



# Precision Ag Trials

**Using lime and chicken litter to address  
low yields on sandy soils**

*Griffith, 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 **Using lime and chicken litter to resolve low yield sandy rises in cropping paddocks** from season 2010.

## **Aim:**

- To develop a method using PA tools and VR technology, to resolve low yielding sandy rises in cropping paddocks.

## **Background:**

Between Griffith and Hillston (NSW) there are large bands of cropping country which have sandy rises, of which, most times yields very poor of less than 1 ton per Ha, where the more productive areas of the paddock could be going 3 to 5 tons / HA. These poor yielding sandy rises can make up to 20 to 30 percent of a paddock.

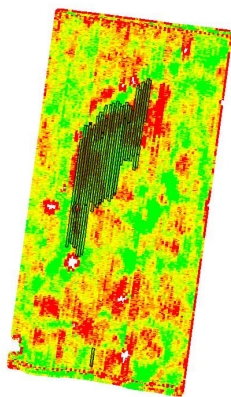
## **About the trial:**

The trial is located in Heaths paddock which is typical Mallee paddock with light textured soils and sandy rises (which is typical of many paddocks of the region). Heaths paddock was also selected because Michael and Barry Haskins from NSW Industry & Investment had already done quite a bit of work with yield maps and soil testing and a liquid fertilizer trial during 2009, resulting in a good history of the site.

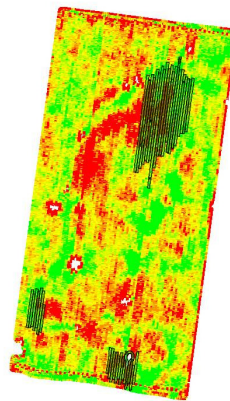


**Figure 1: Shows in the light brown areas where the sandy rises lay in the paddock.**

Prior to sowing, parts of sand rises were treated with 2tons/HA chicken litter and 2tons/HA lime (Highlighted dark green on images below). These were put out to see if there would be a yield response to these areas seen at harvest.



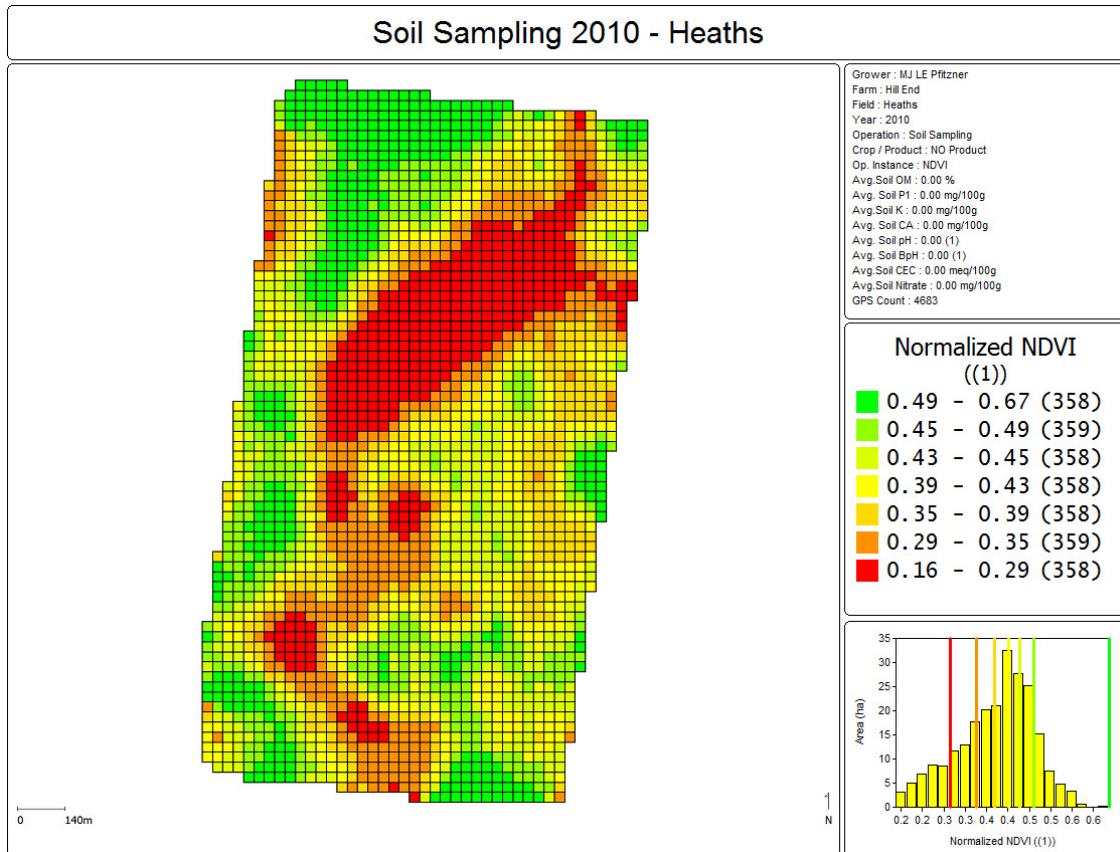
**Figure 2a.**  
**Lime application map**



**Figure 2b.**  
**Chicken litter application map**

The trial was sown on the 16<sup>th</sup> May with a NDF disc planter to Schooner Barley at a rate of 27kg/Ha. Variable rate fertilizer MAP 40, 47 & 50 kg/Ha and Sulphate of Ammonia 15, 19 & 28 kg/HA using a Flexicoil Air Seeder box was also applied.

During the season, in crop sensing with a Greenseeker® found only little (or no) response to Chicken litter or lime applications. Given the wet season, the manure rates were possible lighter than what was required for the season.



**Figure 3: NDVI map**

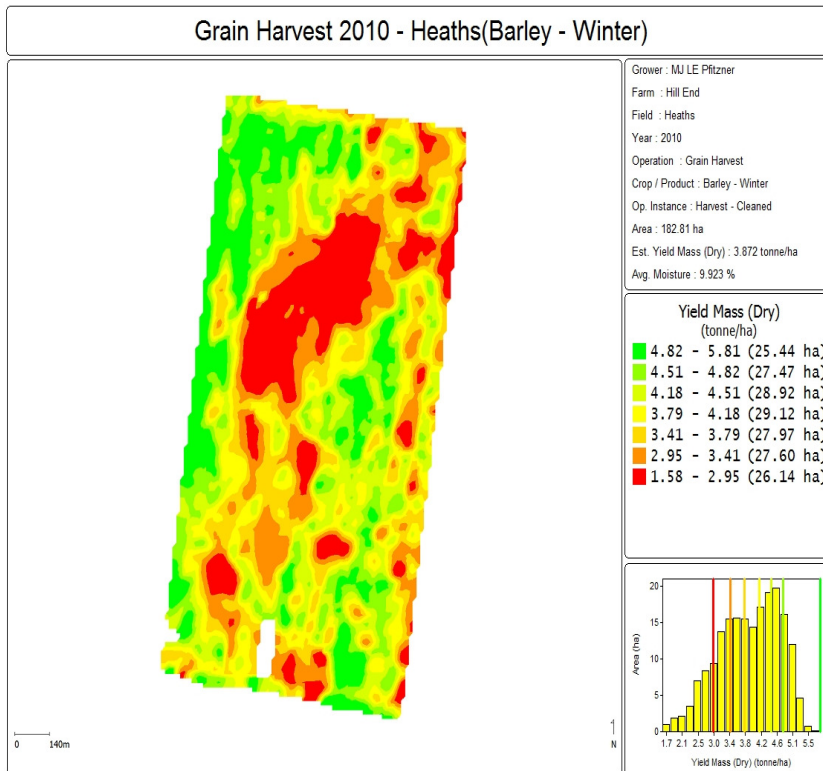
#### Assessments:

- ☐ NDVI
- ☐ Yield mapping
- ☐ Soil profile analysis
- ☐ N rich strips –at which rate 200kg/ha - test strips 2 X 5meters
- ☐ Gross margin analysis

#### Results:

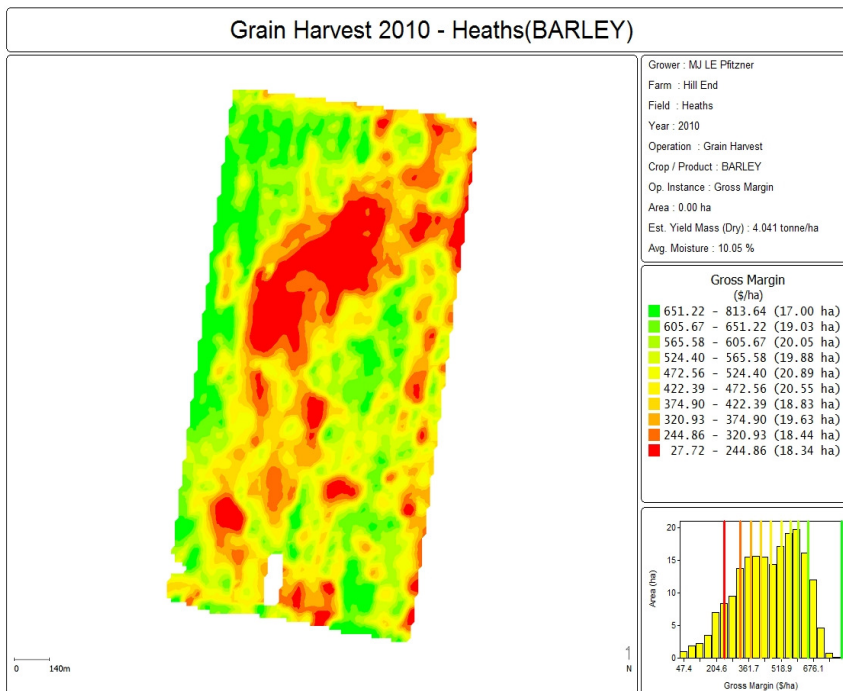
Yields ranged from 1.5t/ha to 5.8t/ha with yields in the lime and chicken litter applied regions still the lowest yielding areas of the paddock.

We managed to target MAP and SOA where there was yield potential and according to the yield map this was successful. The question remains, could we have economically improved the poorer performing areas of the paddock with higher rates of lime or litter?



**Figure 4: Yield map**

Economically, we found that little benefit from the lime and chicken litter application, however as discussed, the weather may have impacted its potential to address the issue observed on these sands.



**Figure 5: Gross margin map**

During the 2010 season, soil pits were dug and with the aid of Ian Packer (Lachlan CMA) and Barry Haskins (NSW I&I), where we identified an acid band 15 to 20 cm down in the A horizon in the areas of the sandy rises which were a few cm thick. This impeded root growth passing through this band.

The lime spreading was not targeted enough and chicken litter with its high nitrogen may have “counteracted the true effects” due to high leaching in the wet 2010 year. In some instances where the spreader had a higher rate in one patch, there was a (non statistical) significant response. Also, the N rich strips gave a big response to biomass.

### **What Next**

Michael intends to do some targeted ripping and lime placement into this acid band, with a machine lent to him by Farm link. He intends to continue monitoring with soil testing, NDVI and yield maps as well as nitrogen rich strips through the sand rises at sowing and after sowing.

### **Who was involved?**

Neil McMillan CWFS

Leighton Wilksch – SPAA Grower groups manager

Barry Haskins – NSW Industry & Investment

James Austin

Ian Packer – Lachlan CMA

Tim Neale & Andrew Whitlock – PrecisionAgriculture.com.au

### **Grower/ feedback:**

As usual, we find ourselves asking as many questions as we possibly can answer. Why don't we get a response to lime on these sandy soils? Is it because the problem is sub surface? We have seen a response to chicken litter on these sand rises before but not so much this year which may be due to the rate not being high enough for the rainfall received. We saw a big response from N rich strips but were mindful not to blow the protein out with the barley. As it turned out the protein was too high for malt.

This paddock is earmarked for Canola the 2011 season thus it will be interesting to see if we can get these sand rises to respond with ripping lime and manure into the problematic part of the soil profile.

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## **For more information**

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