



HYPER YIELDING CROPS: PROVISIONAL HARVEST YIELD RESULTS

Hyper Yielding Crops Project (FAR2004-002SAX)

Trial 3. HYC G.E.M Trial Series - Time of sowing 1

2023 WA Crop Technology Centre (Frankland River)

Sown: 29 April 2023

Harvested: 20 November 2023

Rotation position: 2022 Canola

Soil type & management: Forest gravel loam

Objectives:

To assess the performance of five spring barley germplasm choices, managed under four different management intensities, sown in late April in the Frankland River (WA) HRZ environment. G.E.M – Germplasm x Environment X Management.

Key points:

- There was a significant interaction between cultivar and management approach with cultivars responding differently to the level of management being applied.
- All cultivars, except the longer season barley Laureate, out-yielded RGT Planet under low input 125 N (125kg N/ha), two triazole fungicide applications -Tilt/Opus).
- From grain yield and protein analysis there appeared to be no advantage to additional N inputs, that were associated with either High input management (175 N) or HYC Tactical management approaches (150 N) over the 125 N adopted for Low input and HYC management strategy.
- However, RGT Planet, Neo, Minotaur and Rosalind cultivars responded significantly to greater fungicide input in the HYC Strategic approach based on two foliar fungicides (Prosaro/Aviator).

Table 1. Influence of management strategy and cultivar on grain yield (t/ha). Management inputs outlined in Table 6.

	Yield (t/ha)									
	Low Input		High Input		HYC Strategic		HYC Tactical		Mean	
RGT Planet	5.75	k	6.13	ghi	6.25	f-i	6.21	ghi	6.09	c
Rosalind	6.31	e-h	6.76	abc	6.63	bcd	6.92	a	6.66	a
Laureate	5.83	jk	6.08	hij	5.99	ijk	5.74	k	5.91	d
Minotaur	6.39	d-g	6.05	hij	6.89	ab	6.54	cde	6.47	b
Neo	6.52	c-f	6.77	abc	6.83	ab	6.51	c-f	6.66	a
Mean	6.16	b	6.36	ab	6.52	a	6.38	a	6.35	
LSD Cultivar p = 0.05			0.137				P val	<0.001		
LSD Management p = 0.05			0.217				P val	0.03		
LSD Cultivar x Man. P = 0.05			0.274				P val	<0.001		

Table 2. Influence of management strategy and cultivar on grain protein (%).

Protein (%)										
	Low Input		High Input		Strategic		Tactical		Mean	
RGT Planet	12.1	-	12.5	-	11.7	-	12.6	-	12.2	-
Rosalind	12.2	-	13.1	-	12.2	-	12.7	-	12.6	-
Laureate	12.5	-	12.6	-	12.1	-	12.7	-	12.5	-
Minotaur	12.0	-	13.5	-	11.9	-	12.4	-	12.5	-
Neo	11.6	-	12.6	-	11.9	-	12.6	-	12.1	-
Mean	12.1	bc	12.9	a	11.9	c	12.6	a	12.4	
LSD Cultivar p = 0.05	na				P val		0.081			
LSD Management p = 0.05	0.56				P val		0.015			
LSD Cultivar x Man. P = 0.05	na				P val		0.199			

Table 3. Influence of management strategy and cultivar on test weight (kg/hl).

Test Weight (kg/hl)										
	Low Input		High Input		Strategic		Tactical		Mean	
RGT Planet	60.6	-	61.0	-	66.1	-	61.8	-	62.4	bc
Rosalind	63.4	-	62.4	-	63.8	-	62.7	-	63.1	b
Laureate	56.3	-	59.1	-	59.9	-	57.6	-	58.2	d
Minotaur	65.4	-	63.8	-	65.7	-	65.5	-	65.1	a
Neo	61.6	-	60.6	-	62.7	-	60.9	-	61.4	c
Mean	61.5	-	61.4	-	63.6	-	61.7	-	62.0	
LSD Cultivar p = 0.05	na				P val		0.081			
LSD Management p = 0.05	1.96				P val		0.015			
LSD Cultivar x Man. P = 0.05	na				P val		0.329			

Table 4. Influence of management strategy and cultivar on grain retentions (%).

Retentions (%)										
	Low Input		High Input		Strategic		Tactical		Mean	
RGT Planet	79.7	a-d	75.5	cde	80.9	a-d	77.3	b-e	78.4	b
Rosalind	87.7	abc	82.8	abc	84.9	abc	75.6	cde	82.8	ab
Laureate	65.8	e	69.2	de	84.4	abc	52.6	f	68.0	c
Minotaur	88.4	abc	75.8	cde	89.7	ab	83.2	abc	84.3	ab
Neo	87.8	abc	90.0	ab	86.2	abc	91.0	a	88.7	a
Mean	81.9	ab	78.7	bc	85.2	a	75.9	c	80.4	
LSD Cultivar p = 0.05	6.47				P val		<0.001			
LSD Management p = 0.05	5.12				P val		0.014			
LSD Cultivar x Man. P = 0.05	12.95				P val		0.043			

Table 5. Influence of management strategy and cultivar on grain screenings (%).

Screenings (%)										
	Low Input		High Input		Strategic		Tactical		Mean	
RGT Planet	4.7	bcd	5.1	bc	3.0	cd	4.4	bcd	4.3	b
Rosalind	3.0	cd	4.4	bcd	2.6	cd	4.8	bcd	3.7	bc
Laureate	7.1	b	6.4	b	3.3	cd	11.4	a	7.1	a

Minotaur	2.1	cd	5.2	bc	2.3	cd	3.1	cd	3.2	bc
Neo	3.1	cd	3.1	cd	2.5	cd	1.8	d	2.6	c
Mean	4.0	a	4.8	a	2.7	b	5.1	a	4.2	
LSD Cultivar p = 0.05	1.57				P val				<0.001	
LSD Management p = 0.05	1.10				P val				0.004	
LSD Cultivar x Man. P = 0.05	3.14				P val				0.023	

Table 6. Trial input and management details (kg, g, ml/ha).

Sowing date:		29 April			
Harvest date:					
Seed rate:		180 seeds/m2			
Basal fertiliser:		21 Apr	169kg MAP/MOP (66%/33% blend)		
Nitrogen:			Low Input	High Input	
			125 kg N/ha	175 kg N/ha	
			Strategic	Tactical	
			125 kg N/ha	150 kg N/ha	
PGR:			Low Input	High Input	
		GS31	----	Moddus Evo 0.20 L/ha	
			Strategic	Tactical	
		GS31	----	Laureate Only (as High Input)	
Fungicide:			Low Input	High Input	
		GS00	----	Systiva	
		GS31	Tilt 0.50 L/ha	Prosaro 0.30 L/ha	
		GS39	Opus 0.50 L/ha	Aviator Xpro 0.50 L/ha	
		GS59	----	Opus 0.50 L/ha	
			HYC Strategic	HYC Tactical	
		GS00	----	See below	
		GS31	Prosaro 0.30 L/ha	See below	
		GS39	Aviator Xpro 0.50 L/ha	See below	
		GS59	----	See below	
Tactical Fungicide:					
	RGT Planet	Rosalind	Laureate	Minotaur	Neo
GS00	Systiva	----	----	----	----
GS31	Prosaro 0.30 L/ha	Prosaro 0.30 L/ha	Tilt 0.50 L/ha	Tilt 0.50 L/ha	Tilt 0.50 L/ha
GS39	Aviator Xpro 0.50 L/ha	Aviator Xpro 0.50 L/ha	Opus 0.50 L/ha	Opus 0.50 L/ha	Opus 0.50 L/ha
GS59	----	----	----	----	----

The HYC Strategic management approach was based on previous results from the Hyper Yielding Crops project. HYC Tactical is where during the course of the season adjustments were made to the HYC strategic approach in order to tailor management part way through the season.

FAR Australia gratefully acknowledges the GRDC investment in funding this research.