessity of bulk tank mixes, a calibrated chemical doser such as the Dosatron may be used to introduce **TumbleWeed** and additional herbicides listed into a spray line at the appropriate concentration. Consult a representative from Enviro Weed Control Systems for information in this respect.

CROP USE RESTRICTIONS

SITUATION	CRITICAL COMMENTS
Vineyards	Do not use in vineyards younger than 2 years or near interplants less than 2 years old. Apply only as a directed spray to vines from bud to dormancy. Use only in the dormant pre-bud-burst stage for cover crop destruction in late winter in the Western Cape. In low growing bush or trellised vines or under 60cm high, use only pre-bud burst. Do not permit spray or drift to contact buds, foliage or green stems, suckers or fresh wounds otherwise severe injury or destruction may result. Allow 10 days to elapse between pruning and application to prevent uptake from wounds.
<u>Pome fruit</u> Apples, Pears <u>Stone fruits</u> Peaches, Plums, Nectarines <u>Subtropical fruit</u> Citrus, Nut crops, Avocado, Paw-paw, Mango, Guava, Litchi, Bananas, Tea plantations.	Use only as a directed spray in orchards older than 3 years or near interplants less than 3 years provided the green bark and foliage is protected from the spray or drift. Do not permit spray or drift to contact leaves, green bark or fruit as severe damage or destruction may result. Allow 10 days to elapse between pruning and application to prevent uptake from wounds.

TANK MIX COMBINATIONS

TumbleWeed may be used as follows:

1. With simazine for extended weed control in apples, pears and vines. Do not use simazine in stone fruit or other plantings where simazine is not recommended. The correct quantity of simazine for the soil type and frequency of application must be adhered to.
2. With MCPA for improved control of Plantain (*Plantago lanceolata*), Herons Bill (*Erodium moschatum*), Burr clover (*Medicago polymorpha*), Prostrate Knotweed (*Polygonum aviculare*) and Sheep Sorrel (*Rumex angiocarpus*).

The directions for use and dosage rates for the additional herbicide must be followed in all cases. Should simazine be used, ammonium sulphate as a 2% solution is recommended to assist in compatibility.

USE IN SUGARCANE CULTURE

Situation	ℓ/ha Boom sprayer	Knapsack mℓ/20 ℓ at 200 ℓ/ha	Critical Comments Sugarcane is susceptible to damage particularly in young growth stage.
Annual weed control	1,5 – 3	150 – 300	Apply pre-plant broad cast, or as directed spray to avoid injury in plant or ratoon cane. Avoid drift.
Perennial weed control <i>Cyperus rontundus</i> (nutsedge)	4,5 – 6,0	450 – 600	Apply as a directed spray to plant or ratoon cane when nutsedge is in early head stage, Apply a second treatment after maximum re-emergence in a nutsedge control programme.

CONTROL OF WEEDS ON INDUSTRIAL AREAS

TumbleWeed may be used to control weeds by a post-emergence application to vegetation on roadsides, electrical sub-stations, railway lines, storage areas or where ever unwanted vegetation exists. Consult the weed list for specific weeds where required.

No residual action is obtained and repeat applications will be required to control new germination.

Species controlled	ℓ/ha Boom sprayer	Handgun ℓ/100ℓ	Knapsack mℓ per 20 ℓ calibrated at 200 ℓ/ha	Critical Comments
Annual weeds	2,25 – 4,5	1,125 – 2,25	250 - 450	Use the lower rate on younger actively growing plants under optimum conditions. Increase the rate as plants mature or when environmental conditions are less favourable.
Perennial weeds	4,5 – 7,5	2,25 – 3,75	450 - 750	

COMBINATIONS WITH OTHER HERBICIDES

Where residual weed control is required **TumbleWeed** may be used as a tank mix with OUTPACE FLOWABLE (Reg. L4760), OUTPACE SUPER (Reg. 4769), ARSENAL (Reg. L3013), HYVAR X 80W (Reg. L1885), VELPAR L (L 3996), VELPAR DF (Reg. L 5432), R-P DIURON FLO (Reg. L4558), **TumbleWeed** will assist the action of the co-herbicide by providing additional foliar knockdown, and widening the range of weed species controlled. In all cases follow the directions for use on the product label of the additional herbicide.

A compatibility test with the proposed combination should be made using the spray water intended for use, to determine if flocculation (rapid setting-out of chemicals) occurs, in which case special precautions should be taken to ensure adequate agitation in the spray tank.

**UNWANTED TREES AND WOODY PLANTS, ALIEN INVADERS AND
DECLARED INVADING SPECIES**

200 ℓ Volume per hectare

Species Controlled	ℓ/ha	Handgun ℓ/100 ℓ water	Knapsack mℓ/20 ℓ at 200 ℓ/ha	Critical Comments
Bugweed (<i>Solanum mauritianum</i>)				Use the lower rate on younger actively growing plants under optimum conditions. Increase the rate as plants mature or when environmental conditions are less favourable.
a) Seedlings	0,75	375 mℓ	75	Summer-Autumn application. Spray up to 1,0 metre high saplings.
b) Large trees	1,5 - 2,0	0,75 - 1,0	150 - 200	Apply to 1,0 metre high coppice growth after cutting stems to ± 100 mm.
Black wattle (<i>Acacia mearnsii</i>)	2,25 - 3,0	1,125 – 1,5	225 – 300	Summer-Autumn application. Spray up to 2,0 metres high plants
Lantana (<i>Lantana camara</i>)	4,5 - 6,0	2,25 - 3,0	450 – 600	Summer-Autumn application. Use penetrating spray to wet plants.
Bramble <i>Rubus species</i>	4,5 - 6,0	2,25 - 3,0	450 – 600	Apply in Summer-Autumn. The volumes of 200 ℓ/ha with conventional equipment. Alternatively CDA application at 20 to 30 litres/ha where feasible.
Port Jackson Willow (<i>Acacia saligna</i>) Coppice regrowth after slashing or single stemmed trees up to 2,0 m	4,5	2,25	225 - 450	Treat coppice growth at a height of 0,5 to 1,0 metre high; single stemmed trees up to 2,0 metres high. Low volume CDA application suitable for low growing coppice or seedlings.

AQUATIC WEEDS

Species Controlled	ℓ/ha	Handgun ℓ/100 ℓ using 600 ℓ/ha	Mist blower ℓ/100 ℓ using 600 ℓ/ha	Critical Comments
Water hyacinth (<i>Eichhornia crassipes</i>)	7,5	1,25	1,25	Apply when new leaves are fully developed and follow up with repeat treatments regularly. Avoid run-off into water.
Common reed (<i>Phragmites australis</i>)	7,5	1,25	1,25	Treat in late summer when 20% to 30% flowering. Slash dead material and treat regrowth in same or following season. Visible effects may take several months to become evident.
Bulrush (<i>Typha capensis</i>) or mixed communities with common reed (<i>Phragmites australis</i>)	7,5 + 2 – 3 ℓ Arsenal	1,25 + 335 – 500 mℓ Arsenal	1,25 + 335 – 500 mℓ Arsenal	Use a combination treatment with Arsenal (Reg. L3013) at 2 to 3 ℓ/ha together with TumbleWeed at the recommended rate. Apply from early summer when in active growth, and repeat when necessary in same or following season.

Note: Aerial application

These herbicides may be applied by aerial application to the infestation where conditions permit, using from 20 to 50 ℓ total solution per ha. Follow the directions given under “Aerial Application”

PERENNIAL GRASSES AND BROAD-LEAVED WEEDS

200 ℓ Volume per hectare

Species Controlled	Boom sprayer ℓ/ha	Hand gun ℓ/100 ℓ	Knapsack mℓ per 20 ℓ calibrated 200 ℓ/ha	Critical Comments
Buffalo or Ubabe grass (<i>Panicum maximum</i>)	3,0 - 4,5	1,5 - 2,25	300 - 450	Use the lower rate on younger actively growing plants under optimum conditions. Increase the rate as plants mature or when environmental conditions are less favourable.
Bush Buffalo grass (<i>Setaria megaphylla</i>)	4,5 - 6,0	2,25 - 3,0	450 - 600	Ensure thorough coverage.
Common grass (<i>Cynodon dactylon</i>)				Apply in summer and follow up in autumn; or apply in autumn and follow up in summer.
a) Initial treatment	6,0 - 7,5	3,0 - 4,0	600 - 750	
b) Follow up treatment	6,0	3,0	600	
Common paspalum (<i>Paspalum dilatatum</i>)	4,5 - 6,0	2,25 - 3,0	450 - 600	Apply at flowering and spot treat regrowth in autumn using 4 ℓ/ha
Couch paspalum (<i>Paspalum paspalodes</i>)	8,0	4,0	800	Apply in summer but before onset of dormancy.
Johnson grass (<i>Sorghum halepense</i>)	3,0 - 4,0	1,5 - 2,0	300 - 400	Apply at flowering and treat regrowth at 3 ℓ/ha or 1,5 ℓ/100 ℓ.
Wild grain Sorghum (<i>Sorghum bicolor</i>)	2,25 - 3,0	1,125 - 1,5	225 - 300	Apply when in vigorous growth. Treat any regrowth to prevent re-infestation from dormant buds.
Kikuyu grass (<i>Pennisetum clandestinum</i>)				Apply when in vigorous growth. Treat any regrowth to prevent re-infestation from dormant buds.
a) Initial application	2,25 - 3,0	1,125 - 1,5	225 - 300	
b) Follow up application	2,25	1,125	225	
Natal red top (<i>Rhynchelytrum repens</i>)				In mature stage mow to remove seed stalks; 4 to 6 weeks may be required for full affect.
a) Seedlings	2,0	1,0	200	
b) Tufts	2,0 - 3,0	1,0 - 1,5	200 - 300	
Common thatch grass (<i>Hyparrhenia hirta</i>)	4,5 - 6,0	2,25 - 3,0	450 - 600	In mature stage mow to remove seed stalks; 4 to 6 weeks may be required for full affect.
Red grass (<i>Themeda triandra</i>)	4,5 - 6,0	2,25 - 3,0	450 - 600	
European verbena (<i>Verbena officinalis</i>)	3,5 - 4,0	1,5 - 2,25	350 - 400	
Lovegrass (<i>Eragrostis curvula</i>) (<i>E. chloromelas</i>) (<i>E. gummiflua</i>)	2,25 - 3,0	1,125 - 1,5	225 - 300	Apply to full growth but before onset of dormancy.
Fan lovegrass (<i>Eragrostis plana</i>)	3 - 4	1,5 - 2,0	300 - 400	In mature stage mow to remove seed stalks; 4 to 6 weeks may be required for full affect.
Purple nutsedge (<i>Cyperus rotundus</i>) Yellow nutsedge (<i>Cyperus rotundus</i>)	4,5 - 6,0	2,25 - 3,0	450 - 600	Apply at flowering and follow up with a repeat treatment to regrowth in a programme to reduce infestation.
Field bindweed (<i>Convolvulus arvensis</i>)	4,5-6,0	2,25-3,0	450-600	Apply at early flowering and follow up with 1,5 ℓ/100 ℓ.

Species Controlled	Boom sprayer ℓ/ha	Hand gun ℓ/100 ℓ	Knapsack mℓ per 20 ℓ calibrated 200 ℓ/ha	Critical Comments
Plantain (<i>Plantago lanceolata</i>)				Use the lower rate on younger actively growing plants under optimum conditions. Increase the rate as plants mature or when environmental conditions are less favourable.
a) Pre-flowering	2,25 - 3,0	1,125 - 1,5	225 - 300	Apply before flowering. Resistant after flowering.
b) Flowering	4,5 - 6,0	2,25 - 3,0	450 - 600	
Small mallow (<i>Malva paviiflora</i>)				Apply before flowering and treat any regrowth to prevent re-establishment.
a) Pre-flowering	3,0 - 4,5	1,5 - 2,25	300 - 450	
b) Flowering	4,5 - 6,0	2,25 - 3,0	450 - 600	
Smuts finger grass (<i>Digitaria eriantha</i>)	3 - 4,5	1,5 - 2,25	300 - 450	
Tassel three-awn (<i>Aristida congesta</i>)	3 - 4,5	1,5 - 2,25	300 - 450	

WEEDS IN ARABLE AGRICULTURE PRE-PLANTING (REDUCED TILLAGE) AND IN FORESTRY, FRUIT AND PLANTATION CROPS, SUGARCANE AND NON-CROP AREAS

CRITICAL COMMENTS

Refer to general instructions for use for the crop concerned. Use the lower rate on younger actively growing plants under optimum conditions. Increase the rate as plants mature or when environmental conditions are less favourable. Rates apply from seedling to flowering stage of growth.

Botanical Name	Common Name English	Boom sprayer ℓ/ha	Knapsack mℓ per 20 ℓ at 200 ℓ/ha
Susceptible Weeds			
<i>Altamanthera pungens</i>	Khaki bur weed	1,5 - 2,5	150 - 225
<i>Amaranthus hybridus</i>	Cape pigweed		
<i>Amaranthus spinosus</i>	Thorny pigweed		
<i>Amaranthus thunbergii</i>	Red pigweed		
<i>Argemone subfusiformis</i>	Mexican poppy		
<i>Bidens pilosa</i>	Common blackjack		
<i>Chenopodium album</i>	White goosefoot		
<i>Chenopodium carinatum</i>	Green goosefoot		
<i>Chenopodium murale</i>	Nettle-leaved goosefoot		
<i>Cirsium arvense</i>	Canada thistle		
<i>Cotula tenella</i>	Wild cucumber		
<i>Cucumis</i> spp.			
<i>Datura ferox</i>	Large thorn apple		
<i>Datura stramonium</i>	Common thorn apple		
<i>Galinsoga parviflora</i>	Gallant soldier		
<i>Gisekia pharnaceoides</i>	Gisekia		
<i>Gnaphalium subfalcatum</i>	Cudweed		
<i>Pentzia grandiflora</i>	Karoo bush		
<i>Pseudognaphalium luteo-album</i>	Jersey cudweed		
<i>Pseudognaphalium undulatum</i>	Undulate cudweed		
<i>Spergula arvensis</i>	Corn curry		
<i>Avena</i> spp	Wild oats		
<i>Avena fatua</i>	Common wild oats		
<i>Briza maxima</i>	Quaking grass		
<i>Bromus diandrus</i>	Ripgut brome		
<i>Chloris pycnothrix</i>	Spiderweb chloris		
<i>Ehrharta longifolia</i>	Oat seed grass		
<i>Hordeum murinum</i>	Wild barley		
<i>Lolium multiflorum</i>	Italian rye grass		

<i>Lolium termulentum</i> <i>Poa annua</i> <i>Secale cereale</i> <i>Tragus racemosus</i>	Darnel Winter grass Rye Large carrot seed grass		
Moderately susceptible Weeds <i>Arctotheca calendula</i> <i>Chloris virgata</i> <i>Conyza canadensis</i> <i>Conyza floribunda</i> <i>Emex australis</i> <i>Fumaria muralis</i> <i>Hibiscus cannabinus</i> <i>Oxalis pes-caprae</i> <i>Phalaris canariensis</i> <i>Portulaca oleracea</i> <i>Schkuharia pinnata</i> <i>Senecio consanguineus</i> <i>Sesamum triphyllum</i> <i>Sonchus oleraceus</i> <i>Tagetes minuta</i> <i>Tribulus terrestris</i> <i>Veronica spp.</i> <i>Phalaris minor</i> <i>Setaria pallide fusca</i> <i>Setaria verticillata</i> <i>Conyza bonariensis</i> <i>Eragrostis ciliaris</i> <i>Chamaesyce hirta</i> <i>Chamaesyce inaequilatera</i> <i>Flaveria bidentis</i> <i>Lepidium bonariense</i> <i>Raphanus raphanistrum</i> <i>Setaria sphacelata</i> <i>Solanum nigrum</i> <i>Tragus berteronianus</i> <i>Urochloa panicoides</i> <i>Anchusa azurea</i> <i>Senecio pterophorus</i> <i>Digitaria sanguinalis</i> <i>Eleusine indica</i> <i>Panicum schinzii</i> <i>Taraxacum officinale</i> <i>Medicago polymorpha</i>	Cape margold Featherop chloris Fleabane Tall fleabane Spiny emex Fumitory Kenaf Yellow sorreel Canary grass Common purslane Dwarf marigold Starvation senecio Wild sesame Sowthistle Khaki weed Common dubbeltjie Speedwell Little seede canary grass Red bristle grass Sticky bristle grass Flax-leaf fleabane Woolly love grass Red milkweed Smooth creeping milkweed Smelters bush Pepper cress Wild radish Common bristle grass Deadly nightshade Small carrot-seed grass Herringbone grass Oxtongue Perdegifbos Crab finger grass African goose grass Sweet buffalo grass Dandelion Burclover	2,25 - 3,0	225 - 300
Moderately Resistant Weeds <i>Lactuca serriola</i> <i>Erodium moschatum</i> <i>Rumex angiocarpus</i> <i>Malva parviflora</i> <i>Commelina benghalensis</i> <i>Flaveria bidentis</i> <i>Hypochoeris radicata</i> <i>Echium lycopsis</i>	Wild lettuce Musk heron's bill Sheep sorrel Small mallow Wandering Jew Smelter's bush Hairy wild lettuce Purple echium	3,0 - 4,5	300 - 450

ACKNOWLEDGEMENT OF TRADE MARKS

ARSENAL	: American Cyanamid Company Wayne, New Jersey, USA
HYVAR X 80W	: EI Du PONT DE Nemours & Co, Wilmington, Delaware 19898, USA
BLADBUFF 5	: Plaaskem (Pty)Ltd, P.O.Box 87005 HOUGHTON 2041
VELPAR	: EI Du PONT DE Nemours & Co, Wilmington, Delaware 19898, USA
R-P Diuron Flo	: Rhône-Poulenc Agrichem, POBox 12447 ONDERSTEPOORT 0110