

Developing and testing innovative, practical and reliable methods for incorporating lime into acidic sandplain subsoils

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Purpose:	To test modified one-way ploughs as a method of lime incorporation.
Location:	Will & Lib Browne's property "Warradarge Springs", Coorow-Greenhead Rd, Warradarge.
Soil Type:	Deep sandy duplex
Soil Test Results:	see below for pH results
Rotation:	2013: Wheat, 2014: Canola
Growing Season Rainfall (April- October 2015):	~400 mm

BACKGROUND SUMMARY

Increasing the pH of acidic subsoils in the West Midlands is necessary to increase crop water use and crop yields. A fast way of doing so is to mix lime into the subsoil; spading and mouldboarding are two common methods used in the West Midlands. Both methods are relatively expensive, so this trial aims to assess the effectiveness of a modified one-way plough at achieving subsoil pH change.

TRIAL DESIGN

Plot size: 90m X 10m

Machinery use: Standard orange Chamberlain plough; yellow Chamberlain plough with every second jump arm lifted, with 30" discs fitted ("bought discs"); modified orange Chamberlain plough (2 jump arms into 1) with "Ploz discs" fitted (30" discs with deeper dishing than commercially available).

Repetitions: 2

pH TESTING

The site was sampled by Precision SoilTech as part of the site selection process. The trial site was very acid to 40cm.

pH CaCl ₂	
0-10cm	4.7
10-20cm	4.1
20-30cm	4.2
30-40cm	4.1

TRIAL LAYOUT



1	"Ploz Plough" - deep dish 30" discs, every second jump-arm removed.
2	Nil
3	Standard Chamberlain plough
4	Nil
5	"Bought discs" - 30" discs with every second jump-arm lifted.
6	mistake
7	"Bought discs" - 30" discs with every second jump-arm lifted.
8	"Ploz Plough" - deep dish 30" discs, every second jump-arm removed.
9	Nil
10	Standard Chamberlain plough

Trial was ploughed on 30 May 2015.

RESULTS/STATISTICS

The paddock was sown by Will Browne to Mace wheat in early June 2015.
Plant establishment was measured by taking plant counts on 23 July 2015.

Treatment	Mean wheat plants / m ²	sig 5%
Nil	115.3	a
Ploz plough	83.5	b
Big discs	93.3	b
Std Chamberlain	93.3	b

OBSERVATION/ DISCUSSION/ MEASUREMENTS

All cultivation treatments reduced crop establishment significantly below "Nil" cultivation.
Poor rainfall in September and October 2015 meant that the trial yielded very poorly (~0.5 T/ha), with no significant differences between treatments.

Soil test results are not yet available.

PEER REVIEW/REVIEW

Anne Wilkins, WMG

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