

Trial 3. HYC Barley PGR x Harvest Date Interaction (FAR SAC B23-05)

Key Points:

- *Although there was no statistical interaction between the three factors (variety x PGR x harvest date), on average harvesting on time lead to higher yields (Table 1).*
- *There was an interaction between variety and PGR management where a single, early trinexapac ethyl application produced the best yield in RGT Planet and was significantly higher yielding than the 'European' approach which also included a late application on ethephon. This contrasted with the winter variety Pixel where the European' approach yielded best (Table 1).*
- *Variety, PGR and harvest date all influenced the level of brackling measured in the crop canopy at harvest. At both harvest dates RGT Planet benefited from the 'European' approach, whereas Pixel gave little response when harvested on time (Table 2).*
- *Other canopy measurements at harvest demonstrated that on average there was significantly higher lodging when harvest was delayed by 11 days. Head loss was also significantly more prevalent in the variety Pixel compared to RGT Planet (Table 2).*

Treatments:

4 PGR management approaches applied to two cultivars (RGT Planet and Pixel) and harvested at two harvest dates.

Harvest dates:

1. On Time harvested on the 4 January 2024.
2. Delayed harvested on the 15 January 2024.

Plant growth regulators (PGR) treatments:

1. Untreated.
2. GS31 PGR trinexapac ethyl based (Single Moddus Evo @ 200 mL/ha (50g ai/ha).
3. GS31 + GS37 PGR trinexapac ethyl based (Double Moddus Evo @ 200mL/ha (100g ai/ha).
4. European approach based on GS31 trinexapac ethyl (Moddus Evo @ 200 mL/ha) (50g ai/ha) and at GS37 of Ethephon 720 @500 mL/ha (360g ai/ha).

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

	RGT Planet	Pixel	Mean
Cultivar	8.16 a	7.15 b	7.66
LSD Cultivar P=0.05	0.31	P Value	<0.001
Harvest Date x Cultivar			
On time	8.57 -	7.68 -	8.13 a
Delayed (11 days delay)	7.76 -	6.62 -	7.19 b
LSD Harvest Date P=0.05	0.25	P Value	0.001
LSD Harvest Date x Cultivar P=0.05	ns	P Value	0.348
Canopy Management Regime X Cultivar			
Untreated	8.07 abc	6.75 d	7.41 -
GS31 PGR	8.51 a	6.76 d	7.64 -
GS31 + GS37 PGR	8.29 ab	7.44 cd	7.87 -
GS31 + GS37 PGR (European style)	7.78 bc	7.65 bc	7.71 -
LSD Canopy Management P=0.05	ns	P Value	0.323
LSD Cultivar X Canopy Mgmt P=0.05	0.70	P Value	0.015
Harvest Date X Canopy Mgmt. X Cultivar			
On Time			
Untreated	8.47 -	7.24 -	7.86 -
GS31 PGR	8.72 -	7.39 -	8.05 -
GS31 + GS37 PGR	8.91 -	7.96 -	8.43 -
GS31 + GS37 PGR (European style)	8.18 -	8.15 -	8.16 -
Delayed			
Untreated	7.67 -	6.26 -	6.97 -
GS31 PGR	8.31 -	6.14 -	7.22 -
GS31 + GS37 PGR	7.68 -	6.93 -	7.30 -
GS31 + GS37PGR (European style)	7.38 -	7.15 -	7.26 -
LSD Harvest Date X Canopy Mgmt P=0.05	ns	P Value	0.935
LSD Harvest Date X Canopy Mgmt X Cultivar P=0.05	ns	P Value	0.766

*Ethephon is not on label in SA with the excepting of the varieties Weeah, Maleba and Parwan. Ethephon is registered for use for anti-lodging purposes in Qld, NSW, Vic, Tas and WA.

Table 2. Canopy management and harvest date effect on head loss (heads/m²– heads on ground post-harvest), lodging index (0-500) and brackling (%) across two cultivars (RGT Planet and Pixel).

	Treatment	Head Loss (heads/m ²)		Lodging Index (0-500)		Brackling (%)	
		RGT Planet	Pixel	RGT Planet	Pixel	RGT Planet	Pixel
On Time	Untreated	6.7 -	9.2 -	50.0 -	65.0 -	77.5 abc	56.3 cd
	GS31	5.8 -	9.6 -	48.8 -	72.5 -	87.5 ab	55.0 cd
	GS31 + GS37	8.1 -	8.0 -	70.0 -	62.5 -	78.8 abc	58.8 cd
	European GS31	5.3 -	6.3 -	50.0 -	63.8 -	26.3 e	71.3 bc
	Cul. x man. Mean	6.4 b	8.3 a	54.7 c	65.9 c	67.5 -	60.3 -
Delayed	Untreated	4.3 -	7.5 -	250.0 -	133.3 -	75.0 abc	96.7 a
	GS31	3.3 -	12.6 -	275.0 -	233.3 -	77.5 abc	76.7 abc
	GS31 + GS37	7.0 -	7.5 -	250.0 -	133.3 -	87.5 ab	70.0 bc
	European GS31	2.4 -	9.9 -	175.0 -	166.7 -	40.0 de	61.7 cd
	Cul. x man. Mean	4.3 c	9.4 a	237.5 a	166.7 b	70.0 -	76.3 -
Cultivar Mean		5.3 b	8.8 a	146.1 -	116.3 -	68.8 -	68.3 -
Grand Mean		7.1		131.2		68.5	
LSD P=0.05		ns		ns		24.6	
P Value		0.443		0.409		0.042	

*Lodging index definition in '[Appendix. HYC Barley SA Crop Technology Centre](#)'.

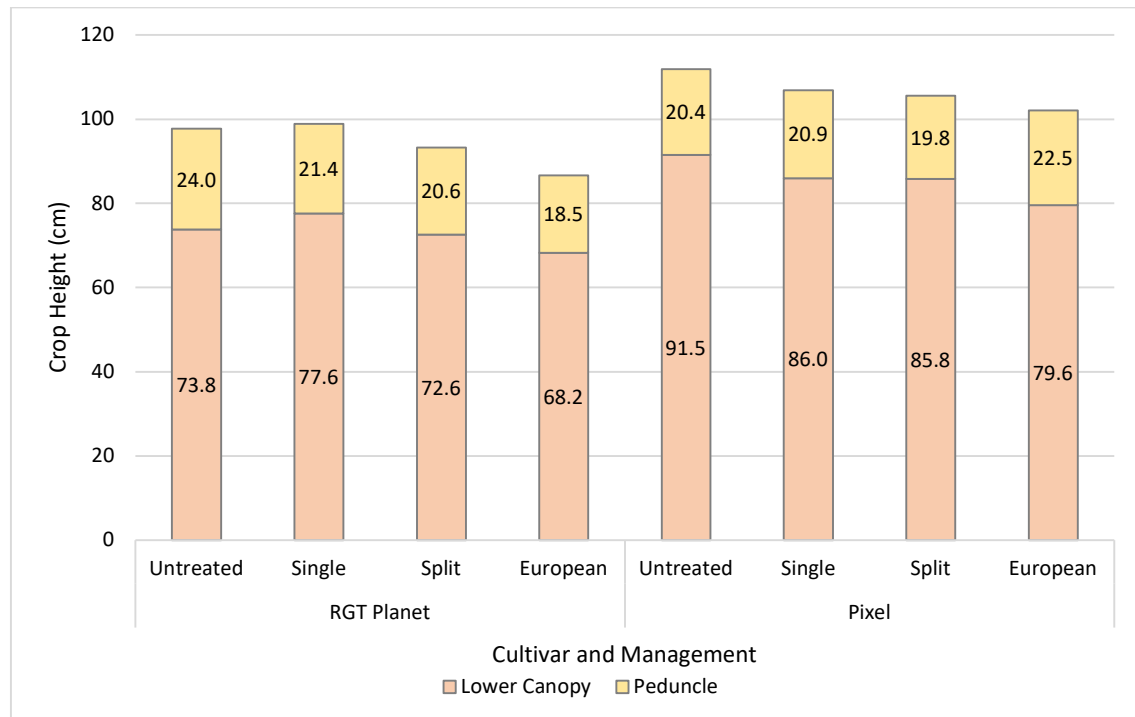


Figure 1. Relative differences in total crop height (combined peduncle and lower canopy), lower canopy length, and peduncle length (all differences are non-significant).

Table 3. Influence of PGR management strategy, cultivar and canopy management regime on grain protein (%).

	RGT Planet		Pixel	Mean
Cultivar	12.8	b	13.2	a
LSD Cultivar P=0.05	0.3		P Value	0.016
Canopy Management Regime X Cultivar				
Untreated	12.6	-	13.1	-
GS31 PGR	12.7	-	13.2	-
GS31 + GS37 PGR	12.5	-	13.1	-
GS31 + GS37 PGR (European style)	13.5	-	13.4	-
LSD Canopy Management P=0.05	0.4		P Value	0.018
LSD Cultivar x Canopy Mgmt P=0.05	ns		P Value	0.449
LSD Harvest Date P=0.05	ns		P Value	0.637
LSD Harvest Date x Cultivar P=0.05	ns		P Value	0.293
LSD Harvest Date. X Canopy Mgmt. P=0.05	ns		P Value	0.643
LSD Harvest Date. x Canopy Mgmt. x Cultivar P=0.05	ns		P Value	0.323

Table 4. Influence of PGR management strategy, cultivar and canopy management regime on grain test weight (kg/hL).

	RGT Planet		Pixel	Mean
Cultivar	61.5	b	62.3	a
LSD Cultivar P=0.05	0.2		P Value	<0.001
Canopy Management Regime X Cultivar				
Untreated	61.5	-	62.9	-
GS31 PGR	61.8	-	63.1	-
GS31 + GS37 PGR	61.4	-	61.9	-
GS31 + GS37 PGR (European style)	61.1	-	61.2	-
LSD Canopy Management P=0.05	0.7		P Value	0.005
LSD Cultivar X Canopy Mgmt P=0.05	ns		P Value	0.434
Harvest Date X Cultivar				
On time	63.0	-	63.7	-
Delayed (11 days delay)	60.0	-	60.9	-
LSD Harvest Date P=0.05	1.0		P Value	0.003
LSD Harvest Date X Cultivar P=0.05	ns		P Value	0.240
LSD Harvest Date X Canopy Mgmt. P=0.05	ns		P Value	0.878
LSD Harvest Date X Canopy Mgmt. X Cultivar P=0.05	ns		P Value	0.080

Table 5. Influence of PGR management strategy, cultivar and canopy management regime on grain retention (%).

	RGT Planet	Pixel	Mean
Cultivar	85.2 b	87.8 a	86.5
LSD Cultivar P=0.05	1.3	P Value	0.002
Canopy Management Regime X Cultivar			
Untreated	88.6 ab	88.8 a	88.7 a
GS31 PGR	85.9 b	88.5 ab	87.2 a
GS31 + GS37 PGR	86.2 ab	87.8 ab	87.0 a
GS31 + GS37 PGR (European style)	80.0 c	86.3 ab	83.1 b
LSD Canopy Management P=0.05	2.0	P Value	<0.001
LSD Cultivar X Canopy Mgmt P=0.05	2.8	P Value	0.026
LSD Harvest Date P=0.05	ns	P Value	0.539
LSD Harvest Date X Cultivar P=0.05	ns	P Value	0.667
LSD Harvest Date X Canopy Mgmt. P=0.05	ns	P Value	0.342
LSD Harvest Date X Canopy Mgmt. X Cultivar P=0.05	ns	P Value	0.569

Table 6. Influence of PGR management strategy, cultivar and canopy management regime on grain screening (%).

	RGT Planet	Pixel	Mean
Cultivar	5.3 a	3.1 b	4.2
LSD Cultivar P=0.05	0.5	P Value	<0.001
Canopy Management Regime X Cultivar			
Untreated	4.5 -	2.8 -	3.6 b
GS31 PGR	4.9 -	2.8 -	3.9 b
GS31 + GS37 PGR	5.8 -	3.3 -	4.6 a
GS31 + GS37 PGR (European style)	5.9 -	3.3 -	4.6 a
LSD Canopy Management P=0.05	0.7	P Value	0.009
LSD Cultivar X Canopy Mgmt P=0.05	ns	P Value	0.499
LSD Harvest Date P=0.05	ns	P Value	0.733
LSD Harvest Date X Cultivar P=0.05	ns	P Value	0.616
LSD Harvest Date X Canopy Mgmt. P=0.05	ns	P Value	0.999
LSD Harvest Date x Canopy Mgmt. X Cultivar P=0.05	ns	P Value	0.298

Table 7. Trial input and management details.

Sowing date:	10 May 2023	
Harvest date:	4 January / 15 January 2024	
Seed rate:	200 seeds/m ²	
Basal fertiliser:	10 May	100 kg/ha MAP
Nitrogen:	26 Jul	50kg N/ha
	19 Sep	100kg N/ha
Fungicide:	8 Aug	Prosaro 0.3 L/ha
	12 Sep	Aviator Xpro 0.5 L/ha

Table 8. Active ingredients and chemical loading (g/L) for products used.

Name	Active 1		Active 2		Type
Fungicide					
Aviator Xpro	Prothioconazole	150 g/L	Bixafen	75 g/L	EC
Prosaro	Prothioconazole	210 g/L	Tebuconazole	210 g/L	SC
PGR					
Ethephon 720	Ethephon*	720 g/L	---	---	SL
Moddus Evo	Trinexapac-ethyl	250 g/L	---	---	DC

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