PROVISIONAL HARVEST RESULTS:

Barley Canopy Management Trial

2020 WA Crop Technology Centre (Albany)

Hyper Yielding Crops (FAR2004-002SAX)

A Grains Research & Development Corporation (GRDC) national investment

Sown: 1 May 2020
Harvested: 26 November 2020
Rotation position: 1st cereal after canola, 2018 pasture, 2017 barley.
Soil type & management: Shallow duplex sand over gravel over clay. Clayed 2017, smudged 2019/20.

Key Results:

- *With a decile 1 start (sowing – early August), barley following canola exceeded 6 t/ha with the fast-developing spring cultivar Rosalind significantly higher yielding than RGT Planet (6.5 v 6.0 t/ha) and the slower developing winter cultivar Cassiopee (3.77 t/ha).*
- *The highest yields at the site were observed with Rosalind grown under a full fungicide package based on Systiva and two foliar sprays (6.7 t/ha), despite low disease levels at early stem elongation.*
- *This higher fungicide input increased harvest dry matter and grain yield relative to a cheaper triazole based two spray programme (standard input) when averaged across all cultivars.*
- *There was no yield benefit of plant growth regulation in the trial.*
- *Mechanical defoliation at GS30 "simulating grazing" reduced grain yields on average by 0.29 t/ha relative to the ungrazed crop. The yield penalty was greater in the winter cultivar Cassiopee which reached GS30 later in the spring.*
- *An additional 50kg N/ha had no significant effect on yield irrespective of fungicide, variety, or defoliation.*

Key Messages:

- Overall, matching crop development to environment (faster developing spring cultivars were favoured) and fungicide management had the greatest effect on yield at this site in 2020. This was due to greater harvest dry matter and head numbers.
- Canopy management tools including defoliation, additional nitrogen and plant growth regulators did not increase yield, suggesting the effect of environment (dry stem elongation period) had the larger influence on canopy yield development.

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

	RGT Planet		Cassiopee		Rosalind		Mean	
Variety	*6.00*	*b*	*3.77*	*c*	*6.49*	*a*	***5.42***	
		LSD	***0.15***			***P Value***	***<0.001***	
Fungicide Management								
Standard Fungicide Management	*5.83*	-	*3.68*	-	*6.28*	-	***5.26***	***b***
High Input Fungicide management	*6.18*	-	*3.85*	-	*6.70*	-	***5.58***	***a***
Fungicide Management		***LSD***	***0.26***			***P Value***	***0.032***	
Fungicide Mgmt x Variety		***LSD***	***ns***			***P Value***	***0.290***	
Canopy Management Regime								
No Intervention	6.05	-	4.02	-	6.47	-	**5.52**	**a**
No Intervention + Nitrogen	6.16	-	3.91	-	6.55	-	**5.54**	**a**
Defoliation + Nitrogen	5.88	-	3.44	-	6.42	-	**5.25**	**b**
PGR + Nitrogen	5.93	-	3.68	-	6.51	-	**5.37**	**b**
Canopy Management Regime		***LSD***	***0.14***			***P Value***	***0.001***	
Variety x Canopy Mgmt Regime		***LSD***	***ns***			***P Value***	***0.287***	
Fungicide Mgmt. x Canopy Mgmt. Regime								
Standard Fungicide Management								
No Intervention	5.75	-	3.98	-	6.35	-	**5.36**	**-**
No Intervention + Nitrogen	6.20	-	3.83	-	6.22	-	**5.42**	**-**
Defoliation + Nitrogen	5.72	-	3.33	-	6.06	-	**5.04**	**-**
PGR + Nitrogen	5.65	-	3.57	-	6.51	-	**5.24**	**-**
High Input Management								
No Intervention	6.36	-	4.07	-	6.60	-	**5.68**	**-**
No Intervention + Nitrogen	6.11	-	4.00	-	6.88	-	**5.66**	**-**
Defoliation + Nitrogen	6.04	-	3.56	-	6.79	-	**5.46**	**-**
PGR + Nitrogen	6.20	-	3.80	-	6.51	-	**5.50**	**-**
Fungicide Mgmt x Canopy Mgmt		***LSD***	***ns***			***P Value***	***0.505***	
Fungicide Mgmt x Canopy Mgmt x Variety		***LSD***	***ns***			***P Value***	***0.064***	

Yield figures followed by the same letter are not considered to be statistically different (p=0.05).
Plot yields: To compensate for edge effect a full row width (22.5cm) has been added to either side of the plot area (equal to plot centre to plot centre measurement in this case). All provisional results have been analysed through ARM software with further analysis when the final results are released.
"Defoliation" – simulated grazing using mechanical defoliation at GS30.

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

Plant pop'n:		200 seeds/m^2			
		Standard (Nil)	**Standard + Nitrogen**	**Graze GS30 + Nitrogen**	**PGR GS30-32 + Nitrogen**
Grazed:		----	---	✓	---
Seed treatment:		Rancona Dimension/ Gaucho			
Basal Fertiliser:	1 May	90Kg MAP	90Kg MAP	90Kg MAP	90Kg MAP
Nitrogen:	19 May	33.3 kg N	33.3 kg N	33.3 kg N	33.3 kg N
	2 August	27.6 kg N	27.6 kg N	27.6 kg N	27.6 kg N
	11 August	16.6 kg N	16.6 kg N	16.6 kg N	16.6 kg N
As per variety reaching GS31			50.0 kg N	50.0 kg N	50.0 kg N
Total N (With 9N at sowing)		**86.5 Kg N**	**137 Kg N**	**137 Kg N**	**137 Kg N**
PGR:	GS31	----	----	----	Moddus Evo. 200ml
Fungicide:					
Standard Management		GS31 Opus 500ml fb GS39 Prosaro 300ml			
High Input Management		Systiva, GS31 Radial 840ml fb GS39 Aviator Xpro 420ml			

All other inputs of insecticides and herbicides were standard across the trial.

**Timings of PGRs and fungicides were adjusted to take account of the differences in spring and winter barley phenology (development).*

Meteorological Data – WA Crop Technology Centre (Albany)

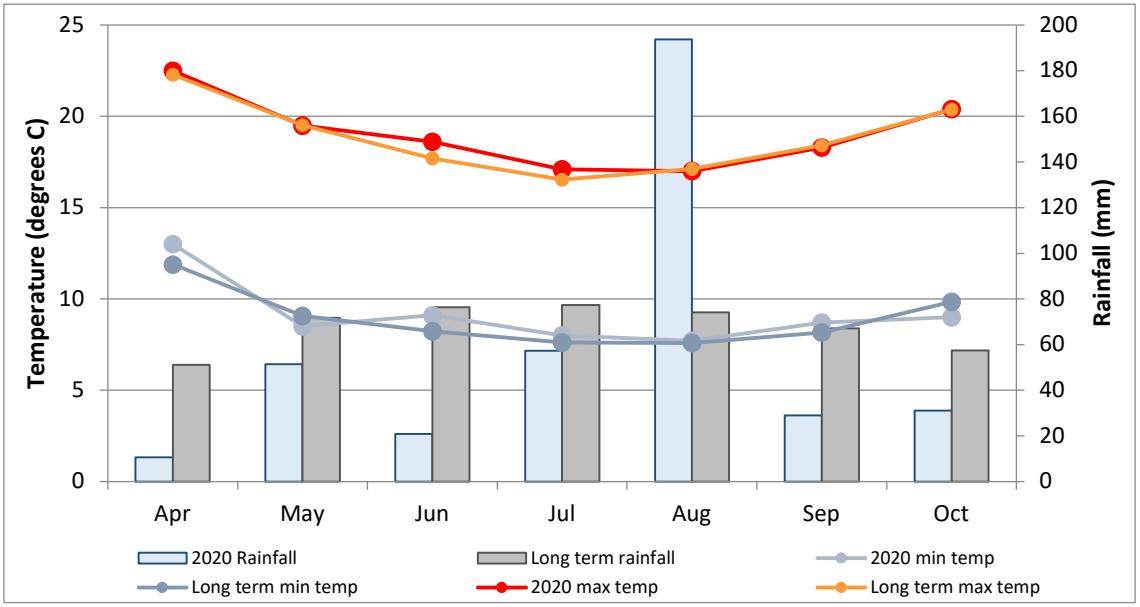

Figure 1. 2020 growing season rainfall and long-term rainfall, 2020 min and max temperatures and long-term min and max temperatures recorded at Warriup (1919 to 2020) for the growing season (April to October).

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