Green Lightning Fertilizer Trial

Winter 2025

Objective: Evaluate the equivalence of Green Lightning to Urea when producing irrigated winter Wheat at MPH Ag.

Treatments:

MPH Ag typically apply Urea @ 100kg/ha to wheat (Beaufort) three times during the growing season (approximately at 4–5-week intervals during the growing season).

1. GS 3.0 (20th of August 2025)
2. GS 4.3 (23rd of September 2025)
3. GS 60-19 (Flowering) (25th of October 2025)

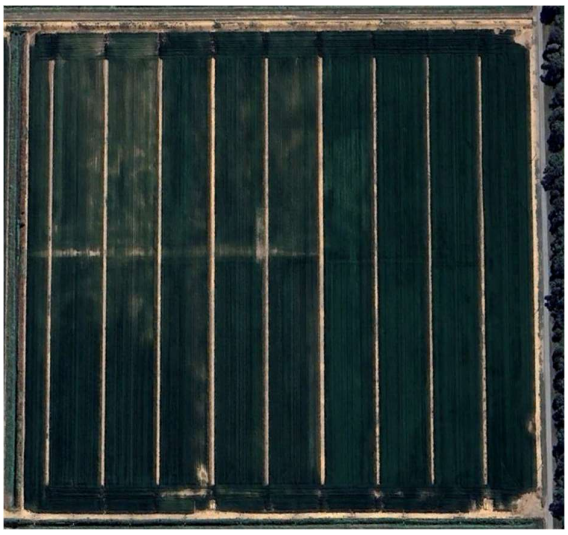
Treatment list	
1	Urea 100kg/ha
2	Green Lightening (200L/ha)
3	Urea 50kg/ha
4	Green Lightening (100L/ha)
5	Untreated

Each application of Green Lightning was made at the same time as the Urea applications.

The crop was planted on the 22nd of June 2025 and included 7.2 Units N at time of planting (starter N). No other fertilizer was applied to the crop during the season apart from a Manganese (Verno) application on the 24th of August 2025. There were two irrigation events during the trail period where all bays were flooded. The water MPH uses (treated waste water from Melbourne Water) typically test around 20 Units of N.

Methodology:

- Two application methods required for the application of **1: Urea** (broadcast) versus application of **2: Green Lightning** (Foliar spray application)
    - Application of fertilizer across a 32.7 swath down the center of each 40m*320m irrigation bay
        - 3m each side of checkbank would therefore be untreated area.
- All applications of Urea to be applied pre rainfall event to allow for incorporation of Nitrogen.
- Green Lightning and Urea applications applied at exactly the same time as the Urea during the growing season.
- Application of Granular Urea (46%) using a Bogbelle spreader and the Green Lightning using a Self-propelled Miller sprayer.
- Paddock location of 165 120-140 West
    - Each bay (1.2ha) will be considered an individual treatment.
    - Headlands not included as part of the trial.
    - Western half bay included as an untreated baseline.



165 120-140 West	Untreated	Urea 100 KG	Green Lightning 200L	Urea 50 KG	Green Lightning 100L	Untreated	Urea 100 KG	Green Lightning 200L	Urea 50 KG	Green Lightning 100L	145 Road
	0.6Ha	1.2Ha	1.2Ha	1.2Ha	1.2Ha	1.2Ha	1.2Ha	1.2Ha	1.2Ha	1.2Ha	
Bay No.	1	2	3	4	5	6	7	8	9	10	
	Rep 2					**Rep 1**					

- In Season herbicide/fungicide treatments
    - PSPE Sakura/Left hook (22nd June 2025)
    - Broadleaf weed control (Condor) + Verno & fungicide (24th August 2025)
    - Headwash fungicide (30th October 2025)
- Measurements to be taken
    - Leaf tests are completed 2 times a week each week from the 20th of August to the 10th of October 2025
        - Monday and Thursday leaf samples taken at 10am each day.
        - Youngest fully unfurled leaf taken from a plant every 4 meters across the treatment (8 leaves/bay * 2 reps = 16 leaves)
    - Final Yield analysis at harvest

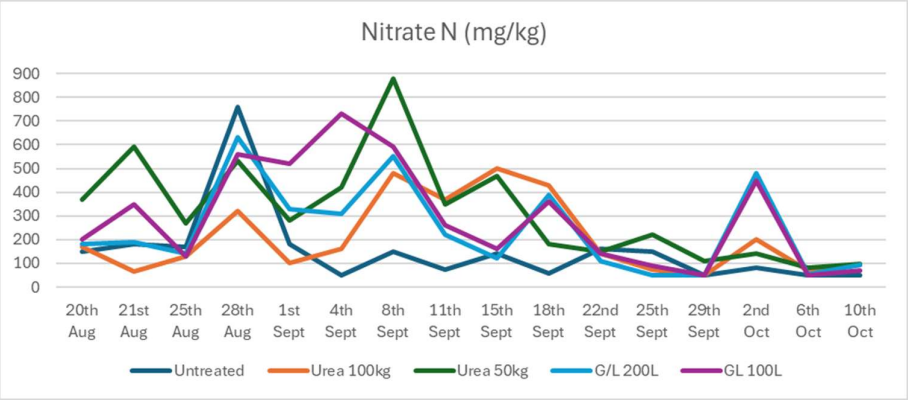
Results:

Leaf test results were compiled across the two months of leaf testing. Leaf test results are influenced by both the timing of application of the Urea/Green Lightning, along with two irrigation events during the leaf testing period which occurred on

- 28th August 2025
- 1st October 2025

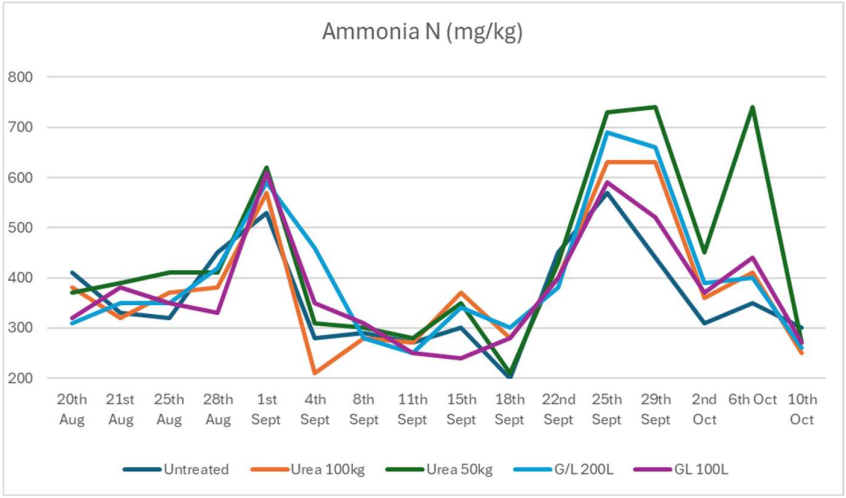
Nitrate N

Comparing Nitrate N of the Urea 100kg/ha (commercial application), levels of Nitrate N were significantly higher for both Green Lightning treatments a week after application however the Nitrate N levels were higher than green lightning in the period 3-4 weeks after application. This would indicate the Green lightning is able to provide a boost to Nitrate levels in the plant more rapidly than Urea due to the time taken for the conversion of Urea to usable N for the plant. There is also evidence of spikes in Nitrate N directly related to the irrigation scheduling (28th Aug & 1st Oct) with N available in the irrigation water.



Ammonia N

There is almost no difference in Ammonia N leaf levels in the leaf tissue tests between all treatments.



Biomass

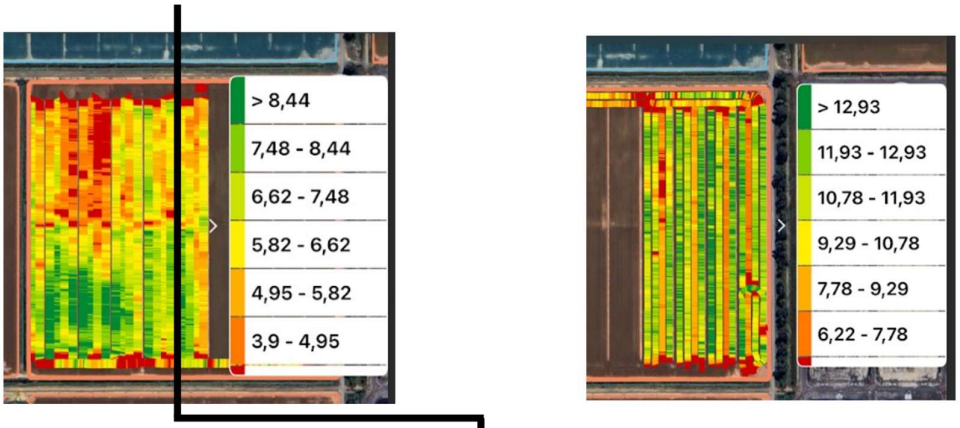
There was no observable difference in biomass between treatments with the exception of the Untreated which did not have as many tillers or total leaf matter.

Yield (Mt/ha)

The crop was not uniform in the northern half of the bays in Rep 2 so only a yield analysis was completed in the southern half of the irrigation bays. The full bays were analyzed in Rep 1 of the trial. The yield mapped was also undertaken by excluding the 4 meters alongside each checkbank which did not receive applications of Urea or Green Lightning.

Note:

Yield maps below have the untreated bay from Rep 1 (bay 6) recorded in the left image. We have added the black line and table to help readers get a better understanding of the data.



165 120-140 West	Untreated	Urea 100 KG	Green Lightning 200L	Urea 50 KG	Green Lightning 100L	Untreated	Urea 100 KG	Green Lightning 200L	Urea 50 KG	Green Lightning 100L	145 Road
	0.6Ha	1.2Ha	1.2Ha	1.2Ha	1.2Ha	1.2Ha	1.2Ha	1.2Ha	1.2Ha	1.2Ha	
Bay No.	1	2	3	4	5	6	7	8	9	10	
	Rep 2					Rep 1					

- Yield results for the treatments showed a significant difference between untreated and both the Urea and Green Lightning treatments. The average yield was similar between both the 50kg/ha and 100kgs/ha Urea along with the 100L/ha and 200L/ha of green lightning. There were also similar yields between the Green Lightning and the Urea treatments.

	Treatment list	Rep 1 (t/ha)	Rep 2 (t/ha)*
1	Urea 100kg/ha	10.3	7.3
2	Green Lightening (200L/ha)	10.7	7.4
3	Urea 50kg/ha	10.7	7.3
4	Green Lightening (100L/ha)	9.6	7.8
5	Untreated	6.9	6.1

* Only southern half of bay yield analysis completed due to paddock variability

Summary:

Green Lightning applications along with Urea applications resulted in increased yields vs untreated. The Green lightning applications resulted in the same yields to the commercial applications of Urea.