

Agronomy to improve profit from wheat production- influence of time of sowing and seeding rate

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11WMG15

Purpose:	Compare the effect of delayed seeding and seeding rates on the yield and quality performance of wheat varieties
Location:	Badgingarra
Soil Type:	Loamy sand
Rotation:	2010 Pasture; 2009 Wheat
GSR:	433 mm

BACKGROUND

In recent years, lower seeding rates have been suggested as a possible tool to limit grain screenings. However, there has been limited scientific evidence to support this strategy across different environments and seasons. This study aims to provide growers with improved knowledge on the impact of seeding rates and sowing time on the performance of wheats important to the agriculture sector.

TRIAL DESIGN

A randomised block design with split plot arrangement was used, with time of sowing as main plots, and cultivars with three seed rate (plant density) as subplots, and with three replicates. Sowing times corresponded with the break of the season (May sowing) followed by three week interval (June sowing). Seed rates of 40, 80 and 120 kg/ha which aimed to achieve 100, 200 and 300 plants /m² was used.

Plot size: 1.54 x 20m

Repetitions: 3

Crop varieties: Calingiri (control), Fortune, King Rock, Mace, Magenta and Wyalkatchem (control)

Seeding dates: TOS 1- 18 May

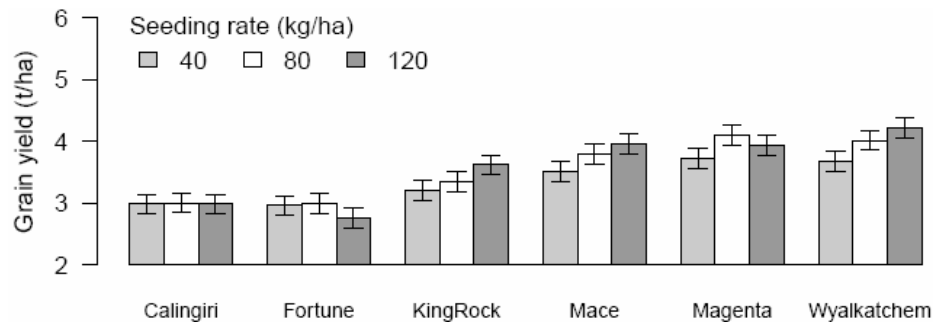
TOS 2- 8 June

Fertiliser: **At seeding:** 100 Kg Agstar Extra at seeding of TOS1

Herbicide: **Pre:** Talstar @ 200ml; Dominex @ 100ml; Sprayseed @ 2 L; Treflan @ 1.5L
Post (TOS 1 only) 13/6/11: Ally @ 2.5Gm; Lontrel @ 200ml; Barracuda @ 0.75L

RESULTS

a) TOS 1- 18 May



b) TOS 2- 8 June

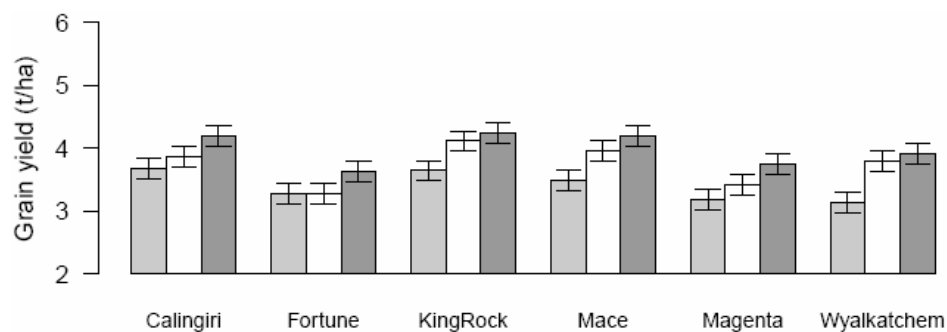
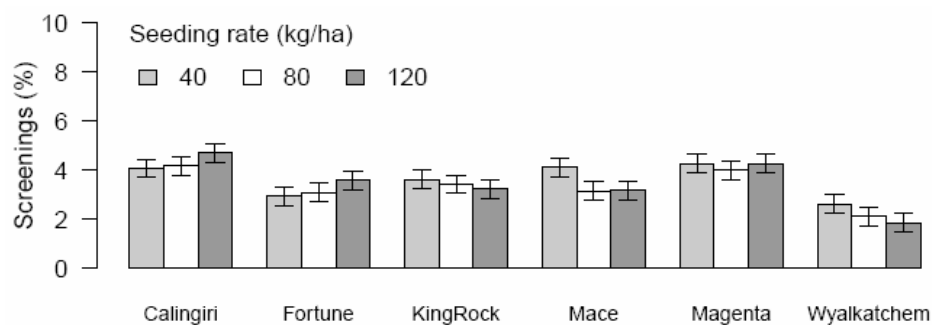


Figure 1: Effect of seeding rate at two sowing times (a: May 18th and b: Jun 8th) on grain yield Badgingarra. Note +/- 1 SED is shown. Significant differences between seed rate within time of sowing x variety combinations if the error bars do not overlap

a) TOS 1- 18 May



a) TOS 2- 8 June

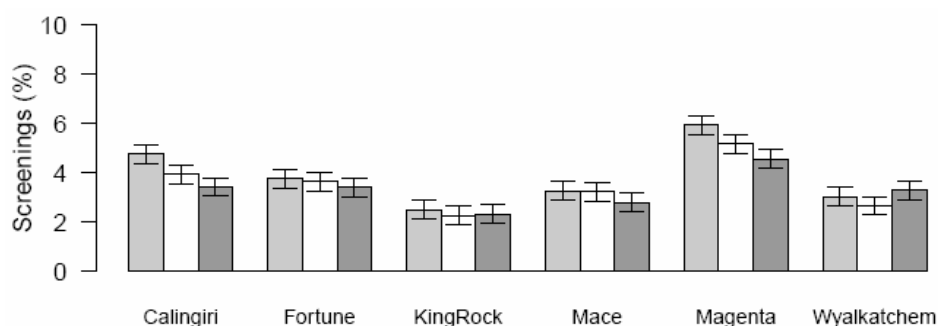


Figure 2: Effect of seeding rate at two sowing times (a: May 18th and b: Jun 8th) on screenings at Badgingarra

FINANCIAL ANALYSIS OF RESULTS

Table 2. Gross income (\$/ha) of varieties at two sowing times and three seeding rates at Badgingarra in 2011

Time of sowing	Variety	Gross Income (\$/ha)- Seed rate		
		40	80	120
18 May	Calingiri	480	484	480
	Fortune	518	483	445
	King Rock	736	767	706
	Mace	694	741	771
	Magenta	707	779	747
	Wyalkatchem	592	647	681
8 Jun	Calingiri	644	677	734
	Fortune	574	574	637
	King Rock	834	942	969
	Mace	800	747	792
	Magenta	511	550	709
	Wyalkatchem	593	719	738

DISCUSSION

Crop establishment was good for both sowing times due to good rainfall after seeding in 2011. Seed rates of 40 kg/ha achieved the target plant population of 100 plants/m² on all sites. With each additional 40kg/ha of seed, plants numbers increased by approximately 50 plants/m² at Badgingarra. Ears/m² increased from 219 to 320 with increasing seeding rate from 40 to 120kg/ha. Averaged across all seeding rates, the ear numbers of Mace (227 ear/m²) were significantly lower than the other varieties (approx 275 ears/m²).

At Badgingarra, increasing the seeding rate from 40 to 120 kg/ha increased the mean grain yield of King Rock, Mace, and Wyalkatchem at both sowing times. The mean yields of Fortune and Calingiri were not influenced by seeding rate at the May sowing time, but did increase from 40 to 120 kg/ha at the second sowing time in June (Fig. 1). Magenta mean yields were higher at the 120 kg/ha than 40 kg/ha seeding rate at the second sowing time, but were highest with the 80 kg/ha seeding rate at the first sowing time in May. Fungal staining of Mace and Wyalkatchem (data not presented) was greater than 5% at all seeding rates when sown on May 18th at Badgingarra.

Seeding rate did not influence the level of screenings at Badgingarra of the varieties sown on May 18th. The screenings of Magenta and Fortune declined when seeding was increased from 40 to 120 kg/ha at the June sowing (Figure 2).

Fungal staining of Magenta was greater than 5% for Magenta when sown at the second sowing time. This influenced the gross income of this varieties (Table 2). Lower yields and downgrading due to hectoliter weight (<74HLW) influenced the economic returns of Calingiri and Fortune in the first sowing time.

In a season like 2011 with good winter rainfall across all sites and stored moisture at seeding, higher seeding rates either improved maintained high grain yields when sown in May and June in a range of environments in Western Australia. There was no evidence that increased seeding rate increased screenings risk in a season with good winter and spring rainfall.

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