



- Herbicide

# SAMURAI®

A foliar applied 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 in stubbles, orchards and set-aside.

This product is a soluble concentrate containing 360 g/l glyphosate present as 480 g/l (41.1% w.w.) of the isopropylamine salt of glyphosate and polyoxyethylene amine surfactant

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

Contents 20 litres

MAPP Number 12674

PROTECT FROM FROST

Imported



Harmful



Dangerous for the environment

**HARMFUL BY INHALATION**

**RISK OF SERIOUS DAMAGE TO EYES.**

**TOXIC TO AQUATIC ORGANISMS, MAY CAUSE LONG-TERM ADVERSE EFFECTS IN THE AQUATIC ENVIRONMENT.**

IN CASE OF CONTACT WITH EYES, RINSE IMMEDIATELY WITH PLENTY OF WATER & SEEK MEDICAL ADVICE.

WEAR EYE/FACE PROTECTION

THIS MATERIAL AND ITS CONTAINER MUST BE DISPOSED OF IN A SAFE WAY.

USE APPROPRIATE CONTAINMENT TO AVOID ENVIRONMENTAL CONTAMINATION.

**To avoid risks to man and the environment, comply with the instructions for use**

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

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Lot number/production date:



**The Voluntary Initiative**

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

## SAMURAI®

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

### IMPORTANT INFORMATION

FOR USE ONLY AS AN AGRICULTURAL/HORTICULTURAL HERBICIDE

**Crops/situations:**

Wheat, barley, oats, combining peas, vining peas, field beans;  
Post planting and pre-emergence of wheat, barley, oats, oilseed rape, peas, field beans, mustard, linseed, sugar beet, swedes, turnips, bulb onions and leeks;  
Oilseed rape, mustard, linseed;  
Sugar beet, swedes, turnips, bulb onions, leeks;  
All edible crops (stubble), all non-edible crops (stubble);  
All edible and non-edible crops (destruction before sowing/planting);  
Grassland;  
Apples, pears, plums, cherries, damsons;  
Green cover on land not being used for crop production;

<b>Maximum individual dose:</b>	}
<b>Maximum number of treatments:</b>	} Full details are given in
<b>Latest time of application:</b>	} the attached leaflet
<b>Other specific restrictions:</b>	} (see Crop Specific Information - marked #)

**READ THE LABEL BEFORE USE. USING THIS PRODUCT IN A MANNER THAT IS INCONSISTENT WITH THE LABEL MAY BE AN OFFENCE. FOLLOW THE CODE OF PRACTICE FOR USING PLANT PROTECTION PRODUCTS.**

# 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 (FACESHIELD) when using weedwiper equipment.

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

WHEN USING, DO NOT EAT, DRINK OR SMOKE.

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

## Environmental protection

DO NOT CONTAMINATE SURFACE WATERS OR DITCHES with chemical or used container [*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 0870 600 6266.

## **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, fertilizer, farmyard manure and pesticides should be delayed until 5 days after application of Samurai.

### **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 a 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 10-15cm 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.
- 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.

### **Weed resistance strategy**

There is low risk for the development of weed resistance to Samurai.

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 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 (Tel: 01954 717575)

### **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 later.

## #Crop specific information

Crops/situations:	Maximum individual dose (litres product/ hectare):	Maximum total dose (litres product/ hectare)	Latest time of application:
Pre-harvest of winter wheat, winter barley, winter oats, spring wheat, spring barley, spring oats, durum wheat, combining peas, 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, swedes, turnips, bulb onions, and leeks	1.5	1.5 l/ha/crop	Pre-emergence
Pre-harvest of 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:	4.0	4.0 l/ha/year	5 days before drilling or planting of the following crop
	or: 1.5	1.5 l/ha/year	2 days before the drilling or planting of the following crop or 24 hours before cultivating
Grassland	6.0	6.0 l/ha/year	5 days before harvest, grazing or drilling
Apple and pear orchards	5.0	5.0 l/ha/year	After harvest but before green cluster stage
Cherry, plum and damson orchards	5.0	5.0 l/ha/year	After harvest but before white bud stage
All edible and non-edible crops (destruction, before sowing/planting).	5.0	5.0 l/ha/year	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
Green cover on land not being used for crop production	6.0	6.0 l/ha/year	24 hours before cultivating

**Other specific restrictions:**

The maximum individual dose must not exceed 22.5 g/l glyphosate for hydraulic knapsack sprayers.

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 crop where the wiper or chemical does not touch the growing crop.

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

Weed wiper Mini	1:2 dilution with water	} Refer to weed wiper guidance under 'Mixing & Spraying' section
Other wipers	1:1 dilution with water	

## 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/m <sup>2</sup>	2.0 (+)	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		
			Up to 75 shoots/m <sup>2</sup>	3.0				
			Over 75 shoots/m <sup>2</sup>	4.0				
		OILSEED RAPE AND MUSTARDS	Up to 75 shoots/m <sup>2</sup>	3.0			100-250 l/ha#	Use high clearance, narrow wheeled tractors, wide booms and crop dividers.
			Over 75 shoots/m <sup>2</sup>	4.0				
	COMBINING PEAS FIELD BEANS	Up to 75 shoots/m <sup>2</sup>	3.0	80-250 l/ha*	Where desiccating crops, check susceptibility of any weeds present.			
		Over 75 shoots/m <sup>2</sup>	4.0					
	Perennial broad-leaved weeds, other perennial grasses	WINTER and SPRING WHEAT, DURUM WHEAT, WINTER and SPRING BARLEY and WINTER and SPRING OATS	Up to 75 shoots/m <sup>2</sup>	3.0	80-250 l/ha*	Do not attempt to desiccate OILSEED RAPE or MUSTARD crops with significant secondary growth, uneven maturity, disease or stress.		
			Over 75 shoots/m <sup>2</sup>	4.0				
		OILSEED RAPE AND MUSTARDS	All levels of all species	4.0	80-250 l/ha*	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.		
COMBINING PEAS FIELD BEANS			All levels of all species	4.0			80-250 l/ha*	Treated straw must not be used as a horticultural mulch.
			LINSEED	All levels of all species				

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*	* 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 Frigate as an adjuvant at 0.5% spray solution as described in 'Compatibility' 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	

** 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	WITHIN ORCHARDS OF APPLE, PEAR, PLUM ,CHERRY OR DAMSON	All levels of most species	5.0	200-400 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	-	All species	5.0		

AREA OF USE	TARGET WEEDS/ USAGE	CROP/ SITUATION	WEED INFESTATION	APPLICATION RATE l/ha	WATER VOLUME	APPLICATION TIMING AND GUIDANCE
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.XX)	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
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.

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 <sup>2</sup>	3.0	80-250 l/ha*	<p>Do not cultivate immediately before spraying.</p> <p>For PERENNIAL weed control, allow:</p> <ul style="list-style-type: none"> <li>- 21+ days growth before spraying in spring</li> <li>- VOLUNTEER POTATOES to make ample top growth</li> <li>- 5 days before cultivating or drilling</li> </ul> <p>For ANNUAL weed control, allow:</p> <ul style="list-style-type: none"> <li>- 24 hours before cultivating</li> <li>- 48 hours before drilling</li> </ul> <p>Allow 7 days before planting trees</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> <p>(+) For optimum results use Frigate as an adjuvant at 0.5% spray solution as described in 'Compatibility' section.</p>
	Other perennial grasses, volunteer potatoes (autumn only)		Over 75 shoots/m <sup>2</sup>	4.0		
	Volunteer cereals and annual weeds		All levels of all species	4.0		
	Perennial broad leaved weeds		All levels of all species	1.5 (+)		
	Perennial grasses and broad leaved weeds	BEFORE ORCHARD PLANTING	Arable weeds	4.0		
		Pasture 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 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/m <sup>2</sup>	3.0	80-250 l/ha*  or  Hand-held equipment (p.X)  or  Tractor mounted weed wiper (p.XX)	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		Over 75 shoots/m <sup>2</sup>	4.0		
	Annual weeds  - Early autumn/spring  - Late spring/summer		All levels/species	4.0		
			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	3.0	150-250 l/ha*	
		Perennial grasses	4.0			
		Perennial broad- leaved weeds	5.0			
		Perennial broad- leaved weeds as listed below.	6.0+			

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	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 regrowth after grazing/mowing.
ROTATIONAL GRASS (DESTRUCTION)			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.
			Permanent pasture	6.0		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.
			See weed table below			* Rotary atomisers may be used at a water volume of 40 l/ha. Ensure droplet diameter falls within the range 200-300 microns.

APPLICATION RATES FOR GRASSLAND DESTRUCTION							
3.0 l/ha		4.0 l/ha		5.0 l/ha		6.0 l/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 Hair-grass		
				Dwarf Thistle	Yarrow		
				Perennial Sow-thistle			

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

## Mixing and spraying

Samurai mixes readily with water and can be applied in spray volumes ranging from 80-400 l/ha using tractor mounted, knapsack, rotary atomisers and hand-held sprayers. Specialised application equipment such as weed wipers, stem injection and spot gun applicators may be used where indicated.

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

### a) Tractor mounted and powered sprayers

These should be capable of applying accurately 80-400 l/ha within a pressure range of 1.5-2.5 bars (20-35 psi).

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

All applications using hydraulic sprayers (including knapsack sprayers) to be as 'MEDIUM' or 'COARSE' spray quality (BCPC definition).

#### *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.

#### *Low Volume Application (minimum 80 l/ha)*

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

### b) Knapsack sprayers

Recommended delivery range is 80 - 300 l/ha. Half fill the spray tank with clean water, add the correct amount of Samurai and top up with water. Fill according to best practice as given on the CPA's Voluntary Initiative website ([www.voluntaryinitiative.org.uk](http://www.voluntaryinitiative.org.uk))

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<sup>2</sup>). To apply 4.0 l/ha of Samurai, therefore, use 40ml of product for each 2 litres 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 4.0 l/ha SAMURAI, in this case, use 80 ml of product for each 2 litres of spray liquid required.

c) Rotary Atomisers

Tractor-mounted boom sprayers and hand-held machines are suitable for use in some situations to apply a minimum spray volume of 40 l/ha.

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

Stir the correct amount of Samurai to control the particular target species into the sprayer bottle half filled with clean water. Top up with water, close the top and shake gently to ensure good mixing.

Do not tank mix Samurai when using rotary atomiser sprayers.

d) Weed Wipers

For ropewick applicators use a concentration of 1 part Samurai to 2 parts of water and add a water-soluble dye if required. Care should be taken to avoid dripping onto wanted vegetation.

For new generation weed wipers, use 1 part Samurai to 10 or 20 parts of water or as directed by manufacturer's instructions. A list of machines is included in the Company Advisory section at the end of this label.

e) Spot Gun Applicators

Spot gun applicators are for the 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 spray solution for targeted dosages of:		
	3.0 l/ha	4.0 l/ha	5.0 l/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).

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 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. Until degraded, the active ingredient in Samurai, glyphosate, is practically immobile in soils and is, therefore, unlikely to contaminate groundwater.

To maximise the intrinsic safety of Samurai to operator, consumer and environment, the label recommendations and the DEFRA/HSC/NAW publication "Code of Practice for Using Plant Protection Products" of January 2006, 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.

### **Effects of weather**

See Directions for Use (Restrictions).

Samurai will remain efficacious at low but not freezing temperatures however the onset of symptoms will be delayed.

A covering of dew may reduce efficacy where run-off occurs. Reduced control is likely where weed growth is impaired by natural senescence, drought, high temperature, a covering of dust, flooding or severe/prolonged frost at, or immediately after application.

## 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

Logic Contact 2000  
Allman Ecowipe  
Rotowiper (UK) Ltd  
C-Dax™ Eliminator  
Weedswiper™

## Disposal

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

## Environmental Information Sheet

An Environmental Information Sheet for this product is available from the CPA's Voluntary Initiative website ([www.voluntaryinitiative.org.uk](http://www.voluntaryinitiative.org.uk))

## Trademark References

Samurai® is a registered trademark of Monsanto Technology LLC.  
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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 trademark registration.

# MATERIAL 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](http://www.monsanto-ag.co.uk) .