

### Lime, fertilisers and trace elements

Grazing farmers' biggest annual bill is the feeding of pastures with lime, fertilisers and trace elements. It is therefore imperative to choose and buy the best, which begins with which is needed first, lime or fertiliser. All who have studied soils, liming and fertilising, know that soils need agricultural lime first for dozens of reasons (See Elements > Calcium.) and that some fertilisers and trace elements work better in correctly limed soils.

Most New Zealand and many world-wide farms have millions of tonnes of phosphate (P) locked up in their soils caused by using the typically inaccurate soil tests. Changing laboratories which some commission agents encourage, doesn't change the antiquated system. Lime, with the help of its synergisms, cause P to become available. Meanwhile some P leaches, which is expensive and is polluting waterways.

### Where do farmers usually get fertilising information?

Mostly from fertiliser companies and the swag of fertiliser sales people, who are seldom, or haven't ever been, successful farmers.

Almost none are from lime companies, or are lime sales people, simply because fertiliser profits are about 20 times higher. Fertilisers sell for about \$500 a tonne, whereas lime sells for between \$15 and \$26 dollars a tonne. The added trace elements are low in total value and earn little profit for the vendors. Some lime companies won't mix trace elements into their lime because doing so is a cost with no profit.

Applying any type of fertiliser to lime hungry soils is a waste, because more phosphate will fix and become unavailable, while more potassium, cobalt and selenium will leach.

So don't expect your usual fertiliser consultant or company to suggest or agree with you about applying lime instead of their fertiliser.

### Organics

Organic farmers like talking about 'biology' in soils. Lime gets it going, while chemical fertilisers such as superphosphate, potash and urea slow, or reverse it. Chemical fertiliser companies seldom admit this.

Organic farmers must be aware that most organic fertilisers are more expensive per kg of element for no benefit. For example kelps are more expensive than coarse agricultural salt which contains more minerals, including ones that the kelp doesn't get out of the sea. NZ organic farmers must keep their costs down. I've been told that in USA, organic dairy farmers get paid twice the price of non-organic milk.

### Misinformation

Some fertiliser sales people make dishonest claims, such as saying that Vaughan Jones is wrong when he claims that each application of urea at average application rates, halve earthworm numbers, but I've seen this on dozens of farms in all soil types, and done trials. Doug Edmeades said that tipping a bag full of urea onto soil would not lower earthworm numbers. He could be right on his chemically fertilised farms because they would have few, if any earthworms to start with.

3,000 kg per hectare of agricultural lime with serpentine (magnesium silicate), deficient trace elements (all based on pasture analyses figures) per hectare on deficient soils (measured by pasture analyses), doubles earthworm numbers as well as pasture growth within a few months of being washed in with rain or irrigation. The earthworms also become healthier and more active. See Soils Earthworms.

### When should fertiliser and lime be applied?

Unfortunately when spring comes farmers think of fertilising, and fertiliser sales people think of making their fortunes, going by the fertiliser company profits that they boast about, so the sales pres-

sure is on to a receptive market.

Since 1960 I've had calls from dairy farmers in many springs asking why their cows wintered well, calved well and milked well, then in spring when in full flush, some cows became unwell, sometimes with an increase in mastitis and/or cell counts and dropping milk yields. Mostly this occurs following the application of spring fertiliser usually of a superphosphate or a similar mix, not reactive phosphate.

An Australian farmer blamed superphosphate and high phosphate for making him and his sheep sick, which occurred in spring after applying superphosphate.

If your pasture P levels are above the optimum of 0.4% and you apply more of any water soluble P, toxicity will adversely affect animals. In this respect, DAP or MAP are the worst, because they have no calcium, which is needed to balance the P. Gafsa and similar reactive phosphates don't cause this problem because they are not water soluble and have about 33% calcium carbonate (CaCO<sub>3</sub>), or 12% calcium (Ca).

### Selenium

I'm sure you all know to be careful about selenium especially with horses. Never use the fast release selenium chips or organic chips, because they are water soluble fast release and cause the pasture levels to go up to three times what they should be so have adversely affected horses and calves. Then after three or four months the levels drop too low.

Unless organic\*, if selenium is needed, use Selcote Ultra slow release selenium and never more than half a kg per hectare for horses. If feeding selenium to horses in any way, keep it low and be even more careful about fertilising with it. Even some vets have got it wrong. Excessive selenium has cost some horse people millions of dollars.

Despite the above, 90% of New Zealand pastures have Se levels below 0.1%, when they should be 0.3%. The result is cattle with heads below their back lines and diarrhoea or loose droppings in most animals.

\* DeLaval are looking into making the one change necessary for Feedtech to be organic. It is only the type of iodine.

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