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Effect of sowing date on heading date and grain yield of fifteen barley and five wheat varieties – Matong 2016

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Key findings

- The highest grain yields were attained from mid May sowing across all barley varieties.
- Longer-season varieties were high yielding in the 2016 season.
- Oxford achieved the highest grain yields for both sowing dates.
- Lodging was prevalent in 2016, significantly reducing grain yield of susceptible varieties in the first sowing.

Introduction This experiment was conducted to investigate the effect of sowing date on heading date and grain yield of 15 commercially relevant barley varieties compared with five fast-developing wheat varieties.

Site details

Location	“Yarrawonga”, Matong NSW
Soil type	Brown chromosol
Previous crop	Canola
Sowing	Direct drilled with DBS tynes spaced at 240 mm using a GPS auto-steer system Target plant density: 150 plants/m ²
Fertiliser	100 kg N/ha mono-ammonium phosphate (MAP) (sowing) 40 kg N/ha (surface spread) 6 May 40 kg N/ha (surface spread) 30 June
Weed control	Knockdown: glyphosate (450 g/L) 1.2 L/ha Pre-emergent: Sakura® 118 g/ha + Logran® at 35 g/ha
Disease management	Seed treatment: Hombre® Ultra 200 mL/100 kg Flutriafol-treated fertiliser 400 mL/ha In-crop: Prosaro® 300 mL/ha applied at GS30 and GS37
In-crop rainfall (April–October)	519 mm (long-term average is 319 mm)

Treatments

Fifteen barley and five wheat varieties were sown on three sowing dates: 26 April, 17 May and 1 June 2016 (Table 1). The site received above average rainfall from June–September, resulting in several waterlogging events during early vegetative growth. The wet conditions caused the third sowing time (1 June) to have poor establishment. It was later re-sown, but failed to establish a second time. No data was recorded for the third sowing date.

Table 1. Barley and wheat varieties included in the experiment at Matong, 2016.

Species	Variety
Barley	Biere, Commander [Ⓛ] , Compass [Ⓛ] , Explorer [Ⓛ] , Fathom [Ⓛ] , Flinders [Ⓛ] , GrangeR, La Trobe [Ⓛ] , Navigator [Ⓛ] , Oxford, Rosalind [Ⓛ] , Scope CL [Ⓛ] , Spartacus CL [Ⓛ] , Urambie [Ⓛ] , Westminster [Ⓛ]
Wheat	Beckom [Ⓛ] , Condo [Ⓛ] , Corack [Ⓛ] , Emu Rock [Ⓛ] , LongReach Spitfire [Ⓛ]

Results

The mid May sowing (17 May) resulted in the highest barley yields (Table 2), as with the 2014 and 2015 experiments at Matong. In contrast to the series of early frosts and the hot, dry finish in 2015, the mild conditions experienced later in 2016 resulted in an extended grain-filling period. The result was minimal grain yield penalties, which are often associated with later heading dates for barley varieties (Figure 1). The longer-season barley varieties, such as Oxford, Urambie[Ⓛ], Navigator[Ⓛ] and Westminster[Ⓛ] achieved high yields (Table 2).

The mean grain yield of the five wheat varieties was 16% higher than the mean grain yield of the 15 barley varieties for the first sowing date and 14% higher for the second sowing date (Table 2).

There was lodging present in both sowing dates. For the first sowing date, there was significant lodging in susceptible varieties such as Compass[Ⓛ], Commander[Ⓛ], La Trobe[Ⓛ] and Scope CL[Ⓛ] (Table 2). Regrowth of later tillers was more apparent in lodged plots, resulting in variability in physiological maturity and delayed harvest.

Table 2. Grain yield, heading date (GS55) and lodging score (0, no lodging to 9, completely lodged) of barley and wheat varieties on two sowing dates at Matong in 2016.

Variety	Sowing date					
	26 April 2016			17 May 2016		
	Grain yield (t/ha)	Heading date (GS55)	Lodging score (0–9)	Grain yield (t/ha)	Heading date (GS55)	Lodging score (0–9)
Beckom*	5.39	5 Sep	4	5.81	23 Sep	0
Biere	3.68	26 Aug	6	4.50	10 Sep	3
Commander	3.97	12 Sep	7	5.36	27 Sep	6
Compass	3.70	20 Aug	8	4.14	27 Sep	7
Condo*	5.05	22 Aug	4	5.94	18 Sep	0
Corack*	4.92	23 Aug	1	6.08	17 Sep	0
Emu Rock*	5.35	17 Aug	1	6.21	15 Sep	1
Explorer	4.17	2 Sep	8	5.97	25 Sep	4
Fathom	4.17	4 Sep	7	5.49	22 Sep	1
Flinders	3.27	11 Sep	5	5.16	26 Sep	2
GrangeR	4.49	5 Sep	7	5.51	25 Sep	6
La Trobe	4.70	31 Aug	9	4.78	18 Sep	0
Navigator	5.05	25 Sep	2	5.61	7 Oct	0
Oxford	5.60	13 Sep	5	6.39	30 Sep	3
Rosalind	4.59	28 Aug	8	3.31	27 Sep	4
Scope CL	3.38	5 Sep	9	4.13	22 Sep	2
Spartacus CL	4.12	4 Sep	8	5.36	18 Sep	1
LongReach Spitfire*	4.66	19 Aug	3	5.63	17 Sep	1
Urambie	4.51	15 Sep	3	5.44	28 Sep	1
Westminster	4.22	15 Sep	5	5.78	30 Sep	0
Mean (barley)	4.24			5.12		
Mean (wheat)	5.07			5.94		
I.s.d. ($P<0.05$) barley varieties = 1.06 t/ha						
I.s.d. ($P<0.05$) wheat varieties = 0.96 t/ha						

* Wheat varieties; grey shading indicates highest-yielding variety for each sowing date.

