

### 4.3.4 Comparing Different Nitrogen Products For Yield and Grain Quality Responses in Wheat - Inverleigh, Vic

**Location:** Inverleigh

**Funding:**

SFS funded with donations from Advanced Nutrients Pty Ltd,

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**Rainfall (mm) April – November:** 393mm,  
Total – 529 mm

**Background:**

The management of wheat crop canopies through nitrogen manipulation (canopy management) has shown positive yield and quality benefits in previous trials. Given the array of nitrogen products on the market correct application to maximize yield and grain quality without damaging the plant is paramount. This trial aims to test the effectiveness of various granular and liquid nitrogen products, two nitrogen timings and two nitrogen dressings on yield and grain quality. This trial was run in conjunction with a similar trial at Mininera and builds on a similar trial conducted in 2006 at Yalla-Y-Poora.

▼ **Table 4.18: Trial inputs**

<b>Sowing date:</b>	16 <sup>th</sup> June 2007
<b>Variety:</b>	Jaeger wheat
<b>Harvest date:</b>	18 <sup>th</sup> December 2007

	Product	Rate	Date Applied
Herbicides	Roundup	1.5l/ha	16.06.07
	Triflur X	1.2l/ha	16.06.07
Fertiliser	MAP + Cu Zn	100kg/ha	16.06.07
Fungicides	Tilt	250mls/ha	10.08.07
	Folicur	145ml/ha	25.09.07

▼ **Table 4.19: Treatment list**

1	Untreated (0 N apart from sowing N)
2	Granular Urea 80kgN/ha @ GS 37 (20.9.07)
3	Split application 40kgN/ha @ GS 37 (20.9.07) + 40kgN/ha @ GS 65 (10.10.07)
4	Liquid N – drizzle bars 80kgN/ha @ GS 37 (20.9.07)
5	Liquid N – AI nozzles 80kgN/ha @ GS 37 (20.9.07)
6	Urease Inhibitor (7) 80kgN/ha @ GS 37 (20.9.07)
7	Urease Inhibitor (14) 80kgN/ha @ GS 37 (20.9.07)
8	Black Urea 80kgN/ha @ GS 37 (20.9.07)

**Product Descriptions:****Black Urea™:** N Analysis – 43.0%.

Works to improve nitrogen efficiency. An organo – urea complex to coat conventional urea. Benefits include: controlled N release, reduces volatilization and leaching, increases micro-organism activity for the N cycle and improves plant uptake. Black Urea is considered ineffective when soil organic carbon is higher than 2-2.5%. At the site, organic carbon was an average 1.2% and therefore the product was in theory, more effective. This product yielded the highest but not significantly.

**Easy N™:** N Analysis - 42.5%.

A concentrated liquid nitrogen fertiliser for application through directed soil and leaf sprays. Applied with both an AI 025 nozzle (the coarsest of conventional nozzles) and a drizzle bar designed specifically for liquid N application. There was no significant difference between the methods of application in terms of yield or protein %.

**Green Urea 7™:** N Analysis - 45.9%

A urease inhibitor. Agrotain treated urea for surface application where nitrogen loss through volatilisation is likely. The product can reduce the loss of ammonia by volatilisation for up to seven days. Its effectiveness may be reduced where urease enzyme activity is high.

**Green Urea 14™:** N Analysis - 45.8%.

A urease inhibitor. Agrotain treated urea for surface application where nitrogen loss through volatilisation is likely. The product reduces the loss of ammonia by volatilisation for up to fourteen days. Its effectiveness may be reduced where urease enzyme activity is high.

**Granular Urea™:** N Analysis - 46.0%.

A concentrated nitrogen fertiliser. Mainly used for pre-plant application in grain crops.

**Trial Design:**

A replicated randomized block design consisting of 4 repetitions. Plot length of 12m and width of 1.45m.

**Results:**

▼ **Table 4.20: Grain yield and grain quality in wheat**

Treatment (ranked in order of yield)	Yield (t/ha)	Protein (%)	Test Weight (kg/hl)	Screenings (%)	Thousand grain weight (g)
8.Black Urea	4.88	12.25 b	78.72	7.98	40.41
3. Split application	4.69	13.13 a	78.92	7.66	40.44
7. Urease Inhibitor (14)	4.63	13.03 a	78.85	7.29	40.03
6. Urease Inhibitor (7)	4.55	12.90 b	78.61	7.19	40.03
5. Liquid N – AI nozzle	4.50	12.53 b	78.95	8.49	39.66
1.Untreated	4.45	11.30 c	78.84	10.28	40.42
2. Granular Urea	4.45	12.90 a	78.87	7.28	40.01
4. Liquid N – drizzle nozzle	4.43	12.43 b	78.79	7.68	39.47
<b>LSD (P=0.05)</b>	<b>NSD</b>	<b>0.7014</b>	<b>NSD</b>	<b>NSD</b>	<b>NSD</b>
<b>CV</b>	<b>7.11</b>	<b>1.89</b>	<b>0.61</b>	<b>19.56</b>	<b>2.74</b>

Means followed by the same letter do not significantly differ.

LSD = Least significant difference. P = Probability. CV = Coefficient of variation. NSD = Not significantly different.

**Trial Observations:**

Significant differences were found in grain protein % only with treatments 3, 7 and 2 all having the highest grain protein. There were no significant differences in other grain quality parameters or in yield. This is likely to be due to the late timing of all nitrogen applications and a reasonably high soil Nitrogen content to start with (approximately 176 kg/ha).