

BLACKLEG MANAGEMENT GUIDE

FACT SHEET



NATIONAL SEPTEMBER 2024

Spring 2024 update: Crown Canker and Upper Canopy blackleg ratings

Blackleg can cause severe yield losses in canola, but it can be successfully managed. Blackleg occurs in two forms in Australia; crown canker is still the main risk to growers, but upper canopy infection (UCI) can also cause significant yield losses

Crown canker results from infection of canola seedlings that allows the pathogen to grow from the cotyledons/leaves to the plant crown, causing vascular tissue damage within the crown.

UCI results from infection of flowers, stems and/or branches that allows the same process as crown canker, but the infection causes damage to the vascular tissue in the branches

and stem and does not affect the crown. Pod infection (not covered here) is a result of infection post-flowering, where lesions form directly onto the pods.

Is this a year of crown canker or UCI?

In most seasons crops will not be prone to both crown canker and UCI. Early sown crops that also germinate early, grow quickly avoiding seedling infection and therefore will also avoid crown canker (plant growth prior to winter may avoid blackleg infection). However, these early sown crops may start flowering early in mid-to-late winter when blackleg is still active. Flowering during winter is critical for UCI to occur.

KEY POINTS

- Never sow your canola crop into last year's canola stubble
- Choose a cultivar with adequate blackleg resistance for your region
- Relying only on fungicides to control blackleg poses a high risk of fungicide resistance
- If your monitoring has identified yield loss is occurring, follow the steps in this guide to manage blackleg
- By monitoring your crops at maturity you can determine if you need to change your blackleg management in future years

Leptosphaeria maculans, the causal agent of blackleg, is a sexually reproducing pathogen that may overcome cultivar resistance genes and fungicides. 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: Identify your farm's blackleg risk.

Table 1: Regional blackleg factors.

Environmental factors that determine risk of severe blackleg infection	Crown canker and UCI 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 at plant maturity (windrowing/swathing time).

Crown canker: Assess the level of disease in your current crop. Ideally, sample the crop within a few days after windrowing/swathing (prior to windrowing is OK but it is difficult to move within the crop and difficult to observe cankers). Look for plants that have fallen over and have external visible crown cankers. Pull 60 randomly selected stems out of the ground, cut off the roots with a pair of secateurs and, using the reference photos in Table 2a, estimate the amount of disease in the crown cross-section. Yield loss will commonly occur when more than 30 per cent of the cut crown is discoloured.

Upper canopy infection (UCI): Mid-flower is the first growth stage that UCI can be observed, although it is not a good

indicator of yield loss. UCI mid-flower infection can cause lesions on the flowers and stems/branches (see reference photos in Table 2b). At windrowing/swathing, UCI symptoms can cause a range of symptoms including causing individual branches to die, individual branches to be dark in colour, and external cankers to be visible on the branches and stem. In addition, UCI will cause the pith within the stem and branches to become black in colour. Therefore, observe the external symptoms and then cut the plant with secateurs to confirm the blackened pith.

The following steps apply equally to crown canker and UCI.

If you have identified that you are in a medium to high-risk situation (steps 1 and 2), use steps 3 and 4 to reduce your risk of blackleg in future seasons.



Cut a plant at the crown (into the top of the root) to assess internal infection. PHOTO: STEVE MARCROFT

If you are in a low-risk situation and you have not identified yield loss due to blackleg infection when assessing your crop, continue with your current management practices.

Table 2a: Crown canker blackleg severity.

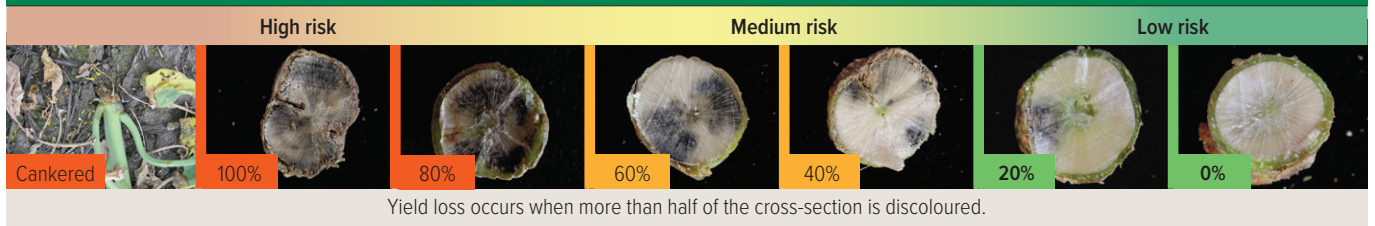


Table 2b: Upper canopy infection symptoms.



External stem lesion. PHOTO: STEVE MARCROFT



Branch death. PHOTO: STEVE MARCROFT



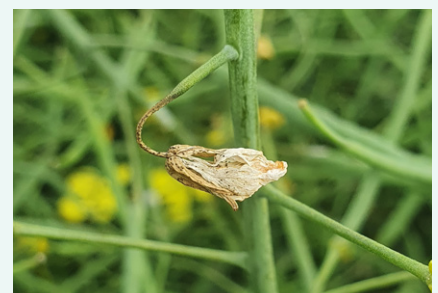
Darkened branch that is indicative of yield loss. PHOTO: STEVE MARCROFT



Cut stems to observe for blackened pith. PHOTO: STEVE MARCROFT



Cutting branches to inspect for blackened pith. PHOTO: STEVE MARCROFT



Infected flower lesion. Blackleg will grow from the flower into the branch. PHOTO: STEVE MARCROFT

STEP 3: Change management practices to reduce the risk of blackleg infection.

If your crop monitoring (step 2) showed yield loss in the previous year, consider changing your management practices for each canola paddock to be sown to reduce blackleg severity. Review each management practice to determine which are increasing risk and how the risk can be reduced.

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

There are several blackleg management practices that determine risk of blackleg infection, discussed here from highest (A) to lowest (H) effectiveness.

A. BLACKLEG RATING

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 2024 blackleg ratings are listed in Table 3.

Crown canker

High risk			Moderate 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.

For UCI, the cultivar blackleg rating will reduce the probability of large yield losses. R-rated UCI cultivars are unlikely to have yield loss, whereas MR and MRMS will have increasing yield losses depending on starting date to first flower and disease severity. MS should only be used in environments of lower disease severity.

Upper canopy infection

High risk		Moderate risk		Low risk
	MS	MRMS	MR	R

B. DISTANCE FROM LAST YEAR'S CANOLA STUBBLE

The distance of your current crop from 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 of at least 500 metres will reduce blackleg severity.

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

C. FUNGICIDE USE

Reliance on fungicides to control disease poses a high risk of fungicide resistance.

Crown canker

Fungicides complement other management practices. Fungicides will provide an economic return only if your crop is at high risk of yield loss. Fungicides are generally warranted where crops have lower blackleg ratings, are sown into higher disease severity situations, and have germinated later so that plants are still small seedlings during early winter. The GRDC/DPIRD BlacklegCM app is an excellent economic fungicide application decision-support tool for crown canker.

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	

Upper canopy infection

Fungicides complement other management practices. Fungicides will provide an economic return only if your crop is at high risk of yield loss. Fungicides are generally warranted where crops have lower UCI/blackleg ratings, have started flowering early and are sown into higher disease severity situations. Fungicides cannot be applied after 50 per cent bloom due to maximum residue limit (MRL) restrictions. The GRDC/DPIRD UCI/BlacklegCM app is an excellent economic fungicide application decision support tool for UCI.

High risk		Medium risk		Low risk
No fungicide				Foliar fungicide applied at early bloom

D. YEARS OF SAME CULTIVAR GROWN

The pathogen will overcome cultivar resistance genes if the cultivars containing the same resistance 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 gene 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 in step 3; and
- sown cultivars from the same resistance group in close proximity (within two kilometres) for three or more years, then sow a cultivar from a different resistance group (see Table 3).

High risk	Medium risk			Low risk	
Sown the same cultivar/resistance group for more than three years	Sown the same cultivar/resistance group for three years			Sown the same cultivar/resistance group for two years	Sown the same cultivar-resistance group the previous year

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 point F, Canola stubble conservation) or if the cultivar resistance has been overcome.

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

F. CANOLA STUBBLE CONSERVATION

Stubble destruction is generally 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 crown canker blackleg when infected in the seedling stage. If crops are sown early in warmer conditions and develop through the seedling growth stage quickly, they may escape high blackleg severity.

Crown canker infection only

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

H. COMMENCEMENT OF FLOWERING DATE

Canola is only vulnerable to UCI if infection occurs early enough in the growing season for the pathogen to grow into the vascular tissue within the branches and stem to cause a blockage. Later infections can occur but are unlikely to cause yield losses. Short growing regions (mature in October) may have only a moderate risk if flowering commences early (June).

Upper canopy infection only

High risk	Medium risk				Low risk	
June	1 to 15 July	15 to 30 July	1 to 15 August		15 to 30 August	
					September onwards	



BlacklegCM app. Get the app for your iPad or tablet.
The app is an interactive format of this management guide that allows you to enter individual crop data and estimate blackleg severity for your crop.



Table 3: 2024 spring blackleg ratings and resistance groups.

Variety	2024 blackleg rating Bare	2024 blackleg rating ILeVo®	2024 blackleg rating Saltro®	2024 upper canopy infection blackleg rating	Type	Major gene resistance group of cultivar
CONVENTIONAL VARIETIES						
Outlaw [Ⓛ]	RMR			MR-UCI	Open pollinated	A
Nuseed® Quartz	RMR			MR-UCI	Hybrid	ABD
Nuseed® Diamond	RMR	R	R	MR-UCI	Hybrid	ABF
TRIAZINE-TOLERANT VARIETIES						
HyTTec® Trifecta	R			MR-UCI	Hybrid, Triazine	ABD
HyTTec® Trident	R			MR-UCI	Hybrid, Triazine	AD
Monola® H524TT	R			MR-UCI	High stability oil, hybrid, Triazine	AD
DG Bidgee TT [Ⓛ]	R	R	R	R-UCI	Open pollinated, Triazine	H
Pioneer® PY429T	R		R	R-UCI	Hybrid, Triazine	ABH
HyTTec® Trophy	R	R	R	MR-UCI	Hybrid, Triazine	AD
DG Torrens TT [Ⓛ]	RMR			R-UCI	Open pollinated, Triazine	H
Hyola® Blazer TT	RMR		R	MR-UCI	Hybrid, Triazine	ADF
InVigor® T 4511	RMR	R		MR-UCI	Hybrid, Triazine	Unknown
Monola® H421TT	RMR			MR-UCI	High stability oil, hybrid, Triazine	BC
ATR-Bluefin [Ⓛ]	RMR			MR-UCI	Open pollinated, Triazine	AB
DG Avon TT [Ⓛ]	MR	R	R	MR-UCI	Open pollinated, Triazine	AC
SF Spark™ TT	MR	R	R	MR-UCI	Hybrid, Triazine	ABDS
Renegade TT [Ⓛ]	MR			MR-UCI	Open pollinated, Triazine	A
HyTTec® Velocity	MR			MR-UCI	Hybrid, Triazine	AB
Monola® 422TT	MRMS			MRMS-UCI	Open pollinated, Triazine	BC
ATR-Swordfish [Ⓛ]	MRMS			MRMS-UCI	Open pollinated, Triazine	AB
SF Dynatron™ TT	MRMS	R	R	MRMS-UCI	Hybrid, Triazine	BC
RGT Baseline™ TT	MRMS	R	R	MRMS-UCI	Hybrid, Triazine	B
Bandit TT [Ⓛ]	MRMS	R	R	MRMS-UCI	Open pollinated, Triazine	A
RGT Capacity™ TT	MRMS	RMR	R	MRMS-UCI	Hybrid, Triazine	B
AFP Cutubury [Ⓛ]	MS	MR	RMR	MS-UCI	Open pollinated, Triazine	AB
ATR-Bonito [Ⓛ]	MS	RMR	R	MS-UCI	Open pollinated, Triazine	A
IMIDAZOLINONE-TOLERANT VARIETIES						
Hyola® Solstice CL	R		R	R-UCI	Hybrid, Clearfield®	ADFH
Captain CL	R			R-UCI	Winter, hybrid, Clearfield®	AH
Hyola® Feast CL	R		R	R-UCI	Winter, hybrid, Clearfield®	H
RGT Nizza™ CL	R			MR-UCI	Winter, hybrid, Clearfield®	B
Hyola® 970CL	R		R	R-UCI	Winter, hybrid, Clearfield®	H
Phoenix CL	R			MR-UCI	Winter, hybrid, Clearfield®	B
Pioneer® 45Y93 CL	R		R	MR-UCI	Hybrid, Clearfield®	BC
RGT Clavier™ CL	R			R-UCI	Winter, hybrid, Clearfield®	ACH
Pioneer® PN526C	RMR			MR-UCI	High stability oil, hybrid, Clearfield®	ABD
Pioneer® 45Y95 CL	RMR		R	MR-UCI	Hybrid, Clearfield®	C
Nuseed® Ceres IMI	RMR			MR-UCI	Hybrid, Imidazolinone	AD
Pioneer® 43Y92 CL	RMR		R	MR-UCI	Hybrid, Clearfield®	B
Pioneer® 44Y94 CL	RMR		R	MR-UCI	Hybrid, Clearfield®	BC
Pioneer® PY421C	RMR		R	MR-UCI	Hybrid, Clearfield®	A
VICTORY® V75-03CL	RMR			MR-UCI	High stability oil, hybrid, Clearfield®	AB

Continued on next page

Table 3: 2024 spring blackleg ratings and resistance groups (continued).

Variety	2024 blackleg rating Bare	2024 blackleg rating ILeVo®	2024 blackleg rating Saltro®	2024 upper canopy infection blackleg rating	Type	Major gene resistance group of cultivar
IMIDAZOLINONE AND TRIAZINE-TOLERANT VARIETIES						
Hyola® Defender CT	R		R	MR-UCI	Hybrid, Clearfield®, Triazine	ADF
Hyola® Enforcer CT	R			MR-UCI	Hybrid, Clearfield®, Triazine	ADF
Nuseed® Griffon TTI	RMR			MR-UCI	Hybrid, Imidazolinone, Triazine	AC
Pioneer® PY520 TC	MR		R	MR-UCI	Hybrid, Clearfield®, Triazine	BC
GLYPHOSATE-TOLERANT VARIETIES						
DG Hotham TF	R			R-UCI	Hybrid, TruFlex®	ABH
Nuseed® Raptor TF	R			MR-UCI	Hybrid, TruFlex®	AD
Nuseed® Eagle TF	R			MR-UCI	Hybrid, TruFlex®	ABD
VICTORY® V55-04TF	R	R	R	MR-UCI	High stability oil, hybrid, TruFlex®	AB
DG Lofty TF	R			R-UCI	Hybrid, TruFlex®	ABH
Nuseed® Hunter TF	RMR			MR-UCI	Hybrid, TruFlex®	AB
Pioneer® 44Y27 RR	RMR	R	R	MR-UCI	Hybrid, Roundup Ready®	B
Pioneer® PY422G	MR		R	MR-UCI	Hybrid, Optimum GLY®	AB
Nuseed® Emu TF	MR			MR-UCI	Hybrid, TruFlex®	AB
Pioneer® PY525G	MR		R	MR-UCI	Hybrid, Optimum GLY®	AB
InVigor® R 4520P	MRMS	R		MRMS-UCI	Hybrid, TruFlex®	B
Pioneer® PY323G	MRMS		R	MRMS-UCI	Hybrid, Optimum GLY®	BC
GLYPHOSATE AND IMIDAZOLINONE-TOLERANT VARIETIES						
Hyola® Regiment XC	R		R	R-UCI	Hybrid, TruFlex®, Clearfield®	ADFH
Hyola® Battalion XC	RMR			MR-UCI	Hybrid, TruFlex®, Clearfield®	ADF
Pioneer® PY424GC	MRMS		R	MRMS-UCI	Hybrid, TruFlex®, Clearfield®	BC
GLUFOSINATE AND TRIAZINE-TOLERANT VARIETIES						
InVigor® LT 4530P	RMR	R		MR-UCI	Hybrid, LibertyLink®, Triazine	BF
GLUFOSINATE AND GLYPHOSATE-TOLERANT VARIETIES						
InVigor® LR 5040P	RMR	R		MR-UCI	Hybrid, LibertyLink®, TruFlex®	AB
InVigor® LR 4540P	RMR	R		MR-UCI	Hybrid, LibertyLink®, TruFlex®	B
InVigor® LR 3540P	MR	R		MR-UCI	Hybrid, LibertyLink®, TruFlex®	AB

Ⓐ denotes Plant Breeder's Rights apply, (p) Provisional, R = resistant, MR = moderately resistant, MS = moderately susceptible, S = susceptible.

STEP 4: Manage variety resistance.

Blackleg disease is controlled by two forms of genetic resistance – major gene and quantitative. These two forms of resistance are both important for controlling blackleg and require management to maintain them. The blackleg rating for each variety takes in a combination both major gene and quantitative resistance.

Major gene resistance (MGR)

Major genes in canola varieties recognise the blackleg fungus, which creates an immune response in the plant and enables it to stop the fungus growing. Major gene resistance controls blackleg at all stages of plant development and therefore protects against leaf lesions, crown canker, upper canopy infection and pod infection.

The major genes are identified in all canola varieties. Each MGR is allocated a resistance group letter (A, B, C, D, F, H and S), as shown in Table 3. Varieties can have a single or multiple MGR. As MGR results in immunity, varieties will always receive an R blackleg rating while the MGR is effective and will not have any yield losses from blackleg. However, the blackleg fungus is adept at overcoming MGR and this will change the status of the blackleg rating (see next paragraph).

Effectiveness of MGR

MGR is only effective if the plant's MGR recognises the blackleg fungus. If the fungus evolves to overcome the plant MGR (via mutation, sexual recombination or population structure), the variety's MGR

no longer recognises the blackleg fungus and the plants will become susceptible. The MGR will still be present in the variety, but it will no longer be effective. Most MGRs in Australian canola varieties are no longer effective; therefore, breeders combine MGRs to restore effectiveness and/or combine MGR and quantitative resistance (QR) to create resistance. MGRs can be partially effective; this scenario occurs when a blackleg population consists of a range of blackleg isolates, only some of which have evolved to avoid recognition by the plant.

MGR monitoring in Australia

MGR effectiveness is monitored each year across Australian canola growing regions (GRDC project MGP2307-001RTX).

Table 4 gives an indication of which MGR may be effective in your growing region. Varieties that contain these MGRs are likely to be highly resistant in your region. However, individual blackleg populations on your farm may have overcome the MGR. The best way to assess the effectiveness of the MGR on your farm is to consult Table 4 and to monitor the performance of the MGR in your crop (see Step 2).

If the MGR is effective, there should be no/few leaf lesions present. However, as the effectiveness of the MGR is reduced overtime you may observe increased leaf lesion severity and increased crown

canker severity. It is advisable to monitor leaf lesion severity as well as cut crowns each year to determine if MGR is reducing on your property.

If you have grown a variety or varieties with the same MGR over several years and blackleg severity has increased, it may be beneficial to change to a variety with different MGR (Table 3). Use Table 4 to identify an MGR that is still effective in your region. If your variety has a MGR stack (multiple letters, e.g. ABD), then choose a cultivar that has at least one new letter that is green or yellow in Table 4. If all letters in your preferred variety are red in Table 4 you will need

to rely on quantitative resistance. Many cultivars have excellent quantitative resistance and are very effective at controlling blackleg; see the section headed 'Quantitative resistance (QR)' for more information.

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. This data provides regional information on the effectiveness of each blackleg resistance group.

Table 4: 2024 regional major gene resistance effectiveness.

2024 SITE	RESISTANCE GROUP						
	A	B	C	D	F	H	S
NSW							
Beckom							
Cootamundra							
Cudal							
Gerogery							
Lockhart							
Parkes							
Wagga Wagga							
Wellington							
SA							
Arthurton							
Cummins							
Keith							
Riverton							
Spalding							
Wangary							
Wasleys							
Yeelanna							
Victoria							
Charlton							
Diggora							
Hamilton							
Horsham							
Kaniva							
Lake Bolac							
Wunghnu							
Yarrawonga							
WA							
Bolgart							
Gibson	Abandoned – waterlogging						
Kendenup	Insufficient disease						
Kojonup	Insufficient disease						
Munglinup							
Stirlings South							
Wagin							
Williams	Insufficient disease						

Green = effective Yellow = partially effective Red = ineffective

Quantitative resistance (QR)

Quantitative resistance (QR) is the combination of several resistance genes (of which there are many) where each gene has a small effect on reducing blackleg severity. Therefore, a greater number of these genes will result in higher blackleg resistance. The blackleg rating of a variety is used to indicate the level of QR. For example, an MR-rated variety may have more QR genes than an MS cultivar. Recent research has shown that QR controls both crown canker and UCI severity.

Quantitative resistance is difficult to characterise; therefore, we cannot characterise the precise QR genetics in a variety. Canola varieties may have the same or different QR genes or different combinations of these genes. QR may not completely protect against the blackleg fungus, so plants will likely still get some crown canker and UCI.

Effectiveness of QR

The blackleg fungus will overcome individual QR genes over time. If you sow the same cultivar intensively for more than three years, the effectiveness of that cultivar's QR may decline on your farm. Reduced resistance will be evident by increased crown canker severity observed by cutting stems at the windrowing maturity timing. For some QR, increased leaf lesion severity will also occur overtime. It is advised to cut crowns each year to determine if resistance is reducing (see step 2 of this guide).

If QR is being overcome on your farm, treat the variety as having a lower blackleg rating than advertised. That is, if the official rating of your variety is R but you have observed increasing crown canker on your property, then manage your variety as MR rated or change to a new variety. Although we do not necessarily know the genetics underlying QR, generally swapping to a variety with a higher blackleg rating will ensure sound QR in the new variety.

Blackleg ratings – definitions and management

Blackleg ratings are determined by the performance of each variety in blackleg disease nurseries. The ratings are a product of both the MGR and QR in

each variety. Blackleg ratings are now available for both crown canker and UCI. The definitions and management options for these two types of blackleg rating are provided.

Crown canker blackleg ratings

R (resistant)

R-rated varieties have excellent crown canker blackleg resistance. These varieties are unlikely to have yield loss from blackleg even when grown in high-rainfall canola/cereal/canola rotations. They are unlikely to benefit from fungicide applications. Consult BlacklegCM app for more detail.

RMR (resistant moderately resistant)

RMR-rated varieties have excellent crown canker blackleg resistance. These varieties are unlikely to have yield loss from blackleg. However, if sown in high-rainfall canola/cereal/canola rotations small yield losses may be possible. They are also unlikely to benefit from fungicide applications. Consult BlacklegCM app for more detail.

MR (moderately resistant)

MR-rated cultivars have very good blackleg resistance. These cultivars are unlikely to have yield losses from blackleg where sound cultural practices are used, that is, 500m isolation between the crop and the previous year's canola stubble. When MR varieties are sown into high disease severity situations they may respond well to fungicide applications. Consult BlacklegCM app for more detail.

MRMS (moderately susceptible moderately resistant)

MRMS-rated varieties have moderate blackleg resistance. MRMS varieties should only be sown in situations of low blackleg severity, that is, 500m isolation between the crop and the previous year's canola stubble and moderate to lower-rainfall regions. When these varieties are sown into higher disease severity situations, they are likely to respond well to fungicide applications. In the event of above-average rainfall years in lower-rainfall regions, it is advised to apply fungicide to MRMS varieties. Consult BlacklegCM app for more detail.

MS (moderately susceptible)

MS-rated varieties have low blackleg resistance. They should only be sown into situations of low blackleg severity, that is, low canola intensity and lower rainfall. When MS varieties are sown into higher disease severity situations, they are likely to respond very well to fungicide applications. Consult BlacklegCM app for more detail.

Upper canopy infection blackleg ratings

R-UCI varieties are likely to have effective MGR and will therefore be unlikely to have yield loss associated with UCI. Check Table 4 for your region and the presence of leaf lesions in your crop to confirm that the MGR is effective. If leaf lesions are found, treat your variety as MR-UCI. Consult UCI-BlacklegCM app for more detail.

MR-UCI varieties have resistance to UCI.

Yield losses will only occur if disease severity is high, that is, flowering starts early in the growing season, there is sufficient rainfall and higher risks such as high canola intensity. Fungicide application at 30 per cent bloom is recommended if flowering is early, there is higher canola intensity and there is rainfall during flowering. Consult UCI-BlacklegCM app for more detail.

MRMS-UCI varieties have low resistance to UCI. Yield losses will occur if disease severity is moderate, i.e., flowering starts early in the growing season. Fungicide application at 30 per cent bloom is recommended if flowering is early and there is rainfall during the flowering growth stage. Consult UCI-BlacklegCM app for more detail.

MS-UCI varieties have low or no resistance to UCI. These varieties should only be sown into situations of low blackleg severity, that is, low canola intensity and lower rainfall. Fungicide application at 30 per cent bloom is recommended if flowering is early and there is rainfall during the flowering growth stage. Consult UCI-BlacklegCM app for more detail.

USEFUL RESOURCES



BlacklegCM app, developed with GRDC investment, allows the user to input information such as paddock selection, variety choice, seed dressing and banded or sprayed fungicide, and takes into account costs, yield benefits and grain prices to give the best/worse-case scenario and likely estimated economic return. Growers can change the parameters on the app to tailor the output to their own individual crop. It can be downloaded onto tablets (not smartphones) from both the App Store and Google Play, agric.wa.gov.au/apps/blacklegcm-blackleg-management-app



UCI BlacklegCM is a new app to assist grain growers in managing blackleg UCI in canola during flowering stage and also to aid in fungicide management decisions.
agric.wa.gov.au/apps/uci-blacklegcm-blackleg-upper-canopy-infection-management-app

Diseases of Canola and their Management: The Back Pocket Guide

Available from *GroundCover™* Direct, 1800 110 044,
grdc.com.au/GRDC-BPG-CanolaDiseases

Canopy Infection by Blackleg – a New Evolution, a podcast,
grdc.com.au/news-and-media/audio/podcast/canopy-infection-by-blackleg-a-new-evolution

Marcroft Grains Pathology marcroftgrainspathology.com

Fungicide Resistance Management
croplife.org.au/resources/programs/resistance-management/canola-blackleg

Blackleg upper canopy infection videos (follow link or search on GRDC website)
grdc.com.au/search?query=blackleg%20upper%20canopy&s&personal=false&form=search-new&collection=grdc-multi&profile=_default&smeta_error_not_found&sort=off&smeta_archive_not=1&f.TypeIctype=Video

GRDC CODES

MGP1905-001SAX
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