INDUSTRY INNOVATIONS 2025: PROVISIONAL HARVEST YIELD RESULTS – April sown barley

2023 WA Frankland River Crop Technology Centre

Sown: 30 April 2023
Harvested: 20 November 2023
Rotation position: 2022 Canola
Soil type & management: Forest gravel loam

The Germplasm Evaluation Network (GEN) is a FAR Australia 'Industry Innovations 2025' initiative that tests crop performance across FAR Australia's national network of Crop Technology Centres. GEN sites are situated in higher yielding regions of the country and test crop performance plus and minus fungicide. FAR Australia provides the control varieties and breeders enter their chosen lines for evaluation.

Objectives:

To assess the yield performance of five spring barley varieties (RGT Planet, Rosalind, Laperouse, AGTB0318 and Minotaur), and one winter barley (Newton) managed with and without fungicide, sown in late April, in the Frankland River (WA) environment.

Key Points:

- *Drier conditions in September and October reduced yield potential and grain quality, particularly in the later developing winter barley Newton.*
- *Minotaur was the highest yielding cultivar (6.22t/ha) giving very little response to fungicide, despite the presence of low levels of disease during grain fill.*
- *Statistically there was no significant difference in the grain yield of Minotaur, RGT Planet, Rosalind and Laperouse, although the presence of net form of net blotch (NFNB) in RGT Planet led to a 0.8t/ha yield increase when a fungicide programme was applied.*
- *Response to fungicide in the other varieties was much smaller; Rosalind 0.28t/ha, Laperouse 0.04t/ha and Minotaur 0.17t/ha).*
- *Best grain quality (test weight, retentions, and screenings) was given by Minotaur and Laperouse. AGTB0318 had good grain quality but higher levels of lodging than other varieties.*
- *The late April sowing date, and significantly slower development (booting whilst spring barleys were at watery-milky ripe in September) resulted in poor yields for the winter barley Newton, although it displayed very good resistance to disease in the region.*
- *Newton gave no yield response to fungicide application at this shorter season HRZ location.*

Issue date 14th December 2023

Table 1. Influence of fungicide on the grain yield (t/ha) of barley cultivars plus and minus fungicide.

	Management Level		
	Untreated	**Full protection**	**Mean**
Cultivar	**Yield t/ha**	**Yield t/ha**	**Yield t/ha**
RGT Planet (FAR Control)	5.17 -	5.96 -	**5.57** ab
Rosalind (FAR Control)	5.66 -	5.94 -	**5.80** ab
Laperouse (FAR Control)	5.78 -	5.76 -	**5.77** ab
Newton	4.24 -	4.05 -	**4.15** c
AGTB0318	4.50 -	5.58 -	**5.04** b
Minotaur	6.13 -	6.30 -	**6.22** a
Mean	**5.25** -	**5.60** -	**5.42**
LSD Cultivar p = 0.05	0.88	**P val**	<0.001
LSD Management p = 0.05	ns	**P val**	0.439
LSD Cultivar x Man. p = 0.05	ns	**P val**	0.667

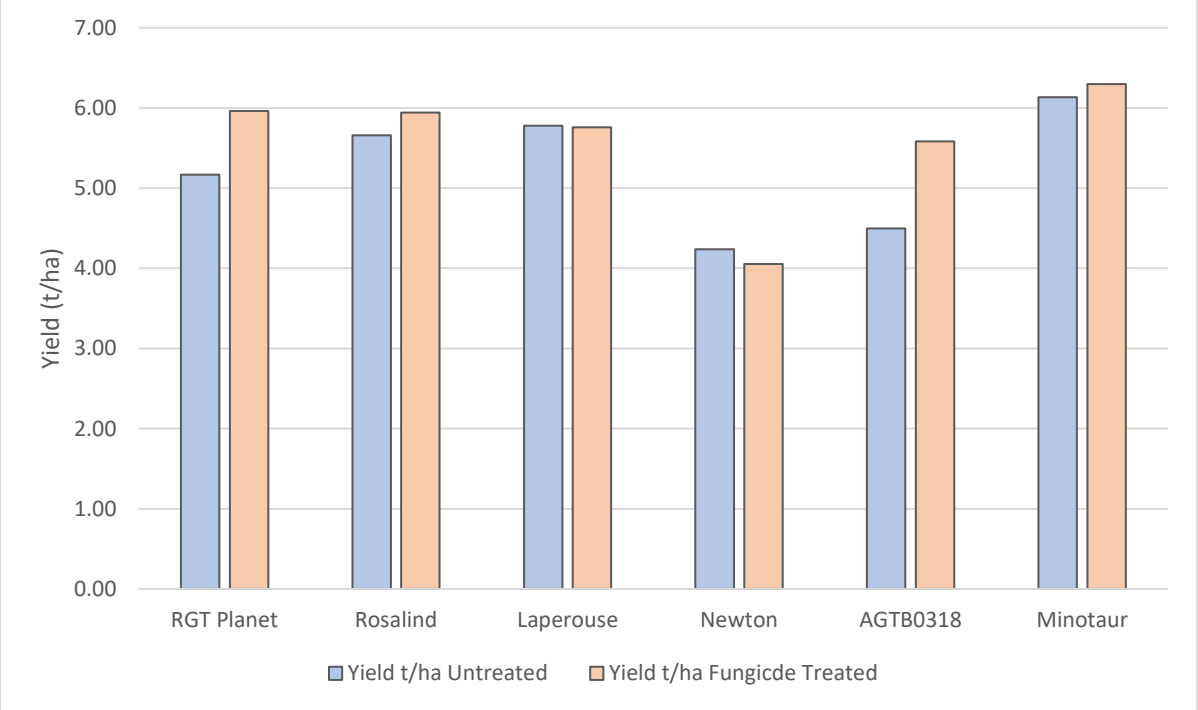

Figure 1. Influence of fungicide on the grain yield (t/ha) of barley cultivars plus and minus fungicide.

Table 2. Influence of fungicide on the grain quality (protein, test weight, retentions and screenings) of barley cultivars plus and minus fungicide.

		Grain quality assessments			
	Cultivar	**Protein (%)**	**Test Weight (kg/hL)**	**Retentions (%)**	**Screenings (%)**
1.	RGT Planet (FAR Control)	12.5 c	57.1 c	69.6 b	7.6 b
2.	Rosalind (FAR Control)	12.8 bc	60.9 b	77.7 b	4.9 c
3.	Laperouse (FAR Control)	12.5 bc	65.3 a	90.4 a	1.9 d
4.	Newton	14.2 a	49.5 d	41.5 c	12.9 a
5.	AGTB0318	13.0 bc	53.9 c	88.4 a	4.1 cd
6.	Minotaur	13.2 b	63.0 ab	90.9 a	2.0 d
	LSD = 0.05	0.7	3.4	10.4	2.4
	Cultivar p-Value	<0.001	<0.001	<0.001	<0.001
	Disease Management				
1.	No Fungicide	13.1 -	57.6 -	73.6 -	6.5 -
2.	Full Fungicide	12.9 -	58.9 -	79.3 -	4.6 -
	LSD = 0.05	ns	ns	ns	ns
	Disease Management p-Value	0.730	0.359	0.352	0.225
	Disease Pressure x Cultivar				
	No Fungicide				
1.	RGT Planet (FAR Control)	12.5 -	55.6 -	62.4 -	10.0 -
2.	Rosalind (FAR Control)	12.9 -	59.4 -	70.9 -	6.9 -
3.	Laperouse (FAR Control)	12.5 -	65.7 -	90.2 -	2.0 -
4.	Newton	14.1 -	49.1 -	40.2 -	13.2 -
5.	AGTB0318	13.7 -	53.5 -	86.5 -	4.8 -
6.	Minotaur	13.1 -	62.5 -	91.2 -	2.1 -
	Full Fungicide				
1.	RGT Planet (FAR Control)	12.4 -	58.6 -	76.7 -	5.3 -
2.	Rosalind (FAR Control)	12.7 -	62.4 -	84.4 -	3.0 -
3.	Laperouse (FAR Control)	12.5 -	64.9 -	90.6 -	1.7 -
4.	Newton	14.3 -	49.9 -	42.9 -	12.5 -
5.	AGTB0318	12.2 -	54.3 -	90.3 -	3.4 -
6.	Minotaur	13.2 -	63.5 -	90.6 -	1.9 -
	LSD = 0.05	ns	ns	ns	ns
	Cultivar x Disease Mang. p-Value	0.150	0.848	0.54	0.26

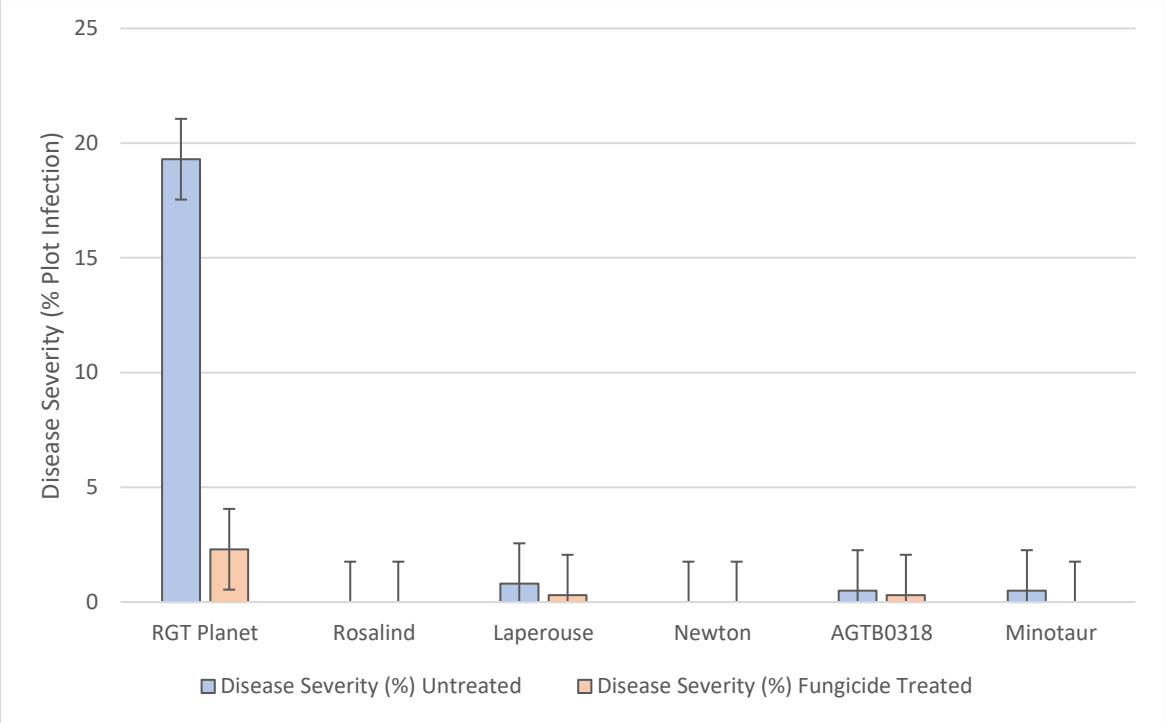

Figure 2. Influence of variety and fungicide on NFNB disease levels recorded at the end of flowering GS69 (% plot infection).

Table 3. Trial input and management details (kg, g, ml/ha).

Sowing date:		**29 April**	
Harvest date:		**20 November**	
Seed rate:		180 seeds/m2 (Vibrance & Cruiser Opti treated)	
Basal fertiliser:	29 Apr	169kg MAP/MOP/MnSO4 (66%/29%/5% blend)	
Herbicide:	29 Apr	Triflurex 2L/ha (pre em)	
		Overwatch 1.25L/ha (pre em)	
	5 May	Paraquat 250 2L/ha (pre em)	
	30 Jun	MCPA amine 750 0.6L/ha (post em)	
Insecticide	30 Jun	Trojan 10mL/ha (post em)	
Nitrogen:	12 Jun	55 kg N/ha	
	13 Jul	32 kg N/ha	
	2 Aug	23 kg N/ha	
Fungicide:		**Full Fungicide Program**	**No Fungicide Program**
	GS31	Prosaro 0.30 L/ha	---
	GS39-51	Radial 0.84 L/ha	---
	GS59-69	Opus 0.50 L/ha*	---
PGR:	GS31	Moddus Evo 200 ml/ha (Rosalind only)	

** Newton was not treated with a third fungicide as there was no disease present.*

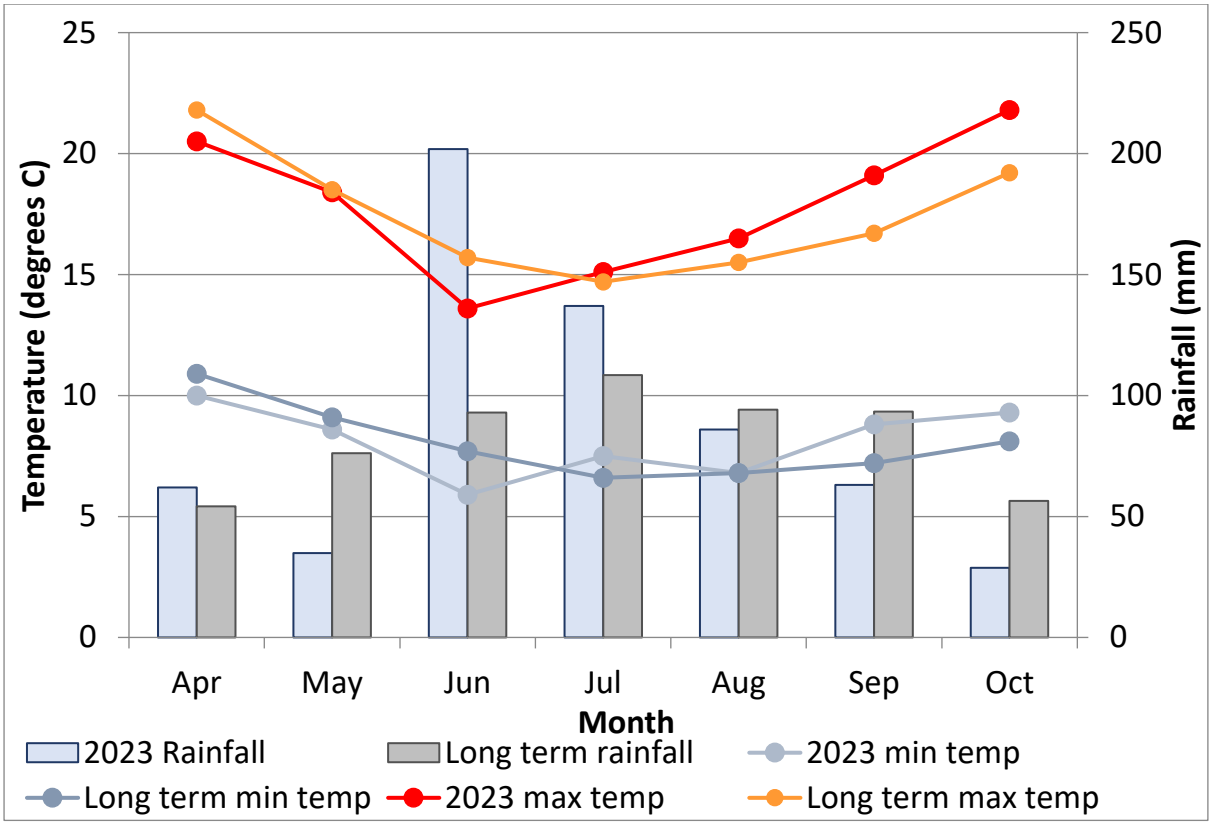

Figure 3. 2023 growing season rainfall, long-term rainfall, 2023 min and max temperatures, and long-term temperatures recorded at Rocky Gully (1996-2023). *Growing season rainfall April to October= 613 mm.*