

Lime Quality

Time to *Re-Lime* Lime

It's neutralising value and particle size that matter

Lime is routinely applied to paddocks to treat acidic soil. Agricultural lime is any product that is used to increase the pH of soil and *the key quality issues are neutralising value and particle size.*

Lime sources

Limesand, mined from coastal sand dunes, limestone, mined and crushed from limestone, and dolomite, mined and crushed from inland lake systems, are the main sources of agricultural lime in WA. Even from the same source, limes can vary, so it is valuable to have a system which tests quality regularly. Lime WA Inc. members provide this information on their product information sheets. You can [download this information from www.limewa.com.au](http://www.limewa.com.au).

Limesand, limestone and dolomite are comprised of calcium and magnesium carbonate; dolomite has a higher proportion of magnesium. In all cases, *carbonate (CO₃) is the 'active' ingredient that neutralises the acid.*

Neutralising value & particle size

Neutralising value is the capacity of lime to neutralise acid relative to pure calcium carbonate, which is given a value of 100%. A higher neutralising value means that more of the product that you have paid to have delivered and spread is working to increase soil pH.

The size of the lime particles determines how quickly the lime can neutralise acid. Our research shows that finer limes increase pH faster. Lime with a higher proportion of finer particles has a larger surface area to react with the acid in your soil.

Value for money

It is best to think about lime in terms of the *cost per tonne of neutralising value delivered and spread.* Different lime products can be compared by multiplying the on-farm cost by 100 and then dividing by the neutralising value.

How quickly you see benefits from your investment in lime is also important in determining the value for money. For a faster treatment of soil acidity, you need a lime with a higher proportion of fine particles. *A useful calculator that takes particle size into account can be found on www.soilquality.org.au/calculator.*



$$\text{Cost/t of 100\% neutralising value} = \frac{\text{On-farm cost} \times 100}{\text{neutralising value}}$$

How does lime work?

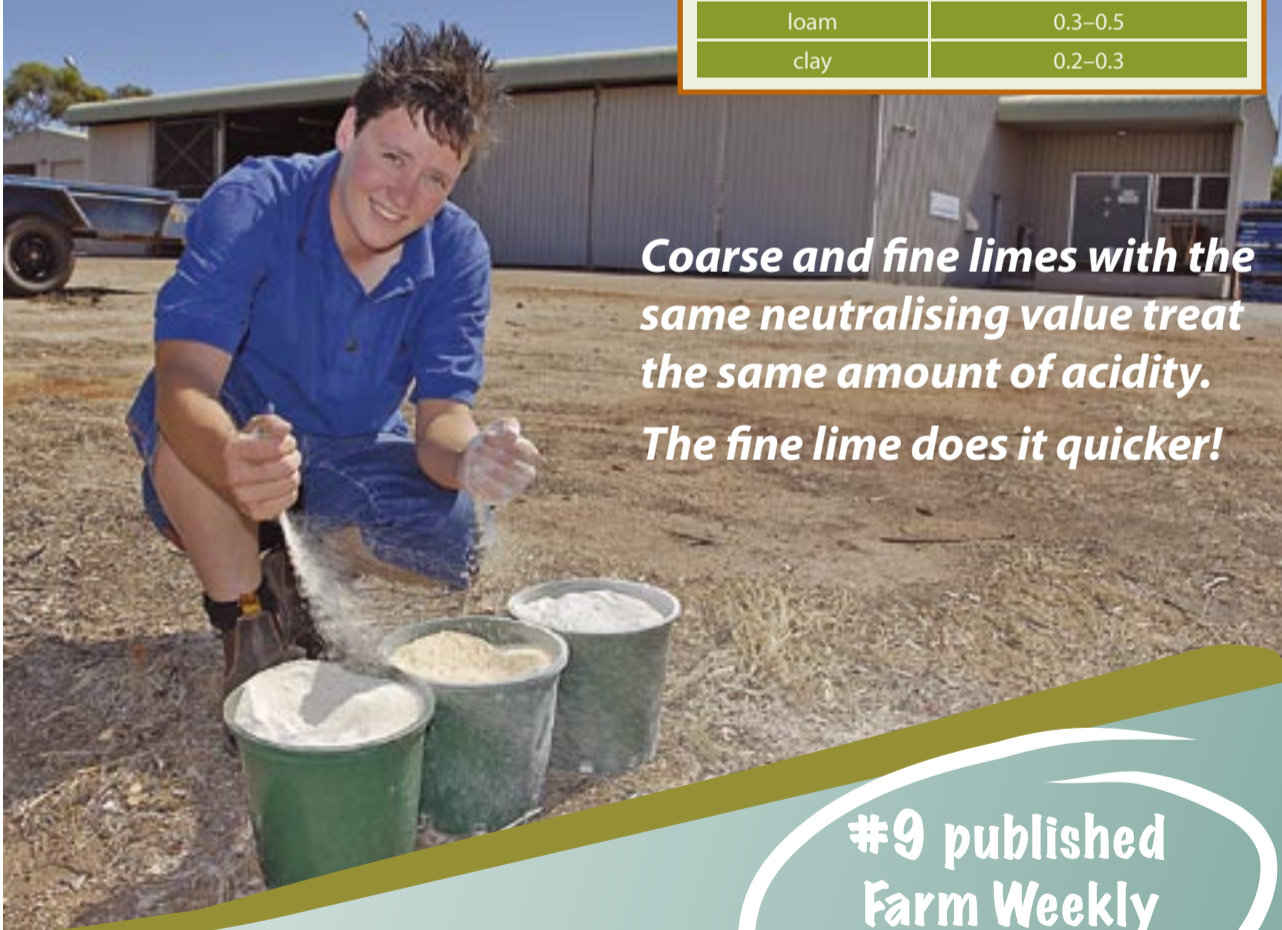
Carbonate (CO₃) in lime neutralises acidity. When calcium carbonate (lime) is added to acid soil, it breaks up into calcium and carbonate ions. The carbonate joins with two hydrogen ions from the soil solution to form carbonic acid, which is unstable and breaks up into carbon dioxide and water. So the hydrogen ions that were contributing to soil acidity are now chemically bound in water.



What pH change can I expect?

Estimated pH increase in the top 10 cm within 1–3 years with the addition of 1 t/ha fine quality lime (100% NV).

Soil type	Increase in pH
sand	0.5–0.7
loam	0.3–0.5
clay	0.2–0.3



Coarse and fine limes with the same neutralising value treat the same amount of acidity. The fine lime does it quicker!

#9 published Farm Weekly 6th Dec 2007

The Avon Catchment Council has set a target pH_{CaCl₂} of 5.5 for topsoils and 4.8 for subsurface soils in the Avon River Basin by 2020.

This article is produced by the Avon Catchment Council Soil Acidity Project, a collaborative project between the Department of Agriculture and Food Western Australia (DAFWA) and Precision SoilTech. The project is funded by the Avon Catchment Council with investment from the Western Australian and Australian Governments through the National Action Plan for Salinity and Water Quality. For more information on soil acidity or liming, please contact Chris Gazey, DAFWA, 9690 2000, or your advisor.



Australian Government



Department of Agriculture and Food
Government of Western Australia

