



Precision Ag Trials

Variable Rate Phosphorus *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 Phosphorus against Flat rate applications
- To compare 'P Replacement' with P application based on EM38 soil surveys

Background:

'P Replacement' is often the first and most commonly used method of managing fertiliser inputs and utilising VR technology. A major benefit of P Replacement is that farmer expenditure is more closely related to income with higher rates of P only been applied where higher yields have been removed.

This trial compares P replacement with a flat rate of 100kg DAP, but also compares variable P based on an EM38 map that has been found to map subsoil constraints.

About the trial:

Site: Urania, Central YP

Crop: Wheat

Equipment: Topcon X20 and Bourgault Seeder

Treatments: VR DAP applied @ 12th May – Average 100kg/ha

Assessments:

Preseason phosphorus testing has shown very reasonable soil reserves.

Table 1. Colwell P values across the EM ranges

	EM 23	EM 40	EM 60	EM 90	EM 130
Colwell P	38	58	48	35	39



Figure 1. EM38 Zones

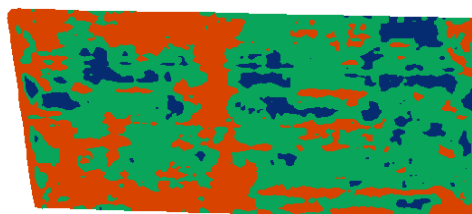


Figure 2. 'P Replacement Zones'

Trial strips, two seeder widths wide, were run the length of the paddock. The trial consisted of three replicates with a 100kg/ha flat rate sown in between each treatment. All treatments were sown with DAP.

Results:

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

VR based on 'P Replacement'			VR based on EM38		
Rate	VR Yield	Control	Rate	VR Yield	Control
80	5.28	5.26	75	5.24	5.33
100	5.34	5.28	100	5.3	5.31
120	5.35	5.24	125	5.2	5.16

As seen in Table 2 there was no significant effect on yield from changes in DAP, the differences between the controls reflect the different zones used for each comparison.

With high levels of soil P (table 1.) there was not expected to be an effect from reducing DAP rate. This is why a 'P Replacement' strategy is considered a viable option in areas with adequate P, inputs are matched to exports and therefore even though lower rates are applied to some areas of the paddock there is no danger of accidentally mining the soil reserves.

With the paddock averaging 5.2 t/ha it can be seen that neither zoning method provided any real benefit. In drier years yield was found to decrease with higher EM38 readings, but this year there was no correlation between Yield and EM. This is despite a very dry period at the start of spring where areas of shallow soils were clearly showing up, but these effects seemed to be more related to stone than chemical constraints.

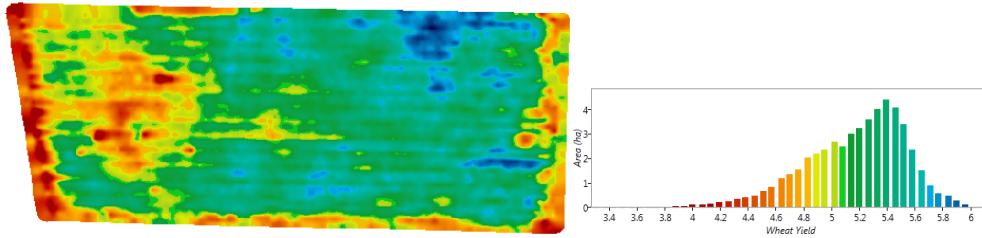


Figure 3. Wheat Yield Map and distribution graph.

Conclusion

With good soil phosphorus reserves 'P replacement' is a safe and viable option that will help farmers manage their inputs and maintain soil fertility in high yielding areas of the paddock.

Who was involved?

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