An evaluation of resin coated Urea as a Nitrogen source in leaching conditions

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Purpose: To evaluate the rate of breakdown and nutrient release of a resin coated urea relative to traditional Nitrogen Sources (Urea and Maxam).

Location: West Midlands Group Trial Site, Badgingarra Research Station

Soil Type: Sand

Soil Results:

P (mg/kg)	K (mg/kg)	S (mg/kg)	OC (%)	Cu (mg/kg)	Zn (mg/kg)	PRI	EC (ms/m)	pH (CaCl2)
10	46	8	1.1	0.23	1.09	8	0.1	5.7

Rotation: 2008 Lupins; 2007 Oats; 2006 Lupins

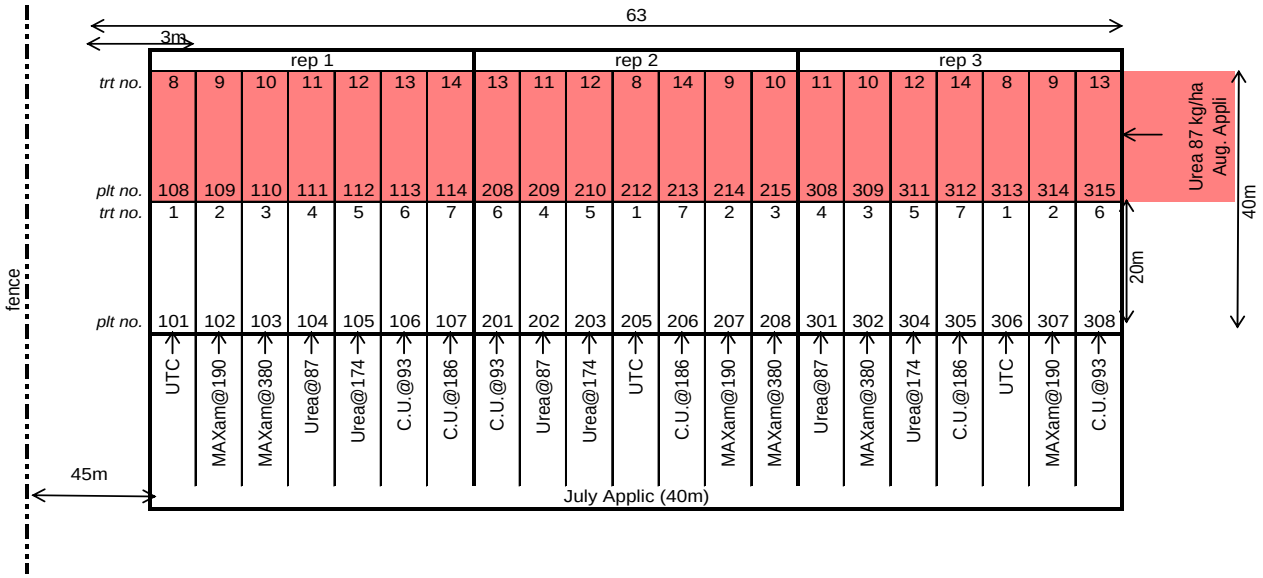
GSR: 447mm

BACKGROUND SUMMARY

Nitrogen strategy and risk management can be difficult issues for sandplain farmers to address. Aiming for high yields, while decreasing losses to both leaching (from too much rain after application) and volatilization (from too little rain after application) has lead to the utilisation of many different N sources and timings.

One possible new technology to reduce both leaching and volatilization is resin coated urea, and this trial was designed to examine this strategy in comparison to more traditional products (Urea and Maxam). The resin coated urea used in this trial aims to protect the fertilizer from volatilization or leaching for around 20 days after application, however the thickness of this coating can be altered to affect this length of protection.

TRIAL DESIGN



UTC= Untreated control; C.U.= Coated Urea

Topdressed N treatments were applied to the site in mid July to a farmer sown crop that had received 100kg/ha of an NPK supplying approximately 10 kg/ha N and 12 kg/ha P and K, as well as trace elements. Additional N was then supplied to half of the plots on the 31st of August in the form of standard urea.

RESULTS

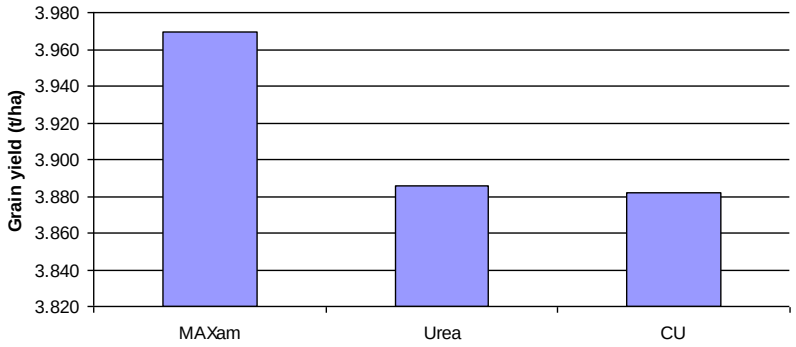


Figure 1 *Factorial Averages for Grain Yield (t/ha)*

Figure 1 shows there were no significant differences between any of the three Nitrogen sources, when averaged across all four nitrogen rates. Analysis of variance showed that while there was a trend for a yield response with applied N this was not statistically significant at P<0.05. So as yield was not significantly improved it is unsurprising that there were no differences between N sources. Grain analysis is still to be completed, which may highlight some differences in nitrogen efficiency between coated and uncoated Urea. Some of the benefit observed through the use of Maxam may be attributed to a possible sulphur response at the site, which was moderate for S prior to seeding, and had received significant leaching rains prior to N application.

Table 1. *Analysis of Variance for Grain yield (t/ha)*

No.	Treatment	Rate		Timing		Yield	
1	UTC					3.738	a
2	MAXam	190	kg/ha	July application	A	3.947	a
3	MAXam	380	kg/ha	July application	A	3.787	a
4	Urea	87	kg/ha	July application	A	3.923	a
5	Urea	174	kg/ha	July application	A	3.670	a
6	C.U.	93	kg/ha	July application	A	3.962	a
7	C.U.	186	kg/ha	July application	A	3.426	a
8	Urea	87	kg/ha	August application	B	4.045	a
9	MAXam	190	kg/ha	July application	A	4.206	a
9	Urea	87	kg/ha	August application	B		
10	MAXam	380	kg/ha	July application	A	3.938	a
10	Urea	87	kg/ha	August application	B		
11	Urea	87	kg/ha	July application	A	4.089	a
11	Urea	87	kg/ha	August application	B		
12	Urea	174	kg/ha	July application	A	3.860	a
12	Urea	87	kg/ha	August application	B		
13	C.U.	93	kg/ha	July application	A	4.108	a
13	Urea	87	kg/ha	August application	B		
14	C.U.	186	kg/ha	July application	A	4.030	a
14	Urea	87	kg/ha	August application	B		
LSD (P=.05)						0.445	
CV						6.770	

DISCUSSION

Over all there were no significant N responses despite a high yield potential and leaching rains. Tissue tests did indicate some differences in the timing of N uptake (later in the case of the coated urea), however none of these differences resulted in differences in N efficiency.

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PAPER REVIEWED BY: Brett Beard, Summit Fertilizers

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