

Liebe Group Soil Health Project – Lime Trial

Aim: To investigate the acidity profile in 2003 and 2004 of a lime trial conducted in 1986 by Aglime Australia. Does lime moved down the soil profile?

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Location: Carnamah



Background: Subsoil acidity has been identified as a key constraint over large areas of the northern region, particularly on the sand plain soils. In December 2004 we decided to re sample a liming trial established by Dr Lorelle Lightfoot in 1986. Our main focus was to compare soil pH with the measurements made down the profile in 1993. By assessing soil pH, we were aiming to understand the movement of lime into the subsoil.

Trial Details:

Plot size and replication	8 x 100m, 3 replicates, Randomised block design.
Soil type	Deep acidic sand
Paddock History	2003 = Pasture

Trial Design: The trial consists of 4 treatments randomised and replicated 3 times in a single bank of 12 plots 8m wide x 100m long, implemented in 1986.

Treatments:

Treatment – Lime T/ha - 1986	Plot No.
5	1, 7, 12
2.5	2, 8, 11
1.25	3, 6, 9
0	4, 5, 10

Results: Taking soil pH profiles on all the plots enabled a comparison with previous available data, although it must be noted that the sample depths differed slightly from samples taken in 1993.

Figures 1 & 2 below compared pH profiles of the different treatments over a ten-year period.

Figure 1: Soil pH profile 1993

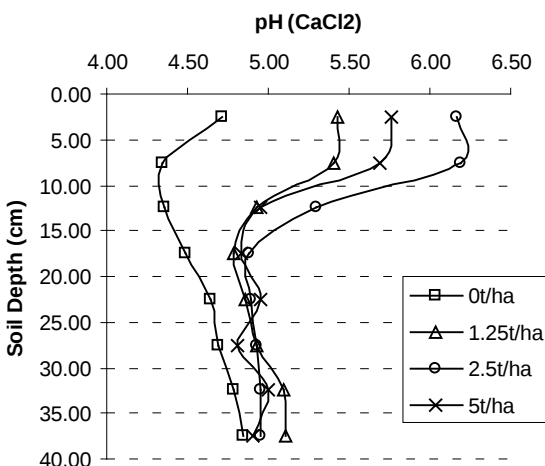
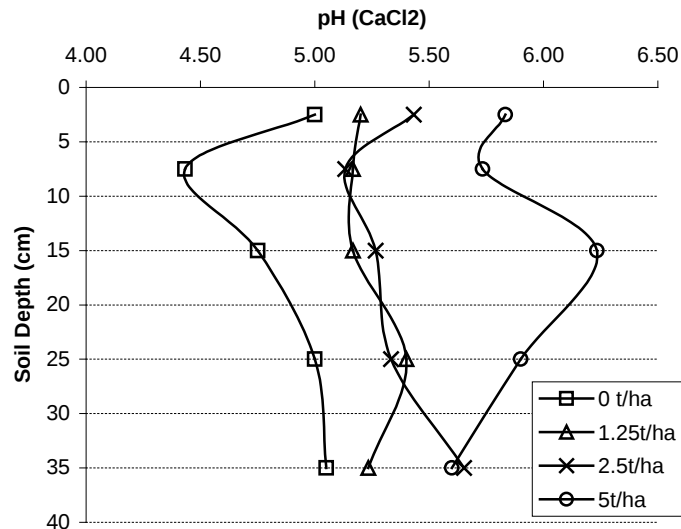


Figure 2: Soil pH profile 2004



Comparing the 5t/ha lime treatment between 1993 and 2004 shows that the lime may have moved to a depth of 10-20cm, as that was where the highest pH was recorded. However, it must be noted that the first year of no-till was in 2003; therefore cultivation will have played a part in the distribution of lime through the soil profile. Removal of grain may have also caused a drop in the pH of the topsoil, which may also be reflected in the drop in pH in the 0-10cm zone for the 2.5t/ha and 1.25t/ha treatments.

Summary:

- o There has been a drop in surface pH for all the lime treatments.
- o After 18 years, 5t/ha treatment shows a pH of >5.5 across the profile, however the topsoil is becoming more acidic due to removal of crop and the inefficiencies of nitrogen use.
- o 2.5 and 1.25t/ha treatments are still showing a liming effect and are within the WA Department of Agriculture target recommended range of pH 5-5.5.
- o The effectiveness of lime application is influenced by farming practice; here incorporation has achieved distribution of lime into the 10-20cm-soil layer.
- o It is anticipated that further work will be carried out at this site

Technically reviewed by: Steve Carr, Aglime Australia

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