

HARVEST YIELD RESULTS

Barley Canopy Management Trial 2021 Esperance Crop Technology Centre

Optimising high rainfall zone cropping for profit in the Western and Southern Regions (DAW1903-008RMX)

A Grains Research & Development Corporation (GRDC) investment

Sown: 16 April

Harvested: 3 November

Rotation position: 1st cereal after canola

Soil Management: Deep ripped to 800mm

Key Learnings:

- **Aspirational grain yield goals of 8t/ha** were achieved with spring barley varieties Laperouse and RGT Planet with a higher input management system at Esperance in 2021 (Table 1).
- Management combinations that achieved 8t/ha had **final dry matters greater than 15t/ha**; these were achieved with higher input management; more Nitrogen and a robust fungicide strategy (Table 2)
- Management that **increased biomass production was more important than the conversion of dry matter to yield** (Harvest Index) in this experiment. Standard grazed and un-grazed had less final biomass than high input strategies, but with a similar harvest index meaning yields were lower.
- **Harvest Index (HI) ranged from 37% to 47%**, and management had little impact on HI (results not significant). These HIs are lower than the theoretical maximum of 55% for spring barley. This means there is potential for yields as high as 9 – 10t/ha available at Esperance. The reasons for this will be investigated.
- The winter cultivar Urambie was the equal highest yielding when defoliated/grazed (6.5t/ha) and achieved similar yields to standard and high inputs.
- Planet and Laperouse suffered a yield penalty from defoliation. The response to higher inputs may indicate that these cultivars required more N or a more robust fungicide strategy to achieve their yield potential or recover from grazing.

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Table 1. Influence of cultivar on grain yield (t/ha) under different canopy management regimes.

Cultivar (Type)	Canopy Management (Grain Yield t/ha)		
	Standard Input	“Grazed” Standard*	High Input
Laperouse (Spring)	7.16 c	6.31 de	8.00 a
Urambie (Winter)	6.31 de	6.48 d	6.60 d
RGT Planet (Spring)	6.59 d	5.59 f	8.00 a
HV8 Nitro (Spring)	5.80 ef	5.56 f	7.45 bc
Rosalind (Spring)	5.74 f	5.32 f	7.70 abc
Mean	6.32 b	5.87 b	7.55 a
LSD Cultivar p = 0.05		0.32	P Value <0.001
LSD Management p=0.05		0.60	P Value <0.01
LSD Cultivar x Management P=0.05		0.55	P Value <0.01

Yield figures followed by the same letter are not considered to be statistically different ($p=0.05$), for example a yield of 7.45bc is considered statistically different to 6.6d but not to a yield of 7.7 abc.

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 results have been analysed through ARM software.

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

Plant pop'n:		200 seeds/m ² (150 plants/m ² target)		
		Standard	Standard Grazed	High Input
Grazed:		----	18 June	----
Basal Fertiliser:	16 April	130kg Summit Vigour	130kg Summit Vigour	130kg Summit Vigour
Nitrogen:	19 May	55 kg N	55 kg N	55 kg N
	18 June	---	---	41 kg N
	7 July	40 kg N	40 kg N	40 kg N
	11 July	46 kg N	46 kg N	46 kg N
	18 August	28 kg N	28 kg N	28 kg N
Total N (13 N at sow)		182 kg N	182 kg N	223 kg N
PGR:	GS31	----	----	Mod. 200mL
Fungicide:	GS00			Systiva
	GS31-32	Prosaro 150ml	Prosaro 150ml	Prosaro 300ml
	GS49	Opus 500ml	Opus 500ml	Radial 840ml

All other inputs of insecticides and herbicides were standard across the trial. All seed was treated with Rancona Dimension and Gaucho. Mod. – Moddus Evo, *Timings of PGRs and fungicides were adjusted to take account of the differences in spring and winter barley phenology (development). Available Soil Nitrogen, 22 February 71 kg N/ha (0 – 80cm) “Grazed standard” – simulated grazing using mechanical defoliation.

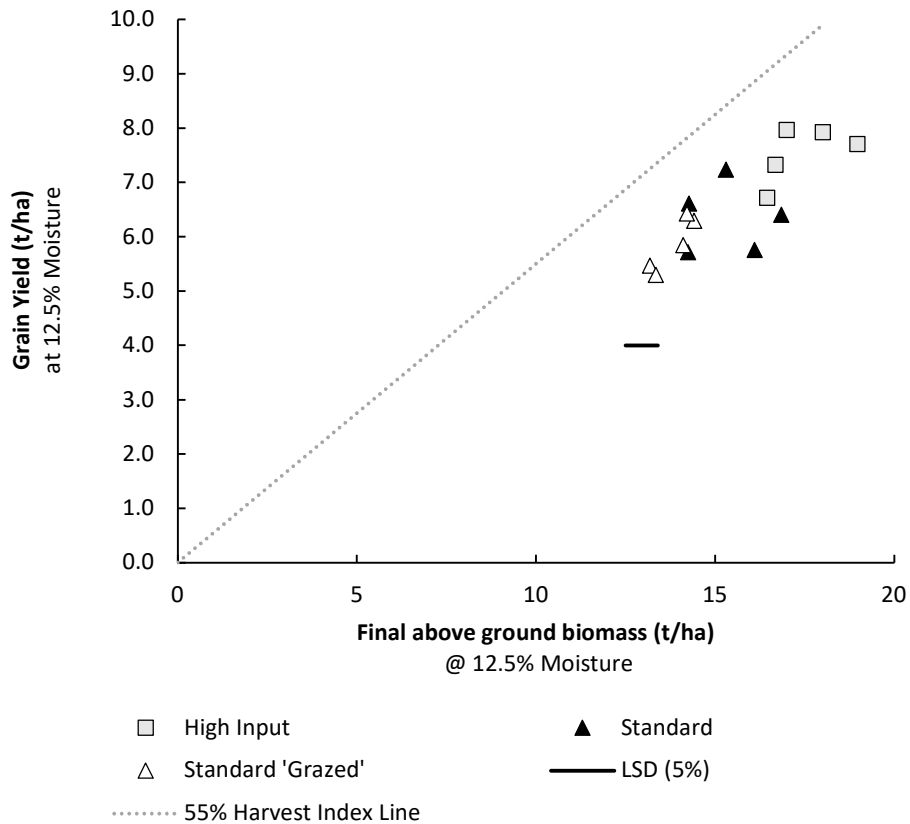


Figure 1. Relationship between final biomass and grain yield (12.5% Moisture) across different management groups at Esperance in 2021. The dashed line represents a theoretical maximum yield for each level of biomass.

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