

# Early sown winter and awnless wheats

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## Key Findings

- This season, highest yields were achieved from early May sowing with Scepter and Catapult at 3.03 and 2.92 t/ha, respectively.
- Long season spring and winter wheats were unable to match the yield of Scepter sown in its optimal window at Hart this season.
- Breeding line LPB18-7982 was the highest yielding (2.66 t/ha) awnless variety trialed.

## Why do the trial?

### *Early sown winter wheats*

The recent GRDC 'Management for Early Sown Wheats' investment had a number of outcomes for low-medium rainfall farmers in the southern region. Some of the key learnings were (Porker et al 2019):

- For sowing prior to April 20, winter varieties are required, particularly in regions of high frost risk.
- Winter wheats will not progress to flower until their vernalisation requirement is met (cold accumulation) whereas spring varieties will flower too early when sown early. The longer vegetative period of winter varieties also opens opportunities for grazing.
- Winter wheat varieties allow wheat growers in the southern region to sow much earlier than currently practiced, meaning a greater proportion of farm can be sown on time.

From 2017—2019 at Hart, this project demonstrated winter varieties flowered within a period of 7-10 days across all sowing dates, whereas spring varieties were unstable and ranged in flowering dates over one month apart. Across three seasons, the mid developing winter wheats such as Illabo and Kittyhawk were best suited to achieve the optimum flowering period of September 15-25 for Hart.

During the three years of this investment an early break was not received (that is, all plots were irrigated with 10 mm to achieve germination). The aim of the trial this season was to evaluate winter and spring wheats under field conditions prior to Anzac Day (April 25) and early May if rainfall was received.

### *Awnless wheats*

A management tactic to reduce wheat production risk in frosty areas is the use of awnless varieties. These dual-purpose wheats can be grazed, made into hay in frost events or taken to grain yield. Breeding investment into awnless varieties has been limited over the past decade. Orion, the most commonly grown awnless variety in the Mid-North, was released over 10 years ago. Growers are seeking new awnless varieties with hard classification to given them a hay-cutting option without awns, but a hard wheat option when the season is right. The aim of this trial was to evaluate new awnless wheat varieties from the LongReach Plant Breeding compared to current commercial standards.

## How was it done?

<b>Plot size</b>	1.75 m x 10.0 m	<b>Fertiliser</b>	DAP (18:20) + 1% Zn + Impact @ 80 kg/ha at seeding
<b>Seeding date</b>	TOS 1 – April 20 TOS 2 – May 6		TOS 1 Urea (46:0) @ 100 kg/ha June 19 + Easy N (42.5:0) @ 50 L/ha August 5
<b>Location</b>	Hart, SA		
<b>Harvest date</b>	November 26, 2020		TOS 2 Urea (46:0) @ 100 kg/ha July 10 + Easy N (42.5:0) @ 50 L/ha on August 5

The trial was a split plot block design with three replicates and nine wheat varieties. Varieties were selected based on development speed and newly released / bred lines (Table 1). The trial was managed with the application of pesticides to ensure a weed, insect and disease-free canopy.

Awnless varieties were assessed for dry matter production (t/ha) by sampling 4 x 1 m sections of row at watery ripe (GS71) for each variety. Plant samples were oven dried at 60°C for 48 hours and weighed. All plots were assessed for grain yield (t/ha) and quality.

Table 1. Summary of wheat varieties, including development and quality.

Variety	Release year	Company	Development	Quality	Awnless
Illabo	2018	AGT	Mid-fast winter	AH	N
DS Bennett	2018	Dow	Mid-slow winter	ASW	Y
Nighthawk	2019	LRPB	Very slow spring	APW	N
Catapult	2019	AGT	Mid-slow spring	AH	N
Denison	2020	AGT	Slow-very slow spring	APW	N
Orion	2010	LRPB		ASFT	Y
LPB18-7982	2022 (?)	LRPB	Mid-slow spring*	?	Y
LPB18-7946	2021 (?)	LRPB	Slow spring*	?	Y
Scepter	2015	AGT	Fast spring	AH	N

\*provisional development rating

## Results and discussion

### Winter wheats

This season, highest yields were achieved from early May sowing with Scepter (optimal sowing window) and Catapult at 3.03 and 2.92 t/ha, respectively. The remaining winter and long season spring wheats were unable to match the yield of Scepter sown in its optimal window (Table 2). This is in contrast to previous years at Hart, where Illabo (winter wheat) and Nighthawk (very slow spring wheat) were able to match Scepter yields (Porker *et al.* 2019). This season, varieties, in particular winter wheats matured 7-10 days earlier than normal in the Hart area. Daily temperatures in May and June were slightly cooler (see 'The 2020 season at Hart; rainfall, temperature and soil moisture'; page 13 of this publication) and vernalisation was saturated earlier than expected, resulting in flowering times outside the optimal window.

Grain yields were also lower at Hart in 2020 compared to previous year's research. A faster maturing variety such as Longsword may have been better suited to this season.

Despite this outcome, previous research (>20 trials) has shown the best performing winter wheats can yield similar to the fast-developing spring variety Scepter sown at the optimal time (Porker *et al.* 2019).

Table 2. Dry matter (t/ha) and grain yield (t/ha) for wheat varieties trialed at Hart, 2020. Numbers appended by different letters within the grain yield columns are different from each other.

Variety	April 20	May 6	April 20	May 6
	Dry matter (t/ha)		Grain yield (t/ha)	
Catapult			2.13 <sup>def</sup>	2.92 <sup>ab</sup>
Denison			1.91 <sup>ef</sup>	2.43 <sup>bcd</sup>
Illabo			1.65 <sup>f</sup>	2.00 <sup>def</sup>
Scepter			1.65 <sup>f</sup>	3.03 <sup>a</sup>
Nighthawk			2.28 <sup>cde</sup>	1.97 <sup>def</sup>
DS Bennett	4.23	3.88	2.19 <sup>cde</sup>	2.25 <sup>cde</sup>
LPB18-7982	4.49	4.31	2.02 <sup>def</sup>	2.64 <sup>abc</sup>
LPB18-7946	4.27	4.81	1.98 <sup>def</sup>	2.04 <sup>def</sup>
Orion	4.46	4.03	2.06 <sup>def</sup>	2.00 <sup>def</sup>
	NS		LSD (P≤0.05) 0.50	

#### Awnless wheats

Dry matter production at the watery ripe (GS71) cutting stage ranged from 3.88 t/ha to 4.49 t/ha for all awnless varieties. The new awnless varieties did not improve dry matter production compared to DS Bennett and Orion.

At harvest, LPB18-7982 was the highest yielding (2.66 t/ha) awnless variety when sown in early May (Table 2). This variety was similar yielding to Scepter and Catapult at this time of sowing. LPB18-7982 is derived from a Scout and Yitpi cross and preliminary data shows it has similar maturity to Tojan / Catapult. All other awnless varieties DS Bennett, Orion and LPB18-7946 yielded similarly at 2.00 – 2.25 t/ha.

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#### References

Porker K, Bruce D, Spriggs B, Buderick S, Hunt J, Harris F, Brooke G, Noack S, Moodie M, Brady M, McDonald T, Straight M, Fettell N, McMillan H, Haskins B, Clarke G and Angel K (2010) Emerging management tips for early sown winter wheats. GRDC Update Paper <https://grdc.com.au/resources-and-publications/grdc-update-papers/tab-content/grdc-update-papers/2019/02/emerging-management-tips-for-early-sown-winter-wheats>

#### Additional resource

##### TEN TIPS FOR EARLY SOWN WHEAT

Click here or find the link on the Hart website

(look for Resources / Grower Guides in the main menu)

