

Understanding Liming Materials

1) Neutralising Value (NV)

Neutralising Value is an indicator of the Limes effectiveness in the soil at neutralising acid compared to pure Calcium Carbonate. Quality Limes have Neutralising Values of greater than 95 %.

2) Particle Size

Particle size is specified in a number of ways in Australia and is important to understand as the smaller the particle the more reactive the Lime is in the soil and the quicker acidity is neutralised.

Lime particle sizing is reported as a percentage of particles below a set size.

Table 1: Particle size conversions

mm	mesh	micron
0.5	35	500
0.1	145	100
0.05	300	50

Table 2: Common Lime product sizing

Lime Material	Sizing
Agricultural Lime	Less than 500 microns
Super Fine Lime	Less than 100 microns
Ultra Fine Lime	Less than 50 microns

Average particle size can be used to assess how quickly the Lime will react in the soil as larger particles have a lower surface area to volume ratio compared to smaller particles.

Lime is not water soluble hence pH reaction can only occur when Lime is in contact with the soil. Once the initial acid neutralisation reaction has occurred at the particle surface, no further internal Lime in the particle can react as acid is not in contact with the Lime particle internal structure.

Lime Products Average Particle Size



Hence the effectiveness of Lime based on reactivity and therefore relative rate of application based on particle size can be summarised as.

Ag Lime	Super Fine Lime	Ultra Fine Lime
100 % rate	30 % rate	15 % rate
1000 kgs / ha	300 kgs / ha	150 kgs / ha

3) Lime Delivery

Small particle size Lime materials offer the greatest reactivity and hence neutralisation of acid in soils per quantity applied. The delivery of such small particles however poses large challenges with agricultural machinery application methods.

Human hair has a width of approximately 100 microns and hence even “large” particle Lime such as Ag Lime averaging 150 microns, requires specialised machinery to ensure even spread of particles on the soil. Environmental conditions such as wind greatly influence the accuracy of delivery and hence rates are often over compensated to ensure an average base rate is achieved.

Horticultural growers have seen the benefits of Super Fine Lime in speed of reactivity however application challenges are further amplified due to even finer particle sizing averaging 50 microns.

Granulation of Lime permits highly reactive Super and Ultra Fine particles to be formed into granules that can they be delivered onto or into the soil using standard fertiliser application equipment. Once in the soil in presence of moisture the granules dissolve releasing the particles.

Granulation and resulting hardness and sizing of the final product is critical. Lime granules must be of at least the same hardness of common fertiliser granules and size as delivery equipment is designed for these specifications. Soft Lime granules will be crushed during application and will result in blockages and inconsistent rates of application reducing their effectiveness. Over or undersize granules will not flow consistently and may separate in blends with fertilisers

Where high technology fertiliser equipment is used such as air seeders, worm / paddle drives, oscillating tails and aerial equipment only clean dust free Lime granules of high hardness can be used. The same quality parameters apply when blending Granulate Lime with fertilisers.




Classification	Ultra Fine Lime
Appearance	White round granule
Neutralising Value	99 %
Calcium content	39.2 %
Particle Size	90% less 45 micron
Granulation Sizing	2-4 mm
Quality	Air Seeder Grade
Hardness	Equiv Urea
Relative rate Ag Lime	15 %