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Introduction

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Using the hundred year old soil pH acidity measurement to decide lime applications is losing New Zealand farmers collectively millions of dollars annually.

I did a soil test on our first farm in 1956 and found it inaccurate and useless, so have not done another soil test, but have seen hundreds of disastrous liming and fertilising results from them. Read Soils > pH & Lime Requirements, and Minerals > Calcium. Pasture analyses are far superior.

The pH can be high because of a lack of organic matter, high potassium, high sodium and/or dry soil. Far better results of indicating calcium levels can be obtained by pasture analyses, looking at the soil, the earthworms, the weed types and quantities, animal wart numbers, the amount of ryegrass pulling, clover leaf sizes and numbers.

Many of the thousands of items* that googling brings up tell us what we already know, i.e., that raw phosphates are slow to release their P. I have not seen one that gives a positive solution which is that finely ground elemental sulphur mixed with finely ground reactive phosphates like Sechura and Gafsa, chisel ploughed into the soil to make good soil contact, release their P at rates. When on an equal cost basis, clover based pasture and maize growths are slightly higher than from Superphosphate.

* They also tell us that reactive phosphates (PR) are relatively insoluble minerals. The reactive phosphate particle size is important: the finer the particle size, the greater the geometric surface area and degree of contact between the soil and reactive phosphate particles and, thus, the greater the PR dissolution rate.

Tania Fernyhough, who read the GrazingInfo eBook, saw this and changed to using the calcium figure in pasture tissue mineral analyses. They then applied three tonnes of lime, serpentine and trace elements per hectare in 2009, and again in 2010, and, with other changes, such as reducing cow numbers from 420 to 340, turned a \$244,000 loss into a \$300,000 profit in four years.

Brendan and Tania opened their 120 ha Walton hill country farm to a field day on March 4. All 60 in attendance, mostly farmers - one client from north west of Brisbane and one client from Taranaki, both just for the field day - agreed the Fernyhoughs' pastures were the best they had seen in a long time.

Tania, who does the bookwork and budgeting, has for three years been reading the GrazingInfo.com web site of 120 chapters, covering most aspects of farming, off-farm investing, health, etc. She had read it more thoroughly than anyone, because she was editing it for the author, Vaughan Jones.

The main things that turned their severe loss into a good profit were reducing cow numbers, reducing the amount of palm kernel extract (PKE) from 5 kg per cow per day to 2 kg, and changing from applying poultry manure without lime or deficient trace elements, to spreading three tonnes per hectare of LimeMagPlus (lime, serpentine and deficient trace elements) in both 2009 and 2010, based on pasture tissue analyses, not on pH, which was high because of excess potassium having been applied.

Bought feed had cost them \$233,000 in 2009, and based on through payout was unprofitable, and resulted in unhealthy cows with toxically high copper and manganese levels from excess PKE, so much so that milk fever treatment didn't work, so cows died. When animals are adversely affected by one toxin (they had two), another such as low magnesium, gave the disastrous double whammy effect.

Pasture analyses revealed that phosphorus and potassium levels were toxically high.

The liming with serpentine and trace elements, grew a lot more pasture and when applied at five tonnes per hectare and chisel ploughed in, increased the yields of maize for silage and mixed summer forage crops of Pasja and Shirohie millet or Nutrifeed. Gafsa reactive phosphate with elemental sulphur was also chisel ploughed in to speed its release and produce higher yielding crops.

These correct farming practices resulted in softer, more rain-absorbent soils, growing more clover and subsequently more total pasture, with roots going three times deeper, and fewer weeds, and the cows being fully fed this summer to produce more per cow with much less bought feed.

Savings also came from \$72,000 from 60 fewer cows at the maintenance cost of \$1,200 per cow per year, healthier cows, with a 50% reduction in vet costs and animal deaths, and faster growing calves, requiring less or no worm drenching.

Almost nothing was spent on the soil-destroying urea, but far more pasture grew from the LimeMag

and trace elements, with applications of some modern nitrogen products.

The savings allowed the Fernyhoughs to reduce their mortgage by \$100,000, buy a large second hand tractor for \$70,000 which enabled them to pull their chisel plough deep enough to deepen the topsoil and bring up subsoil, with its silica and clay, to strengthen the light volcanic Walton soils that normally dry out in summer. They were also able to upgrade their old, worn out car.

Tania wrote, “We had used a consultant who had recommended we feed PKE, canola, wheat bran, dried distillers’ grain, potatoes, kiwifruit and tapioca, via an expensive mixer wagon. However, cows performed sub-optimally. We managed high-inputs badly, due to a lack of knowledge of the complexities involved, and did not follow GrazingInfo feed budgets.

“Our cows had not been on all grass for a number of years and the farm had not had a capital dressing of lime, nor regular applications of lime or magnesium for at least 20 years because the soil pH was 6.1 to 6.3. Problems secondary to this were shallow rooting, clover root weevil, clover flea and grass grub. Soils would dry out quickly in dry weather. Brendan said that this had become increasingly evident over the past 15 years. In November 2009 he phoned Vaughan and asked if just lime, serpentine and trace elements he had recommended could be the reason for less drying out and better pasture growth.



“Blanket spraying the farm for weeds and facial eczema control were causes of animal ill health, as we found out after Vaughan Jones became our consultant. His recommendations were natural and 99% organic, and involved 'catch up' applications of lime, serpentine and trace elements.

“The paddocks that were cropped and re-grassed, so got eight tonnes of LimeMag and trace elements over three years, most chisel ploughed in, became the best. When these paddocks were grazed, the cows each produced two litres more a day, worth \$370.

“The total cropping, fertiliser and lime costs were higher, but previously had been too low. Bought supplemental feeding costs had risen to far above pasture fertilising costs.

“We had animal health problems, high somatic cell counts, mastitis, displaced abomasums, milk fever, pneumonia, ketosis, clinical and sub-clinical acidosis. Calving difficulties resulted in frequent vet visits and dead cows, despite feeding a mineral mix year round, which was obviously deficient.

“Vaughan pointed out the selenium, cobalt, sodium, copper and magnesium deficiency symptoms in our animals.

“Changing to DeLaval’s Feedtech, containing seven balanced minerals, gave amazing animal health improvement within a month.

“Pasture tissue analyses showed what soil tests couldn’t, or not accurately anyway. Calcium, magnesium, boron, cobalt, selenium and sulphur were very low, while pasture phosphorus (0.47%) and potassium (4.3%) were toxically high. This accentuated the animal health problems, which were partly from overfeeding PKE with its high copper and cadmium.



Three years ago pastures had very few clovers and bad ryegrass pulling of 20 plants per m² shown here, which was due to excess aluminium caused by calcium and serpentine deficiencies. Checking showed that it was never by black beetle on this or many other farms.

Pastures died out within four or five years, while dandelion, buttercup, wire weed, storksbill, chickweed and docks increased. Pulling on the farm has now stopped.

Brendan's father, and previous farm owner, John Fernyhough, is impressed with the reduction in weeds without having to spray, and the increase in clover, all without applying any potassium for three years. Excessive potash use has been wrongly indoctrinated into farmers' minds.

The Fernyhoughs now know that their heavy reliance on urea, of up to 200 kg/ha/year, was part of their problem, as it caused hard soils and shallow rooting, especially without lime and deficient elements.

A soil scientist has claimed that no soils in New Zealand need calcium, and one claimed that lime took 12 years to respond, but these claims have been shown on hundreds of farms to be wrong and just fertiliser sales propaganda.

Many farmers have written, "Our farm became a lot greener a few months after Vaughan got us to apply 3 tonnes per hectare of lime, serpentine and deficient trace elements". One farmer from Hawkes Bay wrote, "I'm impressed with the results since applying two tonnes per hectare of lime over the whole property."

Hundreds in New Zealand, Australia, South Africa, South and North America, Europe and Japan have achieved the same results by liming with deficient minerals based on pasture analyses. Many have reported this in testimonials to GrazingInfo.com, the world's newest and most complete and popular agricultural book.

This pasture was typical of many of their best pastures on 4 March 2011.

Tania wrote, "The March rainfall was good after seven weeks of almost none in November and the first three weeks of December. However, even in the dry periods the growth of the new pastures has been amazing, thanks to adequate lime and elements applied over three years in the crop and new grass paddocks, performing like this one which was re-grassed last autumn with Bealey NEA2, white clovers Tahora 2 and Kopu (no longer recommended because it dies out after a few years), Puna chicory and Tonic plantain."

Ryegrass roots that were only 7 cm deep three years ago, now go down 25 cm as shown. Ryegrass pulling has stopped. Insect damage from clover flea was very bad, and from others are now no problem.

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