



SAMURAI

A foliar applied translocated herbicide for the control of annual and perennial grass and broad-leaved weeds before sowing or planting of all crops.

For use pre-emergence and pre-harvest in cereals and certain other crops, for destruction of grassland, and use in stubbles and orchards, and non-crop areas. For control of emerged weeds in forestry situations.

Degraded by micro-organisms/microbes in the soil.

A soluble concentrate containing 360 g/l glyphosate, present as 441g/l (35.3% w/w) of the potassium salt of glyphosate

The (COSHH) Control of Substances Hazardous to Health Regulations may apply to the use of this product at work

Contents **e** 20 litres

MAPP Number 16238

PROTECT FROM FROST

Imported

Lot number/production date:

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Not for reformulation or repackaging.
No licence is granted under any patent.



The Voluntary Initiative

*This label has been produced according to the
Crop Protection Association Voluntary Initiative (VI) guidance.*

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**In case of emergency day or night, telephone
National Chemical Emergency Centre: (01865) 407333**



WARNING

Causes serious eye irritation

Wash hands thoroughly after handling. Wear protective eye protection

If in eyes: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing. If eye irritation persists: get medical advice/attention.

Do not contaminate water with the product or its container

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

**COMPLIANCE WITH THE FOLLOWING CONDITIONS OF USE AND ALL SAFETY PRECAUTIONS
MARKED* IS A LEGAL REQUIREMENT**

FOR PROFESSIONAL USE ON FARMS ONLY AS AN
AGRICULTURAL/HORTICULTURAL/ FORESTRY/ HERBICIDE

Crops/situations:

Wheat, (including Durum wheat), barley, oats, combining pea, vining pea, field bean;
Oilseed rape, mustard, linseed;

Sugar beet, swede, turnip, bulb onion, leek;

All edible crops (stubble), all non-edible crops (stubble);

All edible and non-edible crops (destruction, before sowing/planting);

Grassland;

Apple, pear; plum, cherry damson;

Green cover on land not being used for crop production;

Farm non-crop areas including natural surfaces not intended to bear vegetation, permeable surfaces overlying soil, hard surfaces;

Forest nursery, forest (weed control, stump application and chemical thinning).

Maximum individual dose: }

Maximum number of treatments: } Full details are given in Statutory Area

Latest time of application: } on the attached leaflet

Other specific restrictions: } (Crop Specific Information – marked #)

READ ALL OTHER SAFETY PRECAUTIONS AND DIRECTIONS FOR USE BEFORE USE

SAFETY PRECAUTIONS

Operator protection

** Engineering control of operator exposure must be used where reasonably practicable in addition to the following personal protective equipment:*

*WEAR SUITABLE PROTECTIVE GLOVES AND FACE PROTECTION (FACESHIELD) when handling the concentrate and when handling contaminated surfaces.

*WEAR SUITABLE PROTECTIVE CLOTHING (COVERALLS), SUITABLE PROTECTIVE GLOVES AND RUBBER BOOTS when using hand-held sprayers, hand-held rotary atomisers, weed wiper equipment, spot gun equipment or when making cut stump treatments.

*WEAR SUITABLE PROTECTIVE CLOTHING (COVERALLS), SUITABLE PROTECTIVE GLOVES, RUBBER BOOTS AND FACE PROTECTION (FACESHIELD) when using stem injection equipment.

** However, engineering controls may replace personal protective equipment if a COSHH assessment shows they provide an equal or higher standard of protection.*

WASH HANDS AND EXPOSED SKIN before eating and drinking and after work.

Environmental protection

Do not contaminate water with the product or its container except when used as directed. Do not clean application equipment near surface water. Avoid contamination via drains from farmyards and roads.

Storage and disposal

KEEP AWAY FROM FOOD, DRINK AND ANIMAL FEEDINGSTUFFS.

KEEP OUT OF REACH OF CHILDREN.

KEEP IN ORIGINAL CONTAINER, tightly closed, in a safe place.

RINSE CONTAINER THOROUGHLY by using an integrated pressure-rinsing device or manually rinse three times. Add washings to sprayer at time of filling and dispose of safely. Triple rinsed containers may be disposed of as non-hazardous waste.

Medical advice

Medical guidance is available on a 24 hour basis by telephoning the National Chemical Emergency Centre on 01865 407333 or for doctors, from the National Poisons Information Service on 08448920111.

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 NEIGHBOURING CROPS OR PLANTS.

DO NOT MIX, STORE OR APPLY SAMURAI 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 without rain of at least 6 hours, and preferably 24 hours, must follow application of SAMURAI herbicide.

Do not spray on to weeds suffering from drought, water-logging, heat or frost, otherwise poor control may result.

Do not spray in windy conditions as drift onto desired plants or crops could severely damage or destroy them.

Do not tank mix SAMURAI with adjuvants, pesticides or fertilisers except as specified under Directions for Use – Compatibility.

Applications of lime, fertiliser, farmyard manure and pesticides should be delayed until 5 days after application of SAMURAI unless cultivation and drilling of the next crop has taken place.

TREATED POISONOUS PLANT SPECIES MUST BE REMOVED BEFORE REGRAZING OR CONSERVING. Where Ragwort is present users should consult the Code of Practice on How to Prevent the Spread of Ragwort. Ragwort plants sprayed with this herbicide are more palatable and contain higher levels of toxins. Animals should be excluded from treated areas until any Ragwort has completely recovered or died and there is no visible sign of the dead weed. Do not include treated Ragwort in hay or silage crops.

Weeds controlled

SAMURAI herbicide controls most emerged grasses and broad-leaved weeds. 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

Apply SAMURAI herbicide where there is full emergence of grasses and broad-leaved weeds and they have ACTIVELY GROWING green leaves

- PERENNIAL GRASSES must have full emergence of healthy, green leaf. (Common Couch, for example, becomes susceptible at the onset of tillering and new rhizome

growth, which usually occurs when plants have 4-5 leaves, each with 10-15 cm of new growth).

- PERENNIAL BROAD-LEAVED WEEDS are most susceptible around the flowering stage.
- ANNUAL GRASSES AND BROAD-LEAVED WEEDS should have at least 5 cm of leaf, or 2 expanded true leaves, respectively. In set-aside, annual grasses are best treated at full ear 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.
- OTHER SPECIES - recommendations for specific areas of use are given in the Recommendation Tables.
- This product will not give an acceptable level of control of Horsetails (*Equisetum arvense*) – repeat treatment will be necessary.

Following crops

Upon soil adsorption the herbicidal properties of SAMURAI are lost permitting the drilling of crops 48 hrs after application.

Crop Specific Information #

COMPLIANCE WITH THE FOLLOWING CONDITIONS OF USE AND ALL SAFETY PRECAUTIONS MARKED* IS A LEGAL REQUIREMENT			
Crops/situations:	Maximum individual dose (litres product/hectare):	Maximum total dose (litres of product/hectare/crop/annum):	Latest time of application:
Winter wheat, winter barley, winter oats, spring wheat, spring barley, spring oats, durum wheat, combining pea, field bean	4.0	4.0	7 days before harvest
Post planting and pre-emergence of listed cereals, oilseed rape, combining peas, vining peas, field beans, mustard, linseed, sugar beet, swede, turnip, bulb onion and leek	1.5	1.5	Pre-emergence
Oilseed rape and linseed	4.0	4.0	14 days before harvest
Mustard	4.0	4.0	8 days before harvest.
All edible crops (stubble), all non-edible crops (stubble)	5.0 or 1.5	5.0	5 days before drilling or planting the following crop. 2 days before the drilling or planting of the following crop or 24 hours before cultivating
All edible and non-edible crops (destruction, before sowing/planting).	5.0	-	-
Grassland	6.0	6.0	5 days before harvest, grazing or drilling
Apple and pear orchards	5.0	5.0	After harvest but before green cluster stage
Cherry, plum and damson orchards	5.0	5.0	After harvest (post leaf fall)but before white bud stage
Green cover on land not being used for crop production	6.0	6.0	24 hours before cultivating
Non-crop including natural surfaces not intended to bear vegetation, permeable surfaces overlying soil, hard surfaces	5.0	-	-
Forest nursery, farm forest: • weed control • stump application • chemical thinning (by injection)	10.0 200ml/litre of water (20% solution of product in water) 2.0ml per 10cm diameter (or less) of tree	- - -	- - -

Other Specific Restrictions

When applying through rotary atomisers, the spray droplet spectra produced must be of a minimum Volume Median Diameter (VMD) of 200 microns.

Weed wipers may be used in any recommended crop where the wiper or chemical does not touch the growing crop.

For weed wiper applications, the maximum concentrations must not exceed the following:

- (a) Weed wiper mini - 1:2 dilution with water
- (b) Other wipers - 1:1 dilution with water

For stump application, the maximum concentration must not exceed 200 ml of product per litre of water (i.e. a 20% solution).

READ ALL OTHER SAFETY PRECAUTIONS AND DIRECTIONS FOR USE BEFORE USE

RECOMMENDATION TABLES

AREA OF USE	TARGET WEEDS/USAGE	CROP	WEED INFESTATION	APPLICATION RATE l/ha	WATER VOLUME	APPLICATION TIMING AND GUIDANCE								
PRE-HARVEST ARABLE CROPS	Common Couch	WINTER and SPRING WHEAT, DURUM WHEAT, WINTER and SPRING BARLEY and WINTER and SPRING OATS	1-25 shoots/m ² Up to 75 shoots/m ² Over 75 shoots/m ²	2.0 3.0 4.0	80-250 l/ha*	<p>Grain/seed moisture must not exceed 30% at spraying.</p> <p>Harvest intervals:</p> <table> <tr> <td>CEREALS, PEAS, BEANS</td> <td>7+ days</td> </tr> <tr> <td>OILSEED RAPE</td> <td>14-21 days</td> </tr> <tr> <td>LINSEED</td> <td>14-28 days</td> </tr> <tr> <td>MUSTARDS</td> <td>8-10 days</td> </tr> </table> <p>Use high clearance, narrow wheeled tractors, wide booms and crop dividers.</p> <p>DO NOT TREAT CROPS GROWN FOR SEED.</p> <p>Where desiccating crops, check susceptibility of any weeds present.</p> <p>Do not attempt to desiccate OILSEED RAPE or MUSTARD crops with significant secondary growth, uneven maturity, disease or stress.</p> <p>Desiccate LINSEED when seeds are light brown and capsules brown; stems/leaves may be yellow/green.</p> <p>Effects on brewing and baking have not been tested. Consult grain merchant or processor before use.</p> <p>*Rotary atomisers may be used at a water volume of 40 l/ha. Ensure droplet diameter falls within the range 200-300 microns.</p>	CEREALS, PEAS, BEANS	7+ days	OILSEED RAPE	14-21 days	LINSEED	14-28 days	MUSTARDS	8-10 days
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AREA OF USE	TARGET WEEDS/USAGE	CROP	WEED INFESTATION	APPLICATION RATE l/ha	WATER VOLUME	APPLICATION TIMING AND GUIDANCE
PRE-HARVEST ARABLE CROPS (continued)	Common Couch	OILSEED RAPE MUSTARDS	Up to 75 shoots/m ²	3.0	100-250 l/ha#	# Use higher volumes for dense canopies. * Rotary atomisers may be used at a water volume of 40 l/ha. Ensure droplet diameter falls within the range 200-300 microns.
			Over 75 shoots/m ²	4.0		
		COMBINING PEAS FIELD BEANS	Up to 75 shoots/m ²	3.0	80-250 l/ha*	
			Over 75 shoots/m ²	4.0		
		LINSEED	Up to 75 shoots/m ²	3.0	80-250 l/ha	
			Over 75 shoots/m ²	4.0		
	Perennial broad-leaved weeds and other perennial grasses	WINTER and SPRING WHEAT, DURUM WHEAT, WINTER and SPRING BARLEY and WINTER and SPRING OATS	All levels/species	4.0	80-250 l/ha*	
		OILSEED RAPE MUSTARDS	All levels/species	4.0	200-250 l/ha	
		COMBINING PEAS FIELD BEANS	All levels/species	4.0	80-250 l/ha*	
		LINSEED	All levels/species	4.0	80-250 l/ha	

AREA OF USE	TARGET WEEDS/USAGE	CROP	WEED INFESTATION	APPLICATION RATE l/ha	WATER VOLUME	APPLICATION TIMING AND GUIDANCE
PRE-HARVEST ARABLE CROPS (continued)	Harvest management	WINTER and SPRING WHEAT, DURUM WHEAT, WINTER and SPRING BARLEY and WINTER and SPRING OATS	Annual grasses, crop stems and leaves	1.0	80-250 l/ha*	At harvest management rates, ANNUAL NETTLE, VOLUNTEER POTATO, ROSEBAY WILLOW HERB and POLYGONUM WEEDS will not be susceptible. WHEAT crops, WHEAT VOLUNTEERS and BROAD-LEAVED WEEDS may require up to 14 days before harvest. Treated straw must not be used as a horticultural mulch. # Use higher volumes for dense canopies. * Rotary atomisers may be used at a water volume of 40 l/ha. Ensure droplet diameter falls within the range 200-300 microns.
			Annual broad-leaved weeds	1.5		
	Crop desiccation and annual weeds, prior to direct combining	OILSEED RAPE MUSTARDS	All levels/species	3.0	100-250 l/ha#	
LINSEED			All levels/species	3.0	80-250 l/ha	

AREA OF USE	TARGET WEEDS/ USAGE	CROP/ SITUATION	WEED INFESTATION	APPLICATION RATE l/ha	WATER VOLUME	APPLICATION TIMING AND GUIDANCE
STUBBLES, PRE-SOWING and PRE-PLANTING.	Common Couch	BEFORE ALL CROPS EXCEPT ORCHARDS	Up to 75 shoots/m ²	3.0	80-250 l/ha*	Do not cultivate immediately before spraying. For PERENNIAL weed control, allow: - 21+ days growth before spraying in spring - VOLUNTEER POTATOES to make ample top growth - 5 days before cultivating or drilling For ANNUAL weed control, allow: - 24 hours before cultivating - 48 hours before direct drilling Allow 7 days before planting trees * Rotary atomisers may be used at a water volume of 40 l/ha. Ensure droplet diameter falls within the range 200-300 microns.
	Other perennial grasses; volunteer potatoes (autumn only)		Over 75 shoots/m ²	4.0		
			All levels/species	4.0		
			All levels/species	5.0		
	Perennial broad-leaved weeds	All levels/species	1.5			
Volunteer cereals and annual weeds	BEFORE ORCHARD PLANTING	Arable weeds	4.0			
Perennial grasses and broad-leaved weeds		Pasture weeds	5.0			
POST SOWING/ PLANTING, PRE-EMERGENCE OF THE CROP	Volunteer cereals and annual weeds	LISTED CEREALS OILSEED RAPE, MUSTARD, LINSEED, PEAS, FIELD BEANS, SUGAR BEET, SWEDE, TURNIP, ONION and LEEK	All levels/species	1.5	80-250 l/ha*	CAUTION - Ensure that spraying precedes ANY crop emergence. * Rotary atomisers may be used at a water volume of 40 l/ha. Ensure droplet diameter falls within the range 200-300 microns.

AREA OF USE	TARGET WEEDS/ USAGE	CROP/ SITUATION	WEED INFESTATION	APPLICATION RATE l/ha	WATER VOLUME	APPLICATION TIMING AND GUIDANCE
GREEN COVER ON LAND NOT BEING USED FOR CROP PRODUCTION EG "SET ASIDE"	Common Couch	BEFORE or DURING REMOVAL FROM PRODUCTION	Up to 75 shoots/m ²	3.0	80-250 l/ha*	Before using on land taken out of production as part of a grant aided scheme, ensure compliance with the management rules of that scheme. Do not 'top' or cultivate immediately before application. For PERENNIAL weed control, allow:- - 21+ days growth before spraying in spring - 5 days before cultivating or drilling. For ANNUAL weed control, allow: - 24 hours before cultivating. Do not direct drill after set aside. * Rotary atomisers may be used at a water volume of 40 l/ha. Ensure droplet diameter falls within the range 200-300 microns. Avoid applications during stem elongation as reduced control and re-spray is likely.
	Perennial broad-leaved weeds and other perennial grasses		Over 75 shoots/m ²	4.0	or	
			All levels/species	4.0	hand-held equipment	
	Annual weeds: • early autumn/spring • late spring/summer		All levels/species	1.5	or	
	All levels/species	3.0				
ALL EDIBLE AND NON-EDIBLE CROPS (DESTRUCTION, BEFORE SOWING/ PLANTING)	Vegetation management	-	Annual weeds	1.5	80-250 l/ha* or hand-held equipment (See mixing and spraying section)	Do not use under polythene or glass. *Rotary atomisers may be used at a water volume of 40 l/ha. Ensure droplet diameter falls within the range 200-300 microns Apply the annual weed dose at least 2 days before sowing/planting. Apply at perennial weed doses at least 5 days before sowing/planting. Do not use in or alongside hedgerows
			Perennial grasses	4.0		
			Perennial broad-leaved weeds	5.0		

AREA OF USE	TARGET WEEDS/ USAGE	CROP/ SITUATION	WEED INFESTATION	APPLICATION RATE l/ha	WATER VOLUME	APPLICATION TIMING AND GUIDANCE
GREEN COVER ON LAND TEMPORARILY OUT OF PRODUCTION EG "SET ASIDE" (continued)	Natural regeneration and cover crop destruction	AFTER SHORT ROTATION or LONG TERM REMOVAL FROM PRODUCTION	Annual weeds only	3.0	150-250 l/ha	Best control of annual grasses is achieved between full ear emergence and senescence. +Only for weeds listed as per grassland destruction application rate table below.
			Perennial grasses	4.0	or	
			Perennial broad-leaved weeds	5.0	hand held equipment	
			Perennial broad-leaved weeds as listed below.	6.0+	or tractor mounted weed wiper	
GRASSLAND - DESTRUCTION	Short rotation Ryegrass, longer leys and permanent pasture	GRASS	Short rotation Ryegrass with annual weeds	3.0	150-250 l/ha	Treat EITHER before grazing/mowing in June-Oct, when growth is 30-60 cm, not dense and lacking mature seeds, OR re-growth after grazing/mowing.
			Leys 2-4 years old with perennial grass weeds	4.0		Select the application rate which controls/destroys the least susceptible weed and grass species present in the sward.
			Long leys 4-7 years old with perennial broad- leaved weeds	5.0		Grass may be conserved or grazed by cattle, dairy cows or sheep 5+ days after spraying. REMOVE POISONOUS PLANTS BEFORE GRAZING/MOWING. If Ragwort is present, the guidance in the 'DIRECTIONS FOR USE must be followed.
			Permanent pasture	6.0		
			See Weed Table below.			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.

APPLICATION RATE FOR GRASSLAND DESTRUCTION							
3.0l/ha		4.0l/ha		5.0l/ha		6.0l/ha	
Annual Meadow-grass	Meadow Fescue	Black-bent	Creeping Soft-grass	Bracken**	Red Clover	Common Ragwort	Nardus (Mat grass)
Common Chickweed	Meadow Foxtail	Broad-leaved Dock	Curled Dock	Common Sorrel	Sedges	Hard Rush	Red Fescue
Common Mouse-ear	Rough Meadow-grass	Cock's-foot	Perennial Rye-grass	Common Nettle	Sheep's Sorrel	Heath Rush	White Clover*
Dock Seedlings	Speedwell species	Common Bent	Plantains	Creeping Buttercup	Soft Rush	Jointed Rush	Yellow Rattle
Italian Rye-grass	Timothy	Common Couch	Soft Brome	Creeping Thistle	Spear Thistle	Molinia (Purple Moor-grass)	Sheep's Fescue
Mayweed species		Creeping Bent	Yorkshire Fog	Daisy	Tufted Hairgrass		
				Dwarf Thistle	Yarrow		
				Perennial Sow-thistle			

* White Clover is best cut in June and sprayed one month later.

** At full frond expansion

AREA OF USE	TARGET WEEDS/ USAGE	CROP/ SITUATION	WEED INFESTATION	APPLICATION RATE l/ha	WATER VOLUME	APPLICATION TIMING AND GUIDANCE
ORCHARDS	Perennial grasses, broad-leaved weeds	APPLE, PEAR, PLUM, CHERRY, DAMSON	All levels of most species	5.0	Hydraulic sprayers including hand held 200-400 l/ha or Rotary atomizers at 40 l/ha	<p>Spray AFTER autumn leaf-fall and BEFORE: Apples, pears - green cluster stage Stone fruit - white bud stage</p> <p>Treat root suckers in late spring only.</p> <p>Trees must have been established 2+ years.</p> <p>Avoid contact with tree 30+ cm above ground.</p>
	Root suckers		-	5.0		
IN-CROP (TRACTOR-MOUNTED WEED WIPER APPLICATION)	Bolters, weed beet, other weeds	ARABLE CROPS AND GRASSLAND SET ASIDE	All levels	<p>1:1 dilution with water OR 1:2 dilution with water in hot, dry conditions.</p> <p>For 'new generation' wipers consult the manufacturer for guidance.</p>		<p>Weeds must be 10+ cm taller, and wiper 5+ cm higher, than desired vegetation.</p> <p>Wipe dense populations twice, in opposite directions. BOLTING BEET requires three applications, 2 weeks apart, from early July to early August.</p> <p>Contact Monsanto or your distributor for specific recommended weed wiper applicators.</p> <p>POISONOUS WEEDS and grazing/mowing interval - See GRASSLAND section.</p> <p>If Ragwort is present, the guidance in the 'DIRECTIONS FOR USE must be followed.</p>

AREA OF USE	TARGET WEEDS/ USAGE	CROP/ SITUATION	WEED INFESTATION	APPLICATION RATE l/ha	WATER VOLUME	APPLICATION TIMING AND GUIDANCE
NATURAL SURFACES NOT INTENDED TO BEAR VEGETATION, PERMEABLE SURFACES OVERLYING SOIL. ALL SITUATIONS (DESTRUCTION, BEFORE PLANTING).	Vegetation management	Including farmyards roadsides, paths, and along fences and walls	Annual weeds	1.5	Hydraulic sprayers (boom and knapsack) at water volumes 80-400 l/ha or rotary atomisers*at water volumes 40 l/ha or hand-held equipment. See Mixing & Spraying section.	Do not use under polythene or glass. * Where rotary atomisers are used their droplet diameter must fall within the range 200-300µm.
			Perennial grasses and broad-leaved weeds	4.0-5.0		
HARD SURFACES	Vegetation management	Including farmyards roadsides, paths, hard surfaces and along fences and walls	Annual weeds	1.5	Hydraulic sprayers (boom and knapsack) at water volumes 80-400 l/ha or rotary atomisers*at water volumes 40 l/ha or hand-held equipment. See Mixing & Spraying section.	Apply this product carefully. Ensure spraying takes place only when weeds are actively growing (normally March to October) and is confined to only visible weeds including those in the 30cm swath covering the kerb edge and road gully – do not overspray drains
			Perennial grasses and broad-leaved weeds	4.0-5.0		

FORESTRY/FARM FORESTRY WEED CONTROL

SAMURAI can be used for site preparation and for weed control in planted out trees

AREA OF USE	TARGET WEEDS/ USAGE	WEED INFESTATION	APPLICATION RATE l/ha	WATER VOLUME	APPLICATION TIMING AND GUIDANCE
FORESTRY: - PRE-PLANTING	Arable land, planting, replanting, & grassland areas	Arable weeds Grassland weeds	4.0 5.0	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 atomisers are used their droplet diameter must fall within the range 200-300µm.
FORESTRY: - POST-PLANTING (DIRECTED) IN CONIFERS & BROAD-LEAVED TREES	Clean-up around trees with knapsack applicators	Annual/ perennial grasses and broad-leaved weeds	4.0	Hand held equipment.	It is ESSENTIAL to use a TREE GUARD for all applications made in the growing season. Treat bracken after frond tips are unfurled but before senescence. Treat heather late August to end September. All other woody weeds are treated June to August, before leaf senescence but after new growth of crop has hardened. (*) For improved control of Rhododendron apply 6.4 l/ha SAMURAI, adding Mixture B (ADJ AO161) at 2% of spray volume. Application using a weed wiper is not suitable.
		Woody weeds: Bracken/Beech Brush/Brambles Sycamore/Oak Hazel/Willow/ Ash (excluding Rhododendron	3.0	Knapsack: Apply as a 2% concentration or Weed wiper mini: apply as a concentration of 1 part SAMURAI to 2 parts water (see Mixing & Spraying section)	
		Heather (peat soils)	4.0		
		Heather (mineral soils)	6.0		
		Rhododendron (*)	10.0		

AREA OF USE	TARGET WEEDS/ USAGE	WEED INFESTATION	APPLICATION RATE l/ha	WATER VOLUME	APPLICATION TIMING AND GUIDANCE
FORESTRY: - POST-PLANTING (OVERALL DORMANT SEASON IN CERTAIN CONIFERS – CONIFER RELEASE)	Grass weeds: -Lowland areas -Upland areas Bracken Beech & Birch Brambles	Black Bent, Cock's- foot, Common Couch, Creeping Soft-grass, False Oat-grass, Fescues, Meadow- grasses, other Bent species, Purple Moor-grass, Sweet Vernal-grass, Tufted Hair-grass, Wavy Hair-grass, Wood Small-reed (Bush grass) All levels of all species All levels of all species All levels of all species	1.5 2.0 2.0 2.0 3.0	Hydraulic sprayers: 200-250 l/ha or hand-held equipment - see 'Mixing and Spraying' section	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 Pine, Norway Spruce, Sitka Spruce, Lawson Cypress, Western Red Cedar. Douglas Fir and Noble 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. These recommended application rates refer to forestry usage only. Inadequate control may result if used in other areas. <u>Caution:</u> 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.

Mixing and spraying

Correctly calibrate all sprayers under field or use conditions prior to application.

a) Conventional Hydraulic Sprayers

Knapsack sprayers and tractor mounted or powered sprayers may be used. These should be capable of applying accurately 80-400 l/ha within a pressure range of 1.5-2.5 bars (20-35 psi).

Medium Volume Application (150-300 l/ha)

Avoid high water volumes (> 300 l/ha) which may lead to run-off from the treated vegetation, resulting in reduced control. Nozzles producing a medium or coarse spray (BCPC definition) should be used to minimise the risk of drift :

eg.	Knapsack	Hypro AN 2.0, AN 4.0 Cooper Pegler Floodjet green, red
	Tractor	Hypro 04-F110, 08-F110 Tee Jet 11004, 11008

Low Volume Application (minimum 80 l/ha)

Low volume application can be achieved by reducing pressure and appropriate nozzle selection. Low drift nozzles which produce a medium spray (BCPC definition) should be used to minimise the risk of drift,

eg.	Knapsack	Cooper Pegler VLV 100 Hypro AN 1.0
	Tractor	Hypro Lo Drift

Filling the Sprayer

- Knapsack Half fill the spray tank with clean water, add the correct amount of SAMURAI and top up with water. Mix thoroughly.
- Tractor Mounted To avoid foaming do not use top tank agitation. Half fill the spray tank with clean water, start gentle agitation, then add the correct amount of SAMURAI. Top up the tank with water to the required level. Use of a defoamer may be necessary.

b) Rotary Atomisers – for use in orchards

When rotary atomisers are used to apply SAMURAI ensure that the droplet diameter falls within the range 200-300 microns for all uses.

c) Hand-held Wipers

SAMURAI may be applied through the weed wiper mini. Use a concentration of 1 part SAMURAI to 2 parts of water and add a scarlet dye if required. Care should be taken to avoid dripping onto wanted vegetation.

d) Cut Stump Application

Enso attachment to rotary saws:

This technique is specific to scrub clearance in forestry. A water-soluble dye may be added to SAMURAI to help identify treated stumps.

HAND-HELD EQUIPMENT: SPECIFIC GUIDANCE

e) Knapsack Sprayer Applicators –

When used at a walking speed of 1 m/sec to apply a swath of 1 m width, most knapsack sprayers deliver 200 l/ha spray volume (or 10 litres per 500 m²). To apply 4.0l/ha of SAMURAI, therefore, use a 2% solution (e.g. 200 ml SAMURAI made up to 10 litres).

When used as above, knapsack sprayers fitted with low volume nozzles typically deliver 100 l/ha spray volume (or 10 litres per 1000 m²). To apply 4.0l/ha SAMURAI in this case, use a 4% solution.

Filling the sprayer - hand-held machines

Stir the correct amount of SAMURAI into the sprayer half filled with clean water. Top up with water, close the top and shake gently to ensure good mixing.

f) Spot Gun Applicators – for treatment of individual weeds

Apply 5 ml of spray to target weed, using a narrow cone TG-3 or TG-5 nozzle.

Spot Diameter (metres)	Amount of SAMURAI (ml) per 5 litres of spray solution		
	3.0l/ha	4.0 l/ha	5.0l/ha
0.3	20	28	35
0.6	85	110	140

Compatibility

Do not tank mix Samurai with adjuvants, pesticides or fertilisers except as advised by Monsanto. For up to date information on compatible products contact Monsanto UK Limited (tel: 01954 717575).

SAMURAI is compatible with Mixture B (ADJ 0161). Where conventional hydraulic sprayers are being used Mixture B may be added to the spray tank solution, at a rate of 2% of the final water volume, for all pre-plant and post-plant directed sprays only.

DO NOT APPLY WITH MIXTURE B TO EDIBLE CROPS, OR GRASSLAND WEEDS.

Do not tank-mix SAMURAI when using rotary atomiser sprayers.

For hydraulic sprayers: maintain continuous agitation when using SAMURAI in tank mixture.

For knapsack sprayers: mix thoroughly and use immediately when using SAMURAI in tank mixture.

COMPANY ADVISORY INFORMATION

This section is not part of the Product Label under the Plant Protection Products Regulations 1995 and provides additional advice on the product.

General Information

SAMURAI is an advanced glyphosate formulation. To maximise the intrinsic safe use of SAMURAI to operator, consumer and environment, the label recommendations and the DEFRA/HSC publication "Code of Practice for using Plant Protection Products, 2006" should be adhered to.

SAMURAI herbicide is a foliar-acting herbicide with broad-spectrum activity. It 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. SAMURAI 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. Upon adsorption, the herbicidal properties of SAMURAI are lost, permitting drilling of crops within 48 hours of application. When used as directed, any water subjected to SAMURAI spray drift may be used immediately for irrigation purposes. Until degraded, the active ingredient in SAMURAI, glyphosate, is practically immobile in soils and is, therefore, unlikely to contaminate groundwater.

SAMURAI is recommended for control of annual and perennial weeds in non-crop areas such as roadsides, paths, hard surfaces and along fences and walls. It is recommended for cleaning up weedy ground prior to planting or sowing. SAMURAI may also be used as a directed spray in ornamental plantings, and in forestry for site preparation and post-planting treatments.

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.

Weed resistance strategy

There is low risk for the development of weed resistance to SAMURAI. There are no known cases of weed resistance to glyphosate in UK. Strains of some annual weeds (e.g. Black-grass, Wild oats and Italian Ryegrass) have developed resistance to certain herbicides which may lead to poor control using those products. 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 by the Weed Resistance Action Group and copies are available from the HGCA, CPA, your distributor, crop adviser or product manufacturer (Monsanto).

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 Monsanto UK Ltd (Tel: 01954 717575)

General Cautions

Take extreme care to avoid drift, particularly when using near or alongside hedgerows. The use of low drift nozzles such as 'air induction' and 'pre-orifice' nozzles are recommended.

Calibration

All sprayers should always be calibrated before use. This is essential when nozzles are changed or if a different dose of product is to be applied.

Unused Spray Mixture

Once SAMURAI has been diluted in the spray tank, it should be used as soon as possible. However, if unexpected delays occur the diluted spray can be safely stored. Agitate well before use. Storage for longer than 3 days may result in reduced efficacy.

Sprayer Maintenance

Ensure the sprayer is in good working order and replace damaged, worn or malfunctioning parts before use. Carry out maintenance according to the instructions of the sprayer manufacturer.

Sprayer Hygiene

It is essential to thoroughly clean-out spray 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.

Disposal

Follow the guidance on the disposal of surplus spray solution, tank washings, concentrate and containers as given in Section 5 of DEFRA/HSC publication "Code of Practice for using Plant Protection Products, 2006

Trade Mark References

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All other brand names referred to are trademarks of other manufacturers in which proprietary rights may exist.

Monsanto does not warrant that the purchase or use of equipment mentioned in this document will not infringe any patent or trade mark registration.

SAFETY DATA SHEET

Following the instructions on this Product Label for the specified uses should ensure that the product is used safely and efficaciously for those uses.

A full Material Safety Data Sheet is available on request. Telephone Monsanto Technical Helpline on 01954 717575 or download from www.monsanto-ag.co.uk .