



Precision Ag Trials

Phosphorus Fertilizer Trial *Rand, NSW*

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 conducted in conjunction with and Riverine Plains and John Sykes Rural Consulting at Rand NSW in season 2010.

Aims:

- To investigate the potential role of reducing inputs to improve Gross Margins.
- Examine the effect of in crop monitoring using appropriate PA technology to enhance yield.
- Demonstrate to local farmers the potential use of PA tools for crop management.

Background:

The trial was undertaken in response to local grower interest in:

- Optimising seeding, N and P timing and rates to improve Gross Margins particularly in low rainfall years.
- Demonstrate that yield is not reduced in good years if starting inputs are lower, giving growers more flexibility in tailoring inputs to yield potential.
- Investigating the benefits of using PA particularly using EM to zone paddocks, in crop monitoring using satellite imagery and in crop devices.

About the trial:

- The trial was located at Rand, southern NSW.
- Lincoln wheat was direct drilled into a canola stubble that had been summer sprayed to control weeds.
- It was sown using a Jenke seeder, on 30cm spacing, with press wheels

- Sowing was guided by 2cm guidance, controlled by an Autofarm A5 and differing sowing rates were adjusted manually or using the controller.
- Full details, including management and monitoring, are detailed in the results.

Assessments:

Plant and tiller counts
 NDVI – hand held Crop Circe
 Yield
 Grain Quality
 Gross Margins

Results:

The Rand site was sown on the 12th May 2010 with 8 treatments of various amounts of seed and P fertilizer. The variety was Lincoln and the sowing fertilizer was MAP. The site had grown canola in 2009 and had been summer sprayed for weeds. It was direct drilled into the canola stubble. The site had an N rich strip of 50kg/ha of N applied about 5 weeks prior to the assessment in July 2010. The results are shown in Tables 1 and 2

TABLE 1 Results of the NDVI Test at the Rand Demonstration Site – July 2010

Treatment	NDVI
1. 35/11/0	0.3
35/11/40 (N rich strip ¹)	0.4
2. 70/11/0	0.7
70/15/40 (N rich strip ¹)	0.7+

¹ – N rich strip – Strip of 50 kg/ha of urea applied in early June (3 leaf stage). See notes in Nitrogen Application below. NDVI calculated as an average of 10 individual measurements taken from the each plot from the N rich strip and the treatment area to the south of the N rich strip. Assessment by PBaines Agronomy.

Table 1 shows that in July the higher NDVI were in the higher seed rates but that the N rich strip in the low seed rate area was showing about 0.1 difference to the reference treatment. This difference was not as apparent in the high seeding rate area.

Table 2 shows the yield result of the whole demonstration area from the yield map of the paddock and the grain tests from a sample taken on each treatments and tested using the resources of Grain Corp, Oaklands. The gross margin was calculated using the farm data recording program PAM. Unfortunately the site was flooded for a period of about 10-14 days in October 2010. This may have resulted in yields being lowered at the site. While the NDVI showed responses in the strips N was subsequently applied to the site. The yield map did not show a difference in these strips so it was not analysed separately.

TABLE 2 Results of the Rand Demonstration - 2010

Number	Treatment	Plants (plts/m ²)	Yield (t/ha)	Protein (%)	Test weight (kg/hl)	Screenings (%)	Gross Margin (\$/ha)
1	35/11/20+30 ^{1,2}	56	4.1	11.0%	76	0.9%	\$486
	35/11/50	56	4.1				
2	70/11/50	137	4.1	10.7%	76	1.1%	\$476
3	50/11/50	105	4.0	11.0%	76	0.7%	\$468
4	50/0/50		4.3	10.9%	76	0.9%	\$546
5	50/5/50		4.3	11.0%	76	1.0%	\$534
6	50/11/50		3.9	10.9%	76	0.7%	\$445
7	50/15/50		3.9	10.7%	76	1.0%	\$404
8	50/20/50		3.9	11.5%	76	0.6%	\$457

1- Seed Rate/P rate/N rate. P fertilizer as MAP applied at sowing, N as urea at Z31³. 2- N applied as a split at Z15 and Z31. First number in the N column is the amount of N in kg/ha applied at Z³15 and the number after the plus (+) is the N applied at Z31. 3- Z – Indicates the Zadock growth stage of wheat.

The results show that sowing at 35 kg/ha of seed did not adversely affect yield when compared to 70 or 50 kg/ha of seed. The site apparently did not respond to P. WUE was calculated as 13.5-15.3 kg/mm which is lower than target and probably reflects the waterlogging of the plants due to the flooding. Diseases were not noted as an issue on the site and the yield target was very high until October.

Nitrogen application - The majority of each treatment had 50 kg/ha of N applied as urea in mid August at about Z31. The amendments were

- To fulfill the requirements of the SPAA demonstration an N rich strip was applied across all treatments in late June (3 leaf stage or Z13) to test for N responses. This initially showed a response (Table 1) that was seen at the July field day which was measured using a hand held Crop Circle machine which was being shown at the field day (measurement by Peter Baines of PBaines Agronomy).
- Half of the treatment 1 had 20 kg/ha of N applied at about Z15 to try to determine if the experiment results could be repeated in the paddock. When the final N was applied at Z31, 20 kg/ha of N less was applied to this area. As this treatment did not show a yield response it was not included in the yield and quality results.



John Sykes speaking to growers at the Riverine Plains On Farm Trial Inspection held at Rand on 21 July 2010.



Leighton Wilksch, left, addressing farmers at the Riverine Plains Trial Inspection at Rand on 21 July 2010.

Who was involved?

Riverine Plains farmer, Roy Hamilton, provided both the site and equipment to sow and manage trial. Thank you to the Hamilton family for their generous support.

John Sykes managed the trial and co-ordinated the discussion group.

Riverine Plains provided trial extension, promotion and co-ordination.

Peter Baines Agronomy – Crop Circle.

SPAA – Leighton Wilksch facilitated the discussion group.

Grower/Regional feedback:

The trial site crop walk and PA update was offered to local growers in an effort by local stake holders to promote the use of PA “beyond guidance”. 70 attendees showed the level of interest locally in the issues being trialled and feedback for the day was positive. Unfortunately both the trial site and surrounding district suffered from major flooding in both October and early 2011 delaying harvest and causing hardship for many.

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For more information

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