

Devrinol

Best Use Guide for Winter Oilseed Rape



July 2015

www.upleurope.com



Devrinol Best Use Guide for OSR

DEVRIKOL is a selective systemic pre-emergence herbicide for the control of grass and broad-leaved weeds.

DEVRIKOL has long residual activity providing lasting control. This has been proven under a wide range of conditions whilst at the same time demonstrating excellent crop safety.

Product Profile

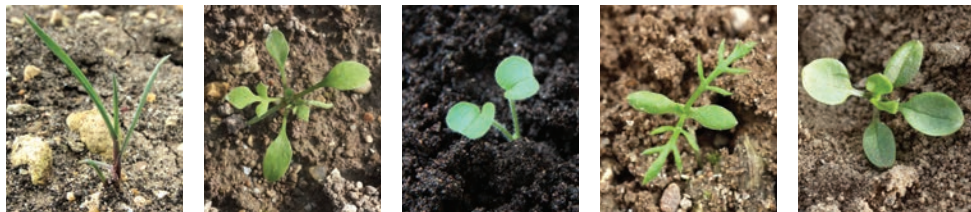
Brand	DEVRIKOL
MAPP number	09374
Active ingredient	450 g/l napropamide
Formulation	Suspension Concentrate (SC)
Label crops*	Winter oilseed rape, strawberries, blackcurrants, gooseberries, raspberries, broccoli, Brussels sprout, cabbage, calabrese, cauliflower, kale, field and container-grown trees and shrubs (See label for details at www.upleurope.com)
Pack size	5 litres
Target weeds	Annual grass and broad-leaved weeds

* Product also has Extensions of Authorisation

Mode of Action

DEVRIKOL works by being absorbed through the roots by acropetal translocation, then by inhibiting cell division DEVRIKOL prevents root development of susceptible weed species.

DEVRIKOL is classified by the Herbicide Resistance Action Committee (HRAC) as belonging to mode of action group K3.



DEVRIKOL has useful activity on black-grass, common field poppy, crane's-bill, mayweed and chickweed species.

Table 1: Herbicides commonly used in winter OSR - Updated July 2015

Example product	Active	Chemical family	HRAC group	MOA	LERAP	Maximum number of applications	Maximum individual dose	Maximum total dose	Timing	HI
Careca	500g propyzamide	benzamides	K1	Microtubule assembly inhibition	—	1	1.7 litres	NS	Apply from October up to 31 January in the year of harvest	42 days
Kerb Flo	400g propyzamide	benzamides	K1	Microtubule assembly inhibition	—	1	2.1 litres	NS	Apply from 1 October up to 31 January in the year of harvest	42 days
Crawler	60% w/w carbetamide	carbamates	K2	Inhibition of mitosis/ microtubule organisation	—	1	3.0kg	NS	Before beginning of stem elongation: no internodes (rosette) and before end of February in the year of harvest	NS
Butisan S ¹	500g metazachlor	chloroacetamides	K3	Inhibition of cell division	B	NS	1.5 litres per year	1.5 litres/ha	Before 9 or more true leaf stage (GS19)	NS
DEVRIKOL	450g napropamide	chloroacetamides	K3	Inhibition of cell division	—	1	2.8 litres	NS	Pre-emergence	NS
Teridox ²	500g dimethachlor	chloroacetamides	K3	Inhibition of cell division	10 metre aquatic buffer zone	1	2.0 litres	NS	Pre-emergence	NS
Avadex Excel 15G ³	15% w/w tri-allate	thiocarbamates	N	Inhibition of lipid synthesis – not ACCase	—	1	15kg	NS	Pre-emergence	NS
Centium 360CS	360g clomazone	isoxazolidinones	F3	Inhibition of carotenoid biosynthesis	—	1	0.33 litres	NS	Pre-emergence	NS
ASTROKerb	63g aminopyralid	pyridine carboxylic acids	O	Like a synthetic auxin	—	1	1.70 litres/ha	NS	Apply from 1st October up to 31st January in year of harvest	NS
	500g propyzamide	benzamides	K1	Microtubule assembly inhibition						

¹ A maximum total dose of 1.0 kg metazachlor/hectare may only be applied every third year on the same field

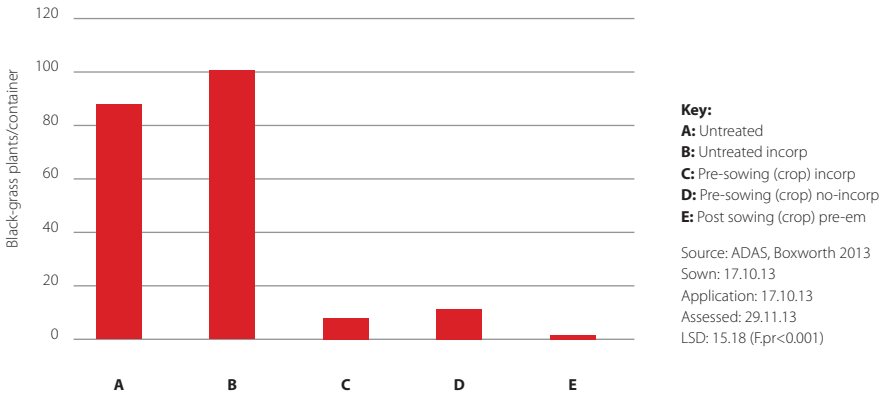
² A maximum total dose of 1.0 kg dimethachlor/hectare may only be applied every third year on the same field

³ Avadex Excel 15G (MAPP 12109) has an Extension of Authorisation for Minor Use (EAMU) for off label use in oilseed rape with a Final Use Date of December 2016

Best Use Advice

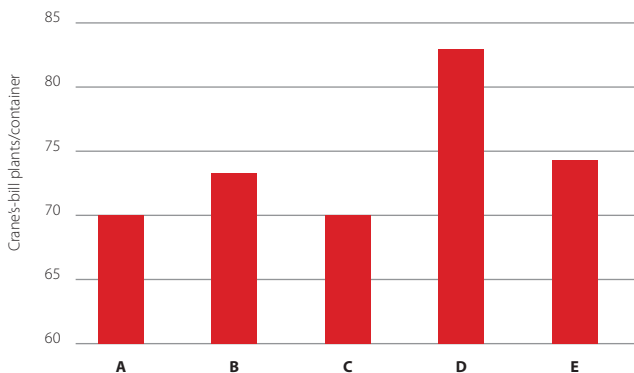
- Recent development work by UPL has shown incorporation is not always necessary to obtain successful weed control from DEVRINOL. In 2013 ADAS carried out a 'container screen' looking at the control of black-grass and crane's-bill. A known weight of weed seeds were sown into containers and DEVRINOL was then applied and incorporated, or not incorporated prior to sowing oilseed rape. A further treatment received DEVRINOL following the sowing of oilseed rape but prior to the crop emerging. Results are shown in the graphs below. There was no significant difference between the DEVRINOL treatments for black-grass control, but all treatments were significantly better than the untreated. The application of DEVRINOL did not reduce the number of crane's-bill but in all treatments growth of the weed did not progress past the cotyledon stage.

Graph 1: Screen test ADAS – Black-grass



UPL DEVRINOL screen showing treated and untreated crane's-bill

Graph 2: Screen test ADAS – Crane’s-bill



Key:
A: Untreated
B: Untreated incorp
C: Pre-sowing (crop) incorp
D: Pre-sowing (crop) no-incorp
E: Post sowing (crop) pre-em

Source: ADAS, Boxworth 2013
 Sown: 17.10.13
 Application: 17.10.13
 Assessed: 29.11.13
 LSD: 15.04 (F_{pr} 0.054)

Crane's-bill growth stage remained at cotyledon stage for all the treated containers throughout the whole study.

- Light incorporation 'through the drill' of DEVRINOL for early drilled rape can help to place the herbicide in the area of weed germination. This can give improved control of weed species such as crane's-bill.
- Apply pre-em treatments within 48 hours of drilling, but ensure that the seed is well covered.
- Dry cloddy seedbeds may result in reduced levels of weed control.
- The approval rate is 2.8 l/ha. However, in soils with less than 25% clay, the dose may be adjusted to between 2.2 and 2.5 l/ha. It is important to take all necessary measures to avoid overdosing.

Summary of DEVRINOL application options

Pre-sowing

Post-sowing

Incorporation by light harrow before last soil working

Just before sowing, for incorporation through the drill

Application 24 to 48 hours after sowing on humid soil



The best results are obtained when Devrinol is applied to moist soil.

Black-grass Control

When used alone DEVRINOL (*napropamide*) will deliver similar control of black-grass plants to Butisan S¹ (*metazachlor*) or Avadex Excel 15G² (*tri-alleate*) averaging around 40–45% control, see Graph 3.

Stacking and sequencing of DEVRINOL can improve the percentage control achieved. HGCA Topic Sheet 116/Summer 2012 suggests that 'stack' and 'sequence' approaches can improve the robustness of black-grass control; with generally at least 3 active ingredients being needed in the more successful approaches.



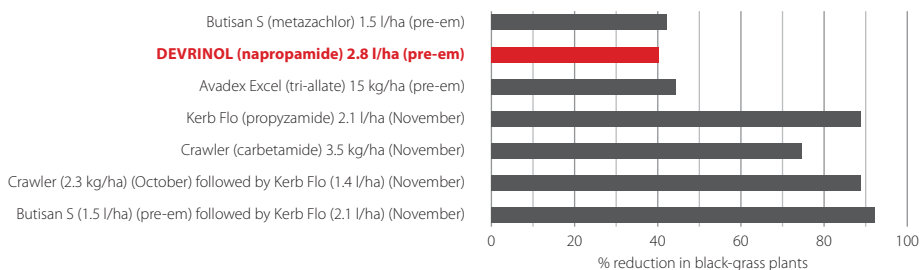
Stacking is when more than one active ingredient or herbicide product is applied at the same time.

Sequencing is when different active ingredients, or mixtures of active ingredients are applied in close succession.

¹ A maximum total dose of 1.0 kg metazachlor/hectare may only be applied every third year on the same field

² Avadex Excel 15G has an Extension of Authorisation for Minor Use (EAMU) for off label use in oilseed rape

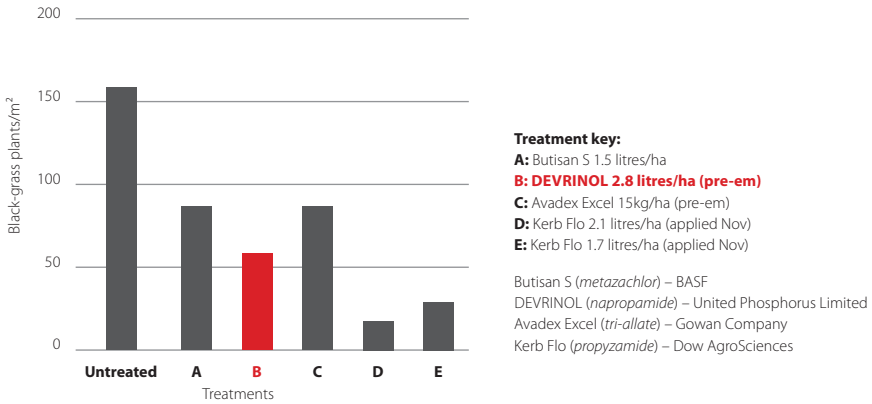
Graph 3: Percentage control of black-grass in oilseed rape. Mean data from five sites over three seasons.



Source HGCA Topic Sheet 116/Summer 2012

Graph 4 shows the effects of different herbicide treatments on black-grass in oilseed rape with DEVRINOL performing slightly better than Butisan S.

Graph 4: Herbicide treatment effects on black-grass in oilseed rape.

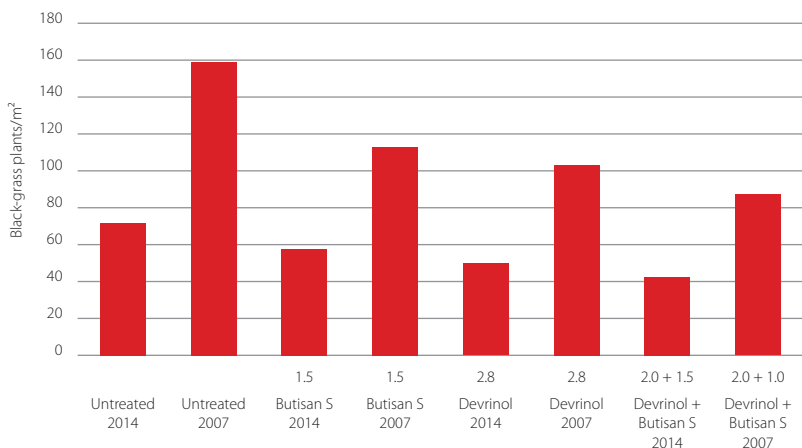


Source: HGCA Project Progress 17/Summer 2010



Graph 5 shows the results from two black-grass field trials carried out by ADAS Boxworth in 2007 and 2014 looking at the effect of DEVRINOL compared to Butisan S. DEVRINOL performed slightly better than Butisan S in both years and an advantage in using a tank mix of DEVRINOL + Butisan S was observed.

Graph 5: Black-grass – ADAS Boxworth



Source: ADAS, Boxworth
 Assessed: 19.03.14 and 25.02.07
 LSD: 48.79 (2014)

Voluntary Initiative

Several of the key residual grass weed herbicides for use in oilseed rape are being found in water e.g. – metazachlor, carbetamide and propyzamide. Unless extreme care is taken to protect water from these herbicides, including napropamide, there is a serious risk that their use will be restricted.

The Voluntary Initiative have published Water Protection Advice Sheets for metazachlor, quinmerac, propyzamide and carbetamide which provide advice on how to protect water.

Chemistry, such as DEVRINOL can support grass weed control programmes and provide greater flexibility for later applied residual herbicide options. Table 1 provides information on commonly used herbicides in winter OSR showing their modes of action (MOA) and Herbicide Resistance Action Committee (HRAC) grouping.

Poppy, Chickweed and Mayweed Control

Table 2: Resistance status of common chickweed, common poppy and mayweed in England

Resistance status:	Enhanced metabolism – not found in broad-leaved weeds in the UK		
	Target site resistance to ALS inhibitors – confirmed in all three species		
<i>N.B. ACCase resistance is irrelevant as these herbicides are not active on broad-leaved weeds</i>			
	Chickweed	Poppy	Mayweed
Resistance first found	2000	2001	2002
Cases confirmed	15	11	1
Number of counties	11	7	1
Comment	Mainly a problem in Scotland and N. Ireland	Limited problem but a big potential threat	Limited problem
Although resistance has only been detected in these three species in the UK, worldwide experience shows that resistance could evolve in many other broad-leaved weeds too, so vigilance is required.			

Source HGCA Managing weeds in arable rotations - a guide. Summer 2010

Resistant populations of poppy, chickweed and mayweed to ALS inhibiting herbicides (e.g. sulfonylureas such as metsulfuron-methyl) have been confirmed in the UK (Table 2). In OSR there is the opportunity to use herbicides with a different MOA to those used in other crops to control these weeds. DEVRINOL (*napropamide*) in tank mix with products such as Butisan S (*metazachlor*) and Teridox (*dimethachlor*) can offer useful control of annual broad-leaved weeds. See Tables 3 and 4.



Table 3a: Pre-emergence weed control mixtures of DEVRINOL for use in winter oilseed rape

Product	Rate (l/ha)	Target
DEVRINOL	2.8	Amaranthus, annual meadow grass, fat hen, knotgrass, mayweeds, common poppy, spurge
DEVRINOL + Centium 360CS	2.0 + 0.25	As above plus; cleavers, chickweed, shepherd's purse, cranesbill, hedge mustard, blackgrass sensitisation
DEVRINOL + Centium 360CS + Butisan S	2.0 + 0.25 + 1.0	As above plus; improved grass weed and mayweed control
DEVRINOL + Butisan S	2.0 + 1.0 – 1.5	Useful in the absence of cleavers, hedge mustard and shepherd's purse. Improved control of black-grass and poppies
DEVRINOL + Teridox	2.0 + 1.0 – 2.0	As above
DEVRINOL + Teridox + Centium 360CS	2.0 + 1.0 + 0.25	As above plus; improved grass weed and mayweed control

DEVRINOL contains napropamide, Centium 360CS contains clomozone, Butisan S contains metazachlor, Teridox contains dimethachlor

Table 3b: The following glyphosate products are compatible with DEVRINOL and the tank mixes listed in Table 3a at the rates given below

Glyphosate product	Formulation	Rate
Clinic Ace	360 SL	1.5 l/ha
Glyphos Dakar	680 WG	0.75 kg/ha
Landmaster	360 SL	1.5 l/ha
Pitch	550 SL	1.0 l/ha
Roundup Biactive	360 SL	1.5 l/ha
Roundup Energy	450 SL	1.2 l/ha

Glyphosate product	Formulation	Rate
Roundup Klik	450 SL	1.2 l/ha
Roundup Max	680 WG	0.75 kg/ha
Roundup Metro	360 SL	1.5 l/ha
Roundup Ultimate	450 SL	1.2 l/ha
Symbol	360 SL	1.5 l/ha

Table 4: Weed spectrum

Weed	DEVRIKOL @ 2.8 l/ha	DEVRIKOL @2 l/ha + Centium 360CS 0.25 l/ha
Amaranthus	S	S
Annual meadow grass	S	S
Blackgrass	MS	MS
Common chickweed	MS	S
Cleavers	MR	S
Cranesbill	MS	MS
Fat hen	S	S
Fool's parsley	-	S
Forget me not	MS	MS
Fumitory	MS	MS
Groundsel	MS	S
Italian ryegrass	MR	MS
Mayweed	S	S
Poppy	S	S
Small nettle	MS	MS
Wild oats	MR	MS
Polygonums	MS	MS
Common poppy	S	S
Red dead-nettle	MS	S
Shepherd's purse	MS	S
Sow thistle	-	MS
Speedwells	MS	S
Spurge	S	S

Tank Mixes

UPL has a comprehensive list of supported tank mixes for DEVRINOL for use on oilseed rape, these can be found on the UPL web site at www.upleurope.com.

Succeeding crops

- The soil should be ploughed to a depth of at least 20cm.
- Only brassica crops and oilseed rape may be drilled providing a period of 7 months has elapsed since spraying.
- Maize may be grown providing a period of 9 months has elapsed since spraying.
- Autumn sown wheat and grass or any other crop may now be planted/drilled providing a period of 12 months has elapsed since spraying. This is a change from 18 months.

References

- HGCA Topic Sheet 116/Summer 2012 Autumn grass weed control in cereals and oilseed rape
- HGCA Oilseed rape guide – Summer 2012
- HGCA Project Progress 17/Summer 2010 Autumn grass weed control in cereals and oilseed rape
- HGCA Managing weeds in arable rotations – a guide Summer 2010
- HGCA Information Sheet 06/Summer 2009 Control of ALS-resistant chickweed and poppy in cereals
- HGCA Information Sheet 09/Summer 2009 Oilseed rape herbicides and water protection
- www.voluntaryinitiative.org.uk



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DEVRINOL contains napropamide.

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Use plant protection products safely.

Always read the label and product information before use.