4.6 ASSESSING THE IMPACT OF NITROGEN TIMING ON CANOPY DEVELOPMENT IN WHEAT (YALLA-Y-POORA VIC)

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Location: SFS Yalla-Y-Poora Research site

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Rainfall (2005): 543 mm
GSR: (Apr – Nov) 359 mm

Summary:
- Where soil nitrogen levels are high at planting, eg 100kgN/ha (0-60cm), further nitrogen applications cannot be justified with a drier finish to the season.
- Late applied nitrogen gave higher grain protein levels than earlier applications.
- Late applied nitrogen did not necessarily result in higher screenings or lower grain test weights.

Background:
The management of wheat crop canopies through nitrogen manipulation has shown positive yield and quality benefits in previous trials. It is unclear however just how far we can lift the nitrogen levels in the HRZ before we get an uneconomic yield response. It is also unclear as to whether timing of nitrogen application will have any impact on grain yield and quality where the starting soil nitrogen levels are high.

Objectives:
To assess the impact of nitrogen timing on canopy development and resultant grain yield and quality, where starting soil nitrogen levels are high.

Methodology:
A replicated trial was established consisting of the wheat variety Kellalac.

Each treatment was based on varying nitrogen strategies used across the district. A randomized block design was implemented. Plot lengths were 7.5m, with each variety being grown on a 2 metre wide raised bed.

Table 4-12: Treatment List

Trt	Pre - Sowing N/ha	Sowing N/ha	N/ha at GS31	N/ha at GS39	Total N/ha
1	0	10	0	0	10
2	30	10	45	0	85
3	0	10	75	0	85
4	0	10	45	30	85
5	0	10	0	75	85

Soil available nitrogen pre-seeding was 100kgN/ha, 40kgN/ha (0-10cm), 60kgN/ha (10-60cm).

Sowing Date:
1st June 2005 to Kellalac wheat.
Seed treatment was Raxil at recommended label rate.

Sowing rate:
Adjusted for seed weight, with the aim of establishing 200 plants/square metre.

Fertiliser:
100 kg/ha MAP was applied at sowing, with Urea applied at seeding, or post emergent at GS31 (7th September) and/or GS39 (27th September).

Trifluralin was applied at 1.2L/ha IBS, with Tigrex at 750ml/ha applied on the 28th July 2005.

Foliar Fungicide:
Tilt Xtra ® was applied at 250 ml/ha on 2 separate occasions, namely 15th September (GS32) and 4th October (GS39). The aim was to keep foliar disease out of the trial and to allow maximum realization of the nitrogen response.

Harvested: 29th December 2005.

Results

Table 4-13: Yield And Grain Quality Data (Descending Yield Order)

Trt	Yield kg/ha	Protein %	Retention %	Screenings %	Test Wt kg/hl	TGW grams
1	6.428	12.03	95.27	4.043	75.24	32.2
4	6.095	13.80	96.13	3.845	75.30	29.8
3	6.065	13.78	95.74	4.260	75.72	31.2
2	6.037	14.07	96.30	3.682	74.63	30.0
5	5.857	14.22	96.48	3.510	75.00	31.6
Average	**6.096**	**13.58**	**95.98**	**3.868**	**75.18**	
LSD 5%	**0.503**	**0.678**	**0.598**	**0.997**	**2.16**	
CV	**6.410**	**6.810**	**0.580**	**17.807**	**1.86**	

Discussion

Observations across the canopy trial showed that at GS39, variance in green leaf retention was highly noticeable between treatments 1 & 5, even though their prior management had been the same. Treatments 2, 3 & 4 had greater green leaf area, although not converting to improved yield in the drier season.

The highest yielding treatment was the control, with only 10 kg/ha nitrogen being applied. There was however no significant yield differences between treatments 1, 4, 3 and 2.

The worst yielding treatment was treatment 5, where most of the nitrogen was delayed until GS39. It is unclear why this was the case, since grain size, screenings and test weight were not significantly different to the control.

Delaying nitrogen application increased grain protein as would be expected. Treatment 5 which had 75 kg/ha nitrogen applied at GS39 (flag) had 2.19% more protein than the control and was higher than the other earlier applied nitrogen treatments, although not significantly higher. The cost involved in chasing this higher grain protein could not be justified