

Blackleg stewardship

– taking a proactive and integrated approach

Canola growers and advisers are being encouraged to take action early and be proactive in developing an integrated approach to managing blackleg in canola.

Promoting these key messages makes good sense and encourages responsible stewardship in managing the risks of blackleg infection and resistance. However, a recent article in issue 116 of the Australian Grains Research and Development Corporation (GRDC) publication *Ground Cover* – in which plant pathologists recommended giving a higher priority to major resistance genes in selecting a canola variety and outlined an identified suspected tolerance to the seed dressing fungicide, fluquinconazole (Jockey Stayer®) – needs to be put into perspective in order to make informed decisions.

We must all recognise that resistance is a reality. Successful producers will manage herbicide resistance, and likewise blackleg resistance. Growers and advisers do not

need bad news or scare tactics. We all have a choice to add diversity to weed and disease management as resistance is identified and/or evolves. These measures aim to reduce the yield and quality losses associated with the disease, but are not likely to eliminate the pathogen or prevent herbicide resistance.

Herbicides alone are not the answer

Relying on herbicides alone to manage weeds is not the answer, as research and experience on-farm have clearly shown in Australia and globally. Regional disease monitoring over the past 15 years across Australia has demonstrated that field populations of *L. maculans* (blackleg) have high evolutionary potential and rapidly adapt to selection pressure from sowing cultivars with major gene resistance, which can lead to resistance 'breakdown' within a few years of cultivar release.

Major gene resistance is a gene-for-gene interaction, with the pathogen having avirulence genes corresponding to the resistance gene in the host canola plant.

Changes in the frequency of *L. maculans* isolates virulent on cultivars, dependent on major

gene resistance, have led to a 'boom and bust' type cycle and resulted in severe yield losses in Australian-grown canola. Two breakdowns of blackleg resistance relying on major gene resistance have been reported from commercial field situations – for instance,

experienced on the lower Eyre Peninsula in South Australia in 2003 and 2012.

An integrated approach

All Pioneer® brand Y series canola hybrids strategically deploy a combination of quantitative (polygenic) and qualitative (major genes) blackleg resistance. Research and experience have proven that quantitative resistance used in an integrated approach with cultural practices and fungicides (seed/foliar) is effective in protecting yield potential, while contributing significantly to durable resistance over more years in the field.

Rotation of cultivars every three years can influence shifts in avirulent allele frequencies of *L. maculans*, but validation of the success from rotation of cultivar resistance groups (based on presence of a major gene) if known and in the longer term is inconclusive.

Cultural practices and fungicide use should be recommended to help preserve the effectiveness of genetic resistance where risk has been assessed, giving resistance conferred by major genes a fighting chance of durability in the long term.

Responsible stewardship

Responsible stewardship programmes for blackleg should include:

- Know your risks by monitoring the incidence and trends in severity of stem canker at windrowing the preceding canola crop and scouting early in the season for leaf lesions in newly sown canola.
- Cultural practices, particularly less intensive rotation of canola, isolation from last year's canola stubble and agronomic practices such as early sowing in April can help to escape high risk of blackleg infection in field



Blackleg on a canola leaf.

situations, in addition to managing other risk factors (e.g. pest damage, losses from heat/soil moisture deficit/late frosts in spring) that may limit yield potential.

- A higher priority is to separate canola from last year's stubble, particularly in high-risk conditions using a farm rotational planner and communicating to neighbours.
- Always use the latest variety blackleg ratings, as the virulence of local blackleg populations may change through crop rotation cycles.
- Avoid blanket recommendations from advisers to plant only one canola variety in a district or rely on the same variety over more than two years.
- Using fungicides on seed (Jockey Stayer®) and applied to fertiliser (Flutriafol) when planting canola, particularly in tight rotations, is a 'critical' best management practice that will reduce fungal infections up to the three to five leaf stage.
- Strategic deployment of foliar fungicides (Prosar® , Aviator Xpro®)



Blackleg fungus seen up close.
(Photograph: www.aginnovators.org.au)

complements other stewardship measures to reduce the severity of stem cankers that in turn helps to protect yield potential.

- Avoid relying on one tactic only to manage resistance (herbicide, disease), and follow-up with another tactic in an integrated double/multiple-knock approach.

Development of new cultivars

In conclusion, the use of race-specific major gene resistance to manage blackleg has been beneficial to improve a variety

of blackleg ratings of new canola cultivars. Ongoing high priority has been given to the development of new cultivars with novel sources of resistance by all proprietary breeders and through the GRDC National Brassica Germplasm Improvement Programme (NBGIP).

This industry initiative is showing good promise. However, this is not the 'silver bullet' solution and should not replace industry stewardship programmes. Being proactive in recommending a more integrated strategy to manage blackleg and increase yield potential in Australian-grown canola crops, is vital.

For more information, contact your local DuPont Pioneer territory manager or promoter agent, visit the Pioneer Hi-Bred Australia website, www.pioneer.com/web/site/australia/stewardship/ or visit www.australianoilseeds.com for the autumn blackleg management guide fact sheet of the agronomy centre of the GRDC Australian Oilseeds Federation. 🌱

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