

28th September 2021

DoloZest® News

0800 843 809

Functional Fertiliser Ltd

peter@functionalfertiliser.co.nz

or coralie@esi.org.nz

www.functionalfertiliser.co.nz



Summer Performance

CalciZest was developed over twenty years ago for the purpose of enhancing clover growth, speeding the rate of nutrient cycling, and improving physical soil structures. Based on independent measures of all three performance goals, it has delivered.

It's not necessary to measure every parameter to know it delivers on all fronts because as with all living, breathing organisms, when one thing improves so too do all others.

Soil is a dynamic organism and Dr Graham Sparling stated in his 2004 Norman Taylor Memorial Lecture, *soil is only soil if it has biological activity (otherwise it's dead like moon dust) and we are very lucky to have it.* He also said, *"We think soil comes for free. It's our repository for waste, it cleans up our excess liquids, contains our contaminants and we use it for sports fields, golf courses and cricket pitches. We do all that and think our soil is miraculously going to take it all."*

He finished his lecture by saying that our dependence on primary production can only mean more intensification and more pressure on the environment. Such a course could lead to a polarized community between those, say, in tourism and those on farms.

Perhaps we should not be surprised by the accuracy of his prediction. Dr Sparling was on the scientific community's international highly cited list, a list that contained the names of 0.1 per cent of five million researchers world-wide.

A different thinking process

Conventional soil fertility programmes are based on a **reductionist** thinking process. If a product containing more than one element provides an increase in growth, trials are conducted to discover which of those elements is providing the performance.

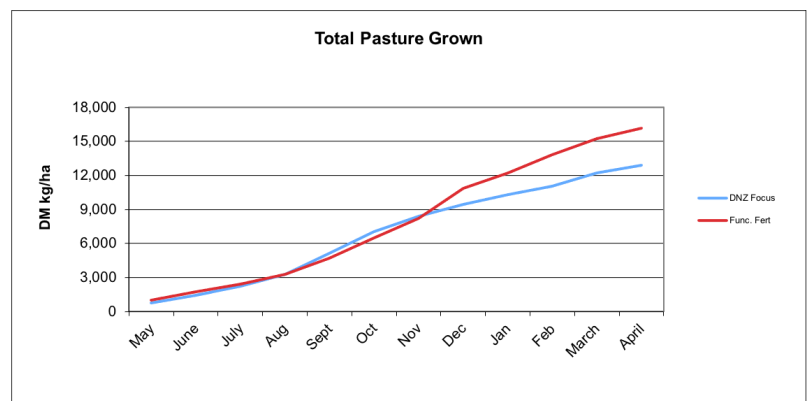
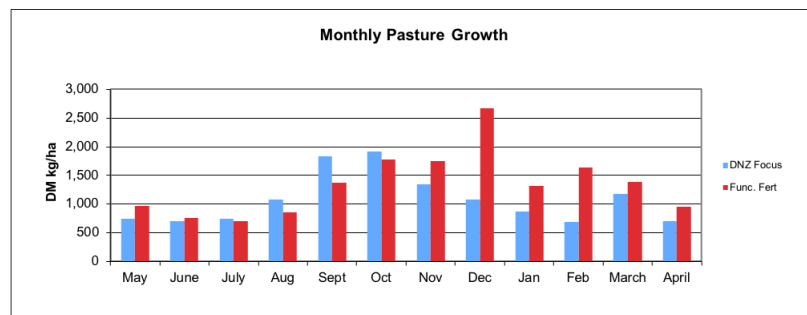
Single Superphosphate, the phosphate fertiliser produced here in NZ, contains both phosphorus and sulphur, which is the reason few long-term trials have been conducted using just Super.

Phosphorus response trials have mostly been conducted using Triple Superphosphate, which contains very little sulphur, and any response therefore can be attributed to the application of phosphorus.

It has been assumed, probably correctly, that the same amount of P applied in the form of Single Superphosphate will provide a similar response. New Zealand soils also require sulphur, the reason that Single Superphosphate (SSP) was manufactured. Low ASC soils, which is virtually all of the South Island, and all the Taupo Ash based country in the North Island, require regular sulphur inputs for best performance and SSP was therefore a logical product to produce.

The process used to develop CalciZest and DoloZest, along with the total nutrient programmes that have evolved has been based on a process of **synthesis**. It's the ability to combine products in such a way that the performance is greater than the sum of the parts.

Performance data comparing the Berryman property with the DairyNZ Focus Farm situated within 5km of each other close to Edgumbe in the Bay of Plenty for the 2008/09 season is below. Pasture production for the season was one of the two lowest, due to dry summer conditions, since the start in 2008 of measuring monthly pasture growth for 12 years.



Over the 12 month period shown the Dairy NZ property grew 12,895kgDM/ha. The Berryman property grew 16,187kgDM/ha, 25% more.

What is significant is the **amount of extra pasture grown during the peak production months of October until the end of May** – the time when high quality pasture is in greatest demand.

At the heart of the success is Calcium

The benefits of calcium when applied to soils is well known, however the speed at which it becomes available for plant uptake is largely dependent on the robustness of soil biology.

The percentage of calcium in clover is 3 – 4 times that of grasses and there is plenty of trial work that shows that extra plant available calcium results in an increase in clover growth over summer.

Earthworm activity and numbers also increase and where they proliferate so too do beneficial fungi and bacteria. The addition of selected beneficial fungi and bacteria enhances the release of nutrient for plant uptake, which means better performance from lower inputs. Increased micro-organism activity also produces an antibiotic effect which helps combat pathogens. This results in plants with greater vitality and disease resistance.

The ideal pH for optimum bacterial and fungal activity is 6.2. Provided soil pH is consistently 6.0 or above and Base Saturation Calcium readings are close to 68% outstanding performance can be expected.

With increased crumb plant roots delve deeper into the soil accessing both nutrient and moisture from a greater depth. Crumb provides the pore space necessary for the optimum 25% air with a further 25% being moisture.

Rainfall is more readily assimilated with less of the valuable summer rain lost via run-off, enhancing growth prior to autumn rains arriving.

By incorporating all the elements that enhance plant growth annual performance is in the order of **30% higher** than that able to be obtained with a standard conventional nutrient programme.

Profit

Extra pasture grown counts for little unless it generates profit. Below is the data from the latest DairyNZ Field Day held at the Berryman property.

Turning pasture into profit is at least as much art

as it is science and the management by Liz and Danny Henman is second to none. Peter’s insightful and wise council contributes greatly to the final outcome.

It’s a family farm that can become the blueprint for the dairy industry in the future, should it genuinely wish to prosper.

| | 2019/20 | | 2018/19 | |
|---------------------------------|---------|-----------|---------|-----------|
| Financial KPIs | B'man | Benchmark | B'man | Benchmark |
| Farm Working Expenses (\$/kgMS) | 2.12 | 2.44 | 1.86 | 2.41 |
| Gross Farm Revenue (\$/ha) | 6,142 | 4,606 | 5,446 | 4,122 |
| Operating Expenses (\$/ha) | 2,943 | 3,632 | 2,453 | 3,518 |
| Operating Profit (EFS) (\$/ha) | 3,199 | 974 | 2,993 | 604 |

Phosphorus pricing

The price of phosphorus has escalated over the last twelve months and is likely to remain high.

The upside is that we know from the work by Dr. Tim Jenkins when head of the Biological Husbandry unit at Lincoln University that the amount of phosphorus required to maintain current soil levels is markedly less than the traditional models indicate.

The 2007 article, **The big “P”**, contained the following. *“In a well-designed system, the additions of phosphorus can be minimized and set to match the true level of loss of P. In a typical sheep and beef operation that may be around 4 to 8kgP/ha and in dairying 10 – 16kgP/ha.”*

The key to holding and releasing P, and any other nutrient for plant growth is to maintain a well-structured biologically active soil. Where that is achieved carbon will be steadily sequestered increasing the storage capacity for nutrients.

Cropping and fruit trees

Independent measures of crops grown over the last two seasons on soil that has a history of DoloZest and CalciZest inputs have shown encouraging yield increases.

Best performance comes from trees grown on well-structured soil. In the Motueka/Nelson area soils are predominantly clay resulting in shrinking and swelling due to drying and wetting.

Maintaining a 25% air content is the key to achieving an ideal structure and that can only be developed by increasing the amount of crumb in the soil.

Glomalin is an essential component of soil crumb and this is exuded by mycorrhizal fungi that extend the harvesting capacity of roots several times over.

Mycorrhizae are adept at gathering both phosphorus and moisture from areas unavailable to plant roots and in return receive carbohydrate developed in the leaf of the plant.

The miracle is photosynthesis, where sunshine, carbon dioxide and water are combined to provide energy that supports all life.

It’s a process that man has been incapable of reproducing and maximizing its efficiency is essential for our continued well-being.

Regards,

