

Response of twelve barley and four wheat varieties to three sowing dates – Matong 2015

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Key findings

- » The 12 barley varieties were, on average, 26% higher yielding than the four wheat varieties in this experiment.
- » The fast developing wheat varieties Emu Rock and Condo generally reached anthesis around the same date as the slow developing barley varieties Navigator, Oxford and Urambie.
- » Long season barley varieties such as Oxford and Urambie performed well from early sowing (24 April), but most barley lines had their highest yield from main season sowing (12 May).
- » The four early season wheat varieties generally had better yield from main season sowing than from early sowing.

Introduction

Barley cultivation has increased markedly in southern NSW in recent seasons, largely due to higher grain yield than wheat in dry springs and greater frost tolerance at flowering than wheat. Despite these findings in commercial paddocks, few experimental comparisons have been made between the two cereal types. This experiment was designed to examine the response of 12 commercially relevant barley cultivars and four fast-developing wheat varieties at three sowing dates in southern NSW.

Site details

Soil type	Brown chromosol (Table 1)
Previous crop	Wheat
Rainfall April–October	300 mm + 120 mm December 2014–March 2015
Fertiliser (sowing)	100 kg/ha MAP + 200 mL/ha flutriafol (500 g/L formulation)
Fertiliser (in-crop)	100 L/ha UAN (42% N) 14 June
Fungicide	300 mL/ha Prosaro applied 7 July and 2 September

Table 1. Soil test results for the experimental site at Matong, 15 April 2015.

	0–10 cm	10–30 cm	0–30 cm
pH (Ca)	4.8	5.9	–

Phosphorus (Colwell mg/kg)	92.0	10.0	–
Exc. Aluminium (%)	1.2	0.4	–
Available nitrogen (N) (kg/ha)	–	–	49.0

Treatments

Sowing dates	24 April 12 May 28 May	
Barley varieties	Commander ^{db} Compass ^{db} Fathom ^{db} Flinders ^{db} GrangeR ^{db} La Trobe ^{db}	Navigator ^{db} Oxford ^{db} Rosalind ^{db} Scope CL ^{db} Urambie ^{db} WI4897
Wheat varieties	Condo ^{db} Corack ^{db}	Emu Rock ^{db} Spitfire ^{db}

Results

La Trobe was the first barley variety to reach anthesis from the 24 April and 12 May sowing times (Table 2). Fathom was slightly quicker to anthesis than La Trobe from the 28 May sowing time. Condo and Emu Rock were the fastest wheat varieties to anthesis from the 24 April sowing time, but were 13 days slower than La Trobe. Anthesis occurred in Condo and Emu Rock at similar dates to the slowest barley varieties, Urambie and Navigator.

Table 2. Anthesis date and grain yield of 12 barley varieties and four wheat varieties sown at three sowing times, Matong 2015.

Variety	Anthesis date			Grain yield (t/ha)		
	24 Apr	12 May	28 May	24 Apr	12 May	28 May
Commander	8 Sep	21 Sep	1 Oct	3.6	4.3	3.5
Compass	3 Sep	17 Sep	29 Sep	3.8	4.3	3.6
Condo*	14 Sep	29 Sep	4 Oct	2.9	3.6	2.9
Corack*	15 Sep	2 Oct	11 Oct	3.2	3.2	3.0
Emu Rock*	14 Sep	30 Sep	6 Oct	2.9	3.4	3.3
Fathom	5 Sep	19 Sep	24 Sep	4.1	4.4	3.0
Flinders	11 Sep	25 Sep	3 Oct	4.1	4.2	2.8
GrangeR	9 Sep	23 Sep	3 Oct	4.0	4.7	3.8
La Trobe	1 Sep	15 Sep	25 Sep	4.1	4.1	3.6
Navigator	14 Sep	1 Oct	4 Oct	3.9	3.7	2.9
Oxford	13 Sep	3 Oct	5 Oct	4.4	4.0	3.3
Rosalind	3 Sep	16 Sep	2 Oct	3.8	4.9	4.2
Scope	6 Sep	19 Sep	1 Oct	3.6	3.8	2.7
Spitfire*	16 Sep	1 Oct	12 Oct	2.6	3.3	2.3
Urambie	15 Sep	1 Oct	4 Oct	4.5	4.1	2.4
WI4897	5 Sep	17 Sep	30 Sep	4.1	4.6	3.8
				l.s.d. (P = 0.05) = 0.4 t/ha		
*denotes wheat variety. Cells shaded grey indicate the highest yielding variety within a sowing time.						

There was an interaction ($P < 0.001$) between variety and sowing date for grain yield. Longer-season barley varieties Urambie, Navigator and Oxford recorded their highest yield from the 24 April sowing time. The remainder of the barley varieties and the four wheat varieties had higher (or equal) grain yield from the 12 May sowing time than the 24 April and 28 May sowing times. The average grain yield of the 12 barley varieties was 3.9 t/ha compared with 3.1 t/ha for the four wheat varieties.

Relationship between anthesis date and grain yield (barley only)

The highest grain yield was achieved when anthesis date occurred around mid-September (Figure 1). There was a slight yield penalty when anthesis occurred in early September (from fast varieties such as La Trobe sown on 24 April). There was a stronger grain yield penalty when anthesis occurred in early October.

Summary

The experiment site was waterlogged at several points during July and August, which reduced the grain yield potential.

Averaged across sowing dates, the 12 barley varieties in this experiment were 26% higher yielding than the four wheat varieties. Sowing barley early gave good results, provided a relatively long season variety was selected, such as Oxford or Urambie. The four wheat varieties generally had their highest yield from sowing on 11 May. Spikelets

from selected wheat and barley treatments were scored for frost-induced sterility to determine the reason for lower grain yield from early sowing.

The optimum anthesis date of mid-September in this experiment was similar to the optimum timing of anthesis in 2014 (results reported in Southern Cropping Region Trial Results 2014). In 2014, the yield penalty from early anthesis was due to frost events in August. Frost assessments are still being compiled from the 2015 experiment.

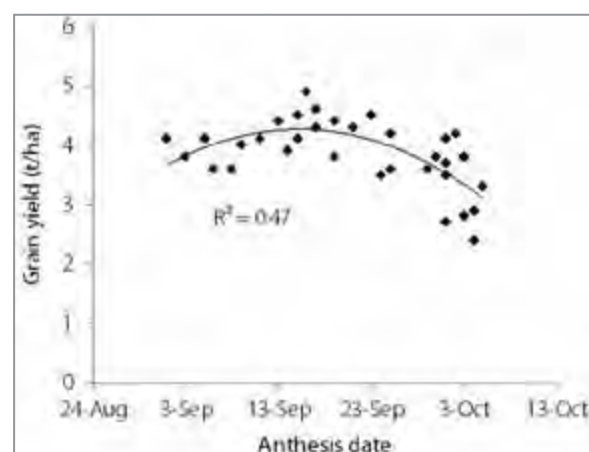


Figure 1. The effect of anthesis date on grain yield of 12 barley varieties, Matong 2015.

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