3rd May 2016

DoloZest® News

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Building soil – The future of farming

There seems to be dissent on just about every aspect of soil fertility, but no-one has been prepared to argue that annual production from permanent pastures isn't steadily declining. We've presented the data to scientists and politicians at the highest level and no-one has disagreed. One outgoing head of AgResearch discussed it with a farmer group and said the scientific fraternity knew it was happening but didn't know why.

Well, here's the reason why. The Report **Soil Organic Matter** published by the Bay of Plenty Regional Council in 2011 contains the following …*recent research has shown that in intensive lowland livestock systems (e.g. dairying), soils have lost organic carbon by an average of one tonne carbon/ha/yr over the last 20 – 30 years, while in hilly land soils, organic carbon levels have increased.*

There is a strong link between soil carbon, physical soil structures, moisture and nutrient holding capacity, and subsequent pasture production. In all districts, almost without exception, it is the land with the highest carbon content that produces the most. And it is under grazed pasture that carbon can be rapidly sequestered. The article **Building Soil Carbon with Yearlong Green Farming** by Dr Christine Jones, on our website, details the steps involved in 'turning air into soil'.

So why the difference between intensive lowland and hill country? There is over 500,000 tonnes of urea being applied to New Zealand's pastoral soils each year, with a high percentage of it being applied to lowland flat and easy contoured dairy area.

All that's required is a study that correlates carbon loss with nitrogen usage, and the answer will be found. Doubtless there will be other factors such as animal numbers and management practises. However, we believe nitrogen usage will be shown to have the largest influence.

It's not that nitrogen isn't required. It's an essential plant element and at just about any time of the year permanent pastures will respond to its addition. However there is always a lag phase that follows where growth slows markedly, and when further N is applied to overcome this, applications normally become increasingly frequent and dependency occurs.

There is usually between 5,000 and 15,000kgN/ha held in soil organic matter within the root zone of pastures. Where clover is fixing the required nitrogen, the only limitation to pasture growth is the speed at which plant available nitrogen is cycled. Alternatively, if 120kgN/ha is applied annually in the form of urea at a cost of $500/tonne, the cost is $130.44/ha plus application. The cost of urea alone for a 115ha dairy farm is around $15,000.

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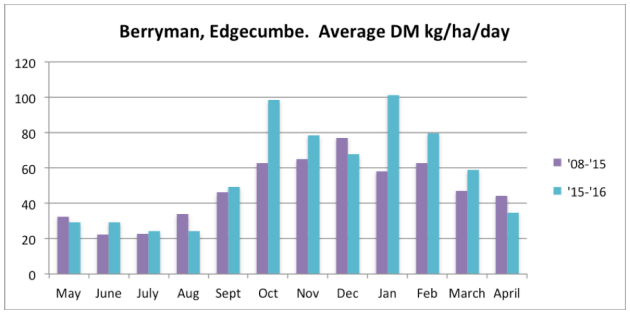
Functional Fertiliser monitor property, no irrigation

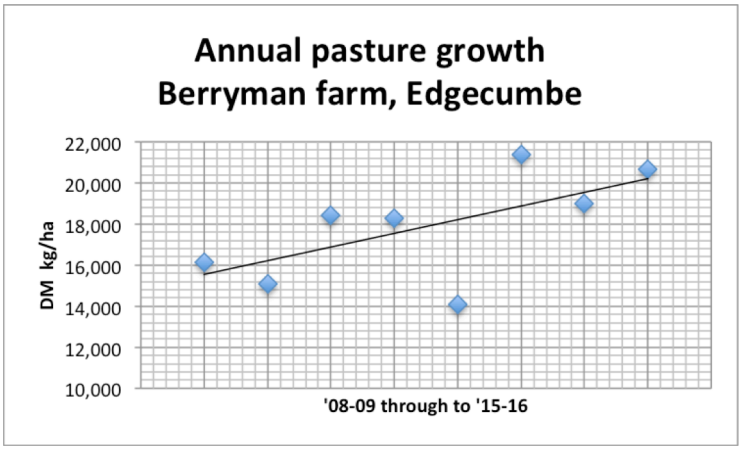


Atmospheric water vapour has been identified as a contributor to weather extremes, so the ability of soils to hold onto water becomes increasingly important.

As intensively farmed lowland livestock systems under conventional fertiliser and management regimes have been losing carbon over the last 20-30 years, the ability of soil to sequester carbon becomes crucial.

continued overleaf

The following chart shows the increase in pasture production over time. The results are unique to DoloZest/CalciZest based nutrient programmes, and are the result of on-going carbon sequestration as result of taking atmospheric carbon dioxide and storing it in the soil.



Annual pasture growth	
	kg/ha
08-'09	16,146
'09-'10	15,070
10-'11	18,420
'11-'12	18,281
'12-'13	14,066
'13-'14	21,397
'14-'15	18,976
'15-'16	20,670

Although rainfall has generally been lower than 'normal' in nearly all areas, the spread of rain in the Bay of Plenty has been sufficiently regular for exceptional pasture growth since late December.

To put the above figures into perspective, the highest recorded annual growth from permanent pastures in New Zealand is somewhere between 22,000 and 22,500kg DM/ha.

We've often been asked to compare the cost of urea with the cost of CalciZest and DoloZest. Because these products do not directly replace nitrogen that's not easily done - it's the process they stimulate that provides the nitrogen. However, the Macintosh report comparing the cost of production at the Berryman property compared with District average for the 2011/12 season stated that the Berryman property enjoyed an extra $1,621 Gross Margin per hectare for that season.

What we learnt from this season

Brix levels have generally been lower than usual at the time of cutting cages. This is one of the reasons for the extra pasture growth not being fully reflected in animal weight gains and milk solid production. At both Edgecumbe and Galatea stock have shown a strong liking for high quality balage throughout summer. This provides both extra energy and fibre, reflecting the also lower than normal dry matter content of the pasture.

Eczema has been more of an issue than usual with most farms reporting an increased incidence of clinical cases, although some have come through with no animals obviously affected at this time.

In a season when climatic conditions favour the build-up of spore there will almost certainly be 'hot spots' behind hedges and other sheltered areas, and should stock be grazing at that time some will ingest sufficient to be affected.

Empty rates have generally been higher than usual by 2 – 3%**,** with no obvious discernible pattern within or between herds. The two herds that have recorded very low numbers are both smaller herds where stock are well fed at all times, however there will be factors other than cow numbers and feeding levels yet to be detected.

It is the carbon (organic matter) content of the top 15cm that is the most important, as most of the plant roots are concentrated there – particularly under a water-soluble nitrogen fertiliser regime.

One of the reasons Functional Fertiliser properties grow more evenly throughout the year, as well as growing longer into dry spells, is the extra organic matter in the top 15cm.

Functional Fertiliser
Capturing Carbon
Building humus
Growing production - Naturally

Regards,

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