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DoloZest® News

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Is grubby water our legacy?

Having started farming on our own account in 1979 it's fascinating looking back over that time in an attempt to put the current farming situation into perspective.

There is plenty to reflect on. Farms, particularly dairy farms are now larger, there's far greater mechanisation with bigger tractors and harvesters, more animals per hectare, and fewer small rural communities with schools and general stores.

There was a prevailing sentiment prior to the late 1980's that farmers held a somewhat privileged place in the scheme of things being the providers of most of the income generated from overseas. There was a genuine effort by suppliers & providers of both product and service to provide best possible value as their welfare depended directly on us doing our bit.

Farmers were generally more self -sufficient. Along with friends and neighbours we did the bulk of our own fencing, race development, weed spraying, building maintenance, and water reticulation work. Financially the numbers were a great deal smaller however profit generation was little different as I recall. At the end of our first season of share milking we had enough in our cheque account for a dinner out, and we thought we'd done well.

Environmentally we are certainly now more aware of our responsibilities and have invested far more in effluent disposal systems. Out of sight, out of mind, is no longer good enough and inspectors are more vigilant than 40 years ago.

Water quality, and in some situations the lack of, is now a focus, and in our view rightfully so. No-one has the right to knowingly cause water quality to diminish regardless of the short-term upside of income generation.

It is also the responsibility of government and councils not to set standards designed to remove intensive pastoral farming from regions without first exploring all possible options, as it is under permanent grazed pasture that carbon is most rapidly sequestered.

And it is soil held carbon that provides the ability to filter water and return nitrate back to the atmosphere as harmless gas.
"The soil biological process of denitrification is the only process whereby we can get reactive nitrogen from soil and water back into benign nitrogen gas." Graham Sparling, Landcare Research Hamilton 2004.

However, it is not all soil held carbon that is essential, it's the biologically active fraction that is important. Raw peat and land covered with deep browntop thatch is doing little to remove carbon dioxide from the atmosphere or provide a filter for water accumulating on the surface.

Soil held nutrient levels
Those selling products containing the essential elements phosphorus, potassium, sulphur, calcium, and magnesium are often guilty of over selling with the argument that elevated levels of production require high annual inputs of 'fertiliser'. That's not the case, and there's plenty of good long-term data to prove that point.

High Olsen P levels, above 20, help reduce the likelihood of low pasture production, but do not guarantee high levels. Ultimately it is the speed at which nutrient is cycled that determines the amount of pasture or crop grown in a season.

Soil quality
Physical soil structures largely determine the rate at which dung, dead grass, and old root matter is digested with nutrient then being available for the next round of growth.

Soils in their ideal state are 25% air and 25% moisture, a total of 50% and where that is the situation pasture growth in excess of 18 tonne of DM/ha annually is achievable.

Nitrogen

All plants have a requirement for nitrogen to maximise their growth potential, and in the case of pasture, applied nitrogen will provide a short-term lift in growth at almost any time during the year when moisture and nutrient are not limiting factors.

This has led to an approximately $500m a year urea industry and a loss of understanding of the importance of clover as the essential provider of nitrogen for permanent grazed pasture. That has accompanied and accelerated the loss of pasture management skills particularly as related to the required recovery period between grazings.

In our view, the removal of the reliance on urea and a re-establishment of the skills necessary to maximise pasture growth will restore the farming communities' position as the providers of both food and wealth for the wider community.

The role of Functional Farming Systems

DoloZest and CalciZest along with the grazing management techniques were developed in response to our own farming experiences and those of neighbours and colleagues.

The mainstream policies of extra cows and earlier calving to utilise more pasture through cows, although lifting production resulted in no more disposable income. It did lead to an increase in animal ill-health costs, bigger facilities, greater labour input and a general sense of running harder while not really gaining ground.

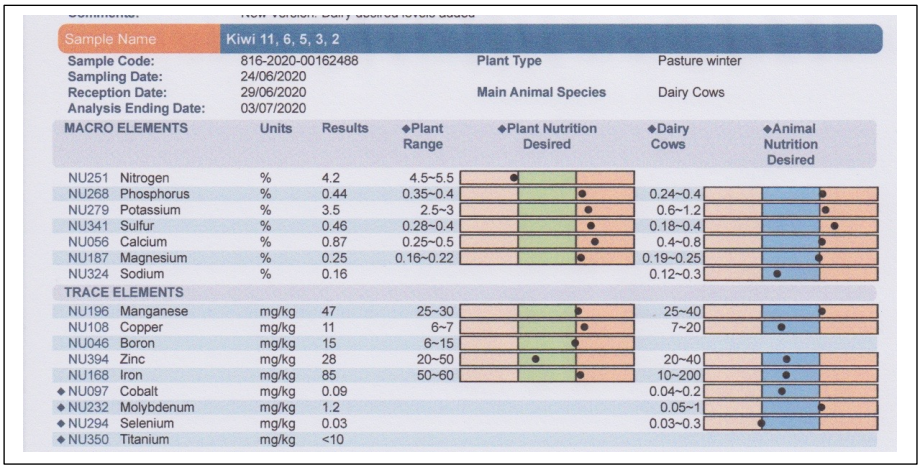
The use of DoloZest and CalciZest as the base of total nutrient programmes has resulted in long-term measures that show a **30% increase** in total pasture production, and a **70% reduction** in the nitrate-nitrogen levels in ground water.

There is also a **measurable increase in soil carbon** compared to neighbouring properties reliant on high levels of applied (synthetic) nitrogen.

The measuring of pasture initially was undertaken independently by Tom Gee, a retired MAF technician with a passion for measuring pasture growth. Since his death the monthly cuts, weighing and drying has been carried out in the same way to ensure the data remains relevant.

The nitrate-nitrogen study at the Berryman property near Edgecumbe was undertaken independently, overseen by Dr Guna Mageson of Scion Rotorua, with the results presented by Dr Mageson at Conferences both here and overseas. The reason for the lower levels of nitrate-nitrogen lost to ground water is in part due to more of the crude protein in the leaf being converted to full protein. This is a function of improved photo synthetic efficiency of the plant, along with the practise of grazing pastures at optimal maturity.

It's important to appreciate that when pasture production lifts so too does the quality of the pasture grown. The following graph from the Berryman property shows excellent levels of all necessary nutrients based on the latest standards from Eurofins.



Sample Name	Kiwi 11, 6, 5, 3, 2					
Sample Code:	816-2020-00162488			Plant Type	Pasture winter	
Sampling Date:	24/06/2020					
Reception Date:	29/06/2020			Main Animal Species	Dairy Cows	
Analysis Ending Date:	03/07/2020					
MACRO ELEMENTS	Units	Results	◆Plant Range	◆Plant Nutrition Desired	◆Dairy Cows	◆Animal Nutrition Desired
NU251 Nitrogen	%	4.2	4.5~5.5			
NU268 Phosphorus	%	0.44	0.35~0.4		0.24~0.4	
NU279 Potassium	%	3.5	2.5~3		0.6~1.2	
NU341 Sulfur	%	0.46	0.28~0.4		0.18~0.4	
NU056 Calcium	%	0.87	0.25~0.5		0.4~0.8	
NU187 Magnesium	%	0.25	0.16~0.22		0.19~0.25	
NU324 Sodium	%	0.16			0.12~0.3	
TRACE ELEMENTS						
NU196 Manganese	mg/kg	47	25~30		25~40	
NU108 Copper	mg/kg	11	6~7		7~20	
NU046 Boron	mg/kg	15	6~15			
NU394 Zinc	mg/kg	28	20~50		20~40	
NU168 Iron	mg/kg	85	50~60		10~200	
◆ NU097 Cobalt	mg/kg	0.09			0.04~0.2	
◆ NU232 Molybdenum	mg/kg	1.2			0.05~1	
◆ NU294 Selenium	mg/kg	0.03			0.03~0.3	
◆ NU350 Titanium	mg/kg	<10				

There are many examples of animals gaining weight more rapidly and producing more milk-solids under the FF System.

With over fifteen years of use throughout the country on both pastoral and horticultural properties, the performance parameters and time frame under which improvements are achieved are well documented.

No system that is directly and immediately influenced by constantly changing weather is ever foolproof, however the Functional Farming System is the only one available that ensures we get more value from our agricultural sector while reducing its environmental impact.