2013 SOIL SURVEY across Fleurieu Peninsula and Adelaide Hills

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Sustainable beef, sheep and pasture production

Paddocks Tested:

- 219 in total
- 2 paddocks per property
- On 30 of properties a hay/silage paddock was tested.
- Southern-Fleurieu 31%, Central-southern 21%, Central-northern 29%, Northern 18%.
- 47% commercial properties
- Funded by the AMLR NRM Board

Results:

- The perfect paddock?
- Not a one!

Phosphorus Levels

	Paddocks (all)	% All	% Northern
Average P overall paddocks		**40 ppm**	**33 ppm**
>10 ppm above ideal P *	69	**32%**	**28%**
Ideal to +10 ppm above ideal P *	44	20%	25%
<10 ppm below ideal P *	47	21%	20%
>10 ppm below ideal P *	59	**27%**	**27%**
	219	100%	100%

* Based on formula ideal P = 19.6 + 1.1 x PBI^0.55

Phosphorus Comments:

- Overall, paddocks are roughly half over ideal and half under.
- Northern area has lower % of high paddocks, … but similar % of low paddocks. Why?
  - Soil type
  - Topography/accessibility for spreading fertiliser.
  - Lower stocking rate making return on fertiliser lower.

Phosphorus (cont'd)

- What about native grass needs?
- The high paddocks are:
  - a waste of money
  - an environmental hazard
  - a waste of a scarce resource.

Potassium Levels

	Pdks	%
Average potassium over all paddocks		281
Over 175 ppm (high)	149	68%
145-175 ppm (adequate)	44	20%
120-144 ppm (marginal)	19	**9%**
Below 120 ppm (deficient)	7	**3%**
	219	100%

- Relatively few low potassium paddocks.
- Probably too much potassium fertiliser being used.

Sulphur Levels

	Pdks	%
Average Sulphur overall paddocks		**10 ppm**
% over 10 ppm S (normal)	81	37%
% 6-10 ppm S (marginal)	98	45%
% less than 6 ppm S (deficient)	40	**18%**

- High correlation between P and S (0.7)
- Keep using P and S containing fertilisers.

pH (water) Levels

	Paddocks All	% All	% Northern
Average pH (water) overall pdks		**5.8**	6.1
pH 6.0 or over (ideal)	68	31%	50%
pH 5.8-5.9 (adequate)	46	21%	25%
pH 5.4-5.7 (marginal)	72	**33%**	**20%**
pH below 5.3 (low)	33	**15%**	**5%**
	219	100%	

Acidity Comments:

- Almost half as many seriously acid paddocks in northern area.
    - Less productive pastures?
    - Naturally higher pH's.
    - Just as well in steep areas.
- Lots of liming is still needed.
- Variation between paddocks on the same property.
- 64% of acid paddocks need dolomite rather than lime…
- What value is dolomite over lime?

Salinity Levels

	Pdks	%
Average conductivity over all paddocks		**0.14**
Less than 0.15 mS/cm (low)	137	63%
0.15-0.25 mS/cm (emerging issue)	65	**30%**
0.26-0.5 mS/cm (significant)	17	**8%**
Over 0.5 mS/cm (high)	0	0%
	219	100%

Trace Elements Levels

	Marginal/ deficient
Copper	37% !!
Zinc	20% !
Manganese	7%
Aluminium (high)	9%
Boron	94% !!!

Trace Elements:

- Not entirely reliable for soil status – an early warning.
- Really need to follow up with plant tissue tests.
- There are many low/marginal copper and zinc paddocks.
- The boron critical levels are extrapolated from other crops - obviously not appropriate for pastures. Need for trials.

Grass Tetany Risk

Grass tetany is caused by low magnesium in the lactating cow. Sheep are seldom affected.

Mostly on grass dominant pastures.

	%
Safe	22%
Marginal risk	26%
High risk	**13%**
Dangerous	**40%**

Commercial vs Small-scale

	Pdks	P	K	S	pH water	pH $CaCl_2$	Conduc-tivity	Cu	Zn
Commercial grazing	47%	**44**	300	12	**5.7**	5.0	0.16	**2.1**	**2.9**
Small scale grazing	53%	**36**	265	9	**5.9**	5.2	0.13	**1.7**	**3.5**

Enterprise

	Pdks	P	K	S	pH water	Conductivity	Cu	Zn
Hay/silage & grazing	30%	**46**	269	12	5.9	0.15	2.0	3.4
Beef cattle	29%	**39**	267	10	5.8	0.13	1.9	3.4
Mixed grazing	19%	**34**	321	9	5.8	0.17	**1.2**	**2.7**
Sheep	19%	**33**	262	9	**5.7**	0.12	2.3	**2.1**

Area

	Pdks	P	K	S	pH water	Conduc-tivity	Cu	Zn
Southern - Fleurieu	69	44	312	12	5.9	0.16	1.7	3.0
Central - southern	46	38	227	9	5.8	0.13	1.8	3.4
Central-northern	64	41	269	10	5.6	0.14	1.9	3.8
Northern	40	33	312	9	6.1	0.13	2.2	2.2

Some Conclusions:

- There is a lot of wasted fertiliser.
- There are many under-fertilised paddocks.
- There are many acid paddocks.
- There are some area differences.
- We need to use soil testing more!!!
- Repeat survey in 5 years.