

NZ GRASSLAND ASSOCIATION

Fuelled by Science, Tempered by Experience

GRASSLAND NEWS

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A note from the President

Jacqueline Rowarth

Science has dominated the news over the last few weeks. Fonterra, earthquakes, water quality and AgResearch's moves - all have contributed to an increasing focus on science-related issues. Yet only with the publication of Hendy and Callaghan's book 'Get off the Grass' has the need for increased expenditure in the science budget, and increased recruitment into science and engineering type disciplines through the education system been highlighted. Hendy and Callaghan argue that New Zealander's work harder and earn less than most other people in the developed world. Many of us in the grassland sector might well agree... But whereas the authors suggest we need to start capitalising on our smarts, not just our sheep, in the grassland sector we know that we have done well with sheep (and other animals, too). Dr Alec Mackay's article (P3-4) makes that clear. We could, however, do more. Tom Fraser, recipient of the Ray Brougham Trophy for 2012, gave the first of his national addresses at Ruakura in mid-August. He suggested that the NZGA Proceedings should be compulsory reading

for all agronomy students (and suggested that the wealth of knowledge that they would then have would mean that they didn't need to go to lectures). He also stated that lack of funding in basic research to do with hill country grazing, nitrogen fixation, and systems research was holding us back. Other countries, recognising their limitations, are investing more in agricultural research (see P2). In New Zealand AgResearch is repositioning in an attempt to achieve greater impact for the funding it has. The human cost of this exercise has yet to be calculated, but the indicators are that scientists in general are not recommending science careers to their children - and this is in part responsible for what Hendy and Callaghan have reported.

Good news, however, is that an experienced scientist, Dr David Chapman (P3) has agreed to be co-opted to the Executive until November, replacing Ashley Cole who resigned at the beginning of the year due to on-farm pressures. David will be standing for election in November at the Tauranga conference - see you there.

75th Conference Tauranga

Warwick Catto, LOC Chair

This year marks the 75th Annual New Zealand Grassland conference. A small team is busy pulling the details of the conference together. The conference venue is the Trinity Wharf in Tauranga, which is a harbour side hotel - a great place to stay. There is alternative accommodation within walking distance nearby in the downtown area but be in quick.

The conference was last hosted here 52 years ago in 1961 and so the field trips are within the local Western Bay area. Field visits will be to a sheep and beef enterprise in the Kaimai area and a dairy farm visit near Maketu.

We make a special invitation to past members and hope they come to the conference dinner to catch up on old friends.

The conference starts promptly on Tuesday morning so we invite attendees to arrive on the Monday evening or better still stay the weekend and enjoy the lovely spring weather the Bay has to offer. Tauranga is serviced by Air New Zea-

land with direct flights from Christchurch, Wellington and Auckland. The airport is in the middle of town and a short 10 minute ride to the venue.

I am trying to find a committee member responsible for the weather but they are all non-committal!!

Mills Reef Winery will be the Tuesday end of day venue with the Conference dinner at the Trinity Wharf. We look forward to hosting many of you who may be visiting the Bay for the first time.

Conference Registration and Accommodation details

<http://grassland.org.nz/eventdetails.php?eventnum=17>



Mills Reef venue



NZGA for over 80 years

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One hundred and 60 million pounds is over \$300 million NZ dollars. This is what the British Government is investing to ensure leadership in a new green revolution for food.

The UK's Agri-tech Strategy was launched this week with the goal of enabling Britain to become a world leader in agricultural technology, innovation and sustainability.

'Exploiting opportunities to develop and adopt new and existing technologies, products and services to increase productivity' is high on the agenda, and contributing to global food security and international development is a worthy addition.

Although the launch didn't receive as much media coverage as the Duchess of Cambridge's successful delivery of an heir to the throne, the impact of the strategy will be felt within the next few years. This is likely to be somewhat ahead of the impact of the new heir, given the longevity in the royal family.

The Agri-tech Strategy aims to bring science and agriculture closer together by investing in four new centres (at £90 million) for agricultural innovation. There will also be an Agri-Tech Catalyst fund (£70 million) to enable the translation of food and farming research into practice. Included in the concept is providing stronger leadership for the sector through a leadership council. Building a stronger skills base through industry-led actions to attract and retain a workforce which is expert in developing and applying technologies from the laboratory to the farm is also key to the planned transformation.

This new strategy initiative is on top of current investment articulated in September last year when the Government stated that Britain did 'not currently have the basic science base to deliver more sustainable food production practices...' (see box).

The strategy builds on history. Statements such as 'the UK has traditionally been a leader in agricultural science' might take some justification on the global scene, as will 'in recent years we have pioneered new approaches to sustainable farming practices.... The UK is therefore well-positioned to play a leading role in the global challenge of the sustainable intensification of agriculture: producing more with less input and impact.' A mention of the role of subsidies (still approximately 20% of gross farm receipts) in changing behaviour might have made the statements easier to swallow by New Zealanders.

However, the new strategy of integrating science and progressive food and farming businesses with the government's support for trade investment and international development has promise. And the aim of unlocking a new phase of global leadership in agricultural innovation could be a model for New Zealand.

Like the UK, New Zealand has institutes and university department at the forefront of areas of research vital to agriculture and related technologies.

Sustainable Food: Government response

<http://www.publications.parliament.uk/pa/cm201213/cmselect/cmenvaud/567/56704.htm>

Defra has supported the development of the industry led Agri Skills Strategy, which aims to communicate the business benefits of skills and support continuous development.

- ◇ The Apprenticeships Programme is continuing to expand to £1.4 billion for apprenticeships training for 2011-12.
- ◇ The Biotechnology and Biosciences Research Council (BBSRC) is providing £12 million for four Advanced Training Partnerships, which provide post-graduate training for sustainable efficient food production; advancement of the UK agri-food industry; food quality and health; and livestock health and production.
- ◇ The BBSRC's Doctoral Training Partnerships (DTP) competition supports PhD studentships across its remit with an increased emphasis on strategic priority areas (this includes both broad and 'niche' research skills relevant to food). To support these new partnerships BBSRC also funds collaborative PhD training with industry (including in areas relating to food) through its CASE schemes.
- ◇ To support the research base, BBSRC is distributing £250 million in grants to fund their strategic research through 26 research programmes in 8 institutes associated with the biosciences which includes sustainable production.

New Zealand also has innovative and dynamic farmers and food manufacturers.

The third claim is that the UK is well positioned to make an impact on global markets through exports of products, science and farming practices. New Zealand, however, has a longer track record in all three than the UK (excluding the original colonisation efforts).

The justification of the new investment on this solid tripod foundation is that the infrastructure to support industry in applying science and technology to help modern farming and food production has been eroded over the past three decades. The UK Government acknowledges that agriculture's productivity growth has declined relative to major competitors, and that current regulatory regimes and skill gaps might be hindering the development and use of innovation and new technologies. The huge potential for change, including leadership for the world, is the vision and the bottom line is the £160 million – over NZ\$300 million of new money.

New Zealand's Primary Growth Partnership (PGP) is going some way to create the same step changes, but with some important differences. The PGP programmes are primarily business-led and market-driven innovation programmes that work across the primary industry value chain. They are not science and education led, as in the UK's strategy. In addition, the PGP is about boosting productivity and profitability, and delivering long-term economic growth and sustainability across the primary sectors, from producer to consumer. This is very important, but is more about evolu-

tion than revolution.

However, just like the UK, current regulatory regimes and skill gaps are hindering the development and use of innovation and new technologies. Huge potential for change has already been outlined by the Ministry for Primary Industries but stronger leadership for the sector is required. The UK's decision to establish a leadership council is reminiscent of calls for a 'green table' in New Zealand. We have

better evidence than UK for a leadership position, but no consolidated body promoting the advances and challenging policies that hinder progress and, indeed, recruitment.

The UK's decision to enable 'world leadership in agricultural technology and sustainability' is a very good gift to the new Prince. New Zealand could do even better (in addition to the fine shawl which is the official gift for the royal couple); a leadership council could be part of the answer.

Short cuts

New Exec member

David Chapman is Principal Scientist, Feed and Farm Systems group, DairyNZ, Lincoln, New Zealand, a position he has held since August 2010. He graduated B Agr Sci (Hons) from Lincoln University in New Zealand in 1978 and completed his PhD at the Grasslands Research Institute, at Hurley, in England, in 1989. Previous positions held include Professor of Pasture Science, University of Melbourne, Australia (1996-2010); and scientist and science programme leader, AgResearch, Palmerston North, New Zealand (1979-1996).



Major research interests are in pasture eco-physiology; grazing management; pasture persistence; bio-economic evaluation of pasture species and cultivars; and dairy systems development including managing environmental impacts.

NZ Grassland Trust Update

The NZ Grassland Trust was established over 40 years ago to commemorate the efforts of exceptional agricultural pioneers, researchers and farming leaders, each of whom contributed significantly to build this country's pastoral farming industry. The objectives of the Trust are to encourage, promote and foster the advancement of pastoral farming.

Each year the Trust awards the Ray Brougham Trophy to a person associated with the pastoral farming industries who has made an outstanding national contribution over their working career. The Ray Brougham Trophy was instituted in memory of the Dr Ray Brougham, Director of DSIR Grasslands 1970 – 1985. The Brougham family donated a bronze statue of a seed sower to the Trust, which is presented annually.

At their recent meeting the NZGT have agreed that nominations for the **NZ Grassland Trust Ray Brougham Trophy** can come from NZGA members. Nominations are to be sent to

Bruce Belgrave by 1st of March each year (bruce.belgrave@grasslanz.com). Nominations are to be accompanied by a one page bio highlighting the national contribution of the nominee.

FAO Sustainable Grassland E-Conference 2 to 30 September 2013

We [FAO] are currently working on a global model to evaluate scenarios of grassland-based food production for 2050. The preliminary results illustrate the potential of grasslands to contribute to environmental, social and economic sustainability.

To further develop grassland-based models, together with the broader spectrum of grasslands research interests, a stocktaking of the current state of grasslands knowledge is desperately needed. Therefore, one immediate objective of the E-Conference is to gather scattered scientific information, identify key data gaps and prioritize future research. Moreover, we believe the time has come to build a framework of international guidelines for sustainable grassland management.

Through this E-Conference, we wish to both bridge knowledge gaps and share best practices between grasslands experts, practitioners and stakeholders from different agro-ecological regions. To do so, we need your inputs as part of a collectively agreed and owned process. We look forward to your active participation in the discussions at:

<http://www.fao.org/nr/sustainability/grassland-e-conference>.

The discussion will be facilitated by Soren Moller and shortly, we will make available our draft modelling results on sustainable grasslands scenarios for 2050. This invitation is sent to all grassland experts and networks, including individual scientists and research groups, as well as grasslands and pastoral producers associations. For more go to <http://www.fao.org/nr/sustainability>

Has the eco-efficiency of sheep and beef farms changed in the last 20 years?

A.D. MACKAY, A.P. RHODES, I. POWER and M.E. WEDDERBURN

Introduction

In New Zealand and elsewhere debates on the level of sustainable economic development possible using natural capital stocks rarely consider the eco-efficiency (i.e., the emissions to air or water per unit product) with which natural resources are used. In a recent paper to the New Zealand Grasslands Association the changes in eco-efficiency of

sheep and beef farming in New Zealand over the last 20 years were presented and discussed (Mackay et al., 2012). Key messages of the paper are reproduced here.

Approach

In the paper the changes in the eco-efficiency of the sheep and beef sector over the last 20 years were calculated by examining the ratios between various inputs (e.g., livestock

numbers, nutrients, etc) and outputs (e.g., saleable products, GHG, nitrate, etc). The MAF sheep and beef Hard Hill country-Central North Island (CNI) and Manawatu Easy Hill finishing farm monitoring models for 3 periods (1989/90, 1999/2000, 2009/10) were used. The Overseer[®] nutrient budget model was used to explore the relationship between inputs and outputs from each sheep and beef system. A livestock reconciliation table was constructed from

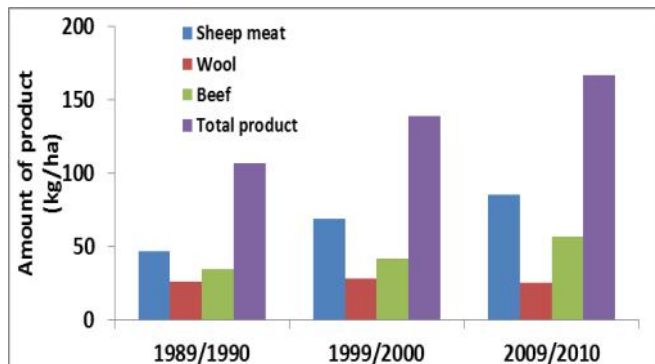


Figure 1: Decadal changes in sheep meat, wool and beef production per hectare from the Hard Hill-Country-Central North Island

the information provided in each of the Sheep and Beef Farm Monitoring models to calculate the amount of sheep meat, wool and beef produced.

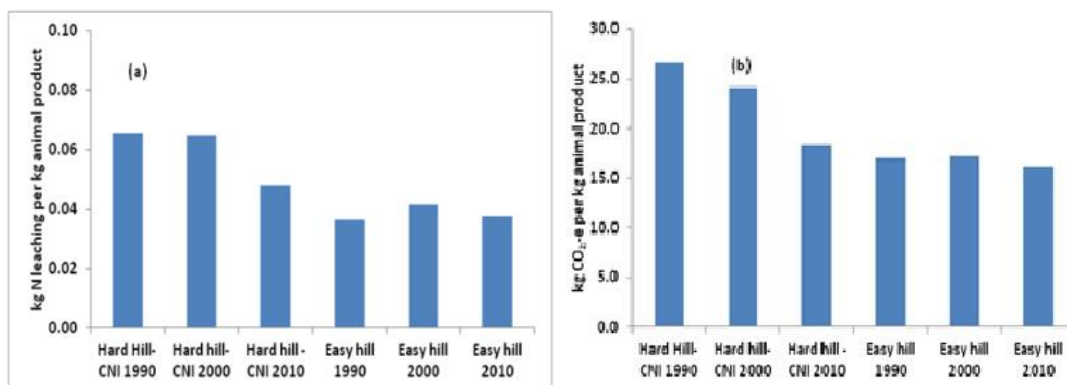


Figure 2 (a) kg N leached and (b) kg CO₂-e per kg animal product (sum of the sheep meat, wool and beef) from sheep and

Findings

There has been little change in the “nominal stocking rates” in the MAF sheep and beef farm monitoring models in the last 20 years, but substantial changes in livestock performance, with lambing percentages increasing from 75% to 124% in the Hard Hill country-Gisborne sheep and beef farm system and from 93% to 134% on the Easy Hill finishing. In addition to the increased ewe fecundity, improvements have also been achieved in lamb growth rates, with slaughter weights of lambs having increased 37% from 14.45 kg to 19.9 kg over the last 20 years. This has contributed to a lift in sheep meat production in the Hard Hill country of 72% since 1989/90 (Fig.1).

Nitrate leaching losses calculated using the Overseer nutrient budgeting model for the sheep and beef systems all fell within a narrow range (7-9 kgN/ha/yr). A very similar pattern emerges with GHG emissions, with little change in

GHG emissions from the sheep and beef systems over time or across the farm systems.

While meat and fibre production per ha increased and the amount of N leached per kg animal product (Fig. 2a) and CO₂-e per kg animal product decreased (Fig. 2b) from 1989 to 2000 and again between 2000 and 2010 for the Hard Hill country-CNI sheep and beef operation.

The decrease in the kg N leached per kg of meat and fibre produced reflects two factors. One, more of the feed grown through the spring and summer is eaten by young growing animals that can be turned into saleable product before the autumn and winter months. Second, less live weight per unit product sold is carried into winter reducing the number of urine patches and the potential for N losses by leaching. The reduction in the kg CO₂-e per kg animal product reflects in part on the increased allocation of the total feed grown to saleable product and less to the maintenance of capital livestock.

The eco-efficiency gains obtained in the Hard Hill country-CNI farm system did not extend to include an overall reduction in N leaching or GHG emissions per hectare. This is an important point to note if there are limits being set on emissions to water in catchments. In those circumstances the absolute losses per ha are a more meaningful measure

than the use of a loss per kg product. While there was not an overall reduction in N leaching or GHG emissions per hectare, on the positive side they have changed little since 1990.

In the Easy Hill finishing system there have been only small changes in the eco-efficiency over the last 20 years (Fig. 2), but again on the positive side little change in

environmental footprint. The Easy Hill finishing system is more eco-efficient with the amount of saleable product per ha higher and the N leached and GHG emissions per kg of saleable product lower than the hard hill country operation (Fig. 2).

The focus of the sheep industry on reproductive performance and higher growth rates in lambs and cattle provides a natural buffer to the increases in emissions generally associated with intensification of a livestock system. Understanding how eco-efficiency changes is more than just an academic exercise as we move to an operating environment where land is a finite resource and there are limits on emissions to the environment.

Reference Mackay, A.D., Rhodes, A.P., Power, I., Wedderburn, M.E. 2012. Has the eco-efficiency of sheep and beef farms changed in the last 20 years? *Proceedings of the New Zealand Grassland Association*: 74 9-14