

Comparison of barley varieties

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Key Findings

- Barley yields for all varieties trialed at Hart in 2020 ranged from 2.84 – 3.56 t/ha.
- Fathom, RGT Planet, Leabrook and Laperouse were the highest yielding varieties.
- All malt varieties met Malt 1 receival standards for protein (%), test weight (kg/hL), screenings (%) and retention (%).
- All feed varieties trialed met the requirements for BAR1 (F1) receival standard this season.

Why do the trial?

To compare the performance of new barley varieties against the current industry standards.

How was it done?

Plot size	1.75 m x 10.0 m	Fertiliser	Seeding: DAP (18:20) Zn 1% + Impact @ 80 kg/ha
Seeding date	May 6, 2020		
Harvest date	November 9, 2020		June 18: Easy N (42.5:0) @ 80 L/ha
Location	Hart, SA		August 5: Easy N (42.5:0) @ 50 L/ha

The trial was a randomised complete block design with three replicates of 12 barley varieties. The trial was managed with the application of pesticides to ensure a weed, insect and disease-free canopy. Plot edge rows were removed at harvest and only the four remaining rows were harvested and used to calculate grain yield. All plots were assessed for grain yield, protein, test weight (kg/hL), screening (with a 2.2 mm screen) and retention (with a 2.5 mm screen).

Compass was re-sown by hand on May 21 due to low seedling emergence from a poor-quality seed source. Yield and quality data was not analysed for this variety.

Results and discussion

Grain yield

RGT Planet was the highest yielding malt variety at 3.53 t/ha. All other malt varieties yielded similarly with the exception of Spartacus CL, Scope CL and Commander which were lower yielding this season (Table 1). Historic yield data from Hart shows Compass, La Trobe and RGT Planet have performed similar or better than the trial average over a number of years (Table 2). The long-term data also shows Spartacus CL has generally out yielded Scope CL over the past five years.

For the varieties currently pending malt accreditation, Leabrook, Laperouse and Beast were all high yielding at 3.40, 3.34 and 3.15 t/ha respectively. Long-term data for these varieties is not available. Maximus CL was lower yielding at 3.03 t/ha (Table 1). This is the second season of evaluating Maximus CL at Hart and in both years it has yielded similar to Spartacus CL.

Fathom was the highest yielding feed variety trialed at 3.56 t/ha. Rosalind yielded close to the trial average at 3.19 t/ha (Table 1). Historic data shows that both varieties yield well at Hart across a range of different seasons (Table 2).

Grain quality

The protein content for all malting varieties was within Malt 1 receival standard range of 9-12%, with protein contents ranging from 9.9% to 11.7%. Spartacus CL, Commander and Scope CL had the highest protein contents (Table 1). Feed varieties Rosalind and Fathom had protein contents of 10.3 and 9.8% respectively. All varieties pending malt accreditation also contained protein levels within the Malt 1 receival standard (Table 1).

Test weights across the trial ranged from 65.2 kg/hL to 69.3 kg/hL. All malting varieties had acceptable test weights for Malt 1 standards. Commander had the highest test weight of malting varieties at 68.2 kg/hL. Feed varieties Rosalind and Fathom were above test weight requirements for BAR1 (F1) receival (Table 1). All varieties pending malt accreditation also had test weights higher than 65 kg/hL (minimum required for maximum grade).

Screening levels were low this season. All varieties (malt and feed) contained screening levels less than 5.0% which met Malt 1 (<7%) and BAR1 (F1) (<15%) receival standards.

Retention in all malting varieties were greater than the minimum of 70% for Malt 1 receival (Table 1). Similarly, varieties pending malt accreditation had retention values greater than 70%.



Table 1. Barley grain yield and quality results from Hart in 2020. Values shaded blue in the same column show the highest performing varieties.

Quality	Variety	Grain yield t/ha	% of site average	Protein %	% of site average	Test weight kg/hL	% of site average	Screenings %	% of site average	Retention %	% of site average
Feed	Fathom ^(b)	3.56 ^e	112	9.8 ^a	92	66.4 ^{abcd}	99	2.9 ^{abc}	88	85.7 ^{de}	103
	Rosalind ^(b)	3.19 ^{bcd}	100	10.3 ^{abc}	96	67.7 ^{de}	101	3.7 ^{bcd}	115	81.2 ^{bc}	97
BAR1 (F1) Receival Standards											
Malt	Commander ^(b)	3.01 ^{abc}	95	11.1 ^{cd}	104	68.2 ^{ef}	102	3.2 ^{abcd}	97	83.8 ^{cd}	100
	LaTrobe ^(b)	2.99 ^{ab}	94	10.7 ^c	100	66.9 ^{bcd}	100	5.0 ^e	154	77.6 ^{ab}	93
	RGT Planet ^(b)	3.53 ^e	111	9.9 ^{ab}	93	65.9 ^{ab}	98	4.1 ^{cde}	125	79.0 ^b	95
	Scope CL ^(b)	2.97 ^{ab}	93	11.0 ^{cd}	103	66.2 ^{abc}	99	4.4 ^{de}	134	73.4 ^a	88
	Spartacus CL ^(b)	2.84 ^a	89	11.7 ^d	109	67.1 ^{bcd}	100	4.1 ^{cde}	125	78.4 ^b	94
	Malt 1 Receival Standards			9-12%		>65		<7%		>70%	
Pending malt accreditation	Beast ^(b)	3.15 ^{bcd}	99	11.1 ^{cd}	104	67.4 ^{cde}	100	2.0 ^a	63	87.5 ^{de}	105
	Laperouse ^(b)	3.34 ^{cde}	105	10.8 ^c	101	68.2 ^{ef}	102	2.1 ^a	64	88.1 ^{de}	106
	Leabrook ^(b)	3.40 ^{de}	107	10.4 ^{abc}	97	65.2 ^a	97	2.6 ^{ab}	81	89.9 ^e	108
	Maximus CL (IGB1705T) ^(b)	3.03 ^{ab}	95	11.0 ^{cd}	102	69.3 ^f	103	2.8 ^{ab}	85	87.9 ^{de}	105
Site average		3.18	100	10.7	100	67.1	100	3.2	100	83.5	100
LSD (P≤0.005)		0.29		0.8		1.4		1.2		4.5	

Retention levels varied among the malt varieties ranging from 52.0 – 88.4%. A large number of varieties fell below 70% required for Malt 1 including; GrangeR, LaTrobe, Navigator, RGT Planet and Scope (Table 1). In contrast Commander, Compass and Spartacus CL all had high retention levels along with Maximus CL (pending malt accreditation).

Table 2. Long-term barley variety performance at Hart for 2016 – 2020 (expressed as % of trial average).

		% of trial average					Grain yield (t/ha)
Quality	Variety	2016	2017	2018	2019	2020	2020
Feed	Banks [Ⓟ]			103	99		3.56
	Fathom [Ⓟ]	104	94	109	104	112	
	Fleet [Ⓟ]	100	104	106	100		
	Hindmarsh [Ⓟ]	92	98	100	103		3.19
	Keel	97	102	105	101		
	Rosalind [Ⓟ]	104	91	102	107	100	
Malt	Commander [Ⓟ]	92	102	104	93	95	3.01
	Compass [Ⓟ]	86	106	105	106		2.99
	GrangeR [Ⓟ]	103	108	89	93		
	La Trobe [Ⓟ]	94	104	99	107	94	
	Navigator	113	111	96	93		3.53
	RGT Planet [Ⓟ]		134	97	101	111	
	Scope CL [Ⓟ]	94	89	89	91	93	2.97
	Spartacus CL [Ⓟ]	95	98	98	100	89	2.84
Pending malt accreditation	Beast [Ⓟ]					99	3.15
	Laperouse [Ⓟ]					105	3.34
	Leabrook [Ⓟ]					107	3.40
	Maximus CL (IGB1705T) [Ⓟ]				102	95	3.03
Average yield (t/ha)		4.62	4.36	2.86	2.25	3.18	
Sowing date		May 10	May 8	May 14	May 15	May 6	
April - Oct (mm)		356	191	160	162	355	
Annual rainfall (mm)		485	331	224	189	503	

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