Precision Ag Trials

Evaluating nitrogen rates using PA

Coolamon

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 trials from season 2011.

Aims:

- To investigate various rates of liquid and granular nitrogen on wheat protein using precision agriculture tools.

Background:

The growers Bruce Holden & his advisor Anthony Hall were interested in testing the efficacy of the 2 N application methods. The trial was planned to look at the impacts of various rates on yield & protein of wheat using precision ag technology. The wished to determine if there was an economic response and if the was any economic difference between the two methods.

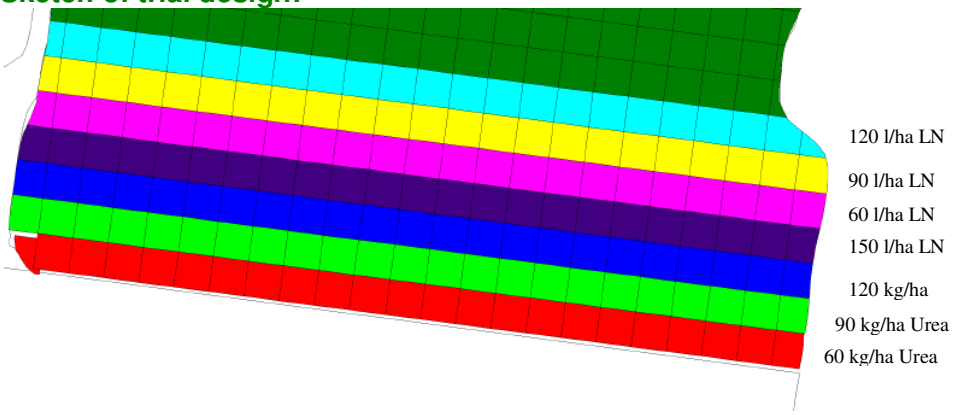
About the trial:

Method: Crusader wheat sown 20th May at 75kg/ha. 80kg/ha MAP + Impact. Logran @ 20gms/ha + Roundup @ 1l/ha pre-emergent. Fungicide to control Yr at Z39

Sowing and spraying and harvesting machinery using controlled traffic principles on multiples of 10.7m. Horwood Bagshaw bar on 250mm spacing's fitted with Golden Valley disc openers and Horwood Bagshaw seed cart running variable rate technology (VRT). Good yield expectations post Z39 and a targeted protein of 11.5% meant that extra Nitrogen would be required.

Urea was applied in 20m swaths using a VRT Marshall belt spreader and liquid N by 32m Goldacres boom spray using streaming nozzles. Four rates of liquid were applied and three rates of urea. Strips were 3 header widths wide. The middle strip was harvested, sub sampled for grain quality and yields recorded on the yield monitor. The entire paddock was yield mapped.

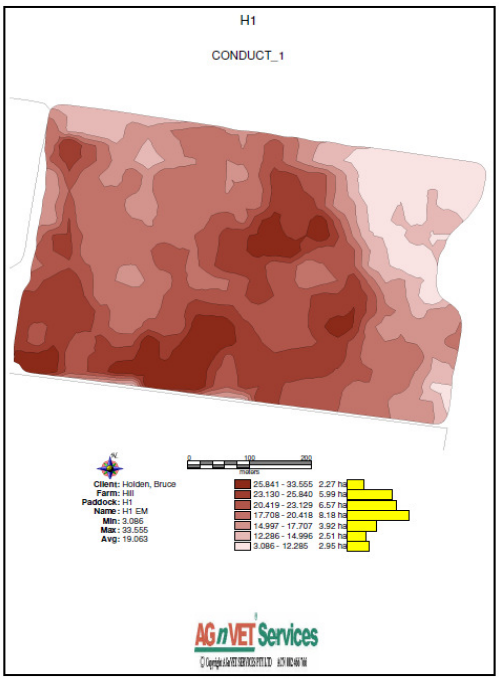
Sketch of trial design:



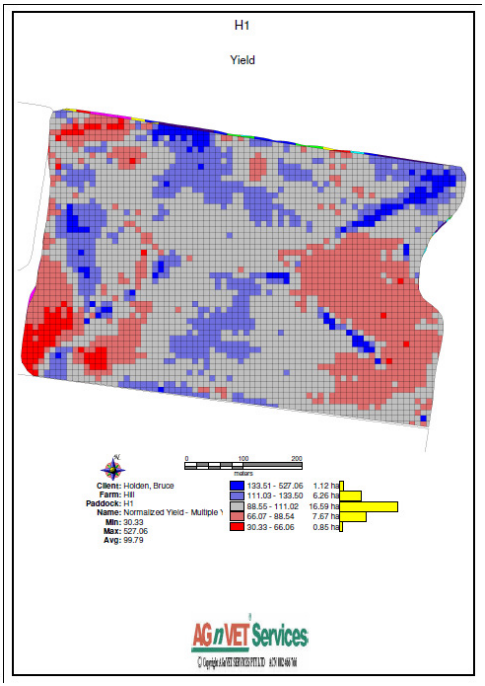
Assessments:

EM survey, soil testing including deep N, yield monitor data, grain quality assessment

Results:



EM survey map to identify zones

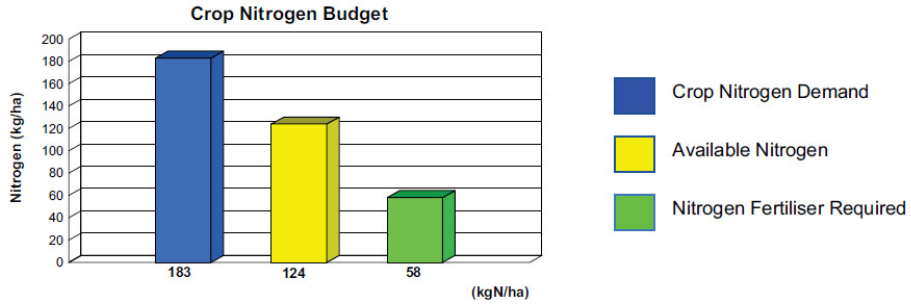


Historical normalised yield maps

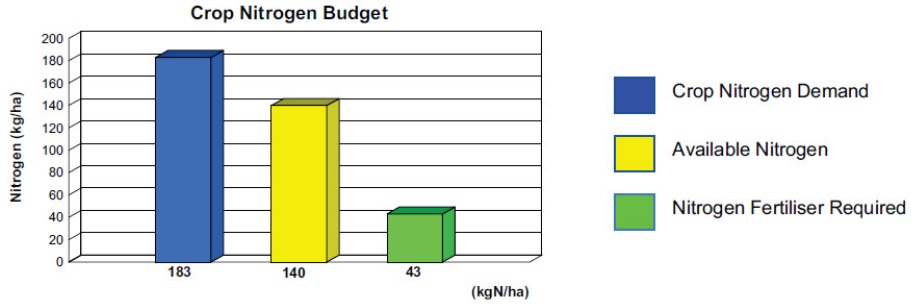
Using the EM survey @1.5m and historical yield maps the trial paddock was split into 3 zones. Soil samples were collected from each zone to determine the N requirements for the crop.

Results:

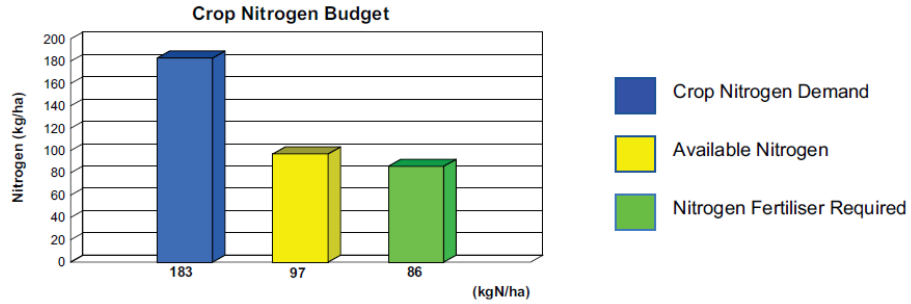
Grower Name:	Bruce Holden	**Nearest Town:**	RANNOCK
Sample No:	021200810	**Test Code:**	2002-093B
Paddock Name:	Hill 1	**Sample Type:**	Soil Cropping - Deepsoil
Sample Name:	high zone	**Sampling Date:**	09/08/2011



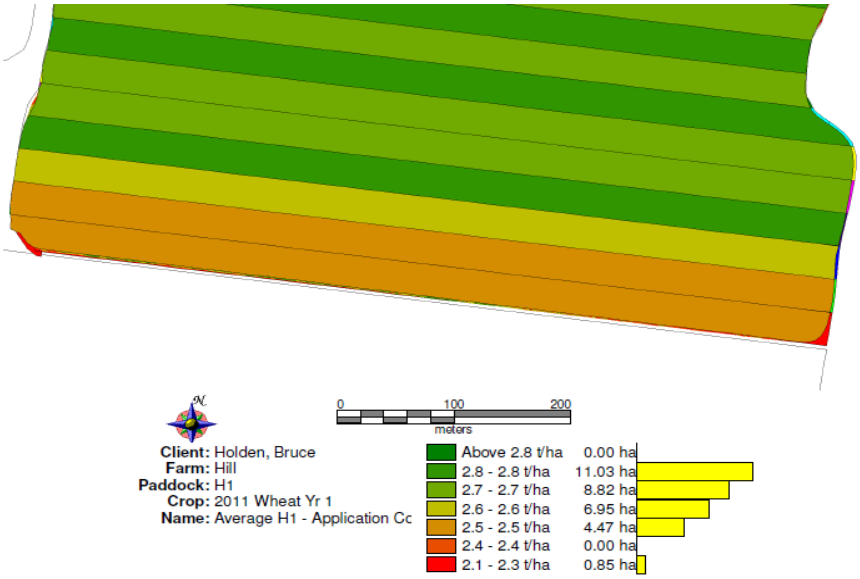
Grower Name:	Bruce Holden	**Nearest Town:**	RANNOCK
Sample No:	021200812	**Test Code:**	2002-093B
Paddock Name:	Hill 1	**Sample Type:**	Soil Cropping - Deepsoil
Sample Name:	Med zone	**Sampling Date:**	09/08/2011



Grower Name:	Bruce Holden	**Nearest Town:**	RANNOCK
Sample No:	021200815	**Test Code:**	2002-093B
Paddock Name:	Hill 1	**Sample Type:**	Soil Cropping - Deepsoil
Sample Name:	Low zone	**Sampling Date:**	09/08/2011



The low EM zone was determined to be low in N and an additional 40kg/ha required.



Yield map for trial area

	Treatment						
	Liquid N				Urea		
	60L	90L	120L	150L	60kg	90kg	120 kg
Moisture (%)	11.5	11.6	11.6	11.5	11.6	11.6	11.6
Protein (%)	12.3	11.5	13	12.8	12.4	11.9	12.6
Screenings (%)	3.7	1.3	4.3	5.6	5.3	2.8	3.9
Test Weight	77.5	78.5	77.5	76.5	76	76	76.5
Grade	H2	H2	H1	AUH2	AUH2	H2	H2
Price	185	185	243	179	179	185	185

Table 1: Grain quality results

The aim of the trial was to investigate the use of variable rate liquid & urea applications and their impacts on yield & grain protein. The liquid N application of 120l/ha achieved 2.8T/ha yield and increased protein to 13% which was $199/ha higher return than the 120kg/ha of Urea treatment. The 120kg/ha Urea treatment yielded 2.6t/ha and was graded as H2 because of a protein level of 12.6%. In this case it was economic to use the liquid N rate of 120l/ha. There were no other economic impacts from this trial work.

Who was involved?

List property owner – Bruce Holden
People and or businesses involved in data collection/ analysis/ services etc – Anthony Hall, AgNvet Services Temora
Trials coordinator – Mitch Allen FarmLink Research
FSG contact – Paul Breust FarmLink Research

This project was funded by the Grains Research and Development Corporation (GRDC).

For more information

Nicole Dimos
SPAA Executive Officer
P: 0437 422 000
E: nicole@spaa.com.au

Paul Breust
Farmlink Research
P: 0407 009750
E: paul@farmlink.com.au

www.spaa.com.au