



The following article was written by Soiltech
Soil Scientist, Dave McKie MAgSc (Hons)

Comparison Between Bulk Lime and Limeflour

Bulk Lime (AgLime)

This product is applied primarily to increase the soil pH over the medium to long term in soils that are too acidic for optimum agricultural production. In essence there are three main benefits of this exercise:

- Physical: improvement in soil structure etc
- Chemical:
 - decrease concentration of hydrogen ions
 - increase concentration of hydroxyl ions
 - decrease solubility of Fe,Al & Mn
 - increase availability of P & Mo
 - increase levels of exchangeable Ca & Mg
 - increase percentage base saturation
- Biological: stimulation of soil organisms (if available Ca & Mg are low)
 - Favours the formation of humus
 - Speeds up the formation of nitrates and sulphates

Collectively, these benefits lead to an increase in pasture productivity and quality. Obviously, a key component here is the speed with which the lime is incorporated into the soil.

Limeflour

This product basically does the same as bulk lime but much more quickly because of its small particle size and consequent greater surface area/unit weight. This particularly enhances the soil biological benefits.

Throughout NZ the standard for fineness of Bulk Lime is:

- More than 50% (by weight) passing a 500micron sieve and
- Less than 2% retained on a 2 mm sieve.

In essence this means that half the Bulk Lime should be smaller than 500microns and most of the rest should be between 0.5-2mm.

Limeflour has an average particle size of around 7-10 microns i.e. it is **50 times smaller** than half of the bulk lime. This means that, all other things being equal (i.e. moisture, temperature etc), the release of Ca from limeflour will be **50 times faster** than half of the bulk lime and substantially faster again than the bigger fractions of bulk lime.

By simple extrapolation, the rate of release of say 100kg of Limeflour is potentially equivalent to 5,000kg (5tonne) of Bulk Lime or, to put it in more commonly accepted terms, 2.5tonne of Bulk Lime correlates with 50kg of limeflour!

There are other factors that need to be considered than just the theoretical benefits i.e. even application of the accurate amounts of lime, incorporation of lime into the soil, contact of lime particles with soil solution etc. However, all things being equal, if the lime can be applied evenly to a paddock (which Mainland Minerals specialises in via their high tech application methods) then the incorporation of the lime as Limeflour will occur more quickly than with Bulk Lime. This has related benefits in that better and quicker incorporation means that run-off is reduced in hilly areas and the lime gets below the surface layer of the soil more quickly – in drier areas, Bulk Lime particles may simply sit on the surface for years!

Importance of a Fast Release of Calcium

Though Ca levels may often be adequate in many NZ soils per se, the level in the soil solution can often be a limitation for soil biological activity in general and earthworms in particular. Limeflour offers an immediate, though short-term boost to soil solution Ca levels. Research indicates that the application of Limeflour can quickly boost the soil solution pH as well as soil solution Ca levels. These are ideal conditions for soil biological activity, earthworm efficiency and the uptake of many plant nutrients.

Research also indicates that the benefits of Limeflour last up to 6 months after which time the soil will buffer the soil solution pH back down to levels similar to the surrounding soil. However, the benefits to soil biology, structure etc are long term and are evidenced particularly in clover growth, general pasture production, quality and palatability. In hill country areas, these benefits can still be seen 3-5 years after the application of Limeflour.