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DoloZest® News

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Clover and carbon sequestration

It's now early November and grasses are rapidly moving from vegetative to reproductive phase with seed head evident throughout pastures.

The owner of the first dairy farm I worked on in the hills behind Cambridge talked about it being the time when cows' feet would slide on the concrete in the shed, due to the polishing effect of grass stalks.

It's essential to ensure grazing residuals are as low as can be achieved without compromising current animal performance and production.

Stalk is less digestible than leaf and pastures left unduly long after grazing will be less palatable and digestible next time around.

By grazing to a 1200 - 1500kg residual, sunlight is better able to penetrate to the base of the pasture and stimulate clover growth.

Clover thrives from now until April due to the higher temperatures and increased sunlight hours, and even mature clover remains highly digestible ensuring animals eat more in their designated grazing time.

The key to good grazing management over the next 6 months is to provide pastures with the time to fully recover from the previous grazing.

A 30-day grazing interval by the end of the year provides the option of making high-quality hay for next spring should summer rainfall allow.

Clover is 3 – 4 times higher in calcium than grass ensuring bigger and stronger bones of young stock and more milk from lactating animals.

Should it stay dry our experience is that there is nothing to be lost from a genuine 30-day interval and paddocks will be grazed a maximum of 3 times between Christmas and the start of autumn rain.

Carbon sequestration

It is under grazed pasture that carbon is most rapidly sequestered, better in the long term than pine plantations or native bush, both of which, when mature, are carbon neutral.

Pasture because it is regularly grazed and therefore in a constant growing state allows carbon to be continuously sequestered.

When carbon is being sequestered the loss of methane and nitrous oxide is largely of academic interest only.

Carbon dioxide is also released from the soil under pasture and being heavier than air it tends to stay close to the ground where it is rapidly absorbed by plants stimulating further growth. Increasing the concentration of carbon dioxide (CO₂) in growing houses is a technique frequently used to boost plant growth.

Animals are a necessary and an integral part of New Zealand's ability to reduce atmospheric carbon dioxide offsetting excess emissions from industry.

The fascinating podcast on youtube, The Fallacy of Mainstream Potassium and Nitrogen Fertilization, featuring Dr Richard Mulvaney of the University of Illinois is just over an hour long but well worth viewing.

<https://www.youtube.com/watch?v=GMPvSHYZd5O&t=1909s>

In it he discusses the findings from the Morrow Plots. The conclusion from the 150 years of continuous cropping is that nitrogen fertiliser is the cause of carbon loss from soil and he talks about the mechanism that causes it to occur.

Not all scientists agree, which highlights the degree to which politics and money largely determine whose science is believed at any point in time, and we are now heading toward a carbon neutral economy.

40min and 30seconds into the podcast Dr Mulvaney discusses Dr Richard Albecht and his soil fertility philosophy, and states that post 1938 Albrecht never recommended the use of fertiliser N to build soil organic matter.

Science is nothing without accurate measures; it is the interpretation of the data that will determine the argument it supports, however there is no question that pastoral farming without

reliance on fertiliser nitrogen is an environmentally positive activity.

Carbon price

The price of a New Zealand Unit (NZU, one tonne of carbon dioxide) is currently \$35, up from \$25 in early June.

Pastoral farming will eventually be part of the scheme and be required to pay for any losses. At the current \$35/tonne that may not seem to be a lot of money however it's better to be receiving than paying.

The BOP Regional Council Land Management Soil Organic Matter publication which discusses soil organic matter, its forms and functions, finishes with the following.

Most pastoral soils in New Zealand are generally considered to be rich in organic carbon (range 3.5% to 15% by weight) so that large increases in productivity are not expected by adding more organic matter. However, recent research has shown that in intensive lowland livestock systems (e.g. dairying) soils have lost organic carbon by an average of 1 tonne carbon/ha/yr over the last 20 – 30 years while in hilly land soils, organic carbon levels have increased...

The widespread and regular use of urea started in 1989 and is largely confined to intensive dairying, and we argue that its use and the loss of soil carbon are closely linked.

The requirements of clover

CalciZest was formulated specifically to promote clover growth over late spring, summer, and early autumn, the time when soil temps are above 20°C.



Over the last twenty years farmers throughout the country have found our claim of double the clover content in the sward to be accurate.

That measure came from the early cage work carried out by the late Tom Gee. Tom also undertook dissections, a laborious and

Month	Clover % in pasture	
	DoloZest/CalciZest	Traditional Fert.
September	20	11
October	24	12
November	31	12
December	35	18

painstaking exercise he perfected in his time with MAF. The dissection percentages are by weight and the highest monthly figure was 35% from the December cuts. At 35% paddocks appear clover dominant, often a sea of red and white flower, as the leaf sits above the grasses helping keep them vegetative and digestible.

Clover is more digestible, contains 3 – 4 times the amount of calcium, and higher in soluble sugars, the reasons for superior animal performance.

Creating suitable conditions

Extra plant available calcium is the key to growing long strong-stemmed clover. CalciZest contains calcium in the form of high-quality lime and to maximise its availability for plant uptake there is a wide range of selected beneficial fungi and bacteria included.

Nutrient only enters a plant via soil biology. As soil becomes increasingly sterile due to compaction and the cumulative effect of weed sprays and muriate of potash applications, growth steadily slows until remediation work in some form is required.

Clover grown under a CalciZest based programme, and grazed at the appropriate time, does not increase the likelihood of bloat, however it is not possible to guarantee a bloat free existence.

Clovers, and lucerne, are classified as natrophobes (plants containing little sodium), and it is therefore important that salt is made available daily to further minimise the likelihood of bloat.

We do not recommend the application of potassium to encourage clover growth unless comprehensive soil and leaf tests indicate its requirement.

Extra calcium also acts a temperature regulator both in the soil and animals with stock on calcium rich pastures less inclined to seek shade.

Best Regards,