

Trial 3. HYC G.E.M Trial series

Objective: To assess the performance of winter and spring barley germplasm managed under four different management intensities (mid-April to early May sown) at two levels of fungicides.

Key Points:

- In a season with a wetter than average growing season and timely rainfall, the fast-developing spring barley Rosalind significantly out yielded RGT Planet (7.80t/ha) and the slower-developing winter barley Cassiopee (7.70t/ha).
- There were significant visual differences in disease protection between the standard and high fungicide inputs which translated to yield increases of 0.93t/ha in the most susceptible cultivar RGT Planet and 0.49t/ha in Rosalind respectively. This means they require a more robust fungicide strategy whereas cultivars with improved resistance such as Cassiopee achieved similar yields with the standard management.
- Extra N increased yields but only when significant canopy management was adopted, however the management strategy depended on cultivar. When extra N was applied the plant growth regulator intervention increased yield by 0.9t/ha in the winter cultivar Cassiopee but not in other cultivars RGT Planet and Rosalind. RGT Planet and Rosalind benefited from defoliation and both yielded 0.7t/ha higher when defoliated an extra N was applied where as Cassiopee did not benefit from defoliation.
- Defoliation was more effective at reducing lodging than the PGR strategy in all cultivars.
- These results highlight the importance of canopy management to improve the crop structure in the higher rainfall zone to maximize the yield and benefit of inputs such as fungicide and nitrogen.

Treatments: Lever 1 – Level of fungicide inputs x Lever 2 – Canopy Control and additional N (to service 25% higher yield potential) x Lever 3 – Germplasm

Table 1. Influence of fungicide management strategy, variety and canopy management regime on grain yield (t/ha).

	<i>RGT Planet</i>	<i>Cassiopee</i>	<i>Rosalind</i>	<i>Mean</i>
Variety	8.23 a	7.70 b	7.80 b	7.91
	LSD	0.25	P Value	<0.001
Fungicide Management				
<i>Standard Fungicide Management</i>	7.77 bc	7.66 c	7.56 c	7.66 b
<i>High Input Fungicide management</i>	8.70 a	7.74 bc	8.05 b	8.16 a
Fungicide Management	LSD	0.26	P Value	0.009
Fungicide Mgmt x Variety	LSD	0.35	P Value	0.005
Canopy Management Regime				
<i>No Intervention</i>	7.99 bcd	7.48 e	7.36 e	7.61 b
<i>No Intervention + Nitrogen</i>	8.10 b	7.52 de	7.58 cde	7.73 b
<i>Defoliation + Nitrogen</i>	8.70 a	7.37 e	8.24 ab	8.10 a
<i>PGR + Nitrogen</i>	8.15 b	8.42 ab	8.04 bc	8.20 a
Canopy Management Regime	LSD	0.27	P Value	<0.001
Variety x Canopy Mgmt Regime	LSD	0.50	P Value	0.002

Fungicide Mgmt. x Canopy Mgmt. Regime					
Standard Fungicide Management					
No Intervention	7.41	-	7.50	-	7.14 - 7.35 -
No Intervention + Nitrogen	7.64	-	7.43	-	7.43 -
Defoliation + Nitrogen	8.28	-	7.27	-	7.84 -
PGR + Nitrogen	7.75	-	8.45	-	8.03 -
High Input Management					
No Intervention	8.57	-	7.47	-	7.87 -
No Intervention + Nitrogen	8.56	-	7.62	-	8.03 -
Defoliation + Nitrogen	9.12	-	7.47	-	8.36 -
PGR + Nitrogen	8.54	-	8.40	-	8.37 -
Fungicide Mgmt x Canopy Mgmt	LSD		ns	P Value	0.778
Fungicide Mgmt x Canopy Mgmt x Variety	LSD		ns	P Value	0.985

"Defoliation" – simulated grazing using mechanical defoliation at GS30.

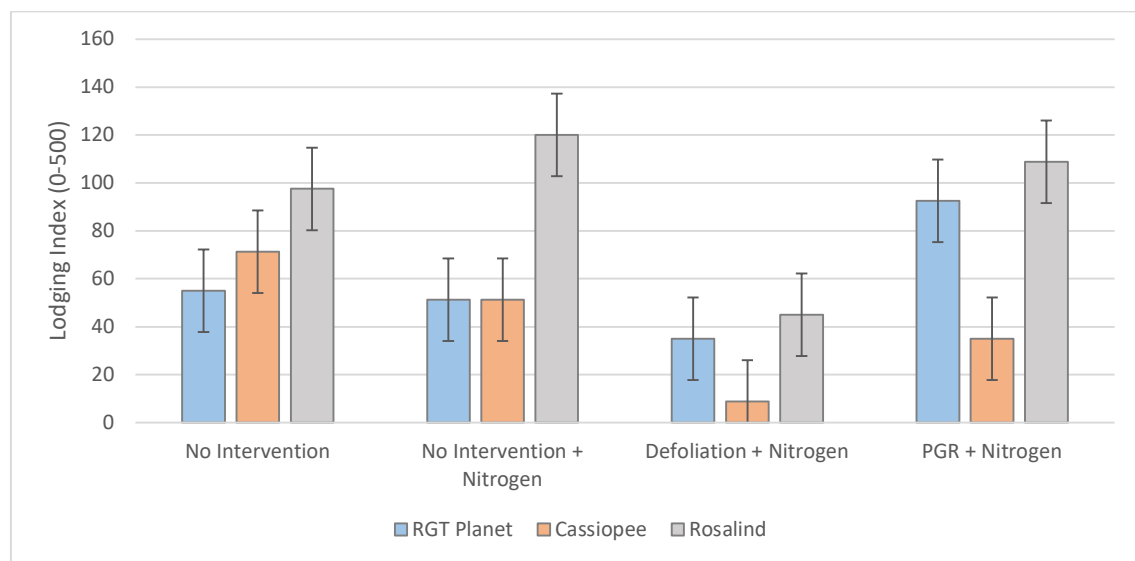


Figure 1. Lodging Index scores (0-500) derived from a severity score (0-5) multiplied by plot area affected (%), assessed at crop maturity (GS99) under the standard management level (the error bars represent the LSD).

Table 2. Details of the management levels (kg, g, ml/ha).

Sowing date:	25-April				
Seed Rate:	200 seeds/m ²				
Sowing Fertiliser:	100kg/ha MAP				
Seed Treatment	Vibrance & Gaucho ± per treatment list				
		Standard (Nil)	Standard + Nitrogen	Graze GS30 + Nitrogen	PGR GS30-32 + Nitrogen
Grazed:		----	---	✓	---
Seed treatment:	Rancona Dimension/ Gaucho				
Nitrogen:	23 June	69 kg N/ha	86 kg N/ha	86 kg N/ha	86 kg N/ha
	7 August	69 kg N/ha	86 kg N/ha	86 kg N/ha	86 kg N/ha
Total N (With 10N at sowing)		148 Kg N/ha	183 Kg N/ha	183 Kg N/ha	183 Kg N/ha

PGR:	GS30-32	----	----	----	Moddus Evo. 200ml
	GS37	----	----	----	Moddus Evo. 200ml
Fungicide:					
Standard Management	GS31 Tilt 500ml fb GS39 Prosaro 300ml				
High Input Management	Systiva, GS31 Radial 840ml fb GS39 Aviator Xpro 500ml				

Trial 4. HYC Disease Management germplasm interaction

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

Key Points:

- The fungicide treatments were effective in reducing the incidence of foliar disease (namely Scald and Net From Net Blotch), prolonging green leaf area and significantly increasing yield at this site in 2020.
- In two susceptible cultivars a single spray application of Prosaro at GS31 increased grain yield on average by 0.62t/ha and shifting to a two-spray strategy with the addition of Radial at GS39-49 increased yield by 1.5t/ha. The addition of the seed treatment Systiva at sowing to this treatment did not further reduce disease infection levels or increase grain yield. These results highlight the later follow up application is likely to be more effective and important than fungicide usage prior to GS31.
- The yield responses observed from the two foliar spray strategies are correlated to both a reduction in Scald and Net From Net Blotch but also an increase in green leaf area.
- Grain quality responses were significant, noticeably the later fungicide application increased test weight by 2kg/hL in RGT Planet.
- The benefits of maintaining a green leaf during grain fill are influencing grain quality in malting barley consistently across the high rainfall zone and even in the absence of a yield response should not be overlooked.

Treatments: 4 fungicide management levels applied to 2 varieties

Table 3. Influence of management strategy and variety of barley grain yield (t/ha).

Treatment			RGT Planet	HV8 Nitro	Mean
GS00	GS31	GS39-49	Yield (t/ha)	Yield (t/ha)	Yield (t/ha)
---	---	---	5.88 -	5.90 -	5.89 c
---	Prosaro 300ml/ha	---	6.78 -	6.23 -	6.51 b
---	Prosaro 300ml/ha	Radial 840ml/ha	7.71 -	7.08 -	7.39 a
Systiva	Prosaro 300ml/ha	Radial 840ml/ha	7.71 -	7.19 -	7.45 a
Mean			7.02 a	6.60 b	6.81
LSD Variety P=0.05			0.45	P val	<0.001
LSD Fungicide P=0.05			0.18	P val	<0.001
LSD Variety x Fungicide P=0.05			ns	P val	0.057
CV			3.46		