



# Precision Ag Trials

## Using different rates of fertiliser across three soil types at Cocata

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 different rates of fertiliser across three soil types at Cocata** in season 2010.

### Aims

- To compare the effects varying fertiliser rates on three different soil types
- To compare fertiliser rates Nil, replacement, standard and high

### Background

No variable rate sowing has been conducted in this area of the district. Soil types vary as does available plant nutrition. This trial was conducted to validate using different rates of fertiliser to gauge future use of VRT.

**Does replacement only rates of fertiliser have a future, or is current practice best practice?**

### About the trial

The trial was conducted on Damien Mullen's property in the Hundred of Cocata, 3km south west of Ucontichie.

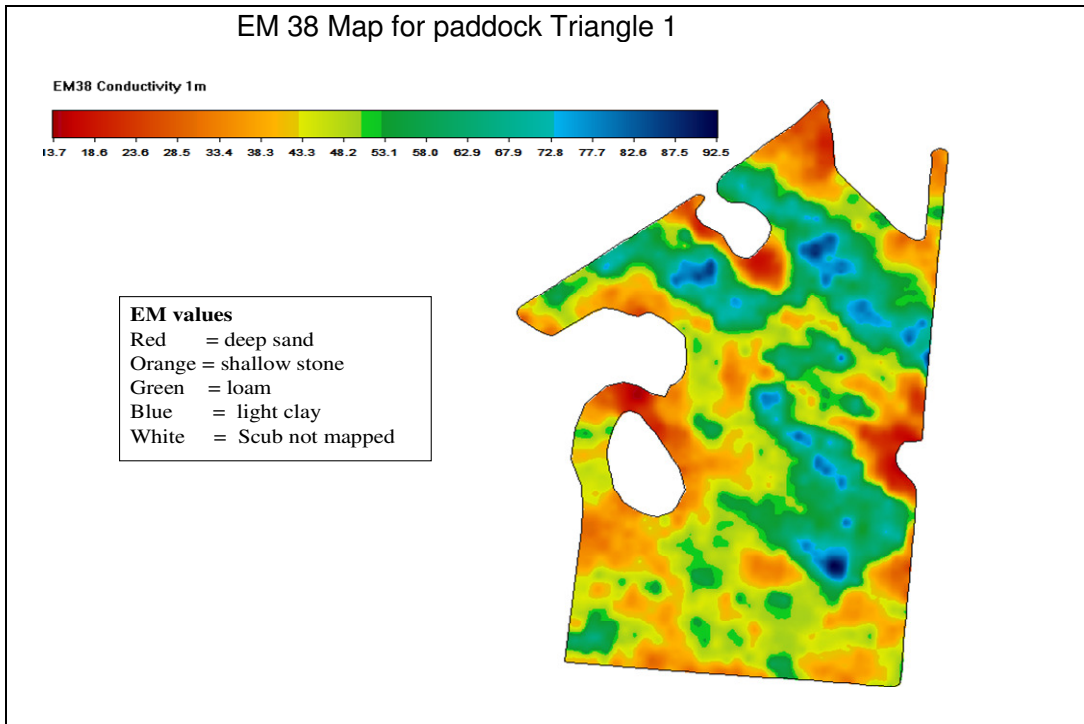
The 0-10 cm soil was tested for nutrition and the whole paddock EM38 mapped by Peter Treloar, Precision Ag Services.

The paddock was sown to wheat with a 60 ft airseeder and reapt using a 40 ft front with yield mapping capabilities. The trials were designed using 2 runs of the airseeder which equalled 4 header widths.

Sketch of trial design

Standard	High	Replace	Nil	Standard	High	Replace	Nil	Standard
60 kg	80 kg	40 kg	0 kg	60 kg	80 kg	40 kg	0 kg	60 kg

- All treatments were sown with wheat at 60 kg/ha with 50 kg urea placed below the seed.
- 2 replicated fertiliser treatments of nil, 40 kg/ha (replacement), 60 kg/ha (standard), 80 kg/ha (high).
- Paddock EM38 mapped but strips were sown directly across all soil types.
- Yield data was correlated to EM38 data after harvest



### Assessments:

**Plant counts** average 120 plants/m<sup>2</sup>

### Soil analysis

0-10 cm	Nitrate	Ammonia	Cowell P	PBI	% CaCO <sub>3</sub>	pH CaCl <sub>2</sub>	pH water	EC (µS)
sand	11.79	1.17	29.1	5.98		6.4	7.29	63.2
loam	15.71	6.67	30.2	24.71		7.63	8.46	116.4
stone	12.19	5.34	30.2	31.34		7.52	8.42	96
<b>40-60 cm</b>		4.52			22	8.45	9.62	144.4

Nitrogen levels, small variation in sand, rock & loam 0-10cm soil tests.

Phosphorus levels were good with little variation over zones. PBI very low in sand which may influence sufficient P available to plants.

No chemical sub soil constraints although a calcrete layer could limit PAW (plant available water) in stony areas.

Paddock name "Triangle 1"

## Yield Results

Harvested on 6 January 2011 (2.8ha or 7 acres per strip)

- **Nil** (0 kg) 1.42t/ha
- **Replacement** (40kg) 2.63t/ha
- **Standard** (60kg) 2.67t/ha
- **High** (80kg) 2.71 t/ha

Protein	Treatment	Yield
8.3%	nil phosphorus /nil	1.42 t/ha
9.7%	replacement 40 kg 18:20+ 30 kg urea	2.63 t/ha
10.3%	standard 60 kg 18:20+ 30 kg urea	2.67 t/ha
10.6%	high 80 kg 18:20 + 30kg urea	2.71 t/ha

A large response to fertiliser from Nil to replacement calculated from previous season. Standard practice of 60 kg/ha did not give an economic yield advantage over the 40 kg replacement, although protein was increased with additional fertiliser.

The P buffering index was low which should allow previous applied P to be readily available. The very low PBI on the sand PO should be monitored. A fence has been removed from paddock and Northern end barley in 2009, Southern pasture 2009. This did not show any difference in the yield map.

## Who was involved?

Property owner: Damien Mullan

People and or businesses involved in data collection/analysis/services etc:  
Linden Masters, Steve McCormick and Damien Mullan - plant counts and soil collection. Peter Treloar, Precision Ag Services the EM38 mapping.

Trials coordinator: Linden Masters

FSG contact: Damien Mullan

## Grower/Regional feedback:

It was the first time Damien had access to EM 38 mapping and setting up a trial such as this. Very interested in future possibilities but would select a better paddock next time to stretch the variable rate aspect. In building this newer country, fertiliser rates are kept up rather than looking for reducing inputs. He felt the need to watch the protein in wheat implicated in the fertiliser rate of this trial.

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## For more information

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