

6b. SARDI Keith and Frances Wheat Nutrition Trials

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Funding Body: SARDI

KEY MESSAGES:

- SARDI funded and managed wheat nutrition trials to evaluate different N and P treatments.
- A nitrogen response was observed at Keith.
- No grain yield differences were observed at Frances with different N or P treatments.
- Grain at both sites achieved a higher grade with the highest N application.
- Protein was the limiting factor for grain achieving maximum grade.

Trial Background

In 2016 SARDI funded wheat nutrition trials at Keith and Frances to value add to the MFMG field days. The Keith and Frances trials evaluated different nitrogen (N) rates and application timings and phosphorous (P) rates.

Trial Design

The Keith trial was sown on 24 May and the Frances trial was sown on 16 May. Scepter wheat (max. quality AH) was used in the trials. Nitrogen was applied at 3 different timings; sowing, growth stage (GS) 31 and GS 39 (Table 1). Single applications of N at GS 31 and split applications at GS 31 and GS 39 were compared. GS 31 was reached on 3 August and GS 39 on 21 September. The two different P rates evaluated were applied at sowing.



Table 1: The six treatments evaluated at Keith and Frances wheat nutrition trials, product applied at sowing and rates applied at different growth stages.

Treatment	Product applied @ sowing	Product applied growth stage Kg N/ha		Total N applied kg N/ha
		GS 31	GS 39	
Treatment 1	No product applied	-	-	0
Treatment 2	DAP - 100 kg/ha (18 N)	60	-	78
Treatment 3	DAP - 100 kg/ha (18 N)	60	30	108
Treatment 4	DAP - 100 kg/ha (18 N)	30	30	78
Treatment 5	Triple Super – 87 kg/ha	40	-	40
Treatment 6	Triple Super – 174 kg/ha	40	-	40

Keith

At Keith grain yield averaged 5.2 t/ha and significant differences in treatments were observed (P value 0.009, l.s.d 0.70, cv % 5.6) (Figure 1). Treatment 1, the nil treatment, had a significantly lower grain yield (4.2 t/ha) compared to all other treatments. The remaining treatments were significantly the same, with Treatment 3 having the highest grain yield (total 108 kg N/ha), while Treatments 2 and 4 were similar in yields (total 78 kg N/ha) and Treatments 5 and 6 were similar in yields (total 40 kg N/ha). Treatment 3, had a significantly higher protein %, achieving APW1 grade, compared to all other treatments achieving ASW1 (Table 2). Protein was the limiting factor for grain achieving max grade, with all treatments test weights and screenings adequate for H1.

Frances

The growing conditions at Frances were not favourable for a nutrition trial. The site mean grain yield was 6.4 t/ha. There were no significant differences between the treatments (P value 0.621, l.s.d 0.48, cv % 5.1) (Figure 1). Not applying N and P resulted in grain achieving ASW1 (Table 3). Treatment 3 had the highest protein, 11.5 %, and was the only treatment to achieve H2, the remaining treatments other achieved APW1. Protein was the limiting factor for grain achieving max grade, with all treatments test weights and screenings adequate for H1.

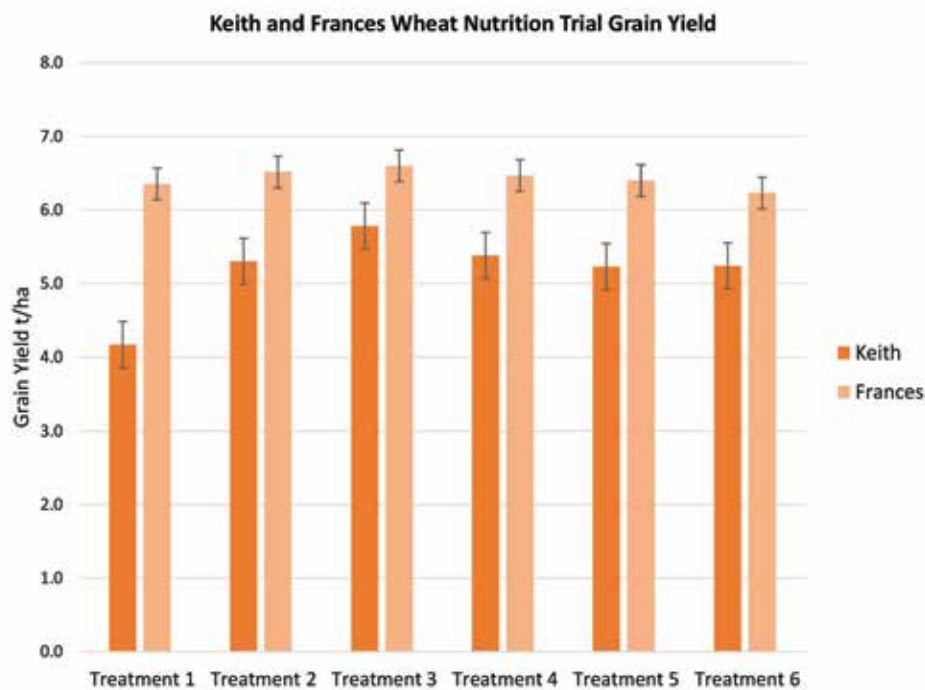


Figure 1: Keith and Frances Scepter wheat nutrition trial grain yield (t/ha).

Table 2: Keith Scepter wheat grain quality.

	Protein	Test Weight	Screenings	Grade Achieved
	%	kg/hl	< 2.0 mm	
Treatment 1	9.6	84.3	1.5	ASW1
Treatment 2	9.9	84.0	1.9	ASW1
Treatment 3	10.5	84.0	1.4	APW1
Treatment 4	10.3	84.4	1.3	ASW1
Treatment 5	9.9	83.8	1.9	ASW1
Treatment 6	9.8	83.7	1.8	ASW1
P value	0.003	0.417	0.247	
l.s.d	0.40	0.75	0.68	
cv %	3.9	0.4	6.8	

Table 3: Frances Scepter wheat grain quality.

	Protein	Test Weight	Screenings	Grade Achieved
	%	kg/hl	< 2.0 mm	
Treatment 1	9.7	83.6	1.3	ASW1
Treatment 2	11.1	83.2	1.0	APW1
Treatment 3	11.5	83.1	1.6	H2
Treatment 4	10.8	82.7	1.5	APW1
Treatment 5	10.8	82.2	1.6	APW1
Treatment 6	10.9	82.1	1.3	APW1
P value	0.004	0.058	0.09	
I.s.d	0.7	1.07	0.44	
cv %	5.8	0.4	5.7	

ACKNOWLEDGEMENTS

- SARDI's South East New Variety Agronomy Team, based at Struan, who manage the Trials;
- Makin Family (Keith) and Koch Family (Frances), as the co-operating growers.



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