GOA trial site report

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	Gilgandra
Trial cooperators	George and Roger Pagan

Keywords

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

Take home messages

- 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 fungicide application during flowering. This work was primarily focused on sclerotinia stem rot.

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

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

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 Hyola Defender CT and dry sown on the 17th of April 2025. The previous year's crop was wheat, and lupins were grown in 2023 with an observed infection of sclerotinia suggesting the paddock to be at a higher risk of disease in 2025. The presence of sclerotinia was confirmed by PredictaB[2] testing at 1.2 log(kDNA copies/g sample), or a 'medium' population density. Apothecia were not observed at either of the spray application timings.

The trial used a randomised complete block design with 4 replicates. Treatment products, rate applied and timing are listed in Table 1 and were applied by a ute 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 possible to avoid any potential influence on disease behaviour.

Two treatment timings were applied based on label recommendations timings of 20-30% bloom.

Timings:

- 30% bloom - 21/07/2025
- 50% bloom - 8/08/2025

[2] *South Australian Research and Development Institute (SARDI). (2025). Predicta® B soil testing service. Retrieved from https://pir.sa.gov.au/sardi/services/molecular_diagnostics/predicta_b.*

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

Rainfall: 2025 was an average season following the better than average conditions of 2024. The in-crop rainfall for 2025 was approximately 201.5mm. While July was an above average rainfall month, the months where flowering was at their peak (August and September) were relatively dry (Table 2).

Table 2. Monthly rainfall[3] (mm) and long-term average (LTA) at trial site

Month	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
2025	58	19	129	44	26	20	51	22	24	16	14	37	**460**
LTA	60	50	48	38	40	42	42	35	38	47	50	52	**542**

There was a period during the flowering window in the last week of July and another in the third week of August where rain fell on three consecutive days (Figure 1), possibly close to the threshold required for sclerotinia infections, of being over 80% humidity for 48 hours.

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

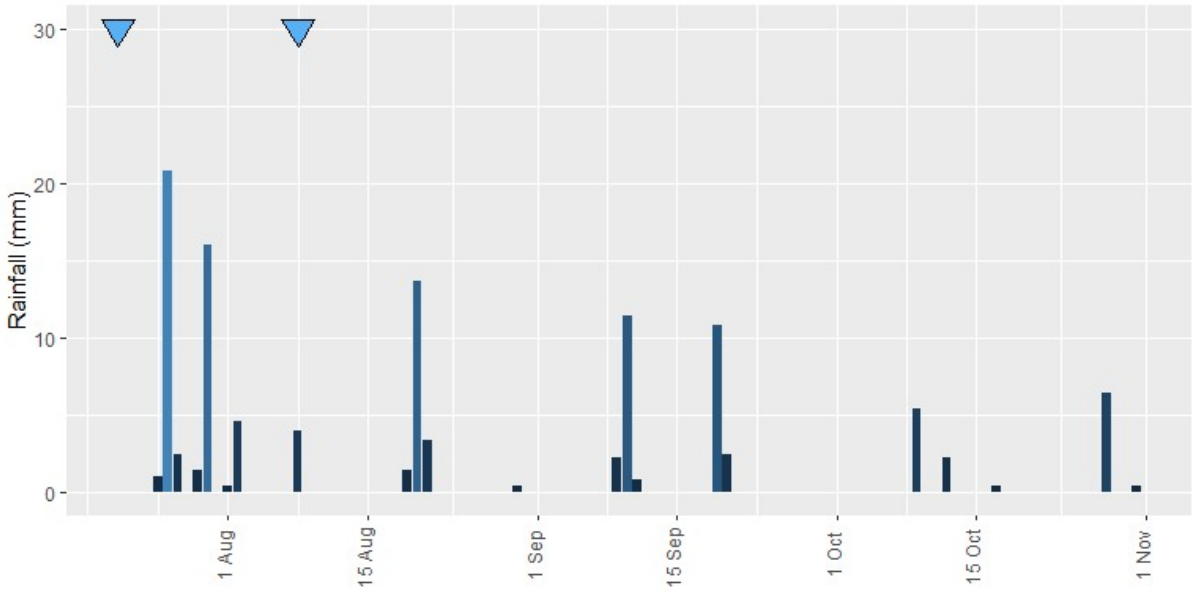

Figure 1. Daily rainfall received (vertical lines) and spray timings (inverted triangles).

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[4]	Alternaria[5]
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.

[4] Modified blackleg scoring system

[5] Adapted from the upper canopy blackleg scoring system

Results

Disease:

Sclerotinia was present at this site at a very low incidence (Table 4), with less than 2% of plants plant assessed (basal, stem or branch) with recorded infections. To determine if sclerotinia infections occurred prior to flowering (or the earliest fungicide applications), both the upper and lower stems were assessed for infections. All stem infections were recorded on the lower stems with none recorded on the higher part of the stems.

Table 4. Sclerotinia infections (%) at the high and low disease risks sites. Treatments with the same letter within each variable are not significantly different.

	Sclerotinia (%)		
Fungicide rate and timing	**basal**	**lower mainstem**	**branch**
Aviator® Xpro® 800 mL/ha @ 30% bloom	0.37 a	0.00 a	0.00 a
Prosaro® 450 mL/ha @ 30% bloom	0.00 a	0.83 a	0.00 a
Aviator® Xpro® 800 mL/ha @ 30% bloom + Prosaro® 450 mL/ha @ 50% bloom	0.00 a	0.00 a	0.00 a
Prosaro® 450 mL/ha @ 30% bloom + Aviator® Xpro® 800 mL/ha @ 50% bloom	0.00 a	0.00 a	0.00 a
Aviator® Xpro® 800 mL/ha @ 50% bloom	0.00 a	0.00 a	0.00 a
Prosaro® 450 mL/ha @ 50% bloom	0.00 a	0.00 a	0.00 a
Miravis® Star 1000 mL/ha @ 30% bloom	0.00 a	0.00 a	0.00 a
UTC	0.20 a	0.97 a	0.20 a
lsd	0.52	1.32	0.41

Alternaria was present at very low levels on both the branch and pod, with slightly higher infections on the latter. Only the early application of Prosaro (as a one spray strategy) reduced the infection levels.

Upper canopy blackleg (UCB) infections were at higher levels on the branch compared to the pod. All treatments (except for the late application of Prosaro) reduced UCB branch infections (Table 5).

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	0.62	ab	1.12	ab	1.00	b	0.00	a
Prosaro® 450 mL/ha @ 30% bloom	0.50	ab	0.75	b	0.88	b	0.00	a
Aviator® Xpro® 800 mL/ha @ 30% bloom + Prosaro® 450 mL/ha @ 50% bloom	0.50	ab	1.25	a	0.75	b	0.00	a
Prosaro® 450 mL/ha @ 30% bloom + Aviator® Xpro® 800 mL/ha @ 50% bloom	0.25	b	1.12	ab	1.13	b	0.00	a
Aviator® Xpro® 800 mL/ha @ 50% bloom	0.63	ab	1.25	a	1.00	b	0.25	a
Prosaro® 450 mL/ha @ 50% bloom	0.63	ab	1.37	a	1.25	ab	0.00	a
Miravis® Star 1000 mL/ha @ 30% bloom	0.25	b	1.00	ab	0.63	b	0.00	a
UTC	0.88	a	1.25	a	1.75	a	0.19	a
lsd	0.55		0.44		0.00		0.00	

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

The unsprayed treatment had close to 12% of the stem area infected by powdery mildew. All treatments reduced the area of stem infected, although Miravis Star was not as effective as other fungicides (and timings) (Table 6).

Table 6. Powdery mildew infection scores at the high and low disease risks sites. 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	3.1	c
Prosaro® 450 mL/ha @ 30% bloom	3.6	c
Aviator® Xpro® 800 mL/ha @ 30% bloom + Prosaro® 450 mL/ha @ 50% bloom	1.3	c
Prosaro® 450 mL/ha @ 30% bloom + Aviator® Xpro® 800 mL/ha @ 50% bloom	2.4	c
Aviator® Xpro® 800 mL/ha @ 50% bloom	3.9	c
Prosaro® 450 mL/ha @ 50% bloom	2.5	c
Miravis® Star 1000 mL/ha @ 30% bloom	7.6	b
UTC	11.9	a
lsd	2.9	

Grain yield:

Canola yields were high, with the average being 2.44 t/ha (Figure 2). There was no yield response to the application of fungicides, as UTC had similar yields to treated plots.

There was ~12% yield variability between the highest and lowest yielding treatments with a range of 0.3 t/ha.

Grain quality:

“Prosaro® 450 mL/ha @ 30% bloom + Aviator® Xpro® 800 mL/ha @ 50% bloom” had a higher oil content than all other treatments and was the only treatment to be higher than the untreated. Oil levels were 42.9% (Figure 2).

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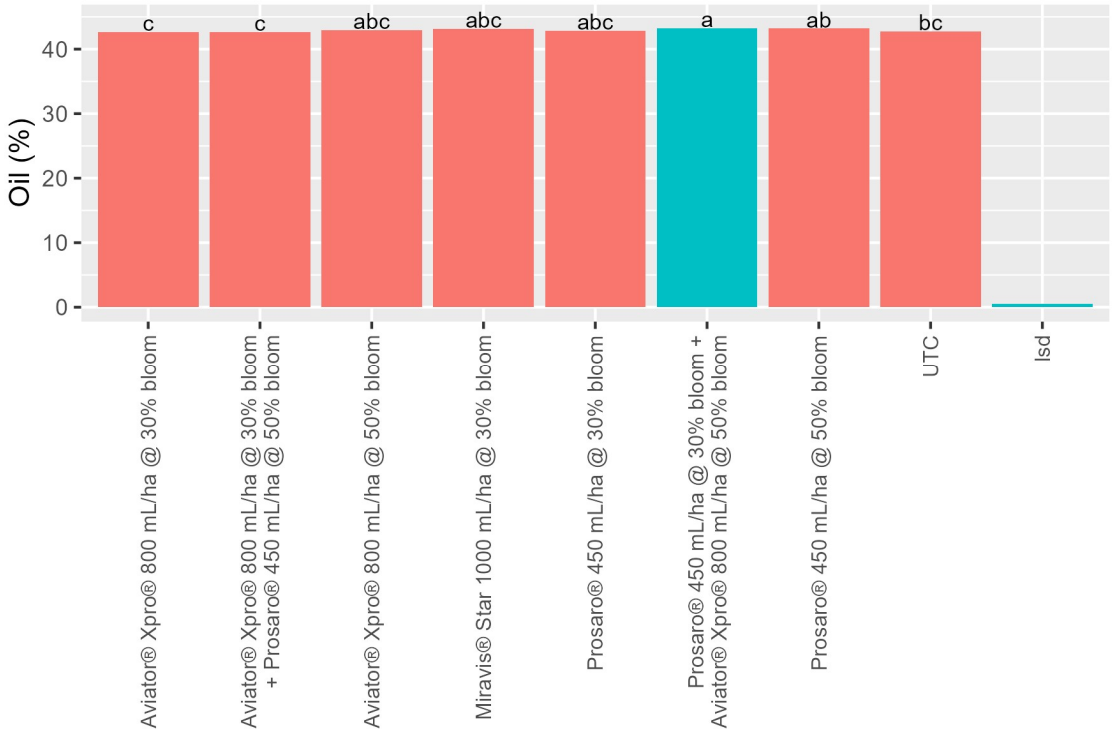

Figure 2. Canola oil (%). Treatments with the same letter within each site and variable are not significantly different.

Economics: As there were no differences in yield, costs for purchase and application of fungicides resulted in net losses in some cases (as illustrated in Table *7* below). At a grain price of $550/t, two treatments resulted in losses between $117- $128/ha. At the higher price of $750/t, only one treatment resulted in a loss of $145/ha.

Table 7. The impact on net income from the application of various fungicide products and timings at two prices of canola grain. Nsd- not significantly different from the UTC

Description	**Net income $/ha**	
	$550/t	**$730/t**
Aviator® Xpro® 800 mL/ha @ 30% bloom	Nsd	Nsd
Miravis® Star 1000 mL/ha @ 30% bloom	1,219 (-$117)	Nsd
Prosaro® 450 mL/ha @ 30% bloom	Nsd	Nsd
Aviator® Xpro® 800 mL/ha @ 30% bloom + Prosaro® 450 mL/ha @ 50% bloom	1,208 (-$128)	1,697 (-$145)
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	1,336	1,842

There was a higher oil content for the two spray Prosaro followed by Aviator Xpro treatment of <0.5%. The application costs ranged from approximately $23 to $88/ha.

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, using the actual weather data and paddock conditions across both spray timings reflected the findings in this trial, in that (i) yield losses were not predicted and (ii) the differences in net return (compared to not spraying) were the cost of the fungicide and its application. The output from SclerotiniaCM for the 50% bloom fungicide application is included in the annex.

Discussion

2025 was an average rainfall year with below average rainfall during the canola flowering period.

July was, however, wetter than average and most crops were tracking well and setting up for a better than average result. This had many growers considering the application of fungicides, and many crops got sprayed.

Better than average yields (and oil contents) were achieved. The dry conditions resulted in low levels of disease. Where there was disease recorded there was often an impact of applied fungicides in reducing disease incidence. One notable example is the reduction in powdery mildew from ~12% down to 3%. However, there was there was no yield response to any treatments applied and only a negligible oil response.

When the economics of the treatments were considered, they either resulted in no difference to the UTC or a lower net profit between $117 and $145/ha. The higher grain price of $750/t did result in less treatments resulting in a loss but a higher loss when it did occur.

Conclusions

In average seasons, where the conditions are less conducive for the development of diseases such as sclerotinia. Despite this, disease was present in the trial and fungicides were useful to reduce the incidence of disease but there was no yield advantage achieved. As would be expected where there was no yield advantage recorded it is not surprising there was no economic benefit to their application. However, there were several cases where the unwarranted application of fungicides resulted in economic losses up to $145/ha and the greatest loss was where the grain price was the highest.

Cropping history and in-crop observations need to be combined with other observations such as prevailing weather conditions should be considered to determine the necessity for fungicide application. The use of the SclerotiniaCM app[6] is a useful tool for assisting in sclerotinia fungicide management.

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

Acknowledgements

The research undertaken as part of this project is made possible by the significant contributions of growers through both trial cooperation and the support of the GRDC. The authors would like to thank them for their continued support. Special thanks go out to George and Roger Pagan who hosted this trial.

DISCLAIMER — TECHNICAL

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ANNEX

Results - in crop disease and harvest observations

Description	Sclerotinia						Alternaria				Upper Canopy Blackleg									
	basal		branch		mainstem		branch		pod		branch		pod		Powdery mildew		Yield		Oil	
	%						score								%		(t/ha)		(%)	
Aviator® Xpro® 800 mL/ha @ 30% bloom	0.37	a	0.0	a	0.0	a	0.6	ab	1.1	ab	1.00	b	0.0	a	0.0	c	2.6	a	42.7	c
Miravis® Star 1000 mL/ha @ 30% bloom	0.00	a	0.0	a	0.0	a	0.3	b	1.0	ab	0.63	b	0.0	a	0.1	b	2.3	b	43.1	abc
Prosaro® 450 mL/ha @ 30% bloom	0.00	a	0.0	a	0.8	a	0.5	ab	0.7	b	0.88	b	0.0	a	0.0	c	2.4	ab	42.9	abc
Aviator® Xpro® 800 mL/ha @ 30% bloom + Prosaro® 450 mL/ha @ 50% bloom	0.00	a	0.0	a	0.0	a	0.5	ab	1.2	a	0.75	b	0.0	a	0.0	c	2.3	b	42.7	c
Prosaro® 450 mL/ha @ 30% bloom + Aviator® Xpro® 800 mL/ha @ 50% bloom	0.00	a	0.0	a	0.0	a	0.3	b	1.1	ab	1.13	b	0.0	a	0.0	c	2.5	ab	43.3	a
Aviator® Xpro® 800 mL/ha @ 50% bloom	0.00	a	0.0	a	0.0	a	0.6	ab	1.2	a	1.00	b	0.2	a	0.0	c	2.5	ab	42.9	abc
Prosaro® 450 mL/ha @ 50% bloom	0.00	a	0.0	a	0.0	a	0.6	ab	1.4	a	1.25	ab	0.0	a	0.0	c	2.4	ab	43.2	ab
UTC	0.20	a	0.2	a	1.0	a	0.9	a	1.2	a	1.75	a	0.2	a	0.1	a	2.5	ab	42.8	bc
lsd	0.52		0.4		1.3		0.6		0.4		0.00		0.0		0.0		0.2		0.5	

Results net income

Description	Net income $/ha			
	$550/t		$730/t	
Aviator® Xpro® 800 mL/ha @ 30% bloom	1,396.33	a	1,945.3	a
Miravis® Star 1000 mL/ha @ 30% bloom	1,218.59	bc	1,707.8	bc
Prosaro® 450 mL/ha @ 30% bloom	1,322.66	abc	1,890.9	a
Aviator® Xpro® 800 mL/ha @ 30% bloom + Prosaro® 450 mL/ha @ 50% bloom	1,208.26	c	1,696.7	c
Prosaro® 450 mL/ha @ 30% bloom + Aviator® Xpro® 800 mL/ha @ 50% bloom	1,340.69	a	1,872.2	a
Aviator® Xpro® 800 mL/ha @ 50% bloom	1,331.58	ab	1,857.4	abc
Prosaro® 450 mL/ha @ 50% bloom	1,303.69	abc	1,796.7	abc
UTC	1,335.89	a	1,841.5	ab
lsd	117.50		160.0	

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Output ScerotiniaCM

Gilgandra 50% bloom application

Version No: 2.3
18/12/2025, 3:39:20 pm

User input

Spray decision	First spray		
Crop circumstance			
Target yield (t/ha)	2.6	Yield range (t/ha)	2.1 to 2.9
Grain price ($/t)	550	Grain price range ($/t)	525 to 580
Production cost ($/t)	490	Surface soil texture	Fine texture
History			
Frequency of broadleaf crops (Years in 10)	3	Frequency of sclerotinia yield loss (Years in 10)	3
Current conditions			
Bloom stage (%)	50	Bloom stage at previous spray (%)	N/A
Wet days in the last 3 weeks (Days in 21)	7	Forecast wet days next week (Days in 7)	1
Forecast wet days in week after next (Days in 7)	1		
Mitigation by spray (%)	50	Spray cost ($/ha)	25

Summary table

	No spray	Spray	Difference
		Net return ($/ha)	
Minimum	759	755	-15
Mean	870	867	-3
Maximum	976	973	10
		Expected yield (t/ha)	
Minimum	2.3	2.3	0
Mean	2.5	2.5	0
Maximum	2.7	2.7	0.1
		Loss to sclerotinia (t/ha)	
Minimum	0.04	0.02	-0.06
Mean	0.08	0.04	-0.04
Maximum	0.12	0.07	-0.02