



- Rainfast in 1 hour for annuals and 4 hours for perennials
- Ensures the maximum amount of glyphosate gets to the roots
- Provides the opportunity to take advantage of weather windows



- Superior performance in challenging conditions
- Improved reliability, even in hot and dry or cool and dry weather conditions
- Helps make the most of weather windows

**Source: Monsanto trials, St Louis 2011*



- Less risk of drift *
- Reduces the risk of bystander exposure
- Reduces risk of damage to neighbouring plantings
- Reduces the risk of direct contamination of surface water

**Silsoe Spray Application Unit study (2010)*



- Minimum waste
- No need to triple rinse
- Less packaging to dispose of

Roundup[®] POWERMAX

Quick guide to weed control



New Improved Dry Formulation

New Improved Dry Formulation

MONSANTO



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Crop specific information

Roundup PowerMax is a water soluble granule containing 72% w.w glyphosate, present as 79.2% w.w ammonium salt of glyphosate. Roundup PowerMax (MAPP No. 16373) is not classified under the DPD or CLP packing regulations and carries no hazard symbols or icons.

Compliance with the following conditions of use is a legal requirement

Crops/situations	Maximum individual dose (kg product/ ha):	Maximum total dose (kg product/ ha/crop)	Latest time of application:
Winter wheat, winter barley, winter oats, spring wheat, spring barley, spring oats, durum wheat, combining peas, field beans <i>Pre-harvest</i>	2.0	2.0	7 days before harvest
Oilseed rape and linseed <i>Pre-harvest</i>	2.0	2.0	14 days before harvest
Mustard <i>Pre-harvest</i>	2.0	2.0	8 days before harvest
Winter wheat, winter barley, winter oats, spring wheat, spring barley, spring oats, durum wheat, oilseed rape, potatoes, vining and combining peas, field beans, mustard, linseed, sugar beet, swedes, turnips, bulb and salad onions, leeks. <i>Post plant pre-emergence</i>	0.75	0.75	Pre-emergence
Asparagus <i>Post plant pre-emergence</i>	2.5	2.5	Pre-emergence
All edible crops (stubble) All non-edible crops (stubble) <i>Stubbles and pre-plant</i>	2.5 or 0.75	2.5 or 1.5	For perennials: 5 days before drilling or planting of the following crop For annuals: 2 days before drilling or planting or 6 hours before cultivating
All edible and non-edible crops <i>Destruction, before sowing/planting</i>	2.5	-	-
Green cover on land not being used for crop production.	3.0	3.0	24 hours before cultivating
Natural surfaces not intended to bear vegetation, permeable surfaces overlying soil.	2.5	-	-
Hard surfaces	2.5	-	-
Apple and pear orchards	2.5	2.5	After harvest (post leaf fall) but before green cluster stage
Cherry, plum and damson orchards	2.5	2.5	After harvest (post leaf fall) but before white bud stage
Vineyards (table and wine grapes)	2.5	2.5	28 days before harvest
Aquatic (Enclosed waters and land immediately adjacent to aquatic areas)	3.0	3.0	
Grassland	3.0	3.0	5 days before harvest, grazing or drilling' in the latest time of application

NB. Each line in the table represents a new situation and where more than one situation occurs for the same crop it can be sprayed once for each situation. For example in winter wheat up to 0.75kg/ha can be applied after planting but before emergence, another maximum of 2.0kg/ha before harvest and up to 2.5kg/ha in the autumn on the stubbles after harvest but before drilling of the following crop.

Pre-harvest

Do not use on any crops where seed may be saved for re-sowing.

Pre-harvest rate and application guidance

	Roundup PowerMax rate kg/ha
Harvest management – cereals: Crop stems, leaves and annual grasses, Above annual broad-leaved weeds – Standard rate	0.5 0.75
Above plus difficult annual broad-leaved weeds – Annual Sow-thistle, Cut-leaved Cranesbill, Fat-hen, Orache, Fool's Parsley, Redshank, Pale Persicaria, Knotgrass and Black Bindweed	1.5
High weed density	1.5
Desiccation – oilseed rape, mustard and linseed: Desiccation plus control of annual weeds and medium levels of Common Couch	1.5
Weed control – peas and beans: (Unsuitable for crop desiccation) Control of annual weeds and low-medium levels of Common Couch	1.5
Weed control – Common Couch: Low levels of Common Couch (<25 shoots/m ²), cereals only	1.0
Medium levels of Common Couch (26–75 shoots/m ²)	1.5
High levels of Common Couch (>75 shoots/m ²)	2.0
Other perennials in all crops: Perennial broad-leaved weeds, other perennial grasses	2.0

Pre-harvest application guidance

Application details	Water volume oilseed rape All other crops Droplet size (BCPC definition)	100-250l/ha 80-250l/ha Medium-coarse
Harvest intervals	Cereals, peas, beans Oilseed rape Linseed Mustard	7+ days 14-28 days 14-21 days 8-10 days
Rainfastness	Annuals (lower figure relates to grasses and seedling blw)	1-4 hours
	Perennials – Common Couch – Other perennials	1 hour 4 hours
Timing	GS BBCH89 Grain/seed moisture 30% or less (see page 7 and 8)	

Timing – cereals



The penduncle test

When the penduncle, situated at the top of the stalk, immediately below the ear, starts to lose its green colour and turns brown, the moisture level should be ideal for spraying.

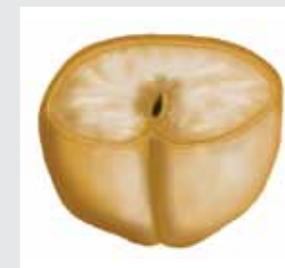
This test applies to wheat and barley.



The Thumbnail test

Collect 20 grains from various areas in the crop (taken from the centre of each ear). Carry out the following test: press the thumbnail firmly into the grain; if the indentation holds on all the grains, the crop is ready for spraying.

This test applies to wheat, barley and oats.



The split grain test

Cut the grains in half to confirm moisture content. If 75% of the grains have a dark brown pigment strand in the crease, as illustrated, the grain has reached 30% moisture. If all the grains are marked, moisture is less than 30%.

This test applies only to wheat.

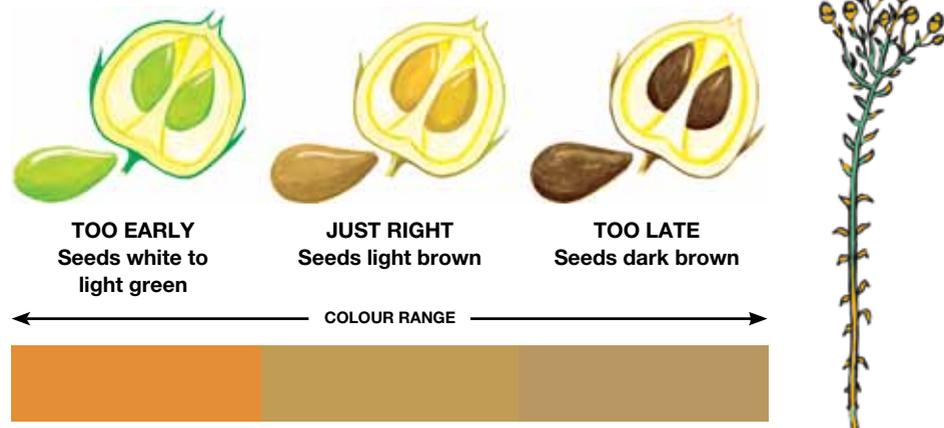
Timing – oilseed rape



1. Select an area of the crop which is representative of the maturity of the majority of the crop. This may be pods in the middle of the main raceme or on side branches depending on the canopy. Pick, at random, total of 20 pods.
2. Open each pod. If a colour change from green to brown is seen in at least two thirds* of the seeds per pod in at least 15 of the pods picked, the earliest correct stage for spraying has been reached.
3. Repeat the procedure in other areas of the crop to check that the assessment is applicable to the entire field. Spray within 4 days, unless the weather is very cool, then the window can be extended to 7 days.
4. An interval of 14-21 days is necessary before combine harvesting.

* If approximately half of the seeds are turning brown, the crop should be ready to spray in 3 days, but repeat the procedure to check that the correct stage has been reached. N.B. Spraying too early will lead to poor desiccation.

Timing – Linseed



- 1) Linseed grown for oil production should be desiccated at the brown capsule stage. Seeds are light brown and rubbery, lower leaves are withered but the upper leaves and stem are still green/yellow.
- 2) Confirm by sampling 40 seeds from four representative points in the field and at least 24 should be in the mid range.
- 3) An interval of 21-28 days is necessary before combine harvesting.

Timing – Peas and Beans

- 1) Crops may be treated when the average moisture of the seeds is below 30%. At this stage pods of both crops will be mature.
- 2) In peas, the lower and middle pods will be dry and brown and the upper pods yellow and wrinkled, and seed rubbery. In beans, the stems are usually green/brown and the pods are black.
- 3) A minimum interval of 7 days should be allowed before combining

Grassland renewal

Where permanent pasture may be classed as semi-natural areas, e.g. hay meadows, they may be subject to the Environmental Assessment Regulations, 2006. If in doubt consult Natural England before destroying permanent pasture. For spot treatment of grassland weeds see page 10.

Situation	Roundup PowerMax rate l/ha	Application timing and guidance
Short rotation Rye-grass	1.5	Treat either before grazing/mowing with annual weeds in June –October, when growth is 30–60cm, not dense and lacking mature seeds, or after 3 weeks re-growth after grazing/mowing.
Leys 2–4 years old with perennial grass weeds	2.0	Only direct drill grass and clover either into 1- to 2-year leys without mat, 5+ days after spraying, or long leys with some mat, in the spring following autumn application.
Long leys 4–7 years old with perennial broad-leaved weeds	2.5	Select the application rate which controls/destroys the least susceptible weed and grass species present in the sward from the grassland species table.
Permanent pasture	3.0	Treated grass can be utilised as normal for grazing or conservation. For perennial broad-leaved weeds apply at the start of flowering but before seed is set. Provided seeds have not matured, treated seeds will be killed and will ensure minimum seed return.

Grassland species

Roundup PowerMax rate kg/ha	Grassland weed species		
1.5	Annual Meadow-grass Common Chickweed Common Mouse-ear Dock seedlings	Italian Rye-grass Mayweed species Meadow Fescue Meadow Foxtail	Rough Meadow-grass Speedwell species Timothy
2.0	Black-bent Broad-leaved Dock Cock's-foot Common Bent	Common Couch Creeping Bent Creeping Soft-grass Curled Dock	Perennial Rye-grass Plantains Soft Brome Yorkshire Fog
2.5	Bracken* Common Sorrel Common Nettle Creeping Buttercup Creeping Thistle	Daisy Dwarf Thistle Perennial Sow-thistle Red Clover Sedges	Sheep's Sorrel Soft Rush Spear Thistle Tufted Hairgrass Yarrow
3.0	Common Ragwort Hard Rush Heath Rush Jointed Rush	Molinia (Purple Moor-grass) Nardus (Mat grass) Red Fescue	White Clover† Yellow Rattle Sheep's Fescue

* At full frond expansion, † White Clover is best cut in June and sprayed 1 month later.

Grassland application guidance

Application details	Water volume Droplet size (BCPC definition)	150–250l/ha Medium–coarse
Grazing/Cultivation intervals	Annuals Perennials	6 hours 5 days
Rainfastness	Annuals (lower figure relates to grasses and seedling blw)	1–4 hours
	Perennials – Common Couch – Other perennials	1 hour 4 hours

Important Note:

Poisonous weeds (including Ragwort, Hemlock, Hogweed, Water Dropwort and Bracken) can become palatable as they die back after treatment and must be removed or allowed to completely degenerate before re-grazing or conserving.

Stubbles and cultivated land

Species susceptibility guide for annuals in stubble and cultivated land

Weed	Weed size and other comments	Roundup PowerMax application rate kg/ha
Annual grasses: Volunteer cereals, annual grasses, Black-grass, Bromes, Meadow grasses, Wild-oats	Spray prior to stem elongation	0.75
Perennial grasses Common Couch 1-75 shoots/m ² Common Couch >75 shoots/m ² Other Perennial grasses	Minimum of 10-15cm of new growth	1.5 2.0 2.0
Most annual broad-leaved species: Charlock, Cleavers, Common Chickweed, Common Fumitory, Common Orache, Common Poppy, Dead Nettles, Fat-hen	Up to 15cm	0.75
Forget-me-not, Field Pansy, Groundsel, Mayweeds, Parsley Piert, Shepherd's Purse, Speedwells	Greater than 15cm	1.0
'Tough' annual broad-leaved species: Black Bindweed, Knotgrass, Pale Persicaria, Redshank, Small Nettle	Up to 2 true leaves 3 true leaves to 15cm Greater than 15cm	0.75 1.0 1.5
Volunteer oilseed rape	Up to 6 true leaves Greater than 6 true leaves	0.75 1.5
Volunteer peas/beans, clover species –	These species are not well controlled unless small and non waxed. Control in the following crop may be necessary, especially if no further cultivations take place.	1.5
All perennial broad-leaved weeds Including volunteer potatoes (autumn only)		2.5
Post sowing but Pre-emergence of crop Cereals, oilseed rape, mustard, linseed, peas, field beans, sugar beet, turnip, onion & leek	Tank mix as appropriate	0.75

Stubbles and Cultivated land application guidance

Application details	Water volume Droplet size (BCPC definition)	80–250l/ha Medium–coarse
Harvest intervals	Annuals Couch Other perennials	6 hours 2 days 5 days
Rainfastness	Annuals (lower figure relates to grasses and seedling blw)	1-4 hours
	Perennials – Common Couch – Other perennials	1 hour 4 hours

Perennials

Allow volunteer potatoes to make ample top-growth before spraying in autumn.

Perennials: Allow at least 21 days of new growth in the spring before spraying. Only partial control of perennials will be obtained in the spring.

Stale seedbeds

Cultivate top down to conserve moisture and consolidate well. Wait 10–20 days for weed growth. Cultivate immediately after harvest for Barren Brome or Great Brome, Black-grass, Meadow-grasses, Wild-oats and cereal volunteers, but **wait for volunteer oilseed rape stubbles to green up** and leave 1 month before creating a stale seedbed for Meadow Brome, Soft Brome and Rye Brome. To maximise out of crop control of resistant annual grasses, encourage several flushes of seedlings and spray with the annual rate up to a maximum total dose of 2.5kg/ha.

Tank mixes physically compatible with Roundup PowerMax

The following mixes have been tested in the laboratory for physical compatibility with 0.75kg/ha of Roundup PowerMax in 100l water/ha. Information is provided for information only and does not constitute a Monsanto recommendation.

All tank mixes should be sprayed out immediately. Maintain constant agitation

Physically compatible	Incompatible
2,4 D**; Absolute; Afalon; Bacara; Basagran SG; Blazer; Buckler; Butisan S/Rapsan; Butisan S +Centium/Cirrus; Cadou Star; Centium/Cirrus; Chikara; Crystal; Defy; Defy+Stomp 400; DuplosanKV,(mecoprop)**; Dursban/Crossfire; Dursban WG*; Elk/KatamaranTurbo; Fiesta T; Firebird; Flexidor 125; Flight/Orient*; Gamit; Goltix WDG; Graduate; Hurricane; KerbFlo; Lexus; Lexus+Firebird; Lexus+Liberator; Liberator; Liberator+Defy; Liberator+Hurricane; Lingo; Linuron500; MCPA**; Metric*; Movon; Movon+Defy; Nimbus CS/CentiumPlus; Nirvana; Nirvana+Cirrus; Oryx; PDM330; PDM330+Centium; PicoPro/Picono*; Shark; Skirmish; Springbok+Centium; Springbok; Stomp400; Stomp400+Cirrus; Stomp Aqua; Sumimax/Guillotine; Teridox; Vigon; Vigon+Defy; Vigon+Lexus; Vigon+PicoPro; Vigon+Stomp Aqua	Carbetamide, chloridazon and mixes, Stomp400 in mixes with Liberator and Lexus, Omex suspension fertiliser, Goltix Flowable, Lexus +Crystal, metazachlor+quinmerac, metribuzin and mixes

*Use minimum of 200 litres water per hectare

** Antagonism when used at high rates.

Aquatic

Roundup PowerMax does not have any environmental hazard classification and is ideally suited for the control of aquatic weeds. Users must have permission from the Environment Agency (or equivalent in Scotland, Wales and Northern Ireland) before use in or near water. Roundup PowerMax can be used to control floating weeds in aquatic areas and emerged weeds in and on the banks of watercourses.

More details can be obtained from the Technical Helpline on 01954 717575 or e-mail technical.helpline.

uk@monsanto.com

Aquatic area	Target weed	Rate per hectare	Water volume	Comments
Enclosed waters (ie ponds or reservoirs which do not drain to a watercourse)	Emerged weeds: reeds, rushes, sedges, grasses and watercress.	2.5	200-400 l/ha	Apply to floating weeds between mid June and mid August.
Open waters (i.e. rivers streams & ditches which drain to a watercourse)	Floating weeds: white lilies; yellow lilies.	3.0		Apply to reeds between mid August and mid – September
Land immediately adjacent to aquatic areas (the bank of the waterbody)				NB Roundup PowerMax will not control submerged weeds.

Hard surfaces

Roundup PowerMax can be used on non-cropped areas around the farm. Non-Porous or hard surfaces may only be spot treated by targeted or spot application. Approved formulations of flazasulfuron may be mixed with Roundup PowerMax on permeable surfaces only to give season-long weed control.

Area of use	Examples	Comments	Target Weeds	Rate Kg/ha	Water volume
Natural surfaces not intended to bear vegetation, permeable surfaces overlying soil, around the farm	Including farmyards and roads, paths and along fences	Do not use under polythene or glass.	Annual weeds	0.75	Hydraulic sprayers (boom and knapsack) at water volumes 80-400 l/ha
Hard surfaces, around the farm	Including non-porous concrete or Tarmac farm yards, roads, paths and alongside walls	Apply this product carefully. Ensure spraying takes place only when weeds are actively growing (normally March to October) and is confined only to visible weeds including those in the 30cm swath covering the kerb edge and road gully – do not overspray drains. Do not use under polythene or glass.	Perennial grasses and broad-leaved weeds	2.0-2.5	

Roundup PowerMax can also be used in orchards, inter-row in vineyards, pre-emergence of asparagus or vegetation on non-cropped and to destroy any crop. For details of these recommendations see product label.

Application methods for selective weed control

Knapsack Sprayers; A full 20l knapsack sprayer with standard deflector nozzles giving 200l/ha output will cover 1,000m² when walking at 1m/sec. Use 12g/l water or 250g/20l water to control perennial weeds. At least 10-15cm of new growth is required.

Weed Wiping; Weeds must be >10cm taller and the wiper >5cm higher than desired vegetation.

Wipe dense populations twice, in opposite directions

- **Hectacare or Microwipe rope types:** 180g/l water or 120g/l in hot dry conditions
- **New generation types** e.g. rotary, carpet, brush or pressure pads: 1kg/20l – 1kg/40l water

Conditioning hard water

The activity of glyphosate can be reduced in hard water areas where dissolved calcium, Magnesium and other cations bind with the glyphosate. Where a water quality issue is diagnosed the problem can be overcome by the addition of a proprietary water conditioner.



- Hazard-free classification
- Low drift formulation

For further information contact the
Monsanto Technical Helpline on 01954 717575,
e-mail technical.helpline.uk@monsanto.com
or visit our website: www.monsanto-ag.co.uk



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