rattler®

GROUP 9 HERBICIDES

PEEL BACK FOR DIRECTIONS FOR USE LEAFLET

A foliar applied herbicide for the control of annual and perennial grasses and broad-leaved weeds before sowing or planting all crops. For use pre-harvest in cereals and certain other crops, destruction of grassland, and in stubbles, orchards, green cover on land not being used for production, forestry and non-crop areas.
This product is a soluble concentrate containing 540 g/L Glyphosate (acid equivalent) present as 400.8 g/L (30.8% w/w) of the isopropylamine salt and 299 g/L (23.0% w/w) of the potassium salt of Glyphosate.

Safety Information

DANGER
Causes serious eye damage.
Toxic to aquatic life with long lasting effects.

Wear protective gloves/protective clothing/eye protection/face protection.
IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing.
Immediately call a POISON Center or doctor/physician.
Avoid release to the environment.
Dispose of contents/container to a licensed hazardous-waste disposal contractor or collection site except for empty triple rinsed containers which can be disposed of as non-hazardous waste.

To avoid risks to human health and the environment, comply with the instructions for use.

Additional Safety Phrase:
Do not contaminate water with the product or its container (Do not clean application equipment near surface water/ Avoid contamination via drains from farmyards and roads).

PCS No. 0[illegible]
UFI No. 25AK-M[illegible]SK-GEAV-[illegible]N[illegible]

FOR USE ONLY AS A PROFESSIONAL HERBICIDE

Crops/situations:
Winter Wheat, winter barley, winter oats, spring wheat, spring barley, spring oats, durum wheat
Oilseed rape and linseed
Mustard
Combining pea, field bean
All crops (pre-emergence)
Stubbles of all crops
Grassland destruction
Non crop areas
Apple and pear
Plum and cherry
Set aside
Forest nursery, Forest

Full application details are given on the attached leaflet

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Nufarm
Grow a better tomorrow

DIRECTIONS FOR USE

IMPORTANT: This information is approved as part of the Product Label. All instructions within this section must be read carefully in order to obtain safe and successful use of this product.

WARNINGS:
EXTREME CARE SHOULD BE TAKEN TO AVOID SPRAY DRIFT AS THIS CAN SEVERELY DAMAGE OR DESTROY NEIGHBOURING CROPS AND PLANTS.
DO NOT MIX, STORE OR APPLY RATTLER IN GALVANISED OR UNLINED STEEL CONTAINERS OR SPRAY TANKS.
DO NOT leave spray mixtures in tank for long periods and make sure tanks are WELL VENTED.

RESTRICTIONS:
A period of at least 6 hours and preferably 24 hours rainfree must follow spraying.
DO NOT spray onto weeds which are naturally senescent, or where growth is impaired by drought, high temperatures, a covering of dust, flooding or frost at, or immediately after application, otherwise poor control may result
DO NOT spray in windy conditions as drift onto desired crops or vegetation could severely damage or destroy them.
As RATTLER takes a few days to fully translocate throughout a weed, applications of lime, fertiliser, farmyard manure and pesticides should be made 5 days or more AFTER application of this product.
After application, large concentrations of decaying foliage, stolons, roots or rhizomes should be dispersed or buried by thorough cultivation before crop drilling.

WEEDS CONTROLLED:
RATTLER is a foliar acting herbicide which controls annual and perennial grasses and most broad-leaved weeds when used as directed. It is translocated from treated vegetative growth to underground roots, rhizomes or stolons.

It is important that all weeds are at the correct growth stage when treated, otherwise some re-growth may occur and this will need re-treatment.

Annual grasses and broad-leaved weeds should have at least 5 cm of leaf, or 2 expanded true leaves, respectively.

PERENNIAL GRASS WEEDS MUST HAVE A FULL EMERGENCE OF HEALTHY, GREEN LEAF WHICH IS GROWING ACTIVELY AT THE TIME OF APPLICATION. COMMON COUCH REACHES THE SUSCEPTIBLE STAGE OF GROWTH WHEN TILLERING AND NEW RHIZOME GROWTH COMMENCE WHICH USUALLY OCCURS WHEN PLANTS HAVE 4-5 LEAVES EACH WITH 10-15CM OF NEW GROWTH.

THE MAJORITY OF PERENNIAL BROAD-LEAVED WEEDS ARE MOST SUSCEPTIBLE IF TREATED WHEN THEY ARE GROWING ACTIVELY AND AT OR NEAR, FLOWERING STAGE.

ANNUAL WEEDS SHOULD BE GROWING ACTIVELY WITH GRASSES HAVING AT LEAST 5 CM OF LEAF AND BROAD-LEAVED WEEDS AT LEAST 2 EXPANDED TRUE LEAVES WHEN SPRAYED.

In set-aside, annual grasses are best treated at full emergence, or before stem elongation. Application during stem extension phase of annual grasses e.g. Black-grass and Brome species on set-aside between the end of April and end of May may result in poor control and require re-treatment.

Bracken should be treated after frond tips are unfurled, but pre- senescence.

This product will not give an acceptable level of control of Horsetails (Equisetum arvense) – repeat treatment will be necessary.

Weeds become less susceptible to RATTLER when their growth is restricted by natural senescence or by drought, frost, high temperature, a covering of dust or flooding. Reduced control will result if such conditions occur at, or immediately after, spraying.

BREAKDOWN AND FOLLOWING CROPS
Upon soil adsorption the herbicidal properties of RATTLER are lost permitting the drilling of crops 48 hours after application.

Occasionally, a slight check to crop growth may occur, particularly after direct drilling, when crop seeds germinate amongst a mass of decaying foliage, stolons, rhizomes or roots. Thorough cultivations are necessary to disperse or bury the decaying organic matter. Consolidate loose soils and ensure crops are adequately fertilized and appropriate measures are taken to prevent insect and fungus damage to the following crop, especially where following grassland.

Planting of trees and shrubs etc may take place 7 days after application. Grass seed may be sown from 5 days after treatment; see 'Recommendation Tables' for specific instructions on direct drilled crops.

Weed resistance strategy
There is low risk for the development of weed resistance to RATTLER.

Growers are encouraged to implement a weed resistance strategy based on (a) Good Agricultural Practices and (b) Good Plant Protection Practices by:

- Following label recommendations
- The adoption of complimentary weed control practices
- Minimising the risk of spreading weed infestations
- The implementation of good spraying practice to maintain effective weed control
- Using the correct nozzles to maximise coverage
- Application only under appropriate weather conditions
- Monitoring performance and reporting any unexpected results to Nufarm UK Limited.

Strains of some annual weeds (e.g. Black-grass, Wild oats and Italian Ryegrass) have developed resistance to herbicides which may lead to poor control. A strategy for preventing and managing such resistance should be adopted. This should include integrating herbicides with a programme of cultural control measures. Guidelines have been produced and copies are available from your distributor, crop adviser or product manufacturer (Nufarm).

Sprayer Hygiene
It is essential to thoroughly clean-out spray tanks, pumps, pipelines and nozzle or disc assemblies, with a recommended detergent cleaner, between applying this product and other pesticides to avoid contamination from pesticide residues. Traces of RATTLER left in the equipment may seriously damage or destroy crops sprayed later.

CROP SPECIFIC INFORMATION
FOR USE ONLY AS A PROFESSIONAL HERBICIDE

Crops/situations:	Maximum individual dose (L product/ ha):	Maximum total dose (L product/ ha crop/ year)	Latest time of application:
Winter wheat, winter barley, winter oats, spring wheat, spring barley, spring oats, durum wheat, combining pea, field bean	2.67	2.67	7 days before harvest
Oilseed rape and linseed	2.67	2.67	14 days before harvest
Mustard	2.67	2.67	8 days before harvest
All crops (pre-emergence)	1.0	1.0	Pre-emergence of the crop
Stubbles of all crops Either:	2.67	2.67	5 days before drilling or planting of the following crop
or:	1.0	1.0	2 days before drilling or planting of the following crop
Grassland destruction	4.0	4.0	5 days before harvest, graz-ing or drilling
Non crop area	4.0	4.0	-
Apple and pear	3.33	3.33	After harvest (post leaf fall) but before green cluster stage

Crops/situations:	Maximum individual dose (L product/ ha):	Maximum total dose (L product/ ha crop/ year)	Latest time of application:
Cherry and plum	3.33	3.33	After harvest (post leaf fall) but before white bud stage
Set aside	2.67	2.67	5 days before drilling or planting of the following crop
Forest nursery, Forest :	6.67	6.67	-

Application Method: Tractor mounted/trailed sprayer / knapsack / weedwiper

Other specific restrictions:
When using with rotary atomiser knapsack sprayers the minimum water volume must be 40 L/ha
When applying through rotary atomisers the spray droplet spectrum must be of a minimum Volume Median Diameter (VMD) of 200 microns
When using with hydraulic knapsack sprayers the maximum concentration must not exceed 22.5 g Glyphosate/L of water (equivalent to a maximum individual dose of 417 ml RATTLER/10L water/ha)
Weedwipers may be used in any crop where the wiper does not touch the growing crop.
Maximum concentrations used must not exceed the following:
Weedwiper mini 1:3.0 dilution with water
Other wiper 1:1.5 dilution with water

All varieties of wheat (including durum wheat), barley and oats may be treated to gain harvesting and grain storage benefits resulting from the reduction of green material in the crop.

RECOMMENDATION TABLES

AREA OF USE	TARGETS WEEDS/ USAGE	CROP/SITUATION	WEED INFESTATION	APPLICATION RATE L/ha	WATER VOLUME	APPLICATION TIMING AND GUIDANCE
PRE-HARVEST ARABLE CROPS	Common Couch	WHEAT (including durum), BARLEY, OATS	Up to 25 shoots/m² 26 to 75 shoots/m² Over 75 shoots/m² in direct drilled crops	1.33 2.0 2.67	Hydraulic Sprayers 80-250 L/ha or Rotary Atomiser	Cereals Apply, when the moisture content of the youngest crop grains is below 30%, not less than 7 days before harvest. Wheat crops, wheat volunteers and broad-leaved weeds may require up to 14 days before harvest Use high clearance tractors with narrow wheels and crop dividers. DO NOT TREAT CROPS GROWN FOR SEED. Straw may be used for all purposes except as a horticultural mulch. After harvest chop/incorporate, or remove straw as required. Normal cultivations may be made after straw removal. Effects on brewing and baking have not been tested. Consult grain merchant or processor before use. N.B. If dull weather persists after application, allow up to 14 days before harvest - particularly on broad-leaved weeds. Annual nettle, volunteer potato, Rosebay Willow Herb and polygonum weeds will not be susceptible at harvest management rates.
		OILSEED RAPE AND MUSTARDS	Up to 75 shoots/m² Over 75 shoots/m²	2.0 2.67	Hydraulic Sprayers only 100-250 L/ha#	
		PEAS FOR COMBINE HARVESTING AND FIELD BEANS	Up to 75 shoots/m² Over 75 shoots/ m²	2.0 2.67	Hydraulic Sprayers 80-250 L/ha or Rotary Atomisers 40 L/ha*	
		LINSEED	Up to 75 shoots/m² Over 75 shoots/m²	2.0 2.67	Hydraulic Sprayers 80-250 L/ha	

AREA OF USE	TARGETS WEEDS/ USAGE	CROP/SITUATION	WEED INFESTATION	APPLICATION RATE L/ha	WATER VOLUME	APPLICATION TIMING AND GUIDANCE
PRE-HARVEST ARABLE CROPS (continued)	Perennial broad-leaved weeds, other perennial grasses	WHEAT (including durum), BARLEY, OATS	All levels of all species	2.67	Hydraulic Sprayers 80-250 L/ha# or Rotary Atomisers 40 L/ha*	Oilseed Rape & Mustards Apply when crop seeds have less than 30% moisture content. Apply to standing crops at these intervals before harvest: oilseed rape 14-21 days mustards 8-10 days Use high clearance narrow wheeled tractors using wide booms and crop dividers. DO NOT TREAT CROPS GROWN FOR SEED. For effective combining: DO NOT treat crops with significant levels of secondary regrowth. DO NOT treat late maturing areas of crops caused by pigeon damage, poor drainage, etc. Crops suffering from stress, disease, extreme heat or drought may not mature evenly following treatment. After harvest, chop/ incorporate, or remove straw as required. Normal cultivations may follow after straw removal. Peas for combine harvesting & field beans Apply when crop seeds have less than 30% moisture content. Apply 7 days or more before harvest.This treatment cannot be used as a crop desiccant. Use high clearance tractors with narrow wheels and crop dividers. DO NOT TREAT CROPS GROWN FOR SEED. Linseed Apply when crop seeds have less than 30% moisture content. At this stage seed is normally light brown and the capsules are brown; the stems and leaves may be green to yellow/ green. Accurate measurements of moisture content must be made. Apply 14 days or more before harvest. A delay of up to 28 days after spraying may be necessary prior to combine harvesting. Where application takes place late in the autumn, it must be checked that weeds are still susceptible. See earlier section on weed control. DO NOT TREAT CROPS GROWN FOR SEED.
		OILSEED RAPE AND MUSTARDS	All levels of all species	2.67	Hydraulic Sprayers only 100-250 L/ha#	
		PEAS FOR COMBINE HARVESTING AND FIELD BEANS	All levels of all species	2.67	Hydraulic Sprayers 80-250 L/ha or Rotary Atomisers 40 L/ha*	
		LINSEED	All levels of all species	2.67	Hydraulic Sprayers 80-250 L/ha	
	Annual weeds	OILSEED RAPE AND MUSTARDS	All levels of all species	2.0	Hydraulic Sprayers only 100-250 L/ha#	

*Where rotary atomiser sprayers are used, their droplet diameter must fall within the range 200-300 microns.

Use higher volumes for dense canopies

AREA OF USE	TARGETS WEEDS/USAGE	CROP/SITUATION	WEED INFESTATION	APPLICATION RATE L/ha	WATER VOLUME	APPLICATION TIMING AND GUIDANCE
STUBBLES OF ALL CROPS	Common Couch	BEFORE ALL CROPS - AUTUMN/ SPRING APPLICATIONS	Up to 75 shoots/m²	2.0	Hydraulic Sprayers 80-250 L/ha or Rotary Atomisers 40 L/ha*	Do not cultivate BEFORE spraying. Allow a minimum of 5 days to elapse between spraying and cultivations or drilling. Allow volunteer potatoes to make ample top growth before spraying. A minimum period of 21 days weed growth in the spring should occur before spraying. Allow 7 days before planting trees.
	Common Couch		Over 75 shoots/m²	2.67		
	Other perennial grasses		All levels of all species			
	Volunteer potatoes (autumn only)		-			
	Volunteer cereals Other annual grasses Annual broad-leaved weeds		All levels of all species	1.0		Cultivations may be made 24 hours after spraying. Direct drilling may take place 2 days after spraying.
ALL CROPS PRE-EMERGENCE	Volunteer cereals and annual weeds	-	All levels of all species	1.0	Hydraulic Sprayers 80-250 L/ha	Ensure that spraying precedes ANY Crop emergence.
*Where rotary atomiser sprayers are used, their droplet diameter must fall within the range 200-300 microns.						

AREA OF USE	TARGETS WEEDS/ USAGE	CROP/ SITUATION	WEED INFESTATION	APPLICATION RATE L/ha	WATER VOLUME	APPLICATION TIMING AND GUIDANCE
GRASSLAND - DESTRUCTION & CONTROL OF ASSOCIATED WEEDS	Short rotation Ryegrass, longer leys and permanent pasture	GRASS	Short rotation Ryegrass with annual weeds	2.0	Hydraulic Sprayers: 150-250 L/ha*	ONLY direct drill grass and clover EITHER into 1-2 year leys without mat, 5+ days after spraying, OR long leys with some mat, in the spring following autumn application. Treatment Timings: 1. Regrowth after grazing or mowing. 2. Before grazing or cutting: - Apply between June-October - Spray crops that are 30-60 cm tall, are not dense and do not contain mature seeds. Grass Utilisation: 1. Grass may be utilised in the normal way from 5 days after treatment. 2. Cattle, dairy cows and sheep may graze or be fed the treated forage. POISONOUS PLANT SPECIES MUST BE REMOVED OR BURIED BEFORE REGRAZING OR MOWING. DO NOT apply lime or fertilizer prior to application. Normal cultivations for the next crop may be made as usual once fields are cleared of grass crops.
			Leys 2-4 years old with perennial grass weeds	2.67		
			Long leys 4+ years old with perennial broad-leaved weeds	3.33		
			Permanent pasture	4.0		
			Select application rate to control least susceptible target weed by selecting from application rate table' Application Rates for Grassland Destruction'			
NON CROP AREA	Annual weeds	-	All species	1.0	Hydraulic Sprayers 80-250 L/ha or Rotary Atomisers 40 L/ha*	Use area's include: Roadsides, paths, hard surfaces, along fences and walls and total weed control on industrial sites. DO NOT USE IN OR ALONGSIDE HEDGEROWS. DO NOT USE UNDER GLASS OR POLYTHENE. Apply this product carefully. Ensure spraying takes place only when weeds are actively growing (normally March to October) and is confined only to visible weeds including those in the 30cm swath covering the kerb edge and road gulley – do not overspray drains. This does not apply to use on railway ballast.
	Perennial grasses		All species	2.67		
	Perennial broad-leaved weeds					
	Refer to "Hand-held Applicators" Under 'Mixing and Spraying'		All species	4.0		

AREA OF USE	TARGETS WEEDS/ USAGE	CROP/ SITUATION	WEED INFESTATION	APPLICATION RATE L/ha	WATER VOLUME	APPLICATION TIMING AND GUIDANCE
NON CROP AREA	Vegetation management	Areas of semi-natural or ornamental vegetation including trees. Areas of bare soil around ornamental plants or areas intended for ornamental planting.	Annual weeds	1.0	Hydraulic Sprayers 80-250 L/ha or Rotary Atomisers 40 L/ha*	AMENITY VEGETATION Applications using a weed wiper may be used in addition to hydraulic sprayers and rotary atomisers. DO NOT USE IN OR ALONGSIDE HEDGEROWS. DO NOT USE UNDER GLASS OR POLYTHENE.
			Perennial grassesand broad-leaved weeds	2.67 - 4.0		

AREA OF USE	TARGETS WEEDS/ USAGE	CROP/ SITUATION	WEED INFESTATION	APPLICATION RATE L/ha	WATER VOLUME	APPLICATION TIMING AND GUIDANCE
ORCHARDS	Perennial grasses and broad-leaved weeds: - in arable stubbles - in pastures	TOP FRUIT -PRE-PLANTING	All levels of species	2.67 3.33	Hydraulic Sprayers 200-250 L/ha or Rotary Atomisers 40 L/ha*	All top fruit crops may be planted from 7 days after spraying.
	Perennial grasses and broad-leaved weeds	WITHIN ORCHARDS OF APPLE, PEAR, PLUM OR CHERRY	All levels of most species	3.33	Hydraulic Sprayers 200-400 L/ha optimum 250 L/ha	Trees must have been established for 2 years before spraying. Spray AFTER autumn leaf-fall and BEFORE: - Apples, pears - green cluster stage - Stone fruit - white bud stage Avoid contact with tree branches and trunks above 30 cm from the ground.
	Root suckers	-	All species	3.33		Treat suckers in late spring only.
*Where rotary atomiser sprayers are used, their droplet diameter must fall within the range 200-300 microns.						

AREA OF USE	TARGETS WEEDS/USAGE	WEED INFESTATION	APPLICATION RATE L/ha	WATER VOLUME	APPLICATION TIMING AND GUIDANCE
SET ASIDE	BEFORE OR DURING REMOVAL FROM PRODUCTION	< 75 shoots/m²	2.0	Hydraulic Sprayers 80-250 L/ha	Weeds should have grown actively for at least 21 days before spring applications. Avoid application during stem elongation as reduced control and re-spray is likely. Best control of annual grasses is achieved between full ear emergence and senescence Perennial weeds – apply not less than 5 days before drilling or cultivating. Annual weeds – apply not less than 24 hours before cultivation. Note: • Ensure that all management rules are followed prior to use on land taken out of production as part of a grant aided scheme. • Do not top or cultivate before spraying. • Do not direct drill after set-aside.
	Common Couch	75 shoots/m²	2.67		
	Perennial broad-leaved weeds and other perennial grasses	-	2.67		
	Annual weed - Autumn/Spring of year 1 only - Summer of year 1 and thereafter AFTER SHORT ROTATION OR LONG TERM REMOVAL FROM PRODUCTION	- -	1.0 2.0		
	Natural regeneration and crop cover destruction				
	Annual weeds	-	2.0		
	Perennial grasses	-	2.67		
	Perennial broad-leaved weeds	-	2.67		
	Perennial broad-leaved weeds as listed below: Common Ragwort Hard Rush Heath Rush Jointed Rush White Clover Yellow Rattle		2.67		
FORESTRY, FOREST NURSERY - PRE-PLANTING	Arable Land Planting Replanting and Grassland Areas	Arable weeds Grasslands weeds	2.67 3.33	Hydraulic Sprayers 80-250 L/ha# or Rotary Atomisers 40 L/ha*	All tree species may be planted 7 days or more after treatment.
* Where rotary atomiser sprayers are used, their droplet diameter must fall within the range of 200-300 microns.					

AREA OF USE	TARGETS WEEDS/USAGE	WEED INFESTATION	APPLICATION RATE L/ha	WATER VOLUME	APPLICATION TIMING AND GUIDANCE
FORESTRY, FOREST NURSERY - POST PLANTING (DIRECTED) IN CONIFERS AND BROAD-LEAVED TREES	Clean-up around Trees with Knapsack applications.	Grasses : Annual/perennial grasses, broad-leaved weeds Woody weeds: Bracken/Beech Brush/Brambles Sycamore/Oak Hazel/Willow/Ash Heather (peat soils) Heather (mineral soils) Rhododendron[.]	2.67 2.0 2.67 4.0 6.67	Knapsack Sprayers: 200-250 L/ha Spot gun and weedwiper mini. See under Mixing and Spraying.	It is ESSENTIAL to use a TREE GUARD for all applications made in the growing season. Treat bracken after frond tips are unfurled but pre-senescence. Treat heather late August to end September. All other woody weeds-treat June-August before leaf senescence (but after new growth of crop as hardened). [.]Application using the weed wiper is not suitable. Cut back and treat re-growth when at least 1 metre in height throughout the entire coppice. Spray to just before point of run-off.
FORESTRY, FOREST NURSERY -POST-PLANTING (OVERALL APPLICATION IN DORMANT SEASON IN CERTAIN CONIFERS – CONIFER RELEASE)	Grass weeds -Lowland Areas -Upland Areas Bracken Beech and Birch Brambles	Black Bent Creeping Soft-grass Meadow-grasses Sweet Vernal Wood Small-reed (Bush grass) Cock's Foot False Oat-grass Other Bent species Tufted Hair-grass Common Couch Fescues Purple Moor-grass Wavy Hair-grass All levels of all species	1.0 1.33 1.33 1.33 2.0	Hydraulic Sprayers 200-250 L/ha or Hand-Held Equipment 40 L/ha	DO NOT OVERALL SPRAY trees being grown for ORNAMENTAL PURPOSES, including CHRISTMAS TREES. Species safe to spray when fully dormant and leader growth has hardened : Corsican, Lodgepole, and Scots Pines, Norway Spruce, Sitka Spruce, Lawson Cypress, Western Red Cedar. Douglas Fir and Nobel Fir - safe to spray when fully dormant and leader growth has hardened but NOT in spring. If overall application takes place after the optimum timing weed control may be reduced. It is advisable to spray a limited area of forest to test crop safety under local conditions before widespread overall application in subsequent years. Treat bracken after frond tips are unfurled but pre-senescence. Caution the timing of hardening of leader growth varies considerably between locations and between seasons. It may occur as early as the end of July or be delayed to October or later. To avoid damage to Lammas growth, sprays should be directed away from leaders.
These recommended application rates refer to Forestry usage only. Inadequate control may result if used in other areas.					

APPLICATION RATES FOR GRASSLAND DESTRUCTION			
2.0 L/ha	2.67 L/ha	3.33 L/ha	4.0 L/ha
Annual Meadow-grass Common Chickweed Common Mouse-ear Dock seedlings Italian Rye-grass Meadow Fescue Meadow Foxtail Mayweed species Rough Meadow-grass Speedwell species Timothy	Black Bent Broad-leaved Dock Cock's Foot Common Bent Common Couch Creeping Bent Creeping Soft-grass Curled Dock Perennial Rye-grass Plantains Soft Brome Yorkshire Fog	Bracken** Common Sorrel Common Nettle Creeping Buttercup* Creeping Thistle Daisy Dwarf Thistle Perennial Sow-thistle Red Clover Sedges Sheep's Sorrel Soft Rush Spear Thistle Tufted Hair-grass Yarrow	Common Ragwort Hard Rush Heath Rush Jointed Rush Molinia (Purple Moor-grass) Nardus (Mat grass) Red Fescue White Clover* Yellow Rattle Sheep's Fescue

* White Clover is best cut in June and sprayed one month later. Creeping Buttercup should be sprayed at flowering stage.
** At full frond expansion

Mixing and spraying
Tractor Mounted Applicators
Conventional Hydraulic Sprayers:

1. Sprayer and Nozzle Selection:
All machines should be capable of applying accurately 80-250 L/ha, as a 'MEDIUM' or 'COARSE' quality spray - (BCPC definition) within a pressure range of 1.5-2.5 bars using 80 or 110 degree nozzles. For application pre-harvest of crops it is essential to use a sprayer whose boom may be raised to the correct height.

2. Water Volume:
For general use 200-250 L/ha is the preferred volume range. For specific uses, volumes may be reduced to 80-120 L/ha by selecting low volume hydraulic nozzles, and adjusting pressure of application and tractor forward speed.

3. Spray Pressure:
Pressures must be related to tractor forward speed, desired water volume and nozzle type. A range of 1.5 - 2.5 bars must be used to ensure optimum results with minimum risk of drift.

4. Tractor Forward Speed:
Speed of travel must be related to nozzle output characteristics. The typical range is from 4-9 kph. The slower speeds should be selected for applications pre-harvest of crops and where soil conditions could cause excessive boom bounce and yaw at faster speeds.

5. Recommended Nozzle Type, Pressure, Volumes and Tractor Speeds for the Application of 80-120 L/ha:
80 or 110 degree nozzles able to apply the required volume at pressures between 1.5 -2.5 bars at between 4-9 kph are recommended. Examples of these nozzles are available in a separate handbook.

6. Filling the Sprayer:
Half fill the spray tank with water and start agitation.
Add recommended quantity of RATTLER herbicide, top-up tank with water to required level. To avoid foaming do not use top tank agitation. Use of a defoamer may be necessary. Triple rinse containers with water and add washing to the spray tank.

7. Calibration:
Before using a sprayer and, especially, after nozzles have been changed, it is essential to calibrate the sprayer by checking the output of at least one nozzle for each separate boom section of the sprayer.

8. Operation in the Field:
Check the following before starting to spray:
- That the nozzles are aligned evenly at the correct angle to the direction of travel.
- That the boom is level over its width.
- The boom height permits the correct pattern of spray overlap on the target weeds.

Rotary Atomisers:
1. Sprayer Selection:
The following rotary atomiser applicators may be used to apply this product:
Cleanacres Dual-Option Sprayer, CDA Boom and CDA Lightweight
Horstine Farmery Microdrop, Variably Hydraspin
Tecnoma Girojet

Stir the correct amount of RATTLER to control the target species into the sprayer bottle filled with clean water. Top up with water, close the top and shake gently to ensure good mixing. Do not tank-mix.

2. Droplet Size and Water Volume:
Set the spray droplet Volume Median Diameter to within the range 200-300 microns for each machine - this corresponds to a 'MEDIUM' or 'COARSE' quality spray (BCPC definition) and the volume of application to 40 L/ha.

3. Operation in the Field:
Apply at 4-9 kph having calibrated the sprayer accurately. Ensure that sprayer bouts are matched by using markers.

Hand-held applicators
Overall, Non-Selective Applications:
1. Spot or Directed Application:
Knapsack Applicator:
These may be used in Orchards and Non-crop areas. Normal water volume is 200-300 L/ha but by fitting low volume nozzles it can be reduced to 100-150 L/ha. All applications to be as a 'MEDIUM' or 'COARSE' quality spray (BCPC definition).

Example of Use:
When used at a walking speed of 1 m/sec to apply a swath of 1 m width, most knapsack sprayers fitted with a Lurmark AN 2.0 or similar nozzle deliver approximately 200 L/ha spray volume (or 10 L per 500 m^2). To apply 2.67 L/ha of RATTLER, therefore, use 26ml of product for each 2 L of spray liquid required. Similarly, knapsack sprayers fitted with low volume nozzles such as Lurmark AN 1.0 typically deliver approximately 100 L/ha spray volume. To apply 2.67 L/ha RATTLER in this case, use 52ml of product for each 2 L of spray liquid required.

Examples for a 10 L sprayer delivering 200 L spray/ha:

Equivalent Application Rate	Sprayer Size	Volume RATTLER (L)	Volume Water (L)	Area treated
2.0 L product/ha	10 L	0.100	9.90	500 m^2
2.67 L product/ha	10 L	0.130	9.87	500 m^2
3.3 L product/ha	10 L	0.170	9.83	500 m^2

2.Hand-Held Wipers:
Weedwiper Mini:
This technique may be used in Top Fruit Orchards and in Non-Crop areas only. Use a combination of 1 part of RATTLER herbicide plus 3 parts water and add a water-based dye if required..

Tractor-Mounted Wipers:
Treatment of Sugar Beet Bolters, Weed Beet and Other Weeds:

For use in arable crops and grassland areas. Ensure there is at least 5 cm between the top of the tallest desired vegetation and the impregnated wiper. Weeds should be a minimum of 10 cm taller than the desired vegetation for safe application. Two passes in opposite directions will be needed where weeds are dense and successive applications will be required to control weeds that were below the original wiping level. Treat before weed seeds have matured to reduce to a minimum seed return to the soil, Bolting beet should be treated by a series of three applications during early July to early August with two weeks between treatments.

WEEDS MUST BE GROWING ACTIVELY TO BE SUSCEPTIBLE.
DO NOT USE WIPER TECHNIQUES IN SOFT FRUIT CROPS

Recommended Machines:

Hectaspan Weedwiper	Tecnoma Top Weeder
Keenan Weed Licker	Telford Homburg Chemical Applicator
Matrot Mobilcord	Vicon Wedge-Wik

For advice on appropriate weed wiper applicators, consult Nufarm

For Best Results with all Wiper Applicators:
- Operate at speeds below 5 kph.
- Treat when weeds reach 10 cm above the desired vegetation.
- Keep wiping surfaces wet but prevent dripping.
- Clean ropes several times a day to maintain optimum flow rate.

CAUTION
Keep stock out of treated areas for 7 days to allow the herbicide to become fully effective.
TREATED POISONOUS PLANT SPECIES MUST BE REMOVED BEFORE REGRAZING OR CONSERVING.

Compatibility
Please contact your Nufarm distributor for a full list of compatible mixtures.
Do not tank-mix this product with other pesticides or fertilisers, EXCEPT when directed by Nufarm, as a reduced level of weed control may result.

COMPANY ADVISORY INFORMATION

General
RATTLER herbicide is an advanced formulation containing the isopropylamine and potassium salts of glyphosate. RATTLER is taken up RATTLER herbicide is an advanced formulation containing the isopropylamine and potassium salts of glyphosate. RATTLER is taken up by foliage and translocated to underground roots, rhizomes and stolons, providing control of both annual and perennial grasses and broad-leaved weeds. RATTLER is rapidly adsorbed onto particulate matter in soils and water and is quickly degraded by the micro-organisms present in soil and aquatic bottom sediments. Until degraded, the active ingredient in RATTLER, glyphosate, is practically immobile in soils and is, therefore, unlikely to contaminate groundwater.
To maximise the safety of RATTLER to the operator, consumer and environment, the label recommendations should be adhered to.

Symptoms on the weeds
Symptoms of treatment are generally first seen 7-10 days, or longer (if growth is slow), after spraying. These take the form of leaf reddening followed by yellowing and are usually quicker to appear on grasses than on broad-leaved weeds. Reaction of nettles is slow.

Sprayer Maintenance
Ensure that the sprayer is in good working order by paying particular attention to the condition of the pump, hoses, nozzles or disc assemblies and pressure gauge. Replace damaged, worn or malfunctioning parts. If extra filtration or pressure damp valves have been fitted for low volume work at 80-120 l/ha make certain this equipment is clean and functioning correctly. Carry out maintenance according to the instructions of the sprayer manufacturer. This is of utmost importance when using low volume nozzles.

Hygiene when using all Sprayers
It is essential to thoroughly clean-out sprayer tanks, pumps and pipelines and nozzle or disc assemblies, with a recommended detergent cleaner, between applying this product and other pesticides to avoid contamination from pesticide residues. For example, after spraying this product pre-harvest in cereals the equipment MUST be cleaned completely before it is used to apply a potato blight fungicide, particularly in seed crops.

TERMS AND CONDITIONS OF SUPPLY, SALE OR USE
All goods supplied by Nufarm UK Ltd. are high grade and we believe them to be suitable for the purpose for which we expressly supply them: but as we cannot exercise any control over their mixing, use or application which may affect the performance of the goods all conditions and warranties statutory or otherwise as to the quality or fitness for any purpose of our goods are excluded and no responsibility will be accepted by us or our Associate Companies for any damage or injury whatsoever arising from their storage, handling, re-application or use. These conditions cannot be varied by our staff, our agents or the re-sellers of the product whether or not they supervise or assist in the use of such goods.

To access the Safety Data Sheet for this product
scan the QR code or refer to the Nufarm website at https://www2.nufarm.com/uk/

SDS