

3.4 Crop Nutrition Trials

3.4.1 TwinN wheat - Lake Bolac, Vic

Location: Lake Bolac Research Site.

Funding:

This was a Mapleton Agri Biotec (MAB) funded trial.

Researchers: Bruce Dixon (SFS)

Acknowledgements:

MAB would like to thank SFS for performing the trials.

Variety: Beaufort

Sowing date: 23 June 2010

Harvest Date: 28 Jan 2011

Herbicides:

- 23 Jun: Roundup Pmax, Goal, Boxer Gold
- 22 Sep: Axial, Precept, Prosaro, Hasten

Trial design:

Randomised complete block, 4 reps

Measurements:

The trial measured yield, protein levels and screenings to assess whether the reduced urea rates or TwinN affected yield and value of the crop

Paddock History:

2009: Barley

Treatments:

1. MAP 100 kg/ha
 2. MAP 100 kg/ha + Urea 100 kg/ha GS31
 3. MAP 100 kg/ha + Urea 50 kg/ha GS31
 4. MAP 100 kg/ha + Urea 50 kg/ha GS31 + TwinN GS 21
 5. MAP 100 kg/ha + Urea 75 kg/ha GS31 TwinN GS 21
- 23 Jun: MAP was applied at planting
 - 10 Sep: TwinN was applied at GS21 according to manufacturer's instructions
 - 30 Sep: Urea was applied at GS31

Summary of findings:

- The trial was designed to test the capacity of TwinN to enable reductions in nitrogen fertiliser applications
- The control treatments showed no statistical difference in yield between 0 and 50 kg/ha urea but a difference was seen between 50 kg and 100 kg/ha urea
- Yield from TwinN plus 75 kg/ha urea was not statistically different from that from the 100 kg/ha urea.
- No treatment effects were found in protein% or screenings%

Background/Aim:

Farmers are looking for ways to reduce their nitrogen fertiliser application rates without loss of yield to:

- Improve profitability
- Reduce negative effects of synthetic nitrogen on soil
- Grow crops in a variable rainfall region that can respond to a good season and better withstand late season dry finishes

TwinN has been shown in multiple trials in Australia and overseas to enable reductions in nitrogen fertiliser application. This trial aimed to evaluate whether TwinN could enable reductions in urea rates without loss of yield in wheat in the medium-high rainfall Victorian wheat region.

Treatment	Yield t/ha	Protein %	Screenings %
MAP 100 kg	2.93 (c)	10.3 (a)	3.5 (a)
MAP 100 kg + urea 100 kg	3.65(a)	10.3 (a)	3.0 (a)
MAP 100 kg + urea 50 kg	2.96 (bc)	10.5 (a)	2.8 (a)
MAP 100 kg + urea 50 kg TwinN GS21	3.15 (bc)	10.3 (a)	3.3 (a)
MAP 100 kg + urea 75 kg TwinN GS21	3.40 (ab)	10.0 (a)	3.0 (a)

* Values with the same letter beside them are not statistically different.

Results and discussion:

The trial results showed some response to nitrogen with no significant difference to yield between 0 and 50 kg urea, however with 100 kg urea producing a higher yield than the 50 kg/ha rate. Protein % and screening % showed no difference with varied rates of urea. The TwinN + 75 kg urea application was statistically equivalent to the 100 kg urea treatment.

This season the sites showed inconsistent responses to nitrogen applications and TwinN. A similar result was seen in the barley trial conducted by SFS in 2010 at Inverleigh, trials in NSW and in SA conducted for MAB. This made it difficult to interpret the results in any objective manner.

It is not possible to specify the reason for the variable nitrogen response, however district agronomists believe that consistent rain after many dry seasons led to substantial mineralisation

of soil nitrogen, thereby delivering sufficient nitrogen to preclude a clear cut nitrogen response.

The use of TwinN with reduced rates of nitrogen is designed to provide lower risk to farmers. High synthetic nitrogen applications have been demonstrated to reduce soil organic carbon, reduce total soil nitrogen, and increase plant susceptibility to disease.

Summary:

Cereal farming requires a cropping system that can leverage good seasons while avoiding penalties in hard finishing seasons. The combination of TwinN and lower rates of synthetic nitrogen is the lower risk, higher yielding option.

SFS will repeat this trial in 2011 to measure the responses to synthetic N and TwinN in a different season where a nitrogen response is more likely.