

How quickly do our lime-sands work?

Background

Soil acidity affects over 70% of Kangaroo Island farmland. Soil monitoring has shown that in those acid prone areas 86% of topsoils and 78% of sub soils are below a critical level of pH(CaCl₂) 5.0.

Liming is the most cost effective and practical way to ameliorate these soils. Local work on KI has shown that the average lime sand application rates (2.5-3t/ha) will increase pH by approximately 0.4 unit, however, there is concern that our local limesands are relatively coarse and thus take time to change the soil pH.

What was done

A trial was set up on R & K Stantons property (Bark Hut Road) to monitor how quickly the lime would change the pH down the profile. All treatments were broadcast onto an existing annual pasture.

The treatments applied:

- Little Sahara lime sand at 3t/ha (replicated 3 times);
- One treatment of Mark Hardy lime @ 3t/ha (ground to achieve fineness comparable to Little Sahara);
- Calciprill at 400kg/ha. Calciprill is a new commercial product. It's a pelletised ground lime. 100kg/ha is reported to increase pH by 0.1 unit. Thus an application rate of 400kg is comparable to local lime sand at 3t/ha.

Each treatment was monitored for pH(CaCl₂) down the soil profile at 0-5cm, 5-10cm, 10-15cm and 15-20cm in April 2013, before any treatments were applied. Plots were then re-tested every six months (Oct 2013, April 2014 and Oct 2014) and compared to the control (no applied lime) plots.

Results

The application of lime sand resulted in a significant pH increase in the surface soil (0-5cm) pH within 6 months of application with a 0.6 unit increase. Even after 18 months the lime had not moved down the soil profile below 5 cm. This correlates well with trial work conducted on KI back in the early 1990's which showed lime only moved down through the soil at about 2-3 cm per year.

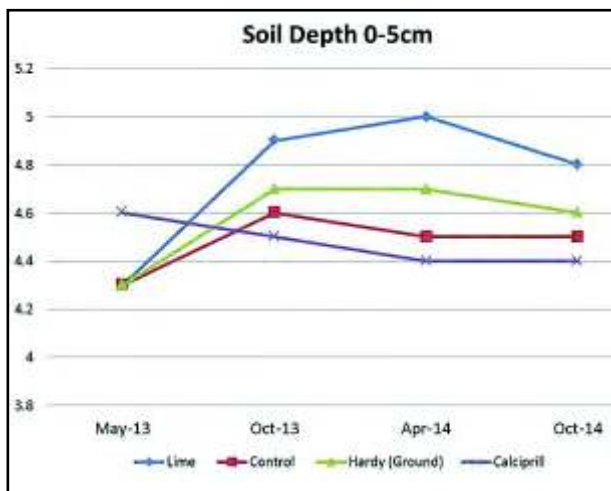
The ground 'Hardy' lime had also increased pH in the surface 0-5cm. Interestingly the Calciprill plot had no significant change in pH at any depth, but with only one plot of Calciprill and Hardy Lime it's difficult to draw any solid conclusions (refer to FIGURE 1). The control shows some variation in pH (as no lime was applied, no change should be expected) this is a reflection of normal soil variability.

In summary, it appears that an application of lime will result in a surface change in pH within 6 months, but it will take up to two years to get a pH change down to 10 cm depth.

TABLE 1: pH changes over time.

Treatment	Depth (cm)	April - 13	Oct - 13	April - 14	Oct - 14
Little Sahara (average results from 3 reps)	0-5	4.3	4.9	4.9	4.8
	5-10	4.3	4.4	4.5	4.4
	10-15	4.5	4.7	4.6	4.5
	15-20	4.7	4.7	4.8	4.7
Control (average results from 2 reps)	0-5	4.3	4.55	4.5	4.5
	5-10	4.3	4.35	4.3	4.4
	10-15	4.55	4.45	4.6	4.6
	15-20	4.8	4.6	4.7	4.8
Mark Hardy Lime (one rep)	0-5	4.3	4.7	4.7	4.6
	5-10	4.1	4.3	4.5	4.3
	10-15	4.3	4.5	4.6	4.5
	15-20	4.6	4.7	4.8	4.7
Calciprill (one rep)	0-5	4.6	4.5	4.4	4.4
	5-10	4.2	4.3	4.4	4.3
	10-15	4.2	4.4	4.6	4.4
	15-20	4.5	4.6	4.7	4.6

FIGURE 1: pH changes over 0 – 5 cm



Take home messages

- 3t/ha limesand will increase the pH in the top 5 cm of soil within 6 months.
- possibly takes up to two years to get a pH change down to 10 cm in the soil profile.

Funding/Sponsors

- Agriculture Kangaroo Island (through Caring for Our Country funding).
- Stanton family for providing the trial site.
- Little Sahara Limesand, Mark Hardy and Calciprill for donation of product.

For further information contact

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