



# Precision Ag Trials

**Variable rate lime**  
*Temora*

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 the impact of variable rate lime applications on dry matter production and yields after assessment with PA technologies.

## **Background:**

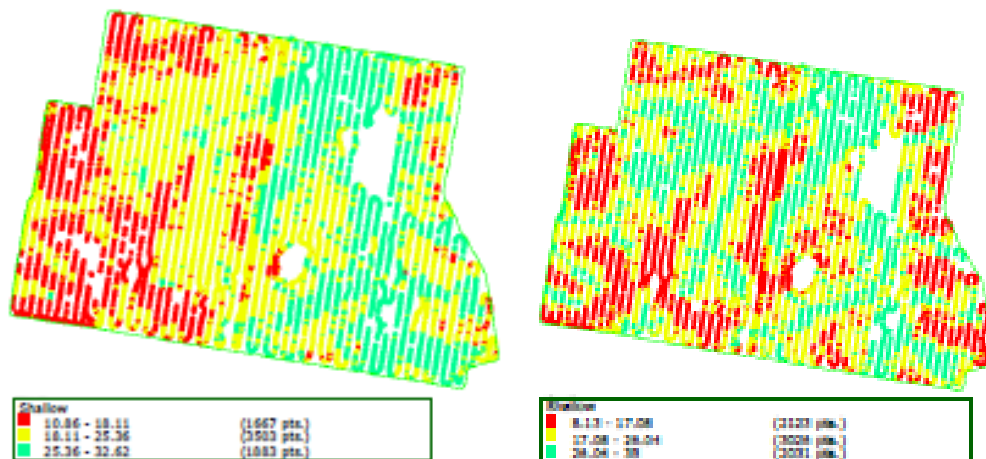
The grower Bruce Thompson had discovered variability in pH levels on his property at Temora. In consultation with his advisor, Craig Warren, Landmark Temora they collected data from various sources to

## **About the trial:**

- EM survey conducted and paddock area split into 3 zones. Soil tests collected from each zone and lime applied according to soil test results. Images collected to determine dry matter production of brown manure peas in 2011. Satellite imagery, NDVI scanning & yield mapping in 2012.

## **Results:**

Soil testing – 4 cores were collected from each zone identified with the EM survey's. Results are tabled below.



EM 0.5 and 1.5 (I) Thompson PA trial 2011

Zone 1.

| Nutrient (Depth 0.00 - 10.00)    | Result | Low                          | Marginal | Sufficient | High | Excess | Sufficiency Range |             |
|----------------------------------|--------|------------------------------|----------|------------|------|--------|-------------------|-------------|
| pH (1:5 CaCl2)                   | 4.7    | [Progress bar: 4.7 to 7.7]   |          |            |      |        |                   | 4.7 - 7.7   |
| pH (1:5 H2O)                     | 5.6    | [Progress bar: 5.5 to 8.5]   |          |            |      |        |                   | 5.5 - 8.5   |
| EC (1:5 H2O) dS/m                | 0.06   | [Progress bar: 0.00 to 0.80] |          |            |      |        |                   | 0.00 - 0.80 |
| EC (se) (dS/m)                   | 0.5    | [Progress bar: 0.0 to 9.7]   |          |            |      |        |                   | 0.0 - 9.7   |
| Chloride (1:5 H2O) mg/kg         | 14     | [Progress bar: 0 - 250]      |          |            |      |        |                   | 0 - 250     |
| Organic carbon (Walkley Black) % | 0.90   | [Progress bar: 1.00 - 2.00]  |          |            |      |        |                   | 1.00 - 2.00 |
| Nitrate nitrogen (KCl) mg/kg     | 19     | [Progress bar: 20 - 50]      |          |            |      |        |                   | 20 - 50     |
| Nutrient (Depth 10.00 - 30.00)   | Result | Low                          | Marginal | Sufficient | High | Excess | Sufficiency Range |             |
| pH (1:5 CaCl2)                   | 5.3    | [Progress bar: 4.7 to 7.7]   |          |            |      |        |                   | 4.7 - 7.7   |
| pH (1:5 H2O)                     | 6.1    | [Progress bar: 5.5 to 8.5]   |          |            |      |        |                   | 5.5 - 8.5   |
| EC (1:5 H2O) dS/m                | 0.04   | [Progress bar: 0.00 to 0.80] |          |            |      |        |                   | 0.00 - 0.80 |
| EC (se) (dS/m)                   | 0.3    | [Progress bar: 0.0 to 9.7]   |          |            |      |        |                   | 0.0 - 9.7   |
| Chloride (1:5 H2O) mg/kg         | 12     | [Progress bar: 0 - 250]      |          |            |      |        |                   | 0 - 250     |
| Organic carbon (Walkley Black) % | 0.40   | [Progress bar: 1.00 - 2.00]  |          |            |      |        |                   | 1.00 - 2.00 |
| Nitrate nitrogen (KCl) mg/kg     | 7      | [Progress bar: 20 - 50]      |          |            |      |        |                   | 20 - 50     |

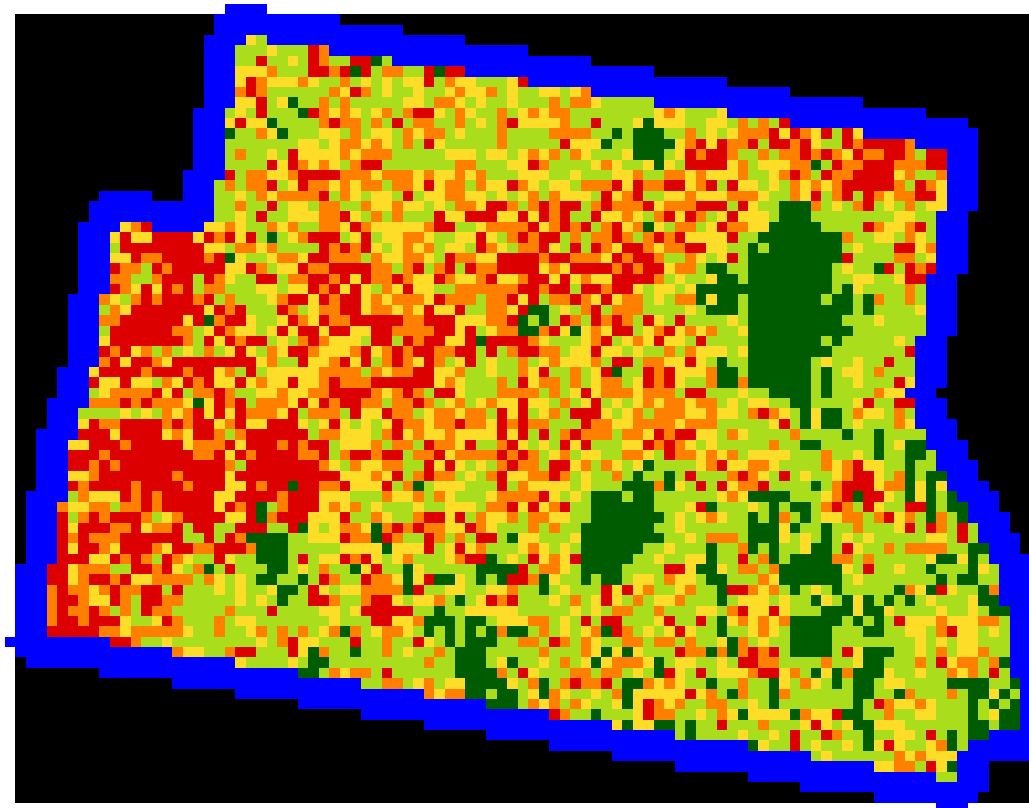
Zone 2.

| Nutrient (Depth 0.00 - 10.00)    | Result | Low                          | Marginal | Sufficient | High | Excess | Sufficiency Range |             |
|----------------------------------|--------|------------------------------|----------|------------|------|--------|-------------------|-------------|
| pH (1:5 CaCl2)                   | 4.4    | [Progress bar: 4.7 to 7.7]   |          |            |      |        |                   | 4.7 - 7.7   |
| pH (1:5 H2O)                     | 5.4    | [Progress bar: 5.5 to 8.5]   |          |            |      |        |                   | 5.5 - 8.5   |
| EC (1:5 H2O) dS/m                | 0.07   | [Progress bar: 0.00 to 0.80] |          |            |      |        |                   | 0.00 - 0.80 |
| EC (se) (dS/m)                   | 0.8    | [Progress bar: 0.0 to 9.7]   |          |            |      |        |                   | 0.0 - 9.7   |
| Chloride (1:5 H2O) mg/kg         | 13     | [Progress bar: 0 - 250]      |          |            |      |        |                   | 0 - 250     |
| Organic carbon (Walkley Black) % | 0.90   | [Progress bar: 1.00 - 2.00]  |          |            |      |        |                   | 1.00 - 2.00 |
| Nitrate nitrogen (KCl) mg/kg     | 25     | [Progress bar: 20 - 50]      |          |            |      |        |                   | 20 - 50     |
| Nutrient (Depth 10.00 - 30.00)   | Result | Low                          | Marginal | Sufficient | High | Excess | Sufficiency Range |             |
| pH (1:5 CaCl2)                   | 5.1    | [Progress bar: 4.7 to 7.7]   |          |            |      |        |                   | 4.7 - 7.7   |
| pH (1:5 H2O)                     | 5.9    | [Progress bar: 5.5 to 8.5]   |          |            |      |        |                   | 5.5 - 8.5   |
| EC (1:5 H2O) dS/m                | 0.04   | [Progress bar: 0.00 to 0.80] |          |            |      |        |                   | 0.00 - 0.80 |
| EC (se) (dS/m)                   | 0.3    | [Progress bar: 0.0 to 9.7]   |          |            |      |        |                   | 0.0 - 9.7   |
| Chloride (1:5 H2O) mg/kg         | 11     | [Progress bar: 0 - 250]      |          |            |      |        |                   | 0 - 250     |
| Organic carbon (Walkley Black) % | 0.40   | [Progress bar: 1.00 - 2.00]  |          |            |      |        |                   | 1.00 - 2.00 |
| Nitrate nitrogen (KCl) mg/kg     | 6      | [Progress bar: 20 - 50]      |          |            |      |        |                   | 20 - 50     |

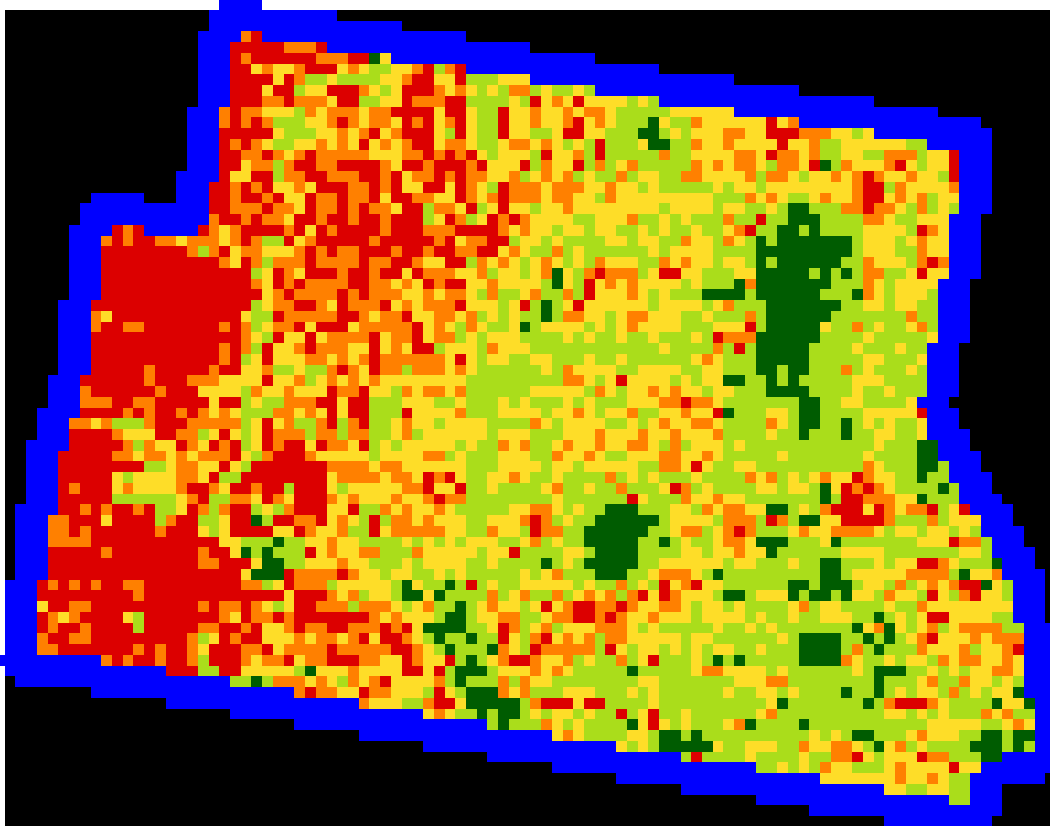
Zone 3.

| Nutrient (Depth 0.00 - 10.00)    | Result | Low | Marginal | Sufficient | High | Excess | Sufficiency Range |             |
|----------------------------------|--------|-----|----------|------------|------|--------|-------------------|-------------|
| pH (1:5 CaCl2)                   | 4.6    |     |          |            |      |        |                   | 4.7 - 7.7   |
| pH (1:5 H2O)                     | 5.5    |     |          |            |      |        |                   | 5.5 - 8.5   |
| EC (1:5 H2O) dS/m                | 0.06   |     |          |            |      |        |                   | 0.00 - 0.80 |
| EC (se) (dS/m)                   | 0.5    |     |          |            |      |        |                   | 0.0 - 9.7   |
| Chloride (1:5 H2O) mg/kg         | 16     |     |          |            |      |        |                   | 0 - 250     |
| Organic carbon (Walkley Black) % | 0.80   |     |          |            |      |        |                   | 1.00 - 2.00 |
| Nitrate nitrogen (KCl) mg/kg     | 22     |     |          |            |      |        |                   | 20 - 50     |
| Nutrient (Depth 10.00 - 30.00)   | Result | Low | Marginal | Sufficient | High | Excess | Sufficiency Range |             |
| pH (1:5 CaCl2)                   | 5.3    |     |          |            |      |        |                   | 4.7 - 7.7   |
| pH (1:5 H2O)                     | 6.0    |     |          |            |      |        |                   | 5.5 - 8.5   |
| EC (1:5 H2O) dS/m                | 0.03   |     |          |            |      |        |                   | 0.00 - 0.80 |
| EC (se) (dS/m)                   | 0.3    |     |          |            |      |        |                   | 0.0 - 9.7   |
| Chloride (1:5 H2O) mg/kg         | 12     |     |          |            |      |        |                   | 0 - 250     |
| Organic carbon (Walkley Black) % | 0.40   |     |          |            |      |        |                   | 1.00 - 2.00 |
| Nitrate nitrogen (KCl) mg/kg     | 6      |     |          |            |      |        |                   | 20 - 50     |

Zone 2 was identified as lower in pH and it was decided to apply an additional .5t/ha above the rest of the paddock that was to receive 1.2t/ha. Application was carried out by using a hand held GPS unit with the zone map uploaded. As the operator moved between zones the rates were adjusted accordingly. A crop of brown manure peas was sown into the paddock following application of the Lime.



Thompson PA trial satellite NDVI image July 2011



Thompson PA trial satellite NDVI image August 2011

NDVI satellite imagery was collected to establish dry matter production difference in 2011. The crop was sown as brown manure peas and therefore there were no yield results. Yield data will be collected in 2012 as part of the trial program.

#### Who was involved?

List property owner – Bruce Thompson

People and or businesses involved in data collection/ analysis/ services etc – Craig Warren, Landmark 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](mailto:nicole@spaa.com.au)

Paul Breust  
Farmlink  
P: 0407 009750  
E: [paul@farmlink.com.au](mailto:paul@farmlink.com.au)



[www.spaa.com.au](http://www.spaa.com.au)