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Is canola fungicide investment justified in low and medium rainfall environments of NSW?

Grain Orana Alliance

Trial Name	Canola Fungicides
GRDC Code	GOA2404-001RTX
Season	Winter 2025
Location	Geurie
Trial cooperator	Jeff Hutchison

Keywords

GRDI015, fungicides, sclerotinia, blackleg, alternaria, powdery mildew, rotations.

Take home messages

- Pre flowering sclerotinia infection events can occur, and fungicide applications during flowering have little effect on these. We could not determine the effects of early infections on yields.
- A crop with a high yield potential alone is not a good indicator of the likelihood of a yield response to applying fungicides.
- Where seasonal conditions are not conducive to the development of diseases such as sclerotinia, the application of fungicides is unlikely to provide a yield or economic benefit.
- Cropping history and in-crop observations should be combined with other observations (weather conditions) to determine the necessity for fungicide application. The use of the SclerotiniaCM app[1] is a useful tool for assisting in sclerotinia fungicide management

Background

Trials have been conducted by Grain Orana Alliance (GOA) and Brill Ag across southern and central NSW's low and medium rainfall zones since 2020 to determine canola's response to management of spring foliar fungal diseases through the applications of fungicide application during flowering. This work was primarily focused on sclerotinia stem rot.

[1] https://www.dpird.wa.gov.au/online-tools/sclerotinia-cm–sclerotinia-management-app/

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The interest in the use of fungicide to control these diseases was supported by the run of good seasons experienced since 2020 as wetter spring conditions are a key requirement. The general findings from the previous work were that multiple diseases were often present including sclerotinia stem rot, upper canopy blackleg (UCB), powdery mildew (PM), and alternaria leaf and pod spot rather than just one single disease.

The work also demonstrated that when diseases were present their incidence could be reduced using foliar fungicides but yield responses were variable. Furthermore, even where disease was reduced and yield improved, their costs were rarely economically justified.

This trial looks to continue to improve our understanding of spring foliar disease management in the low and medium rainfall zones.

Aims

Compare a small range of fungicide management options (product and timing) on disease development, yields and economic returns.

Methodology

The trial was established in a crop that the grower considered good enough for fungicide application if needed, as it was sown on time with a successful establishment, and had good yield potential. The trial site was selected prior to the initiation of flowering in a commercial crop of 45Y95 CL of sown in May 2025. The paddock was previously cropped with wheat in 2023 and 2025 and canola in 2022.

The trial used a randomized complete block design with 4 replicates. Treatment products, rate applied and timing are listed in Table *1* and were applied using an ATV mounted sprayer with 100 L/ha of spray mixture.

Prior to, during and post application of the treatments the crop canopy was left as undisturbed as much as possible to avoid any potential influence on disease behaviour.

Timings:

- 30% bloom - 29/08/2025
- 50% bloom - 5/09/2025

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Table 1. Treatment table with products, timings and rates. All fungicides were applied with 100L/ha water with AIXR015 nozzles running at 3 Bar (coarse spray quality) at 8km/hour.

TIMING	Product 30% bloom	Rate 30% Bloom (mL/ha)	Product 50% bloom	Rate 50% Bloom (mL/ha)
30% bloom	Aviator® Xpro®	800		
30% bloom	Prosaro®	450		
30 & 50% bloom	Aviator® Xpro®	800	Prosaro®	450
30 & 50% bloom	Prosaro®	450	Aviator® Xpro®	800
50% bloom			Aviator® Xpro®	800
50% bloom			Prosaro®	450
30% bloom	Miravis® Star	1000		
Farmers option	UTC			

Rainfall: 2025 was an average season following the better than average conditions of 2024 and good summer fallow rainfall. The in-crop rainfall for 2025 was approximately 312.7mm. July and August were average rainfall months, however September was very wet with majority of rain received at the site falling over a 24-hour period. Rainfall details are in Table 2.

Table 2. Monthly rainfall[2] (mm) and long-term average (LTA) at trial site

Month	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
2025	52	72	57	48	47	47	35	23	100	10	7	46	**544**
LTA	60	51	53	44	42	45	44	43	42	56	56	51	**587**

Extended rain events (rain falling over 3 or more consecutive days) required to support disease progression such as sclerotinia during the flowering and grain fill period only occurred once in the second week of September, possibly creating the conditions for sclerotinia infections of being over 80% humidity for 48 hours (Figure 1).

[2] Gridded data for the trial site from: Access Gridded Data | LongPaddock | Queensland Government

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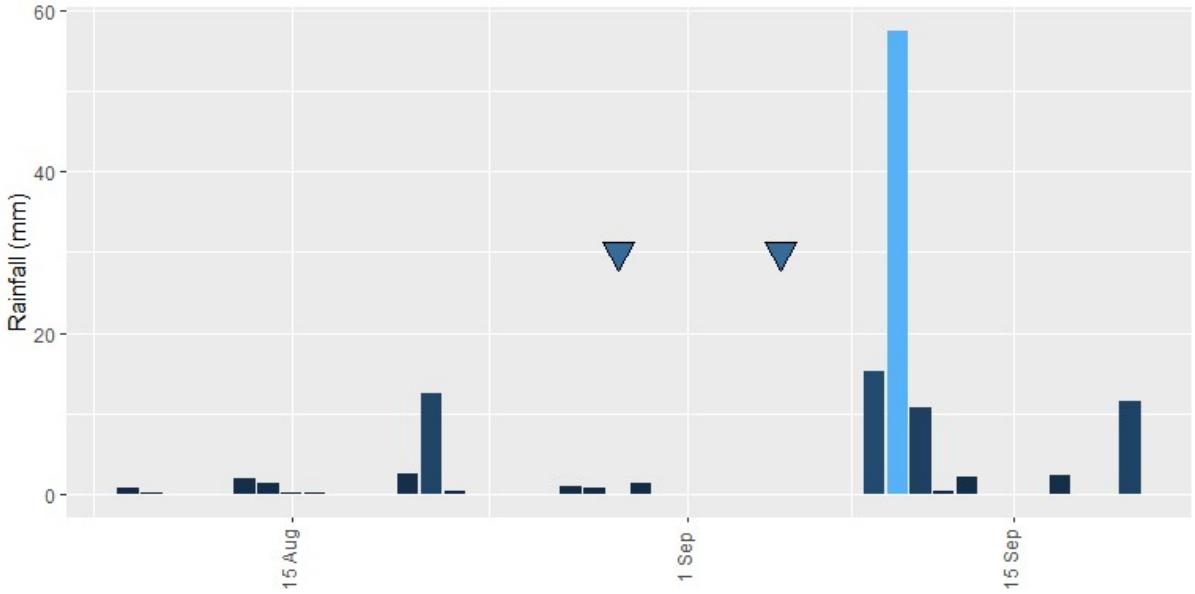

Figure 1. Daily rainfall received (vertical lines) and spray timings (inverted triangles).

Disease incidence was measured around crop windrowing stages of 60-80 seed colour change using the following measures on two 1m^2 areas within each plot;

Sclerotinia- % of plants infected by type of infection e.g. basal, mainstem and branch

Table 3 Blackleg and Alternaria scoring system employed for disease assessments

Score	Blackleg[3]	Alternaria[4]
0	no infection observed	no infection observed
0.5	at least one lesion found	at least one lesion found
1	lesions present	lesions present
2	lesions common	lesions common with 1-5% of pod/stem area infected
3	lesions common causing damage	lesions common with 5-15% of pod/stem area infected and low-level early pod senescence
4	lesions common causing branch death	lesions common with >15% of pod/stem area infected and high level of early pod senescence

Powdery mildew – An assessment was made of the percentage of stem area infected with powdery mildew.

[3] Modified blackleg scoring system ASA2017 https://agronomyaustraliaproceedings.org/images/sampledata/2017/46_ASA2017_Sprague_Susan_Final.pdf

[4] Adapted from the upper canopy blackleg scoring system

Results

Disease:

Sclerotinia was observed in the lower mainstem (but not the upper mainstem). Branch infections were only observed in one treatment (Table 4). No basal of upper mainstem infections were observed. There was no impact by any treatment on the incidence of sclerotinia.

Table 4. Sclerotinia infections (%) observations. Treatments with the same letter within each variable are not significantly different.

	Sclerotinia (%)	
Fungicide rate and timing	**lower mainstem**	**branch**
Aviator® Xpro® 800 mL/ha @ 30% bloom	4.31 ab	0.00 b
Prosaro® 450 mL/ha @ 30% bloom	5.27 ab	0.00 b
Aviator® Xpro® 800 mL/ha @ 30% bloom + Prosaro® 450 mL/ha @ 50% bloom	3.47 b	0.00 b
Prosaro® 450 mL/ha @ 30% bloom + Aviator® Xpro® 800 mL/ha @ 50% bloom	4.33 ab	0.00 b
Aviator® Xpro® 800 mL/ha @ 50% bloom	7.05 a	0.00 b
Prosaro® 450 mL/ha @ 50% bloom	6.63 ab	0.22 a
Miravis® Star 1000 mL/ha @ 30% bloom	4.93 ab	0.00 b
UTC	4.94 ab	0.00 b
lsd	3.20	0.20

Alternaria was scored at low levels (<1 rating) on both branch and pod, with no treatment differences detected.

Upper canopy blackleg (UCB) infections were present on the branch, but almost none observed on pods (Table 5). The following treatments reduced incidence of branch UCB infection levels - Mirvis or Prosaro at 30% and the two- 2 spray treatments (Aviator fb by Prosaro and Prosaro fb Aviator). All other treatment had no impact.

Table 5. Alternaria and upper canopy blackleg infection scores. Treatments with the same letter and variable are not significantly different.

Scores	Alternaria		Upper canopy blackleg		
Fungicide rate and timing	**branch**	**pod**	**branch**		**pod**
Aviator® Xpro® 800 mL/ha @ 30% bloom	0.00	1.00	1.75	ab	0.00
Prosaro® 450 mL/ha @ 30% bloom	0.00	0.87	1.13	c	0.00
Aviator® Xpro® 800 mL/ha @ 30% bloom + Prosaro® 450 mL/ha @ 50% bloom	0.00	0.88	1.00	c	0.00
Prosaro® 450 mL/ha @ 30% bloom + Aviator® Xpro® 800 mL/ha @ 50% bloom	0.00	0.62	1.38	bc	0.00
Aviator® Xpro® 800 mL/ha @ 50% bloom	0.00	0.88	1.75	ab	0.00
Prosaro® 450 mL/ha @ 50% bloom	0.25	0.75	2.12	a	0.00
Miravis® Star 1000 mL/ha @ 30% bloom	0.00	0.87	1.13	c	0.00
UTC	0.00	1.00	2.19	a	0.12
lsd	ns	ns	0.57		ns

Lodging was not observed at the time of the disease assessment.

There was evidence of powdery mildew although at very low levels (less than 2% stem area infection), and all treatments with the exception of Miravis Star reduced its severity, only the 2 spray strategies resulted in nil observed PM (Table 6).

Table 6. Powdery mildew scores. Treatments with the same letter within each site and variable are not significantly different.

Product rate and timing	Powdery mildew (%)	
Aviator® Xpro® 800 mL/ha @ 30% bloom	0.12	b
Prosaro® 450 mL/ha @ 30% bloom	0.75	b
Aviator® Xpro® 800 mL/ha @ 30% bloom + Prosaro® 450 mL/ha @ 50% bloom	0.00	b
Prosaro® 450 mL/ha @ 30% bloom + Aviator® Xpro® 800 mL/ha @ 50% bloom	0.00	b
Aviator® Xpro® 800 mL/ha @ 50% bloom	0.25	b
Prosaro® 450 mL/ha @ 50% bloom	0.50	b
Miravis® Star 1000 mL/ha @ 30% bloom	0.88	ab
UTC	1.75	a
lsd	1.01	

Grain yield:

Canola yields were high, with the average being 3.2 t/ha (Figure 1). There was ~11% yield variability between the highest and lowest yielding treatments with a range of 0.32 t/ha.

Prosaro® 450 mL/ha @ 30% bloom + Aviator® Xpro® 800 mL/ha @ 50% bloom was the only treatment to yield higher than the UTC (Figure 2), all other treatments had no impact on yields.

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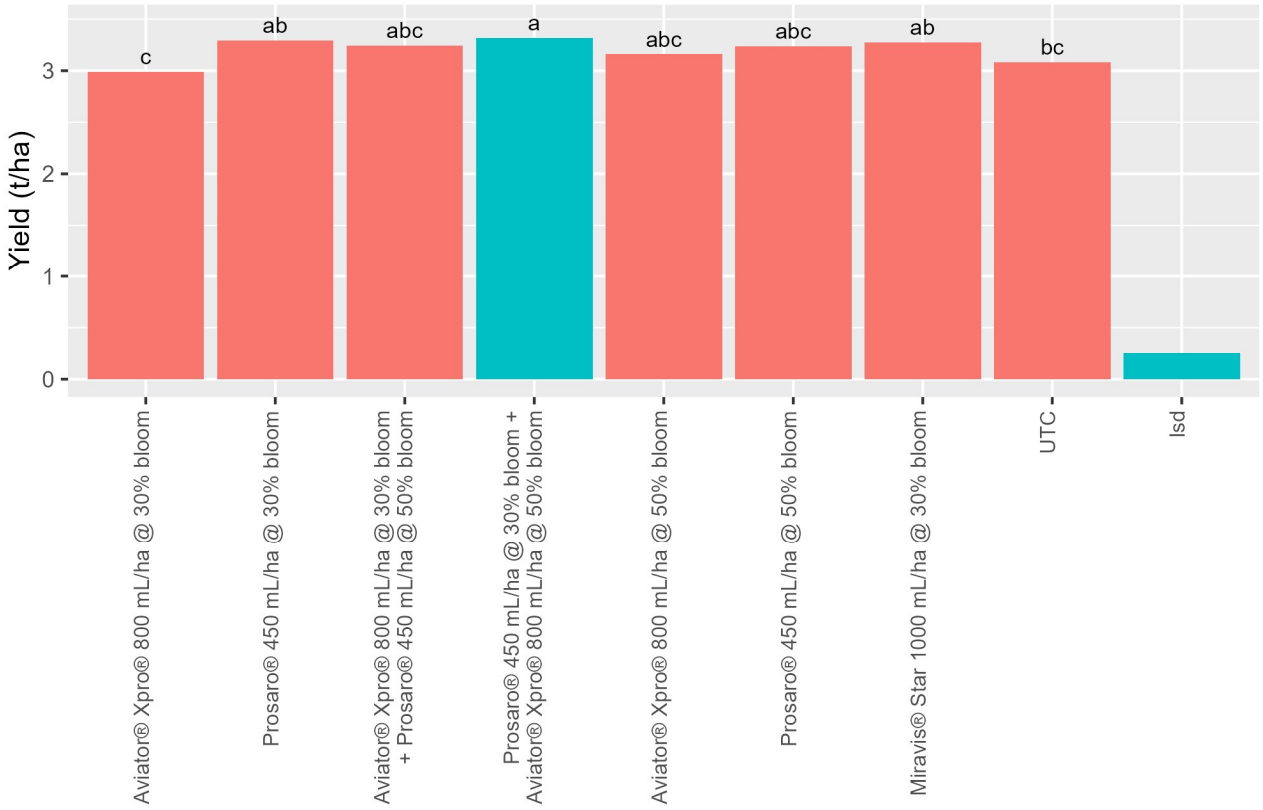

Figure 2. Canola yield (t/ha). Treatments with the same letter are not significantly different.

Grain quality:

Oil levels were an average of 43.1%, and there were no treatment differences.

Economics: The Prosaro® 450 mL/ha @ 30% bloom + Aviator® Xpro® 800 mL/ha @ 50% bloom was the only treatment to result in a higher yield than the UTC. Despite this, no treatments resulted in a net income any different to the UTC (Table 7).

Table 7. Difference in net income (gross income less the cost of fungicides and application) compared to the UTC. Canola base prices of $550 and $730/t, and costs assumed as Aviator Xpro @ $43/L, Prosaro @ $22/L, Miravis® Star $75/l and application $13/ha.

Description	Net income $/ha	
	$550/t	$730/t
Aviator® Xpro® 800 mL/ha @ 30% bloom	Nsd	Nsd
Miravis® Star 1000 mL/ha @ 30% bloom	Nsd	Nsd
Prosaro® 450 mL/ha @ 30% bloom	Nsd	Nsd
Aviator® Xpro® 800 mL/ha @ 30% bloom + Prosaro® 450 mL/ha @ 50% bloom	Nsd	Nsd
Prosaro® 450 mL/ha @ 30% bloom + Aviator® Xpro® 800 mL/ha @ 50% bloom	Nsd	Nsd
Aviator® Xpro® 800 mL/ha @ 50% bloom	Nsd	Nsd
Prosaro® 450 mL/ha @ 50% bloom	Nsd	Nsd
UTC	Nsd	Nsd

Predicting responses using SclerotiniaCM

SclerotiniaCM is a grower decision-support app that estimates sclerotinia risk in canola and shows whether a fungicide spray is likely to pay under different seasonal and crop conditions.

Using the app retrospectively, with the actual weather data and paddock conditions across the second spray timing reflected the findings in this trial, in that-

(i) yield losses were not predicted and

(ii) returns for spraying would only be marginal- (predicted an average net benefit of only at $14/ha).

The output from SclerotiniaCM for the 50% bloom fungicide application is included in the annex.

Discussion

Although 2025 was an average rainfall year, good levels of stored moisture and a good rain in September ensured yields were very good. Weather conditions during flowering were generally drier, with very little rain falling in October and November. As expected, these conditions limited foliar disease to very low levels in canola at this site. However, Sclerotinia, UCI and PM was observed.

At this site there was no impact on sclerotinia levels using fungicides although all infections were noted as lower stem infections. No infections were noted as basal infections, which are believed to be not controlled by fungicide applications however as the infections were all located very low on the stem they may have occurred prior to flowering in which case fungicides had not yet been applied.

Possibly as a function of the low levels of disease and despite the contrasting levels of their reduction using fungicides there was only one treatment that resulted in ~200kg/ha higher yields than the UTC- Prosaro fb Aviator Xpro. All remaining treatments did not yield any different to the UTC.

Despite the higher yields achieved by this treatment, statistical analysis of the net economic benefits of the treatments tested- no treatments showed an economic benefit any different to the UTC.

Conclusions

In average seasons, where the conditions are less conducive for the development of diseases such as sclerotinia, the application of fungicides is likely to result in an economic loss. However, even when there are treatments that result in decreased disease incidence and/or even higher yields result from them, there may not always be an economic case for their application due to the added costs in doing so.

Cropping history and in-crop observations should be combined with other observations (weather conditions) to determine the necessity for fungicide application. The use of the SclerotiniaCM app[5] is a useful tool for assisting in sclerotinia fungicide management.

Acknowledgements

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DISCLAIMER — TECHNICAL

[5] https://www.dpird.wa.gov.au/online-tools/sclerotinia-cm–sclerotinia-management-app/

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ANNEX

Results – In-crop disease and harvest observations

Description	Sclerotinia								Alternaria				Upper Canopy Blackleg									
	basal		mainstem-low		mainstem-high		branch		pod		branch		pod		branch		Powdery mildew		Yield		Oil	
	%								score								%		(t/ha)		(%)	
Aviator® Xpro® 800 mL/ha @ 30% bloom	0.41	ab	4.3	ab	0.0	a	0.0	b	0.0	b	1.00	ab	1.7	ab	0.0	a	0.1	b	3.0	c	43.4	a
Miravis® Star 1000 mL/ha @ 30% bloom	0.22	ab	4.9	ab	0.3	a	0.0	b	0.0	b	0.87	ab	1.1	c	0.0	a	0.9	ab	3.3	ab	43.4	a
Prosaro® 450 mL/ha @ 30% bloom	0.00	b	5.3	ab	0.0	a	0.0	b	0.0	b	0.87	ab	1.1	c	0.0	a	0.8	b	3.3	ab	43.0	a
Aviator® Xpro® 800 mL/ha @ 30% bloom + Prosaro® 450 mL/ha @ 50% bloom	0.00	b	3.5	b	0.0	a	0.0	b	0.0	b	0.88	ab	1.0	c	0.0	a	0.0	b	3.2	abc	42.7	a
Prosaro® 450 mL/ha @ 30% bloom + Aviator® Xpro® 800 mL/ha @ 50% bloom	0.40	ab	4.3	ab	0.0	a	0.0	b	0.0	b	0.62	b	1.4	bc	0.0	a	0.0	b	3.3	a	42.9	a
Aviator® Xpro® 800 mL/ha @ 50% bloom	1.15	a	7.0	a	0.0	a	0.0	b	0.0	b	0.88	ab	1.8	ab	0.0	a	0.3	b	3.2	abc	43.1	a
Prosaro® 450 mL/ha @ 50% bloom	1.14	a	6.6	ab	0.3	a	21.6	a	0.2	a	0.75	ab	2.1	a	0.0	a	0.5	b	3.2	abc	43.3	a
UTC	0.65	ab	4.9	ab	0.5	a	0.0	b	0.0	b	1.00	a	2.2	a	0.1	a	1.8	a	3.1	bc	43.2	a
lsd	0.91		3.2		0.7		19.8		0.2		0.39		0.6		0.0		1.0		0.3		0.7	

Net incomes

Description	Net income			
	$550/t		$730/t	
	$/ha			
Aviator® Xpro® 800 mL/ha @ 30% bloom	1,628.07	b	2,278.2	b
Miravis® Star 1000 mL/ha @ 30% bloom	1,750.01	a	2,465.3	ab
Prosaro® 450 mL/ha @ 30% bloom	1,817.67	a	2,524.0	a
Aviator® Xpro® 800 mL/ha @ 30% bloom + Prosaro® 450 mL/ha @ 50% bloom	1,733.04	ab	2,430.5	ab
Prosaro® 450 mL/ha @ 30% bloom + Aviator® Xpro® 800 mL/ha @ 50% bloom	1,779.37	a	2,490.1	a
Aviator® Xpro® 800 mL/ha @ 50% bloom	1,717.75	ab	2,399.5	ab
Prosaro® 450 mL/ha @ 50% bloom	1,712.61	ab	2,487.7	a

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Description	Net income			
	$550/t		$730/t	
	$/ha			
UTC	1,726.53	ab	2,400.4	ab
lsd	113.98		186.4	

Output ScerotiniaCM

Geurie 50% bloom

Version No: 2.3
23/01/2026, 1:14:52 pm

User input

Spray decision	First spray		
Crop circumstance			
Target yield (t/ha)	3.2	Yield range (t/ha)	3.1 to 3.3
Grain price ($/t)	550	Grain price range ($/t)	525 to 580
Production cost ($/t)	490	Surface soil texture	Fine texture
History			
Frequency of broadleaf crops (Years in 10)	3	Frequency of sclerotinia yield loss (Years in 10)	3
Current conditions			
Bloom stage (%)	50	Bloom stage at previous spray (%)	N/A
Wet days in the last 3 weeks (Days in 21)	6	Forecast wet days next week (Days in 7)	2
Forecast wet days in week after next (Days in 7)	1		
Mitigation by spray (%)	50	Spray cost ($/ha)	25

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Summary table

	No spray	Spray	Difference
		Net return ($/ha)	
Minimum	1121	1143	-7
Mean	1183	1197	14
Maximum	1246	1251	36
		Expected yield (t/ha)	
Minimum	3	3.1	0
Mean	3	3.1	0.1
Maximum	3.1	3.2	0.1
		Loss to sclerotinia (t/ha)	
Minimum	0.07	0.04	-0.11
Mean	0.15	0.08	-0.07
Maximum	0.22	0.12	-0.03