

Trial 3. HYC G.E.M Trial series

Objective: To assess the performance of winter (2 and 6 row) and spring (2 row) barley germplasm managed under six different management strategies.

Key Messages:

- Disease resistance of Pixel was far superior to Planet, management significantly influenced grain yield in the disease susceptible cultivar Planet.
- RGT Planet responded the most to intensifying fungicide inputs achieving 3.98t/ha under standard inputs and 6.48t/ha under higher inputs. The addition of PGR and or more N did not further increase yield in Planet.
- Madness a 2 row winter barley achieved yields in the range of 5.35 – 6.14t/ha across all management and demonstrates its improved disease resistance. There was no yield penalty from grazing.
- Pixel a 6 row winter barley achieved yields in the range of 7.45 – 8.72t/ha across all management combinations. The addition of a PGR in both standard and high input systems resulted in the highest yields of 8.66 and 8.72t/ha.
- The improved disease resistance of winter barley shows it can be farmed with less intensive fungicide strategies when early sowing, Planet is less suited to this system as the disease pressure is too high.
- Tests weights and retention were lower, and screenings higher in Planet compared to the winter varieties which highlights the significant effect of disease (even under high inputs).
- Proteins were all above 11% and suggests yield was non limited by N
- Net form of Net Blotch was the main disease which affected up to 80% of the canopy in Planet under standard conditions.

Treatments:

Treatment ID	Fungicide*	Canopy Intervention	Kg Nitrogen
1. Standard (Std) Fungicide & no intervention (NI)	Standard (cheaper)	Untreated	180
2. Standard (Std) Fungicide & PGR	Standard (cheaper)	PGR	180
3. Higher input Fungicide & no intervention (NI)	Higher input	Untreated	180
4. Higher input Fungicide & PGR	Higher input	PGR	180
5. Hyper - yield system	Higher input	PGR	Extra N 260
6. Dual - purpose system*	Higher input	Defoliation	Extra N 260

¹ Standard Management Control – 2 x cheaper foliar fungicide propiconazole (Tilt® 250 EC at 500mL/ha) @GS31 and tebuconazole (Folicur® 430 SC 290 mL/ha) @GS39-49.

² Increased disease management – Systiva® seed treatment, 2 x foliar fungicides including QoI (strobilurin) & SDHI combinations with DMIs) with third fungicide if required.

^{3,4} Plant growth regulators (PGR) (Moddus® Evo 200 mL/ha @GS30 & Moddus Evo 200mL/ha @GS33-37).

Defoliation was done mechanically (mower) prior to the GS30

Table 1. Influence of management strategy and cultivar on grain yield (t/ha).

	Cultivar				
	Planet	Madness	Pixel	Mean	
Management	Yield t/ha	Yield t/ha	Yield t/ha		
1. Std & NI	3.98 f	5.35 e	8.32 ab	5.89	-
2. Std & PGR	3.79 f	5.57 cde	8.66 a	6.00	-
3. High & NI	6.48 c	5.71 cde	7.93 ab	6.70	-
4. High & PGR	6.33 cd	6.14 cde	8.72 a	7.06	-
5. Hyper-yield system	5.48 de	5.80 cde	8.69 a	6.66	-
6. Dual-purpose system	5.90 cde	5.79 cde	7.45 b	6.38	-
Mean	5.33 c	5.73 b	8.29 a		
LSD Cultivar p = 0.05	0.37	P val	0.123		
LSD Management p = 0.05	0.94	P val	<0.001		
LSD Cultivar x Man. P = 0.05	0.91	P val	<0.001		

Table 2. Influence of management strategy and cultivar on retention (% >2.2 mm).

	Cultivar				
	Planet	Madness	Pixel	Mean	
Management	Retention % >2.2 mm	Retention % >2.2 mm	Retention % >2.2 mm		
1. Std & NI	76.2 fg	86.2 bcd	89.8 ab	84.1	ab
2. Std & PGR	68.9 h	73.7 g	82.4 de	75.0	c
3. High & NI	84.0 d	86.3 bcd	90.8 a	87.0	a
4. High & PGR	78.6 ef	76.4 fg	84.3 d	79.8	b
5. Hyper-yield system	77.6 f	77.1 fg	84.9 cd	79.9	b
6. Dual-purpose system	83.9 d	88.5 abc	89.6 ab	87.4	a
Mean	78.2 c	81.4 b	87.0 a		
LSD Cultivar p = 0.05	1.6	P val	<0.001		
LSD Management p = 0.05	4.7	P val	<0.001		
LSD Cultivar x Man. P = 0.05	3.9	P val	0.001		

Table 3. Influence of management strategy and cultivar on screenings (% <2.2 mm).

	Cultivar				
	Planet	Madness	Pixel	Mean	
Management	Screenings % <2.2 mm	Screenings % <2.2 mm	Screenings % <2.2 mm		
1. Std & NI	7.2 bc	5.1 de	2.0 f	4.8	b
2. Std & PGR	9.3 a	9.1 a	4.5 e	7.6	a
3. High & NI	4.6 e	5.2 de	2.0 f	3.9	b
4. High & PGR	6.5 cd	8.9 a	4.8 e	6.8	a
5. Hyper-yield system	7.1 bc	8.6 ab	4.3 e	6.7	a
6. Dual-purpose system	5.1 de	4.2 e	2.2 f	3.8	b

Mean	6.7 a	6.9 a	3.3 b
LSD Cultivar p = 0.05	0.6	P val	<0.001
LSD Management p = 0.05	1.6	P val	<0.001
LSD Cultivar x Man. P = 0.05	1.6	P val	0.006

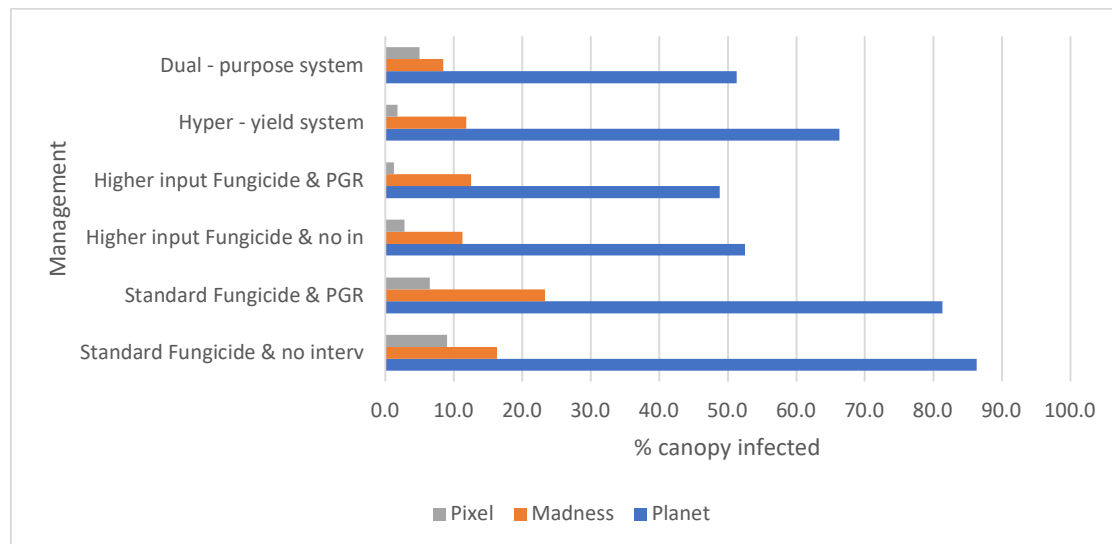


Figure 1. Influence of management strategy and cultivar on net form of net blotch infection (% canopy infected), 22 October 2021. LSD (p = 0.05) = 12.6, P value = 0.004 for the 2-way interaction between management and cultivar.

Trial 4. HYC Disease Management germplasm interaction

Objective: To develop profitable and sustainable approaches to disease management in HRZ barley.

Key messages:

- Yields ranged from 2.75 to 6.16t/ha under different disease management strategies.
- The addition of an SDHI to fungicide program had the largest impact on yield in Planet.
- The application of Systiva on the seed under high disease pressure in this example suggests it is still having good efficacy in the lower SE.
- Quality results also were affected, disease managed plots had higher grain screenings than unmanaged plots.

Treatments: 16 fungicide management levels applied to Planet.

Table 1. Fungicide treatments applied to Planet sowing date 1 at Millicent 2021.

Target application timing and product					
	Sow	GS31	GS39-49	GS59	Grain Yield t/ha
1	---	---	---	---	2.75 g
2	Systiva	Prosaro 300 mL/ha	Radial 840 mL/ha	---	5.47 a
3	Systiva	Prosaro 300 mL/ha	Radial 840 mL/ha	Opus 500 mL/ha	4.93 bc