

Managing your risk of blackleg in canola

FACT SHEET 2009

In 2008, instances with higher than expected levels of blackleg have been identified on lower Eyre Peninsula (SA) and the South East of SA. These are the same regions where sylvestris resistance was overcome in 2003. However all regions that have intensive canola production and high rainfall are at risk.

High risk blackleg indicators

- Higher rainfall regions** (>330mm growing season rainfall). Higher rainfall means a higher risk of severe blackleg. Lower rainfall areas have lower risk.
- Intensive canola production.** The more canola that was grown nearby in the previous season results in more canola stubble that is available to infect this season's crop.
- Growing the same canola cultivar for the third year or more.** Fungal spores from stubble of a variety are more likely to infect the same variety more severely the following season (see below). Also a variety may have its resistance erode over a number of years (see over page).
- Proximity to last season's canola stubble.** Although spores from last season's canola stubble may travel a long distance, most of the spores only go a short distance and put the adjacent paddock at risk.

Recommendations for growers in high risk situations

- Choose a canola variety with good blackleg resistance (use only the current year's ratings), blackleg ratings are available at www.australianoilseeds.com
- Separate this year's canola crop from last year's canola stubble by a minimum of 500m.
- Do not sow varieties within 500m of their own stubble for two seasons e.g. do not sow Variety X in 2009 within 500m of any Variety X stubble from a 2008 or 2007 crop (older stubble does not normally release enough spores to warrant concern).
- Ensure that canola seed is treated with fluquinconazole or fertiliser amended with flutriafol as an insurance against blackleg.
- Monitor blackleg severity within the 2009 crop to assist with decision making in 2010 (see over page).

Table 1 illustrates why growers should avoid stubble of the same variety that they plan to sow. This data is the % blackleg severity of plants sown on their own stubble compared to blackleg severity when plants are sown into stubble of different varieties.

Plants sown in 2008 into canola stubble	Stubble source of varieties sown in 2007			Trial
	45Y77 (CL)	ATR-Beacon	AV-Garnet	
Percent blackleg severity				
45Y77 (CL)	53	33	37	Pot experiment – Nurcong
ATR-Beacon	35	52	34	Field trial – Kalkee
AV-Garnet	23	12	61	Field trial – Nurcong

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Table 2 illustrates that some varieties with good blackleg ratings (R and MR) have a high number of severely infected plants in some paddocks. Therefore this is warning to look at the 'risk indicators' to minimise risk.

Variety	CAA Blackleg Rating	Location	Number of surveyed paddocks	% highest paddock infection	% average paddock infection	% of severely affected plants within the worst affected paddock*
Percentage internal infection						
Hyola 50	R	Lower EP	11	13	4	19
45Y77 (CL)	MR	Lower EP	10	38	24	66
46Y78 (CL)	MR	Lower EP	2	29	22	48
AV-Garnet	MR	Lower EP	12	23	14	36
TornadoTT	MR	Lower EP	24	16	8	24
Hyola 50	R	Lower SE	3	5	2	6
46Y78 (CL)	MR	Lower SE	4	59	37	72
46C76 (CL)	MS	Lower SE	6	52	15	27
ATR-Marlin	MR	Lower SE	5	19	14	36

Internal infection is determined by cutting the stem and visually scoring the percentage of blackened tissue (see Fig 2 and 3). EP = Eyre Pen (SA), SE = South East (SA). *Severely infected indicates plants with 30% or more internal infection.

Why did some varieties have more blackleg in 2008?

The blackleg fungus *Leptosphaeria maculans* has the ability to overcome the disease resistance contained in canola varieties. Where single major resistance genes are used, previously resistant varieties can become completely susceptible (as seen on the Eyre Peninsula in 2003). Current varieties have a number of resistance genes, therefore if blackleg overcomes one resistance gene, other resistance genes remain effective and so the crops should not become completely susceptible. However, some varieties contain major and minor gene combinations and what happens when the blackleg fungus adapts to the variety is uncertain – but the results in Table 2 indicate that disease severity will increase as the fungus adapts to new varieties.

How does blackleg overcome resistance genes?

Unlike cereal rusts in Australia where all individual fungal spores are genetically identical, blackleg is a sexually reproducing fungal pathogen. The spores which attack crops each year are a result of sexual recombination occurring on canola stubble over the summer and autumn.

Blackleg spores are genetically different to each other, so there will always be individual spores that can attack each resistance gene in canola. If a blackleg spore is able to attack, it will colonise the canola plant and then reproduce on the stubble, releasing more spores in subsequent years capable of overcoming that resistance gene or genes. When you sow a particular canola variety which has specific resistance genes you will invariably select for blackleg spores that are able to attack your variety. The number of virulent (highly pathogenic) spores initially is low so that it takes a number of years before they increase to a frequency which can cause yield loss. This can be compared to the overuse of one herbicide group and the subsequent selection of herbicide resistant ryegrass plants.

Past observations have seen that different varieties can differ in their resistance stability; some varieties lose resistance quickly while other varieties have not lost resistance to date. Blackleg will overcome the resistance in all varieties. However in varieties with only polygenic resistance the loss of resistance is normally gradual – termed an 'erosion of resistance'. Where resistance has been eroded a 'Reduced Resistance' warning has been placed on their blackleg rating.

How to monitor blackleg severity

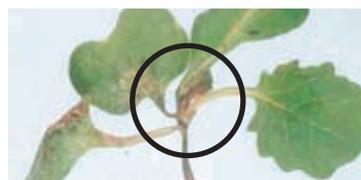


Figure 1. Seedling death (highlighted blackleg pinched hypocotyl). If diseased roots are observed the likely cause is 'Damping-off fungi'.



Figures 2 & 3. Cut 50 random plants at the crown after windrowing. An average of 30% or more internal infection indicates yield loss.



Figure 4. Check for stem cankers at plant maturity.

