

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

#### Key points:

- *On average, a delayed harvest led to higher head loss, a higher lodging index and lower yield (Table 1).*
- *There was a significant interaction in yield between variety and PGR management with a negative response to the addition of Ethephon in RGT Planet management, whereas treatments that were solely trinexapac ethyl (Moddus Evo) based gave no response over the untreated. In contrast, PGR management in Leabrook saw the split application of Moddus Evo yield significantly more than the other PGR treatments, however this still did not yield more than the untreated plots (Table 1).*
- *Although not translating to yield, the 'European' approach was the most successful at reducing lodging, with a significantly lower lodging index to the double Moddus Evo, single Moddus Evo and nil PGR treatments (Table 6).*
- *Grain quality differences were largely influenced by variety and harvest date, although on average the 'European' PGR approach did have a statistically negative effect on test weight (Table 3) and retentions (Table 4).*

#### Treatments:

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

#### Harvest dates:

1. On Time harvested on the 20 November 2023.
2. Delayed harvested on the 13 December 2023.

#### 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, variety and canopy management regime on grain yield (t/ha).

	<b>RGT Planet</b>	<b>Leabrook</b>	<b>Mean</b>
<b>Variety</b>	5.76 b	6.65 a	6.20
<b>LSD Variety P=0.05</b>	0.16	<b>P Value</b>	<0.001
<b>Harvest Date x variety</b>			
On time	5.94 -	6.89 -	6.42 a
Delayed (28 days delay)	5.57 -	6.41 -	5.99 b
<b>LSD Harvest Date P=0.05</b>	0.12	<b>P Value</b>	0.002
<b>LSD Harvest Date x Variety P=0.05</b>	ns	<b>P Value</b>	0.432
<b>Canopy Management Regime x Variety</b>			
Untreated	5.99 c	6.66 ab	6.32 ab
GS31 PGR	5.90 c	6.54 b	6.22 b
GS31 + GS37 PGR	6.09 c	6.87 a	6.48 a
GS31 + GS37 PGR (Europe style)	5.05 d	6.52 b	5.79 c
<b>LSD Canopy Management P=0.05</b>	0.18	<b>P Value</b>	<0.001
<b>LSD Variety x Canopy Mgmt P=0.05</b>	0.25	<b>P Value</b>	<0.001
<b>Harvest Date. x Canopy Mgmt. x Variety</b>			
<b>On Time</b>			
Untreated	6.13 -	6.91 -	6.52 -
GS31 PGR	6.15 -	6.88 -	6.51 -
GS31 + GS37 PGR	6.37 -	7.01 -	6.69 -
GS31 + GS37 PGR (Europe style)	5.13 -	6.75 -	5.94 -
<b>Delayed</b>			
Untreated	5.85 -	6.41 -	6.13 -
GS31 PGR	5.65 -	6.20 -	5.92 -
GS31 + GS37 PGR	5.81 -	6.72 -	6.27 -
GS31 + GS37PGR (Europe style)	4.98 -	6.29 -	5.63 -
<b>LSD Harvest Date x Canopy Mgmt P=0.05</b>	ns	<b>P Value</b>	0.452
<b>LSD Harvest Date x Canopy Mgmt x Var. P=0.05</b>	ns	<b>P Value</b>	0.388

**Table 2.** Influence of PGR management strategy, variety and canopy management regime on protein (%).

	<b>RGT Planet</b>	<b>Leabrook</b>	<b>Mean</b>
<b>Variety</b>	12.3 a	11.9 b	12.1
<b>LSD Variety P=0.05</b>	0.3	<b>P Value</b>	0.029
<b>Harvest Date x variety</b>			
On time	12.7 a	11.8 b	12.3 a
Delayed (28 days delay)	11.9 b	12.0 b	12.0 b
<b>LSD Harvest Date P=0.05</b>	0.1	<b>P Value</b>	0.002
<b>LSD Harvest Date x Variety P=0.05</b>	0.4	<b>P Value</b>	0.006
<b>Canopy Management Regime x Variety</b>			
Untreated	11.8 -	11.8 -	11.8 -
GS31 PGR	12.4 -	11.9 -	12.1 -
GS31 + GS37 PGR	12.3 -	11.9 -	12.1 -
GS31 + GS37 PGR (Europe style)	12.6 -	12.2 -	12.4 -
<b>LSD Canopy Management P=0.05</b>	ns	<b>P Value</b>	0.053
<b>LSD Variety x Canopy Mgmt P=0.05</b>	ns	<b>P Value</b>	0.437
<b>Harvest Date. x Canopy Mgmt. x Variety</b>			
<b>On Time</b>			
Untreated	12.2 -	11.8 -	12.0 -
GS31 PGR	13.0 -	11.6 -	12.3 -
GS31 + GS37 PGR	12.8 -	11.8 -	12.3 -
GS31 + GS37 PGR (Europe style)	12.8 -	12.2 -	12.5 -
<b>Delayed</b>			
Untreated	11.4 -	11.9 -	11.6 -
GS31 PGR	11.8 -	12.1 -	12.0 -
GS31 + GS37 PGR	11.9 -	12.0 -	12.0 -
GS31 + GS37PGR (Europe style)	12.5 -	12.2 -	12.3 -
<b>LSD Harvest Date x Canopy Mgmt P=0.05</b>	ns	<b>P Value</b>	0.955
<b>LSD Harvest Date x Canopy Mgmt x Var. P=0.05</b>	ns	<b>P Value</b>	0.423

**Table 3.** Influence of PGR management strategy, variety and canopy management regime on test weight (Kg/hL).

	<b>RGT Planet</b>	<b>Leabrook</b>	<b>Mean</b>
<b>Variety</b>	57.6 b	60.7 a	59.2
<b>LSD Variety P=0.05</b>	1.4	<b>P Value</b>	0.002
<b>Harvest Date x variety</b>			
On time	57.2 -	61.3 -	59.2 -
Delayed (28 days delay)	58.0 -	60.1 -	59.1 -
<b>LSD Harvest Date P=0.05</b>	ns	<b>P Value</b>	0.353
<b>LSD Harvest Date x Variety P=0.05</b>	ns	<b>P Value</b>	0.160
<b>Canopy Management Regime x Variety</b>			
Untreated	58.5 -	61.8 -	60.1 a
GS31 PGR	57.7 -	61.1 -	59.4 ab
GS31 + GS37 PGR	57.6 -	60.4 -	59.0 bc
GS31 + GS37 PGR (Europe style)	56.7 -	59.6 -	58.1 c
<b>LSD Canopy Management P=0.05</b>	1.0	<b>P Value</b>	0.002
<b>LSD Variety x Canopy Mgmt P=0.05</b>	ns	<b>P Value</b>	0.906
<b>Harvest Date. x Canopy Mgmt. x Variety</b>			
<b>On Time</b>			
Untreated	57.9 -	62.3 -	60.1 -
GS31 PGR	57.5 -	61.6 -	59.6 -
GS31 + GS37 PGR	57.1 -	60.8 -	58.9 -
GS31 + GS37 PGR (Europe style)	56.4 -	60.4 -	58.4 -
<b>Delayed</b>			
Untreated	59.0 -	61.3 -	60.1 -
GS31 PGR	58.0 -	60.6 -	59.3 -
GS31 + GS37 PGR	58.0 -	60.0 -	59.0 -
GS31 + GS37PGR (Europe style)	57.0 -	58.7 -	57.9 -
<b>LSD Harvest Date x Canopy Mgmt P=0.05</b>	ns	<b>P Value</b>	0.895
<b>LSD Harvest Date x Canopy Mgmt x Var. P=0.05</b>	ns	<b>P Value</b>	0.980

**Table 4.** Influence of PGR management strategy, variety and canopy management regime on retention (%).

	<b>RGT Planet</b>	<b>Leabrook</b>	<b>Mean</b>
<b>Variety</b>	75.9 b	94.7 a	85.3
<b>LSD Variety P=0.05</b>	4.2	<b>P Value</b>	<0.001
<b>Harvest Date x variety</b>			
On time	72.9 -	95.4 -	84.2 b
Delayed (28 days delay)	78.9 -	94.0 -	86.4 a
<b>LSD Harvest Date P=0.05</b>	1.0	<b>P Value</b>	0.007
<b>LSD Harvest Date x Variety P=0.05</b>	ns	<b>P Value</b>	0.073
<b>Canopy Management Regime x Variety</b>			
Untreated	77.8 -	94.7 -	86.3 a
GS31 PGR	76.3 -	95.1 -	85.7 a
GS31 + GS37 PGR	80.9 -	94.8 -	87.9 a
GS31 + GS37 PGR (Europe style)	68.6 -	94.1 -	81.3 b
<b>LSD Canopy Management P=0.05</b>	4.3	<b>P Value</b>	0.024
<b>LSD Variety x Canopy Mgmt P=0.05</b>	ns	<b>P Value</b>	0.063
<b>Harvest Date. x Canopy Mgmt. x Variety</b>			
<b>On Time</b>			
Untreated	73.2 -	95.8 -	84.5 -
GS31 PGR	73.7 -	95.3 -	84.5 -
GS31 + GS37 PGR	79.6 -	94.7 -	87.1 -
GS31 + GS37 PGR (Europe style)	65.4 -	96.0 -	80.7 -
<b>Delayed</b>			
Untreated	82.4 -	93.7 -	88.1 -
GS31 PGR	79.0 -	95.0 -	87.0 -
GS31 + GS37 PGR	82.2 -	95.0 -	88.6 -
GS31 + GS37PGR (Europe style)	71.9 -	92.2 -	82.0 -
<b>LSD Harvest Date x Canopy Mgmt P=0.05</b>	ns	<b>P Value</b>	0.942
<b>LSD Harvest Date x Canopy Mgmt x Var. P=0.05</b>	ns	<b>P Value</b>	0.697

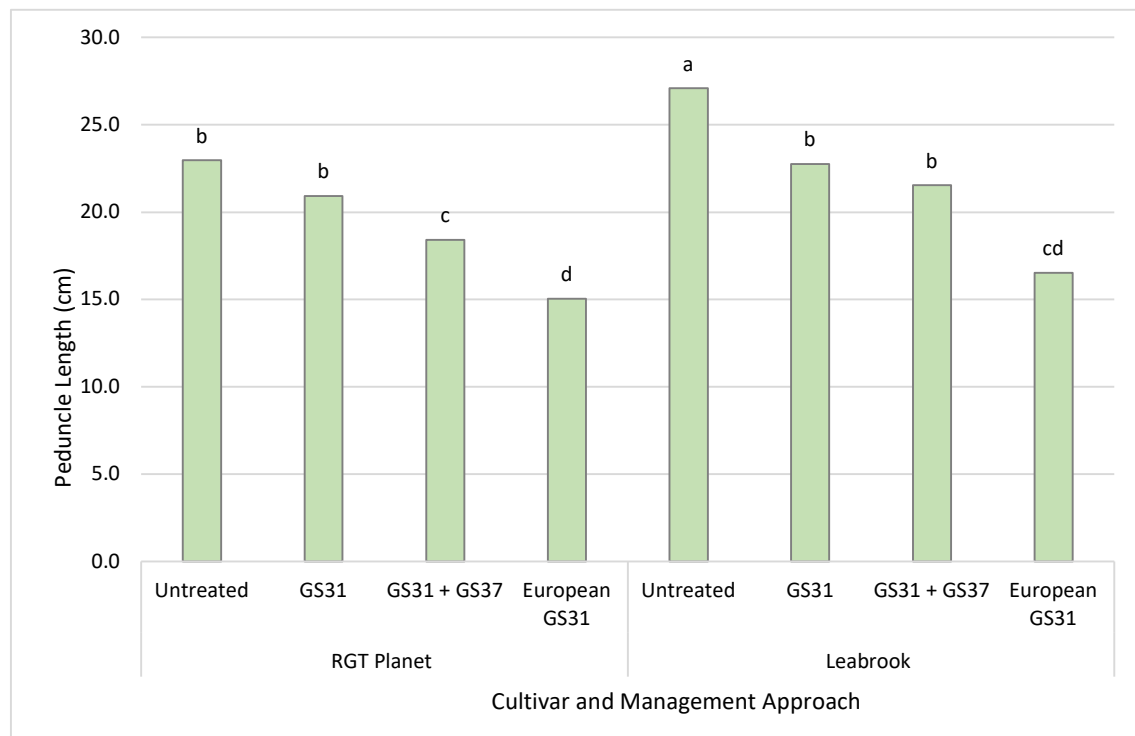
**Table 5.** Influence of PGR management strategy, variety and canopy management regime on screenings (%).

	<b>RGT Planet</b>	<b>Leabrook</b>	<b>Mean</b>
<b>Variety</b>	5.3 a	1.4 b	3.4
<b>LSD Variety P=0.05</b>	0.8	<b>P Value</b>	<0.001
<b>Harvest Date x variety</b>			
On time	6.1 a	1.4 c	3.7 a
Delayed (28 days delay)	4.5 b	1.4 c	2.9 b
<b>LSD Harvest Date P=0.05</b>	0.3	<b>P Value</b>	0.003
<b>LSD Harvest Date x Variety P=0.05</b>	1.1	<b>P Value</b>	0.050
<b>Canopy Management Regime x Variety</b>			
Untreated	5.1 -	1.4 -	3.2 -
GS31 PGR	5.1 -	1.4 -	3.2 -
GS31 + GS37 PGR	4.0 -	1.6 -	2.8 -
GS31 + GS37 PGR (Europe style)	6.9 -	1.4 -	4.1 -
<b>LSD Canopy Management P=0.05</b>	ns	<b>P Value</b>	0.128
<b>LSD Variety x Canopy Mgmt P=0.05</b>	ns	<b>P Value</b>	0.069
<b>Harvest Date. x Canopy Mgmt. x Variety</b>			
<b>On Time</b>			
Untreated	6.5 -	1.4 -	4.0 -
GS31 PGR	5.7 -	1.4 -	3.6 -
GS31 + GS37 PGR	4.5 -	1.5 -	3.0 -
GS31 + GS37 PGR (Europe style)	7.5 -	1.3 -	4.4 -
<b>Delayed</b>			
Untreated	3.6 -	1.4 -	2.5 -
GS31 PGR	4.5 -	1.3 -	2.9 -
GS31 + GS37 PGR	3.5 -	1.6 -	2.6 -
GS31 + GS37PGR (Europe style)	6.2 -	1.4 -	3.8 -
<b>LSD Harvest Date x Canopy Mgmt P=0.05</b>	ns	<b>P Value</b>	0.770
<b>LSD Harvest Date x Canopy Mgmt x Var. P=0.05</b>	ns	<b>P Value</b>	0.820

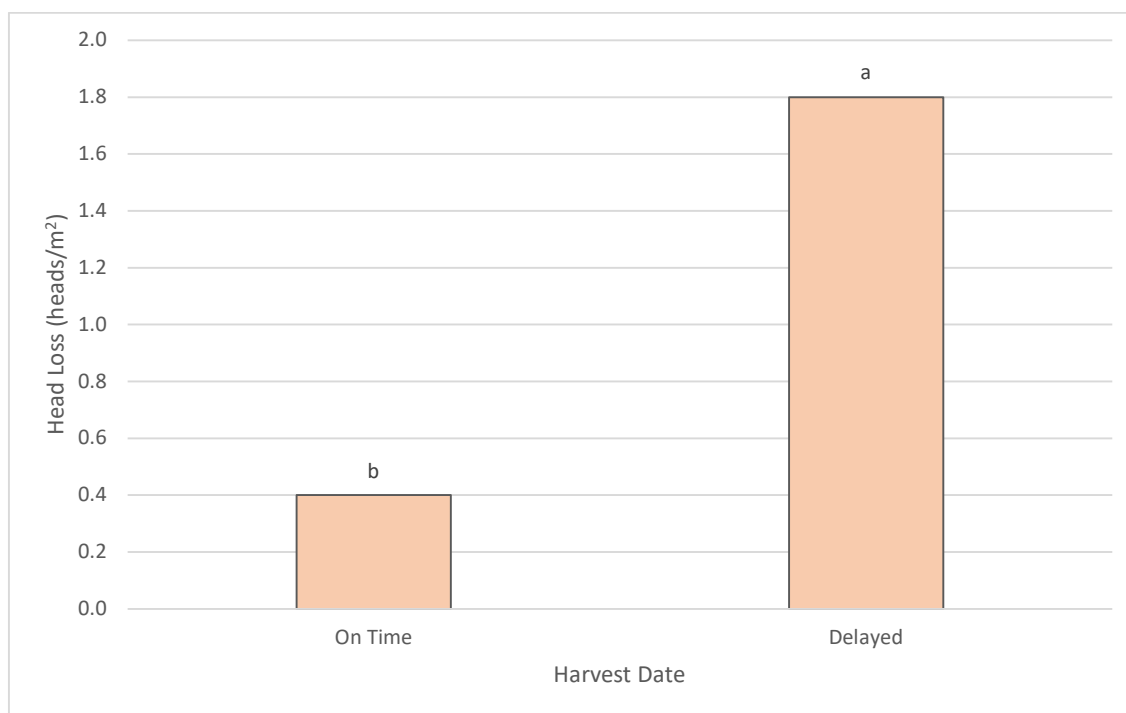
**Table 6.** Canopy management and harvest date effect on lodging index (0-500) and brackling (%) across two varieties (RGT Planet and Leabrook).

Treatment	Lodging Index (0-500)		Brackling %	
	RGT Planet	Leabrook	RGT Planet	Leabrook
Untreated	22.5 -	105.0 -	0.0 -	0.0 -
GS31	21.3 -	60.0 -	0.0 -	0.0 -
GS31 + GS37	5.0 -	32.5 -	0.0 -	0.0 -
European GS31	0.0 -	0.0 -	0.0 -	0.0 -
<b>Cul. x man. Mean</b>	<b>12.2 d</b>	<b>49.4 c</b>	<b>0.0 -</b>	<b>0.0 -</b>
Untreated	125.0 -	275.0 -	15.0 -	15.0 -
GS31	160.0 -	250.0 -	7.5 -	4.3 -
GS31 + GS37	130.0 -	225.0 -	1.3 -	0.0 -
European GS31	70.0 -	175.0 -	0.0 -	0.0 -
<b>Cul. x man. Mean</b>	<b>121.3 b</b>	<b>231.3 a</b>	<b>5.9 -</b>	<b>4.8 -</b>
<b>Cultivar Mean</b>	<b>66.7 b</b>	<b>140.3 a</b>	<b>3.0 -</b>	<b>2.4 -</b>
<b>Grand Mean</b>	<b>103.5</b>		<b>2.7</b>	
<b>LSD P=0.05</b>	ns		ns	
<b>P Value</b>	0.054		0.989	

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



**Figure 1.** Canopy management and harvest date effect on peduncle length across two varieties (RGT Planet and Leabrook). (P Value = <0.001, LSD = 2.5).



**Figure 2.** Harvest date effect on head loss (heads/m<sup>2</sup>– heads on ground post-harvest) across two varieties. All differences are non-significant. (P Value = <0.001, LSD = 0.7).

**Table 7.** Trial input and management details.

<b>Sowing date:</b>	<b>29 April 2023</b>		
<b>Harvest date:</b>	<b>20 November 2023 / 13 December 2023</b>		
<b>Seed rate:</b>	200 seeds/m <sup>2</sup>		
<b>Basal fertiliser:</b>	29 Apr	139 kg/ha MAP and MOP	
<b>Fungicide:</b>	24 Jul	Prosaro 300 mL/ha	
	GS39	Aviator Xpro 500 mL/ha	
	31 Aug	Radial 840 mL/ha	
<b>PGR:</b>		<b>Untreated</b>	<b>Single PGR</b>
	GS31	---	Moddus Evo 0.2 L/ha
	GS37	---	---
		<b>Split PGR</b>	<b>European approach</b>
	GS31	Moddus Evo 0.2 L/ha	Moddus 0.2 L/ha
	GS37	Moddus Evo 0.2 L/ha	Ethephon 720 0.50 L/ha

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

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