



Precision Ag Trials

DEMONSTRATION : Assessing the effects of variable rate N

Rand, Southern NSW

Aim:

- To compare the effects of using variable rate N in crop on the yield of crops in the Rand area
- To determine if N rich stripes and satellite maps could be used to better determine the need for N in crop.

Background:

To help assess if precision agriculture (PA) was a useful tool to help determine the N requirement in crop a demonstration was set up. As part of this large N rich stripes were applied in June 2011 and then strips of different rates of N were applied to a paddock that had already been zoned using a EM study and a single year of yield maps. The plan was to determine the optimum rate of urea for each zone in the paddock and to assess if using the N rich stripe or a satellite map taken in early August could be used to assess the need for N in the paddock.

About the trial:

Location of trial: "Green Park" Rand

Crop variety type: Lincoln Wheat

Equipment used: DBS parallelogram seeder, 12.3 metre with press wheels, Gold acres sprayer, Matador spreader spreading 36 metres and Auto farm and Trimble guidance equipment.

Sketch of trial design

Plot Number	1	2	3	4
N Rate Applied (kg/ha of N as Urea)	0	20	40	80
N Rich Strip*	Yes	Yes	Yes	Yes

*-N Rich strip applied in late June about 6 weeks prior to the expected time of Z31 when the rest of the N was applied.

What and when treatments were applied and what layers of spatial data were utilised.

- N rich stripe of 80 kg/ha of N (160 kg/ha of urea) was applied in late June across the site.
- Rates of urea from 0 to 160 kg/ha (0-80 kg/ha of N) were applied in mid August just prior to growth stage Z31 of the wheat. The site was not assessed using any spatial data but it was planned that a satellite map would be used to help to determine the optimum N rate.

Sowing Date – 18 May 2011

Seeding Rate – 65 kg/ha

Paddock History – 2010 – Canola

Herbicides – At sowing – Glyphosate and Boxer Gold

Assessments:

- Visual assessment prior to Z31.
- Soil analysis: EM was completed in 2009. Soil analysis (0-10 cm) was completed on the zone in the paddock in 2009 and was used in the determining the location of the demonstration. Zonal deep soil nitrogen (DSN) soil tests (0-60 cm) were completed in July 2011. The results showed that the P in all zones was high and that DSN was moderate to high in all plots. In 2012 the site will be tested again for N.
- Yield: Determined from the yield map of the paddock

Results:

N	1	2	3	4
N Rate (kg/ha of N)	0	20	40	80
N Strip	2.9	2.8	3.1	3
N Rich Strip	2.9	2.6	3.2	2.9
Zonal response	No	No	No	No
Quality	ASW	ASW	ASW	H2

*- All results subject to confirmation after the yield maps are fully analysed.

There was no visual response to applying N or yield. The N rich strips were also not obvious at the time of applying the N to the plots. This may have been a result of the moderate level of N in all zones, the dry spring and the time of application. From the DSN results, 20-60 kg/ha of N would have recommended in August in the various zones to achieve the yield targets that were considered achievable at that time.

The quality of the wheat produced was low (ASW due to low protein) indicating that insufficient N was applied. The economic analysis showed that the addition of N, lost money.

The N rich strips were a useful guide to assessing that there would be no response to applying additional of N but not for assessing differing responses in different zones. It has not been possible to assess if satellite map were a useful guide to possible N response.

Who was involved:

Property owner: Angus MacNeil

People and or businesses involved in data collection/ analysis/ services: Riverine Plains Inc, Jason Collier of Rand Fertilizers, Peter Baines of P Baines Agronomy, John Sykes Rural Consulting.

Trials coordinator: John Sykes

FSG contact: Leighton Wilksch

Grower/Regional feedback:

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