

Trial 3. Albany Port Zone Main (FAR WAA W24-03)

Trial Location	Frankland River
GPS	-34.315155963377634, 117.17048703447509
Sowing Dates:	TOS 1: 2-Apr (emergence 9-10 April)
	TOS 2: 29- April (emergence 17-20 May)
Irrigation	15mm (TOS 1)
Rainfall Zone:	HRZ
Plot Size:	12m plots x 1.536m (outside row to outside row) – 25.6cm row spacing - Plot Area with half row width added either side = 21.5m ²
Seed rate:	All plots established at 200 seeds/m ²



Image 5. Frankland River TOS 1 plots. Tillering growth stage, taken on 28 May 2024.



Image 6. Frankland River TOS 2 plots. GS13, taken on 28 May 2024.

Site 3. Frankland River

Sown: TOS 1- 2 April 2024 TOS 2- 29 April 2024

Harvested: 29 November 2024

Rotation position: 2023 Canola

Soil type: Forest gravel

FAR code: FAR WAE W24-03

Key Points

- *The Frankland River research site is typically characterised with higher growing season rainfall (2024 372mm v 278mm (Gibson) GSR April - Oct) and lower average temperatures during grain fill than the EPZ (3.3°C lower average maximum temperature in October 2024).*
- *However, the summer and autumn were equally dry in southwest WA with the first sowing date 2 April established with 15mm of irrigation and the autumn break (25-30mm) not occurring until 9 May.*
- *On average there was no difference in yield between the first (2 April) and second (29 April) sowing dates ($p=0.211$), a possible indication of the poor conditions for emergence following the first sowing and lower overall plant counts relative to the later sowing.*
- *The winter wheat Mowhawk yielded over 5t/ha sown 2 April and was higher yielding than the spring wheats tested, although the yield differences were not significant.*
- *The late April sowing showed no yield advantage to Mowhawk over longer season spring wheats such as Denison, but both types were superior to Scepter in these two sowing windows.*
- *On average the spring barley Neo CL was over 1.2t/ha higher yielding than the highest yielding wheat, although the advantage over Mowhawk was 1t/ha early April sown and 0.8t/ha better than Denison late April sown.*
- *Because of the yield differences and bin grades achieved Neo CL was more profitable than winter or spring wheat germplasm sown in either early or late April.*
- *Unlike the Gibson and Scaddan sites the longer season spring types, such as Denison, did not develop as quickly at Frankland River with flowering dates nearer the optimum but still earlier than Mowhawk which was nearer the regarded optimum of late September/early October.*
- *Scepter as found in previous studies was not suited to April sowing as it develops too quickly.*
- *Higher rainfall at this site resulted in foliar disease being a bigger issue, particularly in Planet barley where fungicide resistant net form net blotch was not properly controlled by a two-spray fungicide programme.*
- *Final harvest dry matters (DM) from the highest yielding wheats and barleys were approximately 10t/ha but harvest indices and head numbers were higher in the barley.*
- *Frost does not appear to have been a feature in the results of this trial.*

Table 1. Influence of time of sowing (TOS) and variety on grain yield (t/ha), harvested 29 November.

Variety	TOS 1		TOS 2		Mean	
	Yield (t/ha)		Yield (t/ha)		Yield (t/ha)	
Illabo*	4.72		.		.	
Mowhawk	5.11	-	4.44	-	4.77	b
Denison	4.40	-	5.01	-	4.71	b
RGT Waugh**	5.04	-	4.42	-	4.73	b
Scepter	2.86	-	4.06	-	3.46	c
RockStar	4.14	-	4.86	-	4.50	b
Neo CL (spring barley)	6.11	-	5.81	-	5.96	a
RGT Planet (spring barley)	5.64	-	5.25	-	5.21	b
Mean	4.69	-	4.69	-	4.76	
LSD Variety p = 0.05	0.71		P value		<0.001	
LSD TOS p = 0.05	ns		P value		0.211	
LSD Variety x TOS. p = 0.05	ns		P value		0.099	

**Illabo data excluded from statistical analysis, **RGT Waugh yield derived from quadrant harvest cut (1m x 4) and so comparisons with other varieties should be treated with caution.*

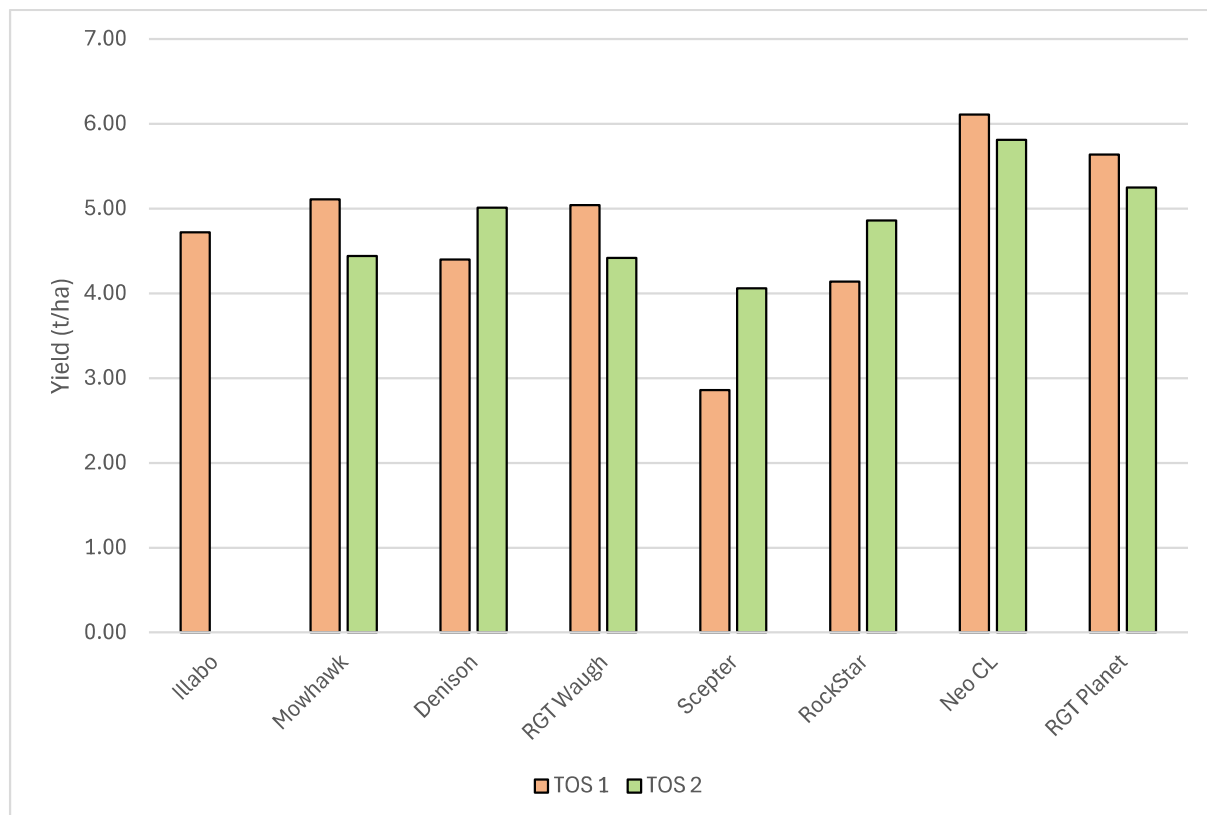


Figure 1. Influence of Time of sowing (TOS) and variety on yield (t/ha), harvested 29 November.

Table 2. Influence of Time of sowing (TOS) and variety on phenology (Zadoks Growth stage 00-99).

		28-May	28-Jun	16-Jul	1-Aug	20-Aug	5-Sep	16-Sep	9-Oct
TOS 1 (2 April)	Illabo	14	23	23	30	32	42	59	72
	Mowhawk	23	24	23	30	32	45	57	76
	Denison	21	23	23	32	37	49	65	80
	RGT Waugh	13	23	23	29	29	30	32	49
	Scepter	23	39	42	49	62	67	71	78
	RockStar	22	30	31	39	60	69	71	84
	Neo	24	26	30	37	55	61	71	87
	RGT Planet	13	29	30	32	49	55	71	87
TOS 2 (29 April)	Mowhawk	13	24	23	30	32	41	51	78
	Denison	13	24	23	32	37	49	57	78
	RGT Waugh	13	23	23	29	29	30	53	43
	Scepter	13	31	37	45	55	65	71	85
	RockStar	13	30	31	39	49	61	71	85
	Neo	24	30	30	37	49	59	72	85
	RGT Planet	23	30	31	37	49	59	71	85

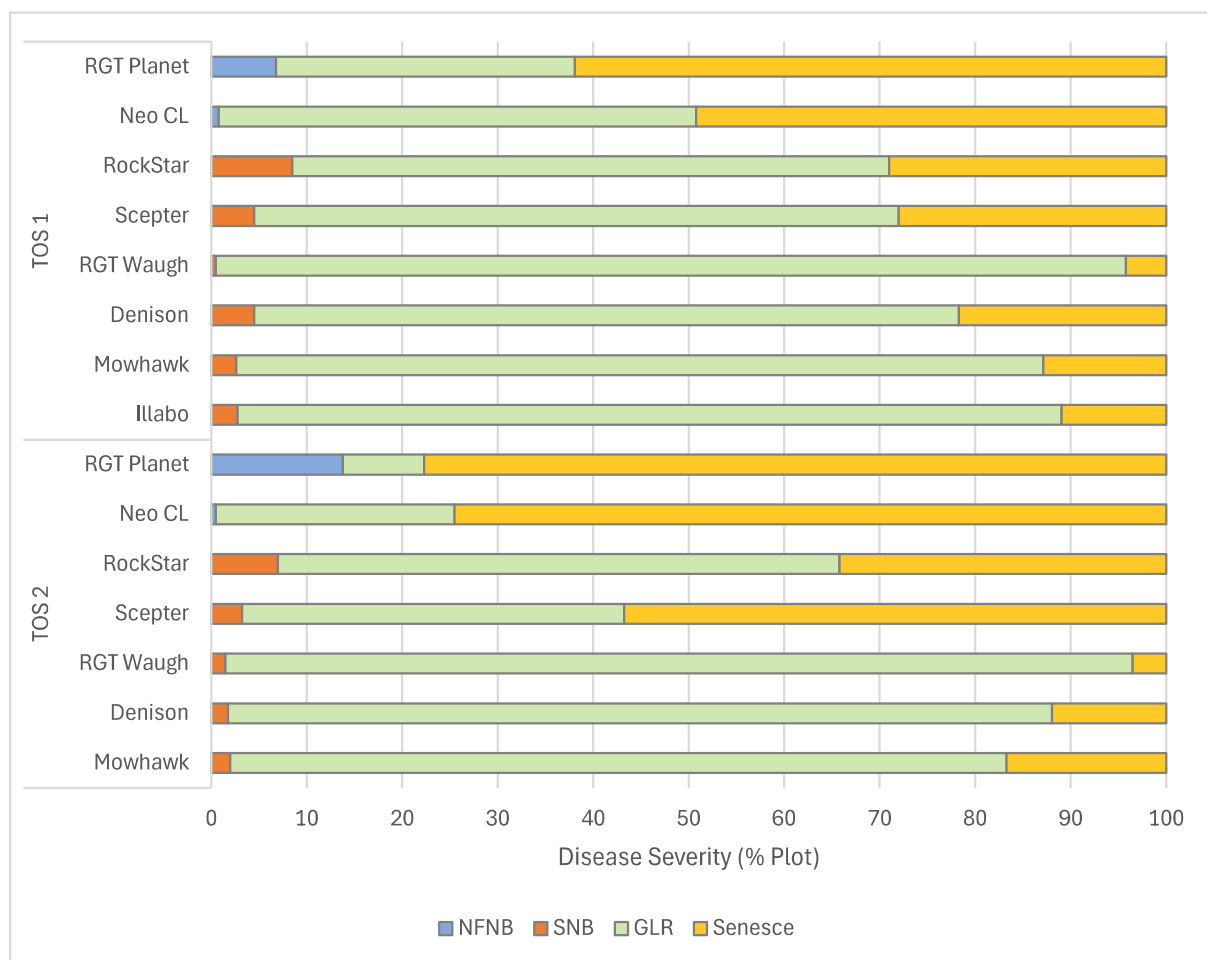


Figure 2. Influence of variety and time of sowing on net form net blotch (NFNB) severity in barley, septoria nodorum blotch (SNB) severity in wheat and green leaf retention (GLR). Assessed 9 October 2024.

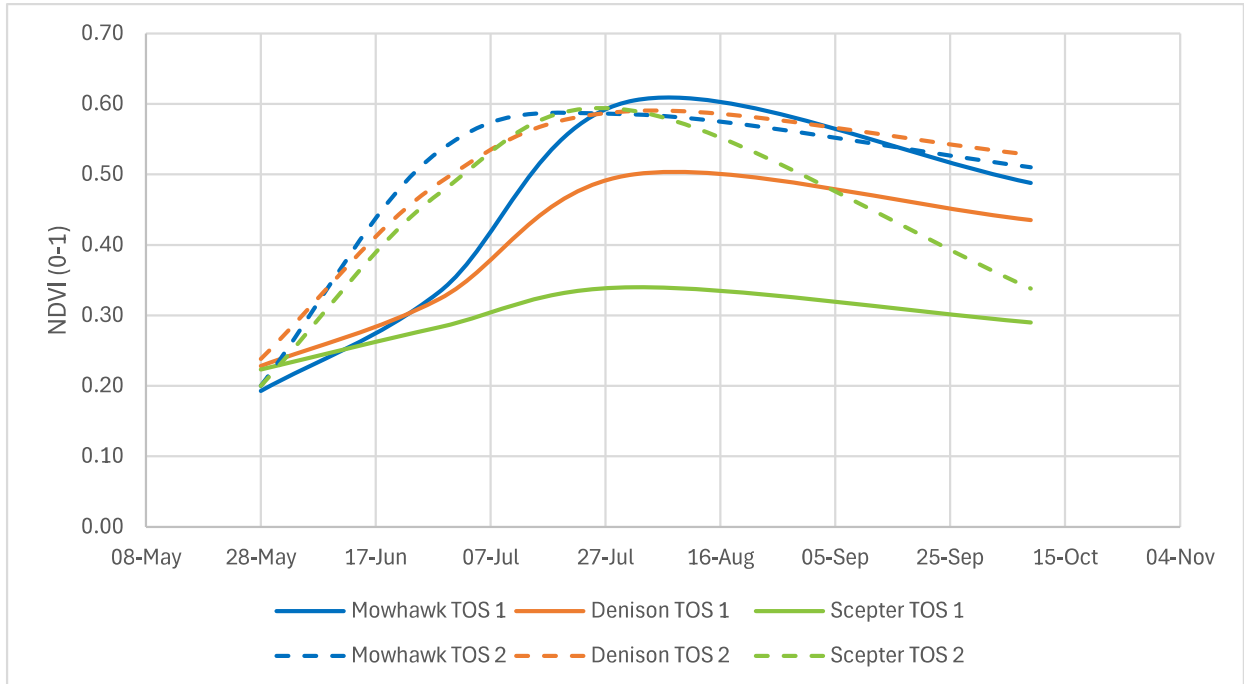


Figure 3. Influence of time of sowing (TOS) and variety on Normalized Difference Vegetation Index (NDVI) (0-1)

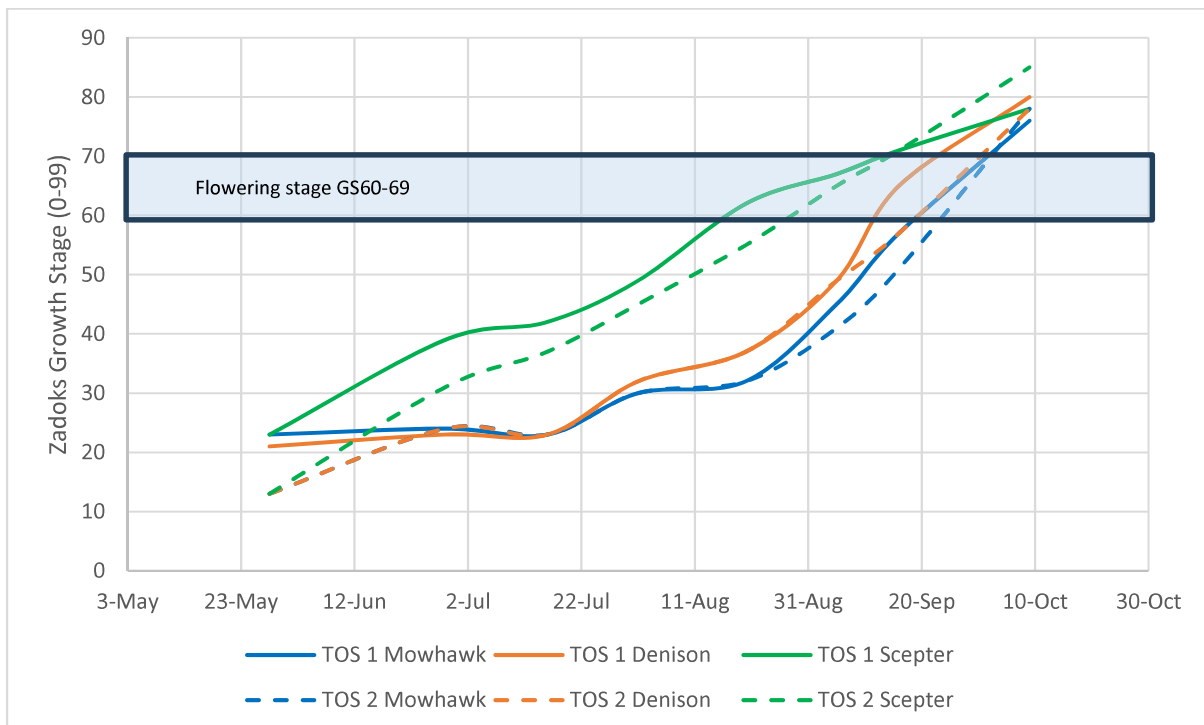


Figure 4. Influence of time of sowing (TOS) and variety on phenology (Zadoks Growth Stage 0-99)

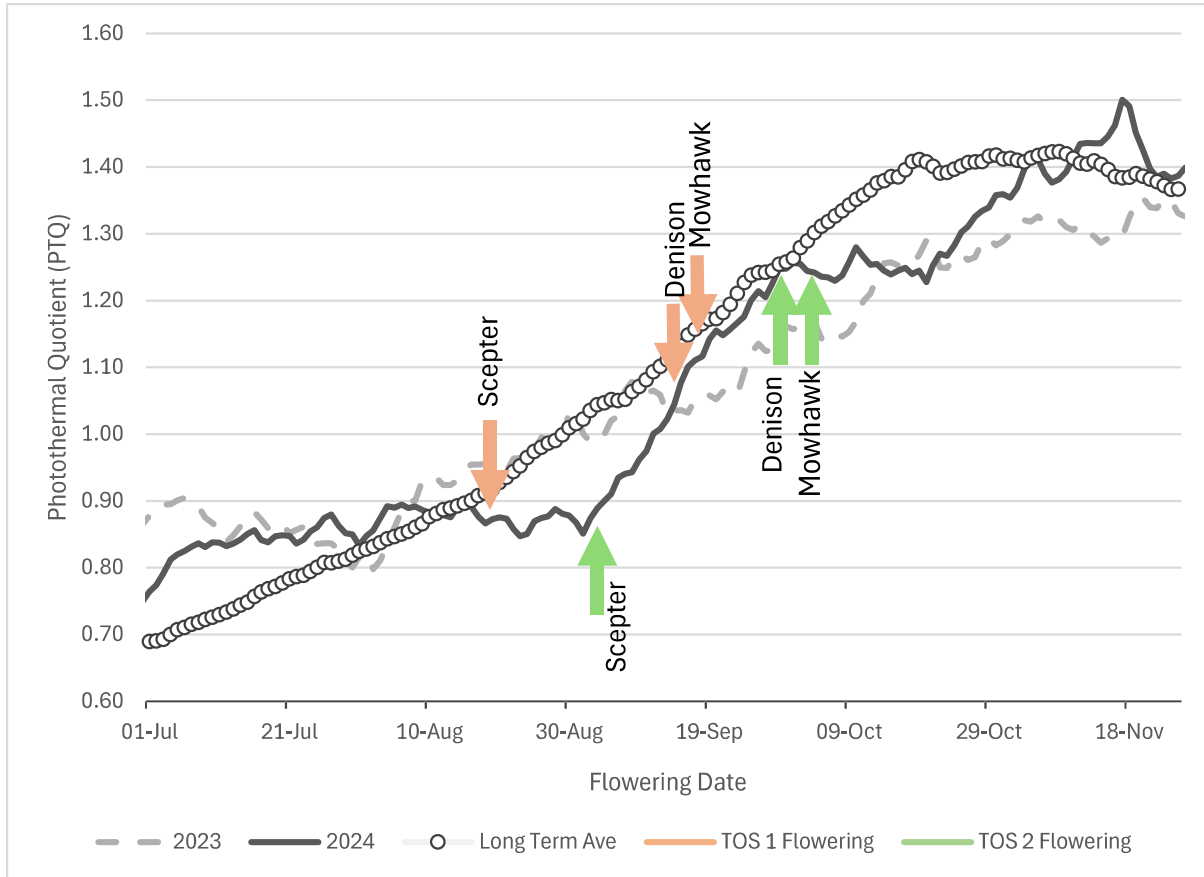


Figure 5. Photothermal Quotient (PTQ) for 2024, 2023 and the long-term average at Rocky Gully (1996-2024) in relation to the 2024 estimated flowering dates of Scepter, Denison and Mowhawk at both times of sowing.

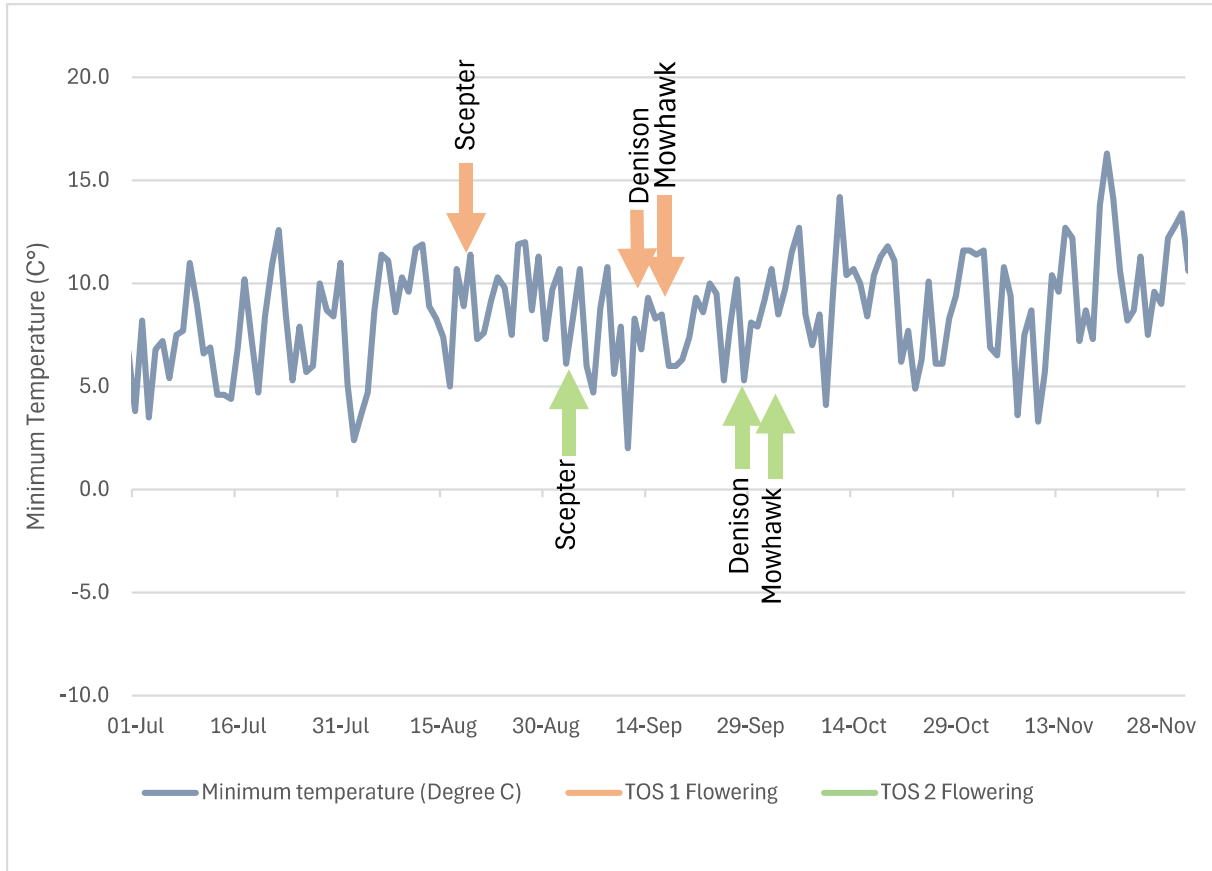


Figure 6. Daily minimum temperature (C°) in 2024 at Rocky Gully (1995-2024) in relation to the 2024 estimated flowering dates of Scepter, Denison and Mowhawk at both times of sowing.

Table 3 Influence of Time of sowing (TOS) and variety on the grain protein (%) and test weights (kg/hL).

Variety	Management Level											
	TOS 1		TOS 2		Mean	TOS 1		TOS 2		Mean		
	Protein (%)		Protein (%)		Protein (%)	Test weight (kg/hL)		Test weight (kg/hL)		Test weight (kg/hL)		
Illabo*	11.7	.	.	.	.	69.6	.	.	.	.
Mowhawk	11.3	-	10.4	-	10.8	c	68.7	-	75.2	-	71.9	b
Denison	11.4	-	10.4	-	10.9	c	72.6	-	74.5	-	73.6	b
RGT Waugh	12.0	-	12.7	-	12.3	ab	80.0	-	85.8	-	82.9	a
Scepter	12.5	-	12.3	-	12.4	ab	72.8	-	72.9	-	72.8	b
RockStar	11.5	-	11.9	-	11.7	b	73.9	-	71.3	-	72.6	b
Neo CL	12.5	-	12.7	-	12.6	a	62.0	-	61.2	-	61.6	c
RGT Planet	12.6	-	12.7	-	12.7	a	62.1	-	59.2	-	60.3	c
Mean	11.9	-	11.9	-	11.9		70.7	-	70.2	-	70.6	
Variety	LSD p = 0.05		0.8	P val	<0.001	LSD p = 0.05		4.3	P val	<0.001		
TOS	LSD p = 0.05		ns	P val	0.704	LSD p = 0.05		ns	P val	0.420		
Var. x TOS.	LSD p = 0.05		ns	P val	0.296	LSD p = 0.05		ns	P val	0.198		

*Illabo data excluded from statistical analysis.

Table 4. Influence of Time of sowing (TOS) and barley variety on retention (% > 2.5mm).

Variety	TOS 1		TOS 2		Mean	
	Retention (%)		Retention (%)		Retention (%)	
Neo CL	91.9	-	88.3	-	90.1	-
RGT Planet	90.7	-	84.3	-	87.5	-
Mean	91.3	a	86.3	b	88.8	
LSD Variety p = 0.05	ns		P value		0.267	
LSD TOS p = 0.05	0.8		P value		0.002	
LSD Variety x TOS. p = 0.05	ns		P value		0.535	

Table 5. Influence of Time of sowing (TOS) and variety on retention (% > 2.5mm) and screenings (% < 2.2mm).

Variety	TOS 1		TOS 2		Mean	
	Screenings (%)		Screenings (%)		Screenings (%)	
Illabo*	5.8		.		.	
Mowhawk	5.4	bc	5.5	bc	5.5	b
Denison	7.0	ab	5.0	c	6.0	ab
RGT Waugh	1.3	f	1.3	f	1.3	d
Scepter	5.9	bc	7.9	a	6.9	a
RockStar	5.5	bc	4.6	cd	5.0	b
Neo CL	2.0	ef	3.2	de	2.6	c
RGT Planet	2.4	ef	3.0	e	2.7	c
Mean	4.4	-	4.4	-	4.3	
Variety	LSD p = 0.05		1.1	P val	<0.001	
TOS	LSD p = 0.05		ns	P val	0.623	
Var. x Man.	LSD p = 0.05		1.5	P val	0.012	

*Illabo data excluded from statistical analysis.

Table 6. Influence of variety on plant emergence/m² at time of sowing 1. Assessed on 29 April, GS12.

Variety	TOS 1	
	Plants (m ²)	
Illabo	48.5	-
Mowhawk	79.8	-
Denison	109.0	-
RGT Waugh	70.0	-
Scepter	55.8	-
RockStar	49.3	-
Neo CL	23.3	-
RGT Planet	44.3	-
Mean	60.0	
LSD (p = 0.05)	ns	
P Value	0.439	

Table 7. Influence of time of sowing (TOS) and variety on tiller number (m²) assessed on 28 June at early stem elongation (GS 32) and head numbers (m²) assessed at crop maturity (GS 89).

	Management Level											
	TOS 1		TOS 2		Mean		TOS 1		TOS 2		Mean	
Variety	Tillers (m ²)		Tillers (m ²)		Tillers (m ²)		Heads (m ²)		Heads (m ²)		Heads (m ²)	
Mowhawk	265.8	-	271.3	-	268.5	b	227.0	d	359.5	ab	293.3	b
Denison	230.5	-	244.3	-	237.4	b	304.5	c	222.5	d	263.5	b
RGT Waugh	.	.	.	.	.	.	206.0	d	233.5	d	219.8	c
Scepter	102.5	-	211.3	-	156.9	b	145.5	e	211.0	d	178.3	d
RockStar	61.8	-	255.0	-	158.4	b	185.5	de	210.0	d	197.8	cd
Neo CL	188.3	-	159.5	-	173.9	b	347.5	abc	366.0	ab	356.8	a
RGT Planet	328.0	-	566.0	-	447.0	a	326.5	bc	378.5	a	352.5	a
Mean	196.1	-	284.5	-	240.4		248.9	b	283.0	a	266	
Variety	LSD p = 0.05		145.7	P val	0.002	LSD p = 0.05		36.7	P val	<0.001		
TOS	LSD p = 0.05		ns	P val	0.101	LSD p = 0.05		28.9	P val	0.039		
Var. x TOS.	LSD p = 0.05		ns	P val	0.342	LSD p = 0.05		51.9	P val	<0.001		

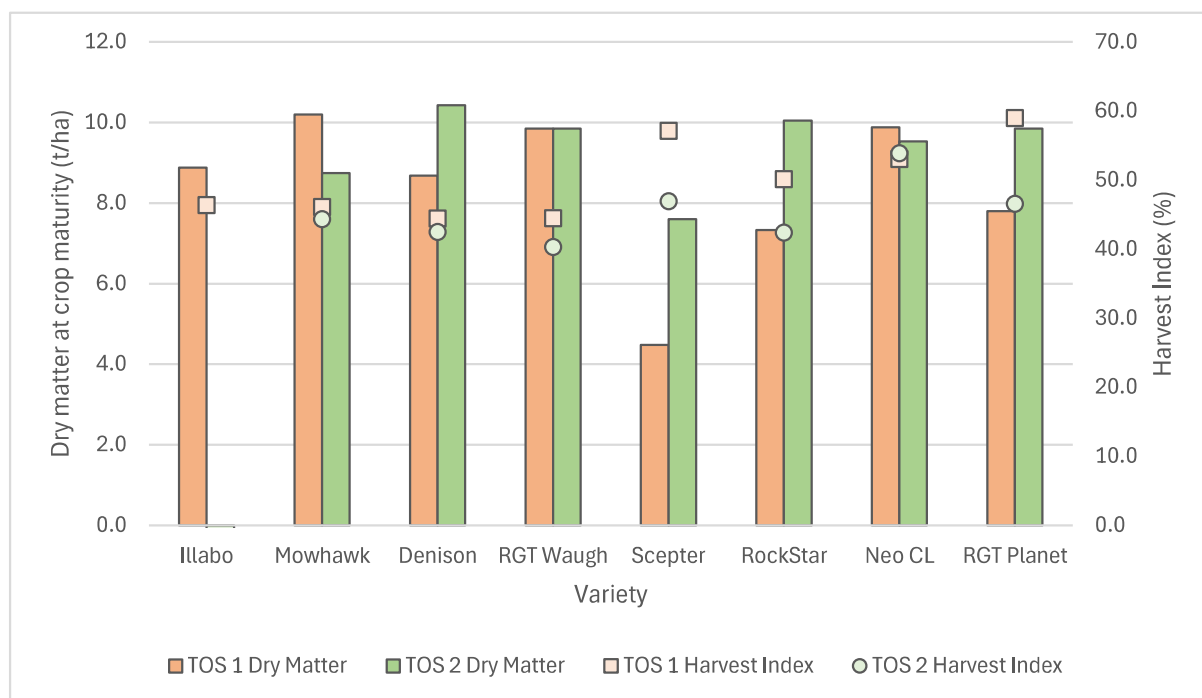


Figure 7. Influence of time of sowing (TOS) and variety on dry matter production (t/ha) assessed at crop maturity (GS 89) and harvest index (%).

Table 8. Influence of time of sowing (TOS) and variety on partial gross margin (total input & application costs. Grain prices (FED1 \$330, ANW2 \$345, AUN1 \$345, APW2 \$345 & BAR1 \$330) based off Cargill 2024/25 season Albany zone rates.

	Yield (t/ha)	Grade	Income (\$)	Cost (\$)	Partial Gross margin (\$/ha)	
TOS 1 (2 April)	Illabo	4.72	AUN1	\$1,627	\$752	\$874
	Mowhawk	5.11	AUN1	\$1,762	\$749	\$1,013
	Denison	4.40	ANW2	\$1,519	\$751	\$768
	RGT Waugh	5.04	FED1	\$1,662	\$752	\$910
	Scepter	2.86	ANW2	\$987	\$752	\$235
	RockStar	4.14	ANW2	\$1,428	\$752	\$677
	Neo CL	6.11	BFED1	\$2,017	\$753	\$1,264
	RGT Planet	5.17	BFED1	\$1,705	\$751	\$954
TOS 2 (29 April)	Mowhawk	4.44	ANW2	\$1,532	\$749	\$783
	Denison	5.01	APW2	\$1,728	\$751	\$978
	RGT Waugh	4.42	FED1	\$1,460	\$752	\$708
	Scepter	4.06	ANW2	\$1,399	\$752	\$647
	RockStar	4.86	ANW2	\$1,677	\$752	\$925
	Neo CL	5.81	BFED1	\$1,918	\$753	\$1,165
	RGT Planet	5.25	BFED1	\$1,733	\$751	\$981

Table 9. Trial input and management details (kg, g, mL/ha, L/ha).

Sowing date:		TOS 1- 2 April 2024 TOS 2- 29 April 2024	
Harvest date:		29 November 2024	
Seed rate:		180 seeds/m ²	
Irrigation at sowing:	TOS 1	15mm	
Basal fertilizer:	2 & 29 April	117 kg/ha MAP/MOP (80/20) with Impact (400 ml/ha)	
		Product	Active ingredient and rate
Pre-em herbicide:	1 April	TriflurX 2.0L/ha	Trifluralin 960 g ai/ha
		Overwatch 1.25 L/ha	Bixlozone 500 g ai/ha
Post-em herbicide:	5 July	LVE MCPA 570 0.4 L/ha	MCPA 228 g ai/ha
		Jaguar 0.8 L/ha	Bromoxynil 200 g ai/ha
			Diflufenican 20 g ai/ha
Insecticide:	31 July	Trojan 0.012 L/ha	Gamma-Cyhalothrin 1.5 g ai/ha
Fungicide:	GS31	Prosaro 0.3 L/ha	Prothioconazole 63 g ai/ha
			Tebuconazole 63 g ai/ha
	GS39	Aviator Xpro 0.5L/ha	Bixafen 37.5 g ai/ha
			Prothioconazole 75 g ai/ha
Nutrition:	24 June	220kg/ha Urea (40%)/MOP (60%) blend (40.5 kg N/ha)	
	5 July	Zinc sulphate mono 35% 0.5 kg/ha	
		Magnesium sulphate 20 kg/ha	
	20 July	160 kg urea/ha (73.6 kg N/ha)	
	4 August	50 kg/ha urea (23 kg N/ha)	

Site 3. Frankland River

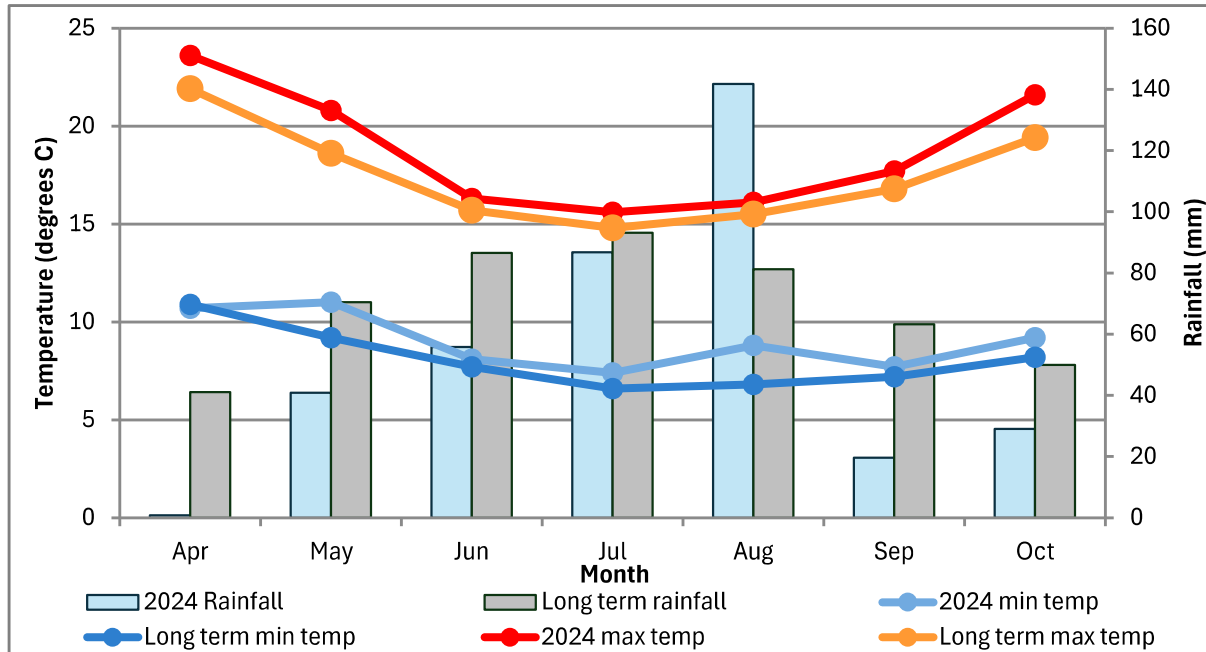


Figure 1. 2024 growing season rainfall and long-term rainfall recorded at Frankland (1923-2024). 2024 min and max temperatures, and long-term temperatures recorded at Rocky Gully (1995-2024). Growing season rainfall April to October= 372 mm.

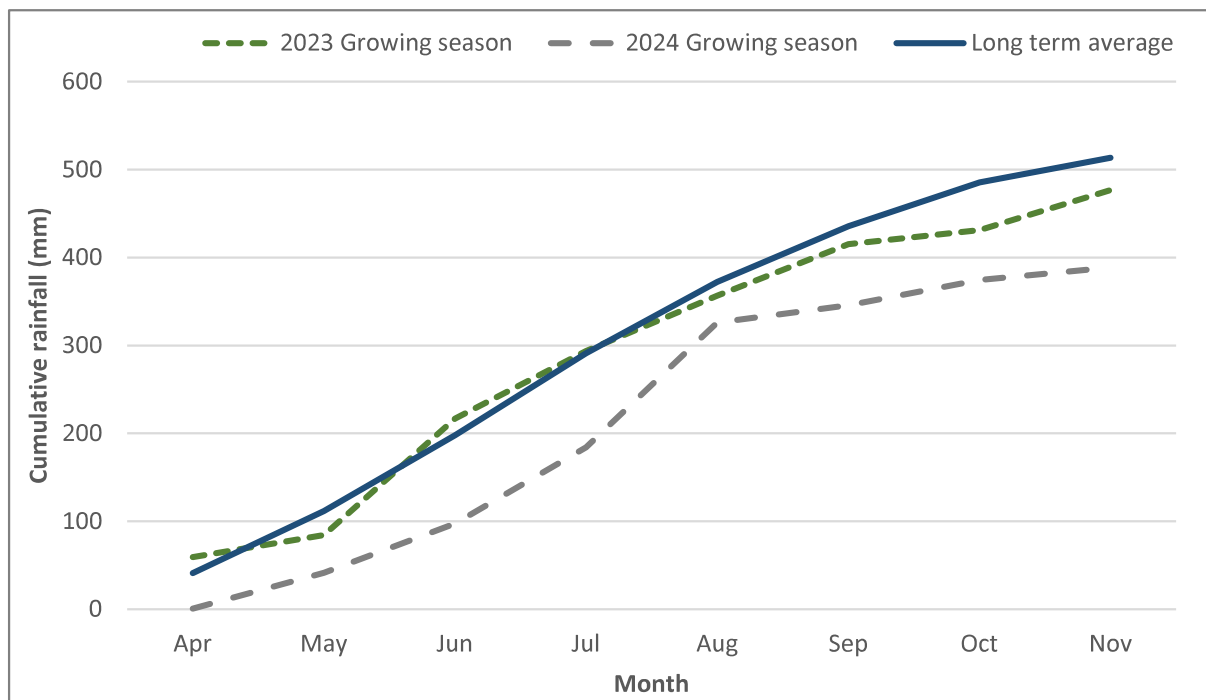


Figure 2. Cumulative growing season rainfall for 2023, 2024 and the long-term average for the growing season (April-October).

Site 3. Frankland River

Table 1. Summary of input and application costs used in partial gross margin analysis.

	Cost (\$)	Unit
Seed Treatment		
Cruiser	\$9.9	/100 kg seed
Rancona Dimension	\$3.6	/100 kg seed
Herbicide		
TriflurX	\$52.0	/ha
Overwatch	\$43.4	/ha
LVE MCPA 570	\$5.3	/ha
Jaguar	\$17.2	/ha
Insecticide		
Trojan	\$1.2	/ha
Fungicide		
Prosaro	\$22.4	/ha
Aviator Xpro	\$27.3	/ha
Nutrition		
Urea	\$720.0	/t
MAP/MOP/MnSO ₄ (66/29/5) blend	\$144.2	/ha
Urea/MOP (40/60) blend	\$160.9	/ha
Zinc sulphate mono 35%	\$3.5	/ha
Magnesium sulphate	\$30.4	/ha
Applications		
Spraying (per application)	\$12.0	/ha
Spreading (per application)	\$8.5	/ha

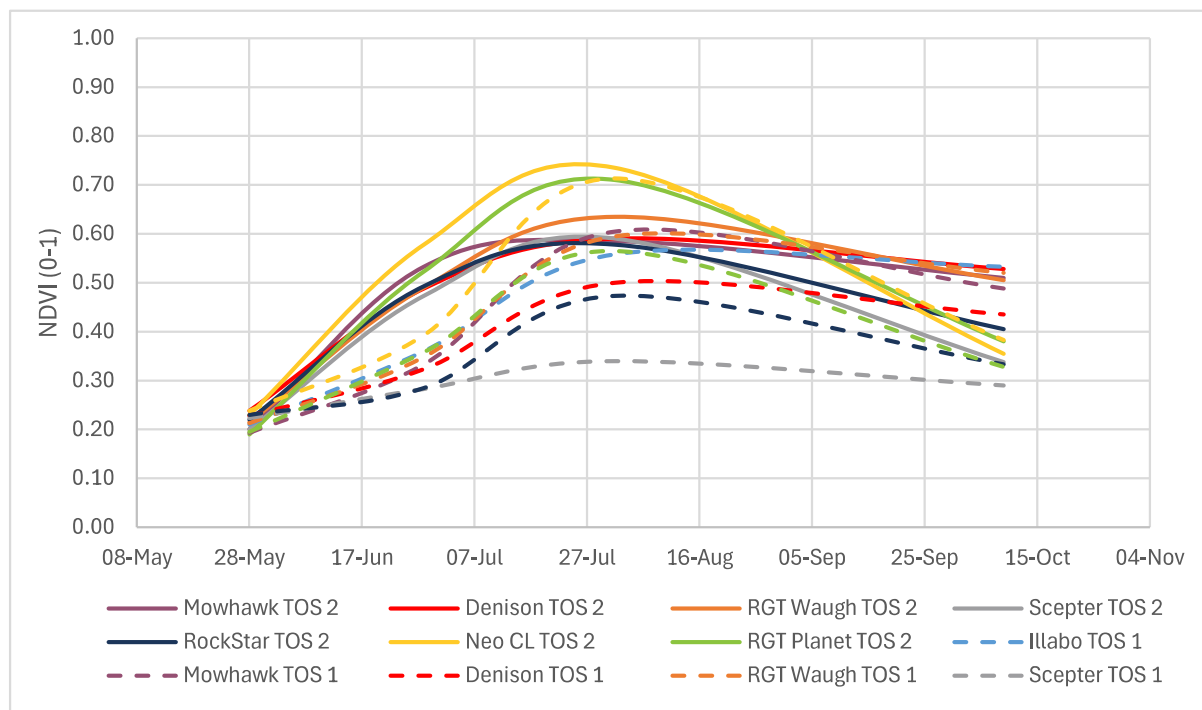


Figure 3. Influence of time of sowing (TOS) and variety on Normalized Difference Vegetation Index (NDVI) (0-1)



Image 3. Demonstration of late forming tillers vs main tillers at the Frankland River field day. Taken 19 September 2024.



Image 4. Location of Frankland River trial within the FAR Australia Albany Crop Technology Centre. Taken at the main field day on 19 September 2024. 120 pax in attendance.

Site 3. Frankland River



Molecular Diagnostic Centre
Gate 2A, Hartley Grove
URRBRAE SA 5064
Ph 08 8429 0290

Sample: **AAJ0663**

Report date: **19/07/2024**

Grower: **DEEP DAS**
Paddock: **ALBANY FRANKLAND**
Nearest town: **FRANKLAND RIVER**
Region: **WESTERN**

Date sampled: **28/06/2024**
Dry weight (g): **372**
Sample condition: **Damp**
Core depth: **10cm**
Sampling strategy: **Between**
Stubble added: **Yes**

Paddock history	2 years ago	Last year	This year
Crop / variety		Canola	Wheat

TEST	RESULT	DISEASE RISK*			
		Not Detected	Low	Med	High
CCN	<0.1 eggs / g sample	■			
Stem nematode	<0.5 nematodes/100 g sample	■			
Take-all	0.9 log(pg DNA/g sample)		■		
Take-all - Oat Strain	<0.8 log(pg DNA/g sample)	■			
Rhizoctonia	<0.5 log(pg DNA/g sample)	■			
Crown rot	<0.1 log(pg DNA/g sample)	■			
Pratylenchus neglectus	12.6 nematodes / g sample			■	
Pratylenchus quasitereoides	3.2 nematodes / g sample		■		
Blackspot	<1.2 log(pg DNA/g sample)	■			
Blackspot (Phoma koolunga)	<1.2 log(pg DNA/g sample)	■			

*Risk categories should be used as a guide only, may be subject to regional and seasonal differences, and may be revised over time.

UNDER EVALUATION

TEST	RESULT	POPULATION DENSITY**			
		Not Detected	Low	Med	High
Common root rot	<0.6 log(pg DNA/g sample)	■			
Pythium clade f	1.2 log(pg DNA/g sample)		■		
Yellow leaf spot	1.4 log(kDNA copies/g sample)		■		
Eyespot	<0.3 log(kDNA copies/g sample)	■			
White grain disorder	<0.3 log(kDNA copies/g sample)	■			
Pratylenchus penetrans	<0.1 nematodes / g sample	■			
Pratylenchus thornei	<0.1 nematodes / g sample	■			
Charcoal rot	3.1 log(kDNA copies/g sample)				■
Ascochyta blight of chickpea	<0.1 log(kDNA copies/g sample)	■			
Sclerotinia sclerotiorum/S. minor	0.4 log(kDNA copies/g sample)		■		

**Population densities are based on the pathogen levels detected in PREDICTA samples across the industry. These are not disease risk categories.

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Molecular Diagnostic Centre
 Gate 2A, Hartley Grove
 URRBRAE SA 5064
 Ph 08 8429 0290

Sample: AAJ0663

Report date: 19/07/2024

Grower: DEEP DAS

Date sampled: 28/06/2024

Paddock: ALBANY FRANKLAND

Dry weight (g): 372

Nearest town: FRANKLAND RIVER

Sample condition: Damp

Region: WESTERN

Core depth: 10cm

Sampling strategy: Between

Stubble added: Yes

Paddock history	2 years ago	Last year	This year
Crop / variety		Canola	Wheat

Pathogen comments

Medium risk *P. neglectus*: Yield losses range from 0 - 50%. Select tolerant varieties to reduce losses. Sow resistant crops/varieties to reduce levels.

Low take-all risk: Potential yield losses from 0-10%. Keep paddock host free after the break and sow at end of seeding program. Consider a seed treatment to control take-all. Summer rain events > 25mm should reduce level of inoculum.

Low risk *P. quasitereoides*: Yield losses range from 0 - 5%. Select tolerant varieties.

Agronomist Recommendations

Current manual version 11.1 is available from <http://rootdisease.aweb.net.au/>. Please note that if the stubble category is listed as No or Not Specified, the risk categories for Crown Rot have been calculated as per the "No added stubble" categories on page 105 of the manual.

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REFERENCES

GRDC final report for *Optimising High Rainfall Zone Cropping for Profit in the Western and Southern Regions 2020-22 (DAW1903-008RMX)*.

ACKNOWLEDGEMENTS

FAR Australia and its staff gratefully acknowledges the funding support of the Grains Research Development Corporation in funding this research and extension project. In addition, FAR Australia would like to thank the four host farmers for their unwavering support to a project carried out in an extremely difficult season when irrigation was needed for the first sowing date at all four research sites. We would like to thank the following host farmers.

Gibson – Jordan Whiting and Cam Wholing

Scaddan – Gavin, Elaine & Brad Egan

Frankland River – Kellie Shields, Terry Scott and the Gunwarrie team

South Stirling – Scott, Alaina & Henry Smith

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