

Lime sources and quality in SA

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Spreading lime in the mid North of SA

Lime sources in SA

- 23 registered lime sources in SA.

Registered with the Resources and Energy Group of the Department of State Development to sell and market lime as an agricultural lime product.

- 7 potential and new lime sources

Most of these have a Mineral Lease and selling lime as a fine sand

Have analysed all lime sources in SA



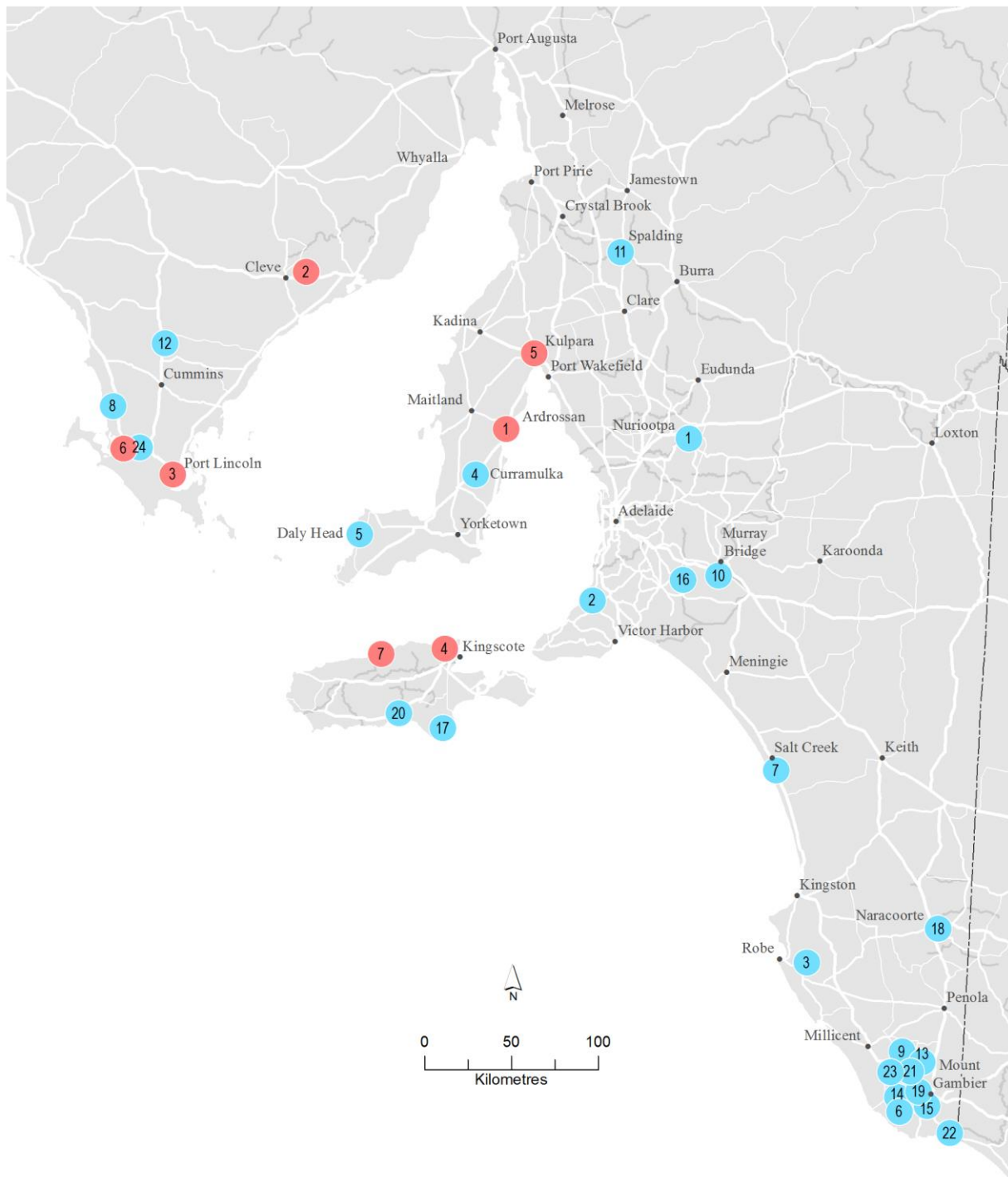
Current and potential lime sources in SA

Registered

- 1 Adelaide Brighton Cement Ltd: Penrice Quarry
- 2 Adelaide Brighton Cement Ltd: Southern Quarries
- 3 Agricola Mining Pty Ltd: Robe
- 4 Agricola Mining Pty Ltd: Curramulka (Depot)
- 5 Agricola Mining Pty Ltd: Daly Head
- 6 Agricola Mining Pty Ltd: Kongorong
- 7 Agricola Mining Pty Ltd: Salt Creek
- 8 Brian Foster
- 9 Bruce Teagle Nominees Pty Ltd
- 10 Cawte's Ag Lime Pty Ltd
- 11 Clare Quarry Pty Ltd
- 12 EP Limesand
- 13 Gambier Earth Movers Pty Ltd: Burnda Rd
- 14 Gambier Earth Movers Pty Ltd: Marte's quarry
- 15 Gambier Earth Movers Pty Ltd: Telford's quarry
- 16 Goolwa Quarries Pty Ltd
- 17 Halloran Earthmovers
- 18 Henschke Industries Pty Ltd
- 19 Mt Gambier Limestone: Bruhns
- 20 Osier Pty Ltd (Little Sahara)
- 21 Peter Whitehead Pty Ltd
- 22 Sibelco Australia Ltd: Caroline
- 23 Sibelco Australia Ltd: Tantanoola
- 24 Wiseman lime sand

Potential and new

- 1 Arrium Mining: Ardrossan
- 2 Cleve
- 3 DK Quarries Pty Ltd
- 4 Hardy Earthmovers
- 5 Kulpara Mine
- 6 Minnirbbie Farm
- 7 Pratt



PIRSA Spatial Information Services
 L13, 25 Grenfell Street, Adelaide, 5000
www.pir.sa.gov.au
 Data from the PIRSA spatial data library.
 The relationship between these data is not guaranteed.

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Lime sources in SA

- Crushed rock sources – limestone and dolomite.
- Lime sands – that do not require crushing
- Lime / dolomite scraped from old lake deposits (Agricola products)
- Industrial by-products – Burnt lime (CaO) (Caustic).
Hydrated lime – Nutrilime® Highly reactive
- Formulated products are available
Calciprill, Magprill, Liquid limes



Lime quality

- Neutralising value (NV) – measure of the purity of the product. Based on 100% calcium carbonate. Liming material should have a NV > 80-90%.
- Particle size – The finer the product the quicker it will react in the soil. Ideally >60% should pass through a 300 micron sieve.
- Effective NV - is based on the particle size and the NV. The larger particles sizes are discounted because of the reduced capacity to change the soil pH in the short term. ENV >65%.



Lime quality (ENV mainly for comparison of 'hard rock' sources)

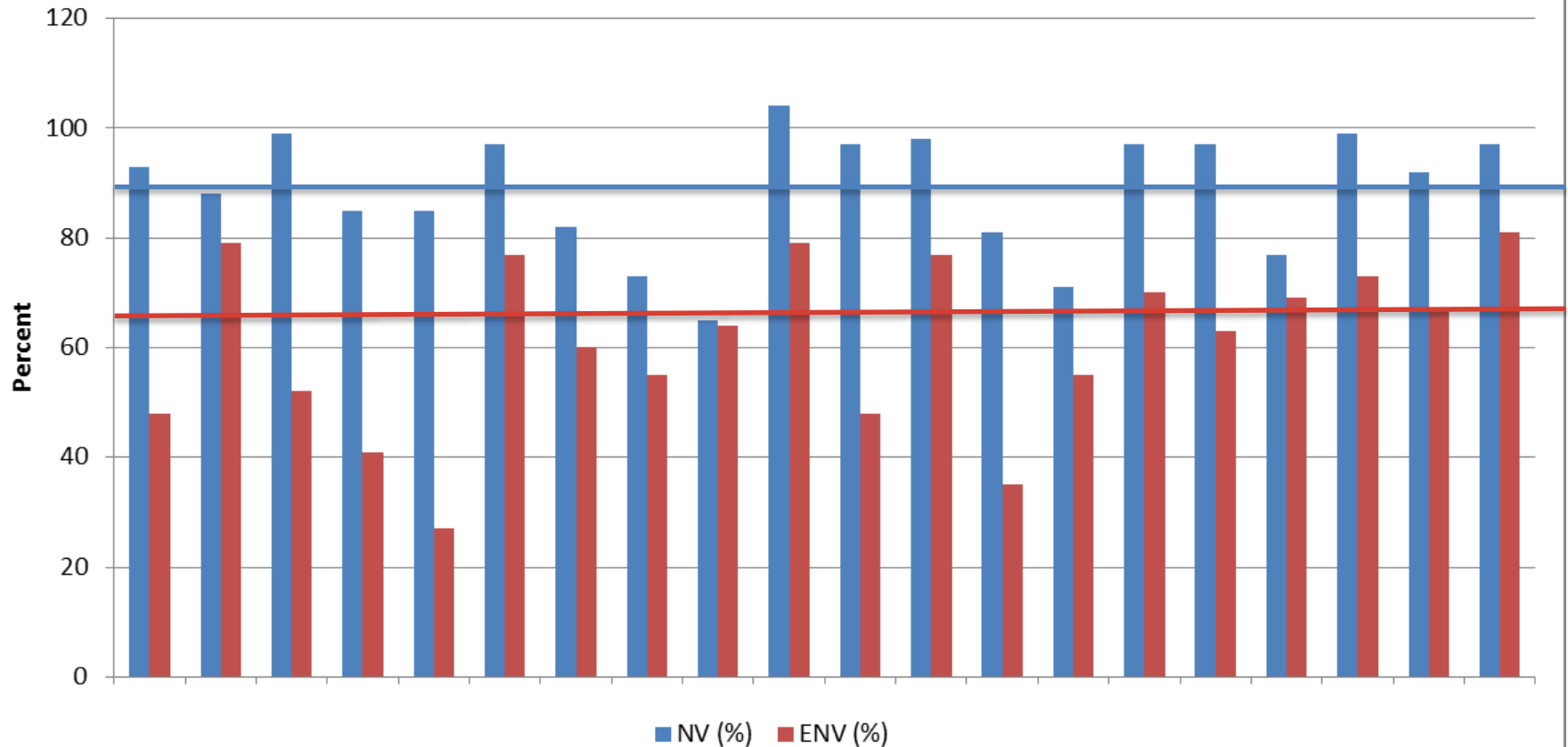
Effective Neutralising Value (ENV) (Based on Victorian Particle Size Method)

Microns	%	X Factor	Results	X NV%	ENV%
>850	6.0	0.10	0.006	88	0.53
300 - 850	11.2	0.60	0.0672	88	5.91
<300	82.8	1.0	0.828	88	72.86
	100			88	79.3



Lime sources and quality

Registered lime sources and quality



Lime quality

- Lime with a higher ENV will generally work quicker. Important if the baseline pH is very low.
- To maintain the soil pH can use lime with a lower ENV value.



Other lime qualities

- Ca and Mg content

Dolomite has a higher magnesium content.

Limestones and lime sands have higher levels of calcium.

- Dispersive

Lime / dolomite scraped from old lake beds are generally more dispersive. Low ENV with dry sieving. High ENV with wet sieving.



Other lime qualities

- Surface area
Some of the softer limestones can have large particle sizes but with more air spaces (high porosity). Honey comb effect e.g. Mt Gambier limestone. This increases the surface area and effectiveness.
- Solubility
Most lime products have a low solubility but soft limes are often more efficient than hard limes and these are more efficient than dolomite in first 12 months of liming, but no differences after two years.



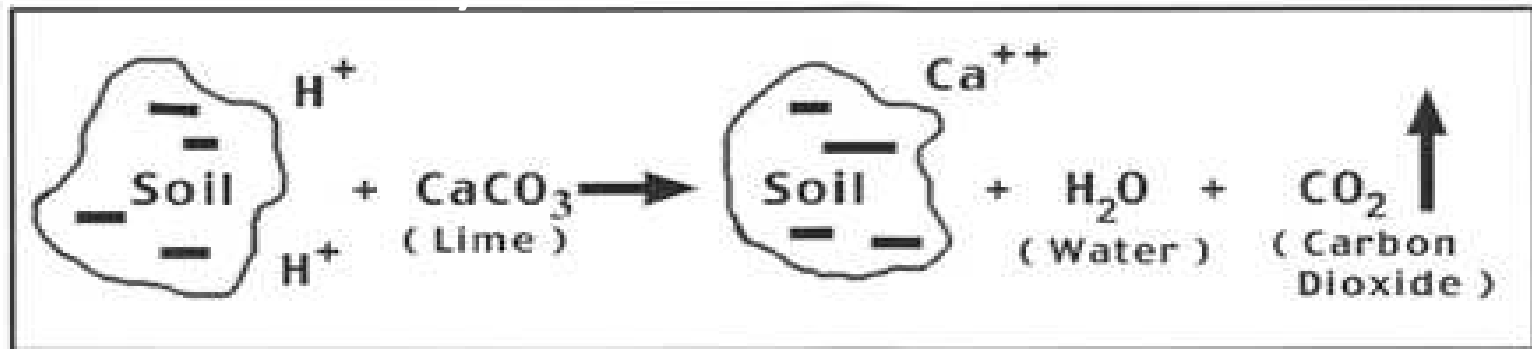
How much lime to apply?

- Target soil pH after liming >5.5 (CaCl₂).
- The amount of lime is based on soil texture

Soil texture	Tonnes of lime required to raise the soil pH by one unit (Based on 100% NV)
Sand	2 t/ha
Sandy loam	3 t/ha
Loam to a clay loam	4 t/ha

- Reduce rate by 25% if the organic carbon is low
- Do not use more than the above rates at any one time. If more lime is required then use a split application over a number of years.

Reaction of lime in the soil



Alternative liming materials

- Alkaline clays – delving and clay spreading
- Alkaline irrigation water
- Biochar – can have an alkaline reaction but depends on the source material
- Composts – alkaline material
- Manufactured fertilisers e.g. calcium nitrate



Summary

- Lime quality is important.
- Neutralising Value (NV)
- Effective Neutralising Value (ENV)
- Also other qualities.
- The NV and \$/t of lime has been built into the decision support tools.

