

Long Season Wheat Agronomy

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Key messages

- Beaufort produced the highest yields in the trial
- There was no significant effect of seeding density, plant growth regulator or imidacloprid seed dressing on yield.
- Results for nitrogen timing were inconsistent, with the variety Beaufort the only variety that appeared to favour a particular nitrogen timing (seeding).
- Stem elongation applications of nitrogen resulted in consistently higher protein levels, generally 0.5% higher than for equivalent nitrogen rates applied at seeding.

Why do the trial?

Long season wheat varieties have a role on farms in the high rainfall zone of SA's Mid North due to the ability to sow them earlier or outside of the traditional planting window. This enables the varieties to utilise out of season rainfall and potentially produce higher yields. Given that long season varieties have a role in this environment, we thought that it would be prudent to gain an understanding of the agronomic management factors associated with these varieties that promote high yields. The management factors that were looked into were: seeding density, insecticidal seed dressing, plant growth regulator and nitrogen timing.

How was it done?

The trial was established at the MNHRZ site at Navan, between Riverton and Tarlee, in the Mid North of SA.

3 longer season varieties of wheat (Beaufort, RAC 2341 and Kittyhawk) were sown on April 6th, 2016 following 5mm of rainfall. The trial design was a randomised complete block design with split plots consisting of 4 replicates. Agronomic factors were explored by applying the following treatments:

- Sowing rates of 100 or 300 seeds/m²
- Imidacloprid applied to seed, Plus or Minus
- Nitrogen application rates of Nil, 120N Seeding or 120N GS 31
- Plant Growth Regulators, Plus or Minus

All plots were sown with 60 kg/ha of MAP. Plots were harvested with a plot harvester and sub-samples kept for protein analysis.

What happened?

Table 1: Yield of long season wheat varieties vs. Imidacloprid seed dressing, Density and Plant Growth Regulator, MNHRZ 2016.

	Imidacloprid		Density		Growth Reg.	
	Plus	Minus	100 Seeds	300 Seeds	Plus	Minus
Beaufort	9.19	8.86	9.04	9.01	9.62	9.29
Kittyhawk	6.66	6.66	6.47	6.85	7.17	6.86
RAC 2341	8.45	8.03	8.22	8.27	8.66	8.34

NB: None of these factors were significantly different from one another

Table 2: Yield of long season wheat varieties vs. Density and Nitrogen, MNHRZ, 2016

Variety	Density	Nitrogen	Yield (t/ha)	Protein (%)
Beaufort	100	GS 31	9.15	8.7
		Nil	8.07	7.6
		Seeding	9.83	9.2
	300	GS 31	9.83	9.8
		Nil	8.46	8.2
		Seeding	10.40	9.4
Kittyhawk	100	GS 31	6.82	10.6
		Nil	6.01	8.8
		Seeding	7.18	10.3
	300	GS 31	7.72	10.8
		Nil	6.22	9.5
		Seeding	7.22	10.6
RAC 2341	100	GS 31	9.00	11.7
		Nil	8.19	10.3
		Seeding	9.09	11.6
	300	GS 31	9.10	11.5
		Nil	7.50	10.1
		Seeding	9.03	10.9

What does this mean?

Varieties were significantly different from one another for yield in this trial. Beaufort and RAC 2341 yielded very well compared to Kittyhawk, which appeared to have poorer adaptation to the local conditions. Beaufort is a very high yielding variety, however its red grain and feed quality mean that it is not favoured on farm where cleanliness at harvest time

cannot be guaranteed. Hopefully RAC 2341 will receive a favourable quality classification, as it is white grained and also has good yield potential.

Imidacloprid seed dressing did not produce a positive yield response in this trial. We aimed to get some information on yield losses associated with Barley Yellow Dwarf Virus infection, however upon closer inspection the trial was discovered to be harbouring Russian Wheat Aphid and was promptly sprayed with chlorpyrifos as many paddocks in the district were.

Prior to spraying, RWA infection was scored and the plots that had the seed dressing had virtually no aphids present in them (data not presented). It was 8-10 weeks after sowing by this point, so clearly showed the effectiveness of imidacloprid on suppressing RWA.

Both density and plant growth regulator application had very little effect on yield. We suspect this is a result of the long growing season and lack of varietal lodging. This reflects results that have been achieved in the past at the MNHRZ, with density being more important in a dry finish (lower = better) and growth regulators only having an advantage in the presence of lodging.

Nitrogen was significant in increasing yield, but timing was not. It appears that Beaufort prefers higher rates of nitrogen early, whereas the other varieties tested appeared to have no preference. Later nitrogen applications resulted in an average of 0.5% higher protein compared to the same rate applied earlier, this is consistent with past results and is a worthwhile strategy for crops for which you get paid for protein (durum, hard wheat).

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