

# 2014 – REVISED SPRING BLACKLEG MANAGEMENT GUIDE FACT SHEET

## WESTERN AND SOUTHERN REGIONS QUANTIFY THE RISK, Paddock BY Paddock

Blackleg can cause severe yield loss, but can be successfully managed. Use this guide to determine whether you are in a high-risk situation and what practices you can change to reduce or prevent yield loss from blackleg. **Follow the four steps, in sequence, below.**

### KEY POINTS

- Monitor your crops to determine yield losses in the current crop.
- Choose a cultivar with adequate blackleg resistance for your region.
- Never sow your canola crop into **last year's canola stubble**.
- Relying only on fungicides to control blackleg poses a high risk of fungicide resistance.
- If your monitoring has identified yield loss and you have grown the same cultivar for three years or more, choose a cultivar from a different resistance group.

Blackleg is a sexually reproducing pathogen that will overcome cultivar resistance genes. Fungal spores are released from canola stubble and spread extensively via wind and rain splash. The disease is more severe in areas of intensive canola production.

### STEP 1: Use Table 1 to determine your farm's blackleg risk

**Table 1** Regional blackleg factors

Environmental factors that determine risk of severe blackleg infection	Blackleg severity risk factor								
	High risk			Medium risk			Low risk		
Regional canola intensity (% area sown to canola)	above 20	16-20	15	11-14	11-14	10	6-9	5	below 5
Annual rainfall (mm)	above 600	551-600	501-550	451-500	401-450	351-400	301-350	251-300	below 250
Total rainfall received Mar–May prior to sowing (mm)	above 100	above 100	above 100	above 100	91-100	81-90	71-80	61-70	below 60

Combined high canola intensity and adequate rainfall increases the probability of severe blackleg infection.

### STEP 2: Determine each crop's blackleg severity

- Assess the level of disease in your current crop. Sample the crop anytime from the end of flowering to windrowing (swathing). Pull 60 randomly chosen stalks out of the ground, cut off the roots with a pair of secateurs and, using the reference photos in Table 2, below, estimate the amount of disease in the stem cross-section. Yield loss occurs when more than half the cross-section is discoloured.
- A dark-coloured stem is a symptom of blackleg (Table 2). Stem cankers are clearly visible at the crown of the plant. Severe cankers may cause the plant to fall over as the roots become separated from the stem.
- If you have identified that you are in a high-risk situation (Steps 1 and 2), use Steps 3 and 4 to reduce your risk of blackleg for future seasons.



*Cut a plant at the crown to assess internal infection.*

**Table 2** Crop blackleg severity

High risk			Medium risk			Low risk	
Cankered	100%	80%	60%	40%	20%	0%	

Yield loss occurs when more than half of the cross-section is discoloured.

### STEP 3: Management practices can reduce the risk of blackleg infection

If your crop monitoring (see Step 2) showed yield loss in the previous year, the following practices can be used to reduce blackleg severity. Complete the following process for each canola paddock to be sown.

- For each of the seven management factors listed below, circle where each canola paddock fits to determine the risk of blackleg. For example, **Blackleg rating:** if your cultivar is AV-Garnet, circle MR indicating a low risk of blackleg; or **Distance from last year's canola stubble:** if your proposed canola crop is 200 metres away, high risk is indicated.
- Complete all seven management factors to determine which practices are causing increased risk and how they can be reduced. For example, for Distance from last year's canola stubble, choose a different paddock, at least 500m away from last year's stubble, reducing the risk from high to low.

**WARNING: 'CANOLA ON CANOLA' WILL CAUSE A SIGNIFICANT YIELD LOSS AND WILL REDUCE THE EFFECTIVE LIFE OF CANOLA CULTIVARS AND FUNGICIDES.**

#### Blackleg management practices that determine risk of blackleg infection, from highest to lowest effectiveness are:

##### Blackleg ratings

The cultivar blackleg rating is the most important blackleg management tool. If your previous crop had a high level of disease, choose a cultivar with a higher blackleg rating. The 2014 Blackleg Ratings are listed in Table 3 Section A on page 4.

High risk			Medium risk			Low risk		
VS	S-VS	S	MS-S	MS	MR-MS	MR	R-MR	R

\*VS = very susceptible; S = susceptible; MS = moderately susceptible; MR = moderately resistant; R = resistant; P = provisional rating

##### Distance from last year's canola stubble

The distance of your current crop to last year's canola stubble will determine disease severity.

**NEVER** sow your canola crop into last year's canola stubble. Distances from last year's stubble up to 500m will reduce blackleg severity.

High risk			Medium risk			Low risk		
0m	100m	200m	300m	400m	500m	>500m		

##### Fungicide use

Fungicides will provide an economic return only if your crop is at high risk of yield loss. Fungicides complement other management practices, never rely solely on fungicides.

#### RELiance ON FUNGICIDES TO CONTROL DISEASE POSES A HIGH RISK OF FUNGICIDE RESISTANCE.

High risk			Medium risk			Low risk		
No fungicide		Foliar applied fungicide		Seed dressing fungicide	Fertiliser applied fungicide	Seed dressing + fertiliser applied fungicide	Seed dressing or fertiliser applied + foliar fungicide	

##### Years of same cultivar grown

The blackleg pathogen will overcome cultivar resistance genes if the same genes are used each year. By sowing a cultivar based on different resistance genes, the ability of the pathogen to overcome resistance will be reduced. All cultivars have been placed into different blackleg resistance groups based on their resistance complement (see Table 3).

If you have:

- high or increasing levels of blackleg in your crop (from monitoring disease levels each year);
- used the management practices outlined here in Step 3; and
- sown cultivars from the same resistance group in close proximity (within 2km) for three or more years,

then sow a cultivar from a different resistance group (see page 4 – Blackleg Resistance Groups).

High risk			Medium risk			Low risk		
Sown the same cultivar- resistance group for more than 3 years			Sown the same cultivar- resistance group for 3 years			Sown the same cultivar- resistance group for 2 years	Sown the same cultivar- resistance group the previous year	Sown cultivar from a different resistance group

##### Distance from two-year-old canola stubble

Stubble older than two years produces fewer blackleg spores and will normally have minimal effects on blackleg severity, even where canola is sown into two-year-old stubble. However, two-year-old stubble may cause disease if inter-row sowing canola (see below, Canola stubble conservation) or if the cultivar resistance has been overcome.

Medium risk			Low risk		
	0m	100m	250m	500m	>500m

##### Canola stubble conservation

Stubble destruction is not effective in reducing blackleg infection. Inter-row sowing canola into two-year-old canola stubble where germinating seedlings are immediately next to standing stubble may result in higher levels of blackleg infection.

Medium risk			Low risk		
Inter-row sowing	Disc tillage	Knife point tillage	Burning/ burying tillage		

##### Month sown

Canola is most vulnerable to blackleg as a seedling. If crops are sown early into warmer conditions and get through the seedling growth stage quickly, they may escape high blackleg severity.

Medium risk			Low risk		
June to August	May 15 to 31	May 1 to 14	April 15 to 30		

## STEP 4: Blackleg resistance groups

Canola cultivars have different combinations of blackleg resistance genes. Over time, growing cultivars with the same blackleg resistance genes has led to changes in the blackleg pathogen's virulence which has enabled it to overcome cultivar blackleg resistance. By rotating between cultivars with different resistance genes, you can reduce the probability of resistance breakdown and reduce disease severity.

Based on Steps 1 to 3, are you in a high risk region or have been observing increasing blackleg severity and have been growing the same cultivar in close proximity for three years or more?

- **No** - Your current management practices should be sufficient to adequately manage blackleg resistance.
- **Yes** - You may be at risk of the blackleg fungus overcoming the blackleg resistance of your cultivar and it is recommended you grow a cultivar with a different combination of blackleg resistance genes.
- To facilitate this process, all cultivars have been placed into groups (A to G) based on their resistance genes in **Table 3**.
- **You do not need to change resistance groups (cultivars) every year.**

## How to use Table 3

- **1.** Identify the resistance group of your previously grown cultivar using the column labelled **Section B – 'Resistance group of cultivar'** (shaded in Light Purple). Note; Some cultivars belong to multiple groups. Some cultivars have not yet been classified and rotation recommendations cannot be made for these cultivars.  
Examples: AV-Garnet belongs to Resistance Group A  
Hyola 50 belongs to resistance Groups A and D
- **2.** Using **Section C** look down the column with the resistance group of the variety grown previously (e.g. Column A if AV-Garnet was grown previously, or Column AD if Hyola 50 was grown previously) to identify cultivars with reduced risk.
  - Green = best possible rotation (no resistance genes in common),
  - Blue = OK rotation (at least 1 resistance gene not in common),
  - Orange = not advised (all resistance genes in common).
 Examples: AV-Garnet (Resistance Group A) for 2014 planting – sown after cells shaded ■ Orange (e.g. GT Cobra) is not recommended, following with anything shaded ■ Blue (e.g. IH30) is okay and anything shaded ■ Green (e.g. ATR Stingray) is best.  
Hyola 50 (Resistance Groups AD) for 2014 planting – sown after cells shaded ■ Orange (e.g. Hyola 555TT) is not recommended, following with anything shaded ■ Blue (e.g. Nuseed Diamond) is okay and anything shaded ■ Green (e.g. VT 121CL) is best.

See page 4, for Table 3

## Blackleg resistance group monitoring

Representative cultivars from all blackleg resistance groups are sown in trial sites in all canola-producing regions across Australia and monitored for blackleg severity. These data provide regional information on the effectiveness of each blackleg resistance group and are available on the NVT Online website ([www.nvtonline.com.au](http://www.nvtonline.com.au)).

### USEFUL RESOURCES

#### Canola best practice management guide for south-eastern Australia

Available Ground Cover Direct, 1800 110 044, [www.grdc.com.au/bookshop](http://www.grdc.com.au/bookshop)

#### Diseases of Canola and their Management: The Back Pocket Guide

[www.grdc.com.au/GRDC-BPG-CanolaDiseases](http://www.grdc.com.au/GRDC-BPG-CanolaDiseases)

Available Ground Cover Direct, 1800 110 044, [www.grdc.com.au/bookshop](http://www.grdc.com.au/bookshop)

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### MORE INFORMATION

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#### Diseases of Canola and their Management: The Back Pocket Guide

[www.grdc.com.au/GRDC-BPG-CanolaDiseases](http://www.grdc.com.au/GRDC-BPG-CanolaDiseases)

#### Australian Oilseeds Federation

– Agronomy Centre

[www.australianoilseeds.com](http://www.australianoilseeds.com)

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**Table 3** 2014 Revised Spring Blackleg Ratings and Resistance groups. See page 3, (Step 4) for information on how to use this table.

Variety	2014 Blackleg Rating Bare	2014 Blackleg Rating Jockey	Type	SECTION A - Resistance group of cultivar	SECTION B - Resistance group of previous year's cultivar (stubble)														
					A	B	C	D	AB	AD	AS	ABD	ABE	ABF	ABS	BF	BC	G	
CONVENTIONAL VARIETIES																			
Hyola® 50	R			AD															
Victory®V3002	R-MR	R	High stability oil	ABF															
Hyola® 635CC	R-MR	R		ABD															
Sensation	R-MR		Winter Graze n Grain	Potential new or combinations of known resistance genes - Effective rotation with existing groups currently unknown.															
Victory®V3003	R-MR	R-MR	High stability oil	ABF															
Brazzil	R-MR		Winter Graze n Grain	BC															
Nuseed Diamond <sup>Ⓛ</sup>	R-MR	R-MR		ABF															
AV-Zircon <sup>Ⓛ</sup>	MR			Potential new or combinations of known resistance genes - Effective rotation with existing groups currently unknown.															
AV-Garnet <sup>Ⓛ</sup>	MR			A															
TRIAZINE TOLERANT VARIETIES																			
Hyola® 650TT	R	R		ABE															
Hyola® 450TT	R	R		ABD															
Monola® 605TT	R		High stability oil	Potential new or combinations of known resistance genes - Effective rotation with existing groups currently unknown.															
Hyola® 559TT	R	R		ABD															
ATR-Stingray <sup>Ⓛ</sup>	MR	R		C															
Monola® 314TT	MR	R-MR	High stability oil	Potential new or combinations of known resistance genes - Effective rotation with existing groups currently unknown.															
ATR-Bonito <sup>Ⓛ</sup>	MR	R-MR		A															
ATR-Gem <sup>Ⓛ</sup>	MR	R-MR		A															
ATR-Wahoo <sup>Ⓛ</sup>	MR	R-MR		A															
Pioneer® Sturt TT <sup>Ⓛ</sup>	MS	MR		No seedling resistance detected, cultivar reliant on adult plant resistance - manage according to blackleg rating.															
CLEARFIELD SYSTEM VARIETIES																			
Hyola® 575CL	R			BF															
Hyola® 474CL	R			BF															
Hyola® 577CL	R	R		Potential new or combinations of known resistance genes - Effective rotation with existing groups currently unknown.															
Hyola® 970CL	R		Winter Graze n Grain	To be determined															
XCEED™ OASISCL	R		Juncea canola	G															
VTX 121CL	R-MR		Juncea canola	G															
Edimax CL	R-MR	R-MR	Winter Graze n Grain	C															
Hyola® 971CL	R-MR	R	Winter Graze n Grain	A															
Pioneer® 44Y89 (CL)	R-MR			BC															
Pioneer® 45Y88 (CL)	R-MR	R-MR		A															
Pioneer® 44Y87 (CL)	MR	R-MR		A															
Pioneer® 43Y85 (CL)	MR	R-MR		A															
Pioneer® 44C79 (CL)	MR-MS			C															
Archer	MR-MS	R-MR		No seedling resistance detected, cultivar reliant on adult plant resistance - manage according to blackleg rating.															
Carbine	MR-MS	R-MR		A															
Pioneer® 45Y86 (CL)	MR-MS	R-MR		AB															
Pioneer® 44Y84 (CL)	MS	MR		A															
ROUNDUP READY VARIETIES																			
Hyola® 400RR	R			ABD															
Hyola® 500RR	R			ABD															
Hyola® 404RR	R-MR	R		ABD															
Nuseed GT-50	R-MR			ABF															
Pioneer® 45Y25 (RR)	R-MR			BC															
Pioneer® 44Y24 (RR)	R-MR	R		C															
Nuseed GT-41	R-MR	R		ABF															
Pioneer® 43Y23 (RR)	R-MR	R		B															
Pioneer® 44Y26 (RR)	R-MR			ABS															
IH52 RR	R-MR	R		AB															
GT Cobra <sup>Ⓛ</sup>	R-MR			A															
IH30 RR	R-MR	R		AB															
DG 550RR	R-MR	R		AB															
IH50 RR	R-MR	R		A															
Monola® 515HGT	R-MR		High stability oil	ABS															
Victory®V5002RR	MR	R	High stability oil	AB															
GT Viper <sup>Ⓛ</sup>	MR			B															
Pioneer® 45Y22 (RR)	MR	R		C															
Monola® 513GT	MR	R-MR	High stability oil	Potential new or combinations of known resistance genes - Effective rotation with existing groups currently unknown.															
ROUNDUP READY and TRIAZINE TOLERANT VARIETIES																			
Hvola® 525RT	R-MR	R		ABD															