

WERE CANOLA FUNGICIDES JUSTIFIED IN 2020 IN LOW AND MEDIUM RAINFALL ENVIRONMENTS

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GRDC
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CORPORATION

2020- BEST START TO CANOLA IN YEARS

High risk for spring foliar diseases- or was it?

- High biomass
 - Early sowing
 - High nitrogen
- High yield potentials
- More rain on the forecast early flowering

WHEN ARE FUNGICIDES JUSTIFIED?

High rainfall vs low- medium rainfall zones

- Returns for fungicides are clearer in higher rainfall zones
 - Higher yield potential
 - Higher crop frequency
 - Disease is more endemic
 - Spring weather more supportive
- Not as clear in low and medium rainfall zones
 - Little trial work publicly available

2020 TRIALS

5 trial sites to test the response to fungicides

- Primarily targeting Sclerotinia
- Farmer sown paddocks
- Replicated trials
- Key timings targeted 30 & 50% bloom, 10% some sites
- Range of products + combinations
- Disease assessed windrowing stage
- Yields by plot header

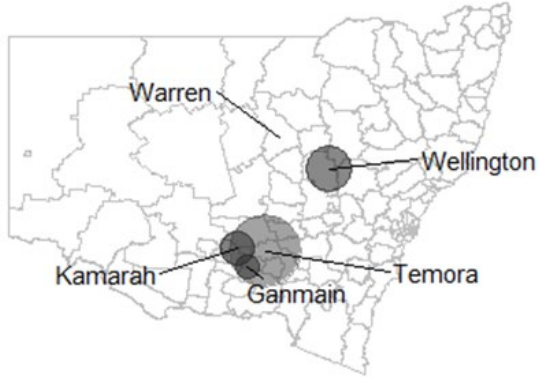


A BIT MORE BACKGROUND

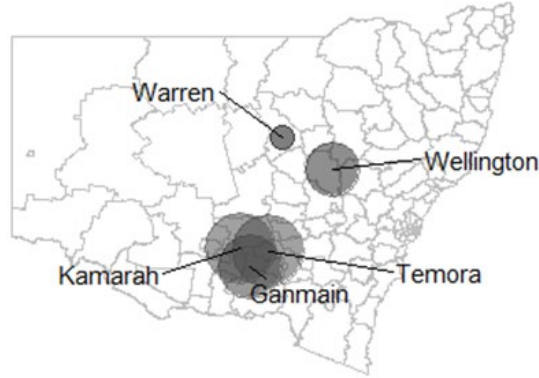
Sclerotinia was present at all sites

Site	Petals infected (%)#
Ganmain	100
Kamarah	78
Temora	100
Warren	87
Wellington	55

Sclerotinia - mainstem

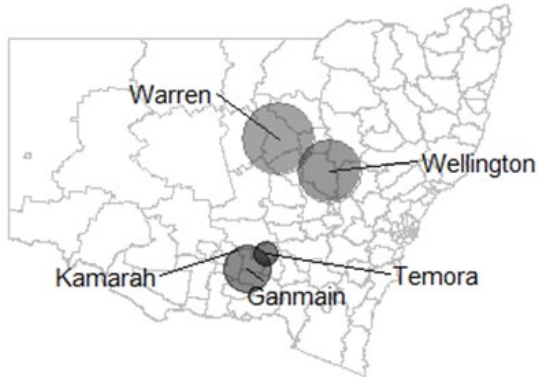


Upper canopy blackleg - branch

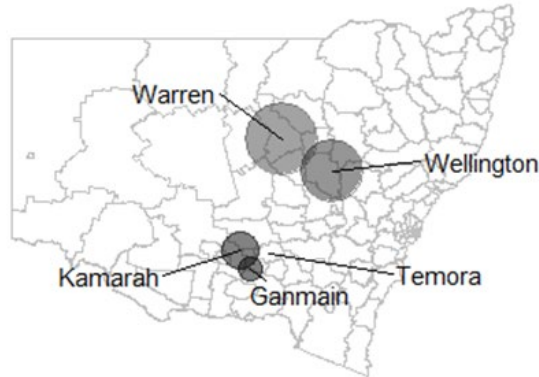


Disease levels
present at
each site for
the key
diseases-
untreated

Alternaria - pod



Powdery mildew

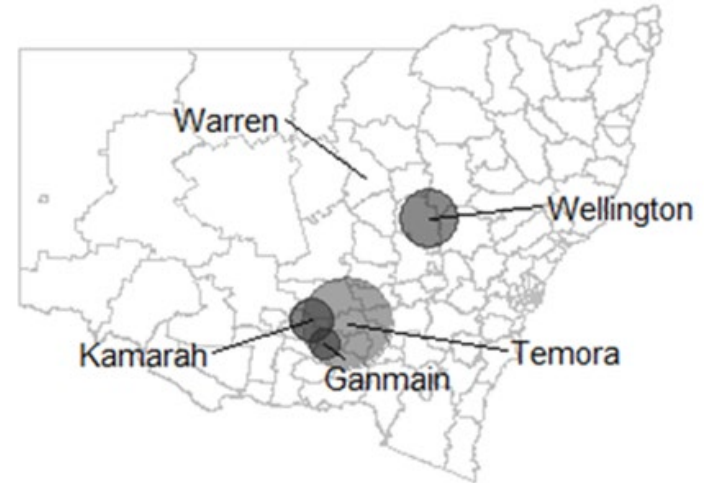


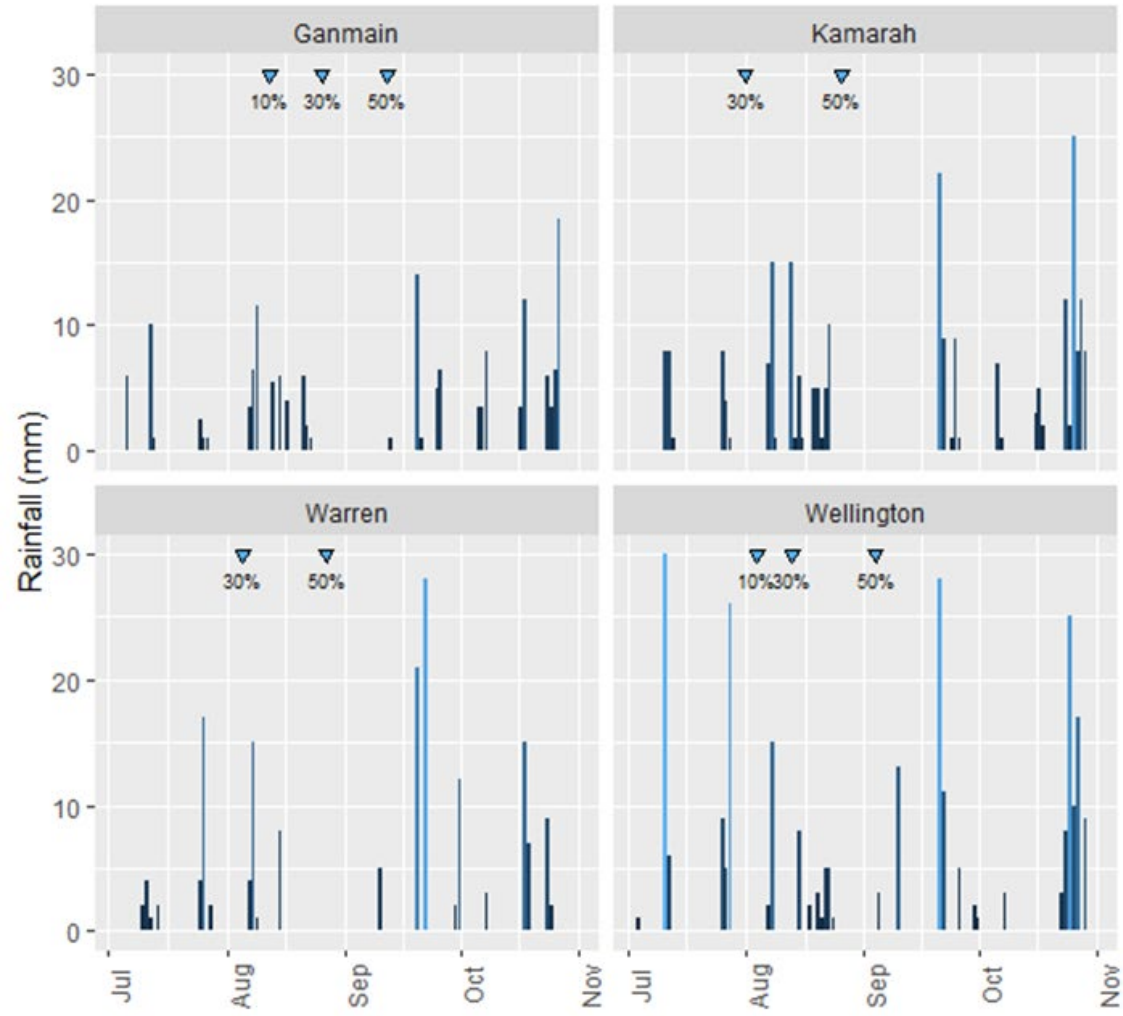
A BIT MORE BACKGROUND

Sclerotinia was present at all sites

Site	Petals infected (%)#
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Sclerotinia - mainstem





RAINFALL PATTERNS

Rating system used

Upper canopy blackleg

- 0 = no infection observed
- 0.5 = at least one lesion found
- 1 = lesions present
- 2 = lesions common
- 3 = lesions common causing damage
- 4 = lesions common causing branch death

Sclerotinia- % of plants/stem infected

Powdery Mildew- % of stem area infected

Alternaria

- 0 = no infection observed
- 0.5 = at least one lesion found
- 1 = lesions present
- 2 = lesions common with 1-5% of pod/stem area infected
- 3 = lesions common with 5-15% of pod/stem area infected and low-level early pod senescence.
- 4 = lesions common with >15% of pod/stem area infected and high level of early pod senescence.

Fungicide treatment and timing (% bloom)*	Sclero MS (%)	Sclero Br. (%)	UC BL Br. (0-4)	Alt. pod (0-4)	PM (%)
Aviator Xpro 650 mL/ha 10%	5.7	0.6	1.4	2.5	10
Aviator Xpro 650 mL/ha 30%	0.3	0	1.4	2.1	5.4
Prosaro 450 mL/ha 30%	0.3	0	1.7	2.5	2.9
Miravis Star 30%	0.5	0	1.4	2	5
Aviator Xpro 650 mL/ha 10% + Prosaro 450 mL/ha 50%	0.8	0	1.7	2.4	2.7
Aviator Xpro 650 mL/ha 30% + Prosaro 450 mL/ha 50%	0.6	0	1.4	2.4	1.2
Prosaro 375 mL/ha 30% + Prosaro 375 mL/ha 50%	0	0	1.9	2.2	1.5
Aviator Xpro 550 mL/ha 30% + Aviator 550 mL/ha 50%	0	0	1.4	1.5	5.6
Aviator Xpro 650 mL/ha 50%	0.6	0.3	1.7	1.9	4.5
Prosaro 450 mL/ha 50%	0.3	0	2.1	2.8	1.6
Untreated	3.3	1.8	2.2	2.8	9.1
<i>l.s.d. (p<0.05)</i>	1.2	0.5	0.8	0.5	3.2

Fungicide treatment and timing (% bloom)*	Yield (t/ha)	Oil (%)	Sclero MS (%)	Sclero Br. (%)	UC BL Br. (0-4)	Alt. pod (0-4)	PM (%)
Aviator Xpro 650 mL/ha 10%	2.47	44.2	5.7	0.6	1.4	2.5	10
Aviator Xpro 650 mL/ha 30%	2.59	43.5	0.3	0	1.4	2.1	5.4
Prosaro 450 mL/ha 30%	2.56	42.9	0.3	0	1.7	2.5	2.9
Miravis Star 30%	2.61	43.9	0.5	0	1.4	2	5
Aviator Xpro 650 mL/ha 10% + Prosaro 450 mL/ha 50%	2.48	44	0.8	0	1.7	2.4	2.7
Aviator Xpro 650 mL/ha 30% + Prosaro 450 mL/ha 50%	2.56	43.5	0.6	0	1.4	2.4	1.2
Prosaro 375 mL/ha 30% + Prosaro 375 mL/ha 50%	2.61	43.4	0	0	1.9	2.2	1.5
Aviator Xpro 550 mL/ha 30% + Aviator 550 mL/ha 50%	2.52	43.6	0	0	1.4	1.5	5.6
Aviator Xpro 650 mL/ha 50%	2.53	43.9	0.6	0.3	1.7	1.9	4.5
Prosaro 450 mL/ha 50%	2.47	43.8	0.3	0	2.1	2.8	1.6
Untreated	2.49	42.9	3.3	1.8	2.2	2.8	9.1
<i>l.s.d. (p<0.05)</i>	n.s.	1	1.2	0.5	0.8	0.5	3.2

KAMARAH PIONEER® 44Y90 CL



Fungicide treatment and timing (% bloom)*	Sclero MS (%)	Sclero Br. (%)	UCI Br. (0-4)	Alt. pod (0-4)	PM (%)
Aviator Xpro 650 mL/ha 30%	0	0	1.9		4.1
Prosaro 450 mL/ha 30%	0	0	2.2		5
Veritas 1 L/ha 30%	0.5	0	3.1		8.6
Miravis Star 30%	0	0	1.9		4.9
Aviator Xpro 650 mL/ha 30% + Prosaro 450 mL/ha 50%	0	0	1.5		3.2
Prosaro 375 mL/ha 30% + Prosaro 375 mL/ha 50%	0	0	2		4.9
Aviator Xpro 550 mL/ha 30% + Aviator 550 mL/ha 50%	0	0	1.6		3.4
Aviator Xpro 650 mL/ha 50%	4.4	0.6	2.8		7.5
Prosaro 450 mL/ha 50%	3.4	0	2.6		7.4
Untreated	2.8	0	3.4		15
<i>l.s.d. (p<0.05)</i>	1.1	0.5	0.6		4.2

Fungicide treatment and timing (% bloom)*	Yield (t/ha)	Oil (%)	Sclero MS (%)	Sclero Br. (%)	UCI Br. (0-4)	Alt. pod (0-4)	PM (%)
Aviator Xpro 650 mL/ha 30%	2.87	42.7	0	0	1.9		4.1
Prosaro 450 mL/ha 30%	2.89	43.3	0	0	2.2		5
Veritas 1 L/ha 30%	2.71	42.3	0.5	0	3.1		8.6
Miravis Star 30%	2.70	42.7	0	0	1.9		4.9
Aviator Xpro 650 mL/ha 30% + Prosaro 450 mL/ha 50%	2.78	42.5	0	0	1.5		3.2
Prosaro 375 mL/ha 30% + Prosaro 375 mL/ha 50%	2.70	43.1	0	0	2		4.9
Aviator Xpro 550 mL/ha 30% + Aviator 550 mL/ha 50%	2.75	42.7	0	0	1.6		3.4
Aviator Xpro 650 mL/ha 50%	2.74	42.6	4.4	0.6	2.8		7.5
Prosaro 450 mL/ha 50%	2.67	42.6	3.4	0	2.6		7.4
Untreated	2.49	42.7	2.8	0	3.4		15
<i>l.s.d. (p<0.05)</i>	0.20	1	1.1	0.5	0.6		4.2

Fungicide treatment and timing (% bloom)*	Sclero MS (%)	Sclero Br. (%)	UCI Br. (0-4)	Alt. pod (0-4)	PM (%)
Aviator Xpro 650mL/ha 10%	13.8	1.5	1.5	2	<i>Nil</i>
Aviator Xpro 650 mL/ha 30%	3.1	1.5	2.1	1.9	<i>Nil</i>
Prosaro 450 mL/ha 30%	2.6	0.3	2.9	2.1	<i>Nil</i>
Veritas 1 L/ha 30%	9.9	2	2.9	2.1	<i>Nil</i>
Miravis Star 30%	2.3	0	2.1	1.4	<i>Nil</i>
Aviator Xpro 650 mL/ha 10% + Prosaro 450 mL/ha 50%	6.1	0.3	1.7	1.9	<i>Nil</i>
Aviator Xpro 650 mL/ha 30% + Prosaro 450 mL/ha 50%	1	0	1.9	1.6	<i>Nil</i>
Prosaro 375 mL/ha 30% + Prosaro 375 mL/ha 50%	1	0	2.1	1.8	<i>Nil</i>
Aviator Xpro 550 mL/ha 30% + Aviator 550 mL/ha 50%	1.3	0.3	2	1.6	<i>Nil</i>
Aviator Xpro 650 mL/ha 50%	7.4	0.8	2.6	1.2	<i>Nil</i>
Prosaro 450 mL/ha 50%	4.6	0.8	3.3	2.1	<i>Nil</i>
Untreated	12.2	3.6	3.1	2.4	<i>Nil</i>
<i>l.s.d. (p<0.05)</i>	6.3	1.7	0.7	0.7	n.s.

TEMORA PIONEER® 45Y91 CL



Fungicide treatment and timing (% bloom)*	Yield (t/ha)	Oil (%)	Sclero MS (%)	Sclero Br. (%)	UCI Br. (0-4)	Alt. pod (0-4)	PM (%)
Aviator Xpro 650mL/ha 10%	3.50	43.2	13.8	1.5	1.5	2	Nil
Aviator Xpro 650 mL/ha 30%	3.73	43.5	3.1	1.5	2.1	1.9	Nil
Prosaro 450 mL/ha 30%	3.37	43.6	2.6	0.3	2.9	2.1	Nil
Veritas 1 L/ha 30%	3.45	42.9	9.9	2	2.9	2.1	Nil
Miravis Star 30%	3.58	43.2	2.3	0	2.1	1.4	Nil
Aviator Xpro 650 mL/ha 10% + Prosaro 450 mL/ha 50%	3.73	42.6	6.1	0.3	1.7	1.9	Nil
Aviator Xpro 650 mL/ha 30% + Prosaro 450 mL/ha 50%	3.46	43.1	1	0	1.9	1.6	Nil
Prosaro 375 mL/ha 30% + Prosaro 375 mL/ha 50%	3.70	43.5	1	0	2.1	1.8	Nil
Aviator Xpro 550 mL/ha 30% + Aviator 550 mL/ha 50%	3.71	43	1.3	0.3	2	1.6	Nil
Aviator Xpro 650 mL/ha 50%	3.45	43.1	7.4	0.8	2.6	1.2	Nil
Prosaro 450 mL/ha 50%	3.62	43.6	4.6	0.8	3.3	2.1	Nil
Untreated	3.07	43.7	12.2	3.6	3.1	2.4	Nil
<i>l.s.d. (p<0.05)</i>	0.44	0.8	6.3	1.7	0.7	0.7	n.s.

WARREN HYTTEC® TROPHY



Fungicide treatment and timing (% bloom)*	Sclero MS (%)	Sclero Br. (%)	UCI Br. (0-4)	Alt. pod (0-4)	PM (%)
Aviator Xpro 650 mL/ha 30%			0	3.6	19.5
Aviator Xpro 800 mL/ha 30%			0	3.6	17.1
Prosaro 450 mL/ha 30%			0	4	17.7
Veritas 1 L/ha 30%			0	3.6	20.6
Miravis Star 30%			0	4	43.1
Aviator Xpro 650 mL/ha 30% + Prosaro 450 mL/ha 50%	<i>Nil</i>	<i>Nil</i>	0	3	2.5
Prosaro 375 mL/ha 30% + Prosaro 375 mL/ha 50%			0	4	5.3
Aviator Xpro 650 mL/ha 50%			0.2	3.2	16.9
Prosaro 450 mL/ha 50%			0.2	3.6	5.8
Untreated			0.2	4	67.4
<i>l.s.d. (p<0.05)</i>	<i>n.s.</i>	<i>n.s.</i>	<i>0.1</i>	<i>0.4</i>	<i>14.8</i>

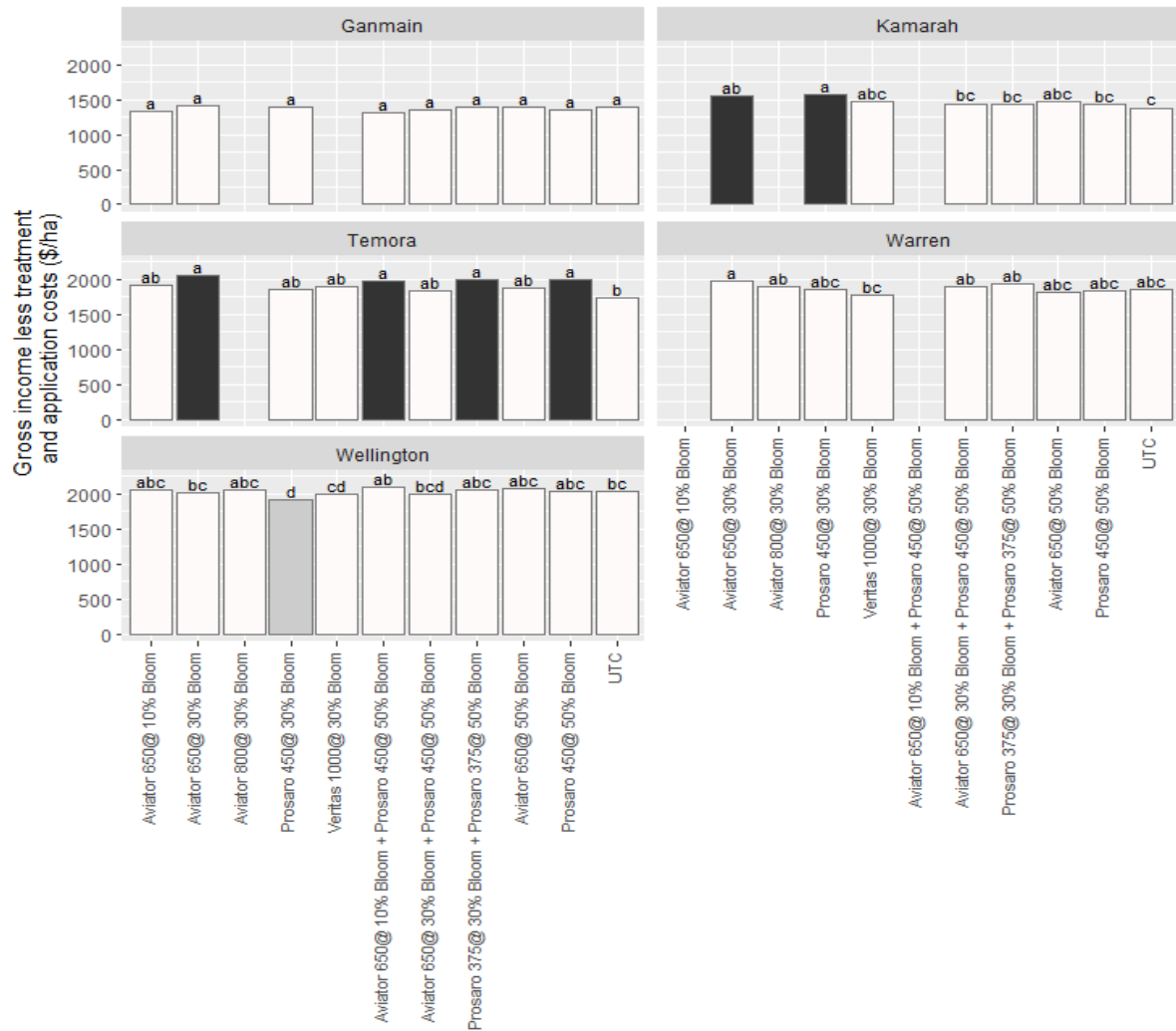
WARREN HYTTEC® TROPHY



Fungicide treatment and timing (% bloom)*	Yield (t/ha)	Oil (%)	Sclero MS (%)	Sclero Br. (%)	UCI Br. (0-4)	Alt. pod (0-4)	PM (%)
Aviator Xpro 650 mL/ha 30%	3.72	41.3			0	3.6	19.5
Aviator Xpro 800 mL/ha 30%	3.60	41.1			0	3.6	17.1
Prosaro 450 mL/ha 30%	3.52	41			0	4	17.7
Veritas 1 L/ha 30%	3.39	40.2			0	3.6	20.6
Miravis Star 30%	3.56	40			0	4	43.1
Aviator Xpro 650 mL/ha 30% + Prosaro 450 mL/ha 50%	3.70	39.6	<i>Nil</i>	<i>Nil</i>	0	3	2.5
Prosaro 375 mL/ha 30% + Prosaro 375 mL/ha 50%	3.75	40.6			0	4	5.3
Aviator Xpro 650 mL/ha 50%	3.43	40.9			0.2	3.2	16.9
Prosaro 450 mL/ha 50%	3.47	40.5			0.2	3.6	5.8
Untreated	3.43	40.5			0.2	4	67.4
<i>l.s.d. (p<0.05)</i>	0.35	1.6	<i>n.s.</i>	<i>n.s.</i>	<i>0.1</i>	0.4	14.8

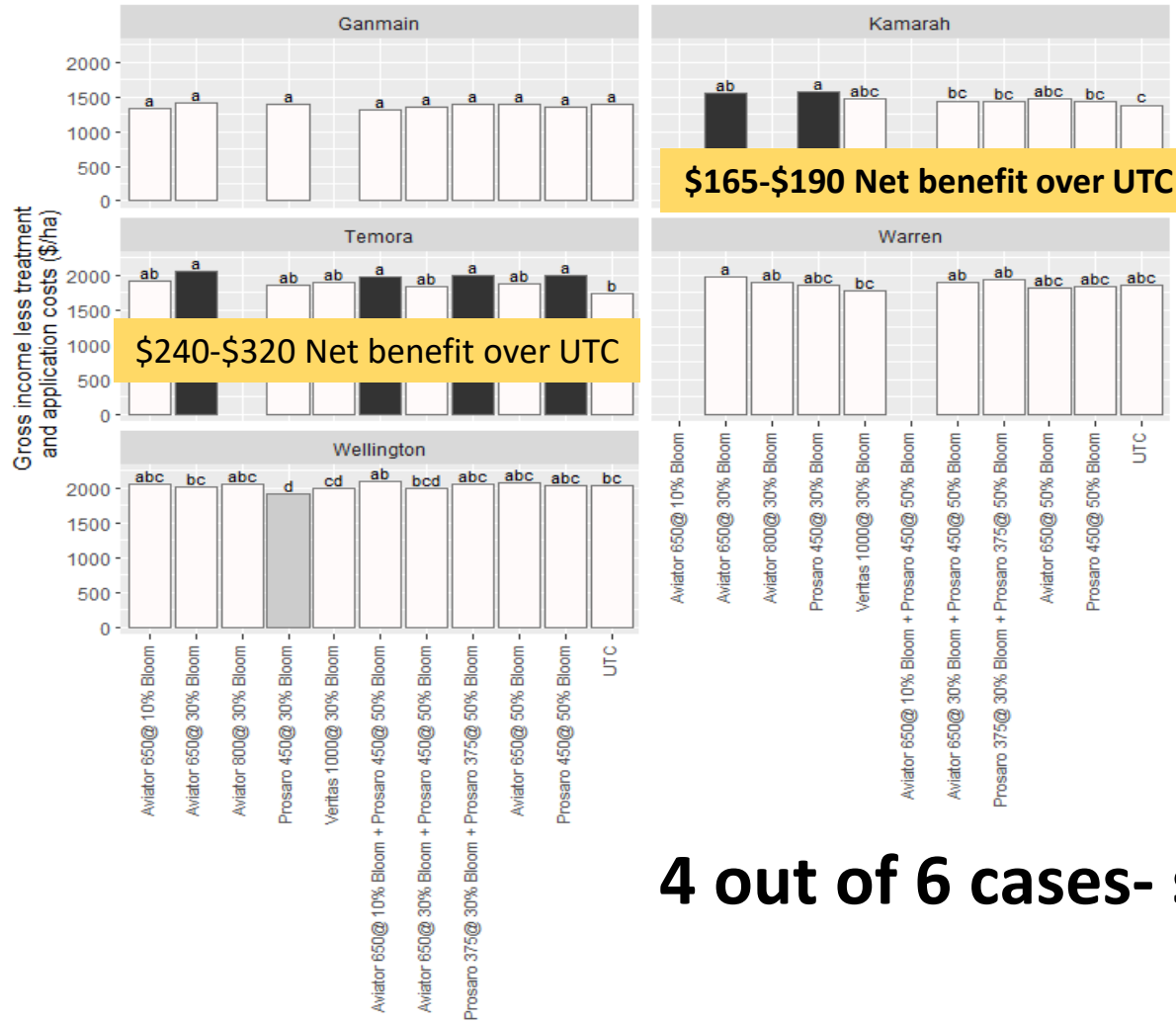
Fungicide treatment and timing (% bloom)*	Sclero MS (%)	Sclero Br. (%)	UCI Br. (0-4)	Alt. pod (0-4)	PM (%)
Aviator Xpro 650mL/ha 10%	1.1	0	0.7	3.4	24.4
Aviator Xpro 650 mL/ha 30%	0.6	0	0.7	3.5	21
Aviator Xpro 800 mL/ha 30%	0.4	0.4	0.9	3.1	15.9
Prosaro 450 mL/ha 30%	5.8	0.3	1.9	3.6	15.2
Veritas 1 L/ha 30%	3.5	3.3	1.4	3.6	18.2
Aviator Xpro 650 mL/ha 10% + Prosaro 450 mL/ha 50%	0	0	0.4	3.3	4.4
Aviator Xpro 650 mL/ha 30% + Prosaro 450 mL/ha 50%	0.5	0	0.7	3.4	8.2
Prosaro 375 mL/ha 30% + Prosaro 375 mL/ha 50%	0.8	0.3	0.7	3.2	5.2
Aviator Xpro 650 mL/ha 50%	1.1	0	1.1	2.1	12.5
Prosaro 450 mL/ha 50%	0.9	0.4	0.8	3	6.1
Untreated	4	1.7	1.9	3.9	18.8
<i>l.s.d. (p<0.05)</i>	2	2.2	0.6	0.6	8.7

Fungicide treatment and timing (% bloom)*	Yield (t/ha)	Oil (%)	Sclero MS (%)	Sclero Br. (%)	UCI Br. (0-4)	Alt. pod (0-4)	PM (%)
Aviator Xpro 650mL/ha 10%	3.78	43.1	1.1	0	0.7	3.4	24.4
Aviator Xpro 650 mL/ha 30%	3.71	42.9	0.6	0	0.7	3.5	21
Aviator Xpro 800 mL/ha 30%	3.75	43.4	0.4	0.4	0.9	3.1	15.9
Prosaro 450 mL/ha 30%	3.51	43	5.8	0.3	1.9	3.6	15.2
Veritas 1 L/ha 30%	3.62	43.1	3.5	3.3	1.4	3.6	18.2
Aviator Xpro 650 mL/ha 10% + Prosaro 450 mL/ha 50%	3.90	43.3	0	0	0.4	3.3	4.4
Aviator Xpro 650 mL/ha 30% + Prosaro 450 mL/ha 50%	3.77	42.7	0.5	0	0.7	3.4	8.2
Prosaro 375 mL/ha 30% + Prosaro 375 mL/ha 50%	3.81	43.2	0.8	0.3	0.7	3.2	5.2
Aviator Xpro 650 mL/ha 50%	3.76	43.7	1.1	0	1.1	2.1	12.5
Prosaro 450 mL/ha 50%	3.77	42.5	0.9	0.4	0.8	3	6.1
Untreated	3.64	43	4	1.7	1.9	3.9	18.8
<i>l.s.d. (p<0.05)</i>	0.17	0.9	2	2.2	0.6	0.6	8.7



SO WHAT WAS THE RESULT FINANCIALLY?

Gross income less costs (product & application)



SO WHAT WAS THE RESULT FINANCIALLY?

Gross income less costs (product & application)

4 out of 6 cases- single applications

WERE FUNGICIDES JUSTIFIED IN THE LOW AND MEDIUM RAINFALL ZONE IN 2020?

It depends?

- Complex of diseases- hard to attribute any impact to any one disease
- Sclerotinia- key driver for many in 2020
 - Incidence was low despite endemic in environments tested (indicator of risk??)
 - Was it the dry period?
- Upper canopy blackleg- present
 - Reduction in incidence from some fungicides, very few really reduced infections substantially- was it impactful on yields?

WERE FUNGICIDES JUSTIFIED IN THE LOW AND MEDIUM RAINFALL ZONE IN 2020?

It depends?

- Alternaria- Reduction in incidence from some fungicides, very few really reduced infections substantially- was it impactful on yields?
- Powdery Mildew- massive reductions (Warren) no yield impacts

WERE FUNGICIDES JUSTIFIED IN THE LOW AND MEDIUM RAINFALL ZONE IN 2020?

It depends?

Financially

- Only at two sites was a net benefit realised (only some treatments)
- Worthwhile “yes”- gamechanger “no”
- Impact on disease levels or even yields \neq economic benefit

INSURANCE OR INVESTMENT?

Spring fungicides are prophylactic

Insurance!

- No economic benefit but had protection in place
- Risk adversity of the individual
- Frequency of epidemic conditions conducive to disease
- Stewardship of fungicides, residues

Investment?

- Could money have been better spent else where for more reliable returns?

Either way- better predictors of response would be handy

TAKE HOME MESSAGES

- Low incidence of Sclerotinia despite being a key driver for 2020 applications
- Multiple fungal pathogens may be more common than singular one
- Impacts on disease and yields from fungicide applications were variable
- Despite impacts on disease, few treatments were cost effective
- Application may have offered some insurance cover, at a cost
- Single applications most likely to deliver \$ benefits
- Alternatively money could have been invested in other more predictable options
- Decision support tools may be useful

THANKS TO

- **Trent Gordon at Warakirri, Kamarah**
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- **Mason family at Wellington**
- **Brill family at Ganmain**
- **Rohan Brill of Brill AG**
- **Associate Professor Sarita Bennett CCDM, Curtin University**

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