Pastoral farming and the science interface – a farmers' view

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Introduction

Farmers are deluged with information on commercially valuable or politically topical issues. Information that is not politically or commercially driven may still be vitally important to a pastoral farming business and farmers need to consciously try and fill the gaps.

This quote from Johnathon Swift seems appropriate: *"That whoever could make two ears of corn, or two blades of grass, to grow upon a spot of ground where only one grew before, would deserve better of mankind, and do more essential service to his country, than the whole race of politicians put together."*

The farm

We farm 2855 ha on the coast northwest of Whanganui. The farm consists of two dairy units which between them milk 1700 cows on a hybrid once-a-day (OAD) system, and an extensive coastal beef and sheep unit which carries 2000 dry heifers, 2000 ewes, and for the cleaning up of pastures, 500 dry dairy cows. The family has been farming the land the dairy farms are on since 1900 and the coastal land since 1993. Many of my comments are prompted by my experience trying to efficiently utilise the extensive coastal farm which is low fertility dry land with native grass and subterranean-clover based pastures. The monthly grass growth, on our light coastal sands, over the last 17 years is depicted in Figure 1.

We have Egmont Clay Loam, river silts, and a variety of sandy soils. As Figure 2 illustrates growth in some years is much better than in others, regardless of soil type! Within, and between years, growth varies widely on all soil types.

When we took over this coastal land its organic matter level was below 3.5% and I know from other experience over 40 years on similar land, we can increase that to 7.5%.

For the last 21 years, our ownership structure has been a family company of four siblings which has been an interesting exercise in itself. I will diverge for a moment and comment on some of the things we have learnt from this arrangement:

- When there are differences to discuss, stop sending emails and start talking
- Having two bankers is better than one. For that matter, a general policy of having two suppliers or customers for all inputs and outputs has served us well
- An annual property valuation is useful for all the interested parties and easy to do after the first one is done and you end up with a meaningful balance sheet
- Change the amount of insurance carried as the risk profile changes
- Recently, there have been great advances in farm accounting with huge benefits from using cloud-based accounting software.

Anyway, back to what is more relevant to a

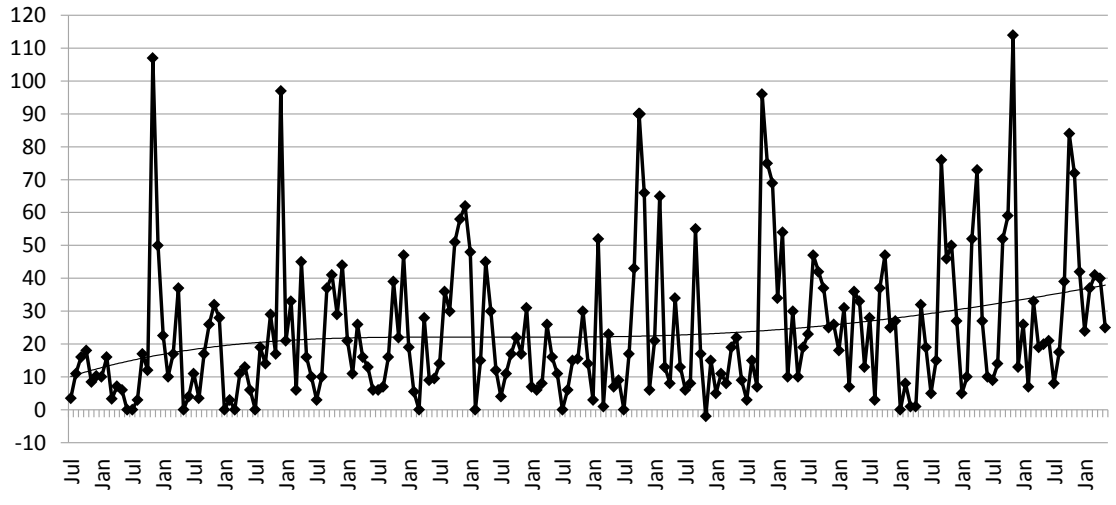

Figure 1 Monthly grass growth (kg DM/ha/day) for 17 years. Coastal yellow/brown sand soils.

ISSN 2463-2872 (Print) ISSN 2463-2880 (Online)

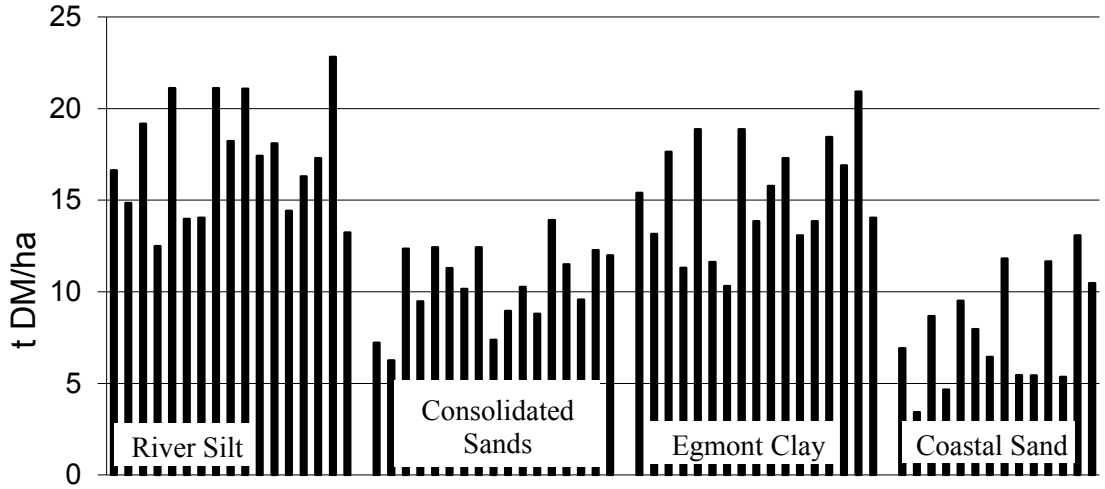

Figure 2 Total annual pasture production (tonnes DM/ha) on four different soil types over 17 years at Waitotara, Taranaki.

grasslands conference. I have found it much easier to get the information that I need for the dairy farms than I have for the extensive dryland farm. To its great credit, the dairy industry largely has a complete package of unbiased advice available through DairyNZ. For other pastoral farmers, it is more difficult. However, all farmers have to grapple with what to take note of, and perhaps more importantly, realise what information is not directly available and where they can seek the advice that is not thrown at them.

When I say thrown at them, I refer to the huge pile of unsolicited mail that ends up on my kitchen table every week. In addition, many of the savvier farm suppliers are now finding ways to persuade me to put their apps on my cell phone.

There is a multitude of 'advice' on fertilisers, seeds and chemicals coming through my letterbox, but grazing management advice is not there? If you look back at the Grassland Conference papers, those discussing grazing management are few and far between.

Grazing management is very important to farmers, farm managers and head shepherds who have to grapple with it every day, but in the market place and the academic system, it is largely neglected.

I suggest, science does not even-handedly serve farmers. The grazing management research that is undertaken, is generally done on good quality land at research farms. The amount of grazing management research done on second class land is pitiful and yet my own experience would suggest that the biggest percentage increase in production comes from improving management where the pastures are in fragile environments. If you look after the pastures in these environments, they reward you. Improving soils and pastures, and evaluating the systems that cause those improvements is a long-term business. Unfortunately, the time frame for much research is matched with the time taken to complete a PhD. Agricultural science is skewed towards seeds, fertiliser, chemicals and short-term research. The academic system works against the long-term research that is necessary for grazing management evaluation.

Also, herbicide, seed and fertiliser companies fund much of the research and then offer farmers 'free' advice about those subjects. This also contributes to the silence on grazing management.

Understandably, science and scientists follow the money. The funding system for our government employed agricultural scientists is such that their independence is compromised (New Zealand Herald http://www.nzherald.co.nz/business/news/article.cfm?c_id=3&objectid=11516652; http://www.nzherald.co.nz/business/news/article.cfm?c_id=3&objectid=11518398).

When I was trying to find what grazing system to adopt on our extensive, low fertility coastal farm, it was very interesting to read about different grazing systems. The DairyNZ ryegrass-based rotational grazing system. 'TechnoGrazing' focussing on small mob sizes, which I find somewhat strange, as dairy farmers are often achieving top production from herds of 500 or more cows. The Savory Institutes work on holistic rangeland grazing systems, which is much more widely known in the arid rangeland areas of the world, and while it has its critics, it has had favourable reviews by some, notably Teague (2009). I found it interesting that in both the DairyNZ, and Savory systems, credit is given to Voisin (1959) for his work on grass productivity. Because of all this reading we have markedly increased the number of paddocks as well as mob sizes on our coastal farm to lengthen the interval between grazing. As shown in Figure 1 we are

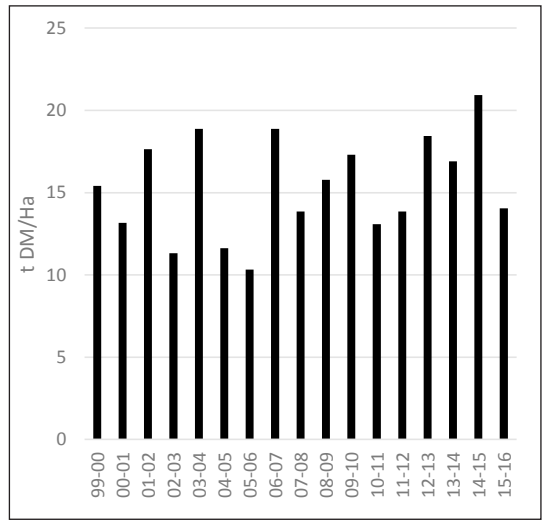

Figure 3 Annual total pasture production. Egmont Clay Loam, cage measured monthly.

getting payback, though it is not a straight line.

Because soil organic matter is non-commercial to the farm suppliers, I think we tend to ignore the benefits of increasing it and it doesn't get the attention it deserves. For example, in New Zealand we seem to have overlooked the French initiative of 4 per 1000, which has the aim of increasing soil carbon by 0.4%/year which would halt the annual increase in atmospheric CO_2.

Something else I have become aware of the longer I farm, is that the alignment of farmers with their Co-ops and industry good bodies is not as close as it looks at first glance. The fertiliser suppliers have some expensive manufacturing plants with high fixed costs to manufacture some of their products, while for other products they only act as merchants. To get a good annual result they need to keep their manufacturing plants operating as close to capacity as they can. This explains why they tend to advertise the products which they manufacture rather than the direct imports. Farmers should think about this when their Co-op representative next gives them a fertiliser recommendation or maybe better still, get independent scientific fertiliser advice. By way of example, after we got independent fertiliser advice in 2006 our dairy farm pasture production stopped trending downwards and started increasing as shown in (Figure 3).

Similarly, when farmers go to a field day put on by Beef+ Lamb New Zealand, they should take note of who is sponsoring the day and consider if the presentations have a bias towards them. For example, does the farmer need the promoted lamb finishing crop or does he just need to grow more clover to finish lambs?

Thinking about these arguments, I concluded, that the government did the agricultural industry a huge disfavour when it dismembered the Department of Agriculture. Initially, the effects were muted because the men that worked for the Department of Agriculture largely went and worked as independent consultants and they took the ethos of the Department with them. Now they are retiring and we (beef and sheep farmers) are bereft of good independent advice.

I think beef and sheep farmers, myself included, should take more interest in what influence Beef + Lamb New Zealand is having on pastoral research.

Maybe we should take note of how the Argentinians do things. My knowledge of this is somewhat limited, but I understand they never had the luxury of a Department of Agriculture so had to invent their own extension system. This is based on a system of user pays discussion groups called CREA (http://www.crea.org.ar/). It has evolved into a successful interface between science and the farmer. It has the advantage of being user pays, so the casual attendee stays away, and it also has a fairness in that the fee charged to CREA members is on a per hectare basis.

We live in very interesting, exciting times. In 1961 the world had 21 people per square kilometre, now there are over 57. Looking at it another way, more relevant to us, there are over five people for every arable hectare (data.worldbank.org). In addition, we have climate change making its immense impact felt.

In summary, I suggest farmers need to keep their eyes wide open, and be discerning, to make sure that they are in the driving seat.

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