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	Narromine
Trial cooperators	Greg and Hamish Job

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 or economic 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.

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 Nuseed HyTTec Trifecta, sown on the 2nd May 2025. The previous year's crop was chickpeas.

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 truck 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 behavior.

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

Timings:

- 30% bloom - 24/07/2025
- 50% bloom - 12/08/2025

GOA trial site report

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 droplet) 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		
Farmers option	UTC			

Rainfall: 2025 was an average season following the better than average conditions of 2024. The in-crop rainfall for 2025 was approximately 300.3mm. July and August were average rainfall months, however September was very wet with the 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	48	31	53	39	44	42	34	35	93	9	18	13	**459**
LTA	56	49	50	41	40	42	40	36	37	47	48	47	**533**

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. These events were at the end of July and the first week in August where rain fell on three consecutive days (Figure 1) where the conditions were possibly close to the threshold (for sclerotinia infections) of being over 80% humidity for 48 hours.

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

GOA trial site report

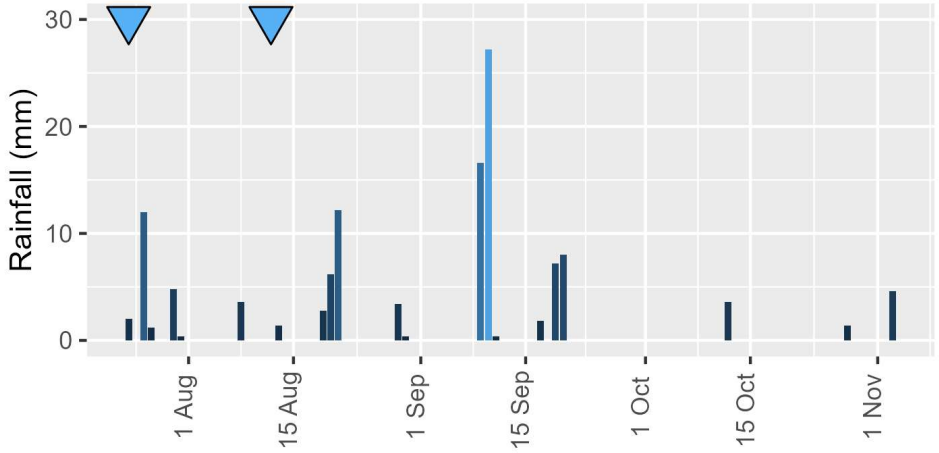

Figure 1. Daily rainfall received (vertical lines) and spray timings (inverted triangles).

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

[4] Adapted from the upper canopy blackleg scoring system

Results

Disease:

Sclerotinia was only observed in one treatment and only on the lower mainstem with an incidence of less than 3 plants in 1000. No other infections were observed in the trial assessments (data is not shown).

Alternaria was present at low levels on both the branch and pod, with infections slightly higher on the latter. Only the two spray strategies of Prosaro followed up with Aviator Xpro or Miravis Star @ 30% reduced the Alternaria infections on the branch. It should be noted the UTC only had a score of less than 1, indicating a very low level of infection.

No treatments reduced pod infections.

Upper canopy blackleg (UCB) had generally higher levels of infections on the branch (compared to the pod). Any treatment that included a 50% application (and Miravis Star applied at 30% bloom) timing reduced the incidence of UCB on the branch. It should be noted the UTC only had a score of less than 1, indicating a very low level of infection.

No treatment made a difference to the UCB score on the pod, Table 4.

Table 4. 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	0.63 ab	1.50 a	0.75 ab	0.50 ab
Prosaro® 450 mL/ha @ 30% bloom	0.62 ab	1.00 a	0.75 ab	0.62 a
Aviator® Xpro® 800 mL/ha @ 30% bloom + Prosaro® 450 mL/ha @ 50% bloom	0.75 ab	1.25 a	0.12 c	0.50 ab
Prosaro® 450 mL/ha @ 30% bloom + Aviator® Xpro® 800 mL/ha @ 50% bloom	0.12 c	1.12 a	0.12 c	0.13 b
Aviator® Xpro® 800 mL/ha @ 50% bloom	0.50 abc	1.37 a	0.12 c	0.13 b
Prosaro® 450 mL/ha @ 50% bloom	0.88 a	1.37 a	0.25 bc	0.25 ab
Miravis® Star 1000 mL/ha @ 30% bloom	0.37 bc	1.25 a	0.12 c	0.25 ab
UTC	0.81 a	1.19 a	0.81 a	0.50 ab
lsd	0.47	0.54	0.00	0.00

Lodging was not observed at the time of the disease assessment, neither was powdery mildew.

There was evidence of premature senescence in some plots and the application of Miravis® Star, Aviator® Xpro® 800 mL/ha @ 50% bloom, Prosaro® 450 mL/ha @ 30% bloom and Aviator® Xpro® 800 mL/ha @ 30% bloom + Prosaro® 450 mL/ha @ 50% bloom reduced the severity (Table 5).

Table 5. Premature senescence scores. Treatments with the same letter within each site and variable are not significantly different.

Product rate and timing	**Premature senescence (score)**	
Aviator® Xpro® 800 mL/ha @ 30% bloom	4.17	a
Prosaro® 450 mL/ha @ 30% bloom	2.38	c
Aviator® Xpro® 800 mL/ha @ 30% bloom + Prosaro® 450 mL/ha @ 50% bloom	2.75	bc
Prosaro® 450 mL/ha @ 30% bloom + Aviator® Xpro® 800 mL/ha @ 50% bloom	2.25	c
Aviator® Xpro® 800 mL/ha @ 50% bloom	2.38	c
Prosaro® 450 mL/ha @ 50% bloom	2.50	bc
Miravis® Star 1000 mL/ha @ 30% bloom	2.38	c
UTC	3.31	ab
lsd	0.00	

Grain yield:

Canola yields were high, with the average being 2.53 t/ha (Figure 2). There was ~12% yield variability between the highest and lowest yielding treatments with a range of 0.67 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.

GOA trial site report

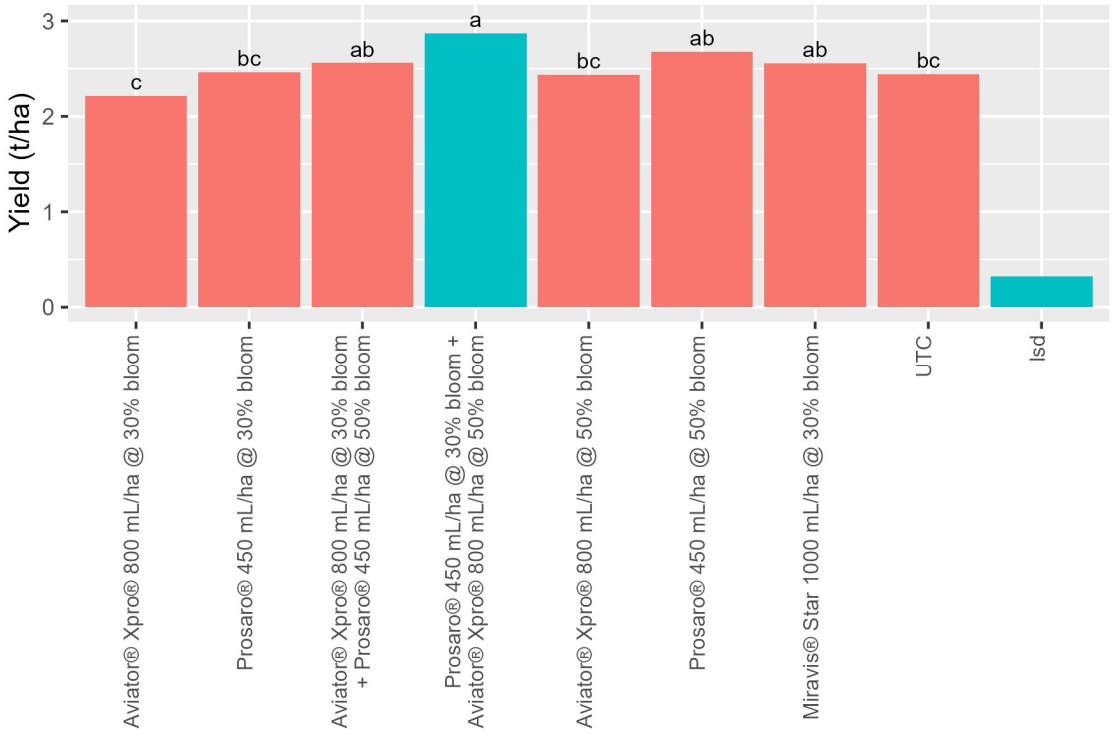

Figure 2. Canola yield (t/ha) in response to various fungicide treatments and timings. Treatments with the same letter within each site and variable are not significantly different.

Grain quality:

Oil levels were 44.9%. There were no treatment differences in oil content.

Economics:

The economic benefits of the various treatments tested varied depending on the canola grain price factored in. At the lower, longer term canola price of $550/t, only one treatment resulted in an economic benefit higher than the UTC- Prosaro® 450 mL/ha @ 20% bloom + Aviator® Xpro® 800 mL/ha @ 50% bloom. This treatment resulted in an increased net return of $176/ha. Aviator® Xpro® 800 mL/ha @ 30% bloom actually resulted in a net benefit lower than the UTC of -$172/ha.

When using the higher grain price of $730/t, two treatments resulted in economic benefits higher than the UTC. Prosaro® 450 mL/ha @ 20% bloom + Aviator® Xpro® 800 mL/ha @ 50% bloom resulted in a net benefit of $327/ha and Prosaro applied at 50% bloom resulted in an extra $238/ha.

Table 6. Difference in net income (gross income less the cost of fungicides and application) compared to the UTC. Canola base prices of $550/t and $730/t and costs assumed as Aviator Xpro @ $43/L, Prosaro @ $22/L, and application $13/ha. Nsd – Not significantly different from the UTC.

Treatment	Net income $/ha (@ $550/t)	Net income $/ha (@ $730/t)
Aviator® Xpro® 800 mL/ha @ 30% bloom	$1225 (-$172)	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	$1573 (+$176)	$2192 ($327)
Aviator® Xpro® 800 mL/ha @ 50% bloom	Nsd	Nsd
Prosaro® 450 mL/ha @ 50% bloom	Nsd	$2103 ($238)
UTC	$1397	$1865

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 minor and (ii) the differences in net return (compared to not spraying) were negligible (or less than the cost of fungicide application). The output from SclerotiniaCM for the 50% bloom fungicide application is included in the annex.

Discussion

Rainfall at this site could be characterised as average through the growing season up till September which received a large rain event in the second half of the month. Rainfall following, and up until harvest was quite dry. Despite this, good yields (~2.5 t/ha) were achieved.

Conditions conducive to the infection for sclerotinia of 3 consecutive days of rain during flowering were not received during the flowering period and as such would explain the low level of infection of the disease. The generally drier conditions from September onwards would also help explain the low levels of the other diseases present.

Surprisingly there was still one- two spray treatment that resulted in yields higher than the UTC despite only a low level of reduction in UCI and Alternaria. It would be suggested it is unlikely that the apparent levels of disease would not generally explain the yield differences, suggesting there could be other impacts not measured or observed.

Similarly, there were several treatments that resulted in differences in the net benefits of the treatments. At the lower grain prices one treatment resulted in a lower value than the UTC and the other a higher value as detailed

above. At the higher grain prices two treatments resulted in strong benefits, but again these seem to be at odds with the impacts on disease that was apparent at the site.

Therefore the findings should be considered cautiously as the mechanism for the impacts is not entirely clear and should be further investigated.

Conclusions

In better than average seasons, weather conditions at the critical period can determine the level of disease development. Even with a big canopy the weather conditions during flowering and pod fill did not support the development of disease (particularly sclerotinia) evidenced by quite low disease incidences. The same can be said for the other disease present.

Despite the low levels of disease there was still evidence that fungicides can reduce their incidence.

There were very limited yield responses, and they did not clearly correlate with expectation based on disease control levels. The same could be said for the economic benefits stemming from the individual treatments. However, it was clear that the increase in the grain price did tend to magnify any yield effects and in turn increase options showing a positive return.

Combining an understanding of disease development requirements with recent weather and forecasts, paddock history and field observations can help make informed canola disease management decisions.

Cropping history and in-crop observations need to 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

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 Greg and Hamish Job who hosted this trial.

DISCLAIMER — TECHNICAL

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

GOA trial site report

Products may be identified by proprietary or trade names to help readers identify particular types of products, but this is not, and is not intended to be, an endorsement or recommendation of any product or manufacturer referred to. Other products may perform as well or better than those specifically referred to.

ANNEX

Results - In-crop disease and harvest results

Description	Sclerotinia		Alternaria		Upper Canopy Blackleg				
	branch	mainstem	branch	pod	branch	pod	Premature senescense	Yield	Oil
	%		score				%	(t/ha)	(%)
UTC	0.01a	0a	0.8a	1.2a	0.8a	0.50ab	3.3ab	2.4bc	44.8ab
lsd	0.01	0	0.5	0.5	0.0	0.00	0.0	0.3	0.7
Aviator® Xpro® 800 mL/ha @ 30% bloom	0.00a	0a	0.6ab	1.5a	0.7ab	0.50ab	4.2a	2.2c	45.0ab
Aviator® Xpro® 800 mL/ha @ 30% bloom + Prosaro® 450 mL/ha @ 50% bloom	0.00a	0a	0.7ab	1.2a	0.1c	0.50ab	2.8bc	2.6ab	45.3a
Aviator® Xpro® 800 mL/ha @ 50% bloom	0.00a	0a	0.5abc	1.4a	0.1c	0.13b	2.4c	2.4bc	45.1ab
Miravis® Star 1000 mL/ha @ 30% bloom	0.00a	0a	0.4bc	1.2a	0.1c	0.25ab	2.4c	2.6ab	44.9ab
Prosaro® 450 mL/ha @ 30% bloom	0.00a	0a	0.6ab	1.0a	0.8ab	0.62a	2.4c	2.5bc	44.4b
Prosaro® 450 mL/ha @ 30% bloom + Aviator® Xpro® 800 mL/ha @ 50% bloom	0.00a	0a	0.1c	1.1a	0.1c	0.13b	2.2c	2.9a	44.7ab
Prosaro® 450 mL/ha @ 50% bloom	0.00a	0a	0.9a	1.4a	0.2bc	0.25ab	2.5bc	2.7ab	45.1ab

Treatment	Net income (@ $550/t)		Net income (@ $730/t)	
Aviator® Xpro® 800 mL/ha @ 30% bloom	1224.741	c	1707.919	d
Miravis® Star 1000 mL/ha @ 30% bloom	1380.546	bc	1937.482	bcd
Prosaro® 450 mL/ha @ 30% bloom	1384.249	bc	1919.978	bcd
Aviator® Xpro® 800 mL/ha @ 30% bloom + Prosaro® 450 mL/ha @ 50% bloom	1406.333	abc	1967.492	abc
Prosaro® 450 mL/ha @ 30% bloom + Aviator® Xpro® 800 mL/ha @ 50% bloom	1573.392	a	2191.652	a
Aviator® Xpro® 800 mL/ha @ 50% bloom	1356.029	bc	1835.531	cd
Prosaro® 450 mL/ha @ 50% bloom	1519.854	ab	2103.096	ab
UTC	1397.37	b	1865.277	cd

GOA trial site report

Output SclerotiniaCM

Narromine 50% application

Version No: 2.3
21/01/2026, 1:07:50 pm

User input

Spray decision	First spray		
Crop circumstance			
Target yield (t/ha)	2.5	Yield range (t/ha)	2 to 2.8
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	713	709	-15
Mean	818	814	-4
Maximum	918	914	8
		Expected yield (t/ha)	
Minimum	2.2	2.2	0
Mean	2.4	2.4	0
Maximum	2.6	2.6	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