

“Canopy Management in Wheat”

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Key Outcomes:

- Trojan sown early produced the highest yields in the trials
- Mace yielded best when sown in the middle of May
- Delayed nitrogen (GS 31) produced a significant increase in yield when wheat varieties were sown early

Trial Objectives: To determine optimum times of sowing and management strategies for a range of varieties in the high rainfall zone.

Trial Duration: 2013

Location: Navan

Farmer Co-operators: Pat & Mary Connell

Soil Type: Black Cracking Clay

Paddock History: 2012 – Faba Beans

2011 - Wheat

Monthly Rainfall:

JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
4.5	23	6.0	35.5	67	70.5	71.5	80.5	70.5	30.5	4.0	33.5

- **Yield Limiting Factors:** Below average spring rainfall
- **Type of Trial:** Replicated small plot trial
- **Trial Design:** Randomised Complete Block Design, split plots, 3 replicates

Treatments:

There were 4 Times of Sowing (TOS), 3 varieties, 2 densities and 4 nitrogen strategies in the trial (see **Table 1**). All plots received 100 kg/ha triple superphosphate at seeding and nitrogen applied as urea applied either immediately post sowing or at GS 31. Yield and grain protein data was collected from the trial to compare treatments.

Table 1: Treatments compared in the MNHRZ 'Canopy Management' trial, 2013

Time of Sowing	Variety	Density	Nitrogen
TOS 1 – 1/5/13	LRPB08-0079	150 Seeds/m ²	Nil N
TOS 2 – 17/5/13	Mace	300 Seeds/m ²	60 kg N/ha Seeding
TOS 3 – 29/5/13	Trojan		120 kg N/ha Seeding
TOS 4 – 13/6/13			120 kg N/ha GS 31

Results:

Figure 1: Yield vs. Time of Sowing and Variety, 'Canopy Management' trial, MNHRZ 2013

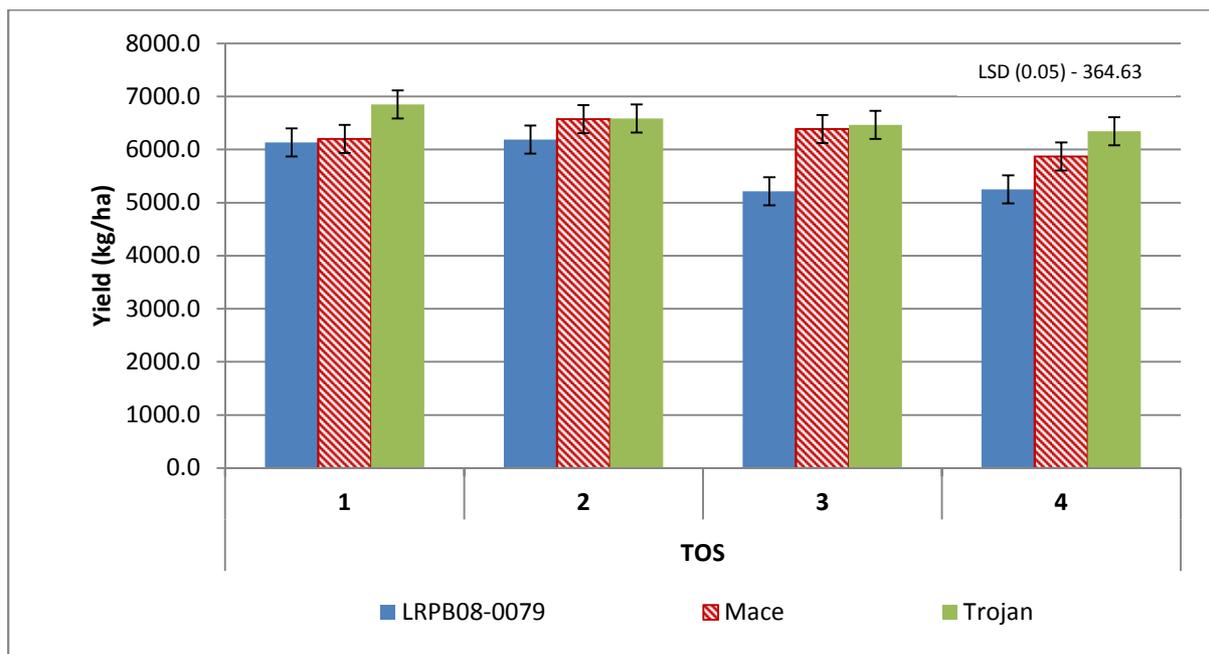


Table 1: The effect of nitrogen application strategy on the yield of wheat sown Time of sowing 1 (01/05/2013), MNHRZ, 2013

	<u>Nil</u>	<u>60N Seeding</u>	<u>120N Seeding</u>	<u>120N GS 31</u>
<u>LRPB08-0079</u>	6505.6	5991.9	6228.8	5804.1
<u>Mace</u>	5875.2	6297.2	6101.7	6533.5
<u>Trojan</u>	6357.3	6890.1	6892.2	7253.5

LSD (P=0.05) – 669.58

Table 2: The effect of nitrogen application strategy on the protein (%) of wheat sown Time of sowing 1 (01/05/2013), MNHRZ, 2013

	<u>Nil</u>	<u>60N Seeding</u>	<u>120N Seeding</u>	<u>120N GS 31</u>
<u>LRPB08-0079</u>	<u>9.6</u>	<u>10.3</u>	<u>10.5</u>	<u>11.4</u>
<u>Mace</u>	<u>9.5</u>	<u>10.1</u>	<u>11.2</u>	<u>11.2</u>
<u>Trojan</u>	<u>7.6</u>	<u>8.2</u>	<u>9.8</u>	<u>10.7</u>

LSD (P=0.05) – 0.75%

Comments:

Longreach Trojan produced the highest yields in the trial at nearly 7 t/ha at TOS 1. Mace was significantly lower yielding at this time of sowing. This was also the case at TOS 4. There was no significant yield difference between Mace and Trojan when sown at TOS 2 and 3. LRPB08-0079 performed poorly compared to Mace and Trojan and was significantly lower yielding at all times of sowing.

Very high yields were achieved at TOS 1 without the addition of extra nitrogen. Protein levels were however, reduced compared to the plots that received nitrogen. Delaying nitrogen until GS 31 at TOS 1 resulted in significant improvements in yields in both Mace and Trojan. GS 31 nitrogen treatments also produced significantly higher protein levels compared to nitrogen applied at seeding treatments.

Conclusion and into the paddock

Early sowing has become a common practice in all cropping areas of the state following a run of dry years during the mid 2000's and the reliability of early sown crops during these years. However, some varieties can be sown too early i.e. go into the reproductive growth phase too early in the season, meaning insufficient time for development of yield structure such as tiller number, leaves and grain number.

This trial was able to demonstrate that Mace wheat can be sown too early in this environment and not achieve optimal yields. Having a number of varieties with significantly different maturities (e.g. Mace and Trojan) gives the grower more flexibility with time of sowing, meaning that more crop can be put in at the ideal time.

Management strategies of early sown wheat differ vastly from those for wheat sown towards the end of May. This trial demonstrated how aggressive root growth of early sown crops allows them to access a greater volume of soil and scavenge nitrogen throughout the soil profile. This allowed the plots that received no nitrogen to yield nearly as well as those that received significant amounts.

The other strategy that should be considered when sowing early is to 1) reduce sowing density – less than 100 seeds/m² is ideal, to ensure that early growth is not excessive, resulting in water deficit later in the season and 2) to delay nitrogen (depending on background soil levels) until early stem elongation for similar reasons.

Conversely, wheat sown toward the end of May has always shown a preference for higher seeding densities and more nitrogen applied at seeding, as the length of time for yield structure development is limited, the later you sow in the season.

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