



Roundup ProBiactive 450

A foliar applied translocated herbicide for the control of emerged annual and perennial grass and broad-leaved weeds in industrial, amenity, aquatic and forestry situations.

Degraded by micro-organisms/microbes in the soil.

A soluble concentrate containing 450 g/l glyphosate, present as 550g/l (42.2% 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** 1 to 20 litres

MAPP Number 12778

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.*

BACK AND BASE LABEL

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National Chemical Emergency Centre: (01865) 407333**

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

To avoid risks to man 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 USE ONLY AS AN INDUSTRIAL/HORTICULTURAL/FORESTRY/AQUATIC HERBICIDE

Crops/situations:

Natural surfaces not intended to bear vegetation, permeable surfaces overlying soil,
hard surfaces;

Enclosed waters, land immediately adjacent to aquatic areas, open waters.

Amenity vegetation;

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

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

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.

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

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

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.

Recommendations apply to the use of this herbicide for the control of weeds growing in or by water and must be read in conjunction with the Official Code of Practice entitled "Guidelines for the Use of Herbicides on Weeds in or near Watercourses and Lakes" obtainable from Department of Environment and Rural Affairs (DEFRA publications tel: 08459 556000), Scottish Executive, Environment and Rural Affairs Department, Department of Agriculture and Rural Development for Northern Ireland and the National Assembly for Wales Agriculture Department.

The Water Act, 1989, The Water Resources Act 1991, the Control of Pollution Act 1974, The Northern Ireland Water Resources Act 1992 and the Control of Pollution and Local Government (Northern Ireland) Order 1978, may apply to the act of applying Roundup ProBiactive 450 for the control of weeds growing in or by reservoirs and water

courses, eg rivers, streams, ditches, drains and ponds/lakes discharging into such water courses.

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.

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 ROUNDUP PROBIACTIVE 450 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 Roundup ProBiactive 450 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 Roundup ProBiactive 450 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 Roundup ProBiactive 450.

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

Weeds controlled

Amenity, Forestry & Industrial

Roundup ProBiactive 450 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 Roundup ProBiactive 450 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.

BRACKEN should be treated after frond tips are unfurled, but pre-senescence. Roundup ProBiactive 450 will not give an acceptable level of control of Horsetails (*Equisetum arvense*) – repeat treatment will be necessary.

Aquatic

AQUATIC WEEDS should be treated when the weeds are actively growing with full emergence of green leaf, at flowering and before dieback. Best results are obtained from applications in the periods from mid-July to mid-August on Water-lily and mid-August to mid-September on reeds.

OTHER SPECIES - recommendations for specific areas of use are given in the Recommendation Tables, pages xx-xx. *printers note: please insert appropriate page numbers*

Following crops (Subsequent land use following application of Roundup ProBiactive 450)

Upon soil adsorption the herbicidal properties of Roundup ProBiactive 450 are lost permitting the drilling of crops 48 hrs after application.

Planting of trees, shrubs, etc. may take place 7 days after application. Grass may be sown 15 days after treatment

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

Crops/situations	Maximum individual dose
Natural surfaces not intended to bear vegetation, permeable surfaces overlaying soil, hard surfaces	4.0 litres per hectare
Enclosed waters, open waters, land immediately adjacent to aquatic area (see Other Specific Restrictions).	4.8 litres per hectare
Forest, Forest nursery: <ul style="list-style-type: none"> • Weed control • Stump application • Chemical thinning (by injection) 	8.0 litres per hectare 160 ml per litre of water (16% solution of product in water) 1.6 ml per 10 cm diameter (or less) of tree
Amenity vegetation	4.0 litres per hectare
All edible crops, all non-edible crops (destruction before sowing/planting).	4.0 litres per hectare

Other specific restrictions:

Users must consult the appropriate water regulatory body (Environment Agency/Scottish Environmental Protection Agency) before using the product near water and must obtain their agreement before using this product to control aquatic weeds. The maximum concentration of active substance in treated water should not exceed 0.04 ppm.

When applying through conventional 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 - 1:2.75 dilution with water
- (b) Other wipers - 1:1.5 dilution with water

For stump application, the maximum concentration must not exceed 160 ml of product per litre of water (i.e. a 16% solution).

READ ALL OTHER SAFETY PRECAUTIONS AND DIRECTIONS FOR USE BEFORE USE

AMENITY, INDUSTRIAL AND GENERAL WEED CONTROL**Exclusion Times**

People, pets and wildlife need not be kept out of treated areas. It is best not to walk in areas where the spray is still wet as transfer to other vegetation may lead to unwanted damage to other foliage. Once the spray is dry this cannot occur.

Area of Use

Roundup ProBiactive 450 is recommended for control of annual and perennial grasses and broad-leaved 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, and for total weed control on industrial sites. Roundup ProBiactive 450 may also be used as a directed spray in ornamental plantings.

Application Rate

1.2 to 4.0 litres/ha – refer to Recommendation Tables

Application Guidance

Use the following guidance when spraying Roundup ProBiactive 450 at a rate of 4 l/ha.

	Spraying with 4 l/ha Roundup ProBiactive 450		
HYDRAULIC SPRAYERS	Standard nozzles (200 l/ha)	Low volume nozzles (100 l/ha)	VLV nozzles (50 l/ha)
Boom sprayer	4 litres in 200 litres water covers 1 ha	4 litres in 100 litres water covers 1 ha	N/A
Knapsack sprayer *	200ml in 10 litres water covers 500 m ²	400 ml in 10 litres water covers 1000 m ²	800 ml in 10 litres water covers 2000 m ²
* Walking speed of 1m/second and 1m swath			

Roundup ProBiactive 450 can also be applied using conventional rotary atomisers, weed wipers and neat through specialised ULV applicators which have drift reducing systems. See 'Mixing and Spraying' section.

RECOMMENDATION TABLES

All edible crops, all non-edible crops (destruction before sowing/planting).

Area of Use	Target Weeds/Usage	Weed Infestation	Application Rate l/ha.	Water Volume	Application Guidance
All edible crops, all non-edible crops (destruction before sowing/planting).	Vegetation management	Annual weeds	1.2	Hydraulic sprayers 80-250 l/ha or hand-held equipment. See 'Mixing and Spraying'	Do not use under polythene or glass. Do not use in or alongside hedgerows
		Perennial grass weeds	3.2		
		Perennial broad-leaved weeds	4.0		

Amenity Vegetation

Area of Use	Target Weeds/Usage	Weed Infestation	Application Rate l/ha.	Water Volume	Application Guidance
Amenity vegetation	Vegetation management – ornamental areas	Annual weeds	1.2	Hydraulic sprayers 80-250 l/ha or hand-held equipment See 'Mixing and Spraying'	Do not use under polythene or glass.
		Perennial grass weeds	3.2		
		Perennial broad-leaved weeds	4.0		

Natural surfaces not intended to bear vegetation, permeable surfaces overlying soil, hard surfaces

Area of Use	Target Weeds/Usage	Weed Infestation	Application Rate l/ha.	Water Volume	Application Guidance
Natural surfaces not intended to bear vegetation, permeable surfaces overlying soil, hard surfaces	Vegetation management - including roadsides, paths, hard surfaces and along fences and walls	Annual weeds	1.2	Hydraulic sprayers 80-250 l/ha or hand-held equipment See 'Mixing and Spraying'	Do not use under polythene or glass.
		Perennial grass weeds	3.2		
		Perennial broad-leaved weeds	4.0		

Japanese Knotweed control

Japanese Knotweed is an invasive alien species reducing biodiversity in areas where it becomes established and propagating from tiny fragments of root, often spreading along watercourses. It is scheduled under the Wildlife and Countryside Act 1981 and all parts of the plant must be treated as Controlled Waste under the Environmental Protection Act 1990. Roundup Pro Biactive 450 can be used alone as part of an eradication programme or as part of an integrated programme in conjunction with soil disturbance or removal. Dormant rhizomes will not be controlled by Roundup Pro Biactive 450, but may be stimulated to grow by soil disturbance and then sprayed. It is particularly suitable for use near water. Sites must be monitored for at least three years and re-treated as necessary.

Area of Use	Target Weed	Method	Application Rate Water Volume	Application Guidance
Amenity vegetation; Forestry; Natural surfaces not intended to bear vegetation, permeable surfaces overlying soil, hard surfaces; Enclosed waters, open waters, land immediately adjacent to aquatic area	Japanese Knotweed	Foliar application	4l/ha Hydraulic sprayers 80-250 l/ha or hand-held equipment – See 'Mixing and Spraying'	For best results apply at flowering (usually August/September) but before dieback. Use specialist extending hand lances for stands 2-3m tall. Good coverage is essential, spray the underside as well as the upper surface of the leaves. Or As part of an integrated programme, spray when stems are 1-1.5m high (Usually at end of May) and repeat once re-growth reaches 1-1.5m again later in same season or the following year.
		Stem filling technique	8 ml of 20% solution per stem	Use where overall spraying is not desirable, especially near watercourses or among desirable plants. See National Trust Methodology for full details*. Timing: After mid August but before leaf fall . Stems must be >8mm diameter Cut stems approx. 200mm above base of cane & 40mm above node. Rupture the central stem tissue with a screwdriver and use a spot gun to insert Roundup Pro Biactive 450 into the hollow stem within 15 minutes of cutting.
		Hand-held weed wiper	1 part Roundup Pro Biactive 450 to 2.5 parts water	Use where overall spraying is not desirable or target plants are small or unsuitable for stem filling, (< 8mm) e.g. in re-treatment following foliar spraying.

*Download from <http://www.projects.ex.ac.uk/knotweed> or contact the Monsanto Technical Helpline 01223 849540

Forestry weed control

Roundup ProBiactive 450 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 Guidance
Forestry: - Pre-planting	Arable land, planting, replanting, & grassland areas	Arable weeds	3.2	Hydraulic sprayers 80-250 l/ha or hand-held equipment See 'Mixing and spraying.'	All tree species may be planted 7 days or more after treatment
		Grassland weeds	4.0		
Forestry: - Post-planting (directed) in conifers & broad-leaved trees	Clean-up around trees with hand-held applicators.	Annual/perennial grasses and broad-leaves	3.2	Hand-held equipment: Knapsack: Apply as a 1.6% concentration of Roundup ProBiactive 450 or Weed wiper mini: 1 part Roundup ProBiactive 450 to 2.75 parts water (See Mixing & Spraying Section) 250 l/ha	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-August, before leaf senescence (but after new growth of crop has hardened). Cut back Rhododendron and treat entire coppice when at least 1 metre in height. Spray to just before point of run-off.
		Woody weeds: Bracken/Beech Brush/Brambles Sycamore/Oak Hazel/Willow/Ash	2.4		
		Heather (peat soils)	3.2		
		Heather (mineral soils)	4.8		
		Rhododendron (*)	8.0 or 4.0% solution (8l in 250l of water)		
(*) For improved control of Rhododendron apply 6.4 l/ha of Roundup ProBiactive 450, adding Mixture B NF (ADJ AO570) at 2% of spray volume to. Application using the Weed wiper is not suitable.					

Area of Use	Target Weeds/Usage	Weed Infestation	Application Rate l/ha.	Water Volume	Application Guidance
Forestry: - Post-planting (overall dormant season in certain conifers – conifer release)	Grass weeds - Lowland areas - Upland areas	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)	1.2 1.6	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 Pines, 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.
	Bracken	All levels of all species	1.6		
	Beech & Birch	All levels of all species	1.6		
	Brambles	All levels of all species	2.4		

Area of Use	Target Weeds/Usage	Weed Infestation	Application Rate/ Water Volume l/ha.	Application Guidance
<p>Forestry: - Stump application for chemical thinning</p>	<p>Deciduous trees Coniferous trees</p>	<p>All species All species</p>	<p>8% solution of Roundup ProBiactive 450 in water 1.6% solution of Roundup ProBiactive 450 in water</p>	<p>Apply the solution to saturate the rim of the newly cut surface, with a suitable 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.</p>
<p>Forestry: - Chemical thinning by injection of tree stems</p>	<p>Coniferous and deciduous species</p>	<p>-</p>	<p>1.6 ml neat Roundup ProBiactive 450 per cut per 10 cm diameter (or less) tree</p>	<p>Use a hatchet to cut one notch in trees up to 10cm diameter and apply 1.6 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.</p>

Aquatic weed control. Roundup ProBiactive 450 herbicide controls emerged and floating aquatic weeds

AREA OF USE	TARGET WEEDS/ USAGE	WEED INFESTATION	APPLICATION RATE l/ha	WATER VOLUME	APPLICATION TIMING AND GUIDANCE
ENCLOSED WATERS, LAND IMMEDIATELY ADJACENT TO AQUATIC AREAS, OPEN WATERS	Emerged weeds: reeds, rushes, Sedges, grasses and Watercress	Dense infestations only	4.0	Hydraulic sprayers 200-400 l/ha (optimum 250 litres) or hand-held equipment See 'Mixing and Spraying.'	Users must consult the appropriate Environment Agency Regional Office or Scottish Environmental Protection Agency before applying Roundup ProBiactive 450 herbicide in reservoirs, water courses and waterways. Roundup ProBiactive 450 herbicide may be used for the control of aquatic weeds in the presence of fish if used in strict accordance with the recommendations in this section
	Floating weeds: -White Water-lily -Yellow Water-lily	Dense infestations only	4.8	Hydraulic sprayer 100-200 l/ha or hand-held equipment See 'Mixing and Spraying.'	On Water-lilies it is preferable to use a tractor or boat-mounted sprayer. During spraying, do not exceed a pressure of 2.0 Bars (30 p.s.i.). When using a tractor mounted sprayer, do not exceed 8 kph (5 mph). With a boat-mounted sprayer, use a slow forward speed to cause minimum disturbance to the floating leaves of the weeds. The use of a boat may result in some leaves being disturbed before Roundup ProBiactive 450 herbicide can be absorbed. Applications made in flowing water should be sprayed against the directions of the flow. When disturbed by wash, WATER-LILIES may require re-treatment.

Application Rates

Situation	Equipment*	Area Treated	Roundup ProBiactive 450	Water Volume
Emergent weeds e.g. reeds and grasses	Boom sprayer	1 hectare	4.0 litres/ha	200-400 litres (Optimum 250 litres)
	Knapsack sprayer**	100m ²	40ml/100m ²	2.0 litres
Floating weeds e.g. water-lilies	Boom sprayer	1 hectare	4.8 litres/ha	100-200 litres
	Knapsack sprayer**	100m ²	48ml/100m ²	2.0 litres

*Conventional rotary atomisers may also be used at water volumes of 10-40 l/ha. The droplet diameter must fall within the range 200-300µm. Roundup ProBiactive 450 may also be applied neat through specialised ULV applicators which have drift reducing systems

** Knapsack sprayer calibrated to 200 litres/ha.

Use boat-mounted sprayers at slowest practical speed. Always apply against direction of any current.

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	Lurmark AN 2.0, AN 4.0 Cooper Pegler Floodjet green, red
	Tractor	Lurmark 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 Lurmark AN 1.0
	Tractor	Lurmark Lo Drift

Filling the Sprayer

- Knapsack Half fill the spray tank with clean water, add the correct amount of Roundup ProBiactive 450 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 Roundup ProBiactive 450. Top up the tank with water to the required level. Use of a defoamer may be necessary.

b) Rotary Atomisers (hand held or tractor mounted) – for use in amenity, industrial and aquatic areas

When conventional rotary atomisers are used to apply Roundup ProBiactive 450 ensure that the droplet diameter falls within the range 200-300 microns for all uses.

Roundup ProBiactive 450 may be applied neat through specialised ULV applicators which have drift reducing systems or at a spray volume of 10-40 l/ha through conventional rotary atomisers.

c) Hand-held Wipers – for orchards, industrial and aquatic areas

Roundup ProBiactive 450 may be applied through the weed wiper mini. Use a concentration of 1 part Roundup ProBiactive 450 to 2.75 parts of water and add a scarlet dye if required. Care should be taken to avoid dripping onto wanted vegetation.

A suitable dye may be obtained from Certis, telephone (01980) 676500.

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 Roundup ProBiactive 450 to help identify treated stumps.

HAND-HELD EQUIPMENT: SPECIFIC GUIDANCE

e) Knapsack Sprayer Applicators – for use in forestry, industrial and aquatic areas.

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 3.2 l/ha of Roundup ProBiactive 450, therefore, use a 1.6% solution (e.g. 160 ml Roundup ProBiactive 450 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 3.2 l/ha Roundup ProBiactive 450 in this case, use a 3.2 % solution.

Filling the sprayer - hand-held machines

Stir the correct amount of Roundup ProBiactive 450 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 4 ml of spray to target weed, using a narrow cone TG-3 or TG-5 nozzle.

Spot Diameter (metres)	Amount of Roundup ProBiactive 450 (ml) per 5 litres of spray solution		
	2.4 l/ha	3.2 l/ha	4.0 l/ha
0.3	16	22.4	28
0.6	68	88	112

Compatibility

Roundup ProBiactive 450 is compatible with Mixture B NF (ADJ 0570). 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 NF TO EDIBLE CROPS, GRASSLAND OR AQUATIC WEEDS.

Do not tank-mix Roundup ProBiactive 450 when using rotary atomiser sprayers.

For hydraulic sprayers: maintain continuous agitation when using Roundup ProBiactive 450 in tank mixture.

For knapsack sprayers: mix thoroughly and use immediately when using Roundup ProBiactive 450 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

Roundup ProBiactive 450 is an advanced glyphosate formulation which, having no hazard classification, offers a high standard of operator safety. To maximise the intrinsic safety of Roundup ProBiactive 450 to operator, consumer and environment, the label recommendations and the DEFRA/HSC/NAWPCD publication "Code of Practice for Using Plant Protection Products" of January 2006, should be adhered to.

Roundup ProBiactive 450 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. Roundup ProBiactive 450 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 Roundup ProBiactive 450 are lost, permitting drilling of crops within 48 hours of application. When used as directed, any water subjected to Roundup ProBiactive 450 spray drift may be used immediately for irrigation purposes. Until degraded, the active ingredient in Roundup ProBiactive 450, glyphosate, is practically immobile in soils and is, therefore, unlikely to contaminate groundwater.

Roundup ProBiactive 450 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, for total weed control on industrial sites and for aquatic weed control. Roundup ProBiactive 450 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.

For aquatic weed control, on reeds and grasses leaf symptoms usually appear within 14-21 days of spraying in the early autumn. Complete foliage desiccation usually occurs 30-40 days after spraying. At this stage, the reeds can be cut and removed. During cold conditions leaf symptoms may not appear before natural dieback but no growth will occur in the season following spraying.

Weed resistance strategy

There is low risk for the development of weed resistance to Roundup ProBiactive 450.

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 when using those herbicides. 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: 01223 849540)

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 Roundup ProBiactive 450 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 the DEFRA/HSC/NAWPCD publication "Code of Practice for Using Plant Protection Products", 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)

Trade Mark References

Roundup® is a registered trade mark of Monsanto Technology LLC.

Biactive® is a registered trade mark of Monsanto Technology LLC.

Monsanto™ and the vine symbol are registered trade marks of Monsanto Technology LLC.

All other brand names referred to are trade marks 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 current Material Safety Data Sheet is available on request (telephone Monsanto Technical Helpline 01223 849540) or can be downloaded from the Monsanto website: www.monsanto-ag.co.uk