Historic and Recent Lime Trial Information in SA

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SOIL ACIDITY AND MANAGEMENT – SUMMARY OF RESPONSES IN CROPPING/LIVESTOCK TO LIME

- Large responses in cropping - up to 40% in some trials
- Particularly in sensitive species such as canola, barley and intolerant varieties of wheat
- Good responses in livestock - up to 30% increases in livestock
Birdwood site on Jim Rathjen’s. Visual responses were still evident in 2001 on both Birdwood and Inman Valley sites on high lime plots (15 years after). Responses mostly using clover/ryegrass pastures which are considered tolerant of acid soils. Inman Valley site took 5 years to respond but still evident in 2001, others responded relatively quickly, some Mn issues at Parawa but went away over time.
SOIL ACIDITY AND MANAGEMENT – CROP RESPONSES, Lower North, SA, Farhoodi

- Yield Wheat (red), Barley (blue), Faba beans (pink)- mean of 2 sites 2000-02,
- 4 t/ha lime 20-40% increases , barley most responsive, original pH 4.7
Fleurieu Trials

Two sites established in 2009
• Sand over clays - glacial valleys
• Intensive dairy - Mulhern - 4.3/4.5/4.7/4.4
• Extensive grazing - Whites - 4.3/4.4/5.2/4.4
Treatments – 6 reps a plus!

Soil modification treatments
Control
Spader only
Delve only
Delve and spaded.

Lime treatments
No Lime
Low rate of lime (2 or 3 t/ha)
High rate of lime (4 or 6 t/ha)
Mulhern’s Trial Results

- Good responses to soil modification treatment and liming early but dropped off – lime used quickly by highly productive pasture.
- Site established to fodder rape and renovated after this.
Whites Fleurieu Trial Results

- Very good responses to soil modification treatment early but dropped off
- Lime responses became better at Whites over time

Effect of Lime on Pasture at Whites, 16/9/12
Whites Fleurieu Trial Results

- Soil pH is altered more and to deeper in the profile by higher lime rates
Effect on plant Manganese

- Avoid over liming on sand as high lime rates can induce manganese issues.
Tungkillo Liming Trials

Background – concerns over loss of Nutrilime and other suitable products, development of subsurface acidity, trialling granulated products and what about low intensity grazing land

Site 1 – Bartsch’s- lower intensity grazing pasture. pHCa 4.3, Al levels 2.3 in the 0-10.

Site 2 - Cameron’s- intensively cropped paddock. pHCa 4.4/4.2, Al levels 5.2/9.1 in the 0-10/10-20 layers.

Supported by NRM - SAMDB
Treatments- L 3t/ha, H 6t/ha, no in-furrow or liquid lime treatments on Bartsch.

<table>
<thead>
<tr>
<th>Treatment</th>
<th>L/ha</th>
<th>Application</th>
</tr>
</thead>
<tbody>
<tr>
<td>Control</td>
<td>L</td>
<td>surface</td>
</tr>
<tr>
<td>Control</td>
<td>H</td>
<td>furrow</td>
</tr>
<tr>
<td>Calciprill L</td>
<td></td>
<td>surface</td>
</tr>
<tr>
<td>Calciprill H</td>
<td></td>
<td>surface</td>
</tr>
<tr>
<td>Calciprill L</td>
<td></td>
<td>furrow</td>
</tr>
<tr>
<td>Calciprill H</td>
<td></td>
<td>furrow</td>
</tr>
<tr>
<td>Agricola L</td>
<td></td>
<td>surface</td>
</tr>
<tr>
<td>Goolwa Quarries L</td>
<td></td>
<td>surface</td>
</tr>
<tr>
<td>Angaston L</td>
<td></td>
<td>surface</td>
</tr>
<tr>
<td>Southern Lime L</td>
<td></td>
<td>surface</td>
</tr>
<tr>
<td>Agricola H</td>
<td></td>
<td>surface</td>
</tr>
<tr>
<td>Goolwa Quarries H</td>
<td></td>
<td>surface</td>
</tr>
<tr>
<td>Angaston H</td>
<td></td>
<td>surface</td>
</tr>
<tr>
<td>Southern Lime H</td>
<td></td>
<td>surface</td>
</tr>
<tr>
<td>Liquid Lime 50 L/ha</td>
<td></td>
<td>Surface spray (2015 only)</td>
</tr>
</tbody>
</table>
Dry Matter production – Bartsch 2014
(Low rates of lime - 3 t/ha)

Pasture production Oct 2014 Bartsch

DM t/ha

Agricola | Angaston | Calciprill | Control | G Q Lime | S L | Dolomite

Government of South Australia
Primary Industries and Regions SA
## Dry Matter production – Bartsch Aug 2015 (Low rates of lime - 3 t/ha)

![Bartsch DM t/ha 5-8-15](image)

<table>
<thead>
<tr>
<th>Treatment</th>
<th>DM t/ha</th>
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</thead>
<tbody>
<tr>
<td>Agricola</td>
<td>0.99</td>
</tr>
<tr>
<td>Angaston</td>
<td>1.20</td>
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<tr>
<td>Calciprill</td>
<td>1.06</td>
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<tr>
<td>Control</td>
<td>0.69</td>
</tr>
<tr>
<td>G Q Lime</td>
<td>0.94</td>
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<tr>
<td>S L Dolomite</td>
<td>1.25</td>
</tr>
</tbody>
</table>
Dry Matter production – Bartsch Oct 2015
(Low rates of lime - 3 t/ha)

Bartsch DM t/ha 24-9-15

Agricola: 0.40
Angaston: 0.31
Calciprill: 0.31
Control: 0.28
G Q Lime: 0.31
S L Dolomite: 0.28
pH changes with depth – Bartsch site 2016
(Low rates of lime - 3 t/ha)
Yield - Cameron 2015

Barley  Mean control yield ~ 2 t/ha
pH Changes by depth – Cameron site 2016

pH (CaCl) by depth, Cameron, 2016

- Agricola
- Angaston
- Calciprill
- Calciprill F
- Control
- Control F
- G Q Lime
- Liquid Lime
- S L Dolomite
Other lime trials recently set up:

• As with the Tungkillo group, many farmers are looking for new sources of lime, and want to evaluate their effectiveness and value for money.

• There are local lime rate trials at Stockport, Barabba and Koonunga (2014).

• There are lime source trials at St Kitts and Halbury (2014).

• pH at the sites ranges from 4.5 to 4.7, with Al values mostly above 2 ppm (toxic level for plants).
Other lime trials recently set up:

• Another lime trial has been set up at Laura, early in 2015. This is a replicated trial examining the effect of both lime source (4 lime products) and rate (at equivalent NV rates of 3 and 6 t/ha).
• No yield benefits were seen in 2015 (first year) of the trial – this is as expected as lime takes 18 months to 2 years to start to work.
• Barley was sown in 2016 and we expect to see some differences at harvest this year.
Other lime activities:

• Trials and information sharing and gathering is continuing in the South-East, Kangaroo Island and the acidic areas of Eyre Peninsula.
Any questions?