



# Precision Ag Trials

## Variable Rate Nitrogen *Urania YP*

Although PA tools have been available to Australian grain growers for many years, and the benefits have been well documented, it is estimated that less than 1-% of grain growers utilise PA 'beyond guidance' in any form.

The objective of this GRDC / SPAA funded project is to increase the level of adoption of PA 'beyond guidance' by broadacre farmers. The project specifically aims to increase the level of adoption of variable rate (VR) by growers in the project to 30% by 2013. This goal will be achieved by demonstrating how to use PA tools to growers at a regional level and by increasing the skills of growers and industry in PA to a level where they can then use PA tools in their farming systems to achieve economic, environmental and social benefits.

Trials and demonstrations are conducted on growers' properties and are visited throughout the season using farm walks and workshops to discuss the advantages and disadvantages of PA techniques with the involvement of other regional growers.

This information sheet presents the outcomes of the SPAA trial **2** from season 2011.

### **Aims:**

- To compare Variable Rate Nitrogen against Flat rate applications
- To compare two methods of zoning – using EM38 soil survey and 2009 Yield data

### **Background:**

Nitrogen is one of the biggest inputs farmers apply on Yorke Peninsula, with the majority applied in season and over multiple applications depending on the seasonal conditions.

With the wet season of 2010 illustrating that very high yields are possible in some areas of the paddocks, there is greater interest to use PA to target these area with higher inputs.

### **About the trial:**

Site: Urania, Central YP

Crop: Wheat

Equipment: Topcon X20 and Variable Rate Spreader

Treatments: VR Urea applied @ 22nd July – Average 100kg/ha

### Assessments:

Preseason Deep N's were collected from a range of EM values.

After the wet summer there were high levels of mineralised N in the soil, mostly in the top 10cm. There were also reasonable levels of subsoil moisture in the top 60cm.

Table 1. Deep N Lab Results (CSBP) (Only Nitrate Nitrogen is shown)

Depth	EM 23	EM 40	EM 60	EM 90	EM 130
0-10cm	51	48	59	42	41
10-40cm	32	25	21	27	11
40-60cm	1	1	2	14	25
<b>Total Water mm</b>	167	131	178	167	229

Overall the deep N tests indicate a high level of soil nitrogen, with an average of 220kg/ha across the sites.

The second part of this trial is to compare different zoning methods, one based on yield and another based on EM38 soil surveys.

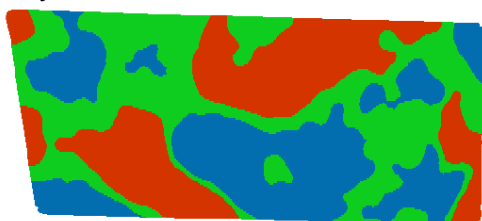


Figure 1. EM38 Zones



Figure 2. Yield Zones

In this trial we have used the 2009 yield map, as that was the last time the paddock had wheat, to create a variable rate input map with higher yielding areas getting more fertiliser and lower yielding areas receiving less.

The EM38 map was broken into 3 zones to match the yield map, with higher EM zones receiving less fertiliser due to the higher subsoil constraints and the lower EM values receiving higher amounts.

Treatments comparing the two zoning methods were spread the length of the paddock, with a flat rate zone in between replicates. There were four replicates across the paddock.

### Results:

Table 2. Results comparing VR to Flat rate of fertiliser across the two trials.

Zones based on EM38			Zones based on 2009 Yield		
EM Rate	VR Yield	Flat Yield	Yield Rate	VR Yield	Flat Yield
60 kg	5.18	5.22	140 kg	5.26	5.33
100 kg	5.03	5.06	100 kg	5	5.03
140 kg	4.76	4.78	60 kg	4.68	4.73

The table shows that while there was a 0.5t/ha variation from the high yielding zone to the low yielding zone there was no interaction with fertiliser. It didn't matter if there fertiliser was increased or decreased from the Flat rate of 100kg/ha urea, there was no significant impact on yield.

Because there was no effect of fertiliser on the yield it meant any potential benefit from VR was greatly reduced. This can likely be put down to the high levels of soil N recorded at the start of 2011. The trial does suggest that this paddock was over fertilised as there was no significant loss of yield from a 40kg/ha reduction in urea in either trial.

### Who was involved?

Farmer: Ashley & Louise Wakefield  
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## For more information

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