

An alternative to conventional lime

Article by World Focus Agri

Ultrafine lime or gypsum is preferred to conventional lime for its superior handling, ease of application and results. Ultrafine lime also achieves a more even and thorough application. This allows the calcium carbonate, the effective neutralising ingredient in limestone, to come into contact with and neutralise as much hydrogen in the soil as possible. Better coverage means that more hydrogen is neutralised or eliminated, which results in higher potential hydrogen (pH).

Ultrafine vs conventional lime

The difference between ultrafine lime and conventional lime is in the particle size. Ultrafine lime is difficult to make because it consists of insoluble limestone particles. Limestone on its own does not suspend very well in water.

Ultrafine lime or gypsum in combination with suspension agents can go into suspension with water. This means that the ultrafine lime or gypsum can be used in sprayers and hydroseeders. It can also be applied through centre pivots, drip and micro-irrigation systems. Limited agitation is necessary due to the suspension.

Advantages of ultrafine lime

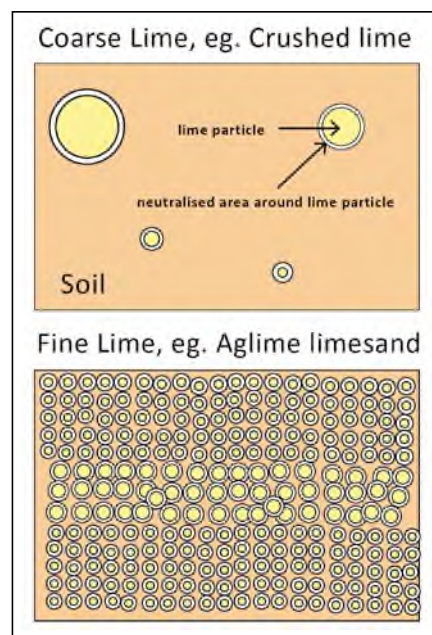
- The increased reactive surface ensures an accelerated reaction time and a higher electrostatic charge for element or energy transfer.
- It initiates an instantaneous change of calcium (Ca): magnesium (Mg) ratio, acid saturation and cation exchange coefficient (KUK).
- The macro-nutrient Ca becomes available due to chemical and biological reduction reactions of Ca/Mg carbonates.

- It includes nitrogen (N) with improved nodulation in legumes and N fixation in free-living bacteria.
- It increases microbial life and activities with faster degradation of organic matter and more effective release of nutrient elements, specifically N.
- Soil texture and structure is improved.
- It leads to increased water penetration and moisture retention.

Comparing types of lime

Lime that raises soil pH the most, relative to the total cost of liming (lime + freight + spreading), will be the most cost-effective. The dominant cost component of liming is freight, which means a smaller amount of a higher quality product will reduce the overall cost. Quality or the effectiveness of lime per ton, is determined by two factors: neutralising value and particle size.

The neutralising value (NV) of lime represents the purity of the lime, based on



A schematic comparison between fine and coarse lime. Fine lime particles raise soil pH far more effectively than coarse lime particles.

a scale of percentage of calcium carbonate (pure lime). Lime with an NV of 90% will be 50% more effective than lime with an NV of 60%, given the same particle size distribution.

Do the homework

Before you buy lime, find out exactly what you are buying. Look at the specification sheets for particle size distribution and NVs and do the calculations. If you are looking at a blend, check the proportions of the various ingredients and look at the specification sheets for the different components. This way you can see what you are paying for and determine whether it would be more economical to buy the components separately.

Finer lime neutralises soil more effectively than coarser lime, and the pH rise from finer lime is greater than from coarser lime.

Acid eats away the surface of the lime particle and dissolves lime in soil. When the acid attacks the lime particle's surface, carbonate, which neutralises the acid, is released. This neutralises the soil next to the lime particle, which is then prevented from dissolving more lime. The lime particle sits in a pocket of neutralised soil and is no longer effective.

Don't be fooled into comparing lime particles by shaking them in liquid. Coarse lime particles remain in contact with fresh acid and therefore continue to dissolve – this does not happen in the soil. Lime particles smaller than 0,5mm are most effective at raising the soil pH. Choose your lime based on particle size but check the NV of the fine particle fraction to ensure that it is lime, and not clay, you are buying. 🌱

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