

## **Forbes Soil Amelioration Trials 2001 Results**

Ken Motley, NSW Agriculture, Forbes.  
Andrew Rice, CWFS, Parkes.

### **Background**

Three long-term soil amelioration trial sites have been established at the Gunning Gap and Mulyandry CWFS regional sites. These are long-term sites and will be monitored over the next 5 years. Below is a summary of the first two years results at the two Gunning Gap sites.

(please see next page for trial details and soil and yield results)

### **Soil Test Comments**

Soil samples were collected at the beginning of the trial in May 2000. The sample was split, with half being sent to the Incitec soil lab and the other half being sent to the Perry soil lab (USA) for a full Albrecht analysis and interpretation.

The Albrecht interpretation stated that very low Ca and excess Mg were the major limiting factors, with a total lime deficiency of 10.8 t/ha. It recommended that lime at a rate of 4 t/ha be applied in the first year and then re-tested to fine tune further lime applications. It also recommended 3 kg/ha of Zn sulphate. This was not applied and no Zn deficiency symptoms appeared in the crop.

The 4t/ha lime plot was retested in the second year as recommended and sent to the Perry soil lab (USA) for another full Albrecht analysis and interpretation. The second interpretation following the lime application stated excessive Mg and Na, and very low Ca were the major limiting factors, with a total lime deficiency of 3.5t/ha.

### **Yield Response Comments**

This particular soil is a real problem to manage. A soil pit field day demonstrated that the sodicity problem extends to a depth of about 60 cm.

The addition of lime or gypsum resulted in significant yield increases in 2001. The gypsum treatment made a large difference to the way the soil looked and felt (softer and did not run together). The lack of response in 2000 was most likely due to the treatments needing more time to react in the soil.

This trial will be cropped back to Wheat in 2002. The 4 t/ha lime plot has had another 3.5 t/ha of lime added as recommended by the Albrecht interpretation.

**Trial** Sodic soil amelioration using lime and gypsum  
**Location** Guning Gap  
**Cooperator** Mark Judson  
**Trial design** Randomised block design with two replicates  
**Date spread** 16-May-00  
**Lime and Gypsum source:** Bagged Ag Lime and Gypsum  
**Sowing 2000** 2nd June, 45 kg/ha Janz, 85 kg/ha DAP  
**2001** 17th May, 25 kg/ha Tiiga, 85 kg/ha DAP

### Soil test summary Judson soil amelioration trial

Incitec (Mav 00)

pH (CaCl <sub>2</sub> )	P (Colwell) ppm	S (MCP) ppm	Zn (DTPA) ppm	CEC meq/100a	Ca:Mg ratio	Na % of cations (ESP)
5.7	14	11	0.3	18.33	0.83	12.81

Perrv (Mav 00)

pH	P (Colwell) ppm	S (MCP) ppm	Zn ppm	CEC meq/100q	Ca:Mg ratio	Na % of cations (ESP)
6.1	50	28	2.1	25.96	0.87	10.5

Perrv soil test summary (Mav 01) on 4t/ha Lime treatment

PH	P (Colwell) ppm	S ppm	Zn ppm	CEC meq/100q	Ca:Mg ratio	Na % of cations (ESP)
7.3	26	12	1.3	18.07	1.87	15.76

### Yield Results

Sodic soil amelioration trial results 2000 and 2001

Rate applied in 2000	Yield			
	Wheat 2000		Barley 2001	
	t/ha	% of Nil	t/ha	% of Nil
Nil	1.28	100%	2.58	100%
2t/ha lime	1.22	95%	3.17	123%
4t/ha lime	1.34	105%	3.22	125%
6 t/ha lime	1.20	94%	3.20	124%
8t/ha lime	1.28	100%	3.03	117%
4 t/ha Gypsum	1.40	109%	3.34	130%
Mean	1.29		3.05	
LSD (5%)	0.45		0.29	11%
Co.Var. %	18%		5%	
Significant	No		Yes	

(see previous page for comments and discussion)

**\*\*Note from Catherine Evans (CWFS Research co-ordinator):** Soil labs use different methods, so soil test results from Perry should not be compared to Incitec results. In the soil test summary above, only compare Perry results from May 2000 to Perry results from May 2001, *not* to the Incitec results.

*Central West Farming Systems*

<b>Trial</b>	<b>Lime response on an acid sandy soil</b>			
Location	Guning Gap			
Cooperator	Graham Coombs			
Trial design	Randomised block design with two replicates			
Date spread	16-May-00			
Lime and Gypsum source:	Bagged Ag Lime			
Sowing	2000	6th June, 45 kg/ha Dollarbird, 75 kg/ha DAP		
	<b>2001</b>	7th June, 45 kg/ha Diamondbird, 80 kg/ha DAP		
		25 kg/ha N presow		

**Soil test summary Combs soil amelioration trial**

Incitec (Mav 00)

pH (CaCl <sub>2</sub> )	P (Colwell) com	S (MCP) DPm	CEC meq/100g	Ca:Mg ratio	Al saturation
4.8	18	3	2.07	4.8	1.6

**Yield results**Acid soil amelioration trial results 2000 and 2001

Rate applied in 2000	Yield			
	Wheat 2000		Wheat 2001	
	t/ha	% of Nil	t/ha	% of Nil
Nil	1.43	100%	2.42	100%
1.5 t/ha lime	<b>1.41</b>	99%	2.50	103%
3 t/ha lime	1.44	101%	2.57	106%
4.5 t/ha lime	1.56	109%	2.87	119%
Mean			2.57	
LSD (5%)			0.52	21%
Co. Var. %			10%	
Significant			No	

**Comments**

No significant yield response was recorded in either year. The trial site appeared to be badly affected by rhizoctonia root rot in 2000. The root rot combined with a period of severe moisture stress in late September probably accounts for the poor yield in that year. The trial site was deep cultivated just prior to sowing in 2001. The yield results appear to have improved greatly in 2001. However,

the responsiveness to lime is still surprisingly low.

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