

Ref: JK23-9221-240215-JEH



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Offices in London, Manchester and Glasgow

Thursday 15th February 2024.

To whom it may concern,

RE: Montbretia (and Cotoneaster) - Land at Maple Close, Heaviley, Stockport, SK2 6HJ

Japanese Knotweed Solutions Limited (JKSL) were instructed by Jafar Abbasi (client) to undertake an inspection at the proposed development site known as land at Maple Close, Heaviley, Stockport, SK2 6HJ, to determine the extents of Cotoneaster sp and Montbretia which have previously been recorded by the client's ecologist in August 2021.

JKSL are an experienced and qualified contractor/consultant who are full members of both UK trade bodies (PCA and INNSA) for consultants/contractors who specifically specialise in dealing with Japanese knotweed and other invasive non-native plant species.

The inspection was carried out by Jonathan Harris (of JKSL) on 18th October 2023. Jonathan is a certified surveyor in Japanese knotweed (CSJK qualified) and has nearly 10 years of experience in dealing with invasive plant species.

During the inspection, an isolated area containing Montbretia (the surface growth was starting to die back due to the time of the year) was recorded adjacent to the south-western boundary of the site, denoted as MT1 on enclosed drawing JK23-9221-01. Due to the close proximity to the site boundary, there is a risk of the Montbretia spreading onto neighbouring land (via rhizome and/or seeds), although there was no visual evidence of associated surface growth on neighbouring land during the inspection (by peering over the boundary fence).



Montbretia area MT1

During JKSL's inspection there was no evidence of Cotoneaster sp surface growth on site. The suspected plant (which was identified as Cotoneaster sp within the client's ecology report) is a honeysuckle plant (likely to be Wilson's honeysuckle or box leaf honeysuckle).



Area as mentioned in client's ecology report as containing Cotoneaster – no evidence of plant being present.



Leaves of suspected plant which is a honeysuckle plant (and demonstrating not Cotoneaster)

To reduce the viability and control the spread of the area of the Montbretia, a 3 year monitoring and treatment programme will be implemented. This is based on the understanding that no future plans (such as landscaping plans, re-development plans) will be undertaken within the area of infestation (includes surrounding 2-3m buffer zone); should this not be the case, it is important that JKSL are provided with up-to-date information about site plans, including accurate site drawings and details of any additional planned works, particularly in any contaminated area – alternative/additional recommendations may then be advised accordingly.

As part of the programme, the Montbretia surface growth will be chemically treated in-situ with an appropriate herbicide. A Glyphosate based herbicide will be applied via a traditional knapsack sprayer. Glyphosate is a broad spectrum and non-selective herbicide, so can potentially kill surrounding vegetation (such as grass species, broad-leaved species, evergreen), should it come into these non-target plants as well. JKSL site operatives will do their utmost to prevent chemical drift from occurring (such as treating the Montbretia within acceptable weather conditions, using the correct spray nozzle), to minimise the risk of surrounding non-target vegetation being affected.

The programme will comprise of 6 monitoring/treatment visits over a 3 year period, as follows (precise dates of visits may vary depending on variables such as weather conditions, growth patterns) –

May-June 2024
July-August 2024
May-June 2025
July-August 2025
May-June 2026
July-August 2026

Upon completion of the 3 year period, the situation will be re-assessed to determine whether additional monitoring/treatment is required. Ideally the treatment area should then be inspected annually in June-August until 3 seasons pass with no re-growth.

We would recommend that the treatment area is not disturbed (includes a circa 2m buffer area around the Montbretia surface growth), to ensure the programme is as effective as possible and to minimise the

risk of propagules (i.e. a vegetative structure that can become detached from the main plant and give rise to a new plant) being spread around site (and off-site).

To ensure the programme is as effective as possible, we would recommend that the area on immediate neighbouring land adjacent to the recorded Montbretia is also monitored during the programme. It is JKSL's understanding that the client will discuss this and obtain permission from the adjacent landowner to facilitate this.

Also enclosed are the Safety Data Sheet and a Product Information Guide brochure for the Glyphosate-based herbicide (Roundup Pro Vantage) that will be used to treat the Japanese Knotweed, for your perusal. The Safety Data Sheet is quite technical, however the Product Information Guide is easier to read. As outlined within herbicide will start to break down and lose activity within a few days from application, and is not known to be toxic / has very low toxicity to humans and animals.

Should you have any queries or require any further information please do not hesitate to get in touch.


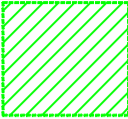
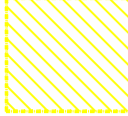
Yours faithfully,

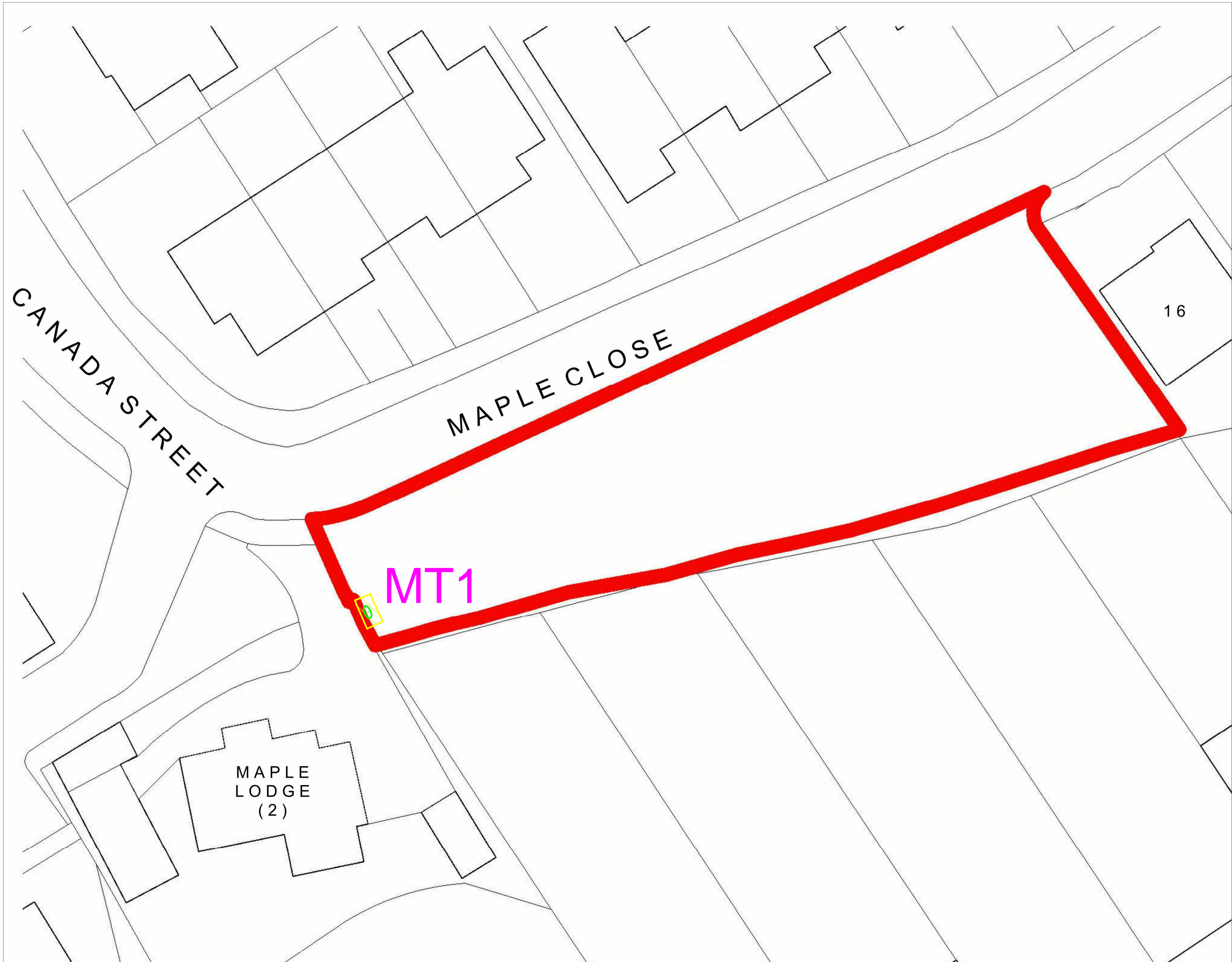


Jonathan Harris
Survey Director
ON BEHALF OF JAPANESE KNOTWEED SOLUTIONS LTD

Encl. Drawing JK23-9221-01
Safety Data Sheet
Product Information Guide

Disclaimer:
Survey based on visual inspection of surface growth. JKSL hold no liability for areas not identified in initial investigation works.
Continued monitoring of site is recommended.

-  approximate extents of boundary
-  Area of montbretia (mt1)
-  anticipated extents of excavation



Rev	Description	Date	By	CHK
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Client
Jafar Abbasi

Contract
Land at Maple Close, Stockport, SK2 6HJ

Drawing
Montbretia - anticipated extents of excavation



Drawing No. JK23-9221-01 Revision /
Scales NTS Date 30-10-2023
Drawn JEH Checked AD

<p style="text-align: center;">MONSANTO Europe N.V. Safety Data Sheet Commercial Product</p>

1. PRODUCT AND COMPANY IDENTIFICATION

1.1. Product identifier

Roundup® ProVantage

- 1.1.1. **Chemical name**
Not applicable for a mixture.
- 1.1.2. **Synonyms**
None.
- 1.1.3. **CLP Annex VI Index No.**
Not applicable.
- 1.1.4. **C&L ID No.**
Not available.
- 1.1.5. **EC No.**
Not applicable for a mixture.
- 1.1.6. **REACH Reg. No.**
Not applicable for a mixture.
- 1.1.7. **CAS No.**
Not applicable for a mixture.

1.2. Product use

Herbicide

1.3. Company/(Sales office)

MONSANTO Europe N.V.
Haven 627, Scheldelaan 460, B-2040
Antwerp, Belgium
Telephone: +32 (0)3 568 51 11
Fax: +32 (0)3 568 50 90
E-mail:
safety.datasheet@monsanto.com

1.4. Emergency numbers

Telephone: Belgium +32 (0)3 568 51 23

2. HAZARDS IDENTIFICATION

2.1. Classification

2.1.1. Classification according to Regulation (EC) No. 1272/2008 [CLP] (manufacturer self-classification)

Not classified as dangerous.

2.1.2. National classification - U.K.

Not classified as dangerous.

EU label (manufacturer self-classification) - Classification/Labeling following the EU Dangerous Preparations' Directive 1999/45/EC.

Not classified as dangerous.

S29

Do NOT empty into drains.

S49

Keep only in the original container.

National classification/labeling - U.K.

R53

May cause long-term adverse effects in the aquatic environment.

S35

This material and its container must be disposed of in a safe way.

S57

Use appropriate containment to avoid environmental contamination.

2.2. Label elements

- Labelling according to Regulation (EC) No. 1272/2008 [CLP]
- 2.2.1. Precautionary statement/statements**
P234 Keep only in original container
- 2.2.2. Supplemental hazard information**
EUH401 To avoid risks to human health and the environment, comply with the instructions for use.
- 2.2.3. Precautionary statement/statements U.K.**
P234 Keep only in original container
- 2.3. Other hazards**
0% of the mixture consists of ingredient/ingredients of unknown acute toxicity.
0% of the mixture consists of ingredient/ingredients of unknown hazards to the aquatic environment.
- 2.3.1. Potential environmental effects**
Not expected to produce significant adverse effects when recommended use instructions are followed.
Not a persistent, bioaccumulative or toxic (PBT) nor a very persistent, very bioaccumulative (vPvB) mixture.
- 2.4. Appearance and odour (colour/form/odour):**
Brown /Liquid / Amino odour

Refer to section 11 for toxicological and section 12 for environmental information.

3. COMPOSITION/INFORMATION ON INGREDIENTS

Active ingredient

Potassium salt of N-(phosphonomethyl)glycine; {Potassium salt of glyphosate }

Composition

Components	CAS No.	EC No.	EU Index No. / REACH Reg. No. / C&L ID No.	% by weight (approximate)	Classification
Potassium salt of glyphosate	70901-12-1	933-437-9	015-184-00-8 / - / 02-2119694167-27- 0000	44	Aquatic Chronic - Category 2; H411; { c } N; R51/53; { b }
Alkylpolyglycoside	68515-73-1	500-220-1	- / 01-2119488530-36 / -	<20	Eye damage - Category 1; H318; { d } Xi; R41; { a }
Nitrotyl	226563-63-9		- / - / -	<3	Acute toxicity - Category 4, Skin irritation - Category 2, Eye damage - Category 1, Aquatic Acute - Category 1, Aquatic Chronic - Category 1; H302+332, 315, 318, 410Xn, Xi, N; R22, 38, 41, 50/53; { c }
Water and minor formulating ingredients			- / - / -	>33	

Full text of classification code: See section 16.

4. FIRST AID MEASURES

Use personal protection recommended in section 8.

4.1. Description of first aid measures

4.1.1. Eye contact

Immediately flush with plenty of water. If easy to do, remove contact lenses. If there are persistent symptoms, obtain medical advice.

4.1.2. Skin contact

Take off contaminated clothing, wristwatch, jewellery. Wash affected skin with plenty of water. Wash clothes and clean shoes before re-use.

- 4.1.3. Inhalation**
Remove to fresh air.
- 4.1.4. Ingestion**
Immediately offer water to drink. Do NOT induce vomiting unless directed by medical personnel. If symptoms occur, get medical attention.
- 4.2. Most important symptoms and effects, both acute and delayed**
- 4.2.1. Potential health effects**
- Likely routes of exposure:** Skin contact, eye contact
- Eye contact, short term:** Not expected to produce significant adverse effects when recommended use instructions are followed.
- Skin contact, short term:** Not expected to produce significant adverse effects when recommended use instructions are followed.
- Inhalation, short term:** Not expected to produce significant adverse effects when recommended use instructions are followed.
- 4.3. Indication of any immediate medical attention and special treatment needed**
- 4.3.1. Advice to doctors**
This product is not an inhibitor of cholinesterase.
- 4.3.2. Antidote**
Treatment with atropine and oximes is not indicated.
-

5. FIRE-FIGHTING MEASURES

- 5.1. Extinguishing media**
- 5.1.1.** Recommended: Water, foam, dry chemical, carbon dioxide (CO₂)
- 5.2. Special hazards**
- 5.2.1. Unusual fire and explosion hazards**
Minimise use of water to prevent environmental contamination.
Environmental precautions: see section 6.
- 5.2.2. Hazardous products of combustion**
Carbon monoxide (CO), phosphorus oxides (P_xO_y), nitrogen oxides (NO_x)
- 5.3. Fire fighting equipment**
Self-contained breathing apparatus. Equipment should be thoroughly decontaminated after use.
- 5.4. Flash point**
Does not flash.
-

6. ACCIDENTAL RELEASE MEASURES

Use handling recommendations in Section 7 and personal protection recommendations in Section 8.

- 6.1. Personal precautions**
Use personal protection recommended in section 8.
- 6.2. Environmental precautions**
SMALL QUANTITIES: Low environmental hazard. LARGE QUANTITIES: Minimise spread.
Keep out of drains, sewers, ditches and water ways. Notify authorities.
- 6.3. Methods for cleaning up**
SMALL QUANTITIES: Flush spill area with water. LARGE QUANTITIES: Absorb in earth, sand or absorbent material. Dig up heavily contaminated soil. Collect in containers for disposal. Refer to section 7 for types of containers. Flush residues with small quantities of water. Minimise use of water to prevent environmental contamination.

Refer to section 13 for disposal of spilled material.

7. HANDLING AND STORAGE

Good industrial practice in housekeeping and personal hygiene should be followed.

7.1. Precautions for safe handling

- Avoid contact with eyes.
- When using do not eat, drink or smoke.
- Wash hands thoroughly after handling or contact.
- Do not contaminate drains, sewers and water ways when disposing of equipment rinse water.
- Emptied containers retain vapour and product residue.
- Observe all labeled safeguards until container is cleaned, reconditioned or destroyed.

7.2. Conditions for safe storage

- Minimum storage temperature: -15 °C
- Maximum storage temperature: 50 °C
- Compatible materials for storage: stainless steel, fibreglass, plastic, glass lining
- Keep out of reach of children.
- Keep away from food, drink and animal feed.
- Keep only in the original container.
- Partial crystallization may occur on prolonged storage below the minimum storage temperature.
- If frozen, place in warm room and shake frequently to put back into solution.

8. EXPOSURE CONTROLS/PERSONAL PROTECTION

8.1. Airborne exposure limits

Components	Exposure Guidelines
Potassium salt of glyphosate	No specific occupational exposure limit has been established.
Alkylpolyglycoside	No specific occupational exposure limit has been established.
Nitroaryl	No specific occupational exposure limit has been established.
Water and minor formulating ingredients	No specific occupational exposure limit has been established.

8.2. Engineering controls

No special requirement when used as recommended.

8.3. Recommendations for personal protective equipment

8.3.1. Eye protection:

If there is significant potential for contact: Wear chemical goggles.

8.3.2. Skin protection:

If repeated or prolonged contact:
Wear chemical resistant gloves.
Chemical resistant gloves include those made of waterproof materials such as nitrile, butyl, neoprene, polyvinyl chloride (PVC), natural rubber and/or barrier laminate.

8.3.3. Respiratory protection:

No special requirement when used as recommended.

When recommended, consult manufacturer of personal protective equipment for the appropriate type of equipment for a given application.

9. PHYSICAL AND CHEMICAL PROPERTIES

These physical data are typical values based on material tested but may vary from sample to sample. Typical values should not be construed as a guaranteed analysis of any specific lot or as specifications for the product.

Colour/colour range:	Brown
Odour:	Amino odour
Form:	Liquid
Physical form changes (melting, boiling, etc.):	
Melting point:	Not applicable.
Boiling point:	No data.
Flash point:	Does not flash.
Explosive properties:	No explosive properties
Auto ignition temperature:	> 600 °C
Self-accelerating decomposition temperature (SADT):	No data.
Oxidizing properties:	No data.
Specific gravity:	1,3426 @ 20 °C / 4 °C
Vapour pressure:	No significant volatility; aqueous solution.
Vapour density:	Not applicable.
Evaporation rate:	No data.
Dynamic viscosity:	107,2 mPa·s @ 20 °C
Kinematic viscosity:	79,83 cSt @ 20 °C
Density:	1,3426 g/cm ³ @ 20 °C
Solubility:	Completely miscible.
pH:	4,3 @ 10 g/l
Partition coefficient:	log Pow: -3,2 @ 25 °C (glyphosate)

10. STABILITY AND REACTIVITY

10.1. Reactivity

Reacts with galvanised steel or unlined mild steel to produce hydrogen, a highly flammable gas that could explode.

10.2. Stability

Stable under normal conditions of handling and storage.

10.3. Possibility of hazardous reactions

Reacts with galvanised steel or unlined mild steel to produce hydrogen, a highly flammable gas that could explode.

10.4. Incompatible materials

Incompatible materials for storage: galvanised steel, unlined mild steel
Compatible materials for storage: see section 7.2.

10.5. Hazardous decomposition

Thermal decomposition: Hazardous products of combustion: see section 5.

11. TOXICOLOGICAL INFORMATION

This section is intended for use by toxicologists and other health professionals.

Likely routes of exposure: Skin contact, eye contact

Data obtained on product and components are summarized below.

Acute oral toxicity

Rat, LD50: > 2.000 mg/kg body weight
No mortality.

Acute dermal toxicity

Rat, LD50: > 2.000 mg/kg body weight
No mortality.

Skin irritation

Rabbit, 3 animals, OECD 404 test:

Redness, individual EU scores: 0,3; 0,0; 0,0
Swelling, individual EU scores: 0,0; 0,0; 0,0
Days to heal: 5

Eye irritation

Rabbit, 3 animals, OECD 405 test:

Conjunctival redness, individual EU scores: 0,7; 1,0; 0,7
Conjunctival swelling, individual EU scores: 1,0; 1,0; 0,7
Corneal opacity, individual EU scores: 0,0; 0,0; 0,0
Iris lesions, individual EU scores: 0,0; 0,0; 0,0
Days to heal: 3
Slightly irritating to eyes but not sufficient for classification.

Skin sensitization

Guinea pig, 9-induction Buehler test:

Negative.
No skin sensitization

N-(phosphonomethyl)glycine; { glyphosate }

Mutagenicity

Not mutagenic.

Repeated dose toxicity

Rabbit, dermal, 21 days:

NOAEL toxicity: > 5.000 mg/kg body weight/day
Target organs/systems: none
Other effects: none

Rat, oral, 3 months:

NOAEL toxicity: > 20.000 mg/kg diet
Target organs/systems: none
Other effects: none

Chronic effects/carcinogenicity

Rat, oral, 24 months:

NOAEL toxicity: ~ 8.000 mg/kg diet
Target organs/systems: eyes
Other effects: decrease of body weight gain, histopathologic effects
NOEL tumour: > 20.000 ppm
Tumours: none

Toxicity to reproduction/fertility

Rat, oral, 2 generations:

NOAEL toxicity: 10.000 ppm
NOAEL reproduction: > 30.000 mg/kg diet
Target organs/systems in parents: none
Other effects in parents: decrease of body weight gain
Target organs/systems in pups: none
Other effects in pups: decrease of body weight gain
Effects on offspring only observed with maternal toxicity.

Developmental toxicity/teratogenicity

Rat, oral, 6 - 19 days of gestation:

NOAEL toxicity: 1.000 mg/kg body weight
NOAEL development: 1.000 mg/kg body weight
Other effects in mother animal: decrease of body weight gain, decrease of survival
Developmental effects: weight loss, post-implantation loss, delayed ossification
Effects on offspring only observed with maternal toxicity.

Rabbit, oral, 6 - 27 days of gestation:

NOAEL toxicity: 175 mg/kg body weight
NOAEL development: 175 mg/kg body weight
Target organs/systems in mother animal: none
Other effects in mother animal: decrease of survival
Developmental effects: none

12. ECOLOGICAL INFORMATION

This section is intended for use by ecotoxicologists and other environmental specialists.

Aquatic toxicity, algae/aquatic plants

Green algae (*Selenastrum capricornutum*):

Acute toxicity, 72 hours, static, ErC50 (growth rate): 118 mg/L

Duckweed (*Lemna gibba*):

Acute toxicity, 7 days, static, ErC50 (frond number): 26,8 mg/L

Duckweed (*Lemna gibba*):

Acute toxicity, 7 days, static, NOEC (growth rate): 6,9 mg/L

Arthropod toxicity

Honey bee (*Apis mellifera*):

Contact, 48 hours, LD50: > 279 µg/bee

Honey bee (*Apis mellifera*):

Oral, 48 hours, LD50: > 282 µg/bee

Soil organism toxicity, invertebrates

Earthworm (*Eisenia foetida*):

Acute toxicity, 14 days, LC50: > 10.000 mg/kg dry soil

Soil organism toxicity, microorganisms

Nitrogen and carbon transformation test:

27 L/ha, 28 days: Less than 25% effect on nitrogen or carbon transformation processes in soil.

Similar formulation

Aquatic toxicity, fish

Rainbow trout (*Oncorhynchus mykiss*):

Acute toxicity, 96 hours, static, LC50: > 1.039 mg/L

Aquatic toxicity, invertebrates

Water flea (*Daphnia magna*):

Acute toxicity, 48 hours, static, EC50: 243 mg/L

N-(phosphonomethyl)glycine; { glyphosate }

Avian toxicity

Bobwhite quail (*Colinus virginianus*):

Dietary toxicity, 5 days, LC50: > 4.640 mg/kg diet

Mallard duck (*Anas platyrhynchos*):

Dietary toxicity, 5 days, LC50: > 4.640 mg/kg diet

Bobwhite quail (*Colinus virginianus*):

Acute oral toxicity, single dose, LD50: > 3.851 mg/kg body weight

Bioaccumulation

Bluegill sunfish (*Lepomis macrochirus*):

Whole fish: BCF: < 1

No significant bioaccumulation is expected.

Dissipation

Soil, field:

Half life: 2 - 174 days

Koc: 884 - 60.000 L/kg

Adsorbs strongly to soil.

Water, aerobic:

Half life: < 7 days

13. DISPOSAL CONSIDERATIONS

13.1. Waste treatment methods

13.1.1. Product

Keep out of drains, sewers, ditches and water ways. Follow all local/regional/national/international regulations on waste disposal. Follow current edition of the General Waste, Landfill, and Burning of Hazardous Waste Directives; the EU List of Waste; and the Shipment of Waste Regulation. Disposal in a waste incinerator with energy recovery is recommended. According to the manufacturer self-classification, following the EU Dangerous

Preparations' Directive 1999/45/EC, the product can be disposed as a non-hazardous industrial waste. According to the manufacturer self-classification, following Regulation (EC) No. 1272/2008 [CLP], the product can be disposed as a non-hazardous industrial waste.

13.1.2. Container

Follow all local/regional/national/international regulations on waste disposal, packaging waste collection/disposal. Follow current edition of the General Waste, Landfill, and Burning of Hazardous Waste Directives; the EU List of Waste; and the Shipment of Waste Regulation. Do NOT re-use containers. Triple or pressure rinse empty containers. Pour rinse water into spray tank. Properly rinsed container can be disposed as a non hazardous industrial waste. Store for collection by approved waste disposal service. Recycle if appropriate facilities/equipment available. Recycle the non-hazardous container only when a proper control on the end use of the recycled plastic is possible. Suitable for industrial grade recycling only. Do NOT recycle plastic that could end in any human or food contact application. This package meets the requirements for energy recovery. Disposal in a incinerator with energy recovery is recommended.

Use handling recommendations in Section 7 and personal protection recommendations in Section 8.

14. TRANSPORT INFORMATION

The data provided in this section is for information only. Please apply the appropriate regulations to properly classify your shipment for transportation.

Not regulated for transport under ADR/RID, IMO, or IATA/ICAO Regulations

15. REGULATORY INFORMATION

15.1. Other Regulatory Information

SP1 Do not contaminate water with the product or its container.

15.2. Chemical Safety Assessment

A Chemical Safety Assessment per Regulation (EC) No. 1907/2006 is not required and has not been performed.

A Risk Assessment has been performed under Directive 91/414/EC.

16. OTHER INFORMATION

The information given here is not necessarily exhaustive but is representative of relevant, reliable data.

Follow all local/regional/national/international regulations.

Please consult supplier if further information is needed.

In this document the British spelling was applied.

This Safety Data Sheet has been prepared following the Regulation (EC) No. 1907/2006 (Annex II) as last amended by Regulation (EC) No. 453/2010

Data provided in this Safety Data Sheet are for the product as supplied unless otherwise indicated.

Classification of components

Components	Classification
Potassium salt of glyphosate	Aquatic Chronic - Category 2 H411 Toxic to aquatic life with long lasting effects. N - Dangerous for the environment R51/53 Toxic to aquatic organisms, may cause long-term adverse effects in the aquatic environment.
Alkylpolyglycoside	Eye damage - Category 1 H318 Causes serious eye damage. Xi - Irritant R41 Risk of serious damage to eyes.
Nitrotyl	Acute toxicity - Category 4 Skin irritation - Category 2 Eye damage - Category 1 Aquatic Acute - Category 1 Aquatic Chronic - Category 1 H302+332 Harmful if swallowed or if inhaled

	<p>H315 Causes skin irritation. H318 Causes serious eye damage. H410 Very toxic to aquatic life with long lasting effects. Xn - Harmful Xi - Irritant N - Dangerous for the environment R22 Harmful if swallowed. R38 Irritating to skin. R41 Risk of serious damage to eyes. R50/53 Very toxic to aquatic organisms, may cause long-term adverse effects in the aquatic environment.</p>
Water and minor formulating ingredients	

Endnotes:

- { a } EU label (manufacturer self-classification)
- { b } EU label (Annex I)
- { c } EU CLP classification (Annex VI)
- { d } EU CLP (manufacturer self-classification)

Full denomination of most frequently used acronyms. BCF (Bioconcentration Factor), BOD (Biochemical Oxygen Demand), COD (Chemical Oxygen Demand), EC50 (50% effect concentration), ED50 (50% effect dose), I.M. (intramuscular), I.P. (intraperitoneal), I.V. (intravenous), Koc (Soil adsorption coefficient), LC50 (50% lethality concentration), LD50 (50% lethality dose), LDLo (Lower limit of lethal dosage), LEL (Lower Explosion Limit), LOAEC (Lowest Observed Adverse Effect Concentration), LOAEL (Lowest Observed Adverse Effect Level), LOEC (Lowest Observed Effect Concentration), LOEL (Lowest Observed Effect Level), MEL (Maximum Exposure limit), MTD (Maximum Tolerated Dose), NOAEC (No Observed Adverse Effect Concentration), NOAEL (No Observed Adverse Effect Level), NOEC (No Observed Effect Concentration), NOEL (No Observed Effect Level), OEL (Occupational Exposure Limit), PEL (Permissible Exposure Limit), PII (Primary Irritation Index), Pow (Partition coefficient n-octanol/water), S.C. (subcutaneous), STEL (Short-Term Exposure Limit), TLV-C (Threshold Limit Value-Ceiling), TLV-TWA (Threshold Limit Value - Time Weighted Average), UEL (Upper Explosion Limit)

Although the information and recommendations set forth herein (hereinafter "Information") are presented in good faith and believed to be correct as of the date hereof, MONSANTO Company or any of its subsidiaries makes no representations as to the completeness or accuracy thereof. Information is supplied upon the condition that the persons receiving same will make their own determination as to its suitability for the purposes prior to use. In no event will MONSANTO Company or any of its subsidiaries be responsible for damages of any nature whatsoever resulting from the use of or reliance upon information. NO REPRESENTATIONS OR WARRANTIES, EITHER EXPRESS OR IMPLIED, OF MERCHANTABILITY, FITNESS FOR A PARTICULAR PURPOSE OR OF ANY OTHER NATURE ARE MADE HEREUNDER WITH RESPECT TO INFORMATION OR TO THE PRODUCT TO WHICH INFORMATION REFERS.

Safety Data Sheet (SDS) Annex

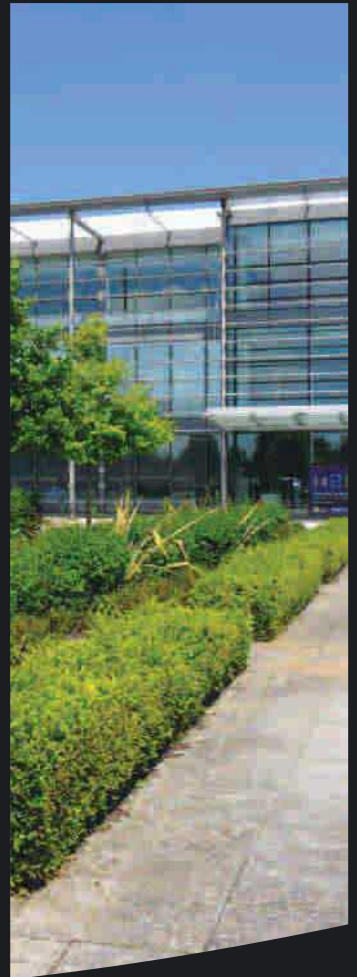
Chemical Safety Report:

Read and follow label instructions.



Roundup[®]
Pro Vantage

Product information guide



Contents



Monsanto UK Ltd.
PO Box 663,
Cambridge CB1 0LD.
Technical Helpline: 01954 717575
e-mail: technical.helpline.uk@monsanto.com
Web: www.monsanto-ag.co.uk

Roundup is a registered trademark of Monsanto Technology LLC.
Mixture B NF is a trademark of Amega Sciences, all other Brand names used are
trademarks of other manufacturers in which proprietary rights may apply.
Roundup ProVantage contains glyphosate.

USE HERBICIDES SAFELY. ALWAYS READ THE LABEL AND
PRODUCT INFORMATION BEFORE USE.

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3	ROUNDUP PRODUCT STEWARDSHIP
4	NEW AND IMPROVED STANDARDS
5	HOW ROUNDUP PROVANTAGE WORKS
6	PLANNING A WEED CONTROL PROGRAMME FOR WEED-FREE AREAS
7	WEED CONTROL IN AMENITY VEGETATION
8	WEED CONTROL IN PLANT FREE AREAS
9	RULES FOR NON-POROUS HARD SURFACES
10	WEED CONTROL FOR TREES AND FORESTS
11	POST PLANTING, WEEDS AROUND YOUNG TREES
12	SPECIAL TECHNIQUES FOR WOODLAND MANAGEMENT
13	WOODLAND MANAGEMENT-RHODEDENDRON CONTROL
14	TREATMENTS IN SPECIFIED CONIFERS/ORCHARDS
15	SPECIAL TECHNIQUES FOR GRASSLAND USE
16	AQUATIC WEED CONTROL WITH ROUNDUP PROVANTAGE
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Roundup Product Stewardship

Product stewardship encompasses a range of activities from the responsible development of new formulations right through to supporting their usage, their users, their suppliers and others as may be required. This support doesn't stop after a product is introduced but continues throughout its life cycle. Just a few of the ways we support Roundup are shown here.

Best Practice

The increasing pressures on active ingredients mean best practice use is essential for sustainability. Equally, best practice is essential for legislative compliance and to ensure maximum value from the product through correct use. We are committed to providing advice on Roundup best practices e.g.

- n Providing up to date, accurate information regarding both glyphosate and Roundup products
- n Providing best practice advice on specific areas of concern, such as:
 - l Minimising glyphosate levels in water
 - l Minimising risk of glyphosate resistance development via correct dose rates and timing
- n Working with Roundup users, suppliers and others to ensure sharing of knowledge on Roundup and best practice through the whole of the product life cycle
- n Availability of a technical helpline for immediate advice and assistance for both Roundup users (pre and post purchase) and their advisors
- n Online support providing general and seasonal advice, product labels, safety data sheets, and Environmental Impact Assessment forms
- n Prompt communication of any new legislation and how it may relate to Roundup use



Roundup Manufacturing Quality

Roundup has been produced at the European plant since 1974. Product quality and consistency has always been at the forefront for Roundup manufacturing. Over this 40 year period many production improvements have been made, and regular monitoring has been paramount in ensuring a reliable product both in terms of its glyphosate loading and surfactant content.

Roundup Product Development

Over 40 years of investment in Roundup formulation innovation has ensured the delivery of a product that continually responds to the increasing challenges faced by modern amenity professionals.

The Roundup ProVantage formulation recognises the need for a high level and consistent product performance whilst meeting the increasing demands of environmental stewardship and the practical use of glyphosate in modern amenity situations. The optimised blend of surfactants as well as the high loading makes Roundup ProVantage our most advanced amenity glyphosate on the market.



Roundup ProVantage Sets New and Improved Standards



High load

- n Supports the environmental need to reduce packaging waste
- n Less product to transport



Superior performance in challenging conditions

- n Improved reliability in hot and dry or cool and dry conditions*
- n Helps make the most of weather windows



Clean label

- n Non hazardous as classified by COSHH
- n Does not carry a hazard symbol for transport and storage
- n Approved for use in aquatic areas



Low drift formulation**

- n Reduces the risk of bystander exposure
- n Reduces the risk of damage to neighbouring plantings
- n Reduces the risk of direct contamination of surface water



Improved rainfastness and speed of uptake

- n Rainfast in 1 hour for annuals and 4 hours for perennials
- n Reduces risk of run off
- n Ensures a maximum amount of glyphosate reaches the roots



Improved hard water efficacy

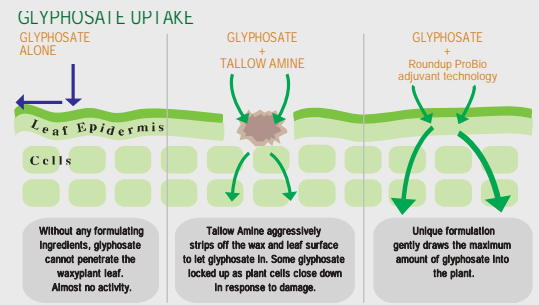
- n No need for additional water conditioners
- n Cost efficient

*Monsanto trials. St. Louis 2011

**NIABTAG Spray Applications Unit, Silsoe 2010

How Roundup ProVantage Works

For any herbicide to function it must first break through the waxy surface of the leaf and enter the plant cells. This is achieved by developing a formulation containing surfactant which breaks down the waxy cuticle. Differences in glyphosate formulations are brought about by the different surfactants they contain. Original glyphosate formulations used Tallow Amine but this has been superseded in both efficacy and safety by the unique surfactants used in Roundup ProVantage.



Optimising results from Roundup ProVantage

Always using the correct dose rates, timings and application methods according to the relevant sections in this guide will ensure the best results, however there are a number of other factors which can affect the performance of Roundup ProVantage:

Relative humidity, dew, fog, rainfall

High humidity leads to good control provided run-off is minimal. So spray in the morning on dew or in fog as long as it dries out during the day. Avoid spraying in the evening as the risk of run-off and night rainfall is higher.

Rainfall challenges performance most when the performance is restricted by other factors.

Light

Best results come from morning-lunchtime application because of the long light period before dark to move the herbicide throughout the plant. Anything which cuts out light will prevent the movement of the herbicide to the growing points and give poorer results. This includes burying, cultivation, application of lime or manure to treated plants within 5 days of spraying.

Stress

Target weeds can suffer stress from hot weather, freezing, die-back, water-logging or disease. Stress causes reduced metabolism and leads to reduction in transport to the growing points and inferior results.

Areas in close proximity to traffic can have particular problems in prolonged dry spells. Plants lay down thicker waxy cuticles to reduce moisture loss from the drought, plus debris and dust builds up on the leaf surface, physically preventing efficient uptake.

Temperature

Moderate temperatures favour efficacy, 15-25°C, though low temperatures will still give good results but slowly. Hard or long-term frosts, (when the plants go floppy and the metabolism shuts down), or high temperatures causing scorch or stress will lead to poor uptake and poor performance.

Cleaning up weedy ground prior to planting or sowing

Roundup ProVantage can be safely used to remove unwanted vegetation before planting any species, including shrubs, ornamentals, vegetables and seeding down grass. The herbicidal effect is lost on contact with the soil and leaves no residues to affect subsequent plantings, however seedlings which germinate after application will not be controlled. Planting or sowing may take place 5-7 days after application.

DO NOT USE under polythene or glass because spray droplets may dry onto the roof and later cause damage by dripping back down onto newly planted crops in times of high humidity.

Tough perennials may take more than one application see difficult weeds section, p20. Weeds need to be actively growing at the time of treatment and should have the following minimum growth:

Perennial weeds –at least 4-5 leaves of 10-15cm in length; annual grasses –at least 1 leaf; Annual broad-leaved weeds –at least 2 leaves.

Rates of use

Roundup ProVantage provides control of a wide range of established annual grasses, annual broad leaved weeds and perennial weeds.

Annual grasses and annual broad leaved weeds 2.25 l/ha

Perennial weeds 3.75 l/ha

Planning a Weed Control Programme for Weed-Free Areas

Timing

The timetable needs to be flexible according to conditions rather than calendar. The first spray should not be done until weeds have emerged and are actively growing and this will vary from year to year according to the weather.

The graph below right shows spray windows as late April to mid-May for Spring treatment, with a subsequent optional spray in Summer, and a further spray in the period August to September.

Monitoring the Results

Inspection and evaluation is essential to assess the performance and check if you need follow-up treatments. Weeds sprayed with Roundup ProVantage do not show signs of die-back until 7-10 days have elapsed. It

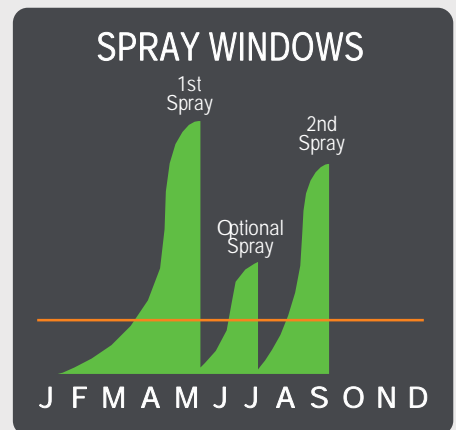
is important to be able to recognise early symptoms, so that treated weeds can be identified. Symptoms show first in Annual Meadow-grass, which takes on a yellow tinge a few days after spraying. Other grasses follow by turning first yellow, then reddish brown before they die.

Broad-leaved weeds will appear healthy at this time, however, if you look closely you will see the leaves will be turning white in the centre. Within a week the plant will be dead. Use this guide to monitor the progress and effect of the treatment. You should expect 95% kill of all weeds to occur with the 3.75 litre rate, approximately 10 - 21 days after treatment. Any seedlings that germinate after spraying will NOT be affected.



A timetable based on the plan below is a good basis for formulating your programme.

JAN FEB	Survey and planning
MAR APR MAY	First Roundup ProVantage spray after weed emergence
JUN	Monitor weed control
JUL	Optional spray of Roundup ProVantage
AUG SEP	Second Roundup ProVantage spray
OCT	Monitor weed control
NOV DEC	Review and plan for next season



Weed Control in Amenity Vegetation

Roundup ProVantage gives effective control of emerged weeds as a directed spray around ornamentals, trees and shrubs in parks, shrubberies, street plantings and roundabouts

Timing

Roundup ProVantage can be used at any time of year, provided that the weeds are green and actively growing.

Avoid spraying during acute drought, or when frost is on the ground.

Spring

This is when the first flush of weeds emerge. Effective control of annual weeds can be achieved once the weeds are more than 1.25cm (½ inch) high.

Perennial weeds have larger, deeper roots, and need to be sprayed when they have a larger leaf area in order to kill the roots thoroughly.

Some perennial weeds will be controlled by a spring treatment, especially those that have overwintered and are actively growing. Others, such as bindweed, will need to be treated later.

Follow up Treatment

Any weeds which emerge during the summer can be given a spot treatment as required. This is the best time to treat later emerging perennials such as bindweed.

Autumn

Treatment in September, October or November will normally give good control until the spring flush of weeds in April or May. Weeds treated in autumn will take longer to show treatment symptoms compared to those treated earlier in the year, because the speed of kill is temperature dependent.

Weed Control in Bark Mulches

Before mulching it is important to control deep-rooted perennial weeds, otherwise they will grow up through the mulch. For best results, perennial weeds should be treated in summer or autumn with 3.75 l/ha of Roundup ProVantage prior to the application of at least 10cm, (4 inches), of bark. A minimum of 5 days must be left between spraying and covering with bark.

Maintenance

Wildlife, pedestrian traffic and wind blow will reduce the thickness of the mulch allowing weeds to establish. Because of the high organic content, most residual herbicides will not be effective.

Roundup ProVantage applied as a spot treatment at a rate of 3.75 l/ha will give effective weed control in these areas.

Caution

When using Roundup ProVantage it is important to avoid drift, especially onto green leaves and soft stems of desired plants and trees. If a shrub is sprayed accidentally, immediately prune the affected part to save the plant.

Take care to avoid the spray touching plants not intended for treatment. Use a sprayer hood when working close to shrubs, cultivated plants and trees.

Roundup ProVantage is not absorbed through mature bark, so it is possible to spray right up to mature trees. The green bark of immature whips will absorb the herbicide. Take care if young trees are not protected by a tree shelter.

Rates of use

Roundup ProVantage provides control of a wide range of established annual grasses, annual broad-leaved weeds and perennial weeds.

Annual grasses and annual broad leaved weeds 2.25 l/ha

Perennial weeds 3.75 l/ha

Application

For knapsack spraying guide, details of low and conventional volume spraying, and CDA see page 19.



Weed Control In Plant Free Areas

Roundup ProVantage is approved for weed control in amenity and industrial areas. It can be used on paths, roads, fencelines, car parks and around buildings. It does not creep in the soil to affect untreated areas such as grass verges or trees.

Timing

Roundup ProVantage can be used at any time of the year as long as weeds are green and actively growing. Full control will not be achieved if weeds are suffering from drought stress or frost.

Spring Application

The first flush of germinating weeds occurs in April and May. Spraying should not start until the weeds have at least 1.25cm (½ inch) of growth. At this stage, they will not have started to cause any damage, and can be treated effectively.

Roundup ProVantage at 3.75 l/ha will also control any overwintered perennials and weeds germinating in spring.

Follow up Treatment

If the weather is mild and moist after the spring treatment, it may be necessary to re-treat areas where new weeds have emerged.

Autumn Treatment

Roundup ProVantage can be applied as late as October or November. The limiting factor is the first hard frost. Up to this time treatment will be effective, although symptoms will be slower to appear.

Autumn treatments should be 3.75 l/ha to eradicate damaging deep-rooted weeds. Experience has shown that a late autumn application can help to even out work loads in the spring, by removing weeds which would have overwintered. Spring treatment is not normally needed until after the first grass cuts.

Approved Uses Explained

Plant free areas are divided into 4 groups by the Chemicals Regulation Directorate and different rules apply according to the surface classification, so it is vital to identify them before treatment.

1 Natural surfaces not intended to bear vegetation



Open soil



Grass path edges



Areas of soil around buildings or along fences

3 Porous hard surface

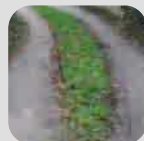


Railway ballast

2 Permeable surfaces overlaying soil



Gravel drive



Aggregate drive



Sand school

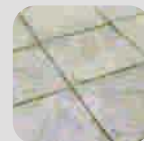


Porous parking area

4 Non porous hard surfaces



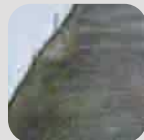
Streets & pavements



Block paving



Crazy paving



Concrete



Brick paving

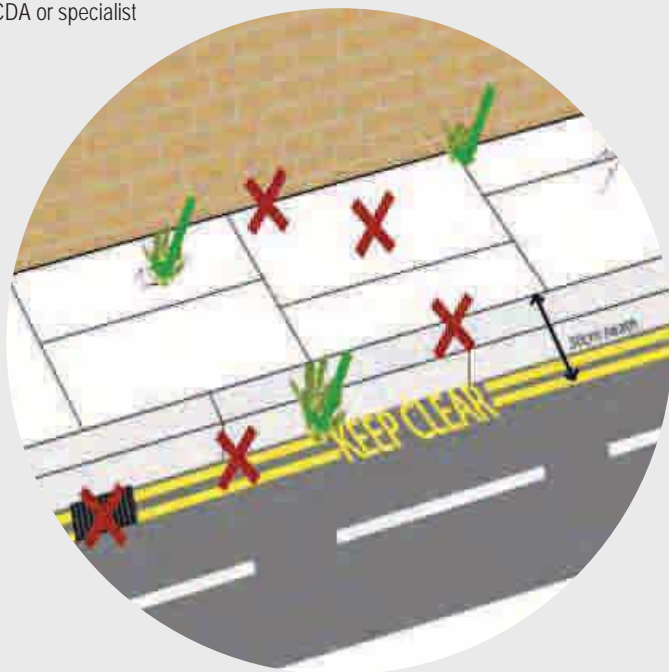
Rules for Non-porous Hard Surfaces

Label restrictions on the use of all herbicides on non-porous hard surfaces will reduce run-off to drains and water bodies as required by the Water Framework Directive as well as minimising the use of pesticides as required by the Sustainable Use Directive by reducing unnecessary herbicide use in overall spraying.

Roundup ProVantage can be applied only to visible weed foliage including those in the 30cm swath covering the kerb edge, but not over drains. Spot treatment can be achieved with weed wipers or sprayers. E.g automated infra-red weed detection units or manual operation from ATV mounted units, knapsacks, CDA or specialist ULV applicators.

Application

For knapsack spraying guide, details of low and conventional volume spraying, and CDA see page 19.



Rates of use in plant free areas

The application rates are the same whether applied alone or in a tank mixture with flazasulfuron. Roundup ProVantage applied at a rate of 2.25 l/ha provides control of a wide range of established annual grasses and annual broad-leaved weeds. In mixed infestations of annual and perennial weeds, Roundup ProVantage should be applied at 3.75 l/ha

Annual grasses and annual broad leaved weeds 2.25 l/ha

Perennial weeds 3.75 l/ha

Tank mix for residual weed control on natural, permeable and porous hard surfaces

Roundup ProVantage will control emerged weeds, but has no residual effect. If long term weed control is required from a single application, Roundup ProVantage may be tank mixed with an approved formulation of flazasulfuron in certain areas. This will prevent seedlings establishing after application of the mix for up to 5 months.

The mixture should be applied in 200 - 250 litres of water per ha. Flazasulfuron can only be used on porous surfaces and is not approved for use on hard surfaces (except railway ballast). It should not be used near trees, shrubs or other desirable vegetation. See flazasulfuron label for full details.

Weed Control for Trees and Forests

Young trees need effective weed control if they are to thrive.

Maintaining a weed free area at the tree base removes weed competition from young trees, allowing water and soil nutrients to be fully utilised, maximising growth.

Roundup ProVantage is the ideal herbicide because it leaves no harmful residues in the soil to check tree growth and development.

Trees planted in land pre-treated with Roundup ProVantage in the autumn, show improved survival and growth compared to trees which have not been weeded.

Forestry Commission trials have established that a 1 metre diameter weed free spot is enough for a transplanted whip, but a standard will require a 1.5 metre diameter weed free area to optimise growth.

Tree shelters make herbicide application easier by protecting the young tree from spray.

All young whips have immature bark, which can be penetrated if sprayed by Roundup ProVantage. Therefore the product should be used as a directed spray, and spray drift should be avoided.

Pre-Planting, Re-Forestation

The best time to control weeds is before planting. This makes planting easier, ensures that the trees get a good start, free from weed competition, and reduces future weed control problems. Difficult weeds such as Rhododendron are more easily controlled at this time, because spraying operations are not restricted by the presence of young trees.

The excellent broad-spectrum weed control properties of Roundup ProVantage make it ideal for clearing weeds before planting all types of trees.

Roundup ProVantage has no residual effect in the soil, so it will not affect the trees through their roots. All tree species may be planted from 7 days after treatment.

Hand-held or tractor-mounted equipment may be used, and the choice of sprayer will normally be determined by the area to be covered and the ease of access for machinery or on foot.

Where trees are to be planted in lines, the herbicide can be applied in bands of 1 to 1.5 metres width. Alternatively, a circle of 1 to 1.5 metres diameter can be treated at each planting site. This technique is ideal where trees are to be planted irregularly, such as in amenity plantings.

Timing

Trials show that pre-planting treatments help both tree survival, and increase growth after planting.

Rates of Use

Arable weeds 3.0 l/ha

Grassland weeds 3.75 l/ha

Water Volume

Hydraulic Sprayers 80-250 l/ha

Rotary atomisers 10-40 l/ha

Note

Allow 7 days for the herbicide to be absorbed by the weeds before planting or cultivating.



Post Planting, Weeds Around Young Trees

The aim is to treat weeds in a circle of up to 1.5 metres diameter around the base of the tree, so that the tree's root system does not have to compete with weeds for soil nutrients and water.

It is important to ensure that the spray does not fall on the soft parts of the tree, such as leaves and green stems. One way to do this is to use a spray guard fitted to a knapsack sprayer. Accidental spraying of thick bark on established trees will not affect the tree as the herbicide does not penetrate mature bark. An alternative method is to use a hand-held weedwiper to treat the weeds, taking care not to let the rope wick touch any part of the tree.

Tree Shelters

It is common practice to fit tree shelters around young trees at planting to provide protection against vermin damage and adverse weather conditions. Fitting tree shelters will improve survival and the growth rate of trees, but it is no substitute for effective weed control.

When trees are fitted with shelters, there is no need to use a spray guard or to direct the spray away from the tree, so weeds can be treated quickly and easily right up to the shelter.

Note that the spiral type of shelter, and those with holes, do not provide sufficient protection from the herbicide, and trees fitted with these should be treated as if they had no tree shelter.

Timing

Apply between April and September, depending on the weeds to be controlled.

General Advice

Best results are normally achieved by applying Roundup ProVantage to plants that are green and actively growing. A general guide is that the greater the leaf area the more herbicide reaches the roots and the more effective the control. Control will be reduced if the weeds are suffering drought stress, or not actively growing for any reason.

Rates of Use

Site clearance and directed sprayers around young trees.

Weed Type	Rate litre/ha Roundup ProVantage
Annual/perennial grasses and broad-leaved weeds	3.0
Scrub - Hazel Oak Sycamore Willow Tough Weeds	3.75
Heather - Peat Soils Mineral Soils	3.0 4.5
Rhododendron	7.5 (6)*

* The rate shown in brackets may be used if Mixture B NF is added at 2% of spray volume.

Water Volume

Knapsack Sprayers or hand-held weedwipers see page 19.



Special Techniques for Woodland Management

Use of Roundup ProVantage can aid scrub clearance and prevent re-growth. Scrub can be difficult to control by mechanical means alone, because it can regrow quickly after cutting back.

Stump Treatment

By treating the cut stumps with Roundup ProVantage, the root system can be killed and regrowth prevented. This method is also suitable to prevent coppicing of crop trees after felling.

A water soluble dye should be added to identify treated stumps.



Timing

Treat stumps immediately after cutting. This method may be used between November and March or April, depending on the season and location. Do not use this method during the period of active sap flow during the spring and summer.

Special Advice

Apply at the time of cutting with a suitably adapted clearance saw such as the Enso attachment to rotary saws, or apply as soon as possible after cutting using a knapsack sprayer, spot gun or paint brush.

Rates of Use

Deciduous species: 7.5% solution of Roundup ProVantage in clean water

Coniferous and evergreen species: 15% solution of Roundup ProVantage in clean water

Chemical Thinning

Treat standing timber without felling. This technique has the benefit of not requiring the stump to be freshly cut, it can be used where trees have already been cut back, or where the tree is to remain in place. It is also easy to see which areas have been treated.

Timing

This method works from slightly earlier in the season, (ie October), so is especially useful before stump painting commences in November.

Rates of Use

1.5ml of neat Roundup ProVantage per hatchet cut

Method

Neat Roundup ProVantage is introduced straight into the phloem through a hatchet cut into the bark of the tree or stump.

A Spot gun with a solid stream nozzle is recommended. (It is advisable to make a second cut under the first to catch any surplus herbicide.)

One cut plus 1.5ml Roundup ProVantage is needed for each 10cm diameter of the trunk. Work out how many are needed and space them round the girth. Alternatively the concentrate can be introduced through an 8 mm drill hole, about 40mm long, aimed slightly downwards and radially towards the centre of the stem.

DO NOT OVERDOSE WITH EITHER METHOD

It is possible for collateral damage to occur to nearby trees where the product is overdosed and the trees are the same species which are intimately connected by mycorrhizal fungi or root grafts.

Woodland Management - Rhododendron Control

Rhododendron can be a troublesome weed, and is difficult to control effectively by conventional methods since it can regrow quickly after cutting back. Using Roundup ProVantage kills the roots, preventing regrowth.

The leaves of this species have a thick, waxy cuticle, and in older bushes translocation is restricted.

Consequently a higher dose of Roundup ProVantage is needed than for most other woody weeds, and complete coverage of the plant is required.

Mature Rhododendron is often so tall that spraying is difficult, and it is less susceptible to the herbicide. For this reason, it may be preferable to cut back the bushes with a brush saw. The cut stumps may be treated immediately, or left to regrow for 2-3 years before spraying the regrowth when it is at its most susceptible stage. By this time any seedlings will have germinated and will also be susceptible.

Timing

Roundup ProVantage sprayed onto the foliage gives the most effective control of rhododendron between June and early September.

Cut stump treatments should be made during the dormant season from November to March, before the period of active sap flow starts in the Spring. Chemical thinning can also be used on Rhododendron, see page 12.

Rates of Use

Knapsack sprayers 7.5 l/ha
Or spray 6 l/ha + Mixture B NF
at 2% of spray volume.

Water Volume

Knapsack sprayers

Knapsack sprayers with standard, (200 l/ha output) nozzles - apply 3.75% solution of Roundup ProVantage in clean water as an even foliar coverage. Or use 400l/ha output nozzles and apply a 1.9% solution to just before the point of run-off.

Cut stump treatments

15% solution of Roundup ProVantage in clean water, applied to the freshly cut stumps with an Enso saw attachment, knapsack sprayer, spot gun or paintbrush.

Special Advice

The Micron Ulva may be used as an alternative to a knapsack sprayer for spraying Rhododendron foliage. Use a solution of 1.5% Roundup ProVantage in clean water, applied at 50 l/ha total spray volume.

Telescopic spray lances can be used to apply spray to inaccessible vegetation.



Rhododendrons: before treatment



Rhododendrons: after treatment

Post-Planting Overall treatments in specified conifers

Timing

Overall application of Roundup ProVantage, may be made to certain conifers in the dormant season. Trees must be fully dormant and leader growth hardened. The timing of hardening of leader growth varies considerably between locations and years, from the end of July to October or later.

Rates of Use

Grass weeds	
Lowland areas	1.1 l/ha
Upland areas	1.5 l/ha
Woody weeds	
Bracken, Birch	1.5 l/ha
Brambles	2.25 l/ha

These recommended application rates refer to Forestry usage only. Inadequate control may result if used in other areas.

Water Volume

Hydraulic sprayers 80-250 l/ha

Rotary atomisers 10-40 l/ha

General Advice

Species safe to spray when fully dormant, (leader growth has hardened but before buds swell in the spring):

Corsican pine, Lodgepole pine, Scots pine, Norway Spruce, Sitka Spruce, Lawson Cypress, Western Red Cedar.

Whenever dormancy is in question use a tree guard and direct spray away from leading shoots.

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.



Orchards

Apple Pear, Cherry, Plum and Damson

Roundup ProVantage can be used to clear weeds around the base of listed fruit trees which have been established for at least 2 years.

Treatment at 3.75 l/ha will also control root suckers in the late spring. Do not treat suckers in summer or early autumn as translocation back to the mother tree can cause damage. This does not occur when the sap is rising strongly in the late spring.

Timing

Spray after leaf fall in the autumn and BEFORE apple/pear green cluster stage and spray stone fruit before white bud stage.



Grassland Use

Roundup ProVantage can be used to destroy grassland prior to planting ornamentals or re-seeding with amenity grasses. Choose rates according to the table below and apply when there is 30-60cm of growth from June-October.

Sprayed grass should be left for a minimum of 5 days before cultivation and planting can take place.

The treated sward can be grazed or conserved where appropriate. See label for more details.



2.25 l/ha	3.0 l/ha	3.75 l/ha	4.5 l/ha
Annual Meadow-grass	Black-bent	Bracken**	Common Ragwort
Meadow Fescue	Creeping Soft-grass	Red Clover	Hard Rush
Common Chickweed	Broad-leaved Dock	Common Sorrel	Heath Rush
Meadow Foxtail	Curled Dock	Sedges	Jointed Rush
Common Mouse-ear	Cock's-foot	Common Nettle	Molinia (Purple Moor-grass)
Rough Meadow-grass	Perennial Rye-grass	Sheep's Sorrel	
Dock Seedlings	Common Bent	Creeping Buttercup*	
Speedwell species	Plantains	Soft Rush	
Italian Rye-grass	Common Couch	Creeping Thistle	
Timothy	Soft Brome	Spear Thistle	
Mayweed species	Creeping Bent	Daisy	
	Yorkshire Fog	Tufted Hair-grass	
		Dwarf Thistle	
		Yarrow	
		Perennial Sow-thistle	

Spot treatment of broad-leaved weeds in grass areas and paddocks can also be achieved by targeted spot application using a spot nozzle in a knapsack or by a weed wiper, (see page 19 for details). This can be particularly useful for Docks, Nettles and noxious weeds like Common Ragwort, Bracken and Hemlock or invasive non-native species like Giant Hogweed or Japanese Knotweed.

Remember to remove treated poisonous weeds before any grazing animal is allowed back.



Aquatic Weed Control with Roundup ProVantage

Aquatic use means spraying in or on land immediately adjacent to a body of water, where the land immediately adjacent to is defined as the bank of the body of water. The body of water can be enclosed (ie ponds or reservoirs which do not drain to a watercourse) or open (i.e. rivers and streams which drain to a watercourse).

All aquatic use of herbicides requires Environment Agency approval. Contact the local EA office before work begins.

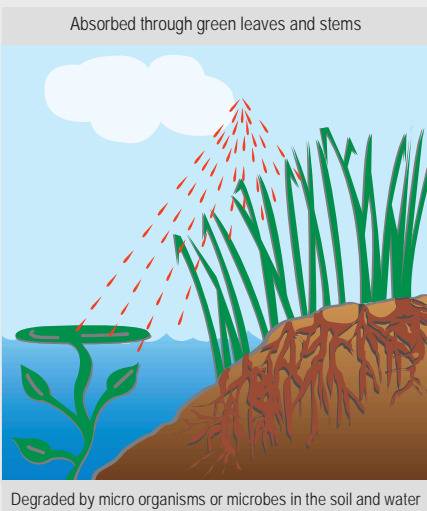
Safety to the environment

Safety to the environment is an important consideration when treating weeds in and around water. Roundup ProVantage is particularly suitable for these areas. It gives effective weed control, and is quickly broken down in soil or sediment into harmless natural substances. It is non-residual, and does not harm animals, birds, fish, insects and other wildlife.

When Roundup ProVantage is used correctly, only a small proportion of the spray reaches the water. Any herbicide which enters the water is broken down by microbes. This was confirmed by monitoring sites after application[#]. The amount of glyphosate found in slow-flowing water one hour after treatment, and in still water 12 hours after treatment, is barely detectable[#].

At these sites, the variety and number of microorganisms showed no significant change during the year after treatment[#].

Evidence suggests that Roundup ProVantage has less effect than mechanical weed control on wildlife[#].



Government Approval

The Department of Environment, Food and Rural Affairs imposes strict control on the use of herbicides in aquatic areas.

Glyphosate, the active ingredient in Roundup ProVantage, is the only active ingredient approved for such use.

Before granting approval, DEFRA considers extensive data on the herbicide's characteristics, including its toxicology, degradation, persistence, and effects on invertebrates and fish.

Roundup ProVantage provides long-term control of aquatic weeds in ditches and drainage channels. It controls emergent and floating weeds including especially difficult to kill species such as reeds, rushes, sedges and grasses.



[#]Glyphosate dissipation studies UK, Monsanto, 1979 and Integrated aquatic vegetation management with glyphosate herbicide. Garnett, 2000

Roundup ProVantage toxicological and environmental profile is reviewed in other Monsanto publications. For copies please contact the Helpline on Tel: 01954 717575.

Safety to operators and wildlife

Roundup ProVantage has very low toxicity to humans, animals, birds, fish and insects. It acts on an enzyme which is found only in plants, preventing the plant from making proteins. The World Health Organisation rates glyphosate, the active ingredient in Roundup ProVantage, as 'practically non-toxic', the lowest classification available.

There is no need to restrict public access after spraying with Roundup ProVantage, and correctly treated water may be used for irrigation.

Caution

When used as directed there is little risk to spray operators, wildlife, or the environment. Roundup ProVantage may be used in waters stocked with fish, if used in strict accordance with the recommendations.

Weeds Controlled

Roundup ProVantage controls emerged or floating weeds, but does not control submerged weeds or algae.

Timing

Emergent Weeds

Spray when the weeds are actively growing with a full emergence of green leaf at the flowering and up to die-back stage. For the control of watercress, the best results are from June applications. Bulrush from late July applications and for all the remaining species from mid-August to mid-September.

Leaf symptoms on the weeds begin with a grey/greening and then yellowing of the foliage usually appearing within 14-21 days of spraying in the early Autumn. Complete foliage desiccation usually occurs 30-40 days after spraying. At this stage the weeds can be cut and removed. During cold conditions leaf symptoms may not appear before natural die-back but no growth will occur in the season following spraying.

Floating Weeds

Spray when there is a maximum emergence of floating leaves. For the control of Water Lilies, the best results are obtained from applications made from mid-July to mid-August. From 7-21 days after spraying the foliage turns yellow, gradually disintegrates and sinks below the surface of the water. A few leaves may remain green until the end of the season but do not regrow in the following year.

Adjuvants must not normally be used with Roundup ProVantage in aquatic areas, but for floating weeds where wash-off can be a potential problem the addition of 475 ml TopFilm[®], (a natural biosponge called Biocar[®] made from maize) may improve control of species where herbicide wash-off is a problem, e.g. *Hydrocotyle ranunculoides* (Floating Pennywort), *Myriophyllum aquaticum*, (Parrot's Feather), *Potamogeton natans*, (Broad leaved pondweed), reeds and rushes, *Nymphoides peltata* (Fringed water lily). TopFilm[®] is an approved adjuvant for use in water. See <http://www.topfilm-uk.com/>



Aquatic Weed Control with Roundup ProVantage

Planning a Weed Control Programme

Weeds are sometimes defined as plants growing where they are not wanted. Water plants are usually wanted, and become weeds only when their growth is excessive.

Before taking action, the manager should define the objectives of weed control, consider the consequences, and choose the most appropriate method.

Inappropriate weed control, whether chemical or mechanical, can harm the environment, leading to: poor species diversity; changes in the pattern of silt deposition; de-oxygenation of the water; and poisonous weeds becoming more palatable to grazing animals. It can also let in invasive weeds which are more difficult and expensive to control.

Guidance on managing aquatic vegetation with particular reference to wildlife is available from Natural England, Scottish Natural Heritage and the Countryside Council for Wales.

Rates of Use

Roundup ProVantage 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.

Target Weeds	Roundup ProVantage	Volume of Water for hydraulic sprayers
Emergent Weeds	3.75 l/ha	200-400 optimum 250
Floating Weeds	4.5 l/ha	100-200

For further details on sprayers and water volumes see page 19.

Application

Any knapsack sprayer, tractor-mounted or boat mounted sprayer may be used provided it is capable of applying the appropriate spray volume accurately and at the correct pressure, to achieve a 'medium' or 'coarse' quality spray, (BCPC definition).

Avoid high water volumes which may lead to run-off and loss of chemical.

Applications made in flowing water should be sprayed against the direction of flow. Roundup ProVantage must be applied as a directed spray to green, actively growing weeds and drift must be avoided.

Applications must be made before the leaves of the weeds have started to die back.

Hand-held weedwipers may be used to apply Roundup ProVantage directly to weeds, using a concentration of 1 part of Roundup ProVantage to 3 parts of clean water. When operating in or near water, it can be difficult to get the spray nozzle over weeds growing at a distance from the bank. Consider using a telescopic hand-held lance which extends to give a spray range of up to 5 metres. These lances are also useful for spraying tall bankside weeds such as Giant Hogweed and Japanese Knotweed.

All spray equipment should be checked and cleaned thoroughly before and after use, and should be calibrated regularly.

With a boat-mounted sprayer, use the slowest forward speed to cause minimum disturbance to the leaves of the weeds. When disturbed by the wash, water lilies may require retreatment.



Emergent Weeds include: Bulrush, Common Reed, Creeping Bent, Reed Canary Grass, Reed Sweet Grass, Sedges, Soft Rush, Watercress, Whorlgrass

Floating Weeds include: White Water Lily, Yellow Water Lily

Sprayers and Water Volumes

Knapsack Spraying

Roundup ProVantage may be applied in water volumes between 80 and 250 l/ha. Different nozzles are designed to deliver different water volumes.

Standard knapsack sprayers are supplied with a set of deflector nozzles of varying swath width but each with an output of 200 l/ha. This is the standard rate we use in the table below.

However, Roundup ProVantage works very well at low water volumes, enabling improved operator efficiency with less downtime for filling and less clean water to carry on site. The dilution rates will need to be adjusted pro-rata for nozzles of different outputs.

Calibration of the knapsack should always be carried out by individual users according to the procedures covered in the syllabus of the PA6 Certificate of competence in hand held spraying and the Code of Practice for Using Plant Protection Products.

Pressure 1.5-2.5 bars. Use low setting on knapsack fitted with low/high settings. Droplet size should be in the range of medium to coarse, (BCPC). These can be easily seen but are neither large enough to roll off the target leaves nor fine enough to drift onto non-target areas to cause damage. Use a sprayer hood to avoid damage to non-target plants in close proximity.

Once sprayed the leaves should have an even coverage of drops without running off.

Using standard nozzles giving 200 l/ha at 1 bar pressure, a 20 litre knapsack covers 1000 square metres, when walking at 1 metre per second.

Special Advice

When operating in water or for very tall weeds, it can be difficult to get the spray nozzle to reach far enough. Use of telescopic hand-held lances which extend to give a spray range of up to 3 metres is recommended. Monsanto produces further guidance on knapsack nozzle selection and calibration.

Telephone 01954 717575 for more details.

Useful reference: Hand-held & amenity sprayers handbook - A complete guide to safe effective spraying. (BCPC Publications, Bear Farm, Binfield, Bracknell, BERKS, RG42 5QE Tel: 0118934 2727)

Controlled Droplet Application

Roundup ProVantage may be used at spray volumes of between 10 and 20 l/ha through CDA equipment which produces droplets in the range of 200-300 microns.

Markers

Some operators choose to apply Roundup ProVantage with markers which allows the product to be used with CDA sprayers.

Hand-Held Weedwipers

The hand-held weedwipers rope wick applicator may be used to apply Roundup ProVantage directly to weeds, using a concentration of 1 part of Roundup ProVantage to 3 parts of clean water.

The use of a hand-held weedwiper on tall vegetation can give effective control of the weed without damage to underlying ground cover. The Micro weedwiper is available from Micron Sprayers phone (01885) 482397 or Billericay Farm Services, phone (01268) 710237

Stem Injection Equipment

Specialist injection tools are available and are useful for treatment of hollow-stemmed plants like Japanese Knotweed and Giant Hogweed in environmentally sensitive areas use a needle to inject Roundup ProVantage directly into the stem, several systems are now available including the NoMix Stem Master and Micron InjectorDos as well as the original JK1000 Injection System which originated in the US.

The technique is covered by the same chemical thinning method used in forestry. More details at

<http://www.steminjector.com>

<http://www.nomixenviro.co.uk>

<http://www.micron.co.uk/injector>

Dyes

Suitable dyes are available which can be added to the spray solution to enable sprayed weeds to be readily identified. Ask your Roundup ProVantage supplier for details.

All spray equipment should be checked and cleaned thoroughly before and after use, and should be calibrated regularly.

Rate per hectare	Equivalent dilution for 200l/ha water volume	Weeds controlled
2.25 litres	1:87 or 12ml per litre of water	Annual grasses, annual broad-leaved weeds
3.0 litres	1:67 or 15ml per litre of water	Arable weeds pre-planting of trees
3.75 litres	1:53 or 19ml per litre of water	Most perennial weeds
4.5 litres	1:44 or 23ml per litre of water	Floating aquatic weeds
7.5 litres	1:27 or 37ml per litre of water	Rhododendron, Ivy Horsetail and difficult waxy-leaved plants

Difficult Weeds



Japanese Knotweed (*Fallopia japonica*)

Highly invasive, particularly problematic near watercourses. Scheduled under the 1981 wildlife and countryside act. Classified as a 'controlled waste' requiring licensed landfill disposal. Grows through walls, Tarmac™ and concrete and can reach 3m high by June. Spreads via rhizomes, does not produce viable seed. Rhizomes from one plant can be 2m deep and 7m wide. Fragments of rhizome of only 1 cm can produce new plants. Repeated cutting will weaken rhizomes but is ineffective for eradication. Digging can increase spread unless every piece of root is removed.

Apply 3.75 l/ha of Roundup ProVantage in 200 L water. Spray underside as well as the upper surface of the leaves. For best results spray from flowering onwards in late summer, but before dieback. Only remove plant materials when there is no further sprouting. Establish stands may take several years to completely control. Monitor annually and re-treat fresh growth as necessary.



Giant Hogweed (*Heracleum mantegazzianum*)

Giant version of common hedgerow and pasture weed, growing up to 5m tall with flowers up to 0.5 metre and leaves 1metre across. Serious invasive alien, often found near watercourses. It is an offence under the 1981 Wildlife and Countryside Act to plant or cause it to grow in the wild. Poisonous sap causes photosensitive skin irritation and precludes manual methods of removal. Up to 50,000 seeds per plant viable for 15 years means it can spread rapidly.

Apply 3.75 l/ha of Roundup ProVantage in 200 L water. Spray the plant once it reaches 0.5 m at rosette stage, in spring or spray flowering plants with extending lances in summer. A weed wiper can be used when working close to desirable species, use 1 part Roundup ProVantage to 3 parts water. Specialist injection equipment can be used to inject 1.5 mls of Roundup ProVantage per flowering stem. Wear full protective clothing and avoid contact with sap.



Himalayan Balsam (*Impatiens glandulifera*)

Tallest annual weed in Britain, growing to more than 2-3m in height. Each plant produces more than 800 seeds which are released explosively from seed pods, travelling distances of up to 7m. Seeds can remain viable for up to 2 years and can be transported by water. Colonisation of riparian areas can cause a deterioration of ecological status under the Water Framework Directive and the UK's Biodiversity Action Plan lists the species as an invasive alien, so many areas have now introduced eradication policies.

Spray 2.25-3.75 l/ha Roundup ProVantage in 80-250 litres of water. Use lower rate for seedlings and plants up to 0.5m high, and the higher rate for taller plants. Spray when good foliage has developed to a height of at least 0.5m in late spring, before the end of June. A second treatment may be necessary if more seedlings germinate. A hand held weed wiper can be used when working amongst desirable plants, apply 1 part Roundup ProVantage in 3 parts water.



Nettles (*Urtica dioica*)

Nettle flowers from June-August and is dioecious (carries male and female flowers on separate plants) and relies on wind pollination to produce seed. Once established the spread is mainly by the underground stems and the plant easily takes over to the exclusion of other species. Nettle thrives on well-fertilised soil and is a good indicator of phosphate rich soil. Large clumps of nettles may have active growth on the outside and dormant stolons in the overcrowded centre.

Spray at or just after flowering, but before die back, usually at a rate of 3.75 l/ha. Mature nettles should be cut back in June or July and allowed to re-grow before being sprayed. Larger clumps may require further treatment the following year as dormant stolons are stimulated to grow after an initial application. Nettles have very hairy leaves and can be difficult to wet. The addition of a wetter like Mixture B NF may help leaf penetration. Use droplet quality on the finer side of medium.



Horsetail (*Equisetum Arvense*)

Spreads mainly by extensive underground rhizomes, up to 2m deep, foliage shoots emerge in May, preceded by spore-bearing shoots in early spring. Prefers moist, shady areas but increasingly found on waste ground and non-cropped areas. Poisonous to livestock, but avoided by grazing animals, must be excluded from hay or silage. Thick waxy cuticle and small needle-like leaves make treatment difficult. Repeated cutting will weaken rhizomes but is generally ineffective for eradication.

Wait until vegetative shoots are at full height (60cm) usually in July. Apply 3.75 l/ha of Roundup ProVantage in 200 L of water and Mixture B NF @ 2% spray volume. Bruise leaves lightly before to break wax. (E.g a light roller or a stiff broom.) A weedwiper can be used if working near desirable plants, use 1 part Roundup ProVantage to 3 parts water.



Common Ragwort (*Senecio jacobaea*)

Bright yellow flowers prominent on light land, neglected pasture and waste ground. Spread by seed blown in wind. Poisonous to livestock, especially horses, both fresh and in hay or silage. Spread to livestock grazing areas must be prevented under Weeds Act 1959 & landowners must adhere to the Ragwort Code of Practice. Cutting can weaken plants, but may turn them from biennials into perennials. Dead foliage must be completely removed before livestock return to treated areas.

Apply Roundup ProVantage at a rate of 3.75 l/ha. Optimum time for spraying is when the flowering stem has formed, but before seed set. Avoid spraying whilst the stem is extending rapidly. Use a hand held weed wiper with 1 part Roundup ProVantage to 3 parts water.

Difficult Weeds



Tree of Heaven (*Allanthus altissima*)

The Tree of Heaven tolerates a wide range of conditions and colonises disturbed areas rapidly, spreading both by seed and suckers. Female trees carry large numbers of yellowish green flowers on long panicles in mid summer, with the male trees producing a foul smell said to resemble rotting nuts, to attract pollinating insects. Suckers can cause damage to sewers and pipes and because it exudes an allelopathic chemical called alianthone, few other trees will grow near it. Growing rapidly the tree can grow 2 m per year and larger trees are prone to become hollow and unstable in high winds and rarely live beyond 50 years.

Spray during summer at or after flowering, but before seed set with 3.75 l/ha of Roundup ProVantage. Control of older plants with toughened leaves can be improved by the addition of Mixture B NF at 2%. Or apply a 7.5% solution of Roundup ProVantage to a fresh cut in the stump using a paintbrush or spotgun. When using a paintbrush saturate the rim of stumps, concentrating on the live wood just inside the bark. Or the chemical thinning technique using 1.5 mls of neat product per hatchet cut per 10 cm diameter of trunk



Buddleja (*Buddleja davidii*)

A woody, multi-stemmed, fast-growing shrub it can grow to 5 metres tall. Individual plants can live for 20 years. Spreads by prolific seed production, (1-3 million per plant) with an ability to establish in a wide range of conditions, even in the absence of soil. Seeds are disseminated from the bushes over a long period of time, can also spread in water and remain viable in the soil for up to 3 years. Flowers on current season's growth so even if cut back over winter it can set viable seed the same year. An established shrub soon causes damage to stone and brickwork.

Spray during summer at or after flowering, but before seed set with 3.75 l/ha of Roundup ProVantage. Control of older plants with toughened leaves can be improved by the addition of Mixture B NF at 2%. Or apply a 7.5% solution of Roundup ProVantage to a fresh cut in the stump using a paintbrush or spotgun. When using a paintbrush saturate the rim of stumps, concentrating on the live wood just inside the bark. Or the chemical thinning technique using 1.5 mls of neat product per hatchet cut per 10 cm diameter of trunk



Rosebay Willow Herb (*Chamerion angustifolium*)

Large spikes of pink flowers appear from June to August pollinated by both bees and moths. Shallow rhizomes spread up to 1m per year and new plants regenerate from small fragments. It grows in dense stands which can exclude other plants. Dormant roots can grow after 20 years when disturbed. Prolific seed production and wind dissemination over long distances together with vegetative spread via rhizomes mean this plant can easily become a nuisance.

Spray during summer at or after flowering, but before seed set with 3.75 l/ha of Roundup ProVantage. Control of older plants with toughened leaves can be improved by the addition of Mixture B NF at 2%. Large underground root systems produce new aerial shoots in late spring. They can be poorly controlled if sprayed too early not only because translocation down to the roots is poor but also because late emerging shoots may be missed. Excellent control should be achieved by spraying Roundup from late June through until August, when all new shoots have emerged and produced a flowering stem, but before seed set. Spraying whilst in flower will prevent the production of viable seed.



Bracken (*Pteridium aquilinum*)

Widely distributed throughout the UK, vast stands in upland areas but also increasingly found on waste ground. Fronds are poisonous to cattle and horses; harbours disease-carrying ticks and carries carcinogenic spores. Thick stands shade out all other plants. Extensive underground network of two rhizome types makes control difficult.

Non frond bearing storage rhizomes are not killed by some herbicides. Repeated cutting will weaken rhizomes but is generally ineffective on its own.

Roundup gives good control of frond-forming and storage rhizomes when in full leaf. Use a tractor mounted weed-wiper for selective control in grassland. Established stands may take several years to completely control. Spray with 3.75l/ha as fronds approach full size in July/August. Treated fronds will die back within four weeks of treatment.



Ground Elder (*Aegopodium podagraria*)

Deep-rooted perennial invading disturbed ground and amenity areas, particularly prone to infest ornamental plantings. Spread mainly by long underground rhizomes. Digging can cause rapid multiplication, due to brittle nature of the roots and rapid regeneration from the tiniest fragment can occur.

Optimum time to spray is from when the white flowers are showing at the end of May. Earlier treatment will give top growth suppression only, requiring further treatment of re-growth in autumn. Spray with 3.75l/ha, using a shroud when working in ornamental plantings. Or use a weed wiper with 1 part roundup ProVantage to 3 parts water to apply directly when weed is too near to desirable species for spraying.

Monsanto produce more detailed briefing notes on the following weeds:

- n Rhododendron
- n Giant Hogweed
- n Japanese Knotweed
- n Himalayan Balsam
- n Nettles
- n Ground Elder
- n Common Ragwort
- n Bracken
- n Horsetail
- n Tough Herbaceous & Woody Weeds
- n Bamboo
- n Bindweed
- n Duckweed
- n Hemlock Water Dropwort
- n Ivy
- n Thistles
- n Buddleja
- n Tree of Heaven
- n Rosebay Willowherb

Please telephone the Helpline on 01954 717575 to request or download from www.monsanto-ag.co.uk

COSHH Safety Assessment Roundup ProVantage

INTRODUCTION:

The Control of Substances Hazardous to Health Regulations, (COSHH), 2004 come under the Health and Safety at work Act 1974 and as such give a legal duty to anyone working with hazardous substances to evaluate the risk to health and to eliminate or adequately control such risks.

HAZARD –The intrinsic potential of a substance to cause harm.

RISK - The likelihood of harm being caused in the actual circumstances of use.

Many pesticides are classed as hazardous and so a COSHH assessment should always be carried out. In gaining Approval under FEPA from the Chemicals Regulation Directorate the hazards of a pesticide are evaluated and appear on the label, but it is the way the product is used which determines the risk involved and is the reason why each use needs a separate assessment.

- Roundup ProVantage has no hazard rating, but its use must still be evaluated under COSHH.
- You should always choose the safest product available.
- By carrying out a COSHH assessment you demonstrate you have thought through fully the safety aspects of your weed control operations. You must know why you have chosen Roundup ProVantage rather than any other method of weed control.

The following information about Roundup ProVantage will help in conducting a COSHH assessment. Details can be found on the HSE website and can be completed online <http://www.hse.gov.uk/coshh/essentials/index.htm>. Once written it will only need to be repeated if circumstances change, however it must be reviewed at least every 5 years and preferably annually. More details are included in The Code of Practice for using Plant Protection Products, 2006.

PRODUCT DETAILS

MAPP number 15534

588g/l Potassium salt of N-(Phosphonomethyl), glycine = (Potassium salt of glyphosate).

Containing 480 g/l of glyphosate 43.8% w/w (CAS No. 70901-12-1, EC No 933-437-9)

Surfactants	<23
Water & minor formulating ingredients	>33%

PRODUCT TOXICITY KEY FACTS

An up to date Material Safety Data Sheet is available from your distributor or from www.monsanto-ag.co.uk

SUMMARY

Hazard Rating - None

Acute Oral Toxicity:
World Health Organisation (WHO) toxicity rating –not classified. Glyphosate is practically non-harmful by ingestion.

Acute Dermal Toxicity:
World Health Organisation (WHO) toxicity rating –not classified. Glyphosate is practically non-harmful by skin absorption.

Acute Inhalation:
No risk in normal use situations.

Sensitisation:
No sensitising potential. i.e. No allergic reaction.

OCCUPATIONAL EXPOSURE STANDARD (OES)

Roundup ProVantage is non-hazardous; there is no OES and no specified need to monitor the health of users of Roundup ProVantage herbicide.

CHRONIC TOXICITY: ACTIVE INGREDIENT – GLYPHOSATE

The results of longer term studies which assess the risk of long term low dose exposure, show that glyphosate is:

NOT MUTAGENIC
NOT CARCINOGENIC
NOT TERATOGENIC
NO REPRODUCTIVE EFFECTS
NOT A CHOLINESTERASE INHIBITOR

The data from extensive studies confirm that if used according to the label instructions, Roundup ProVantage does not constitute a hazard to human health.



Practical Guidance to Avoid Exposure

Try not to walk through the spray swath during application or through treated vegetation.

PERSONAL PROTECTIVE EQUIPMENT

1. CODE OF PRACTICE & LABEL DICTATE MINIMUM PERSONAL PROTECTIVE EQUIPMENT,(PPE);WHEN HANDLING THE CONCENTRATE AND SPRAYING USING CONVENTIONAL SPRAYERS, USING ROTARY ATOMISERS, WEEDWIPERS, SPOT GUNS & MAKING CUT STUMP APPLICATIONS OR USING STEM INJECTION EQUIPMENT.

Suitable protective coverall (e.g. Tyvek disposable overall)

Suitable protective gloves: e.g. Rubber or nitrile (0.5mm thick EN374)

Suitable waterproof boots: e.g. Wellingtons, rubber boots or water repellent boots complying with BSEN ISO 20345:2004

DISPOSAL OF PESTICIDE WASTE

STORAGE OF UNUSED CONCENTRATE

Unused product should be stored only in the original container. It will keep for several years in a suitable chemical store. Always rotate stock and use the oldest first.

UNUSED DILUTED SPRAY

Ideally plan not to have any left over, or use later in making the next batch of diluted spray.

Once diluted the active ingredient will start to break down and lose activity within a few days.

Surplus spray should be sprayed out onto an untreated area where it will have a beneficial herbicidal effect, but not on hard surfaces like Tarmac™ or concrete where run-off to drains can occur.

EMPTY CONTAINERS

Empty cans of Roundup ProVantage should be triple rinsed and stored safely until transferred to someone authorised to handle waste. More detailed sheet on disposal available from the Technical Hotline on 01954 717575

IN CASE OF SPILL OR ACCIDENT

FIRST AID:

Skin; Wash with water

Contaminated clothing; Remove and wash before reuse.

Eye contact; Rinse with plenty of potable water/sterile eye wash solution.

Wearing gloves and a coverall, surround the area with sufficient absorbent, non-combustible material such as sand bags to prevent entry into drains. Then sweep or shovel into suitable Aluminium, plastic, plastic-lined steel, stainless steel or fibreglass containers, label and seal. Containers should be collected by an appropriately authorised /licensed specialist waste disposal operator.

FURTHER INFORMATION

INCIDENT REPORTING:

Any incident involving humans or pets should be investigated as soon as possible.

Telephone 01954 717575 during office hours or the National Chemical Emergency Centre, 01865 407333 at other times.

PUBLIC INFORMATION

Monsanto produce a Public Information Guide as well as a poster which provides information about Roundup. Please telephone 01954 717575 to order.

USE HERBICIDES SAFELY. ALWAYS READ THE LABEL AND PRODUCT INFORMATION BEFORE USE

Frequently asked questions

From the Public

The Public sometimes ask questions when they see people wearing protective suits and spraying in public areas. It is important to note that it is a Legal requirement that anyone spraying chemicals, however safe, has to wear minimum prescribed protective clothing. This does not necessarily mean there is a danger from the operation.

Below is a typical question from the Public and an answer from Monsanto.

Q The council have sprayed streets all around my house. I thought all pesticides were harmful and dangerous for the environment? If you spray the pavements and roads surely it will damage wildlife and get into the water? Why can't you use non-chemical methods to keep the streets clean?

A Your council has chosen Roundup ProVantage for its favourable environmental characteristics, these along with the effectiveness of Roundup herbicide, have combined to make it one of the most widely used and trusted herbicides in the world for more than 35 years.

Glyphosate, the active ingredient in Roundup ProVantage, controls weeds by blocking the plant's protein production system. It stops the production of an enzyme, which is present in most plants but not in humans, animals, fish or insects. Glyphosate is not absorbed to any extent through skin and even when treated foliage is ingested by animals the glyphosate passes through the digestive system unmetabolised. Indeed Roundup-treated grass has full registration to be made into silage and fed to cattle, sheep etc.

Glyphosate degrades in the environment and does not accumulate. When used according to approved uses, it has no negative effects on wildlife. Roundup ProVantage has been approved for use in aquatic areas to control weeds that invade and can even block watercourses.

Mechanical methods of weed control such as the use of strimmers need to be carried out 2-3 times more often because they are not as effective at killing weed roots. This means council bills could cost up to 20 times more per season for mechanical methods compared to a Roundup ProVantage programme. There are other reasons too – such as the devastating effect of strimming on all other fauna in treated areas, not to mention the danger to the public and operators from flying debris and the increased carbon footprint from petrol engines.

Monsanto are committed to minimising the environmental impact of herbicide treatments as well as maximising their effect on killing target weeds.

From Spray Operators

Spray Operators sometimes seek clarification on access to a sprayed areas.

Q I want to spray an area that is open to the public, do I need to prevent access to this area once sprayed? If so, for how long?

A 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. You should still carry out a COSHH assessment and try to make the application when public areas are not busy, e.g early in the morning.



Further documents are available from Monsanto to help with these and other questions:
Public Information Guide –Weed Control
User Guide
Rate Guide
For copies: Tel: 01954 717575

Support Services

Monsanto recommendations are made with over 40 years of technical experience. We guarantee to manufacture a consistent, high quality formulation and give excellent after-sales support, including the items below which are available on request or as downloads at www.monsanto-ag.co.uk.

Public Information Leaflets –

- n A pocket sized leaflet for operatives to use with the general public when explaining about Roundup ProVantage

Spray Notification Poster –

- n For use in areas prior to spraying

Fact Sheets on –

- n Paddock care
- n Calibration of knapsack sprayer
- n COSHH notes
- n Weedwipers
- n Disposal
- n Stump Treatment

Hand Held Sprayer Guide –

- n Quick reference for spray rates

User Guide –

- n General overview of use of Roundup ProVantage

Regulatory Items –

- n Environmental Impact Assessment, Spray record form, COSHH record form

Briefing Notes on –

- n Rhododendron
- n Giant Hogweed
- n Japanese Knotweed
- n Himalayan Balsam
- n Nettles
- n Ground Elder
- n Common Ragwort
- n Bracken
- n Horsetail
- n Tough Herbaceous & Woody Weeds
- n Bamboo
- n Bindweed
- n Duckweed
- n Hemlock Water Dropwort
- n Ivy
- n Thistles
- n Buddleja
- n Tree of Heaven
- n Rosebay Willowherb

For any technical queries contact our Technical Helpline on 01954 717575
or email: technical.helpline.uk@monsanto.com
web: www.monsanto-ag.co.uk
includes free downloads of literature, Fact Sheets and other relevant information.

Monsanto UK Ltd. PO Box 663, Cambridge CB1 0LD.

Roundup is a registered trademark of Monsanto LLC. USE HERBICIDES SAFELY. ALWAYS READ THE LABEL AND PRODUCT INFORMATION BEFORE USE.

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The logo graphic consists of two overlapping semi-circular shapes. The top shape is orange and the bottom shape is green, both with a white outline.

Roundup[®]
Pro Vantage