

“CSIRO Wheat Time of Sowing and Grazing, 2014”

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Key Outcomes:

- Trojan and Mace wheat were the highest yielding varieties in the trial when sown on the 29th April
- When sown earlier than optimal (14th April), the yield of Mace increased 1.5 t/ha by grazing
- Early sown long season wheats performed significantly better than late sown main season wheats

Trial Objectives: To determine 1) the grain yield recovery potential of 6 different wheat varieties with various developmental characteristics sown across a range of sowing times and 2) whether grazing can be used to manipulate varietal maturity and hence “open up” the seeding window.

Trial Duration: 2014

Location: Navan

Farmer Co-operators: Pat & Mary Connell

Soil Type: Red Clay Loam

Paddock History: 2013 – Faba Beans
2012 - Wheat

Monthly Rainfall:

JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
2	81	7	69.5	64.5	99.5	67.5	18.5	20	9	18.5	4.5

- **Yield Limiting Factors:** Below average spring rainfall
- **Type of Trial:** Replicated small plot trial
- **Trial Design:** Randomised Complete Block Design, split plots, 4 replicates

Treatments:

The trial contained 6 wheat varieties (Trojan, Mace, W7A, Sunstate, Rosella, Bolac) and 2 grazing treatments (Ungrazed, Rotationally grazed to GS 30). There were 4 separate times of sowing (TOS) TOS 1 – 14/04/2014, TOS 2 – 29/04/2014, TOS 3 – 12/05/2014 and TOS 4 – 30th May.

All plots were sown at 200 seeds/m² and were sown with MAP 1% Zinc at 80 kg/ha. All nitrogen treatments were applied by hand following the final defoliation of the grazed treatments. This corresponded to GS 30 in the ungrazed treatments. A mower was used to simulate stock grazing.

The plots were harvested and grain yields determined. Grain samples were kept for protein analysis.

Results:

Table 1: Grain yield results for the ungrazed treatments at the MNHRZ, 2014.

Cultivar	14-Apr	29-Apr	12-May	30-May
Rosella	5.5	5.4	4.6	3.5
Bolac	6.1	6.1	4.6	3.7
Mace	4.1	7.4	6.4	5
Trojan	6.6	7.4	6.1	4.6
Sunstate	3.8	6.2	4.9	3.6
W7A	6.1	6	4.5	3.5
<i>P-value</i>	<i><.001</i>			
<i>LSD (P=0.05)</i>	<i>0.6</i>			

Table 2: Grain yield results grazed and ungrazed treatments at the MNHRZ, 2014.

Cultivar	14-Apr		29-Apr		12-May		30-May	
	Ungrazed	Grazed	Ungrazed	Grazed	Ungrazed	Grazed	Ungrazed	Grazed
Bolac	6.1	4.4	6.1	5.1	4.6	3.9	3.7	3.5
Mace	4.1	5.6	7.4	6.4	6.4	5.7	5	4.5
Rosella	5.5	4.3	5.4	4.5	4.6	4.4	3.5	3.4
Sunstate	3.8	3.9	6.2	5.3	4.9	4.3	3.6	3.5
Trojan	6.6	4.9	7.4	5.7	6.1	5.7	4.6	4.3
W7A	6.1	4.3	6	5.3	4.5	4.2	3.5	3.5
<i>P-value</i>	<i><.001</i>							
<i>LSD (P=0.05)</i>	<i>0.6</i>							

Comments:

Both Trojan and Mace were the highest yielding varieties in this trial, both sown on the 29th of April. Mace in this environment normally yields highest when sown around the middle of May (previous MNHRZ trials), as this timing enables it to fill grain under ideal soil moisture and temperature conditions. However, 2014 was a year that favoured early sown crops, and spring rainfall was all but non-existent, resulting in higher yields with earlier times of sowing.

Sowing on the 14th of April resulted in significantly lower yields of Mace & Sunstate (some frosting evident in both) and Trojan, compared to the 29th of April TOS. Bolac, W7A and Rosella had similar yields across TOS 1 & 2, which were similar to Mace and Trojan sown at TOS 3 (12th May). These

varieties are all longer season (either winter wheats or long season spring wheats) and are able to make the most of early sowing opportunities should they arise.

Mace was the only variety that produced yields of 5 t/ha sown on the 30th of May. This was still not as good as some of the longer season varieties sown in the middle of April.

Grazing tended to reduce yields of most varieties more heavily at the early TOS. The clear exception to this was Mace, which was able to increase yield by 1.5 t/ha in response to grazing at the early TOS (Mid-April). This is most likely the result of the grazing delaying the maturity of this variety sufficiently to 1) Avoid the frost events that occurred in September that caused yield loss in the ungrazed Mace treatment and/or 2) Delaying the maturity of the variety sufficiently to enable more complete utilisation of plant available water during grain fill.

Conclusion and into the paddock

The 14th of April is considered too early for sowing wheat in this environment, as many of the wheat varieties currently available would mature too early not be able to utilise the cool conditions and soil moisture for optimal grain fill. One of the objectives of this trial was to see if there were other wheat varieties that could be planted early, yet develop later reproductively to enable them to utilise soil moisture and spring rainfall.

These results clearly show that well adapted winter wheats (e.g W7A) and longer season spring wheats (Bolac) have a role to play when sowing very early in this environment. This is particularly relevant for growers that have large seeding programs that can potentially result in main season wheat varieties being sown later than ideal and consequently reducing yield.

The developmental pattern of these longer season varieties spreads farmers' seasonal risk in this environment as they are able to utilise early season moisture that would otherwise partially evaporate. They also enter the reproductive phase of growth (different seasonal triggers) at slightly different timings to main season wheat varieties which may enhance frost risk buffering.

Grazing of early sown wheat crops may be a viable alternative to growing a longer season wheat, particularly for farmers with stock. However, grazing to achieve a delay in maturity needs to have adequate fencing and stock numbers to ensure that the crop is grazed evenly for an extended period of time. This is definitely achievable, particularly in small paddocks or where a frost prone part of the paddock is divided off the main paddock via electric fencing.

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