

# Wheat response to polymer-coated urea at Dandaragan 2013

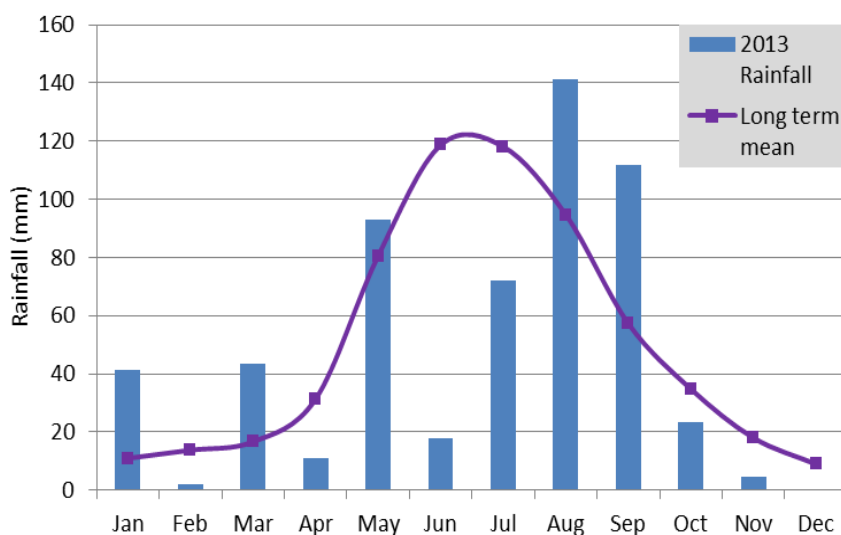
Brett Beard, Area Manager, Summit Fertilisers, Moora

<b>Purpose:</b>	To investigate the response of wheat to polymer-coated urea
<b>Location:</b>	WMG Main Trial Site, Negus's farm, Dandaragan RD, Dandaragan
<b>Soil Type:</b>	Sand
<b>Rotation:</b>	2012 Pasture

## Soil Test Results:

Depth (cm)	Topsoil	Subsoil
pH Level (CaCl <sub>2</sub> ) (pH)	5.4	3.9
Aluminium CaCl <sub>2</sub> (mg/Kg)	0.5	8.2
PBI	27	
Organic Carbon %	1.3	
Conductivity (dS/m)	0.08	0.02
Ammonium Nitrogen (mg/kg)	1	
Nitrate Nitrogen (mg/kg)	23	
Phosphorus Colwell (mg/kg)	21	13
Potassium Colwell (mg/kg)	79	36
Sulphur (mg/kg)	6	3
Copper (mg/kg)	0.2	
Zinc (mg/kg)	0.7	
Exch Calcium (mg/kg)	3.4	
Exch Magnesium (mg/kg)	0.4	
Exch Sodium (mg/kg)	0.1	
Exch Potassium (mg/kg)	0.2	

**Growing Season Rainfall (April-October 2013):** 471mm compared to the long-term average of 536mm. Mid-May to mid-July was particularly dry. June saw 18mm fall compared with the long-term June average of 119mm.



## BACKGROUND SUMMARY

An investigation of the potential benefits to growing wheat with the slower release of N from polymer-coated urea compared with traditional uncoated urea, either completely banded at seeding or split with topdressed follow-up applications.

## TRIAL DESIGN

**Plot size:** Length 12 m, Width 2 m, Row spacing 25.4 cm (10")  
**Machinery use:** Small plot seeder, knife points and press wheels  
**Crop type and varieties used:** Cobra wheat  
**Seeding rates and dates:** 70 kg/ha on 10<sup>th</sup> May 2013  
**Fertilizer prep:** SOP 100 kg/ha IBS  
Gusto Gold 120kg/ha

**Herbicide rates and dates:**

Pre-emergent	118 g/ha Sakura
	2 L/ha Avadex
	400 mL/ha Diuron
	3 g/ha Ally
	2 L/ha SpraySeed
Post-emergent	30 g/ha Monza (2/06/13)
	350 mL/ha Axial (15/06/13)
	670 mL/ha Velocity (25/06/13)

**Insecticides applied:**

Pre-emergent	200 mL/ha Bifenthrin
	1 L/ha Chlorpyrifos
Post-emergent	300 mL/ha Chlorpyrifos (26/05/13)

## Treatments:

Trt	N (kg/ha)	Urea Form	Applicato nmethod		Urea banded at seeding (kg/ha)	Urea topdressed 25 <sup>th</sup> June (kg/ha)	Urea topdressed 22 <sup>nd</sup> July (kg/ha)
1	0		Untreated				
2	35	Coated	Banded		75		
3	55	Coated	Banded		120		
4	35	Coated	Topdress ed	split	25	25	25
5	55	Coated	Topdress ed	split	40	40	40
6	35	Uncoate d	Banded		75		
7	55	Uncoate d	Banded		120		
8	35	Uncoate d	Topdress ed	split	25	25	25
9	55	Uncoate d	Topdress ed	split	40	40	40

## TRIAL LAYOUT

→N

Rep/plot No. 

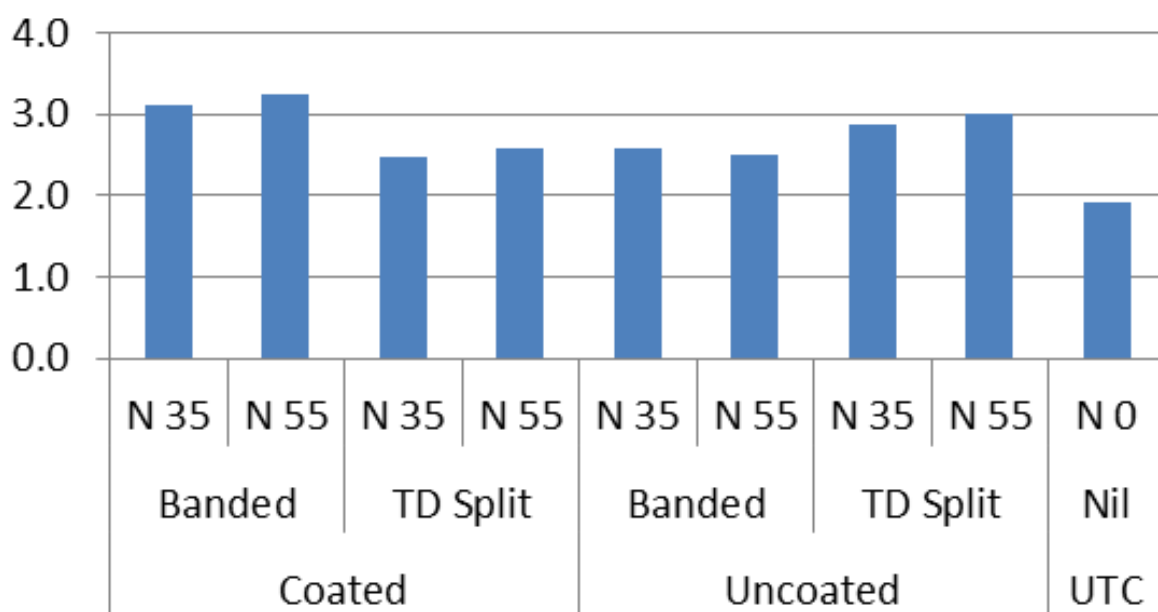
Treatment No. 

301 7	302 5	303 6	304 1	305 2	306 9	307 8	308 3	309 4
201 1	202 2	203 3	204 4	205 5	206 6	207 7	208 8	209 9
101 5	102 6	103 8	104 4	105 3	106 1	107 2	108 9	109 7

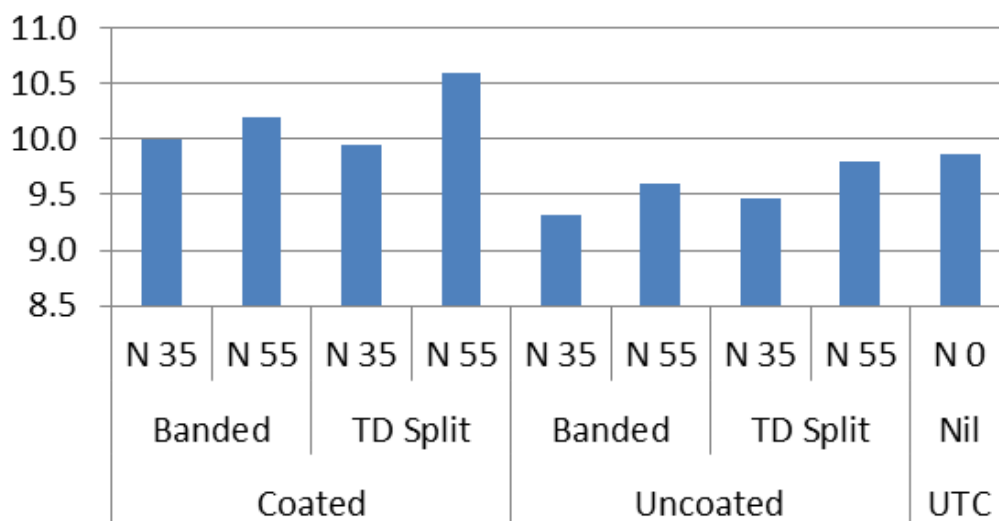
## RESULTS/STATISTICS

- There were treatment differences but these were unrelated to urea form or application method.
- All treatments receiving fertilizer showed increased crop vigour, biomass and grain yield compared to untreated plots.
- Yield increases were not consistent with urea rate.
- Yield increases were not consistent with application method – banded or top-dressed and split.
- Protein responded to increasing N application. Trends appear to show coated urea producing higher protein (10.2%) compared to uncoated urea (9.5%) if averaged across both application and placement methods.

**Yield (t/ha)**



**Protein (%)**



## **OBSERVATION/ DISCUSSION/ MEASUREMENTS**

- Poor performance of pre-emergent herbicides led to poor weed control. Ryegrass was a significant problem. Ryegrass also appeared to respond to the N treatments resulting in increased competitive effect and would have limited responses in the wheat to the applied treatments.
- 2013 growing season rainfall limited production and the value of increasing fertilizer rates. Rainfall during mid-May to mid-July – when important tillering and growth response to applied N is expected – was about 10% of long-term average.
- Non wetting soils had an impact on early emergence of wheat in this trial.
- The combination of low rainfall and non-wetting soils decreased the herbicide effectiveness.
- Sub soil pH and aluminium levels may well have limited deep root growth and exacerbated the impact of the dry conditions and, therefore, limited the total plant response to applied fertilizer.

## **CONCLUSION**

Under the 2013 growing season conditions, there was no advantage to wheat growth and grain yield in the use of a polymer-coated urea product.

## **PEER REVIEW**

## **ACKNOWLEDGEMENTS**

Living Farm for establishment and management of the trial for Summit Fertilizers and Peter Negus for allowing the trial on his property.