

2015 AUTUMN BLACKLEG MANAGEMENT GUIDE FACT SHEET

WESTERN, NORTHERN 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 in Spring 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 March–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 increase the probability of severe blackleg infection.

STEP 2: Determine each crop's blackleg severity in Spring

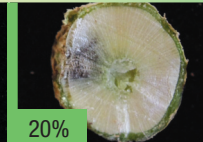
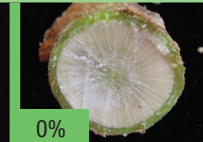
- Assess the level of disease in your current crop. Sample the crop anytime from the end of flowering to windrowing (swathing). Pull 60 randomly chosen stalks out of the ground, cut off the roots with a pair of secateurs and, using the reference photos in Table 2, below, estimate the amount of disease 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.
- If you are in a low risk situation and you have not identified yield loss due to blackleg infection when you assessed your crop, continue with your current management practices.

PHOTO: STEVE MARCROFT



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 ATR-Stingray, 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:

A. 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 2015 Blackleg Ratings are listed in Table 3 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

B. 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		

C. 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	

D. 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

E. 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.

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

◀ STEP 3 FROM PAGE 2

► F. 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.

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

► G. 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.

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

► H. Dual-purpose grazing canola

Grazing canola can increase the severity of blackleg in the crop. To minimise any associated reduction in grain yield select a cultivar with a high level of blackleg resistance ($\geq R-MR$), and if using a cultivar with a lower level of resistance, consider use of a fungicide (keeping in mind chemical with-holding periods).

High risk			Medium risk			Low risk		
				Grazing canola				

Click on the following link to access a worksheet that allows you to visualise the blackleg risk of your individual paddock and how you can reduce this risk. <http://www.grdc.com.au/GRDC-FS-BlacklegManagementGuide>



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 H) 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 A – '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-Zircon belongs to Resistance Group A
Hyola 50 belongs to resistance Groups A and D
If your previously grown cultivar is not included in Table 3 (page 4), as it is no longer commercially available, refer to Table 4 (page 5).
- **2.** Using **Section B** look down the column with the resistance group of the variety grown previously (e.g. Column A if AV-Zircon 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-Zircon (Resistance Group A) for 2015 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 2015 planting – sown after cells shaded ■ Orange (e.g. ATR-Wahoo) is not recommended, following with anything shaded ■ Blue (e.g. Nuseed Diamond) is okay and anything shaded ■ Green (e.g. VTX 121CL) is best.

Table 3 2015 Autumn Blackleg Ratings and Resistance groups. See page 3, (Step 4) for information on how to use this table.

[illegible]

Table 4 Resistance groups of cultivars that are no longer commercially available.

VARIETY	RESISTANCE GROUP
ATR-Cobbler ⁽¹⁾	B
ATR-Marlin ⁽¹⁾	AS
ATR-Snapper ⁽¹⁾	C
AV-Garnet ⁽¹⁾	A
Bonanza TT ⁽¹⁾	No seedling resistance detected, cultivar reliant on adult plant resistance. Manage according to blackleg rating.
CB™ Agamax	AB
CB™ Atomic HT	AB
CB™ Combo HT-RR	BC
CB™ Eclipse RR	A
CB™ Frontier RR	Unclear results further testing required of known resistance genes. Effective rotation with existing groups currently unknown.
CB™ Fusion HT-RR	AB
CB™ Henty HT	B
CB™ Jardee HT	No seedling resistance detected, cultivar reliant on adult plant resistance. Manage according to blackleg rating.
CB™ Junee HT	Unclear results further testing required of known resistance genes. Effective rotation with existing groups currently unknown.
CB™ Nitro HT	AB
CB™ Status RR	AB
CB™ Tango C	B
CB™ Taurus	No seedling resistance detected, cultivar reliant on adult plant resistance. Manage according to blackleg rating.
CB™ Telfer	B
Crusher TT ⁽¹⁾	A
Hyola® 400 RR	ABD
Hyola® 433	D
Hyola® 444TT	BD
Hyola® 500 RR	ABD
Hyola® 505 RR	Unclear results further testing required of known resistance genes - Effective rotation with existing groups currently unknown.
Hyola® 555 TT	D
Hyola® 635CC	ABD
Hyola® 656 TT	ABD
Hyola® 971 CL	A
Jackpot TT ⁽¹⁾	Unclear results further testing required of known resistance genes - Effective rotation with existing groups currently unknown.
Monola™ 413TT	D
Monola™ 506TT	BF
Monola™ 515HGT	ABS
Pioneer® 45Y22 (RR)	C
Pioneer® 45Y82 (CL)	A
Thumper TT ⁽¹⁾	E
Victory® V3001	BF
Victory® V3003	ABF
VT 525G	AB
VT 535G	B

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).

MORE INFORMATION

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USEFUL RESOURCES

Canola best practice management guide for south-eastern Australia

Availabe Ground Cover Direct, 1800 110 044, www.grdc.com.au/bookshop

Diseases of Canola and their Management: The Back Pocket Guide

www.grdc.com.au/GRDC-BPG-CanolaDiseases

Availabe Ground Cover Direct, 1800 110 044, www.grdc.com.au/bookshop

Australian Oilseeds Federation – Agronomy Centre www.australianoilseeds.com

Ground Cover Supplement (issue 116): Foliar fungal diseases of Pulses and oilseeds

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