Historic and Recent Lime Trial Information in SA

RURAL SOLUTIONS SA
PIRSA

Rebecca Tonkin, Rural Solutions SA

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

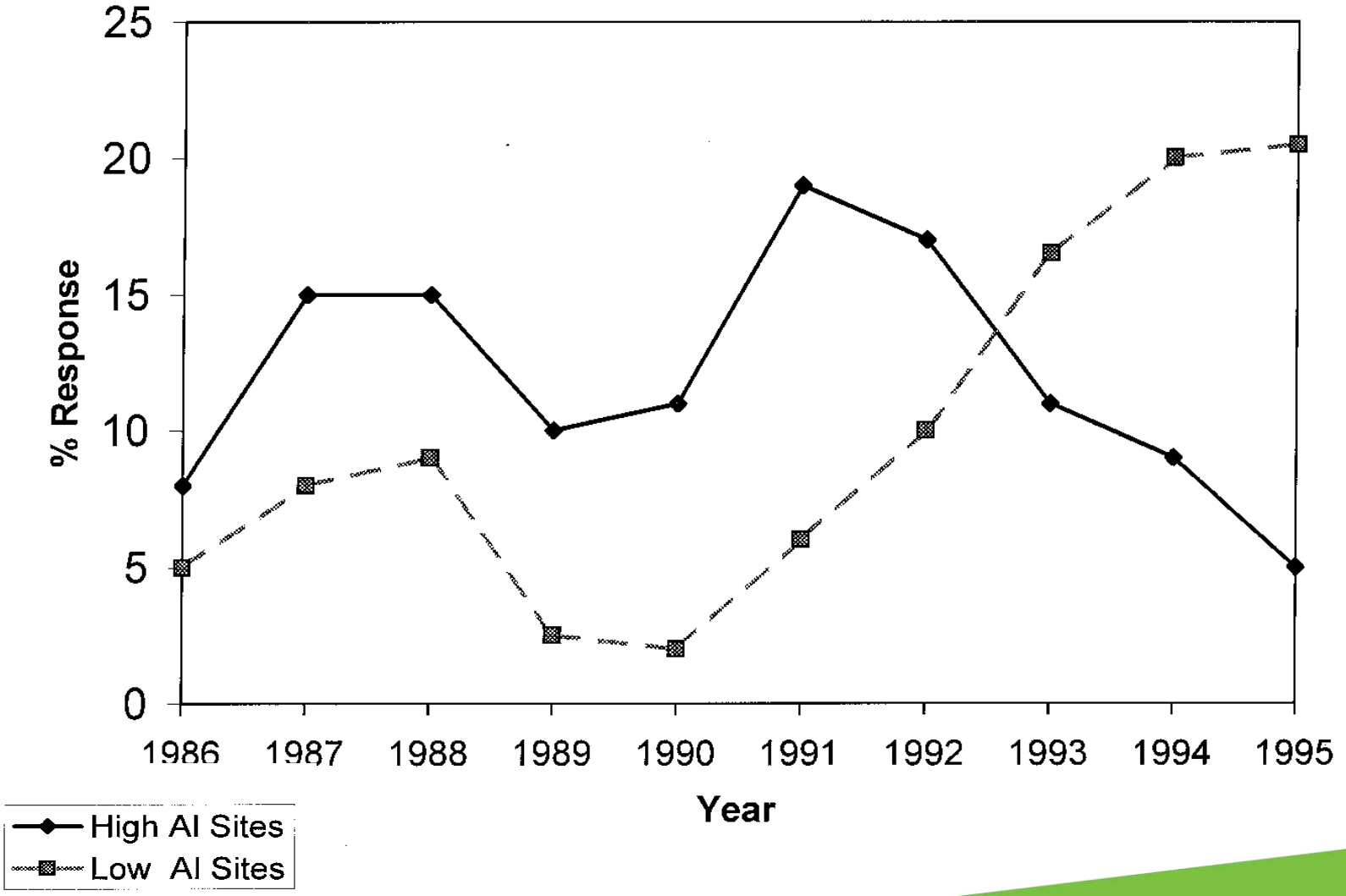
- Large responses in cropping - up to 40% in some trials
- Particularly in sensitive species such as canola, barley and intolerant varieties of wheat
- Good responses in livestock - up to 30% increases in livestock

Mt Lofty Ranges - PIRSA and CSIRO

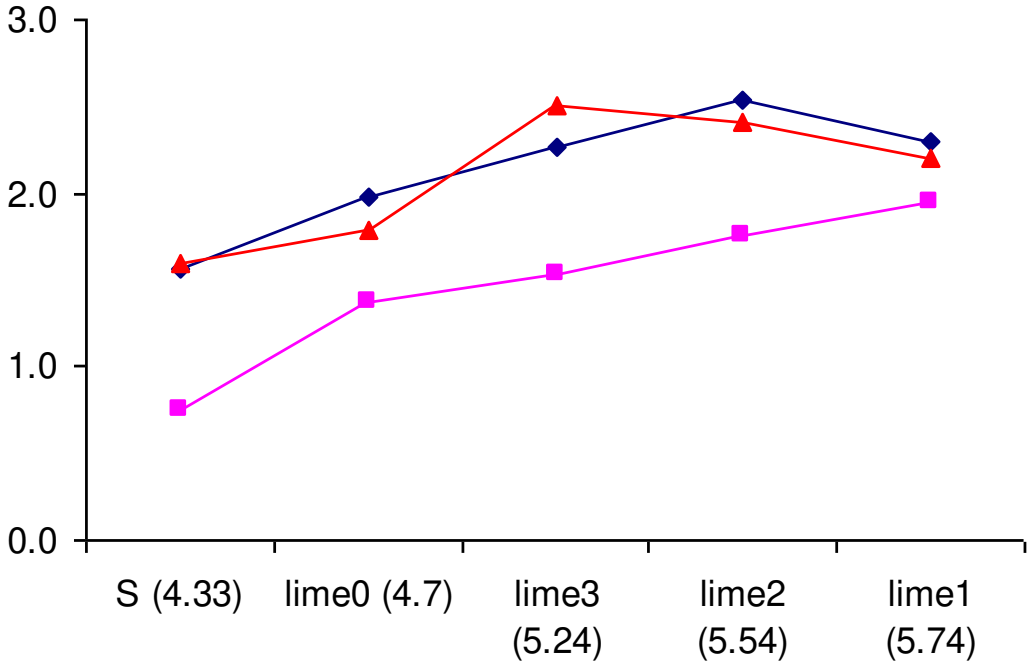
Sites	Soil	pHCa	Al – Ca Cl2
Birdwood	FSL/ brown clay	4.3	2.8
Flaxley	SL/ orange Clay	4.2	4.7
Inman Valley	Thick LS/ C	4.2	1.5
Parawa	SCL/orange C	4.6	4.1

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 – EARLY SEASON PASTURE RESPONSES MLR



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

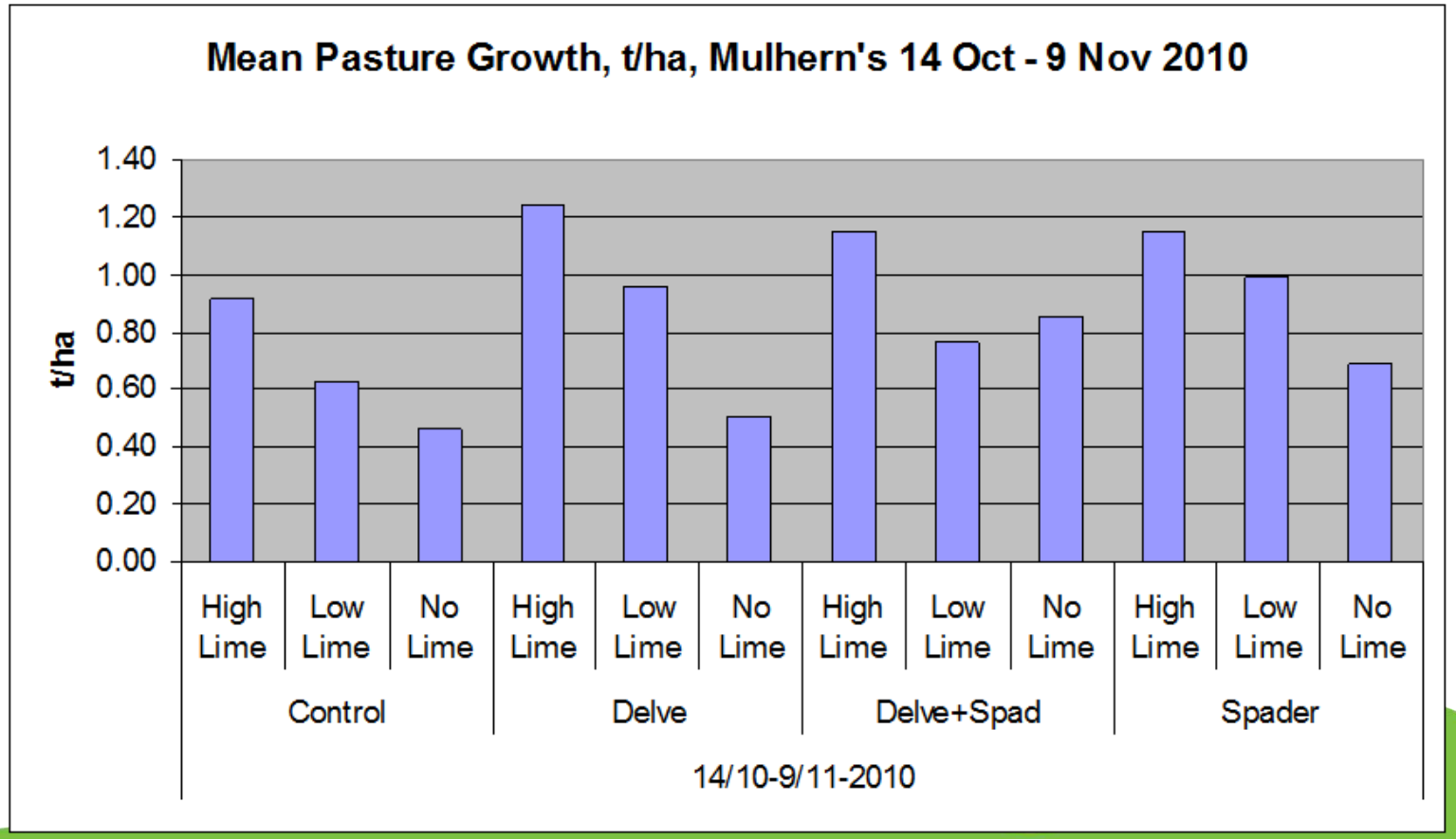
Control
Spader only
Delve only
Delve and spaded.

Lime treatments

No Lime
Low rate of lime (2 or 3 t/ha)
High rate of lime (4 or 6 t/ha)

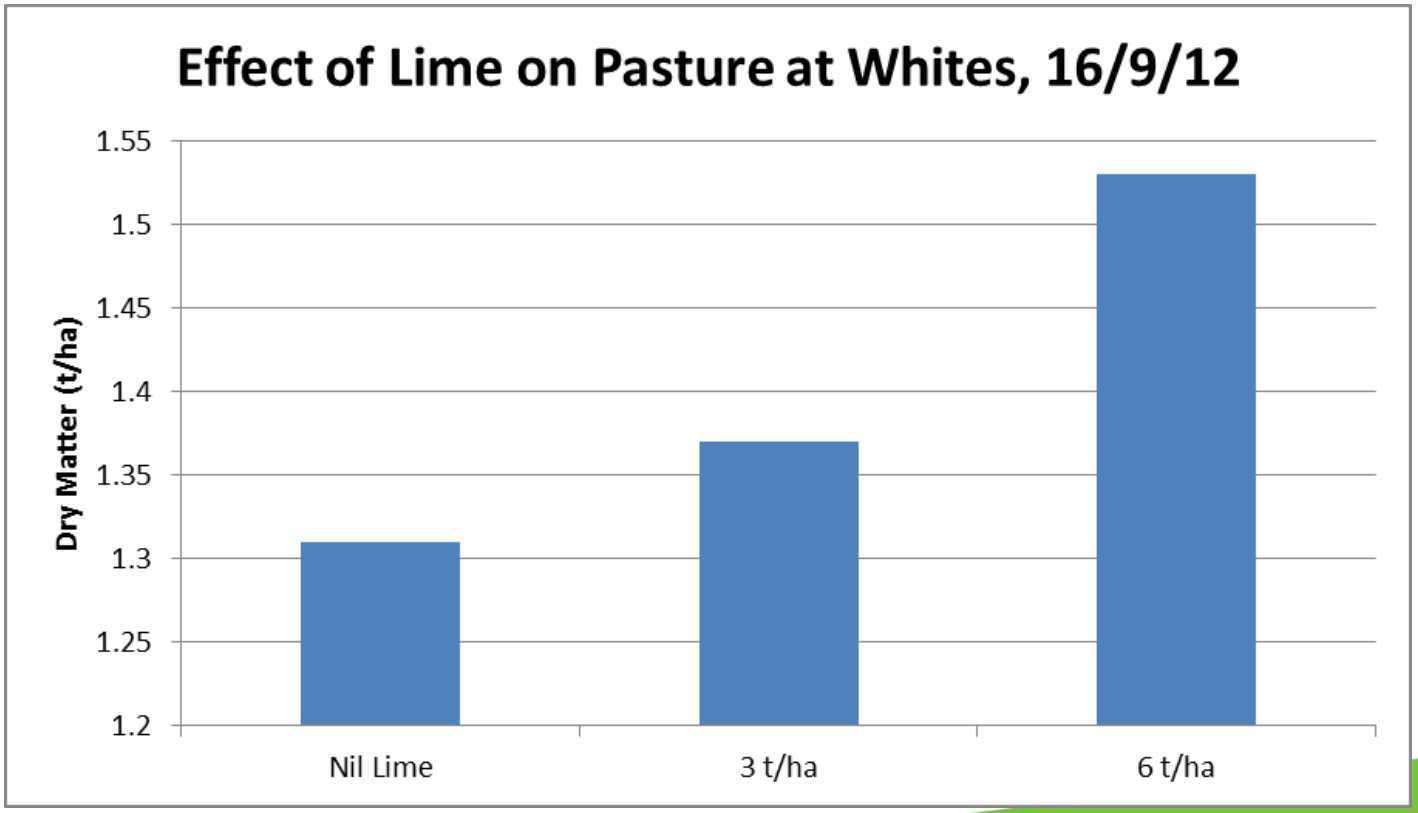
Mulhern's Trial Results

- 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.



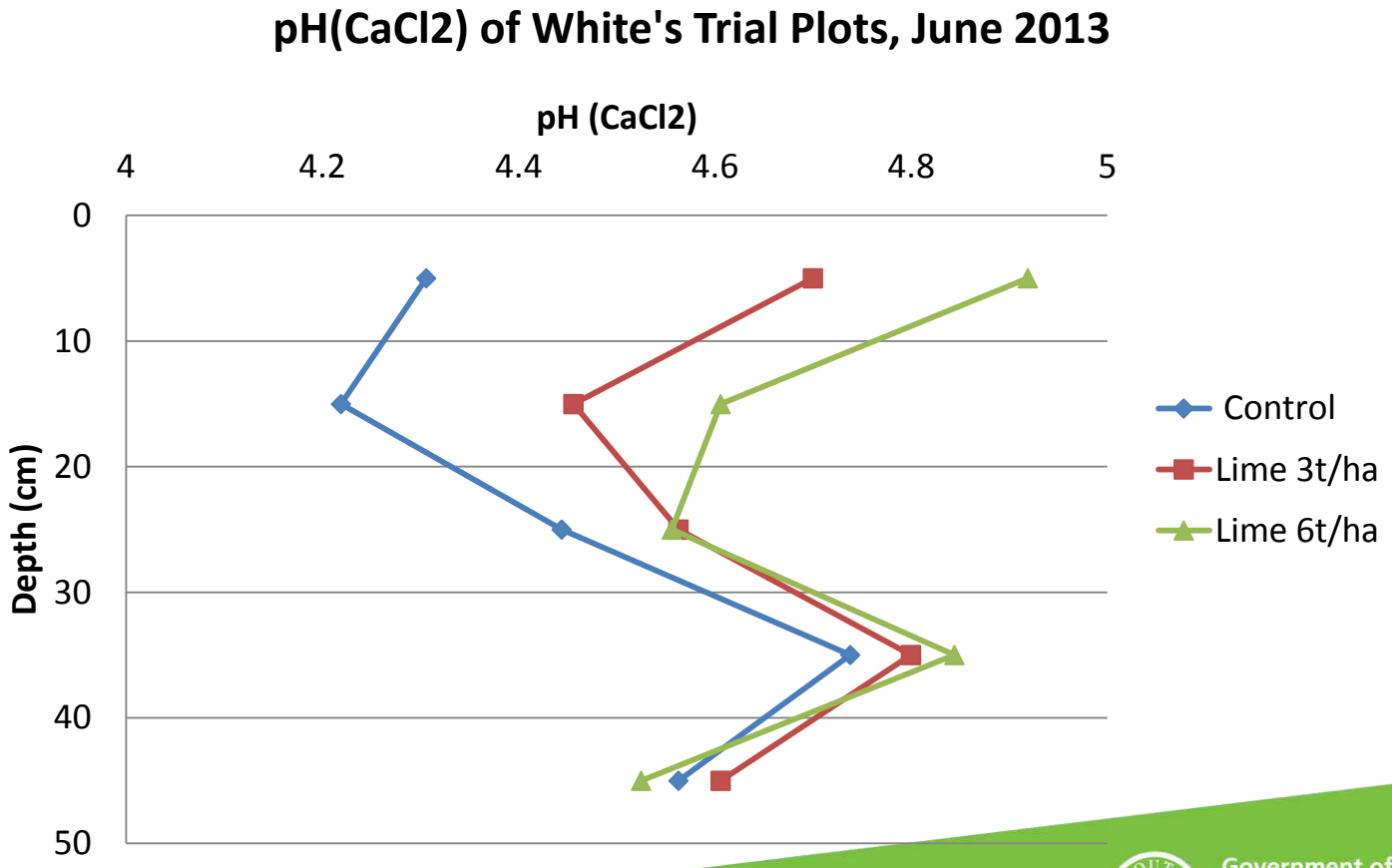
Whites Fleurieu Trial Results

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



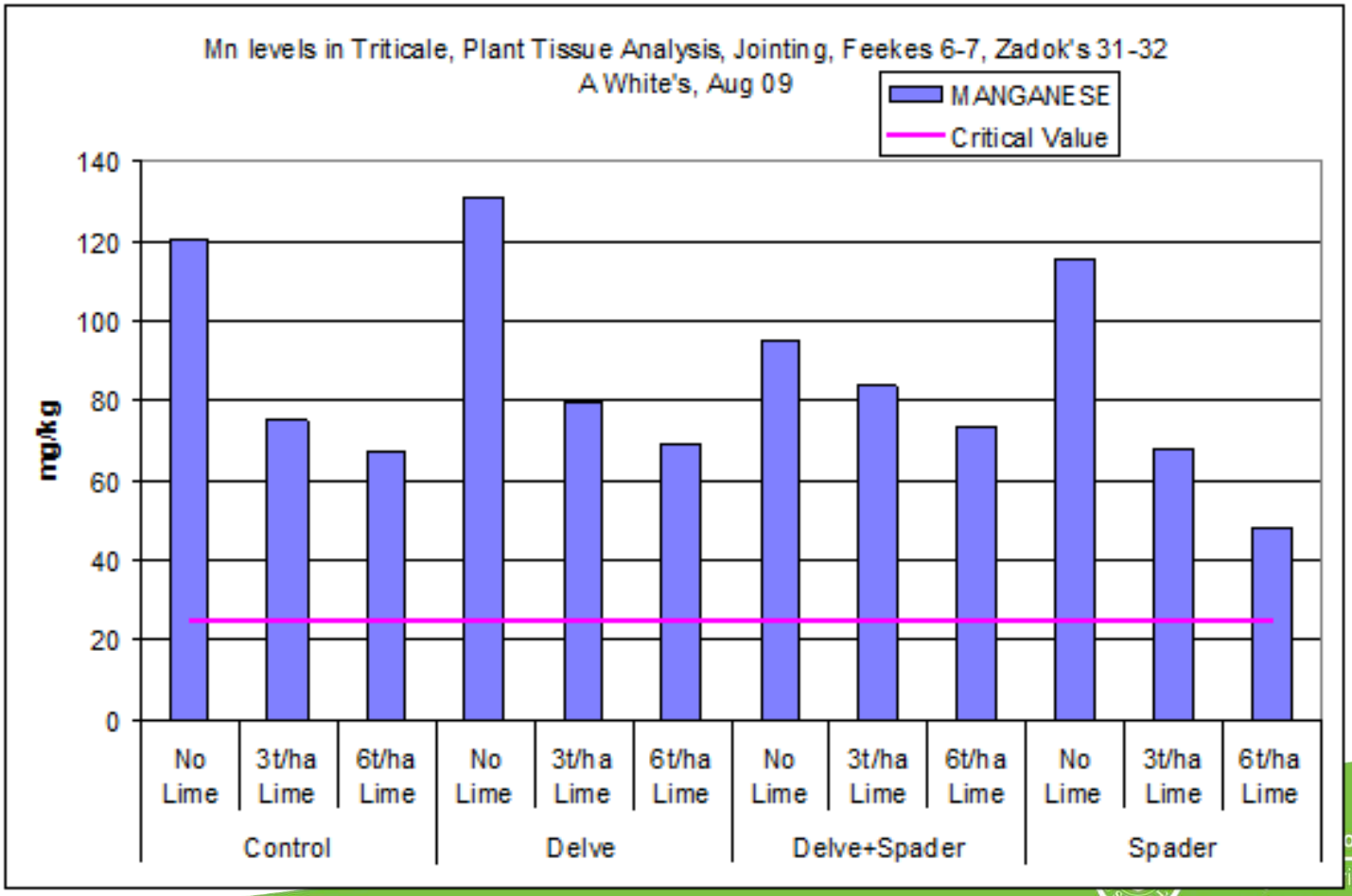
Whites Fleurieu Trial Results

- 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.

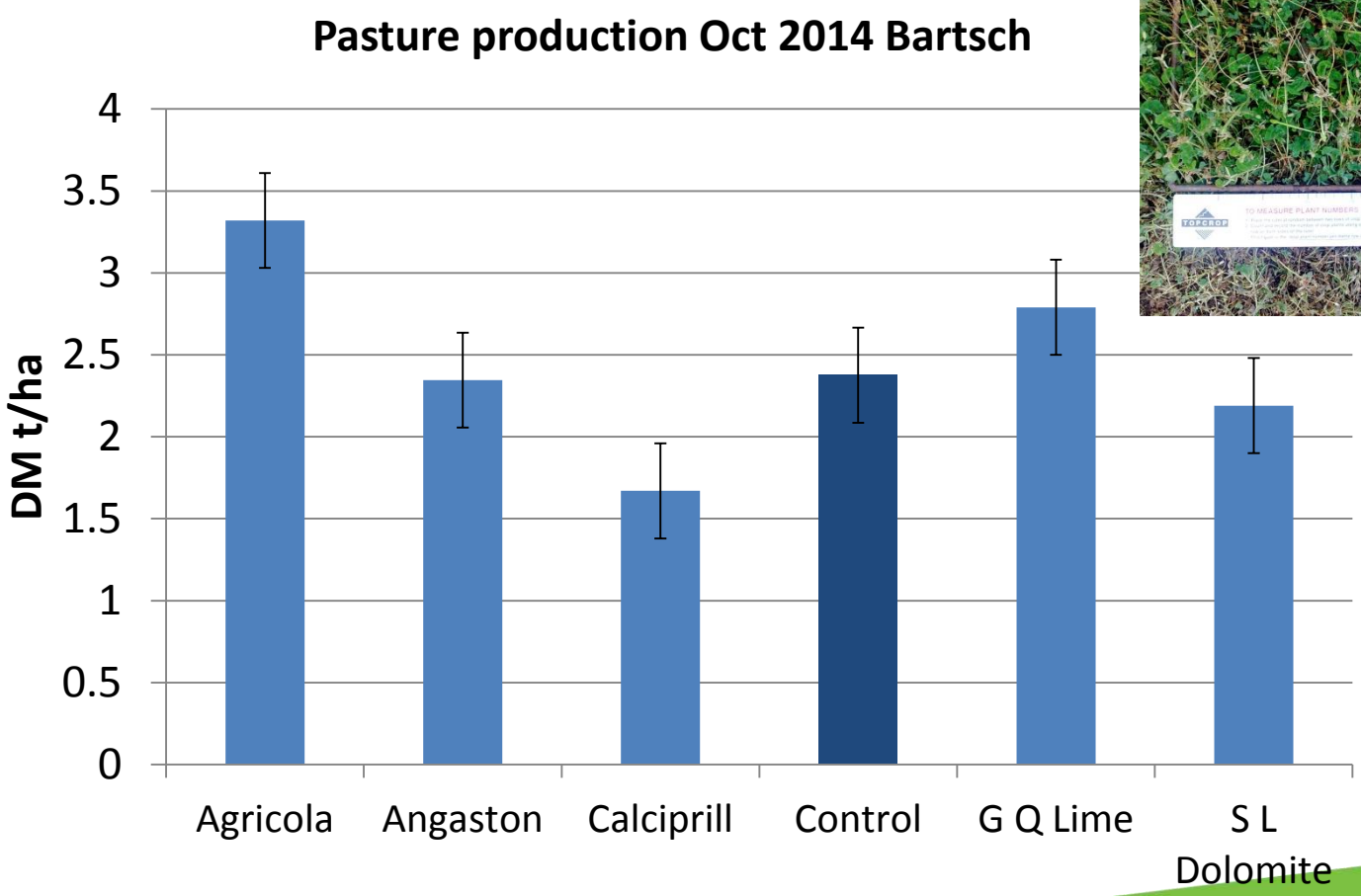
Site 2 - Cameron's- intensively cropped paddock. phCa 4.4/4.2, Al levels 5.2/9.1 in the 0-10/10-20 layers.

Supported by NRM - SAMDB

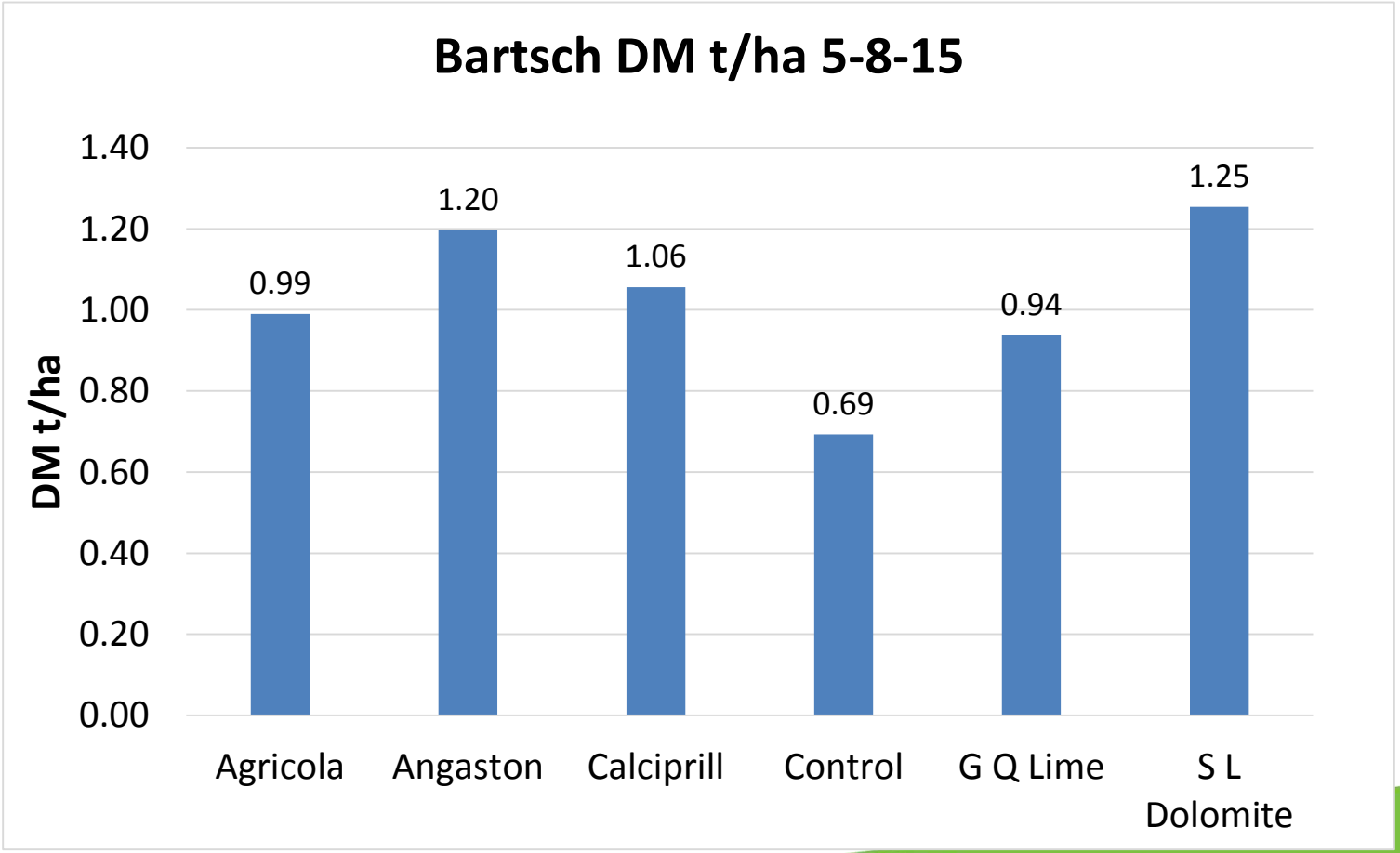
Treatments- L 3t/ha, H 6t/ha, no in-furrow or liquid lime treatments on Bartsch.

Control	Control	surface
Control	Control	furrow
Calciprill	L	surface
Calciprill	H	surface
Calciprill	L	furrow
Calciprill	H	furrow
Agricola	L	surface
Goolwa Quarries	L	surface
Angaston	L	surface
Southern Lime	L	surface
Agricola	H	surface
Goolwa Quarries	H	surface
Angaston	H	surface
Southern Lime	H	surface
Liquid Lime	50 L/ha	Surface spray (2015 only)

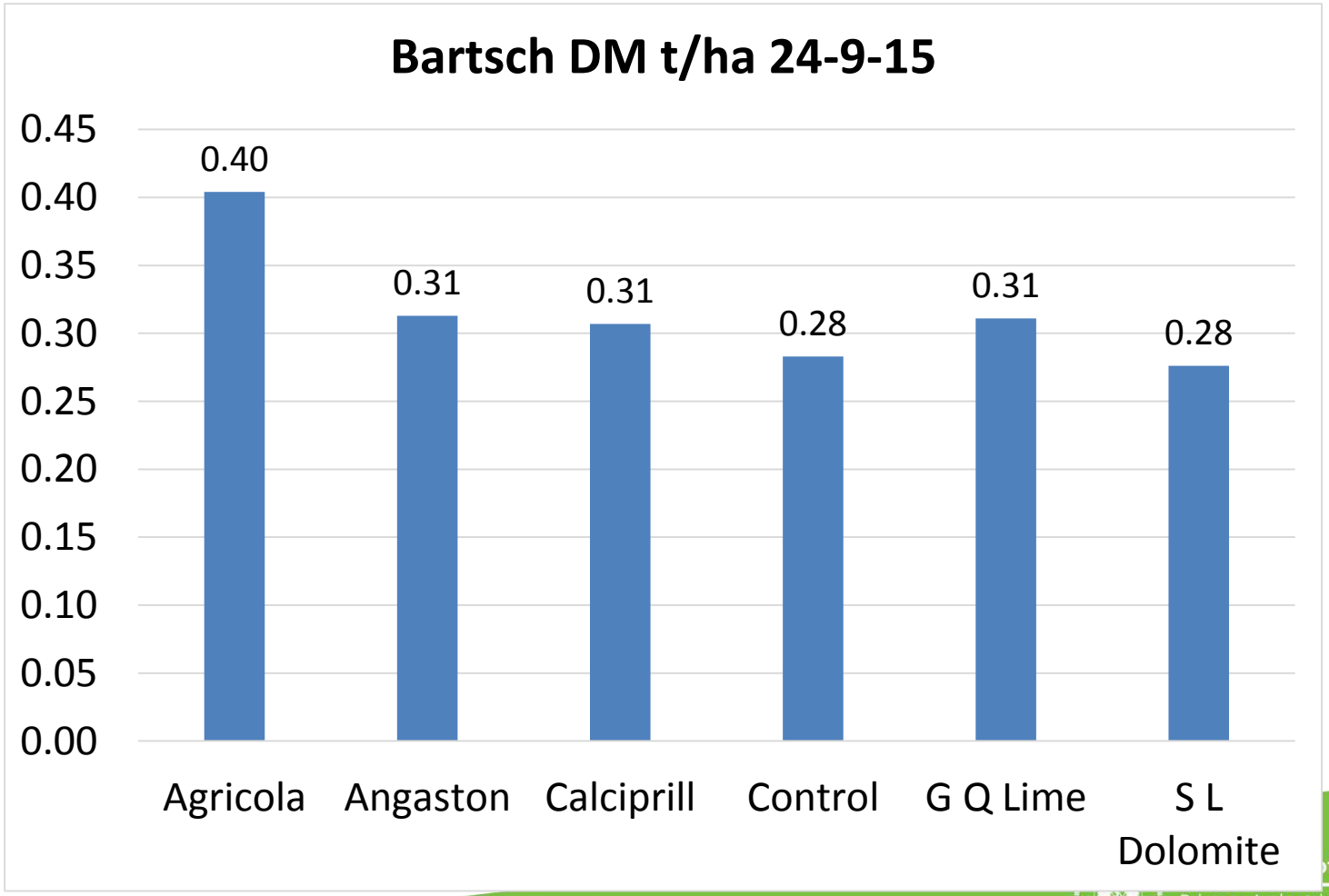
Dry Matter production – Bartsch 2014 (Low rates of lime - 3 t/ha)



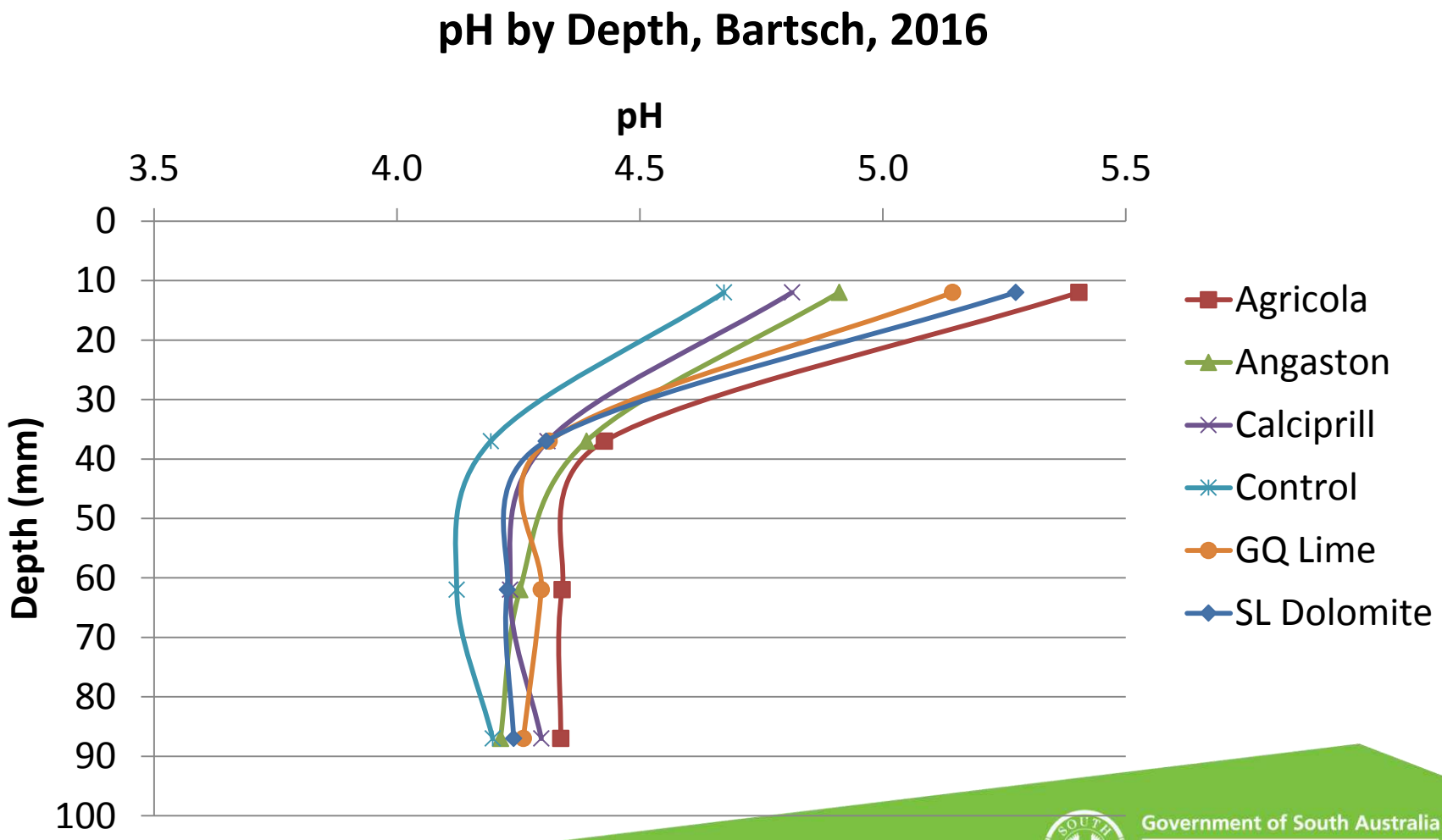
Dry Matter production – Bartsch Aug 2015 (Low rates of lime - 3 t/ha)



Dry Matter production – Bartsch Oct 2015 (Low rates of lime - 3 t/ha)

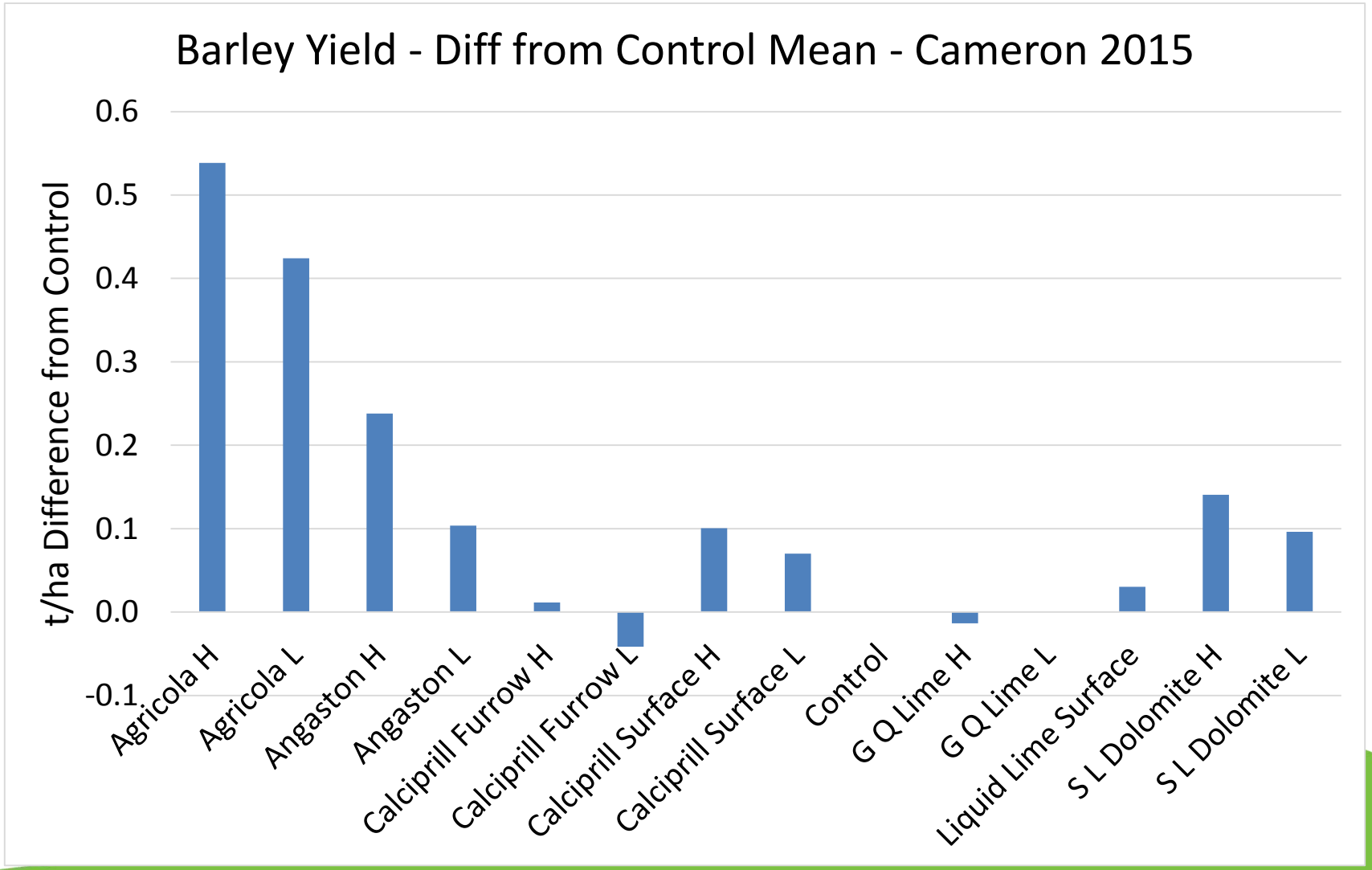


pH changes with depth – Bartsch site 2016 (Low rates of lime - 3 t/ha)

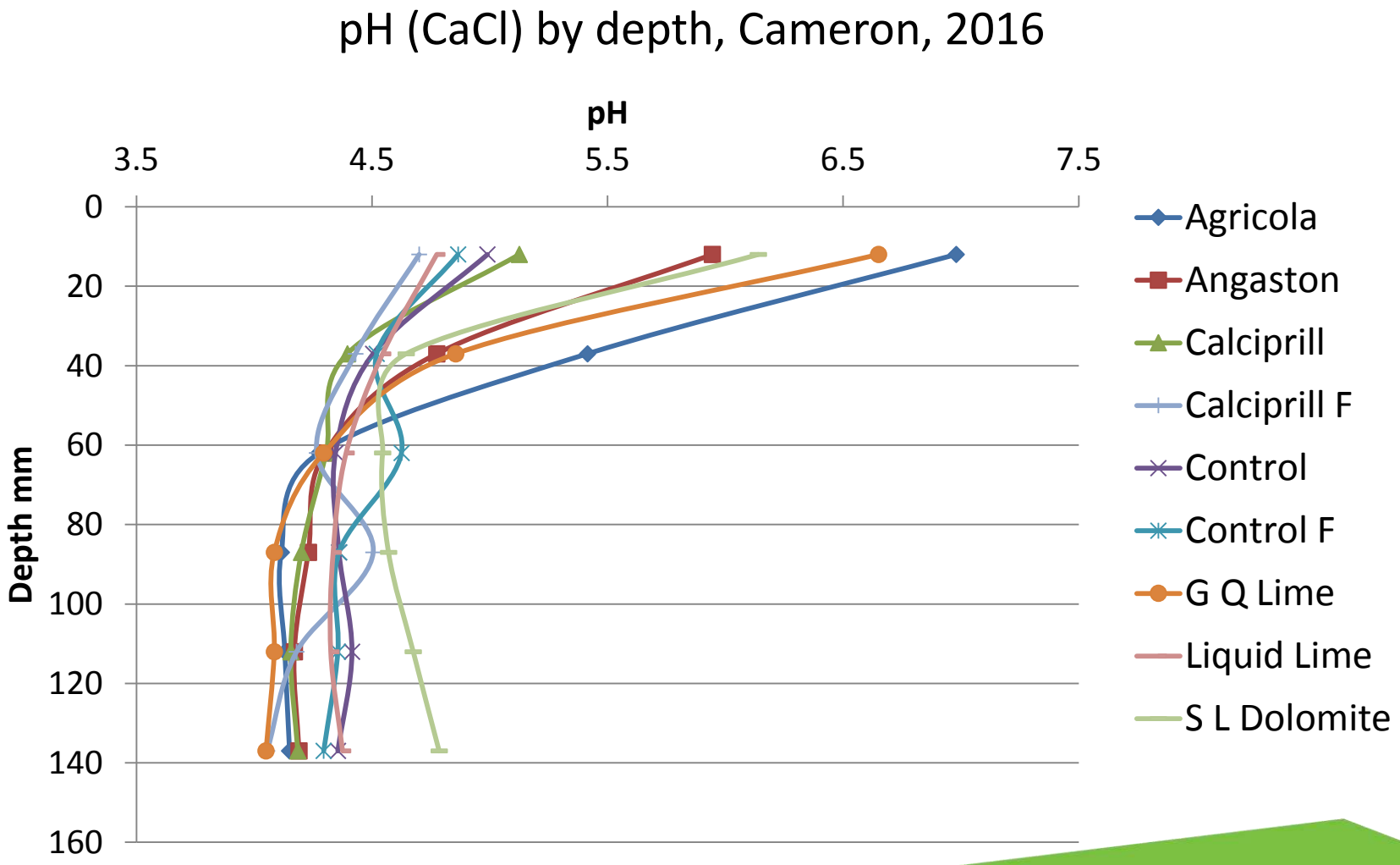


Yield - Cameron 2015

Barley Mean control yield ~ 2 t/ha



pH Changes by depth – Cameron site 2016



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?