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Lime application to acid. Yellow eastern wheatbelt sandplain soils

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Porter, W, and Carr, S. (1987), *Lime application to acid. Yellow eastern wheatbelt sandplain soils*. Department of Primary Industries and Regional Development, Western Australia, Perth. Report.

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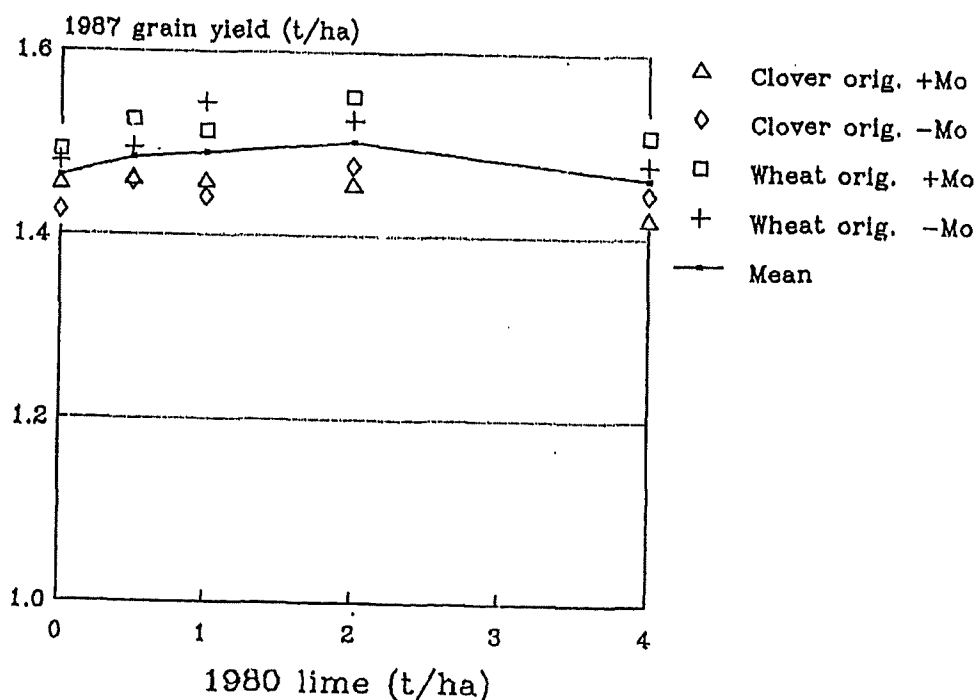
Lime application to acid, yellow eastern wheatbelt sandplain soils
1. Surface applied lime - topsoil incorporated

8QM3Q

Location: Merredin Research Station

History: 1980: 5 Lime x 2 (Wheat/Clover) x 2 Molybdenum rates (0,+)
1981: resown - same species, no Mo applied
1982: volunteer pasture
1983: Wheat plots sown to wheat, clover to triticales; Mo
was applied to those plots which had not received Mo
in 1980.
1984: All plots sown to wheat.
1985: All plots sown to lupins.
1986: All plots sown to wheat.
1987: June 4: Agran topdressed (73 kg/ha) and worked back.
5: Sown Gutha (40 kg/ha) & Super+Mo (150 kg/ha)
July 6: Sprayed Brominil M 1.4 l/ha.
Nov 20: Harvested.

COMMENTS: No differences between treatments were observed during the
season, nor in harvested grain yield (see figure).

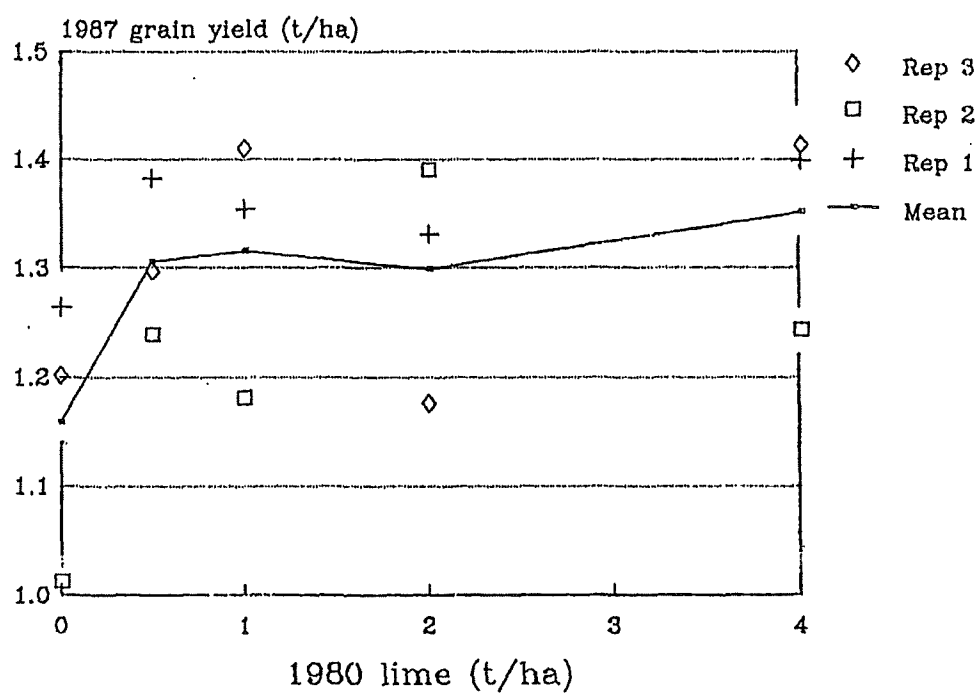


Residual value of lime

80M31

Location: Merredin Research Station

1987 details: June 4: Agran topdressed (73 kg/ha) and worked back.
5: Sown Gutha (40 kg/ha) & Super+Mo (150 kg/ha)
July 6: Sprayed Brominil M 1.4 l/ha.
Nov 20: Harvested.



2. Surface applied lime - deep incorporated

86M11

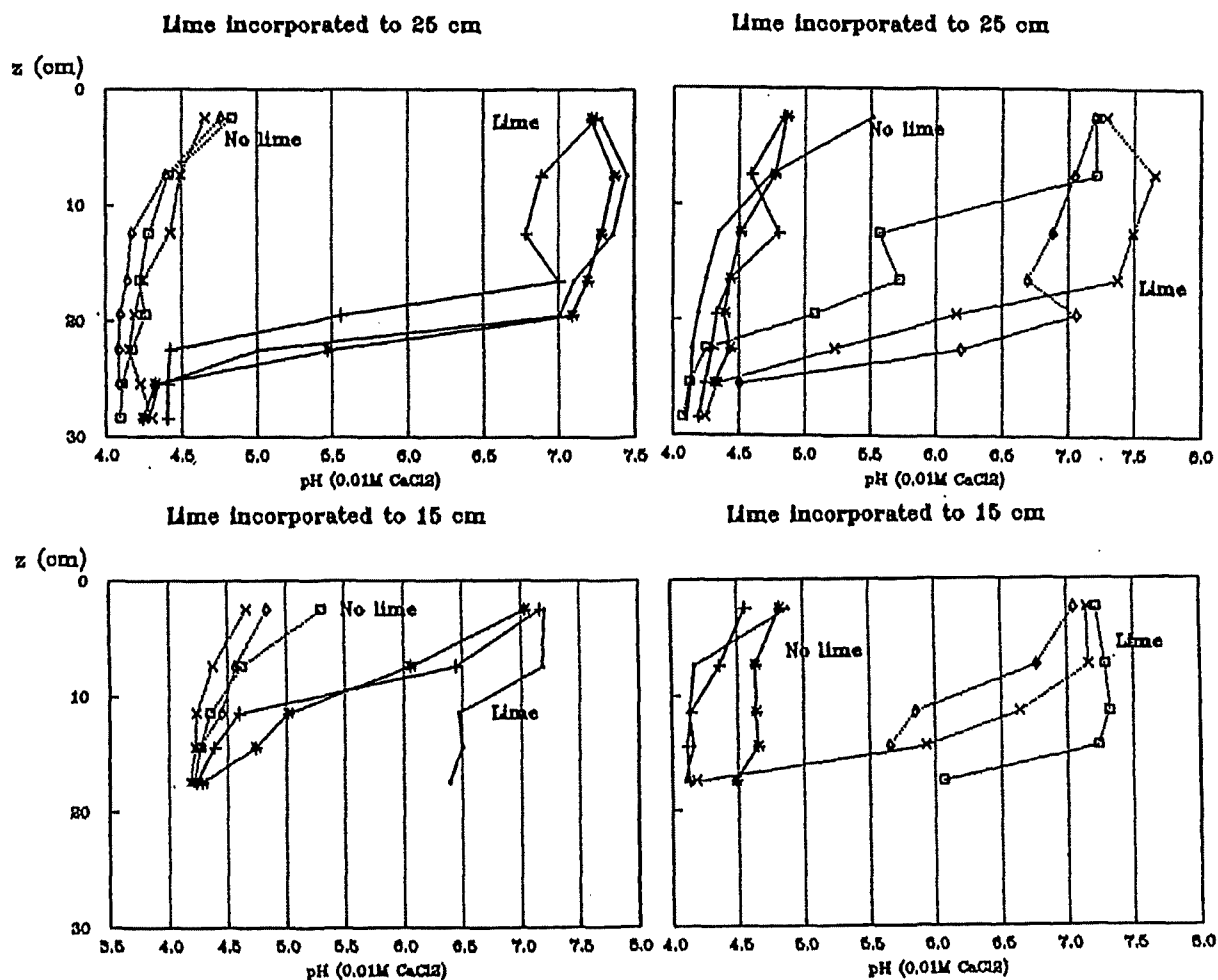
Location: South Carrabin block of Merredin Research Station

History: 1986: Apr.: Lime applied and rotary hoed to depth
Jun.: Sown to Gutha with Agras CuZnMo
1987: The six replicates were split into 3 rotations:
a continuous wheat rotation and two
lupin:wheat rotations (one sown to wheat in 1987,
the other to lupins).

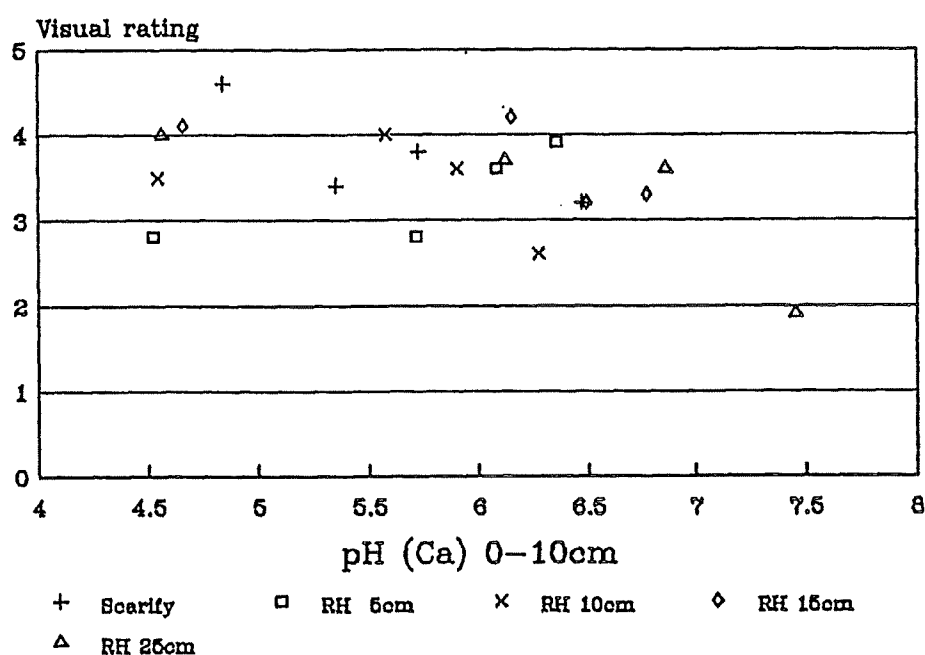
Comments:

pH profiles: In May 1987 the depth of lime incorporation was measured in the 15cm and 25cm treatments (Fig. 1 a.-d.: 2 plots of each, 3 profiles per plot).

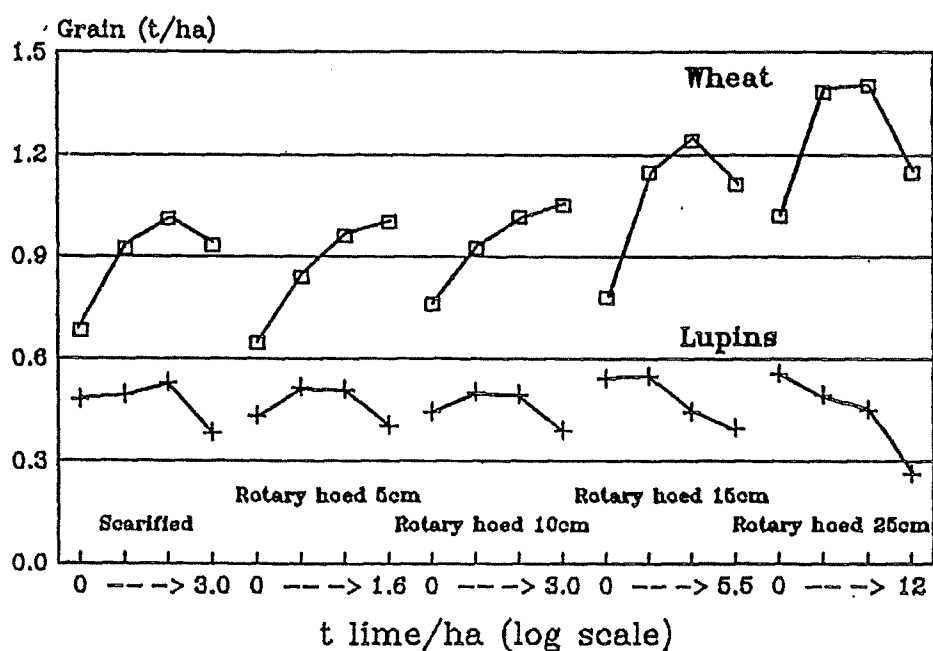
Figure: The effect of the highest rate of lime rotary hoed to 15cm or 25cm on soil pH distribution down the profile.



Lupins: By late August large treatment effects could be clearly seen in the lupin plots (Fig. 2 shows visual ratings for rep 1.). There was a positive effect of deep rotary hoeing, and a negative effect of high rates of lime, particularly where the lime was incorporated deep. These effects were maintained through to grain production (Fig. 3). Symptoms on the lupins were consistent with those of Manganese deficiency.



Wheat: Deep cultivation, without liming, increased wheat yield (Fig. 2). Lime incorporated, either shallow or deep, increased wheat yield by 30 to 40%. (Fig. 2).



86ME4

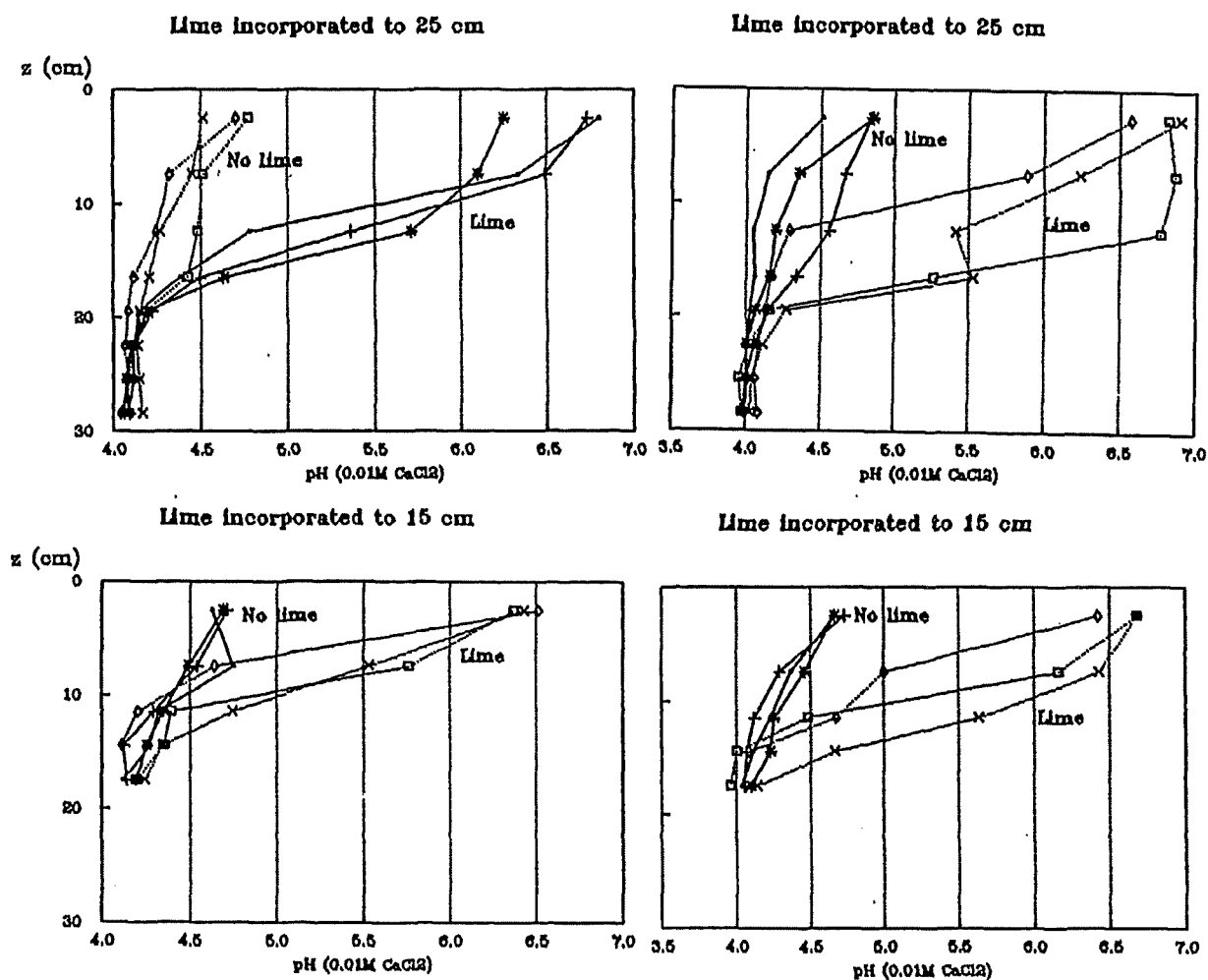
Location: T. Aitken, N. Mukinbudin.

History: 1986: Apr. : Lime applied and rotary hoed to depth
Jun. : Sown to Gutha with Agras CuZnMo
1987: May 20: Sown to Danja (83 kg/ha) & Super (199 kg/ha).

Comments:

A very poor growing season. No differences were observed during the season. The crop was too poor to harvest.

Figure: The effect of the highest rate of lime rotary hoed to 15cm or 25cm on soil pH distribution down the profile.



3. Profile removal, liming and return

85M48

1987 Details: Sown to Gutha (50 seeds/drum, 50 kg/ha in plots), sown in rows with superphosphate (100 kg/ha) and topdressed with Agran (200 kg/ha).

1. Total dry matter production (t/ha) at harvest.

<u>Treatment</u>	<u>Nutrients in 1986</u>			<u>Analysis of variance</u>	
	<u>0</u>	<u>+</u>	<u>Mean</u>		
Lime: 0					
Water '86: 0	2.496	2.361	2.428	LIME	NS p<.374
+	2.463	2.359	2.411	WATER86	NS p<.130
Mean	2.479	2.360	2.420	NUTR86	NS p<.699
				REP	** p<.024
Lime: +				LIME WATER	NS p<.163
Water '86: 0	2.555	2.942	2.748	LIME NUTR	NS p<.217
+	2.307	2.373	2.340	WATER NUTR	NS p<.607
Mean	2.431	2.657	2.544	LIME WATER NUTR	NS p<.533
Lime: mean					
Water '86: 0	2.525	2.651	2.588		
+	2.385	2.366	2.375		
Mean	2.455	2.509	2.482		

2. Grain yield (t/ha) at harvest.

<u>Treatment</u>	<u>Nutrients in 1986</u>			<u>Analysis of variance</u>	
	<u>0</u>	<u>+</u>	<u>Mean</u>		
Lime: 0					
Water '86: 0	0.862	0.691	0.776	LIME	NS p<.515
+	0.843	0.805	0.824	WATER86	NS p<.716
Mean	0.853	0.748	0.800	NUTR86	NS p<.734
				REP	** p<.004
Lime: +				LIME WATER	NS p<.271
Water '86: 0	0.814	0.966	0.890	LIME NUTR	NS p<.202
+	0.810	0.780	0.795	WATER NUTR	NS p<.839
Mean	0.812	0.873	0.843	LIME WATER NUTR	NS p<.225
Lime: mean					
Water '86: 0	0.838	0.829	0.833		
+	0.827	0.793	0.810		
Mean	0.832	0.811	0.822		

2. Harvest Index.

Treatment	Nutrients in 1986			Analysis of variance	
	0	+	Mean		
Lime: 0					
Water '86: 0	0.342	0.281	0.312	LIME	NS p<.937
+	0.340	0.341	0.341	WATER86	NS p<.193
Mean	0.341	0.311	0.326	NUTR86	NS p<.180
				REP	** p<.004
Lime: +				LIME WATER	NS p<.360
Water '86: 0	0.320	0.326	0.323	LIME NUTR	NS p<.397
+	0.339	0.317	0.328	WATER NUTR	NS p<.524
Mean	0.329	0.322	0.325	LIME WATER NUTR	NS p<.094
Lime: mean					
Water '86: 0	0.331	0.304	0.317		
+	0.339	0.329	0.334		
Mean	0.335	0.317	0.326		