



**Industry
Innovations**

leading the way to a brighter grains industry



WA CROP
TECHNOLOGY
CENTRE (ESPERANCE)

INDUSTRY INNOVATIONS 2024: PROVISIONAL HARVEST RESULTS – May Sown Barley

2024 WA Esperance Crop Technology Centre (HRZ Gibson)

Sown: 10 May 2024

Harvested: 7 November 2024

Rotation position: 2023 Canola

Soil type: Loamy Sand (Deep ripped 2022)

FAR code: FAR WAE IIB24-23-02

The Germplasm Evaluation Network (GEN) is a FAR Australia 'Industry Innovations' initiative that tests crop performance across FAR Australia's national network of Crop Technology Centres. GEN sites test crop performance with and without fungicide. FAR Australia provides the control varieties and breeders enter their chosen lines for evaluation.

Key Points:

- *A drier season at the start and finish resulted in 279mm growing season rainfall (GSR) and grain yields that ranged from 4.64 – 6.07t/ha depending on variety and fungicide input.*
- *Net form net blotch infection (NFNB) and phenology appeared to be key drivers of yield with Cyclops, Neo CL, Minotaur and Bigfoot CL (AGTB0669) having the highest yields and lowest (<2.5% plot infection) NFNB infections.*
- *Although there was no significant yield response to fungicide application ($p=0.12$) there was a general trend to indicate a yield increase from a two-spray fungicide programme in those varieties showing the highest levels of NFNB in untreated crops.*
- *The highest levels of NFNB infection in untreated crops were recorded in RGT Planet, KWS Thalix, RGT Orbiter and RGT Asteroid, and although fungicide lifted yields, fungicide protection was ineffective in these varieties during grain fill, suggesting fungicide resistance in the NFNB pathogen is influencing results.*
- *As a general trend the quicker developing varieties tended to perform slightly stronger than the later developing varieties, which was most evident in comparisons of Neo CL and Rosalind (quicker developing) with IGB21130 (slower developing).*
- *The warmer drier grain fill period had the effect of increasing screenings and reducing retentions, particularly in the later developing varieties.*
- *There were no varieties that achieved malt as per CBH 2024/25 receival requirements due to low test weights.*

Yield (t/ha) & quality data (% protein, test weight, % screenings)

There were significant differences in yield and quality due to variety ($p < 0.001$), but fungicide effects, whilst generally positive, were smaller and not statistically significant (Tables 1 – 3 & Figure 1).

Table 1. Influence of fungicide on the grain yield (t/ha) of barley varieties plus and minus fungicide – May 10 sown.

Variety	Management Level		Mean Yield t/ha	Significance
	Untreated Yield t/ha	Plus fungicide Yield t/ha		
RGT Planet	4.64	5.27	4.96	cd
Neo CL	5.69	5.68	5.68	a
Minotaur	5.53	5.68	5.60	a
Rosalind	5.41	5.71	5.56	ab
AGTB0667	5.43	5.65	5.54	ab
Cyclops	5.43	6.07	5.75	a
Bigfoot CL (AGTB0669)	5.74	5.53	5.64	a
IGB22117	5.10	5.22	5.16	cd
IGB21130	5.02	5.02	5.02	cd
KWS Thalís	4.85	5.26	5.06	cd
KWS Willis	4.94	5.28	5.11	cd
KWS 18/3518	5.13	5.38	5.25	bc
RGT Asteroid	4.65	5.08	4.87	d
RGT Orbiter	4.77	5.14	4.95	cd
Mean	5.17	5.43	5.30	
LSD Variety p = 0.05	0.33	P val	<0.001	
LSD Management p = 0.05	ns	P val	0.121	
LSD Variety x Man. p = 0.05	ns	P val	0.424	

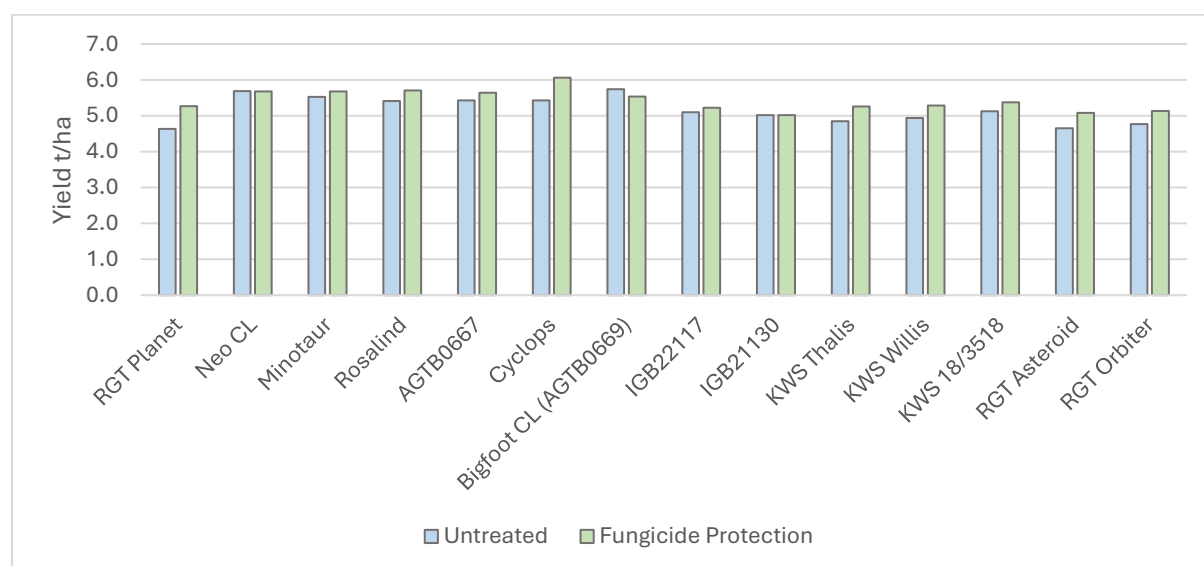


Figure 1. Influence of fungicide and variety on yield (t/ha). All fungicide differences are not significant – May 10 sown (staggered late May germination).

For the same input of nitrogen fertiliser (approximately 152kg N/ha) Neo CL produced significantly lower proteins (10.3%) than all other varieties except AGTB0667, Bigfoot CL, and Cyclops (Table 2). Proteins across all varieties and fungicide input fell within the CBH malt requirement range of 9.5-12.8%. However, test weights were generally poor, and despite some significant differences between varieties no variety or treatment achieved the minimum 64 kg/hL requirement for malt. Retention and screenings varied significantly across varieties, and better results were typically seen in varieties that developed quicker and filled grain in more favourable conditions (Table 3).

Table 2. Influence of fungicide on the protein (%) and test weights (kg/hL) of barley varieties plus and minus fungicide – November 7 harvest.

Management Level												
Variety	Untreated		Fungicide protection		Mean		Untreated		Fungicide protection		Mean	
	Protein %		Protein %		Protein %		Test weight kg/hL		Test weight kg/hL		Test weight kg/hL	
RGT Planet	12.1	-	11.7	-	11.9	a	60.6	-	58.8	-	59.7	ab
Neo CL	10.5	-	10.2	-	10.3	d	59.7	-	59.4	-	59.6	ab
Minotaur	11.3	-	10.7	-	11.0	c	59.1	-	61.9	-	60.5	a
Rosalind	11.5	-	11.4	-	11.4	abc	58.3	-	59.2	-	58.7	abc
AGTB0667	10.8	-	11.0	-	10.9	cd	55.5	-	55.6	-	55.5	e
Cyclops	11.2	-	10.5	-	10.9	cd	55.6	-	56.8	-	56.2	de
Bigfoot CL	11.2	-	10.4	-	10.8	cd	58.8	-	56.9	-	57.9	bcd
IGB22117	11.3	-	11.1	-	11.2	bc	59.6	-	59.9	-	59.7	ab
IGB21130	11.4	-	11.2	-	11.3	abc	58.4	-	57.2	-	57.8	bcd
KWS Thalix	11.4	-	11.1	-	11.2	abc	58.3	-	59.8	-	59.0	ab
KWS Willis	11.1	-	11.3	-	11.2	bc	56.0	-	56.5	-	56.3	de
KWS 18/3518	11.1	-	11.8	-	11.4	abc	57.6	-	58.4	-	58.0	bcd
RGT Asteroid	12.0	-	11.6	-	11.8	ab	57.0	-	57.1	-	57.0	cde
RGT Orbiter	11.6	-	11.4	-	11.5	abc	59.0	-	59.6	-	59.3	ab
Mean	11.3	-	11.1	-	11.2		58.1	-	58.4	-	58.2	
Variety	LSD p = 0.05		0.7	P val	0.002	LSD p = 0.05		2.0	P val	<0.001		
Management	LSD p = 0.05		ns	P val	0.494	LSD p = 0.05		ns	P val	0.687		
Var. x Man.	LSD p = 0.05		ns	P val	0.813	LSD p = 0.05		ns	P val	0.647		

Table 3. Influence of fungicide on the retention (% > 2.5mm) and screenings (% < 2.2mm) of barley varieties plus and minus fungicide – November 7 harvest.

Management Level												
Variety	Untreated		Fungicide protection		Mean		Untreated		Fungicide protection		Mean	
	Retention %		Retention %		Retention %		Screenings %		Screenings %		Screenings %	
RGT Planet	74.4	-	74.1	-	74.3	cd	4.5	-	4.7	-	4.6	bcd
Neo CL	84.7	-	89.1	-	86.9	a	2.9	-	2.1	-	2.5	f
Minotaur	77.5	-	84.4	-	80.9	ab	4.1	-	2.5	-	3.3	def
Rosalind	85.4	-	82.1	-	83.8	ab	3.3	-	4.7	-	4.0	c-f
AGTB0667	83.8	-	85.8	-	84.8	a	3.0	-	3.2	-	3.1	def

Cyclops	74.8	-	82.6	-	78.7	bc	4.8	-	3.9	-	4.3	b-e
Bigfoot CL	85.7	-	87.8	-	86.7	a	2.9	-	2.8	-	2.9	ef
IGB22117	78.3	-	78.8	-	78.5	bc	4.0	-	4.1	-	4.1	c-f
IGB21130	60.9	-	59.5	-	60.2	e	9.2	-	10.0	-	9.6	a
KWS Thalís	78.1	-	78.4	-	78.2	bc	3.6	-	3.6	-	3.6	def
KWS Willis	80.2	-	82.9	-	81.6	ab	2.9	-	2.6	-	2.7	ef
KWS 18/3518	75.5	-	74.0	-	74.7	cd	4.6	-	4.9	-	4.7	bcd
RGT Asteroid	72.2	-	70.7	-	71.4	d	5.9	-	5.7	-	5.8	b
RGT Orbiter	68.6	-	78.0	-	73.3	cd	6.3	-	4.5	-	5.4	bc
Mean	77.1	-	79.2	-	78.1		4.4	-	4.2	-	4.3	
Variety	LSD p = 0.05		6.0	P val		<0.001	LSD p = 0.05		1.7	P val		<0.001
Management	LSD p = 0.05		ns	P val		0.379	LSD p = 0.05		ns	P val		0.732
Var. x Man.	LSD p = 0.05		ns	P val		0.652	LSD p = 0.05		ns	P val		0.907

Disease assessment data

At the start of grain fill NFNB was the principal disease present in the trial (Figure 2) with evidence that despite two foliar fungicides, treated plots were not controlling the infection. This lack of control has been widely observed in HRZ regions in both 2023 and 2024 indicating that the NFNB pathogen is increasingly resistant to our fungicide arsenal, in this case DMI and SDHI fungicides.

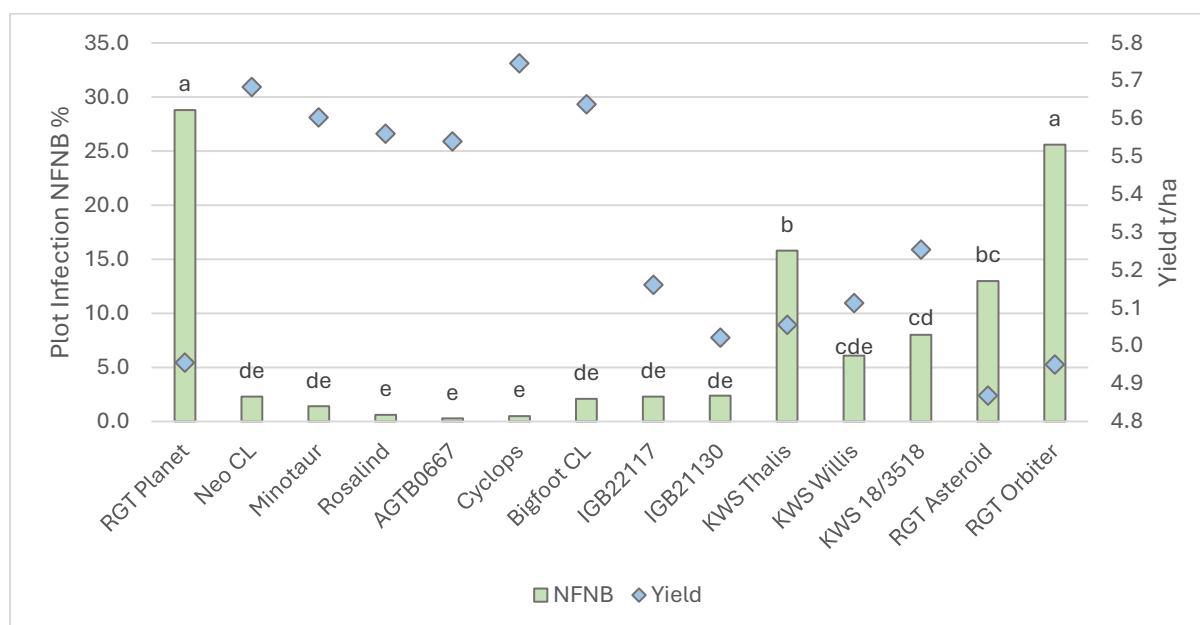


Figure 2. Influence of variety on plot % infection of Net form net blotch (NFNB) (mean of treated & untreated) compared with grain yield – assessed September 9 (NFNB, Cultivar LSD ($p < 0.05$) = 7.1, p value = <0.001).

Development (Phenology)

Whilst there are not large differences in barley phenology compared to wheat, at mid stem elongation there were differences in the speed of development, with the control variety Rosalind being quicker and IGB21130 being the slowest developing (Table 4). At head emergence differences in crop development were much more difficult to differentiate, although the differences between Rosalind and IGB21130 were still apparent. Normalised Difference Vegetation Indices (NDVIs) recorded during grain fill revealed a significant increase in crop canopy greenness due to the application of fungicide (Table 4).

Table 4. Influence of variety on phenology (speed of development – Zadoks Growth Stage) and Normalised Difference Vegetation Index (NDVI, mean of treated and untreated crops).

Variety	Zadoks Stage	Zadoks Stage	NDVI (Sept 30)					
	17 August	8 September	Untreated	Plus Fungicide	Mean			
RGT Planet	37	57	0.41	-	0.49	-	0.45	abc
Neo CL	41	58	0.39	-	0.44	-	0.42	cd
Minotaur	39	58	0.40	-	0.45	-	0.43	bcd
Rosalind	43	61	0.35	-	0.40	-	0.37	e
AGTB0667	37	58	0.36	-	0.42	-	0.39	de
Cyclops	41	58	0.44	-	0.50	-	0.47	ab
Bigfoot CL	41	59	0.44	-	0.46	-	0.45	abc
IGB22117	41	57	0.41	-	0.43	-	0.42	cd
IGB21130	32	53	0.44	-	0.51	-	0.48	a
KWS Thalys	41	57	0.42	-	0.51	-	0.47	ab
KWS Willis	37	58	0.45	-	0.52	-	0.49	a
KWS 18/3518	37	56	0.44	-	0.50	-	0.47	ab
RGT Asteroid	37	56	0.36	-	0.45	-	0.40	de
RGT Orbiter	41	57	0.39	-	0.42	-	0.40	de
			0.41	b	0.46	a	0.43	
			Var. LSD p = 0.05		0.04	P val	<0.001	
			Man. LSD p = 0.05		0.04	P val	0.015	
			Var x Man. LSD p = 0.05		ns	P val	0.805	

Trial Inputs

Table 5. Trial input and management details (kg, g, ml/ha).

Sowing date:	10 May		
Harvest date:	7 November		
Seed rate:	200 seeds/m ²		
Basal fertiliser:	10 May	125 kg MAP (28.5kg P/ha & 13.75kg N/ha)	
Pre-em herbicide:	9 May	TriflurX 2.00 L/ha Overwatch 1.25 L/ha	
Post-em herbicide:	31 July	Verno Copper 10 g/ha LVE MCPA 570 0.50 L/ha Clopyralid 750 SG 40 g/ha	
Insecticide:	31 July	Trojan 12 mL/ha	
Nitrogen:	18 June	140 kg urea/ha (64.4 kg N/ha)	
	20 July	160 kg urea/ha (73.6 kg N/ha)	
Fungicide:		Untreated	Fungicide Protection
	GS31	----	Prosaro 0.30 L/ha
	GS39	----	Aviator 0.50 L/ha

Climate data

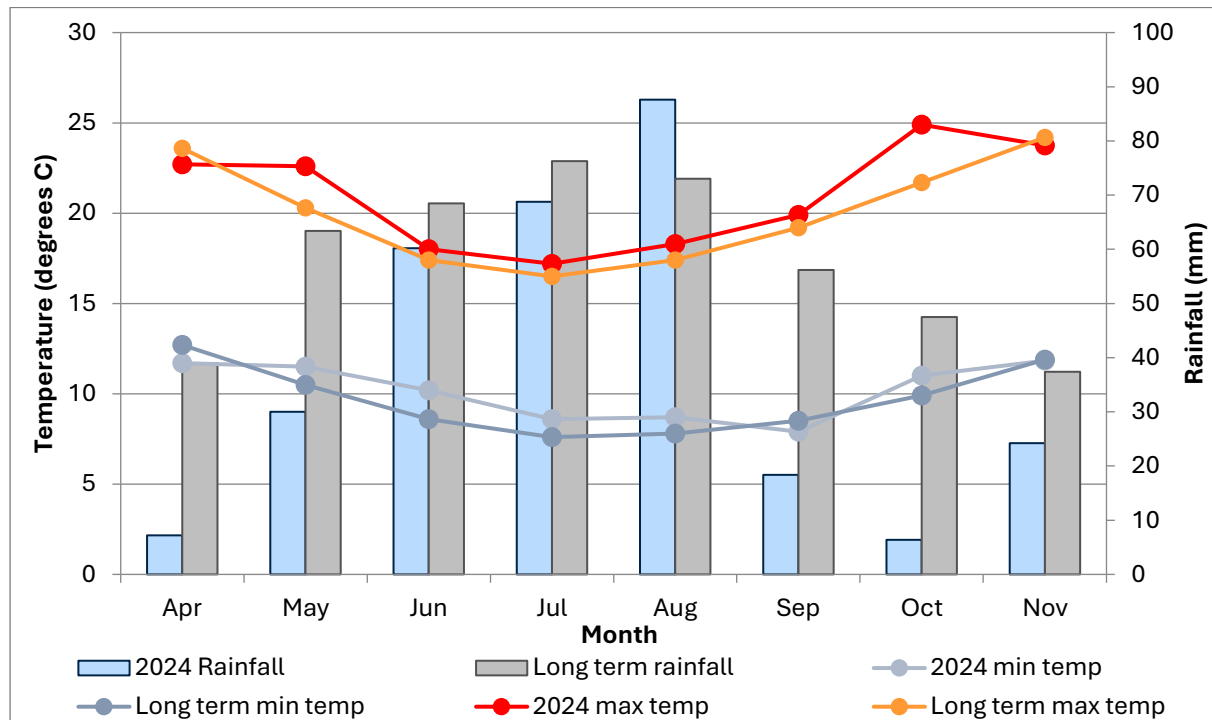


Figure 3. 2024 growing season rainfall and long-term rainfall recorded at Gibson (1991-2024). 2024 min and max temperatures, and long-term temperatures recorded at Esperance Aero (1991-2024). Growing season rainfall April to October= 279 mm.

These results are offered by Field Applied Research (FAR) Australia solely to provide information. While all due care has been taken in compiling the information, FAR Australia and employees take no responsibility for any person relying on the information and disclaims all liability for any errors or omissions in the publication.