

Comparison of wheat varieties

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Key Findings

- The average wheat grain yield at Hart this season was 2.5 t/ha.
- The highest yielding AH varieties were Emu Rock, Vixen, Devil, Rockstar, Mace, Scepter, LongReach Scout, Hammer CL Plus and Catapult ranging between 2.49 – 2.77 t/ha.
- Sheriff CL Plus and Chief CL Plus were the highest yielding APW varieties, yielding 2.50 t/ha and 2.82 t/ha respectively.
- Grain test weight and screenings across all varieties averaged 83.1 kg/hL and 2.8%.

Why do the trial?

To compare the performance of new wheat varieties alongside current commercial standards.

How was it done?

Plot size	1.75 m x 10.0 m	Fertiliser	DAP (18:20) + 1% Zn + Impact @ 80 kg/ha
Seeding date	May 6, 2020		Easy N (42.5:0) 80 L/ha on June 18, 2020
Location	Hart, SA		Easy N (42.5:0) 50 L/ha on August 5, 2020
Harvest date	November 26, 2020		

The trial was a randomised complete block design with three replicates and 18 wheat varieties. This trial was managed with the application of pesticides to ensure a weed, insect and disease-free canopy. All plots were assessed for grain yield (t/ha), protein (%), test weight (kg/hL) and screenings (%). The in-season nitrogen budget was managed to target a wheat grain yield of 2.5 t/ha.

Results and discussion

Wheat grain yields at Hart this season ranged from 1.86 – 2.82 t/ha across all varieties with a trial average of 2.5 t/ha (Table 1). The highest yielding Australian Hard (AH) varieties were Emu Rock, Vixen, Devil, Rockstar, Mace, Scepter, LongReach Scout, Hammer CL Plus and Catapult.

Long-term yield data (Table 2) shows for varieties evaluated over five seasons Scepter, Scout and Trojan have consistently yielded above the trial average. Newer varieties Vixen, Devil, Rockstar and Catapult have also performed well across multiple seasons of evaluation at Hart.

Sheriff CL Plus and Chief CL Plus were the highest yielding Australian Premium White (APW) varieties, yielding 2.50 t/ha 2.82 t/ha respectively. Long term yield data for the APW varieties trialed at Hart is variable. Nighthawk and Cutlass are longer season spring wheats and historical data shows Cutlass has performed well in three out of five seasons. Newer varieties still need further evaluation across a range of season at Hart.

Wheat protein levels for all varieties ranged between 10.3% and 13.1%. All AH varieties were below AH1 receival standards (>13%) with APW and ASW varieties meeting protein requirements (>10.5%).



Table 1. Grain yield (t/ha), protein (%), test weight (kg/hL) and screenings (%) for wheat varieties at Hart in 2020. Values shaded within each 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
AH	Ballista ϕ	2.38	95	10.3	89	81.6	98	3.4	120
	Catapult ϕ	2.68	107	11.2	97	84.0	101	2.8	98
	Devil ϕ	2.74	109	10.9	94	82.9	100	3.6	126
	Emu Rock ϕ	2.77	111	12.5	108	83.8	101	2.1	74
	Hammer CL Plus ϕ	2.66	106	12.0	103	83.6	101	2.5	90
	LongReach Scout ϕ	2.65	106	11.4	99	84.8	102	3.1	109
	Mace ϕ	2.49	99	11.8	102	84.0	101	2.0	72
	Rockstar ϕ	2.70	108	10.8	93	82.6	99	3.3	117
	Scepter ϕ	2.52	101	11.1	96	83.9	101	3.4	120
	Vixen ϕ	2.72	109	11.6	100	81.8	98	2.9	103
AH1 receival standard				>13.0		>76		<5.0	
APW	Chief CL Plus ϕ	2.82	113	12.0	104	82.3	99	2.4	84
	Cutlass ϕ	2.02	81	11.6	100	83.3	100	2.4	86
	Grenade CL Plus ϕ	2.33	93	12.0	103	82.1	99	2.2	79
	Nighthawk ϕ	1.86	74	13.1	113	81.3	98	3.2	115
	Sheriff CL Plus ϕ	2.50	100	11.4	98	82.6	99	3.2	112
	Trojan ϕ	2.34	93	11.4	98	84.0	101	3.5	123
APW1 receival standard				>10.5		>76.0		<5.0	
ASW	Razor CL Plus ϕ	2.45	98	11.9	103	83.8	101	2.3	81
ASW1 receival standard				>10.5		>76		<5.0	
Unclassified	LRPB- 2485	2.45		11.4	98	83.9	101	2.6	91
Site Average		2.50	100	11.6	100	83.1	100	2.8	100
LSD (P \leq 0.05)		0.37		ns		0.95		0.95	

The soil available nitrogen at Hart pre-seeding was 30 kg N/ha (0-60cm) after oaten hay in 2019.

The nitrogen budget consisted of an additional 70 kg N/ha applied at seeding and throughout the growing season, targeting a grain yield of 2.5 t/ha. Grain yield potential was impacted by a dry winter profile; however, it is likely that the late application of N in August increased grain protein with spring rainfall of 177 mm.

Grain test weights averaged 83.1 kg/hL across all varieties, ranging between 81.3 – 84.8. All varieties were above 76 kg/hL (minimum required for maximum grade). Trial screenings were also low with all varieties below 5%.

Table 2. Long term wheat variety performance at Hart (expressed as % trial average).

Quality	Variety	% trial average					Grain yield (t/ha)
		2016	2017	2018	2019	2020	2020
AH	Ballista ^(b) (RAC2598)					95	2.38
	Catapult ^(b)				97	107	2.68
	Devil ^(b)				104	109	2.74
	Emu Rock ^(b)	99	98	104	104	111	2.77
	Grenade CLPlus ^(b)	96	95	110	93	93	2.33
	Hammer CL Plus ^(b)					106	2.66
	Mace ^(b)	94	102	95	95	100	2.49
	Rockstar ^(b)				104	108	2.70
	Scepter ^(b)	106	111	113	106	101	2.52
	Long Reach Scout ^(b)	103	107	107	107	106	2.65
	Vixen ^(b)				111	109	2.72
Longreach Trojan ^(b)	121	113	106	102	94	2.34	
APW	Chief CL Plus ^(b)			87	85	113	2.82
	Cutlass ^(b)	119	104	117	98	81	2.02
	Nighthawk ^(b)					74	1.86
	Sheriff CL Plus ^(b)				96	100	2.50
ASW	Razor CL Plus ^(b)		103	104	109	98	2.45
Unclass	LPB15-2485				98	98	2.45
	Trial average yield (t/ha)	3.87	3.83	2.13	1.50	2.50	
	Sowing date	May 10	May 8	May 14	May 15	May 6	
	Apr-Oct rain (mm)	356	191	160	162	336	
	Annual rain (mm)	485	331	224	189	503	

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