

# Acidity... in the Limestone Coast?

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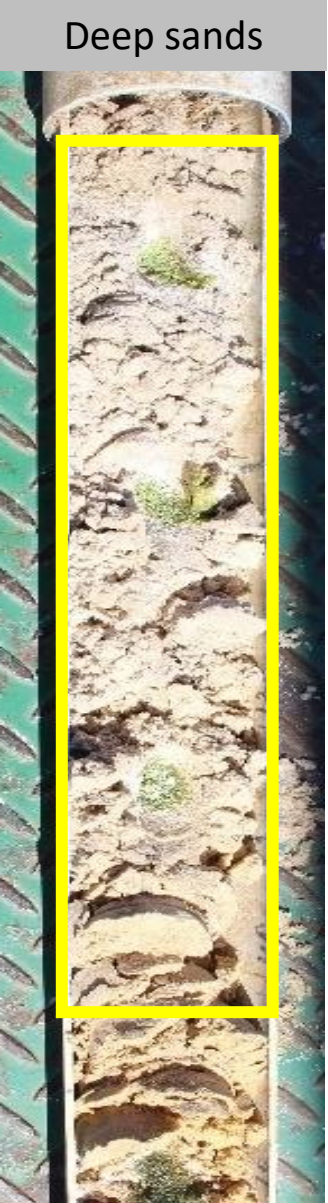
## Local Perspectives + Research Results **LIMEASSIST Calculator**



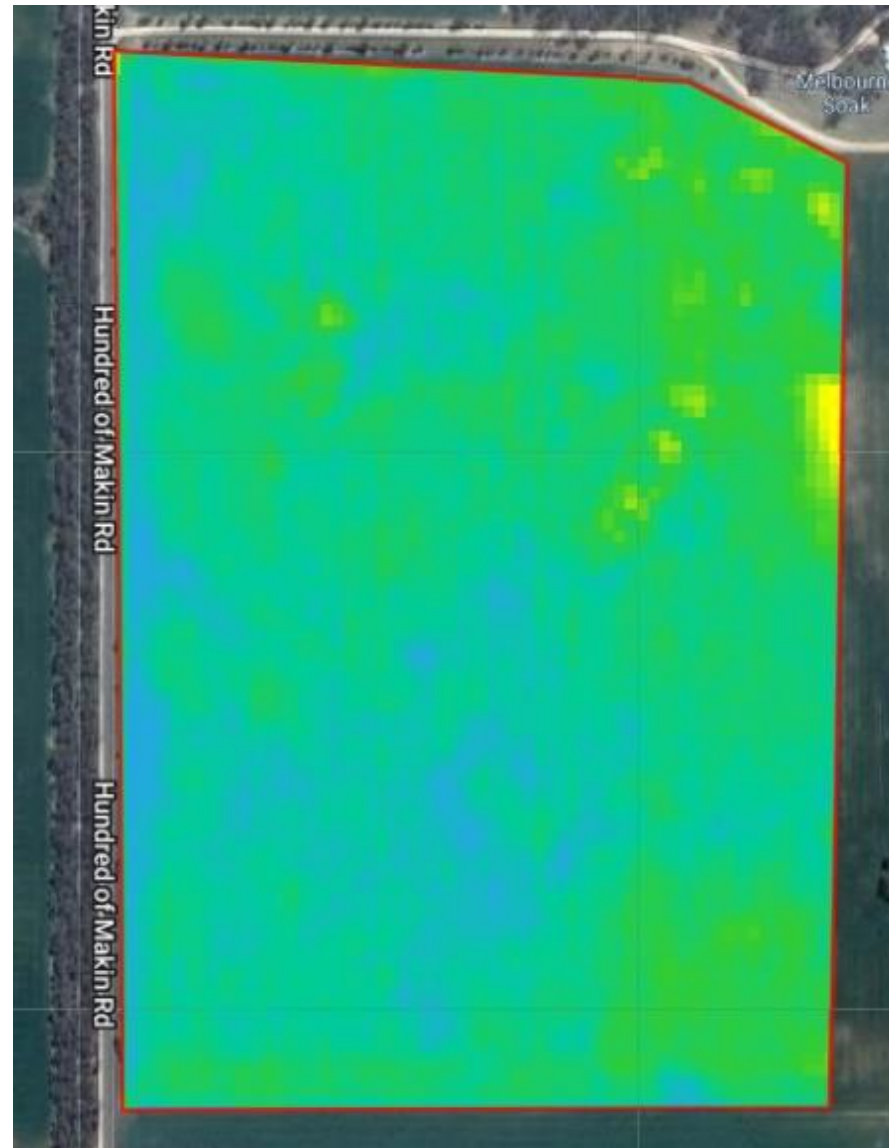


What do we know  
about acidity in the  
LC?

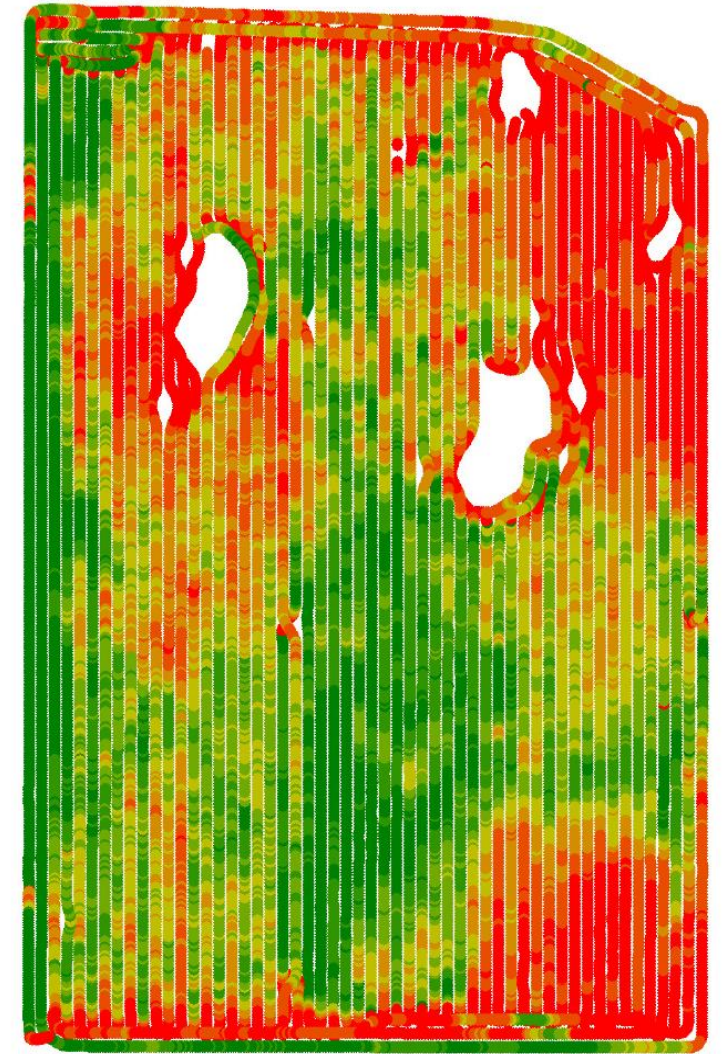
# Acidity is widespread



But, is it uniform?

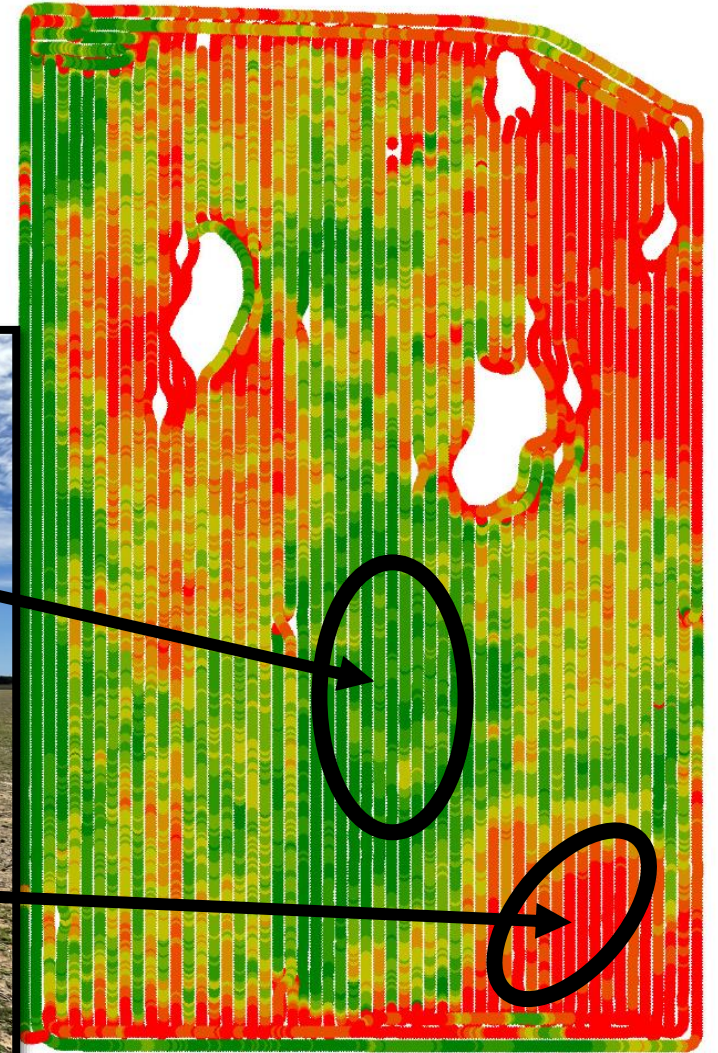


NDVI 14/9/2021



Yield map 21/11/20

But, is it uniform?

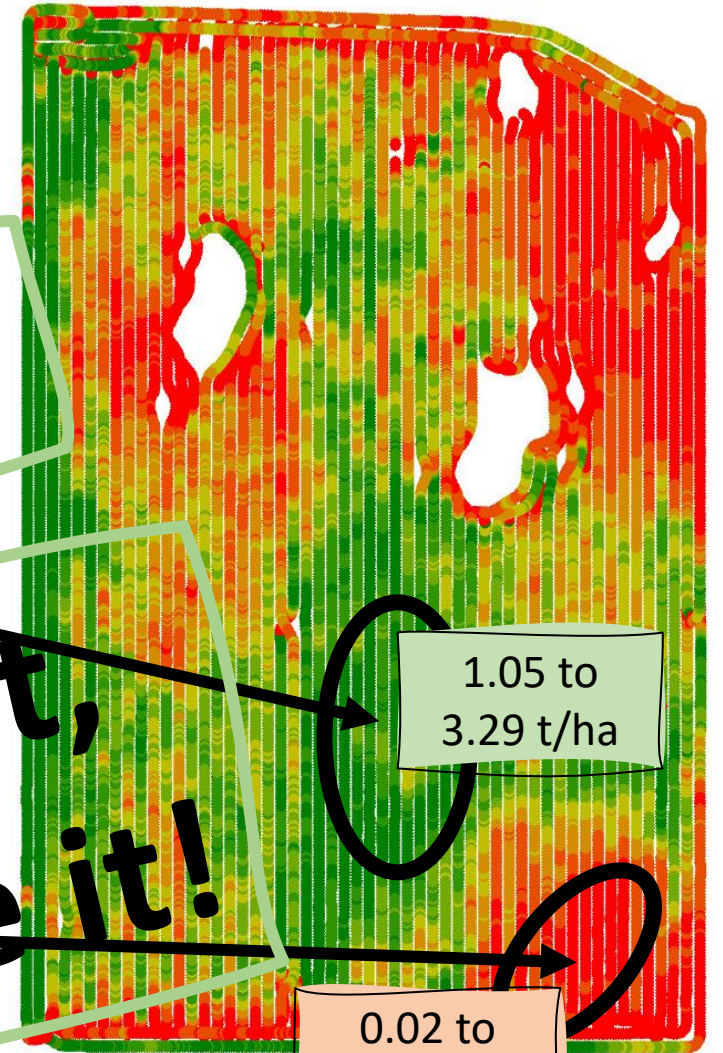


No, it's not uniform



= Lost \$

Lime it,  
or lose it!



1.05 to  
3.29 t/ha

0.02 to  
0.31 t/ha



How do I know how  
much lime to apply,  
and where?

# Acidity Mapping



What rate  
do I use?



# Soil texture

Soil Texture	Tonnes of Lime required to increase soil pH by one unit
Sand	2 t/ha
Sandy loam	3 t/ha
Loam	4 t/ha (caution)
Clay	5 t/ha (caution)

**Organic carbon content matters too!**

# Lime quality

1. **Neutralising value** – the amount of acid the lime can neutralise

- Proportional to the %  $\text{CaCO}_3$ .
- Most SA lime NV = 70 to 95%

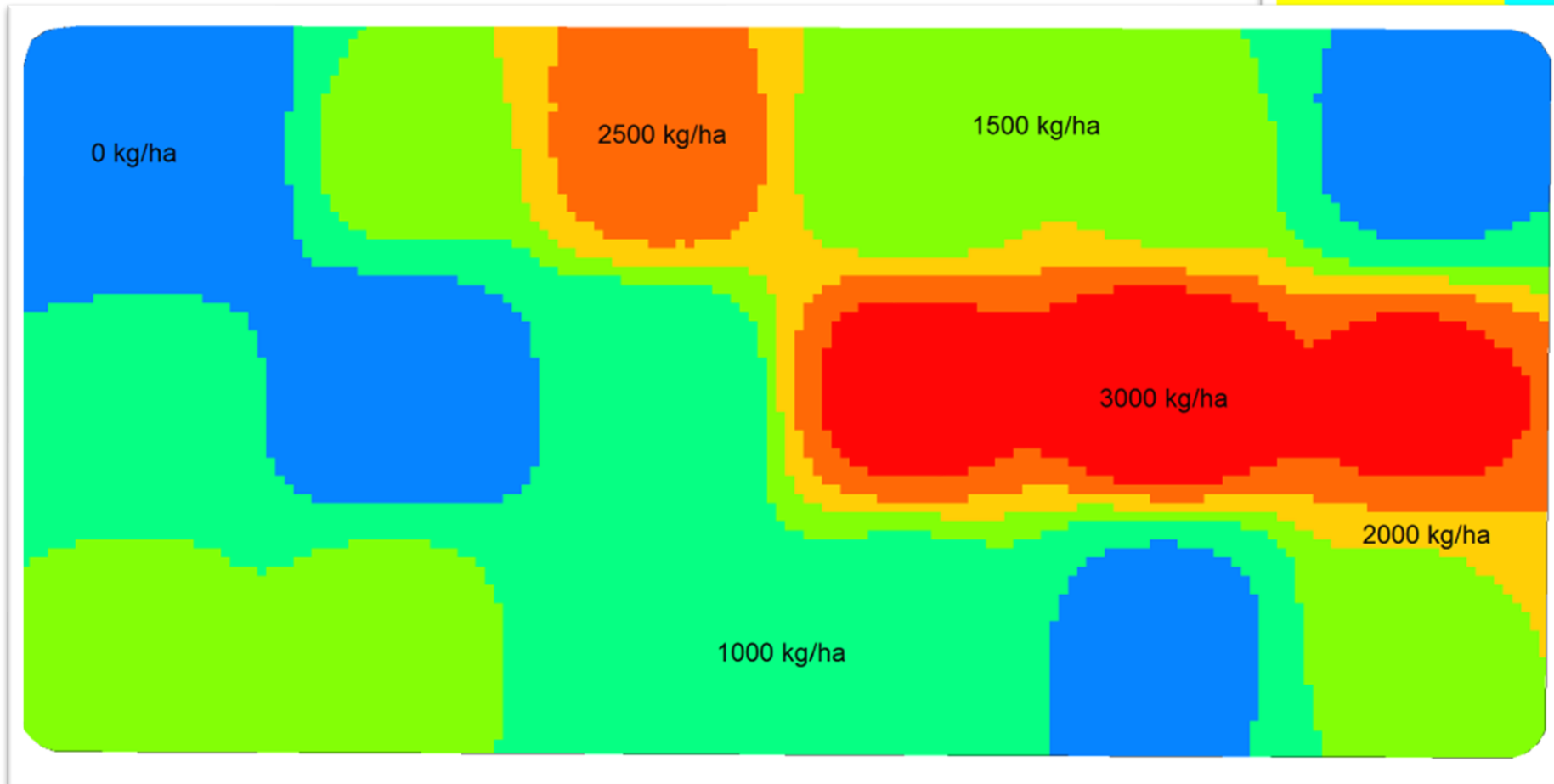
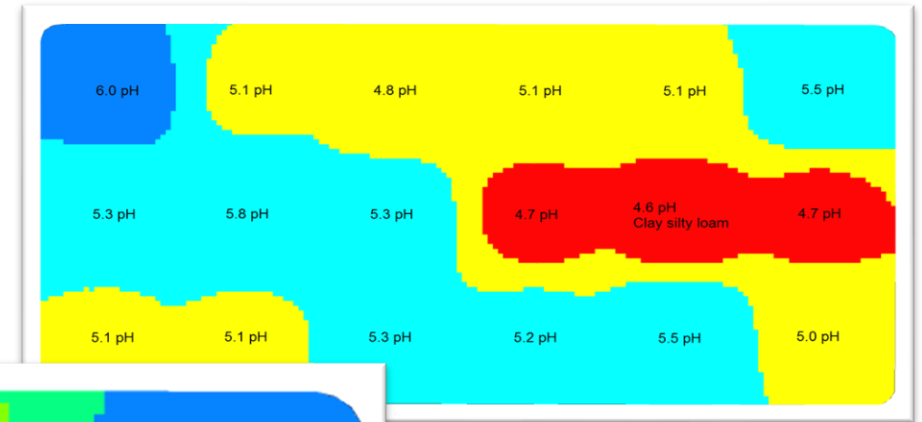
2. **Particle size**

- The finer the size the quicker the change in pH
- Particles  $>0.25\text{mm}$  are inefficient at raising pH quickly

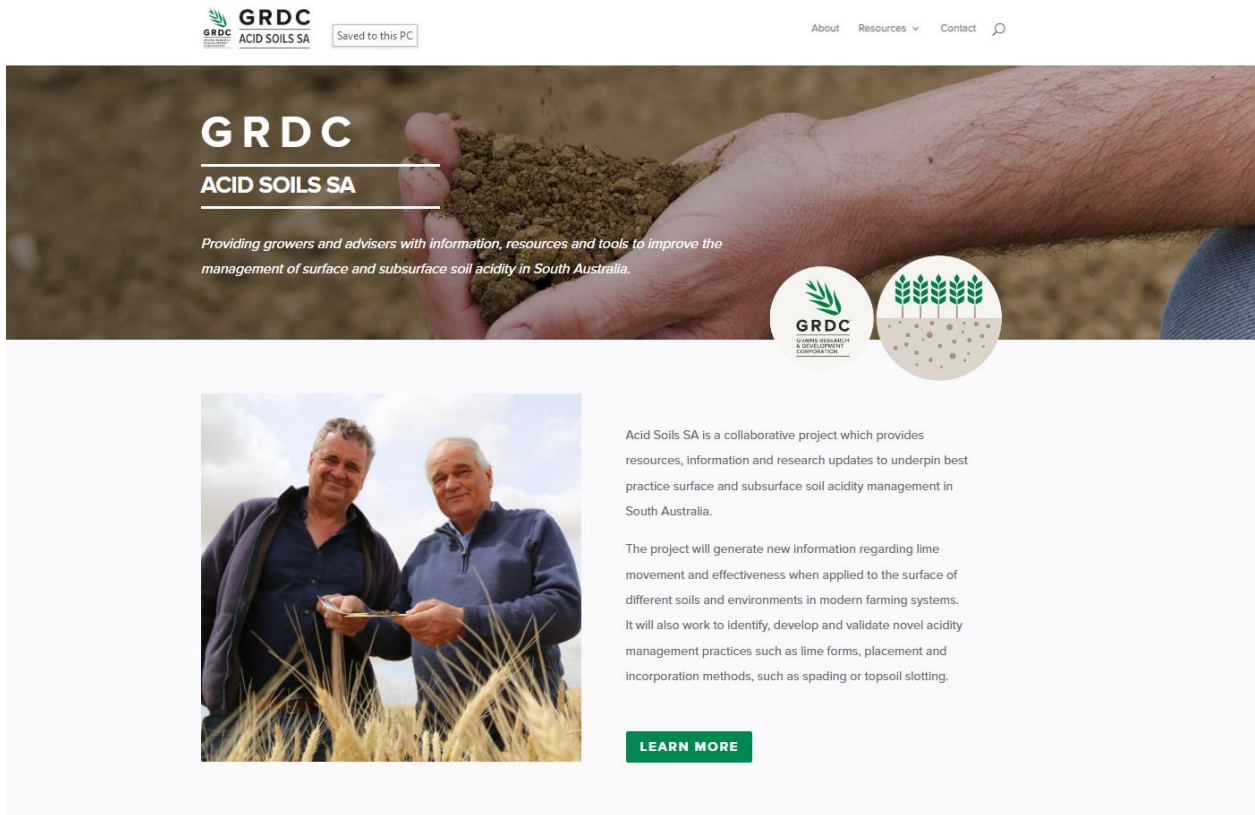
**Effective neutralizing value (ENV) takes purity and particle size into consideration**



# Lime rate recommendation



# Tools & Resources



The screenshot shows the GRDC Acid Soils SA website. At the top left is the GRDC logo and 'ACID SOILS SA' with a 'Saved to this PC' button. A navigation menu includes 'About', 'Resources', and 'Contact'. The main header features the text 'GRDC ACID SOILS SA' and a sub-header: 'Providing growers and advisers with information, resources and tools to improve the management of surface and subsurface soil acidity in South Australia.' Below this is a photo of hands holding soil. A 'LEARN MORE' button is visible at the bottom right of the page content.

[www.acidsoilssa.com.au](http://www.acidsoilssa.com.au)



The screenshot shows the Lime Assist website. At the top is the 'LIME ASSIST' logo. Below it is the text: 'Helping you answer your questions on does lime pay, lime rates, access and quality'. There are two images: 'Image: SFS Lime Spreading' and 'Image: CLAAS Harvest Centre Swayn & McCabe'. A 'Start LimeAssist calculator' button is present. The 'About LimeAssist' section explains the tool's purpose: 'This tool is designed to help advisors and farmers make decisions on liming to address soil acidification. While it can't make the decision for you, it gives you the critical information in an easy to use online platform to help you make decisions on lime investment.' It lists the information provided: 'All you need to do is input some basic paddock and farm location data into the clear boxes. Background calculations, underpinned by years of credible research, occur to provide you with information on:'.

- How much lime to apply broadscale or as variable rates across paddocks.
- Locate and compare costs and quality of lime from lime quarries.
- Economic response of lime application and the future expected benefits from amelioration of soil acidity reported as break even times, return on investment and Benefit/Cost Ratio
- When you need to re-lime.

The 'Support buttons provide you information to help you provide informed data selection choices. You can save the paddock information or print out the results.' The 'Project partners' section lists logos for SFS, Australian Government, National Landcare Program, GRDC, Agriculture Victoria, Federation University, CeRDI, VLPA, MFMG, AGKI, and precision agriculture.

[www.limeassist.sfs.org.au](http://www.limeassist.sfs.org.au)

A wide-angle photograph of a rural landscape. The foreground is dominated by dark, tilled soil in neat, parallel rows, suggesting a field prepared for planting. The middle ground shows a vast, flat expanse of land, possibly a field of young crops or a pasture, stretching towards a distant line of trees. The sky is a clear, bright blue. The overall scene is bright and open, typical of a rural agricultural setting.

What does research  
in our patch show?

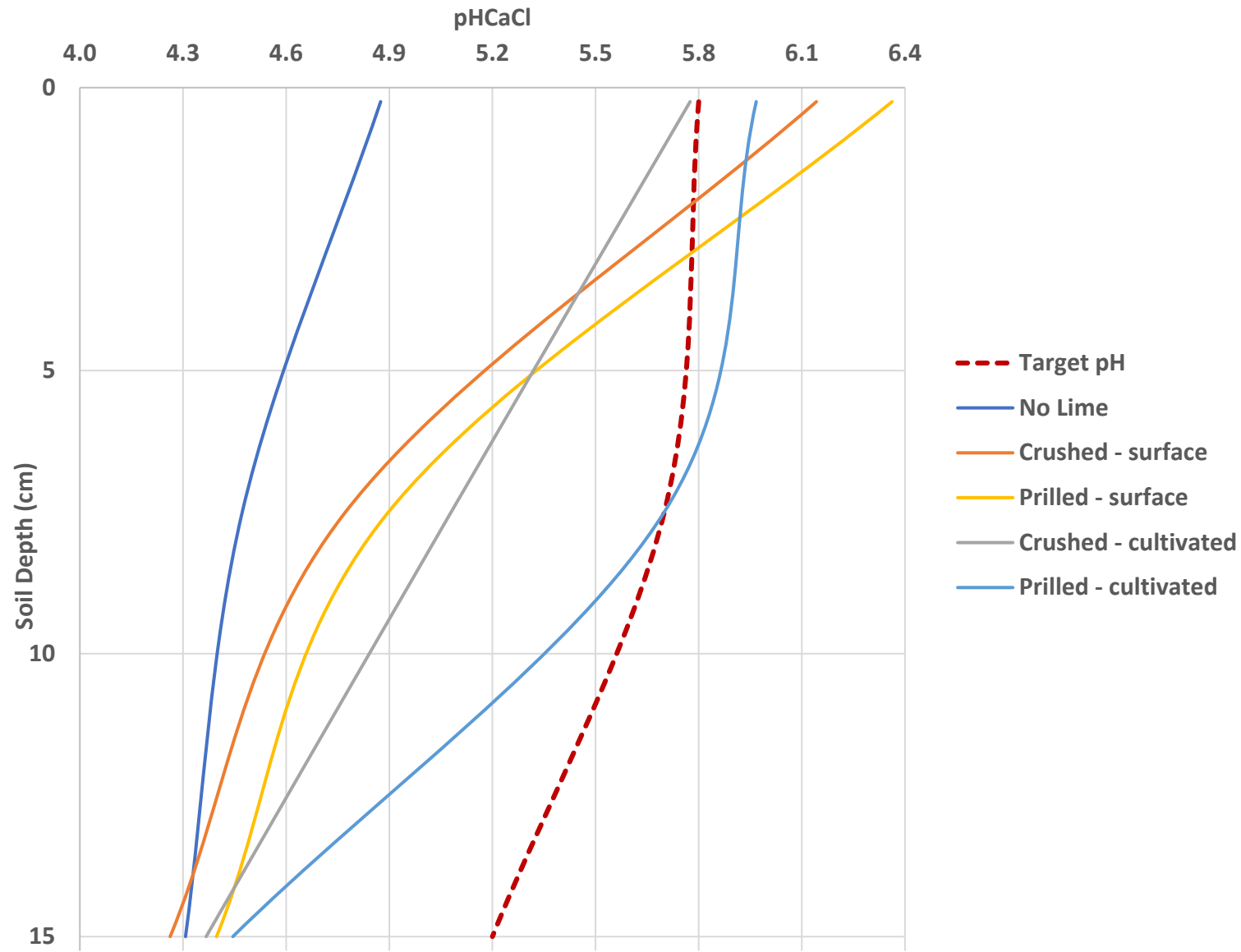


# Product & Placement Response

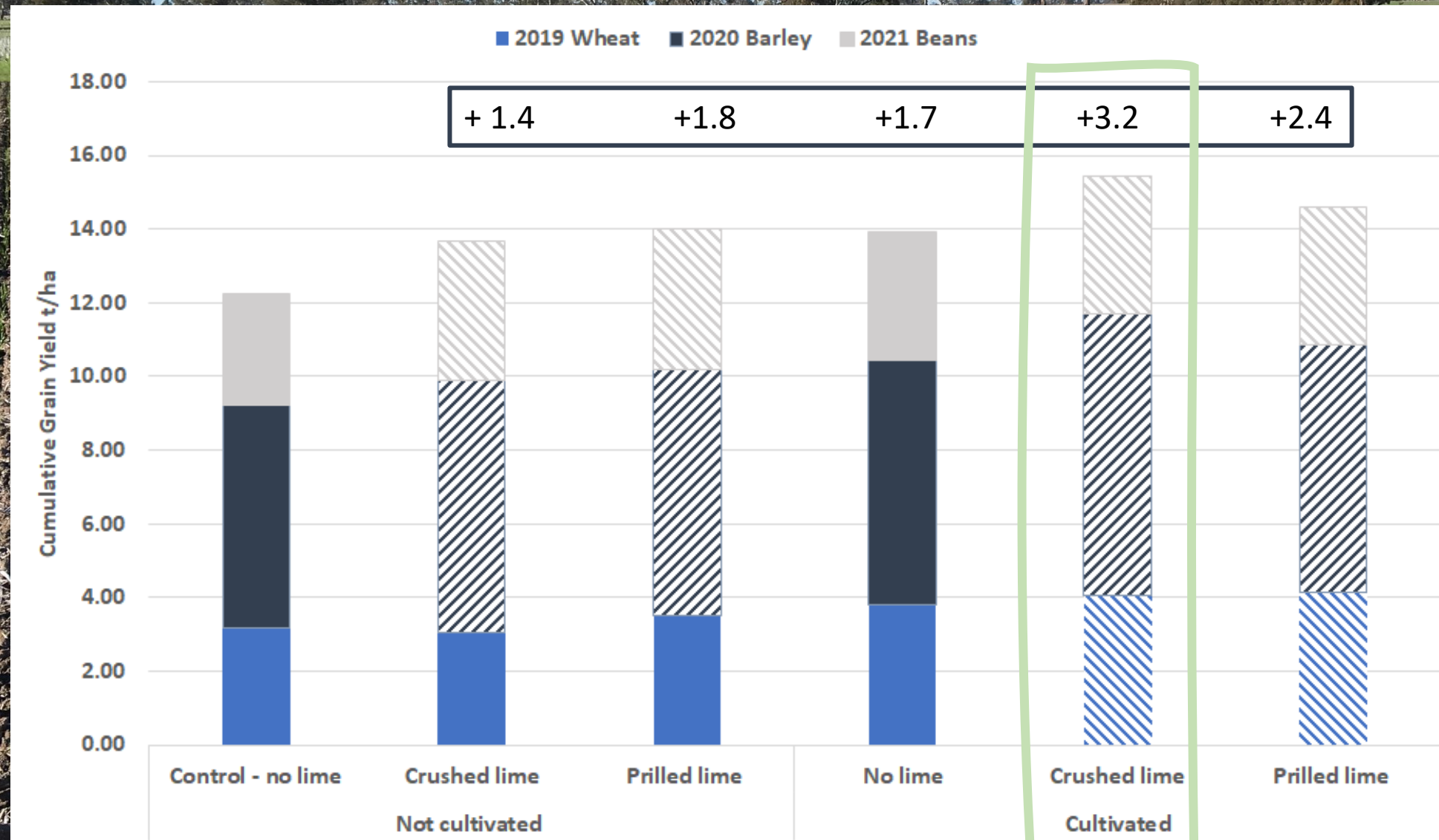
	Kybybolite		Sherwood	
	Initial	Target	Initial	Target
pH 0-10cm	4.8	→ 5.8	4.9	→ 5.8
pH 10-20cm	4.4	→ 5.2	5.0	→ 5.2

Treatment	Kyby (t/ha)	Sherwood (t/ha)
<b>Crushed lime</b> <i>surface applied or incorporated</i>	2.7	1.6
<b>Prilled lime</b> <i>surface applied or incorporated</i>	2.3	1.4

# Kybybolite – change in pH



# Kybybolite – Grain yield response







No Lime

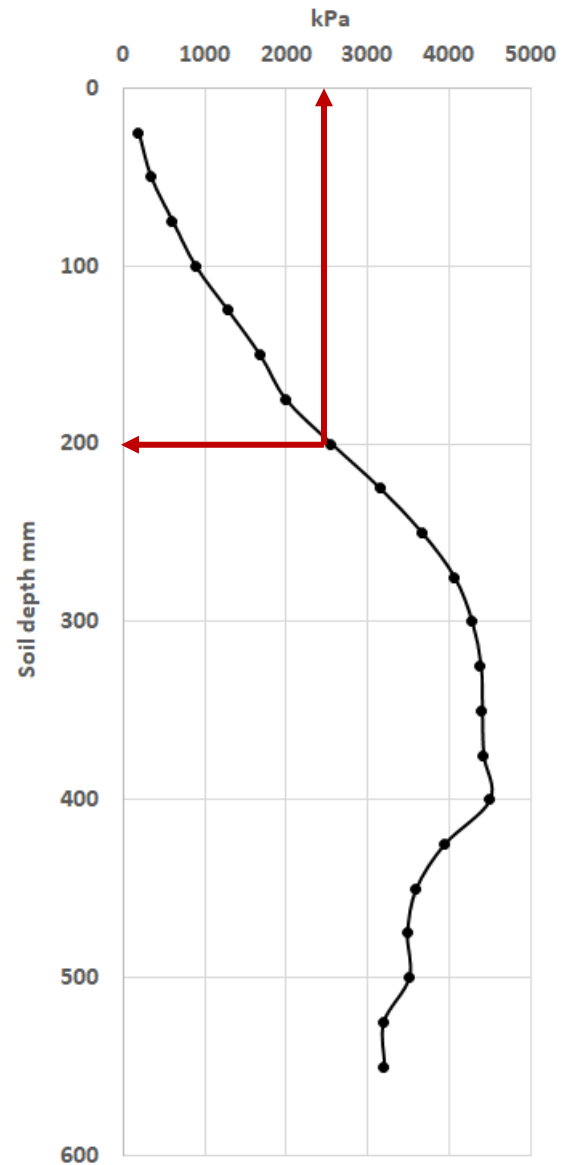


Crushed Lime -  
surface

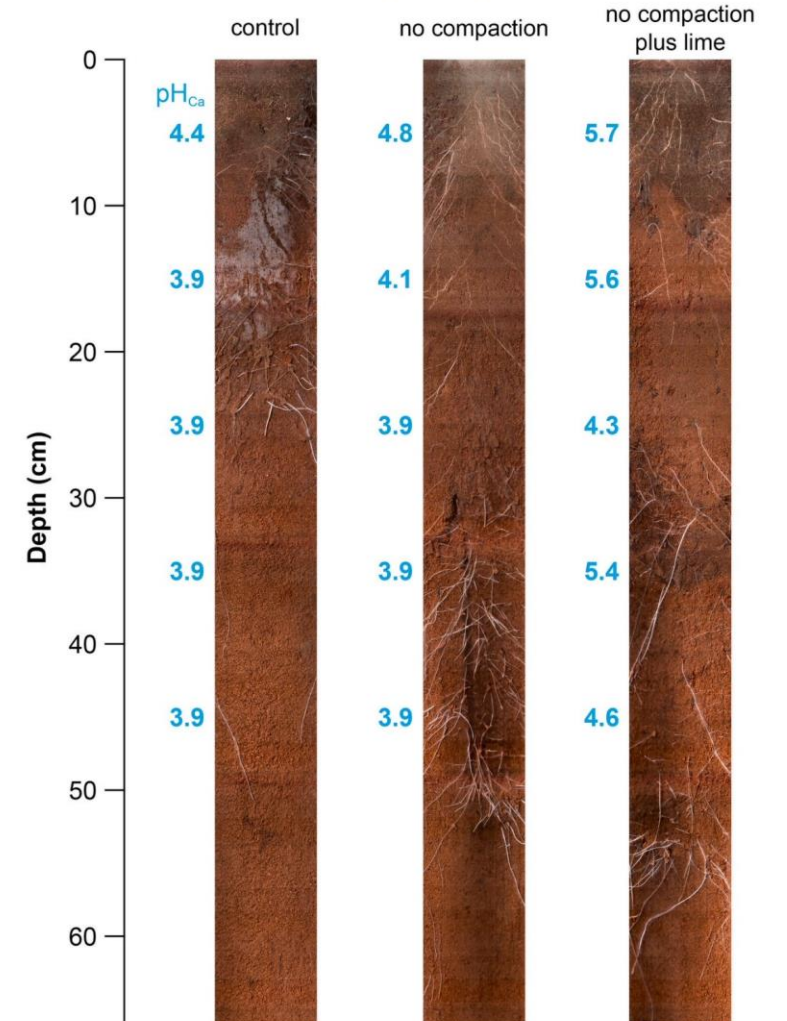


Crushed lime -  
incorporated

# Our soils often have more than one constraint



Wheat root distribution (56 DAS), Kalannie, WA



Gaus Azam and Chris Gazey

# Key messages

- Acidity is widespread, but not uniform
- Know your lime source
- Access tools and info to make good decisions
- Incorporation counts
- Know the full range of constraints

What questions do  
you have?



Many thanks to our trial hosts and collaborators, SARDI Field Crops Struan and the project teams.



A wide-angle photograph of a lush green agricultural field, likely corn, stretching to a flat horizon under a clear blue sky with a few wispy clouds. A semi-transparent dark grey rectangular box is overlaid on the center of the image, containing white text.

What about when  
multiple constraints  
are present?

# Select the right deep tillage type

Control

Rip40

Inverted

Mixed



Water Repellence - MED				
0-5	4.0 – Very Severe	2.0 - Moderate	0 – Not repellent	0 – Not repellent
5-15	0	0	0	0
pH Ca				
0-5	5.22	5.75	4.71	5.57
5-15	4.46	4.57	4.12	4.98
15-25	4.37	4.51	5.31	4.28
Penetration Resistance – kPa				
10	880	500	895	1120
20	2550	1000	1370	1650
30	4270	1320	2440	2060
40	4495	3650	4070	4170

# Select the right deep tillage type

Control



Rip40



Inverted



Mixed



It makes sense to treat multiple constraints



Established plants #/m <sup>2</sup>				
Barley	133	132	84	144
Wheat	79	88	161	122
Grain yield t/ha				
Barley	3.4	3.0	3.5	4.0
Wheat	2.7	2.5	3.3	3.2
Total	6.1	5.5	6.8	7.2