

# AgGrow

AGRONOMY + RESEARCH



## 2019 AG GROW AGRONOMY WHEAT VARIETY EVALUATION

Barellan & Goolgowi

INDEPENDENT AGRONOMY ADVICE + CUTTING EDGE RESEARCH

# Local Wheat Variety Trials

## KEY POINTS

- Growing conditions in 2019 were characterised by a strong break in April, but with significantly below average rainfall in all other months.
- The dry growing season did not favour the longer season winter wheats, such as Accroc and Bennett. Despite having the highest NDVI, due to its growth habit, Accroc was the lowest yielding variety at both sites.
- The standout varieties in the trials were Lancer and Beckom, with Lancer the highest yielding variety at Barellan and one of the highest yielding varieties at Goolgowi. The newly released variety Vixen also performed well at Barellan.

## BACKGROUND

Over the past 6 years, in conjunction with Hart Bros Seeds, Ag Grow Agronomy has been conducting wheat and barley variety trials to see how new and existing varieties are performing in our own environment. These trials have complimented the NVT work that is being carried out locally.

To further build on our knowledge base about how the main wheat varieties are performing in our area, and to further compliment the work that is already being done, 2 additional trials were carried out in 2019 using selected varieties grown or likely to be grown in the area in the future.

## TRIAL DETAILS

Two wheat variety evaluation trials were established by Ag Grow Agronomy and Research in 2019.

These trials were set up to evaluate the performance of the main wheat varieties grown across the client base.

**Barellan site:** The Barellan trial was established at “Phil Bouchier’s “Yarrandale” property. The trial was sown following a chemical fallow, and was sown on 5<sup>th</sup> April 2019 at 25 kg/ha and with 80 kg/ha MAP. The trial was topdressed with 60 kg/ha in July. It was harvested on 19<sup>th</sup> November, 2019.

**Goolgowi site:** The Goolgowi trial was sown at Chris Condon’s “Gillabri” property. The trial was sown following a fallow, and was sown on 2<sup>nd</sup> April 2019 at 25 kg/ha and with 80 kg/ha MAP. The trial was topdressed with 80 kg/ha in July. It was harvested on 18<sup>th</sup> November, 2019.

Each trial consisted of 12 varieties of wheat, as shown in table 1, and was replicated 4 times.

The trials were sown with a Morris Contour Drill plot seeder with 25cm row spacings. Plot sizes were 1.75m x 11m (19.25m<sup>2</sup>), with appropriate pest, disease and weed control undertaken on each trial throughout the season.

Table 1: 2019 Wheat variety trial list

Treatment No	VARIETY
1	Accroc
2	Longsword
3	Kittyhawke
4	Bennett
5	Pascal
6	Illabo
7	Wedgetail
8	Scepter
9	Mustang
10	Vixen*
11	Lancer
12	Beckom

\*note: Coolah was used at Goolgowi instead of Vixen as the seed did not arrive in time for sowing

### 2019 Seasonal Conditions:

The 2019 season was characterised by a continuation of the 2018 drought, with the greatest climatic effect upon the region being that of drought.

Good rain in April and May provided a strong start to the cropping season, however below average rainfall was recorded for all other months, table 2

Table 2: 2019 Rainfall and growing season rainfall at the 2 sites

MONTH	"Yarrandale" Rainfall (mm)	"Gillabri" Rainfall (mm)
January	33	5
February	10	5
March	15.5	0
<b>April</b>	<b>13</b>	<b>45</b>
<b>May</b>	<b>74.5</b>	<b>28</b>
<b>June</b>	<b>28</b>	<b>10</b>
<b>July</b>	<b>11</b>	<b>19</b>
<b>August</b>	<b>0</b>	<b>8</b>
<b>September</b>	<b>6</b>	<b>0</b>
<b>October</b>	<b>6</b>	<b>0</b>
November	49	42
<b>YTD Total</b>	<b>246</b>	<b>162</b>
<b>GSR</b>	<b>138.5</b>	<b>110</b>

## RESULTS AND DISCUSSION

Establishment, crop vigour, NDVI, grain yield and quality were all assessed on each trial, with NDVI, grain yield and quality statistically analysed.

### Establishment:

Establishment and vigour were assessed mid-May at each site, when the trials were early tillering, figure 1.

Establishment was scored from 0 to 9, with 0 being very poorly established and uneven and 9 being very evenly established. Crop vigour was also scored from 0 to 9, with 9 being the most vigorous. This score was an assessment of ground cover and included any visual crop effects such as colour and plant health.

Figure 1: Establishment at Barellan (top) & Goolgowi (bottom)



**Barellan:** At Barellan establishment scores averaged 6.9, ranging from 6.5 for Lancer to 7.1 for the varieties Accroc, Illabo, Kittyhawk and Pascal. For vigour the average score was 7.1, ranging from 6.6 for Beckom, Illabo and Wedgetail to 7.8 for Vixen.

**Goolgowi:** At Goolgowi establishment scores averaged 7.5, ranging from 6.0 for Wedgetail to 8.0 for Bennett. Vigour was similar to establishment averaging 7.4 and ranging from 6.9 for Lancer to 7.9 for Scepter.

### NDVI:

Crop biomass was measured around flowering (mid/late September), using a handheld NDVI at each site. There were significant differences in NDVI between varieties at both Barellan and Goolgowi, table 3.

The effects of the frosts and drought conditions were evident on plant growth, and had an impact on the results, figure 2.

**Table 3: NDVI flowering - Barellan Lsd (p=0.05) 0.033 and Goolgowi Lsd (p=0.05) 0.052)**

VARIETY	BARELLAN	GOOLGOWI
Accroc	0.66	0.36
Beckom	0.45	0.26
Bennett	0.64	0.34
Coolah	-	0.27
Illabo	0.50	0.30
Kittyhawk	0.59	0.32
Lancer	0.59	0.31
Longsword	0.53	0.30
Mustang	0.45	0.27
Pascal	0.50	0.28
Scepter	0.47	0.24
Vixen	0.41	-
Wedgetail	0.57	0.29
<b>mean</b>	<b>0.53</b>	<b>0.29</b>
<b>Lsd (p=0.05)</b>	<b>0.033</b>	<b>0.052</b>

**Barellan:** The average NDVI for the Barellan site was 0.53, with Vixen having the lowest NDVI of 0.41, significantly lower than all other varieties and Accroc having the highest NDVI of 0.66, significantly higher than all other varieties except Bennett (0.64).

**Goolgowi:** At Goolgowi Accroc also had the highest NDVI (0.36), figure 3, significantly higher than all other varieties except for the varieties Bennett (0.34), Kittyhawk (0.32) and Lancer (0.31).

Scepter (0.24) had the lowest NDVI at Goolgowi, significantly lower than all other varieties except Beckom (0.26), Coolah (0.27) and Mustang (0.27). The average NDVI at Goolgowi was 0.29.

**Figure 2: The effect of the dry conditions at Goolgowi on plant growth, September 2019.**



**Figure 3: Ground cover of Accroc (right) v Kittyhawk (left) at Goolgowi, June 2019.**



## Grain Yield & Quality:

The drought conditions experienced throughout 2019, had an impact on the grain yield and quality results of the trials, with most months experiencing lower than average rainfall, with the exception of April and May.

### Grain yield:

The Barellan trial was harvested on 19<sup>th</sup> November, 2019 and the Goolgowi trial was harvested on 18<sup>th</sup> November, 2019.

**Barellan:** The average yield of the Barellan trial was 2066 kg/ha, figure 4.

Lancer was the highest yielding variety in the trial yielding 2697 kg/ha, which was statistically similar to Beckom (2197 kg/ha), Bennett (2103 kg/ha), Illabo (2133 kg/ha), Longsword (2532 kg/ha), Pascal (2125 kg/ha) and Vixen (2522 kg/ha), but significantly higher than the other varieties in the trial.

Accroc was the lowest yielding variety in the trial, yielding 1070 kg/ha, significantly lower than all other varieties in the trial.

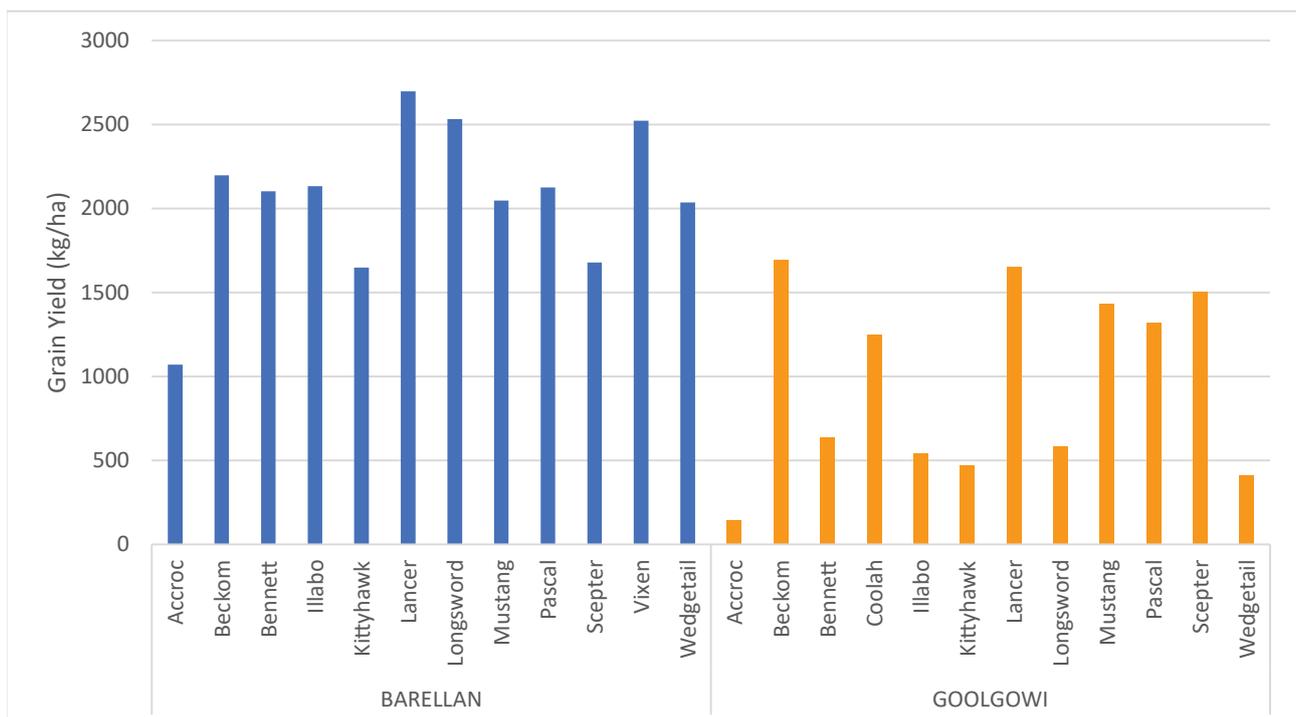
**Goolgowi:** At Goolgowi the average yield of the trial in 2019 was 970 kg/ha.

The highest yielding variety in the trial was Beckom (1695 kg/ha), which was significantly higher than all other varieties except Lancer (1652 kg/ha), Mustang (1432 kg/ha) and Scepter (1505 kg/ha).

Accroc was also the lowest yielding variety at Goolgowi, yielding 146 kg/ha, which was significantly lower than all other varieties in the trial except Wedgetail (413 kg/ha).



Figure 4: Grain yield (kg/ha) for Barellan LSD (p=0.05) = 548 kg/ha and Goolgowi LSD (p=0.05) = 350.9 kg/ha



### Grain Quality:

Protein, screenings and test weight were all measured and analysed on each trial, table 4.

**Barellan:** Grain protein in the trial averaged 13.8%. Wedgetail had the highest grain protein with 15.3%, which was significantly higher than all other varieties in the trial except Accroc (15%). Vixen had the lowest grain protein in the trial with 13.1%, significantly lower than Accroc (15%), Illabo (14.2%), Kittyhawk (14.3%) and wedgetail (15.3%).

Screenings in the trial averaged 6.2%. Accroc had the highest screenings with 9.1%, significantly higher than all others except Bennett (8.3%), Scepter (7.4%) and Vixen (8.0%). Beckom had the lowest screenings with 4.4%, with Illabo (4.9%) and Wedgetail (4.5%) the only other varieties to have screening below 5%.

The average test weight of the trial was 80.03 kg/HL. The lowest test weight was 74.57 kg/HL for Accroc, which was significantly lower than all other varieties in the trial. Kittyhawk had the highest test weight with 84.01 kg/HL, significantly higher than all other varieties in the trial.

**Goolgowi:** The average grain protein at Goolgowi was 14.11%. Longsword had the highest protein in the trial with 17.6%, significantly lower than all other varieties in the trial, and Coolah had the lowest grain protein in the trial with 11.9%, which was statistically similar to Beckom (12.7%), Lancer (13.0%), Scepter (12.4%) and Mustang (13.1%).

Screenings were high in this trial with the average screenings for the trial 13.0%. Pascal had the highest screenings in the trial with 19.4%, which was significantly higher than Beckom (8.5%), Illabo (8.3%) and Lancer (8.2%). Lancer had the lowest screenings in the trial with 8.2%, which was significantly lower than the varieties Longsword (19.2%) and Pascal (19.4%) which had the highest screenings.

Test weights ranged from 73.09 kg/HL for Longsword, which was statistically similar to Accroc (75.56 kg/HL), Illabo (74.39 kg/HL) and Wedgetail (73.94 kg/HL), up to 79.84 kg/HL for Bennett, which was statistically similar to Coolah (77.36 kg/HL), Kittyhawk (77.22 kg/HL), Lancer 77.49 kg/HL and Mustang (78.19 kg/HL). The average test weight of the trial was 76.18 kg/HL.

Table 4: Barellan and Goolgowi quality data 2019 - Protein, Screenings and Test Weight

VARIETY	BARELLAN			GOOLGOWI		
	Grain Protein %	Screenings %	Test Weight kg/HL	Grain Protein %	Screenings %	Test Weight kg/HL
Accroc	15.0	9.1	74.57	14.7	15.8	75.56
Beckom	13.2	4.4	80.30	12.7	8.5	76.65
Bennett	13.7	8.3	78.21	13.2	15.8	79.84
Coolah	-	-	-	11.9	10.2	77.36
Illabo	14.2	4.9	79.93	16.0	8.3	74.39
Kittyhawk	14.3	5.0	84.01	16.1	11.5	77.22
Lancer	13.3	5.4	80.99	13.0	8.2	77.49
Longsword	13.4	5.4	81.29	17.6	19.2	73.09
Mustang	13.3	5.0	81.61	13.1	10.5	78.19
Pascal	13.4	6.7	79.27	12.8	19.4	73.81
Scepter	13.9	7.4	80.78	12.4	12.6	76.68
Vixen	13.1	8.0	79.95	-	-	-
Wedgetail	15.3	4.5	79.51	15.3	16.2	73.94
<b>mean</b>	<b>13.8</b>	<b>6.2</b>	<b>80.03</b>	<b>14.1</b>	<b>13.0</b>	<b>76.18</b>
<b>Lsd (p=0.05)</b>	<b>0.94</b>	<b>1.81</b>	<b>1.245</b>	<b>1.26</b>	<b>10.88</b>	<b>2.703</b>



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### Further contacts

Barry Haskins

Ag Grow Agronomist

[barry@aggrowagronomy.com.au](mailto:barry@aggrowagronomy.com.au)

Rachael Whitworth

Ag Grow Research Manager

[rachael@aggrowagronomy.com.au](mailto:rachael@aggrowagronomy.com.au)