



Precision Ag Trials

Variable urea rates on sandy loam and deep sand

Location

10km south of Kimba

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.

Urea rates on sandy loam and deep sand at Kimba 2011

Aims

- To compare the effects of variable urea rate on two soil types
- To compare different rates of urea applied at GS30

Background

Nitrogen is a limiting factor on siliceous sands on the upper Eastern Eyre Peninsula. Farmers use medic based pastures or more intensively cropped systems use a replacement fertiliser strategy. High rates are rarely used due to uncertainty of spring rainfall.

It was decided to push the limits in a small plot demonstration trial using district practice, high and very high rates to guide future decision making. Variable fertiliser rates were also applied on a broad scale in this paddock.

About the trial

Location of trial: 10km South of Kimba in typical dune swale country.

Rotation: wheat pasture wheat pasture.

Trial was located on two soil types in same paddock along a fence line that went from a sandy loam over a deeper sand hill. Paddock and trial sown end of May using a DBS seeder and Morris double box with a Canlink 3000 Farmscan controller at 50 kg 18:20 and 50 kg of Pugsley wheat.

Trial design

Demonstration only, not replicated

Site 1 = 20 cm of sand over a sandy clay loam.

Site 2 = deep sand > 1 metre.

Parallel plots 2 m width x 20 m length with control on each side.

What and when treatments were used

At sowing fertiliser used 50 kg 18:20 and 50 kg of Pugsley wheat

Control, 50 kg, 100 kg & 200 kg urea hand spread at GS31

Anticipated using a green seeker for evaluation during season

Harvested with SARDI small plot header

Assessments

Plant counts were consistent averaging 110 plants per square metre.

The amount of tillers in each treatment was not significantly different.

Root disease decreased yields in plots 7 & 8.

Observation that extra N allowed better growth and matured slightly early in season.

Yield decimated by rust in demonstration plots and paddock, estimated 50% loss.

Results

Additional N did not have an economic advantage in this season.

Paddock and demonstration site suffered from the dry 6 weeks period mid season.

Stem rust devastated potential 3 ton crop reducing yield by 50%. This combination resulted in poor yields, low test weight and high screenings.

Good soil showed improved protein over deeper sand regardless of extra N applied.

Extra N marginally improved protein but not enough economically to apply more.

Treatment	Plot	1/2 litre	kg/hL	Scr	Scr	Protein	Moisture	Yield
kg Urea		grams	/5	grams	%	%	%	t/ha
Sandy loam								
0	1	332	66.4	43.6	13.1	10.4	11.3	1.71
50	2	351	70.2	32.9	9.4	11.2	11.4	1.64
100	3	338	68.1	31.2	9.2	11.5	11.3	1.71
200	4	358	71.6	31.3	8.7	12.5	11.1	1.70
Deep sand								
0	5	299	59.8	42.3	14.1	10.1	11.4	1.49
50	6	317	63.4	47.6	15.0	10.3	11.5	1.64
100	7	344	68.8	26.1	7.6	10.6	11.6	1.51
200	8	367	73.4	31.5	8.6	10.9	11.3	1.48
Standard								
Feed F1			68-62	\$177*	15%			
GP			74-68	\$190*	10%			
APW/ASW			74	\$216*	5%	10.5		

*cash Port Lincoln

NOTE: high levels of rust affected yield and quality

Who was involved?

- “The Soaks” property owners Dion, Bert Barb Woolford
- Paddock and trial sown by Dion Woolford
- Tim Moyle Landmark Kimba pegged trials and applied urea
- Linden Masters MAC monitored plots and interpreted results
- Leigh Davis and Brenton Spriggs SARDI reapt plots
- Trials coordinator & FSG contact is Linden Masters

Grower/Regional feedback

Many questions exist of how much Nitrogen to apply in different seasons and soil types. With low organic carbon levels and sandy soils lack of ability to store nitrogen, adding N to the system using fertiliser is a standard district practice. Sowing machines with VRT allow a new option to address different soil types and potential crop needs.

How much N to apply to reap economic gains is at the forefront of decision making and risk management consideration in this district. Providing sufficient nutrition for early crop establishment is essential. Applying N at GS30 allows some flexibility towards seasonal conditions and managing risk. These trials aimed to push the boundaries and unfortunately due to rust results were inconclusive.

What we did learn it is essential to protect against rust as early as possible.

This project was funded by the Grains Research and Development Corporation (GRDC) and run in conjunction with Eyre Peninsula Farming Systems 3.

For more information

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