

## Key Outcomes:

- Best response with eNtrench was seen when applied early and IBS
- Highest yielding treatment was with 100L UAN applied at GS16
- No significant difference was found in protein results
- This is a difficult product to demonstrate using small plots as the benefit of nitrogen stabilisers is often shown improving the average result over a complete paddock.

**Trial Objectives:** To evaluate the efficacy of eNtrench as a nitrification stabiliser against current practise.

**Trial Duration:** 2013 Season

**Location:** Frances SA

**Soil Type:** Loam/Clay over clay

**Paddock History:** 2012 - Barley

**Crop Type/Variety:** Wheat - Scout

**Sowing Date:** 5/6/13

**Harvest Date:** 30/12/2013

**Growing Season Rainfall (Apr-Oct):** 472mm

**Yield Limiting Factors:** The trial site received heavy rainfall during July to August, and experienced intermittent water logging

**Type of Trial:** Replicated small plot trial

**Trial Design:** 8m Long plots x 8 rows x 15cm Spacing's, Randomised block Design with 4 replicates

## Abstract:

eNtrench is a nitrification inhibitor for use with nitrogen based fertilisers. Nitrification inhibitors reduce the bacterial conversion of ammonium nitrogen to nitrate nitrogen. This will retain more soil stable ammonium nitrogen in the root zone of crops for use at key crop yield determining growth stages. To be effective eNtrench must be applied with the nitrogen fertiliser.

This trial was conducted near Frances in SA to evaluate eNtrench and its ability to prevent nitrogen leaching or escaping via denitrification. All plots were sown with small plot equipment and managed as per usual agronomic treatment. Wheat variety chosen was Scout sown at 225 plants/m on the 6<sup>th</sup> of June. All plots were sown with 20kg/ha of P in the form of MAP with 400ml/ha of flutriafol.

A deep nitrogen test was taken from each treatment after harvest to determine if the stabiliser has prevented any nitrate nitrogen leaching. The protein in the grain from each

sample was measured to determine if the stabiliser maintained nitrogen availability later into the season. Evaluations were made by measuring yield from a small plot harvester. The greenseeker was also used to determine NDVI values for the different treatments at 2 timings.

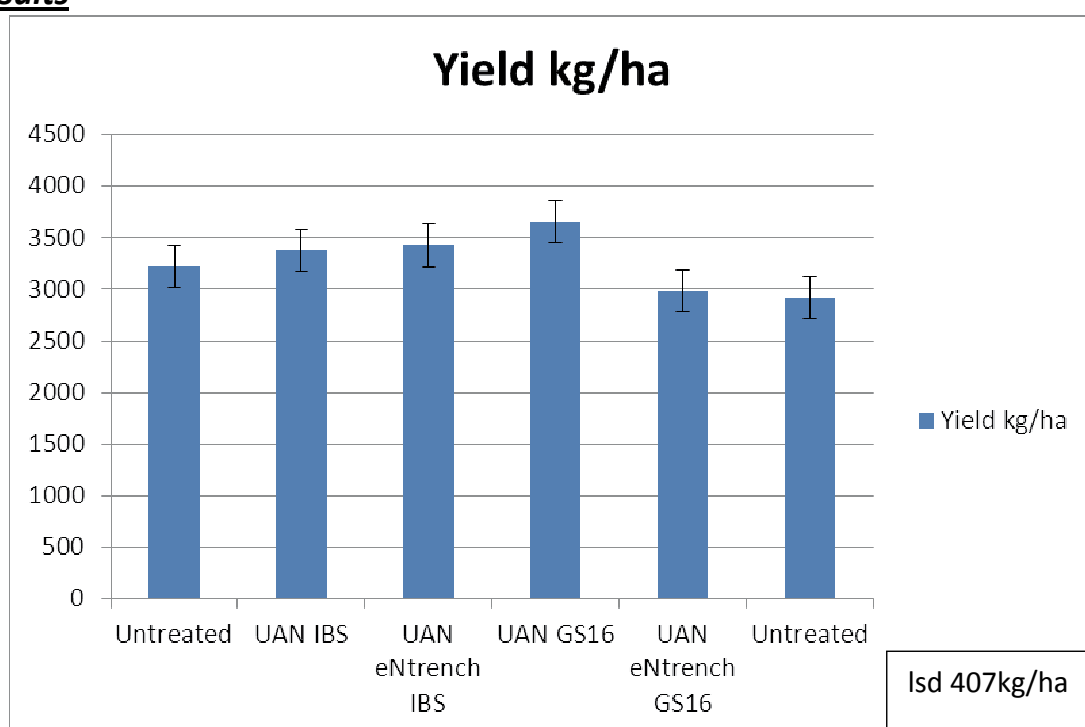
### Treatments & Trial Layout

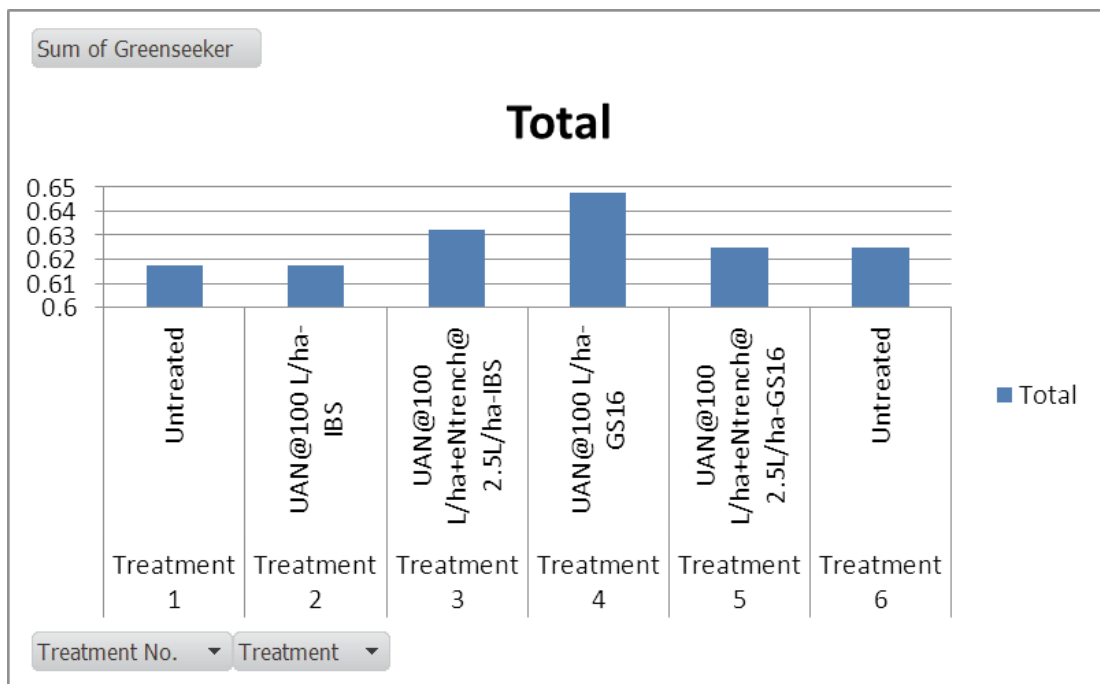
*All plots received 20kg of Phosphorus at sowing (MAP)*

NO.	TREATMENT	TIMING	AI RATE (gai / ha)	PRODUCT RATE (ml / kg / ha)	NOZZLES
1	Untreated	----	----	-----	
2	UAN	Pre Sow IBS	42kgN	100L/ha	Flat fan
3	UAN	Pre Sow IBS	42kgN	100L/ha	Flat fan
4	UAN	GS12	42kgN	100L/ha	Stream
5	UAN	GS12	42kgN	100L/ha	Stream
6	Untreated	----	----	----	

\* All other treatments required for grass weeds, nutrition, disease and insect control will be standard across all treatments.

### Results





The yield response graph shows the earlier application of eNtrench to be most effective, one possibility for this is during seeding the soil temperatures are still conducive for bacterial conversion of ammonium to nitrate (>10C). eNtrench protects the applied N (as ammonium) during the early warm soil period leading into winter then releases it during spring as the soil temperature increases again – this is the period during the maximum N uptake of the crop.

The bacteria that eNtrench influences typically go dormant when soil temperatures drop to 10 degrees so product response should weaken with later applications, however the reduced yield when eNtrench was applied with UAN at GS16 in this trial may suggest that the nitrogen was held in the less available ammonium form later into the season.

The graph showing the green seeker NDVI results were taken on the 14<sup>th</sup> of October and correlates well with yield response. NDVI readings show both an indication of chlorophyll or 'greenness' of the crop and the biomass of the crop canopy. The results show a higher NDVI reading with eNtrench applied with UAN IBS.

The trial suggests that eNtrench is having an influence on the nitrogen that it is applied with – further work is required at a commercial scale to measure the economic response.

### **Acknowledgements**

Elders Naracoorte would like to acknowledge and thank the following People and Organisations

- Tim Fry and Martin Flower for providing the location and site.
- SARDI for their cooperation and professionalism in conducting the trial on Elders behalf
- Dan Dixon & Ashley Knight from Dow for technical support and product
- Felicity Turner, Krysteen McElroy and the Mackillop Farm Management Group for a platform to communicate important agronomic issues to growers.