

Trial 6. Disease management for hyper-yielding canola

Objectives: To determine optimum foliar fungicide management for hyper-yielding canola.

Individual objectives specific to the trial are:

1. Determine the value of contrasting major gene blackleg resistance groups in HYC environments:
 - a. BC (45Y28 RR and 45Y93 CL) – largely ineffective major gene resistance (good minor gene resistance).
 - b. ABD (HyTTec Trifecta) – currently effective major gene resistance.
2. Determine the effect of fungicide management strategies on disease control (upper canopy blackleg and sclerotinia), grain yield and profitability.

Key points:

- The Roundup Ready cultivar 45Y28 RR was consistently higher yielding than the TT cultivar HyTTec Trifecta.
- Hyperyielding Crops don't always need a lot of fungicide:
 - A two-spray strategy of Miravis Star at 20% Bloom followed by Prosaro at 50% Bloom yielded 0.3 t/ha more than the untreated control. At a cost >\$100/ha, the profitability of this fungicide program would have been approximately break-even.
- Resistant cultivars are useful to reduce disease infection, in this case for Upper Canopy Blackleg:
 - In this trial however the yield potential of 45Y28 RR outweighed the resistance benefit of HyTTec Trifecta which has major gene resistance still effective.

Treatments: Six Fungicide strategies applied to two varieties

Table 1. Influence of management strategy and variety of wheat grain yield (t/ha).

Treatment I.D.	Treatment			45Y28 RR		HyTTec Trifecta	Mean	
	4-Leaf	20% Bloom	50% Bloom	Yield (t/ha)		Yield (t/ha)	Yield (t/ha)	
1	Prosaro 300ml/ha	---	---	4.77	-	4.60	4.68	c
2	Prosaro 300ml/ha	Prosaro 450ml/ha	---	4.99	-	4.68	4.83	b
3	Prosaro 300ml/ha	Prosaro 450ml/ha	Prosaro 450ml/ha	5.07	-	4.68	4.87	b
4	Prosaro 300ml/ha	Aviator 800ml/ha	Prosaro 450ml/ha	5.09	-	4.79	4.94	ab
5	Prosaro 300ml/ha	Miravis Star 1000ml/ha	Prosaro 450ml/ha	5.14	-	4.84	4.99	a
6	Prosaro 300ml/ha	Revystar 1000ml/ha	Prosaro 450ml/ha	5.03	-	4.76	4.89	ab
			Mean	5.01		4.72	4.87	
	LSD Variety P=0.05			0.07		P val	<0.001	
	LSD Fungicide P=0.05			0.12		P val	<0.001	
	LSD Variety x Fungicide P=0.05			n.s.		P val	0.663	

There was no effect of fungicide on oil concentration, but HyTTec Trifecta (48.1%) had slightly higher oil concentration overall compared with 45Y28 RR (47.6%).

Increasing fungicide input from nil fungicide, to one Prosaro at 20% Bloom to two fungicides, one at 20% Bloom and one at 50% Bloom, reduced the symptoms of the diseases Sclerotinia stem rot, Upper canopy blackleg (branch infection) and Powdery Mildew but none of the disease were present at levels that caused severe yield loss. Upper canopy blackleg infection was higher in 45Y28 RR than in HyTTec Trifecta. Fungicide provided close to full control in HyTTec Trifecta but there was still some disease in 45Y28 RR even with a two-spray fungicide program. Despite this yield was still highest in 45Y28 RR and the response to the highest yielding fungicide treatment was only 0.3 t/ha above the nil fungicide treatment. For Powdery Mildew, HyTTec Trifecta consistently had higher infection levels than 45Y28 RR but the magnitude of the yield loss was much smaller than the magnitude in reduction in Powdery Mildew symptoms from fungicide application.

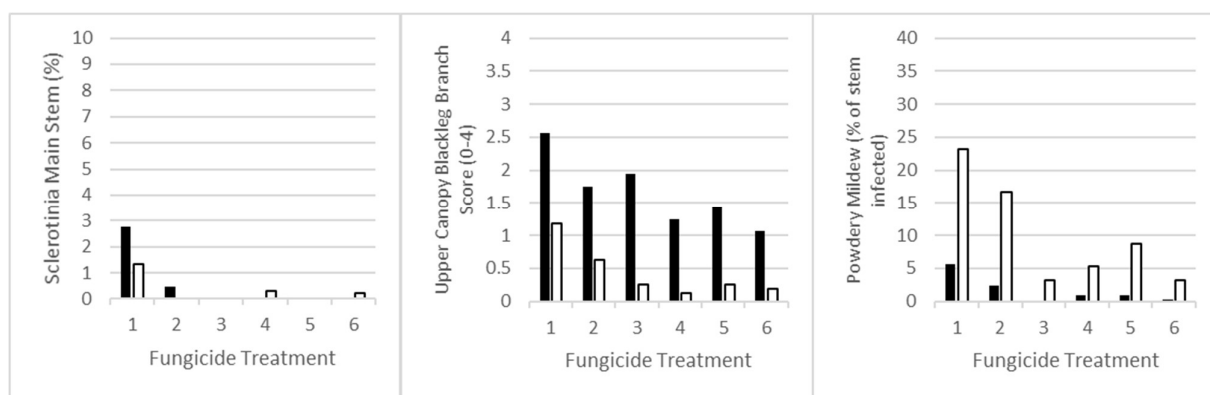


Figure 1. Effect of fungicide treatment on a) Sclerotinia stem rot infection (percentage of main stems infected, b) Upper canopy blackleg branch infection, where 0 = nil infection, 2 = infection common but with minimal branch death, 4 = infection common with a high rate of branch senescence; c) Powdery mildew infection (percentage of branch/stem area infected). Black bars = 45Y28 RR and white bars = HyTTec Trifecta. L.S.D. Sclerotinia = 0.79%, Upper Canopy Blackleg = 0.66 and Powdery Mildew = 5.8%.

Table 2. Details of the management levels (kg, g, ml/ha).

Sowing date:	17 April	
Seed Rate:	60 seeds/m ²	
Sowing Fertiliser:	130kg/ha MAP	
Seed Treatment:	Jockey + Poncho	
Nitrogen:	17 April	150 kg/ha SOA (30 kg/ha N)
	11 June	196 kg/ha Urea (90 kg/ha N)
	4 August	70 kg/ha Urea (32 kg/ha N)
Fungicide:	As per treatment list	