Always read the label for full instructions. The information and recommendations set out in this brochure are based on tests and data believed to be reliable at the time of publication. Results may vary, as the use and application of the products is beyond our control and may be subject to climatic, geographical or biological variables, and/or developed resistance. Any product referred to in this brochure must be used strictly as directed, and in accordance with all instructions appearing on the label for that product and in other applicable reference material. So far as it is lawfully able to do so, Bayer CropScience Pty Ltd accepts no liability or responsibility for loss or damage arising from failure to follow such directions and instructions.

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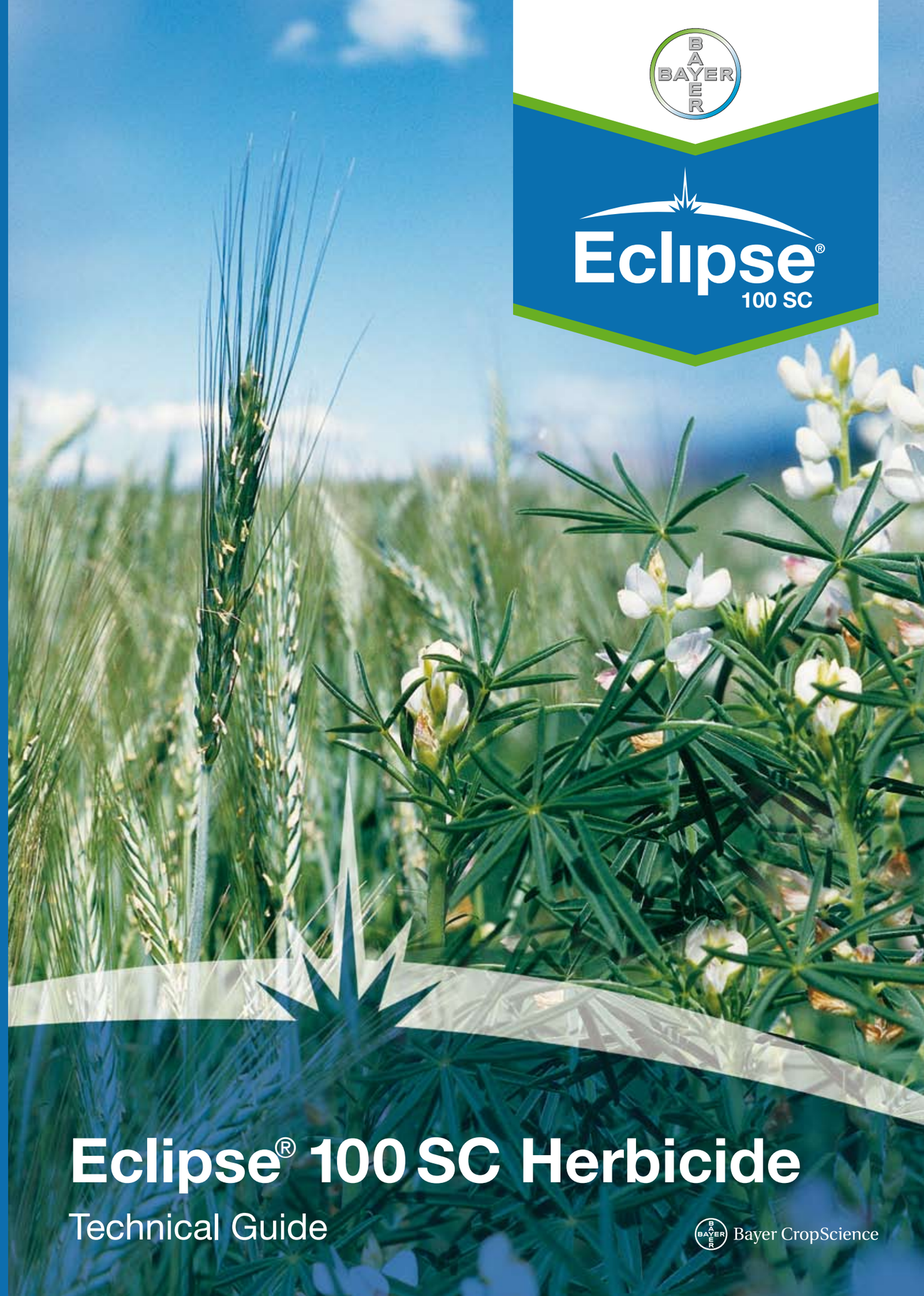


Eclipse® 100 SC

Eclipse® 100 SC Herbicide

Technical Guide

Bayer CropScience

Index

Introduction

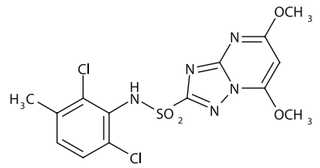
Our technical guides are designed to provide technical information to key advisors within the broadacre industry. Experience has shown that the information contained within the guide must not just recognise the product attributes in isolation but how they impact and integrate into farming practice. It is this principle that will ensure that these technical guides remain a valuable information source.

Eclipse® is a herbicide which controls a range of key broadleaf weeds in lupins and cereals. Eclipse enables growers to control larger wild radish plants in lupin crops, and has the flexibility to be used alone or in combination with other broadleaf herbicides in cereals.

Eclipse® is a herbicide which controls a range of key broadleaf weeds in lupins and cereals.

Product formulation

The active constituent

Common name:	Metosulam
Chemical name (IUPAC):	2‘,6‘-dichloro-5,7- dimethoxy[1,2,4] triazolo[1,5-a] pyridimidine-2-sulfon-m-toluidine (ISO)
Chemical name (CAS):	[1,2,4]triazolo[1,5-a]pyrimidine- 2- sulfonamide, N-(2,6-dichloro-3-methylphenyl)-5,7-dimethoxy
Chemical class:	Triazolopyrimidines (Sulfonamides)
Molecular formula:	$C_{14}H_{13}Cl_2N_5O_4S$
Structural formula:	
Molecular weight:	418.3 g/mol
Appearance:	Cream to tan powder
Odour:	Slight garlic
Melting point:	210 - 211.5° C
Solubility in water at 20°C:	pH 5 0.001 g/L
Solubility at 20°C in organic solvents:	Acetone 0.0078 g/L
Vapour pressure:	4 x 10^{-10} mPa at 20° C
Partition co-efficient:	log K_{OW} at 20°C: pH 5 2.12

The product

Tradename:	Eclipse 100 SC Herbicide
Formulation:	Suspension concentrate (SC)
Active ingredient content:	100 g/L metosulam
Appearance:	White to beige liquid
Odour:	Weak characteristic
Storage stability:	At least 2 years when stored according to label directions
Flammability:	Not flammable
Chemical properties:	Not corrosive, not explosive
Poison schedule:	Schedule 6
Dangerous goods classification:	Not classified as a Dangerous good for transport by road or rail.

Toxicological properties of metosulam

Parameter	Species	Result
Oral LD_{50}	rat	> 5000 mg/kg
Dermal LD_{50}	rabbit	> 2000 mg/kg
Eye irritation	rabbit	Slight irritant

Formulation

Eclipse is now produced as a 100 g/L suspension concentrate formulation.

Eclipse 100 SC is available in 3 litre and 5 litre containers.

The rate of application per hectare is a factor of seven times greater than for the previous WG formulation ie:

- 5 g/ha of the old formulation equals 35 mL/ha of Eclipse 100 SC
- 7 g/ha of the old formulation equals 50 mL/ha of Eclipse 100 SC
- 10 g/ha of the old formulation equals 70 mL/ha of Eclipse 100 SC

An Eclipse 100 SC measuring jug will ensure that your application rates are accurate.

Biological properties

Mode of action

Metosulam, the active ingredient in Eclipse, is a triazolopyrimidine sulfonanilide herbicide and is classified as a Group B herbicide. Eclipse inhibits the enzyme acetolactate synthase (ALS), which is essential for the conversion of pyruvate and alpha-ketobutyrate into the branched-chain amino acids valine, leucine and iso-leucine. This reduction in the levels of amino acids disrupts protein synthesis, which is essential for normal cell division and plant growth.

The relative susceptibility of plants to Eclipse is almost entirely attributable to the rate of metabolism, but absorption and translocation can also influence susceptibility. Acetolactate synthase is not present in man and other animals, which helps to explain the low toxicity of the triazolopyrimidine sulfonanilides. Eclipse is rapidly absorbed by the roots and foliage of plants, and translocated in both the xylem and phloem tissue. This movement allows herbicidal action to occur at the growing points in both the shoots and roots. Initial symptoms include the immediate cessation of plant growth and yellowing of the foliage. After a period of 1–2 weeks, the weed foliage becomes brittle and chlorosis of the leaf tissue occurs. Under Australian winter field conditions, maximum herbicide effects normally take between six and eight weeks to occur.

Resistant weeds warning

GROUP B HERBICIDE

Eclipse is a member of the triazolopyrimidine sulfonanilide group of herbicides, and acts by inhibiting ALS. For weed resistance management, Eclipse is a Group B herbicide. Some naturally occuring weed biotypes which are resistant to Eclipse, and other herbicides which inhibit ALS, may exist through normal genetic variability in any weed population. The resistant individuals can eventually dominate the weed population if these herbicides are used repeatedly. These resistant weeds will not be controlled by Eclipse. Since the occurrence of resistant weeds is difficult to detect prior to use, Bayer CropScience Pty Ltd accepts no liability for any losses that may result from the failure of Eclipse to control resistant weeds.

Unlike the current sulfonylurea and imidazolinone herbicides in the market, Eclipse at label rates (and even up to four times label rates) applies no selection pressure on annual ryegrass as determined by visual mortality and dry weight measurements. It would be predicted that Eclipse should cause minimal selection pressure for the development of resistance to ALS-inhibiting herbicides in annual ryegrass *(L. rigidum)* populations when applied at the recommended application rates.

Eclipse can therefore be used in both the lupin and cereal cropping phases without contributing to annual ryegrass resistance.

Strategies to minimise the risk of herbicide resistance are available at the CropLife Australia website, www.croplifeaustralia.org.au or contact your farm chemical supplier, consultant, local Department of Agriculture, or local Bayer CropScience representative.

Effects on flora and fauna

Birds
Metosulam is practically non-toxic to birds when used as directed, with the 4-day dietary LC50 being greater than 5260 ppm, and the No Observed Effect Level for reproduction 1000 ppm. No hazard to birds from consumption of grain from Eclipse-treated crops is expected.

Bees
Metosulam is not hazardous to terrestrial invertebrates and can be classified as relatively non-toxic to bees when used as directed.

Earthworms and micro-organisms
Metosulam does not interfere with the processes of short-term respiration and nitrogen mineralisation in soil, and therefore does not pose a significant risk to soil micro-organisms. Metosulam does not demonstrate any significant toxicity to earthworms when used as directed.

Aquatic organisms
Metosulam is practically non-toxic to freshwater fish and crustacea when used as directed. The acute toxicity (LC50) is greater than 100 mg/L. Although metosulam is extremely toxic to freshwater algae, its low application rate means the amounts likely to enter aquatic systems should be insufficient to produce toxic effects. Metosulam is also practically non-toxic to marine fish and crustacea, and only slightly toxic to shellfish when used as directed. No significant hazard to aquatic organisms is expected from the use of metosulam. The potential for damage to algae is moderated by the use pattern.
Eclipse is a slightly acidic, (pKa = 4.8) water-soluble herbicide (0.2 g/L at pH 7) which adsorbs to humic and clay particles. Following application, Eclipse is expected to become associated mainly with the soil fraction and susceptible to microbial breakdown.

Environmental fate

Degradation rates and routes
No hydrolysis or photolysis occurs. The principal route for degradation appears to be aerobic microbial degradation in soil solution. Degradation proceeds more readily in soil with a high level of organic matter. Degradation appears to slow in soils high in clay because binding to clay particles reduces the availability of Eclipse to microbes. The half-life under field conditions ranges from 6 to 47 days. The half-life is lowest when microbial activity is greatest.

Mobility
Although the organic carbon partition coefficient (Koc) values suggest potential for moderate mobility (particularly in sandy soils), field-test results have shown Eclipse to be relatively immobile. Leaching studies show Eclipse is retained in the top 15 cm of sandy clay and humic soils, and the top 30 cm of sandy loams. Low application rates and the existence of microbial degradation pathways mean that significant residues are unlikely to occur in deeper soil profiles or groundwater.

Accumulation in soils and aquatic systems
The low octanol-water partition coefficient (Kow=1) of Eclipse indicates that aquatic bio-accumulation is not likely to occur. In water, metosulam degrades slowly, with an average aerobic half-life of eighty-four days and an anaerobic half-life of ninety days. Since Eclipse should only be applied once a year, degrades relatively quickly, has moderate mobility, and adsorbs to humic and clay particles, no accumulation in the soil is expected. This lack of accumulation is confirmed by field dissipation studies.

Plant-back periods for rotational crops

Susceptible crops – which include canola or any other brassica crops, medics, sub-clover, lucerne, faba beans and field peas – can be safely sown nine months after the use of Eclipse.

Tank-cleaning recommendations

Eclipse is a flexible herbicide that can be used in both cereals and lupins, provided the correct decontamination procedures for other herbicides have been followed. To avoid damage to sensitive crops (e.g.: canola, field peas, beans, medics, sub-clover, lucerne and various summer crops) sprayed after the use of Eclipse in cereals or lupins, the following procedures of washing, rinsing and decontamination should be followed:

A. Wash
After using Eclipse, empty the tank completely and drain the whole system. Thoroughly wash inside the tank using a pressure hose, drain the tank and clean tank, pump, line and nozzle filters.

B. Rinse
After cleaning the tank as above, quarter-fill the tank with clean water and circulate (preferably with agitation) through the pump, lines, hoses and nozzles. Drain and repeat the rinsing procedure twice.

C. Decontaminate
Quarter fill the tank and add a liquid alkali detergent (e.g. Surf®, Omo®, Drive®) at a rate of 500 mL/100 L of water and circulate throughout the system for at least fifteen minutes. Drain the whole system, then remove filters and nozzles and clean them seperately. Finally flush the system with clean water and allow to drain.

Rinse water should be discharged onto a designated disposal area, or if this is unavailable, onto unused land away from desirable plants and their roots and water courses.

Use of surfactants / spraying oils

Cereals
Eclipse should always be applied with an adjuvant to achieve the best weed control. The most effective adjuvants are Uptake or D-C-Trate Advance at 500 mL/100 L or D-C-Trate used at 1 L/100 L. Alternatively, a non-ionic surfactant such as BS-1000 at 100 mL/100 L should be used.

Lupins
DO NOT use Eclipse with any adjuvants.

Withholding period

Harvest
CEREALS AND LUPINS: The use pattern of Eclipse is such that the recommendation of a withholding period is not necessary.

Grazing
DO NOT GRAZE OR CUT FOR STOCK FOOD BEFORE THE FOLLOWING PERIODS AFTER APPLICATION:

CEREALS: 14 DAYS

LUPINS: 4 WEEKS

When using Eclipse in combination with another pesticide it is important to comply with all products' withholding periods.

Application recommendations

Ground
Apply Eclipse in sufficient water to obtain good coverage. It should be applied by an accurately calibrated sprayer delivering 200–300 micron droplets. Recommended water volumes are 50–100 L/ha. Use the higher water volume in dense crops where the weeds may be shielded by the crop canopy. The adjuvants recommendation for Eclipse must be followed to maximise efficacy.

Aerial
DO NOT apply Eclipse by aircraft.

Rainfastness
Eclipse is rainfast within two hours of application.

Mixtures

When tank-mixing Eclipse with other herbicides, wettable powder formulations or water-dispersible granules should be added to a half-filled spray tank first, followed by suspension concentrates (such as Eclipse) or flowables, water-soluble salts, then emulsifiable concentrate formulations, and finally surfactants or crop oils, where recommended.

Cereals

Compatibility

Eclipse is highly compatible and may often be applied in tank-mixtures with other herbicides to broaden the spectrum of weed control. When Eclipse is used in tank-mixture with another herbicide, application windows, adjuvants and any restrictions relating to the use of that herbicide must be observed. When mixing Eclipse with another herbicide, the adjuvant recommendation for the partner herbicide should be used. If no surfactant, wetter or crop oil is recommended, then Eclipse should be applied at 50 mL/ha with a non-ionic wetter/surfactant at 100 mL/100 L water.

Trial data has indicated that Eclipse is compatible with the following products in cereals:

Broadleaf herbicides:	2,4-D amine (except where doublegee (spiny emex) is present), Ally®, Bromoxynil, Buctril® MA, Diuron (except where Indian hedge mustard is present), Flowable Igran® 500 SC Liquid Herbicide, Jaguar®, Lontrel®, Lontrel/MCPA LVE (except where doublegee (spiny emex) is present), MCPA amine (except where doublegee (spiny emex) is present), MCPA LVE, Starane® 200, Tigrex®, Tordon® 75-D
Grass herbicides:	Achieve®, Hoegrass® 500, Wildcat® 110 EC, Topik®, Tristar® Advance, Cheetah® Gold

Note: Some crop yellowing can be expected with Ally, diuron or Igran mixtures and crop oils should not be used with these products.

Eclipse has been found to be physically compatible with the following products in cereals:

Fungicides	Folicur® 430 SC, Prosaro® 420 SC, triadimefon 125 EC
Insecticides	Le-mat®
Follar nutrients	Twin zinc

Note that "physical compatibility" indicates the product has been found to mix satisfactorily and remains stable when mixed. Whilst these tests have been carried out it is important to note that product formulations can change at any time. For this reason, a jar test (small quantities mixed in the correct proportions with water) should be carried out to confirm physical compatability before any of the above products are tank mixed in large quantities.

Crop effects

A significant number of varieties have been tested in weed-free screens and found to be tolerant to Eclipse. The crop normally shows no symptoms, but occasionally a transitory yellowing with slightly reduced crop height can occur. The varieties Goldmark, Silverstar and H45 have demonstrated a greater level of crop yellowing and 'top-hatting' (see page 10). This however does not lead to any reduction in yield. Eclipse should not be applied to Cadoux wheat.

Application under stress conditions

Under adverse conditions such as multiple frosts, trials have shown that there are some wheat variety sensitivities, particularly when Eclipse is tank-mixed with other broadleaf herbicides (MCPA LVE or Lontrel). Some varieties (Ouyen, Janz, Kellalac, Frame, Camm and Yitpi) showed no increased sensitivity to the mixture.Yellowing and reductions in crop height indicated that Diamondbird, Silverstar, Mira, Meering, Rosella and Krichauff were moderately affected by the mixture.Goldmark and Chara were severely or very severely affected. As a result of these findings, the Eclipse label clearly states that it is not to be applied under conditions of stress, including frost or drought.

'Top-hatting'

Besides crop yellowing and some height reduction, treatment of wheat can occasionally result in symptoms known as 'top-hatting': the loss of leaves which capture the emerging shoot gives crops a triangular, 'hatted' appearance. Varieties like Goldmark and Silverstar, which are lighter in appearance, are more prone to yellowing after spraying. None of these symptoms have been associated with yield loss.

Several important factors have been identified as likely risk factors for 'top-hatting': wheat variety, crop growth stage, the use of adjuvants and/or herbicide mixtures, and environmental conditions.

Varieties

Eclipse alone and mixed with other herbicides has been widely used since launch in 1994, and shown excellent crop selectivity across varieties and years. However, Cadoux wheat is not listed on the Eclipse label for safe use in WA. Goldmark and Silverstar have both exhibited 'top-hatting' issues to varying degrees in isolated paddocks in some seasons, but no loss of yield has been recorded. More recent experience has shown that the variety H45 is also sensitive to the 'top-hatting' effect.

Growth stage

Detailed analysis of glasshouse trials has shown that wheat varieties may be more sensitive at the early crop stages. A trial in 1994 on Cadoux wheat showed that Eclipse applied at 3-leaf produced more 'top-hatting' than when the same treatments were applied at the 1-tiller growth stage.

Adjuvants

A trial included adjuvants such as Agral 600, Uptake® and LI700®. More 'top-hatting' was observed where Eclipse was applied with Agral 600 or Uptake. 'Top-hatting' was reduced when LI700 was used with either Agral 600 or Uptake and Eclipse.

Mixtures

Eclipse mixed with Ally resulted in higher levels of 'top-hatting'. Where possible this mix should be avoided to reduce the risks of crop yellowing and 'top-hatting', and as part of Group B herbicide resistance management.

Environment

Detailed European research was undertaken in 1994 to determine the effect of temperature and the rate of Eclipse on the incidence of 'top-hatting'. Eclipse at rates of 10 mL/ha, 50 mL/ha, 100 mL/ha and 200 mL/ha was applied to wheat at the 2.5-leaf stage, and these plants were kept in controlled temperature cabinets at 26ºC/14ºC, 20ºC/11ºC, 14ºC/8ºC and 8ºC/5ºC day/night temperature regimes. 'Top-hatting' increased in the most sensitive variety as the rate increased, but plateaued at the 100 mL/ha and 200 mL/ha Eclipse rates. The highest level of 'top-hatting' occurred under the 20ºC/11ºC temperature regime. Further European field experience has shown that the worst cases of 'top-hatting' occur when there is rapid crop growth through a spell of cold nights and hot days (Thompson, pers. comm. 1999). There were also obvious differences in varietal sensitivity in these trials. Goldmark and Silverstar appear to be the most sensitive varieties in Australia, but (despite the appearance of symptoms) no apparent yield reductions have been observed in trials.

Summary

Extensive research has shown that wheat variety, crop growth stage, adjuvant use, herbicide mixing and environmental conditions may all play a role in the appearance of 'top-hatting' and other crop effects. There has been no reported yield reduction of sensitive varieties in herbicide tolerance trials to date. If the cosmetic effect of 'top-hatting' is an issue, growers can use the information in this guide to choose the most appropriate weed-control option.

There has been no reported yield reduction of sensitive varieties in herbicide tolerance trials to date.

Cereals

Crop safety

Side by side trials in wheat, comparing Eclipse 100 SC versus the original fomulation, Eclipse 714 WG were conducted across southern Australia.

i. Biomass reduction
In wild radish efficacy trials it was found that, when used with adjuvant or with adjuvant plus MCPA LVE, all crop biomass reductions recorded for Eclipse 100 SC were negligible, being similar or less than those recorded for the same metosulam rate applied as Eclipse WG. When mixed with Ally a herbicide which regularly causes crop biomass reduction, one trial 07WB10 had slight crop biomass reduction (rating 15) from Eclipse WG plus Ally plus adjuvant and a marginal increase where Ally was mixed with Eclipse 100 SC plus adjuvant (rating 20). This effect was transient having declined 16 days later.

ii. Crop discoloration
Discoloration was nil or very low from Eclipse 100 SC alone or in tank-mixture, and was similar or less than that recorded for Eclipse WG at the same rate of metosulam.

iii. Grain yields
Only one trial was harvested, 07WA23. This was a high yielding site with yields of 3.44 to 3.95 t/ha where weeds were controlled. At this site, there was a significant yield response to metosulam application but no significant difference in grain yield when the two formulations were compared at the same metosulam rate.

In summary, Eclipse 100 SC had either similar selectivity or better selectivity than Eclipse WG at the same rate of metosulam.

Conclusion
The trials conducted demonstrate that Eclipse 100 SC is equivalent to or better than Eclipse WG in relation to crop selectivity. The equivalent Eclipse 100 SC rate can be substituted for the effective Eclipse WG rate when used alone, with adjuvant or in mixture with other pesticides.

Use of adjuvants

For application in cereals always apply Eclipse with a crop oil or wetting agent, except where specified in the *Directions for Use* table. The most effective adjuvants are Uptake or D-C-Trate® Advance at 500 mL/100 L or D-C-Trate® at 1 L/100 L water. Alternatively, a non-ionic surfactant such as BS 1000® at 100 mL/100 L water can be used. Consult the *Directions for Use* tables for details.

When mixing with a compatible herbicide, use the adjuvant specified on the label of that particular herbicide. If mixing Eclipse with another herbicide and no surfactant is recommended, then Eclipse should be used at 50 mL/ha with a non-ionic wetter at 100 mL/100 L water.

Efficacy

Trials have demonstrated excellent control of brassicas weeds (wild radish, wild turnip, turnip weed, Indian hedge mustard, ball mustard and volunteer canola) and good suppression (50–70% biomass reduction) of many other broadleaf weeds, including capeweed, doublegee, bedstraw, volunteer peas, medics and sub-clover. Weed control is most effective on small, actively growing weeds, and for best results a recommended adjuvant should be used.

Eclipse is highly compatible with many broadleaf and grass herbicides and these mixtures can offer one-pass weed control in cereals.

Directions for use

Restraints

DO NOT apply to crops or weeds which may be stressed (inactive growth) due to prolonged periods of extreme cold, moisture stress (water-logging or drought), previous herbicide treatment, insect damage or disease, as crop damage or reduced levels of control may result.

DO NOT spray if rain is likely to occur within two hours.
DO NOT apply Eclipse to Cadoux wheat as unacceptable crop injury may occur.

TABLE 1 - Eclipse post-emergence in WESTERN AUSTRALIA only.

Crop	Crop growth stage	Weeds controlled	Weed growth stage	Rate (mL/ha)	Critical comments
Wheat Barley Oats Rye Triticale	2-leaf to 1st node (Zadoks 12-31)	Wild radish	Up to 4-leaf and up to 12 cm diameter	35 mL	35 mL/ha should only be used on low to moderate (less than 100 plants/m2) populations and where there is good crop competition. Apply with Uptake Spraying Oil, D-C-Trate Advance at 500 mL/100 L water or D-C-Trate spraying oil at 1 L/100 L water.
		Hedge mustard, Indian hedge mustard, Turnip weed, Volunteer canola, Wild radish, Wild turnip, Yellow burrweed	Up to 8-leaf and up to 15 cm diameter	50 mL	Apply with Uptake, D-C-Trate Advance or D-C-Trate at rates as above.If the weed population is less than 100 plants/m2 and crop competition is good, a non-ionic wetter such as BS-1000 at 100 mL/100 L water can be used instead of Uptake or D-C-Trate. ①Eclipse will give useful suppression of these weeds.
		Subterranean clover ①	Up to 6-trifoliate		
		Volunteer medics ①	Up to 5-leaf		
		Volunteer peas ①	Up to 7-node		
		Capeweed ①	2 to 10-leaf and up to 10 cm diameter		
		Doublegee ①	2 to 6-leaf and up to 10 cm diameter		
		Capeweed	Up to 5 cm diameter	35 mL Eclipse + 75 mL/ha Lontrel Herbicide	For control of capeweed: Lontrel at 75 mL/ha must be added together with Uptake, D-C-Trate Advance or D-C-Trate at rates as above.
	3-leaf to 1st node (Zadoks 13–31)		Up to 5 cm diameter	35 mL Eclipse + 300 mL/ha Buctril MA (bromoxynil /MCPA)	For control of capeweed: Buctril MA must be added together with Uptake, D-C-Trate Advance or D-C-Trate at rates as above.
	3-leaf to 1st node (Zadoks 13–31)	Doublegee	Up to 1-leaf (5 cm max. diameter)	35 mL Eclipse + 300 mL/ha Buctril MA (bromoxynil / MCPA)	For control of doublegee: Buctril MA must be added together with Uptake, D-C-Trate Advance or D-C-Trate at rates as above. DO NOT exceed doublegee growth stage.
Wheat Barley Rye Triticale (Not oats)			Up to 3-leaf (10 cm max. diameter)	35 mL Eclipse + 3 g/ha metsulfuron-methyl (600 g/kg)	When Eclipse and metsulfuron-methyl are tank-mixed together, a non-ionic wetter such as BS-1000 at 100 mL/100 L water must be added. DO NOT add a crop oil. DO NOT use metsulfuron-methyl on oats.

TABLE 2 - Eclipse + partner herbicide post-emergence in cereals in States as specified.

Crop	Crop growth stage	Weeds controlled	Weed growth stage	Rate (mL/ha)	State	Critical comments
Wheat Barley Oats Rye Triticale	3-leaf to 1st node (Zadoks 13–31)	Wild radish	Up to 8-leaf and 15 cm diameter	35-50 mL Eclipse + 350 - 500 mL/ha MCPA LVE (500 g/L)	All states	Apply with Uptake at 500 mL/100 L water or a non-ionic wetter such as BS-1000 at 100 mL/100 L water. ①**DO NOT** use less than 50 mL/ha Eclipse on yellow burrweed or bedstraw. (S) Good suppression of bedstraw will be achieved with this mixture, however to ensure bedstraw control, add Starane 200 at 1 L/ha or Buctril MA at 500 to 700 mL/ha. Use the higher rates of Eclipse + MCPA LVE where the weed populations are high or growing conditions are less than ideal.
		Bedstraw(S) ① Hedge mustard Indian hedge mustard Muskweed Turnip weed Wild turnip Volunteer canola Yellow burrweed ①			Qld, NSW, ACT, Vic, SA and WA only	
		Ball mustard	Up to 6-leaf		SA only	
		Above weeds plus		35-50 mL Eclipse + 350 - 500 mL/ha MCPA LVE (500 g/L) + 100 mL/ha Lontrel Herbicide	NSW, ACT, Vic, SA and WA only	**Note:** On larger weeds refer to the Lontrel and MCPA ester labels. ②Eclipse has little effect on lupins, thistles or safflower. Control is by the companion herbicides. (S) ③See Lontrel label for thistles suppressed by this mixture. Refer to Lontrel label if control of thistles is desired. Apply with Uptake or a non-ionic wetter such as BS-1000 at rates as above.
		Capeweed	Up to 4-leaf			
		Chickpeas	Up to 4-branch, 10 cm tall			
		Faba beans	Up to 4-node, 10 cm tall			
		Lupins ②	Up to 6-leaf, 10 cm tall			
		Safflower ②	Up to 5-leaf, 10 cm tall			
		Thistles (S) ②③	Up to 10 cm diam.			
		Volunteer medics	Up to 6-leaf, 5 cm diam.			
		Volunteer peas	Up to 6-nodes			
		Volunteer sub-clover	Up to 5-trifoliate, 5 cm diam.			
		Volunteer vetch	Up to 4-branch, 10 cm diam.			
		Above weeds plus		35-50 mL Eclipse + 500 - 700 mL/ha Buctril MA (bromoxynil/ MCPA) + 100 mL/ha Lontrel Herbicide	NSW, ACT, Vic, and SA only	Apply with Uptake or a non-ionic wetter such as BS-1000 at rates as above. ④To control bedstraw and sheepweed only, use 35-50 mL/ha Eclipse + 500–700 mL/ha Buctril MA. ⑤Eclipse has little effect on prickly lettuce. Control is by the companion herbicide. Use the higher rates of Eclipse + Buctril MA where the weed populations are high or growing conditions are less than ideal. Note: On larger weeds refer to Lontrel and Buctril MA labels
		Bedstraw ④	Up to 4-whorl, 5 cm diam.			
		Prickly lettuce ⑤	Up to 6-leaf, 10 cm diam.			
		Sheepweed ④	Up to 4-leaf, 5 cm diam.			

TABLE 3 - Eclipse alone post-emergence in States (other than Western Australia) as specified.

Crop	Crop growth stage	Weeds controlled	Weed growth stage	Rate mL/ha	State	Critical comments
Wheat Barley Oats Rye Triticale	2-leaf to 1st node (Zadoks 12–31)	Turnip weed	Up to 4-leaf and up to 12 cm diameter	35 mL	Qld, NSW, ACT only	35 mL/ha should only be used on low to moderate (less than 100 plants/m^2) populations and where there is good crop competition. Apply with Uptake, D-C-Trate Advance at 500 mL/100 L water or D-C-Trate at 1 L/100 L water.
		Hedge mustard Indian hedge mustard Turnip weed Volunteer canola Wild radish Wild turnip Yellow burrweed	Up to 8-leaf and up to 15 cm diameter	50 mL	Qld, NSW, ACT, Vic and SA only	Apply with Uptake or D-C-Trate at rates as above. If the weed population is less than 100 plants/m2 and crop competition is good, a non-ionic wetter such as BS-1000 at 100 mL/100 L water can be used instead of Uptake or D-C-Trate. ①Eclipse will give useful suppression of these weeds.
		Ball mustard	Up to 6-leaf		SA only	
		Volunteer medics ①	Up to 5-leaf		Qld, NSW, ACT, Vic and SA only	
		Volunteer peas ①	Up to 7-node			
		Subterranean clover ①	Up to 6-trifoliate			
		Threehorn bedstraw ①	Up to 4-whorl		Vic and SA only	

TABLE 4 - Eclipse + Glyphosate pre-plant to cereals in States as specified.

Crop	Crop growth stage	Weeds controlled	Weed growth stage	Rate mL/ha	State	Critical comments
Wheat Barley Oats Rye Triticale	Fallow, pre-sowing	Wild radish	Up to 7-leaf or up to 20 cm diameter	21 mL Eclipse + 600 - 800 mL/ha glyphosate (450 g/L)	WA only ①	①For Western Australia the rate of the glyphosate used will determine the rate of Eclipse required. Use Uptake at 500 mL/100 L water or BS-1000 at 200 mL/100 L water where Eclipse is tank-mixed with glyphosate for control of all weeds on this label. Read the glyphosate label and follow the instructions on it relating to intervals between application and planting, use of wetters/ surfactants and control of weeds other than those present on this Eclipse label. ②These rates should assist in control of doublegee.
				35 mL Eclipse + 400 - 800 mL/ha glyphosate (450 g/L)	NSW, ACT, Qld, SA, Vic and WA only①	
		Doublegee (Spiny emex)	Up to 4-leaf and up to 10 cm diameter	21-35 mL Eclipse + 400 - 600 mL/ha glyphosate (450 g/L)	WA only ②	
		Hoary cress	Up to 10-leaf and up to 10 cm diameter	35 mL Eclipse + 400 - 800 mL/ha glyphosate (450 g/L)	Vic only	
		Turnip weed	Up to 10-leaf and up to 40 cm diameter	35 mL Eclipse + 600 - 800 mL/ha glyphosate (450 g/L)	NSW, ACT, Qld, SA, WA and Vic only	
		Wild turnip	Up to 8-leaf or up to 15 cm diameter			
		Volunteer clovers and medics	Up to 4-leaf and up to 5 cm diameter			

Weed Susceptibility - Western Australia

POST-EMERGENCE SUSCEPTIBILITY OF KEY WEEDS IN WESTERN AUSTRALIAN CEREALS (weed sizes as specified in the Directions for use table of the relevant product). The details presented in the table below have been compiled from trial data and field observations. This information is intended as a guide only and cannot account for all in-field parameters. Refer to the Eclipse and tank-mix partner label for comprehensive details on use recommendations.

		Eclipse at 50 mL/ha in tank mix with:								
Broadleaf Weeds	**Eclipse alone at 50 mL/ha**	**Lontrel**	**Diuron (4)(5)**	**Ally (5)**	**Buctril MA**	**MCPA LVE (3)**	**Wildcat (1)**	**Hoegrass© (1)**	**Tristar Advance (1)**	**Achieve (1)(2)**
Capeweed *(Arctotheca calendula)*	••	••••	••••	••	••••	•••	••	••	••	••
Doublegee *(Emex australis)*	••	••	•••	••••	•••	NR	••	••	••	••
Indian hedge mustard *(Sisymbrium orientale)*	•••	•••	NR	••••	••••	••••	•••	•••	•••	•••
Turnip weed *(Rapistrum rugosum)*	••••	••••	••••	••••	••••	••••	••••	••••	••••	••••
Volunteer canola *(Brassica* spp.*)*	••••	••••	••••	••••	••••	••••	••••	••••	••••	••••
Volunteer lupins *(Lupinus* spp.*)*	NA	••	••	••••	•••	•••	NA	NA	NA	NA
Volunteer medics *(Medicago* spp.*)*	••	••••	•••	••••	•••	•••	••	••	••	••
Volunteer peas *(Pisum sativum)*	••	••••	•••	••••	•••	•••	••	••	••	••
Volunteer sub-clover *(Trifolium* spp.*)*	••	••••	•••	••••	•••	•••	••	••	••	••
Wild radish *(Raphanus raphanistrum)*	••••	••••	••••	••••	••••	••••	••••	••••	••••	••••
Wild turnip *(Brassica tournefortii)*	•••	•••	•••	••••	••••	••••	•••	•••	•••	•••
Yellow burr weed *(Amsinckia calycina)*	•••	•••	•••	•••	••••	•••	•••	•••	•••	•••
Grassweeds										
Ryegrass *(Lolium rigidum)*	NA	NA	NA	NA	NA	NA	•	••••	••••	•••
Wild oats *(Avena* spp.*)*	NA	NA	NA	NA	NA	NA	••••	•••	•••	NA
Crop timing Observe application window restrictions of tank-mix partner	2-leaf up to jointing	2-leaf up to jointing	3–5 leaf	3-leaf +	3-leaf up to jointing	5-leaf +	2–5 leaf wheat	2–4 leaf wheat 4–5 leaf barley	2-leaf to 2-tiller wheat	3–6 leaf wheat & barley
Surfactant or adjuvant addition	Best activity from: 1 L/100 L D-C-Trate or 500 mL/ 100 L Uptake or 100 mL/100 L non-ionic surfactant	Adjuvant/crop oil recommendations applicable to the tank-mix partner must be observed but note recommendations to optimise ECLIPSE activity may not be desirable with tank-mix partner. However, 50 mL/ha with surfactant system recommended for partner will provide good weed control.								

(1) The full label rate of the grass herbicide should be used, and these mixes may not yet be on grass herbicide labels.
(2) This mixture may be less selective to the crop than the other grass herbicides.
(3) MCPA amine can also be used.
(4) Diuron is not as selective as other partners and some crop yellowing can be expected.
(5) DO NOT use crop oils in these mixtures.

Key:
- NR = Not recommended
- NA = No useful activity
- • = Poor activity
- •• = Suppression
- ••• = Good control
- •••• = Excellent control
- Optimal weed control option

Weed Susceptibility - Queensland

POST-EMERGENCE SUSCEPTIBILITY OF KEY WEEDS IN QUEENSLAND CEREALS (weed sizes as specified in the Directions for use table of the relevant product). The details presented in the table below have been compiled from trial data and field observations. This information is intended as a guide only and cannot account for all in-field parameters. Refer to the Eclipse and tank-mix partner label for comprehensive details on use recommendations.

		Eclipse at 50 mL/ha in tank-mix with:								
Broadleaf Weeds	**Eclipse alone at 50 mL/ha**	**Lontrel**	**Ally (3)**	**Bromoxynil**	**Buctril MA**	**MCPA LVE (1)**	**Igran (2)(3)**	**Lontrel/ MCPA**	**Tordon 75-D)**	**Starane**
Climbing buckwheat *(Polygonum convulvulus)*	•	NR	••	NR	NR	NR	••	NR	••••	••••
Deadnettle *(Lamium amplexicaule)*	•	NR	••••	••	••	•	•••	•	NR	••
Doublegee *(Emex australis)*	••	••	••••	•	•••	NR	••	••	NR	••
Hedge mustard *(Sisymbrium officinale)*	•••	•••	••••	•••	••••	••••	•••	••••	•••	•••
Indian hedge mustard *(Sisymbrium orientale)*	•••	•••	••••	•••	••••	••••	•••	••••	•••	•••
Prickly lettuce *(Lactuca serriola)*	NA	••	•••	•	••	•••	•	••••	•••	•••
Saffron thistle *(Carthamus lanatus)*	NA	••••	NR	••	•••	•••	•	••••	•••	NR
Sowthistle *(Sonchus oleraceus)*	•	••	•••	•	••	•••	•	••••	•••	•••
Annual thistles	NA	•••	NR	••	•••	•••	•	••••	NR	NR
Turnip weed *(Rapistrum rugosum)*	••••	••••	••••	••••	••••	••••	••••	••••	••••	NR
Variegated thistle *(Silybum marianum)*	NA	•••	NR	••	•••	•••	•	••••	•••	NR
Volunteer canola	••••	••••	••••	••••	••••	••••	••••	••••	NR	NR
Volunteer medics	••	••••	••••	••	•••	•••	••	••••	NR	NR
Wild radish *(Raphanus raphanistrum)*	••••	••••	••••	••••	••••	••••	••••	••••	••••	••••
Wireweed *(Polygonum* spp.*)*	NA	NR	•••	•••	•••	•	•	•	•••	•
Crop timing Observe application window restrictions of tank-mix partner	2-leaf up to jointing	2-leaf up to jointing	3–5 leaf	3-leaf +	3-leaf up to jointing	5-leaf + to flag leaf	3–5 leaf	5-leaf + to flag leaf	3–4 tiller up to lag leaf	4-leaf up to jointing
Surfactant or adjuvant addition	Best activity from: 1 L/100 L D-C-Trate or 500 mL/100 L Uptake or 100 mL/ 100 L non-ionic surfactant	Adjuvant/crop oil recommendations applicable to the tank-mix partner must be observed but note recommendations to optimise ECLIPSE activity may not be desirable with tank-mix partner. However, 50 mL/ha with surfactant system recommended for partner will provide good weed control.								

(1) MCPA amine can also be used.
(2) Unacceptable crop damage may sometimes occur with this mixture.
(3) Do not use crop oils in these mixtures.

Weed Susceptibility - New South Wales

POST-EMERGENCE SUSCEPTIBILITY OF KEY WEEDS IN NEW SOUTH WALES CEREALS (weed sizes as specified in the Directions for use table of the relevant product).

The details presented in the table below have been compiled from trial data and field observations. This information is intended as a guide only and cannot account for all in-field parameters. Refer to the Eclipse and tank-mix partner label for comprehensive details on use recommendations.

		Eclipse at 50 mL/ha in tank-mix with:								
Broadleaf Weeds	**Eclipse Alone at 50 mL/ha**	Lontrel	Ally (6)	Bromoxynil	Buctril MA	MCPA LVE (1)	Igran® (2)(3)	Lontrel/ MCPA	Tordon® 75-D)	Starane®
Capeweed *(Arctotheca calendula)*	••	••••	••	••••	••••	••	••••	••••	NR	NR
Charlock *(Sinapis tarvensis)*	•••	•••	••••	••	••••	••••	•••	••••	••••	•••
Climbing buckwheat *(Polygonum convulvulus)*	•	NR	••	NR	NR	NR	••	NR	••••	••••
Deadnettle *(Lamium amplexicaule)*	•	NR	••••	••	••	•	•••	•	NR	••
Doublegee/Spiny emex *(Emex australis)*	••	••	••••	•	•••	NR	••	••	NR	NR
Fumitory *(Fumaria* spp.*)*	NA	•	•••	•••	••••	•••	•••	•••	NR	NR
Hedge mustard *(Sisymbrium officinale)*	•••	•••	••••	•••	••••	••••	••••	••••	••••	•••
Indian hedge mustard *(Sisymbrium orientale)*	•••	•••	••••	•••	••••	••••	••••	••••	NR	NR
Paterson's curse *(Echium plantagineum)*	•••	•••	••••	•••	••••	••••	•••	•••	NR	NR
Prickly Lettuce *(Lactuca serriola)*	NA	••	•••	•	••	•••	NA	••••	•••	•••
Saffron thistle *(Carthamus lanatus)*	NA	••••	NR	••	•••	•••	NR	••••	•••	NR
Sheepweed/Corn gromwell *(Lithospermum arvense)*	•	•	••	•••	••••(5)	••	••••	••	NR	NR
Shepherd's purse *(Capsella bursa-pastoris)*	•••	•••	•••	•••	••••	••••	•••	••••	•••	•••
Skeleton weed *(Chondrilla juncea)*	NA	•••	•	NR	•	••	NR	••••	NR	NR
Sorrel *(Rumex acetosella)*	•	•	••••	•	•	•	•	•	NR	••
Soursob *(Oxalis pes-caprae)*	NA	NA	••••	•	••	•	•	•	NR	•
Sowthistle *(Sonchus oleraceus)*	•	••	•••	•	••	•••	NR	••••	•••	•••
Crop timing Observe application window restrictions of tank-mix partner	2-leaf up to jointing	2-leaf up to jointing	3 leaf +	3-leaf up to jointing	3-leaf up to jointing	5-leaf up to flag leaf	3–5 leaf	5-leaf up to flag leaf	3–4 tiller up to jointing	4-leaf up to jointing
Surfactant or adjuvant addition	Best activity from: 1 L/100 L D-C-Trate or 500 mL/ 100 L Uptake	Adjuvant/crop oil recommendations applicable to the tank-mix partner must be observed but note recommendations to optimise ECLIPSE activity may not be desirable with tank-mix partner. However, 50 mL/ha with surfactant system recommended for partner will provide good weed control.								
	or 100 mL/ 100 L non-ionic surfactant									

Weed Susceptibility - New South Wales (continued)

		Eclipse at 50 mL/ha in tank-mix with:								
Broadleaf Weeds	**Eclipse alone at 50 mL/ha**	Lontrel	Ally (6)	Bromoxynil	Buctril MA	MCPA LVE (1)	Igran® (2)(6)	Lontrel/ MCPA	Tordon® 75-D)	Starane®
Annual thistles	NA	•••	NR	••	•••	•••	•	••••	NR	NR
Toadrush *(Juncus bufonius)*	•	•	•	•	•	•	•••	•	NR	NR
Turnip weed *(Rapistrum rugosum*	••••	••••	••••	••••	••••	••••	••••	••••	••••	NR
Variegated thistle *(Silybum marianum)*	NA	•••	NR	••	•••	•••	•	••••	•••	NR
Vetch (Tares) *(Vicia* spp.*)*	••	••••	••••	•	•••	•••	•••	••••	NR	NR
Volunteer canola	••••	••••	••••	••••	••••	••••	••••	••••	NR	NR
Volunteer lupins	NA	••	••••	••	•••	•••	NR	•••	NR	NR
Volunteer medics	••	••••	••••	••	•••	•••	••	••••	NR	NR
Volunteer peas	••	••••	••••	••	•••	•••	•••	••••	NR	NR
Volunteer sub-clover	••	••••	••••	••	•••	•••	•••	••••	NR	NR
Wild turnip *(Brassica tournefortii)*	•••	•••	••••	••••	••••	••••	•••	••••	NR	NR
Wild radish *(Raphanus raphanistrum)*	••••	••••	••••	••••	••••	••••	••••	••••	••••	••••
Wireweed/Tree hogweed *(Polygonum* spp.*)*	NA	NR	•••(4)	•••	•••(4)	•	•	•	•••(3)	•••
Yellow burrweed *(Amsinckia calycina)*	•••	•••	••••	•••	••••	•••	••••	•••	NR	NR
Crop timing Observe application window restrictions of tank-mix partner	2-leaf up to jointing	2-leaf till jointing	3 leaf +	3-leaf till jointing	3-leaf till jointing	5-leaf up to flag leaf	3–5 leaf	5-leaf up to flag leaf	3–4 tiller till jointing	4-leaf till jointing
Surfactant or adjuvant addition	Best activity from: 1 L/100 L D-C-Trate or 500 mL/ 100 L Uptake	Adjuvant/crop oil recommendations applicable to the tank-mix partner must be observed but note recommendations to optimise ECLIPSE activity may not be desirable with tank-mix partner. However, 50 mL/ha with surfactant system recommended for partner will provide good weed control.								
	or 100 mL/ 100 L non-ionic surfactant									

(1) MCPA amine can also be used.
(2) Unacceptable crop damage may sometimes occur with this mixture.
(3) Northern agricultural areas.
(4) Southern agricultural areas.
(5) If greater than 4-leaf suggest Igran, but see (2).
(6) DO NOT use crop oil in these mixtures.

Key:
- NR = Not recommended
- NA = No useful activity
- • = Poor activity
- •• = Suppression
- ••• = Good control
- •••• = Excellent control
- Optimal weed control option

Weed Susceptibility - Victoria

POST-EMERGENCE SUSCEPTIBILITY OF KEY WEEDS IN VICTORIAN CEREALS (weed sizes as specified in the Directions for use table of the relevant product).

The details presented in the table below have been compiled from trial data and field observations. This information is intended as a guide only and cannot account for all in-field parameters. Refer to the Eclipse and tank-mix partner label for comprehensive details on use recommendations.

		Eclipse at 50 mL/ha in tank-mix with:						
Broadleaf Weeds	**Eclipse Alone at 50 mL/ha**	**Lontrel**	**Ally (4)**	**Bromoxynil**	**Buctril MA**	**MCPA LVE (1)**	**Igran® (2)(4)**	**Lontrel/ MCPA**
Capeweed *(Arctotheca calendula)*	••	••••	••	••••	••••	•••	••••	••••
Charlock *(Sinapis arvensis)*	•••	•••	••••	••	••••	••••	•••	••••
Deadnettle *(Lamium amplexicaule)*	•	NR	••••	••	••	•	••••	•
Doublegee *(Emex australis)*	••	••	••••	•••	••••	NR	•••	•••
Fumitory *(Fumaria* spp.*)*	NA	•	•••	•••	••••	•••	•••	•••
Hedge mustard *(Sisymbrium officinale)*	••••	•••	••••	•••	••••	••••	••••	••••
Indian hedge mustard *(Sisymbrium orientale)*	••••	•••	••••	•••	••••	••••	•••	••••
Prickly Lettuce *(Lactuca serriola)*	NA	••	•••	•	••	•••	NR	••••
Saffron thistle *(Carthamus lanatus)*	NA	••••	NR	••	•••	•••	NR	••••
Skeleton weed *(Chondrilla juncea)*	NA	•••	•	NR	•	••	NR	••••
Sorrel *(Rumex acetosella)*	•	•	••••	•	•	•	•	•
Soursob *(Oxalis pes-caprae)*	NA	NA	••••	•	••	•	•	•
Sowthistle *(Sonchus oleraceus)*	•	••	•••	•	••	•••	NR	••••
Annual thistles	NA	•••	NR	••	•••	•••	•	••••
Threehorn bedstraw *(Galium tricomutum)*	••	••	••	•	•••	•••	••	•••
Turnip weed (Rapistrum rugosum)	••••	••••	••••	••••	••••	••••	••••	••••
Crop timing Observe application window restrictions of tank-mix partner	2-leaf up to jointing	2-leaf up to jointing	3 leaf +	3-leaf up to jointing	3-leaf up to jointing	5-leaf up to flag leaf	3–5 leaf	5-leaf up to flag leaf
Surfactant or adjuvant addition	Best activity from: 1 L/100 L D-C-Trate or 500 mL/ 100 L Uptake	Adjuvant/crop oil recommendations applicable to the tank-mix partner must be observed but note recommendations to optimise ECLIPSE activity may not be desirable with tank-mix partner. However, 50 mL/ha with surfactant system recommended for partner will provide good weed control.						
	or 100 mL/ 100 L non-ionic surfactant							

Weed Susceptibility - Victoria (continued)

		Eclipse at 50 mL/ha in tank-mix with:						
Broadleaf Weeds	**Eclipse alone at 50 mL/ha**	**Lontrel**	**Ally (4)**	**Bromoxynil**	**Buctril MA**	**MCPA LVE (1)**	**Igran® (2)(4)**	**Lontrel/ MCPA**
Variegated thistle *(Silybum marianum)*	NA	•••	NR	••	•••	•••	NR	••••
Vetch (Tares) *(Vicia* spp.*)*	••	••••	••••	•	•••	•••	•••	••••
Volunteer canola	••••	••••	••••	••••	••••	••••	••••	••••
Volunteer lupins	NA	••	••••	••	•••	•••	NR	•••
Volunteer medics	••	••••	••••	••	•••	•••	••	••••
Volunteer peas	••	••••	••••	••	•••	•••	•••	••••
Volunteer sub-clover	••	••••	••••	••	•••	•••	•••	••••
White-iron weed *(Lithospermum arvense)*	••	••••	••••	•	•••• (3)	••	••••	••
Wild turnip *(Brassica tournefortii)*	••••	•••	••••	••••	••••	••••	•••	••••
Wild radish *(Raphanus raphanistrum)*	•••	•••	•••	•••	••••	••••	•••	••••
Wireweed/Tree hogweed *(Polygonum* spp.*)*	NA	NR	•••	•••	•••	•	•	•
Yellow burrweed (Amsinckia calycina)	•••	•••	••••	•••	••••	•••	••••	•••
Crop timing Observe application window restrictions of tank-mix partner	2-leaf up to jointing	2-leaf up to jointing	3 leaf +	3-leaf up till jointing	3-leaf up till jointing	5-leaf up to flag leaf	3–5 leaf	5-leaf up to flag leaf
Surfactant or adjuvant addition	Best activity from: 1 L/100 L D-C-Trate or 500 mL/ 100 L Uptake	Adjuvant/crop oil recommendations applicable to the tank-mix partner must be observed but note recommendations to optimise ECLIPSE activity may not be desirable with tank-mix partner. However, 50 mL/ha with surfactant system recommended for partner will provide good weed control.						
	or 100 mL/ 100 L non-ionic surfactant							

(1) MCPA amine can also be used.
(2) Unacceptable crop damage may sometimes occur with this mixture.
(3) If greater than 4-leaf suggest Igran, but see (2).
(4) DO NOT use crop oil in these mixtures.

Key:
- NR = Not recommended
- NA = No useful activity
- • = Poor activity
- •• = Suppression
- ••• = Good control
- •••• = Excellent control
- Optimal weed control option

Weed Susceptibility - South Australia

POST-EMERGENCE SUSCEPTIBILITY OF KEY WEEDS IN SOUTH AUSTRALIAN CEREALS (weed sizes as specified in the Directions for use table of the relevant product).

The details presented in the table below have been compiled from trial data and field observations. This information is intended as a guide only and cannot account for all in-field parameters. Refer to the Eclipse and tank-mix partner label for comprehensive details on use recommendations.

		Eclipse at 50 mL/ha in tank-mix with:						
Broadleaf Weeds	**Eclipse Alone at 50 mL/ha**	**Lontrel**	**Ally (4)**	**Bromoxynil**	**Buctril MA**	**MCPA LVE (1)**	**Igran® (2)(4)**	**Lontrel/ MCPA**
Ball mustard *(Neslia paniculata)*	●●●●	●●●●	●●●●	●●●●	●●●●	●●●●	●●●●	●●●●
Bifora *(Bifora testiculata)*	●	●	●	●●	●●	●●	●	●●
Cape weed *(Arctotheca calendula)*	●●	●●●●	●●	●●●●	●●●●	●●●	●●●●	●●●●
Charlock *(Sinapsis arvensis)*	●●●	●●●	●●●●	●●	●●●●	●●●●	●●●	●●●●
Deadnettle *(Lamium amplexicaule)*	●	NR	●●●●	●●	●●	●	●●●	●
Doublegee *(Emex australis)*	●●	●●	●●●●	●	●●●	NR	●●	●●
Fumitory *(Fumaria* spp.*)*	NA	●	●●●	●●●	●●●●	●●●	●●●	●●●
Hedge mustard *(Sisymbrium officinale)*	●●●	●●●	●●●●	●●●	●●●●	●●●●	●●●●	●●●●
Indian hedge mustard *(Sisymbrium orientale)*	●●●	●●●	●●●●	●●●	●●●●	●●●●	●●●	●●●●
Prickly lettuce *(Lactuca serriola)*	NA	●●	●●●	●	●●	●●●	NR	●●●●
Saffron thistle *(Carthamus lanatus)*	NA	●●●●	NR	●●	●●●	●●●	NR	●●●●
Sheep weed *(Lithospermum arvense)*	●	●	●●	●●●	●●●● (3)	●●	●●●●	●●
Skeleton weed *(Chondrilla juncea)*	NA	●●●	●	NR	●	●●	NR	●●●●
Sorrel *(Rumex acetosella)*	●	●	●●●●	●	●	●	●	●
Soursop *(Oxalis pes-caprae)*	NA	NA	●●●●	●	●●	●	●	●
Sowthistle *(Sonchus oleraceus)*	●	●●	●●●	●	●●	●●●	NR	●●●●
Annual thistles	NA	●●●	NR	●●	●●●	●●●	●	●●●●
Threehorn bedstraw *(Galium tricornutum)*	●●	●●	●●	●	●●●	●●●	●●	●●●
Turnip weed *(Rapistrum rugosum)*	●●●●	●●●●	●●●●	●●●●	●●●●	●●●●	●●●●	●●●●
Crop timing Observe application window restrictions of tank-mix partner	2-leaf up to jointing	2-leaf up to jointing	3 leaf +	3-leaf up to jointing	3-leaf up to jointing	5-leaf up to flag leaf	3–5 leaf	5-leaf up to flag leaf
Surfactant or adjuvant addition	Best activity from: 1 L/100 L D-C-Trate or 500 mL/ 100 L Uptake or 100 mL/ 100 L non-ionic surfactant	Adjuvant/crop oil recommendations applicable to the tank-mix partner must be observed but note recommendations to optimise ECLIPSE activity may not be desirable with tank-mix partner. However, 50 mL/ha with surfactant system recommended for partner will provide good weed control.						

Weed Susceptibility - South Australia (continued)

		Eclipse at 50 mL/ha in tank-mix with:						
Broadleaf Weeds	**Eclipse alone at 50 mL/ha**	**Lontrel**	**Ally (4)**	**Bromoxynil**	**Buctril MA**	**MCPA LVE (1)**	**Igran® (2)(4)**	**Lontrel/ MCPA**
Variegated thistle *(Silybum marianum)*	NA	●●●	NR	●●	●●●	●●●	●	●●●●
Vetch (Tares) *(Vicia* spp*)*	●●	●●●●	●●●●	●	●●●	●●●	●●●	●●●●
Volunteer canola	●●●●	●●●●	●●●●	●●●●	●●●●	●●●●	●●●●	●●●●
Volunteer lupins	NA	●●	●●●●	●●	●●●	●●●	NR	●●●
Volunteer medics	●●	●●●●	●●●●	●●	●●●	●●●	●●	●●●●
Volunteer peas	●●	●●●●	●●●●	●●	●●●	●●●	●●●	●●●●
Volunteer sub-clover	●●	●●●●	●●●●	●●	●●●	●●●	●●●	●●●●
Wild turnip *(Brassica tournefortii)*	●●●	●●●	●●●●	●●●●	●●●●	●●●●	●●●	●●●●
Wild radish *(Raphanus raphanistrum)*	●●●●	●●●●	●●●●	●●●●	●●●●	●●●●	●●●●	●●●●
Hogweed/wireweed *(Polygonum* spp.*)*	NA	NR	●●●	●●●	●●●	●	●●	●
Yellow burrweed *(Amsinckia calycina)*	●●●	●●●	●●●●	●●●	●●●●	●●●	●●●●	●●●
Crop timing Observe application window restrictions of tank-mix partner	2-leaf up to jointing	2-leaf up to jointing	3 leaf +	3-leaf up to jointing	3-leaf up to jointing	5-leaf up to flag leaf	3–5 leaf	5-leaf up to flag leaf
Surfactant or adjuvant addition	Best activity from: 1 L/100 L D-C-Trate or 500 mL/100 L Uptake or 100 mL/ 100 L non-ionic surfactant	Adjuvant/crop oil recommendations applicable to the tank-mix partner must be observed but note recommendations to optimise ECLIPSE activity may not be desirable with tank-mix partner. However, 50 mL/ha with surfactant system recommended for partner will provide good weed control.						

(1) MCPA amine can also be used.
(2) Unacceptable crop damage may sometimes occur with this mixture.
(3) If greater than 4-leaf suggest Igran, but see (2).
(4) DO NOT use crop oil in these mixtures.

Key:
- NR = Not recommended
- NA = No useful activity
- • = Poor activity
- •• = Suppression
- ••• = Good control
- •••• = Excellent control
- Optimal weed control option

Lupins
Compatibility

Eclipse is compatible with Brodal® Options in lupins.

Eclipse is physically compatible with the following products in lupins.

Broadleaf herbicides:	Sniper

Note that "physical compatibility" indicates the product has been found to mix satisfactorily and remains stable when mixed. Whilst these tests have been carried out it is important to note that product formulations can change at any time. For this reason, a jar test (small quantities mixed in the correct proportions with water) should be carried out to confirm physical compatability before any of the above products are tank mixed in large quantities.

Crop safety

Side by side trials in lupins, comparing Eclipse 100 SC versus the original formulation, Eclipse 714 WG were conducted across southern Australia.

The broadleaf crop lupin is more sensitive to metosulam than cereals, where Eclipse shows very good selectivity. Therefore weed free tolerance trials were conducted in lupins to evaluate the comparative crop safety of Eclipse 714 WG and Eclipse 100 SC.

i. Biomass reduction
In weed free trials, all crop biomass reductions recorded for Eclipse 100 SC were negligible, and in each case where some crop effect was seen from Eclipse WG, the effect of Eclipse 100 SC was less.
In wild radish efficacy trials, when applied alone Eclipse 100 SC produced a similar crop biomass reduction to Eclipse WG applied at the same metosulam rate. When applied with Brodal Options or Sniper, Eclipse 100 SC tended to increase biomass reduction compared with Eclipse WG, although this was transient and it remained commercially acceptable, with a maximum biomass reduction rating of 11.

ii. Crop discoloration
In weed free trials, all crop discoloration ratings recorded for Eclipse 100 SC were negligible, and in each case where some crop effect was seen from Eclipse WG, the effect of Eclipse 100 SC was less. The maximum discoloration rating recorded for Eclipse 100 SC or Eclipse 100 SC mixtures with Brodal Options was 6 compared to 20 for Eclipse WG.
In wild radish trials, all crop discoloration ratings recorded for Eclipse 100 SC were negligible with a maximum rating of 10, i.e. similar or less crop discoloration than the same metosulam rate applied as Eclipse WG.

iii. Grain yields
Eclipse 100 SC yields were not significantly different to Eclipse WG yields at the same rate of metosulam, with and without Brodal Options addition.

In summary, crop effects were recorded in lupins as expected. Eclipse 100 SC had either similar selectivity or better selectivity than Eclipse 714 WG at the same rate of metosulam.

Conclusion
The trials presented demonstrate that Eclipse 100 SC is equivalent to or better than Eclipse WG in relation to crop selectivity. The equivalent Eclipse 100 SC rate can be substituted for the effective Eclipse WG rate when used alone, or in mixture with other pesticides.

Use of adjuvants

For application in lupins DO NOT apply with crop oils, wetters, surfactants, insecticides or grass herbicides. If you need to apply insecticides and/or grass herbicides, allow at least ten days before or after Eclipse application.

Crop tolerance

Eclipse is registered for use in selected lupin varieties from the 8-leaf to the big bud stage in Western Australia and at the 2–12 leaf stage in New South Wales, Victoria, South Australia and the ACT.

In efficacy and crop tolerance trials it has been shown that a transitory crop yellowing may occur following Eclipse application, occasionally followed by slight stunting of the crop. This may sometimes result in a yield reduction.

To minimise the impact of Eclipse on lupins, the crop must be actively growing when Eclipse is applied. DO NOT spray lupins suffering from stress such as leaf disease, herbicide stress or insect attack.

The table below is based on crop tolerance compared with untreated crop, when Eclipse is applied at label rates to generally weed-free crops. It reflects applications at three crop development stages, across a range of lupin varieties.

Key:

No yield loss when used as directed
Varieties marked in green are those specifically recommended on the Eclipse label at the relevant growth stage. Note any warnings or limitations which may appear on the label with respect to these varieties. (see the label instructions on page 25 of this guide).

Some yield loss; generally <10%
Varieties marked in yellow require caution due to variable performance or limited data for a clear recommendation.

DO NOT apply Eclipse on these cultivars
Varieties marked in red should never be treated with Eclipse, as the results reflect regular yield depression or occasional excessive yield depression.

ID **Insufficient data (trials)**

nd **No data**

Cultivar	Recommended on labelled	2-8 leaf	8-12 leaf	>12 leaf to big bud
Andromeda		nd	ID (2)	
Belara		ID (1)	(14)	(12)
Coromup		nd	ID (3)	ID (1)
Danja	Yes (WA only)	ID (1)	(3)	ID (1)
Gungurru	Yes (WA only)	(4)	(7)	(3)
Jenabillup		nd	ID (1)	nd
Jindalee	Yes (Not WA)	nd	(6)	ID (2)
Kalya	Yes (WA only)	nd	(29)	(14)
Kiev Mutant	Yes (WA, NSW, VIC, SA, ACT)	nd	(17)	ID (2)
Luxor		nd	(3)	nd
Magna		nd	ID (1)	nd
Mandalup		nd	(9)	ID (3)
Merrit		(13)	(27)	(18)
Myalie		(4)	(22)	(8)
Pootallong		nd	ID (1)	nd
Quilinock	Yes (Not WA)	nd	(14)	(4)
Rosetta		nd	(3)	nd
Tallerack		nd	(13)	(6)
Tanjil	Yes (WA only)	ID (1)	(18)	(9)
Ultra		ID (2)	ID (2)	nd
Wodjil		nd	(10)	(3)
Wonga*	Yes (Not WA)	nd	(14)	nd

* DO NOT spray at or beyond the 8 leaf stage.

This table is intended as a guide only. For further information on other varieties contact Bayer CropScience.
(Brackets) indicate the number of trials conducted.

Lupins
Directions for use

Restraints

DO NOT apply to crops or weeds which may be stressed (inactive growth) due to prolonged periods of extreme cold, moisture stress (water-logging or drought), previous herbicide treatment, insect damage or disease, as crop damage or reduced levels of control may result.
DO NOT spray if rain is likely to occur within two hours.

TABLE 5 - Eclipse post-emergence in WESTERN AUSTRALIA only.

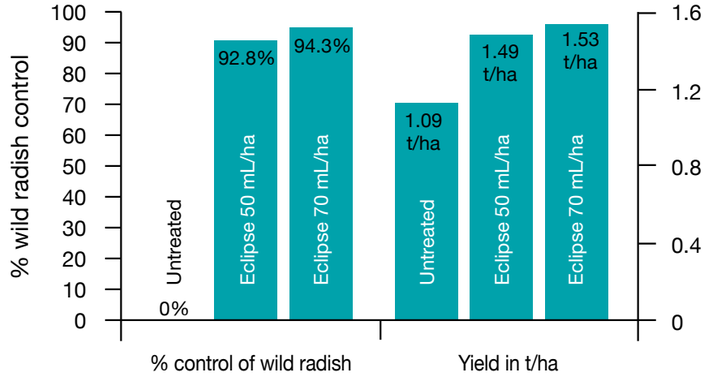
Crop	Crop growth stage	Weeds controlled	Weed growth stage	Rate (mL/ha)	Critical comments
Lupins Danja, Gungurru, Kalya, Kiev, and Tanjil varieties. *For information on other varieties contact Bayer CropScience*	Apply no earlier than the 8 leaf stage, and up to the appearance of the flower bud.	Wild radish	Up to 8 leaf and up to 20 cm diameter	50-70 mL	**Surfactants/oils and tank mixes:** Crop oils, wetters, surfactants, insecticides or grass herbicides should not be mixed with Eclipse for application to lupins as unacceptable crop damage may occur. **Rate:** Use 50 mL/ha when wild radish population is low (less than 100 plants/m2) and growing conditions are optimal. Where higher wild radish populations (greater than 100/m2) occur or crop competition is poor, 70 mL/ha should be used. **Timing:** Delay application of Eclipse until all successive major germinations have occurred, which is normally when the majority of the weeds are at the 8 leaf stage (20 cm diameter). A minimum of ten days should elapse between application of a grass herbicide and Eclipse. **Crop Tolerance:** Lupins should be actively growing at the time of treatment with no evidence of brown leaf spot or insect damage. A slight yellowing, often accompanied by height reduction, may be noticeable from 1-4 weeks after application, however these effects are generally transient. Avoid spraying double overlaps. For information on crop tolerance of lupin varieties not listed in the CROP column, consult Bayer CropScience. Eclipse causes severe damage to Luteus (Yellow) lupins eg. Wodjil variety.
Lupins Danja, Gungurru, Kalya, Kiev, and Tanjil varieties. *For information on other varieties contact Bayer CropScience*	Apply no earlier than the 8 leaf stage and before the start of primary flowering (big bud).	Wild radish	Up to 8 leaf stage and not more than 20 cm in diameter	50 mL Eclipse + 100 mL/ha Brodal® Options	Apply when weeds are actively growing. Good spray coverage of the weeds is important. Apply before weeds are obscured by the crop canopy. Control may be reduced where wild radish populations exceed 100 plants per m2. **DO NOT** add crop oils, wetters, surfactants, insecticides or grass herbicides as unacceptable crop damage may occur. A minimum of ten days should elapse between application of a grass herbicide and this mixture. Do not use this mixture where water hardness exceeds 500 ppm. Lupins should be actively growing at the time of treatment with no evidence of brown leaf spot or insect A slight yellowing, often accompanied by height reduction, may be noticeable from 1-4 weeks after application, however these effects are generally transient. Avoid spraying double overlaps.
		Cape weed *(Suppression only)*	Up to 6 leaf stage		

TABLE 6: Eclipse post-emergence in NSW, ACT, Vic and SA only.

Crop	Crop growth stage	Weeds controlled	Weed growth stage	Rate (mL/ha)	Critical comments
Jindalee, Kiev, Quilinock and Wonga* varieties For information on other varieties contact Bayer CropScience	2–12 leaf (except Wonga)*	Wild radish	Up to 8-leaf and up to 20 cm diameter	50 - 70 mL/ha	**Adhere to critical comments made in the table above (table 5)** Crop effects may be more pronounced in Jindalee, Quilinock and Wonga varieties when treated with the 70 mL/ha rate at the 2–6 leaf stage. Avoid spraying double overlaps. For information on crop tolerance of lupin varieties not listed in the CROP column, consult Bayer CropScience. ***Wonga variety only: DO NOT** spray at or beyond the 8-leaf stage. Crop damage and reduced yields may result. Eclipse causes severe damage to Luteus (Yellow) lupins, e.g. Wodjil variety.

Weed control in lupins

Eclipse provides effective control of wild radish in lupin crops. Eclipse is most useful in controlling large wild radish, which are difficult to control with Brodal® Options alone. The graph below illustrates the yield benefits of using Eclipse as well as demonstrating the effective control of wild radish.



GRAPH 4: Wild radish control with Eclipse and the resultant yield of lupin (mean of six trials in Western Australia)