H - Herbicide

SAMURAI

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

For use pre-harvest in cereals and certain other crops, destruction of grassland, and use in stubbles and orchards, and non-crop areas.
For control of emerged weeds in amenity and forestry situations.
Degraded by micro-organisms/microbes in the soil.
A soluble concentrate containing 360 g/l glyphosate present as 441 g/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

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

Lot number/production date:

The Voluntary Initiative

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

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

SAMURAI

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This product is a soluble concentrate containing 360 g/l glyphosate present as 441 g/l (35.3 % w.w.) of the potassium salt of glyphosate.

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

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

FOR PROFESSIONAL USE 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 the Statutory Area
Latest time of application: } on the attached leaflet
Other specific restrictions: } (see 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 (FACE -SHIELD) 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 and hand-held rotary atomisers.

WEAR SUITABLE PROTECTIVE CLOTHING (COVERALLS), SUITABLE PROTECTIVE GLOVES, RUBBER BOOTS AND FACE PROTECTION (FACE-SHIELD) when using weed wiper 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 0844 8920111.

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 of at least 6 hours and preferably 24 hours rain-free must follow application of SAMURAI.

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.

After application, large concentrations of decaying foliage, stolons, roots or rhizomes should be dispersed or buried by thorough cultivation before crop drilling.

Applications of lime, fertiliser, farmyard manure and pesticides should be delayed until 5 days after application of SAMURAI.

TREATED POISONOUS PLANT SPECIES MUST BE REMOVED BEFORE GRAZING 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 is a foliar acting herbicide which controls annual and perennial grasses and most broad-leaved weeds when used as directed. 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 once grasses and broad-leaved weeds have emerged 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 commences 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.

- OTHER SPECIES - recommendations for specific areas of use are given in the Recommendation Tables, pages 3 – 10.

- 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 hours after application.

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

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.

Traces of SAMURAI left in the equipment may seriously damage or destroy crops sprayed late.

#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 product/ hectare/crop/annum):	Latest time of application:
Winter wheat, winter barley, winter oat, spring wheat, spring barley, spring oats, durum wheat, combining pea, field beans	4.0	4.0 l/ha/crop	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 l/ha/crop	Pre-emergence
Oilseed rape and linseed	4.0	4.0 l/ha/crop	14 days before harvest
Pre-harvest of mustard	4.0	4.0 l/ha/crop	8 days before harvest.
Stubbles (of all crops) Either: Or:	4.0 or 1.5	4.0 l/ha/crop or 1.5 l/ha/crop	5 days before drilling or planting of 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	5.0	-
Grassland	6.0	6.0 l/ha/crop	5 days before harvest, grazing or drilling
Apple and pear orchards	5.0	5.0 l/ha/crop	After harvest but before green cluster stage
Cherry, plum and damson orchards	5.0	5.0 l/ha/crop	After harvest 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	-	-

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).

Recommendation Tables

AREA OF USE	TARGET WEEDS/USAGE	CROP/SITUATION	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 to 25 shoots/m² Up to 75 shoots/m² Over 75 shoots/m²	2.0 3.0 4.0	80-250 l/ha*	Grain/seed moisture must not exceed 30% at spraying. Harvest intervals: CEREALS, PEAS, BEANS 7+ days OILSEED RAPE 14-21 days LINSEED 14-28 days MUSTARDS 8-10 days Use high clearance, narrow wheeled tractors, wide booms and crop dividers. Where desiccating crops, check susceptibility of any weeds present. Do not attempt to desiccate OILSEED RAPE or MUSTARD crops with significant secondary growth, uneven maturity, disease or stress. Desiccate LINSEED when seeds are light brown and capsules brown; stems/leaves may be yellow/green. Effects on brewing and baking have not been tested. Consult grain merchant or processor before use. At harvest management rates, ANNUAL NETTLE, VOL. 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.
		OILSEED RAPE AND MUSTARDS	Up to 75 shoots/m² Over 75 shoots/m²	3.0 4.0	100-250 l/ha#	
		COMBINING PEAS FIELD BEANS	Up to 75 shoots/m² Over 75 shoots/m²	3.0 4.0	80-250 l/ha*	
		LINSEED	Up to 75 shoots/m² Over 75 shoots/m²	3.0 4.0	80-250 l/ha*	
	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 of all species	4.0	80-250 l/ha*	
		OILSEED RAPE AND MUSTARDS	All levels of all species	4.0	100-250 l/ha#	
		COMBINING PEAS AND FIELD BEANS	All levels of all species	4.0	80-250 l/ha*	
		LINSEED	All levels of all species	4.0	80-250 l/ha	

AREA OF USE	TARGET WEEDS/USAGE	CROP/SITUATION	WEED INFESTATION	APPLICATION RATE l/ha	WATER VOLUME	APPLICATION TIMING AND GUIDANCE
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 Annual broad-leaved weeds	1.0 (+) 1.5 (+)	80-250 l/ha*	Treated straw must not be used as a horticultural mulch. DO NOT TREAT CROPS GROWN FOR SEED. * Rotary atomisers may be used at a water volume of 40 l/ha. Ensure droplet diameter falls within the range 200-300 microns. # Use higher volumes for dense canopies. (+) For optimum results use an approved adjuvant at 0.5% spray solution as described in `Compatability` section.
	Crop desiccation and annual weeds, prior to direct combining	OILSEED RAPE AND MUSTARDS	All levels/species	3.0	100-250 l/ha#	
		LINSEED	All levels/species	3.0	80-250 l/ha	
ALL EDIBLE AND NON-EDIBLE CROPS (DESTRUCTION, BEFORE SOWING/ PLANTING)		Vegetation management	Annual weeds Perennial grasses Perennial broad-leaved weeds	1.5 4.0 5.0	80-250 l/ha* or hand-held equipment (p. 9 – 10)	Do not use in or alongside hedgerows Do not use under polythene or glass. Apply the annual weed dose at least 2 days before sowing/planting. Apply at perennial weed doses at least 5 days before sowing/planting. *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
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, BULB 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.
STUBBLES, PRE-SOWING and PRE-PLANTING	Common Couch	BEFORE ALL CROPS EXCEPT ORCHARDS	Up to 75 shoots/m² Over 75 shoots/m²	3.0 4.0	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 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. (+) For optimum results use an approved adjuvant at 0.5% spray solution as described in `Compatibility` section.
	Other perennial grasses; volunteer potatoes (autumn only)	BEFORE ALL CROPS EXCEPT ORCHARDS	All levels of all species	4.0		
			All levels of all species			
	Volunteer cereals and annual weeds		All levels of all species	1.5 (+)		
	Perennial broad-leaved weeds		All levels of all species	5.0		
	Perennial grasses and broad-leaved weeds	BEFORE ORCHARD PLANTING	Arable weeds Pasture weeds	4.0 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 NOT BEING USED FOR CROP PRODUCTION EG "SET ASIDE"	Common Couch	BEFORE or DURING REMOVAL FROM PRODUCTION e.g. prior to growing a set aside mixture	Up to 75 shoots/m² Over 75 shoots/m²	3.0 4.0	80-250 l/ha* or hand-held equipment (p. 9 – 10) or tractor mounted weed wiper (p. 9)	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. Avoid applications during stem elongation as reduced control and re-spray is likely * Rotary atomisers may be used at a water volume of 40 l/ha. Ensure droplet diameter falls within the range 200-300 microns. 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 broad-leaved weeds and other perennial grasses		All levels/species	4.0		
	Annual weeds: • Early autumn/spring • Late spring/ summer		All levels/species All levels/species	1.5 3.0		
	Natural regeneration and cover crop destruction	AFTER SHORT ROTATION or LONG TERM REMOVAL FROM PRODUCTION	Annual weeds only Perennial grasses Perennial broad-leaved weeds Perennial broad-leaved weeds as listed below.	3.0 4.0 5.0 6.0+	150 – 250 l/ha*	

AREA OF USE	TARGET WEEDS/ USAGE	CROP/ SITUATION	WEED INFESTATION	APPLICATION RATE l/ha	WATER VOLUME	APPLICATION TIMING AND GUIDANCE
PERMANENT GRASSLAND (DESTRUCTION)	Short rotation Ryegrass, longer leys and permanent pasture	GRASS	Short rotation Ryegrass with annual weeds	3.0 l/ha	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 l/ha		Select the application rate which controls/destroys the least susceptible weed and grass species present in the sward.
ROTATIONAL GRASS (DESTRUCTION)			Long leys 4-7 years old with perennial broad-leaved weeds	5.0 l/ha		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 See Weed Table on p. 9 - 10	6.0 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.

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

* 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 and broad-leaved weeds	APPLE, PEAR, PLUM, CHERRY OR DAMSON -	All levels of most species	5.0 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. Treat suckers in late spring only.
	Root suckers		-	5.0 l/ha		
IN-CROP (TRACTOR-MOUNTED WEED WIPER APPLICATION)	Bolters, weed beet, other weeds	ARABLE CROPS AND GRASSLAND SET ASIDE	All levels		1:1 dilution with water OR 1:2 dilution with water in hot, dry conditions. For 'new generation' wipers consult the manufacturer for guidance.	Weeds must be 10+ cm taller, and wiper 5+ cm higher, than desired vegetation. Wipe dense populations twice, in opposite directions. BOLTING BEET requires three applications, 2 weeks apart, from early July to early August. Contact Monsanto or your distributor for specific recommended weed wiper applicators. POISONOUS WEEDS and grazing/mowing interval - See GRASSLAND section.

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).		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 equip-ment. 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 equip-ment. 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 gulley – do not overspray drains.
			Perennial grasses and broad-leaved weeds	4.0-5.0		

Application guide for hydraulic sprayers

EQUIPMENT	AMOUNT OF SAMURAI	AREA TREATED	MEDIUM VOLUME Amount of Water	LOW VOLUME Amount of Water
Boom Sprayer	4 litres	1.0 ha	200 litres	100 litres
Knapsack Sprayer	80ml	200m2	4 litres	2 litres

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. 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)	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. Application using a weed wiper is not suitable.

AREA OF USE	TARGET WEEDS/ USAGE	WEED INFESTATION	APPLICATION RATE l/ha	WATER VOLUME	APPLICATION TIMING AND GUIDANCE
		Woody weeds: Bracken/Beech Brush/Brambles Sycamore/Oak/Hazel/ Willow/ Ash (excluding Rhododendron	3.0		
		Heather (peat soils) Heather (mineral soils) Rhododendron (*)	4.0 6.0 10.0		(*) For improved control of Rhododendron apply 8.0 l/ha SAMURAI, adding Mixture B (ADJ O570) at 2% of spray volume.
FORESTRY: - POST-PLANTING (OVERALL DORMANT SEASON IN CERTAIN CONIFERS – CONIFER RELEASE)	Grass weeds: - Lowland areas - Upland areas Braken 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. 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.

AREA OF USE	TARGET WEEDS/ USAGE	WEED INFESTATION	APPLICATION RATE l/ha	WATER VOLUME	APPLICATION TIMING AND GUIDANCE
FORESTRY: - STUMP APPLICATION FOR CHEMICAL THINNING	Deciduous trees Coniferous trees	All species All species	10% solution of SAMURAI in water 20% solution of SAMURAI in water		Apply the solution to saturate the rim of the newly cut surface, with a suitably adapted clearing saw, spot gun or paintbrush. Treat as soon as possible after felling, in the period November to March/April. Do not apply in the period of active sap flow in the spring/early summer. Do not cut trenches or drill holes and fill with the solution or use undiluted product. Note: for ease of identification of treated areas a suitable, commercially available, water-soluble dye may be added to the prepared spray solution
FORESTRY: - CHEMICAL THINNING BY INJECTION OF TREE STEMS	Coniferous and deciduous species	-	2 ml neat SAMURAI per cut per 10 cm diameter (or less) of tree		Use a hatchet to cut one notch in trees up to 10cm diameter and apply 2 ml of the solution to each cut. Use two or three notches in trees over 10cm diameter. Do not treat in the period of active sap flow in the spring/early summer.

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. Low drift nozzles such as air induction and pre-orifice types producing a medium or coarse spray (BCPC definition) should be used to minimise the risk of drift :

eg. Knapsack Hypro 1.2-2.4 Cooper Pegler Floodjet green, red
Tractor Hypro GuardianAIR, or standard F110 -04, -05 or -06 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

Tractor Hypro LD110-025

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 for targeted dosages of		
	3.0l/ha	4.0 l/ha	5.0l/ha
0.3 0.6	20 85	28 110	35 140

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 (ADJ0161). 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 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. To maximise the 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.

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 confirmed 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 resistant 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.

New generation weed wipers

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/NAW publication "Code of Practice for using Plant Protection Products of January 2006

Sprayer Hygiene

The product must only be transferred and measured using a closed transfer system that meets or exceeds British Standard BS 6356 Part 9. If any doubt exists regarding equipment suitability contact the equipment manufacturer or your agronomist for further advice.

Remove the tamper evident plastic cap from valve unit fitted to the top of the IBC. Attach the coupler of the transfer system as instructed in the equipment manual to

the IBC and operate using the equipment manufacturer's instructions to transfer the required amount of product. Remove the coupling after use and rinse the equipment in line with the instructions ensuring that the transfer system is clean and empty before placing in the storage position.
The container must be empty of product and left in a clean condition for collection. Do not attempt to rinse the inside – external clean only.

Trade Mark References

SAMURAI™ , Monsanto™ and the vine symbol are registered trademarks of Monsanto Technology LLC.
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 .