HARVEST RESULTS:

Winter Barley Canopy Management Trial

2019/20 SA Crop Technology Centre Yield Results *(Provisional)*

Sown: 17 April 2019
Harvested: 17 December 2019
Rotation position: 1st Cereal after Broad bean
Soil Type: Neutral-slightly alkaline Organosol (Peat soil) – high organic matter (0-30cm)

Key Messages:

- *There was a significant interaction between cultivar and canopy management approach.*
- *Left untreated with PGRs or grazing (mechanical defoliation) there was no significant difference in the yield performance of spring and winter germplasm (RGT Planet, Cassiopee and Salmandre), however if split PGR applications were applied to the same cultivars winter germplasm out yielded spring.*
- *The yield of the spring control RGT Planet benefited from grazing the crop canopy, in contrast to the yields of the winter cultivars Cassiopee and Salamandre that did not.*
- *These results reflect the differences in season length between winter and spring barleys and the susceptibility of the cultivars to lodging.*
- *An April 17 sowing date was too early for the shorter season spring barley. Grazing delayed development and reduced disease pressure and frost risk.*
- *In contrast, for both longer season winter cultivars (Cassiopee an Salamandre) grazing whilst controlling lodging served to delay development even later in the spring, resulting in negative yield effects from grazing.*
- *Positive PGR effects had much less effect on crop development than grazing but still controlled the lodging risk, hence increasing resultant yields.*
- *Awn emergence was delayed in RGT Planet, Salamandre and Cassiopee following the application of PGRs, but the delays in development were not as great as those observed when canopies from mechanically defoliated (simulated grazing).*
- *There was no statistical difference in yield between one and two applications of PGRs but a non-significant trend suggesting splitting was higher yielding in all three cultivars.*
- *Winter barley defoliation caused significant decreases in yield and thousand seed weight compared to grazing RGT Planet.*

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

	Canopy Management (Grain Yield t/ha)			
	Untreated	**One PGR**	**Split PGR**	**Grazed**
Cultivar	**t/ha**	**t/ha**	**t/ha**	**t/ha**
RGT Planet (control)	6.31 def	6.30 def	6.56 cd	6.36 def
Cassiopee	6.49 c-f	7.13 ab	7.25 a	6.15 efg
Salamandre	6.09 fg	6.55 cde	6.80 bc	5.84 g
LSD Cultivar p = 0.05		0.20 t/ha	**P val**	<0.001
LSD Management p=0.05		0.46 t/ha	**P val**	0.019
LSD Cultivar x Management P=0.05		0.40 t/ha	**P val**	0.014

Please read the notes accompanying these harvest results for interpretation

Yield figures followed by the same letter are not considered to be statistically different (p=0.05), for example a yield of 6.76 cd is considered statistically different to 7.65b but not to a yield of 7.08c.

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).

Table 2. Influence of cultivar on grain protein (%) under different canopy management regimes

	Canopy Management (Grain Protein %)			
	Untreated	**One PGR**	**Split PGR**	**Grazed**
Cultivar	**%**	**%**	**%**	**%**
RGT Planet (control)	11.5 e	11.5 e	11.5 e	11.2 e
Cassiopee	13.9 a	13.5 ab	13.4 b	12.3 d
Salamandre	13.3 bc	13.2 bc	12.9 c	11.3 e
LSD Cultivar p = 0.05		0.21 %	**P val**	<0.001
LSD Management p=0.05		0.44 %	**P val**	<0.001
LSD Cultivar x Management P=0.05		0.43 %	**P val**	<0.001

Table 3. Influence of cultivar on thousand seed weight (gram) under different canopy management regimes

	Canopy Management (TSW grams)			
	Untreated	**One PGR**	**Split PGR**	**Grazed**
Cultivar	**gram**	**gram**	**gram**	**gram**
RGT Planet (control)	42.2 d	39.6 e	40.6 de	40.7 de
Cassiopee	48.3 b	47.1 b	48.0 b	44.3 c
Salamandre	54.4 a	53.1 a	54.1 a	48.8 b
LSD Cultivar p = 0.05		2.61g	**P val**	0.048
LSD Management p=0.05		0.99g	**P val**	<0.001
LSD Cultivar x Management P=0.05		1.97g	**P val**	0.009

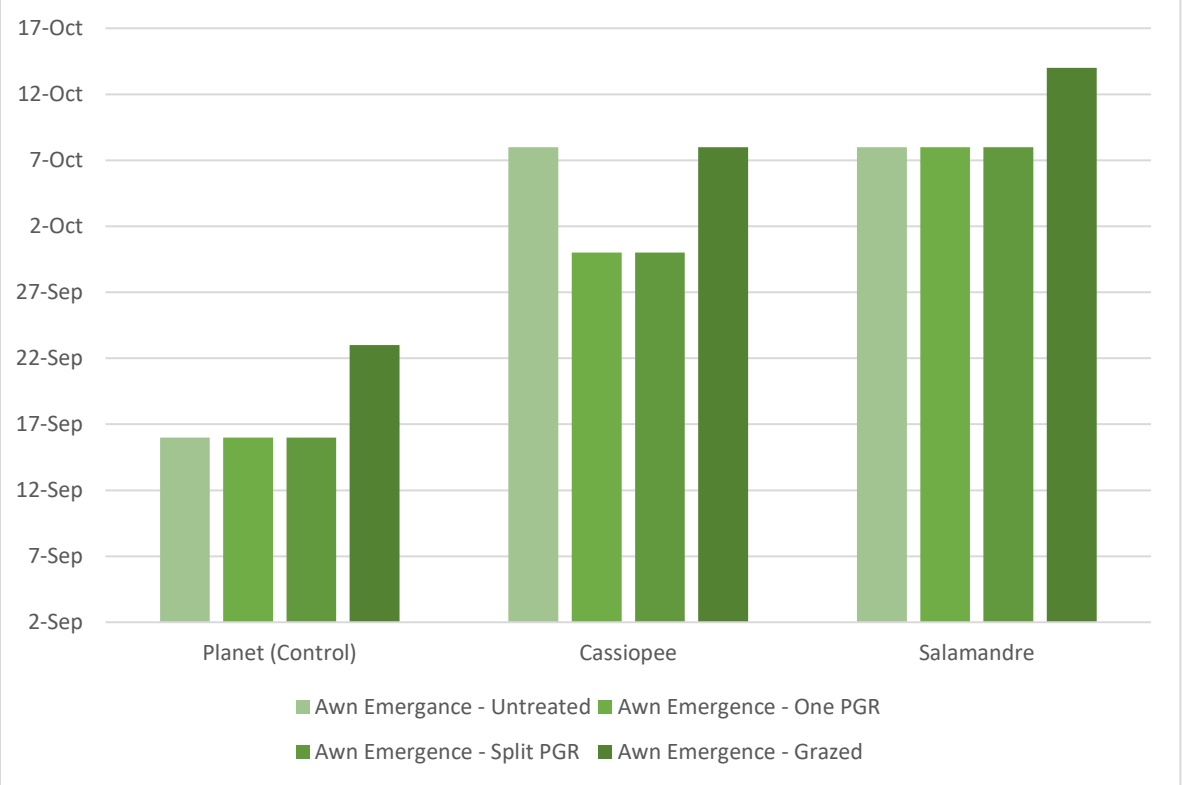

Figure 2. Influence of cultivar and canopy management regime on date of awn emergence (GS49).

Table 4. Details of the four management levels (kg, g, ml/ha).

Plant pop'n: 180 seeds/m^2 (150 plants/m2 target)

		Nil	**One PGR**	**Split PGR**	**Grazed**
Grazed:		----	----	----	✓
Seed treatment:		Rancona Dimension/ Gaucho	Rancona Dimension/ Gaucho	Rancona Dimension/ Gaucho	Rancona Dimension/ Gaucho
Basal Fertiliser:	17 April	145kg MAP	145kg MAP	145kg MAP	145kg MAP
Nitrogen:	6 August	87 kg Urea (40 N)	87 kg Urea (40 N)	87 kg Urea (40 N)	87 kg Urea (40 N)
	30 August	87 kg Urea (40 N)	87 kg Urea (40 N)	87 kg Urea (40 N)	87 kg Urea (40 N)
PGR:	GS30 (24-Jun – 5 Aug)	----	Mod. 400ml*	Mod. 200ml*	----
	GS33 (25-Jul – 17-Sep)	----	----	Mod. 200ml*	----
Fungicide:**	GS31-32	Prosaro 300ml	Prosaro 300ml	Prosaro 300ml	Prosaro 300ml

	GS49	Aviator Xpro 400ml	Aviator Xpro 400ml	Aviator Xpro 400ml	Aviator Xpro 400ml

All other inputs of insecticides and herbicides were standard across the trial. Mod. - Moddus
**Timings of PGRs and fungicides were adjusted to take account of the differences in spring and winter barley phenology (development).*
Available Soil Nitrogen (10th April) – 445.1 kg N/ha (0 – 60cm) prior to sowing

Meteorological Data- SA Crop Technology Centre

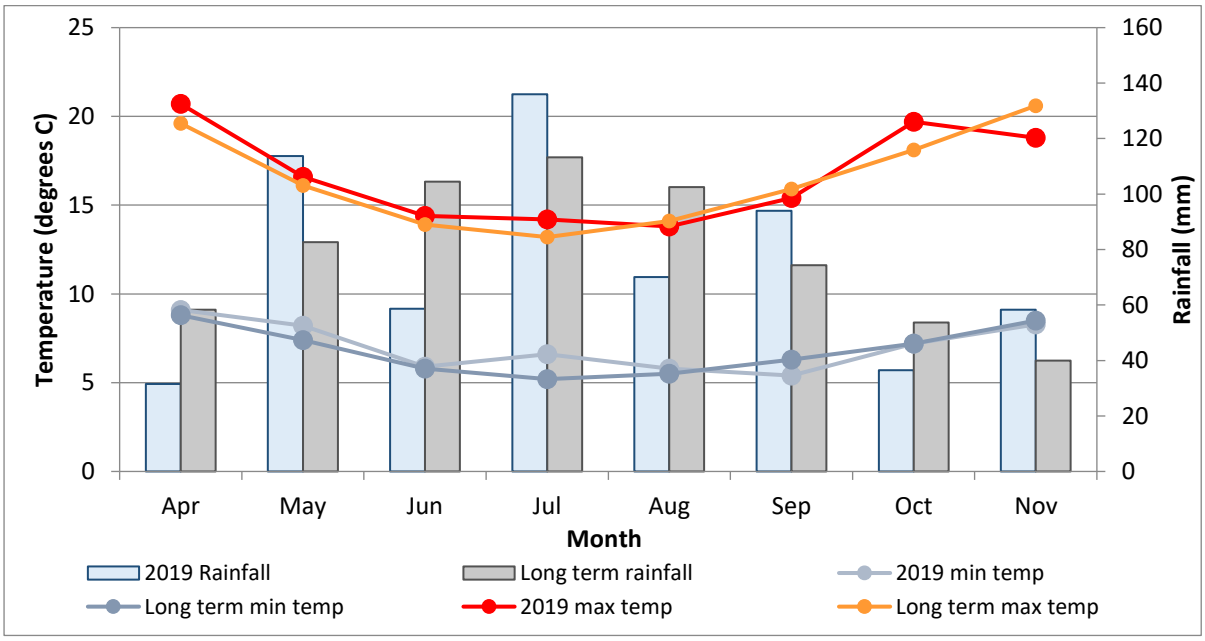

Figure 1. 2019 growing season rainfall and long term rainfall (1877-2019) (recorded at Millicent), 2019 min and max temperatures and long term min and max temperatures recorded at Mount Gambier (1941-2019) for the growing season (April-November). *Rainfall April to November= 598.8mm.*

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