

NZ GRASSLAND ASSOCIATION

Fuelled by Science, Tempered by Experience

GRASSLAND NEWS

www.grassland.org.nz

February 2013

ISSN 1179-4216

A note from the President

Jacqueline Rowarth

Welcome and all the usual words about new year, new opportunities and new ideas.... Recognising that for many farmers, researchers and industry personnel, real life continues with moving stock, bidding for money, and coping with life's issues. One in which NZGA has become involved has reappeared at another conference. The issue is meta-analysis and what it is or isn't and does or doesn't entail. As always NZGA is trying to

assist in understanding between researchers, industry and farmers practitioners—as well as policy people. We have a brief comment below. Another is the number of cows and how to minimise their impact; an article is included in this newsletter outlining some of the pitfalls in proffered solutions.

Debates will be on-going and no doubt enliven the Tauranga conference. We hope you'll get involved.

Meta-analysis and biological data

Tony Parsons, AGMARDT Chair in Carbon Cycling
Jacqueline Rowarth, University of Waikato

A 'meta-analysis' approach is attractive because it appears to cast a wider net; it includes more information on the premise that this will achieve greater objectivity. This means that the analyser must be very careful with respect to the criteria used to select or omit studies, and to the weighting given to the various studies included.

The only criterion for omitting studies at the outset might be where the 'trials' have no control, replication, randomisation etc., or don't provide any evidence of testing the original hypothesis. The point is that a good 'meta-analysis' of badly-designed studies will still result in bad statistics and conclusions. Much of what has been described as 'meta-analysis' in recent debates on the efficacy of agrochemicals, has actually been a 'Cumulative Distribution Function' approach. A proper meta-analysis more rigorously incorporates weightings for sample sizes and calculates other relevant diagnostic stats like the fail-safe number. Weighting in formal meta-analyses is normally given depending on the accuracy of the particular measurement of interest. The trials could be weighted on, for instance, the LSD determined for each trial. The perfect case is where the analyser becomes concerned that he or she might

have erred on the side of giving equal weight to all studies when some might have been more thorough than others.

The major challenge is always objectivity, which may be difficult to achieve if researchers have a vested interest, i.e., are not independent. The best test of independence and what conclusions have been drawn is to analyse statistically whether there is any systematic basis for why some data sets lead to one conclusion, while other data sets lead toward another. For example, does the compound boost growth only in spring at low temperatures, and as a consequence data taken from different times of year might give conflicting conclusions. Ultimately separate controlled trials, controlling for that new factor, should test that specific hypothesis. Meta-analysis cannot be any substitute for critical experimentation when you are trying to establish if there are particular factors that systematically affect the outcome.

Professor Jonathan Newman (Director of the School of Environmental Sciences at the University of Guelph, Canada), says "All meta-analyses have some drawbacks that should be discussed so that the reader can understand the background of the analysis."

Tauranga 2013

Warwick Catto confirms that the planning has started and the team are developing some interesting field day options under their banner of 'Bay of Diversity'.

We will once again be celebrating a significant milestone for the Association - **our 75th Conference** - our very own Diamond Jubilee. The executive and LOC will be organising some small celebration for conference attendees.

REMINDER: Call for Papers for the 75th Conference Closing date for Submissions - Friday Feb 22nd

There is an Abstract Submission Form and a Word template for submitting the full paper available on the website.

Submit abstracts to nzgaeditor@gmail.com. Please note that **this year we would appreciate people closely following the Guide for Authors (see website).**



NZGA celebrates 80 years

SPONSORED BY AGRESEARCH

Are fewer cows but better fed the answer to nitrogen issues?

Tony Parsons, AGMARDT Chair in Carbon Cycling
Jacqueline Rowarth, University of Waikato

The proportion of the total amount of nitrogen (N) eaten by the national herd, that escapes to the waterways and atmosphere could be reduced by capturing more of that N within the body of the animal. This improves the efficiency of use of N, by reducing the proportion of the total amount of N in the system that is being repeatedly cycled in a very labile form – urine. Dairy cows do exactly this; they do it more effectively than drystock.

This means that for the same total intake of N, per animal or per hectare, in dry v. lactating stock, dairy systems harvest N in milk, that would otherwise have been excreted in urine, and so reduce the potential to impact negatively on the environment.

This suggests highly-producing cows are more efficient environmentally as well as economically – but confusions continue. Notably these are around how much N in total is applied nationally and what are the sources of N.

The fundamental point is that grazing animals are not the real source of N, they are simply recyclers and concentrators (in urine patches) of what they are fed, and so what was supplied to the pasture/feed. Furthermore, whereas plants 'couple' /combine carbon (C) (from the atmosphere) and N (from the soil/atmosphere), into an organic form, animals 'uncouple' /separate much of the C and N again. Most of the C is returned to the atmosphere as carbon dioxide CO₂ (and some in methane), but in a lactating cow a smaller proportion of C is released as CO₂, as more remains coupled and harvested in the milk. As a consequence fast growing or dairy animals are far more effective in harvesting C (that would otherwise have been lost to the atmosphere) and N, e.g. in milk.

A single highly producing lactating cow will be eating far more than a dry-stock cow, so overall it is likely to be producing more N in its urine – but it is operating more efficiently. The issue then is over how much feed (and N in it) is entering the national herd altogether.

The next confusion is in the suggestion that reducing the number of cows but feeding them better will reduce the environmental impact. This strategy would improve energy (C) use per unit of intake and food produced because larger, better fed animals have improved margins of production over maintenance energy (C). It would not, however, improve efficiency of N-use per animal; indeed, it is likely that such a strategy would lead to increased losses of N through urine. The problem is that N excretion, notably in urine, rises at least linearly as intake of N rises. In addition, if the same amount of N was excreted by fewer animals, it would be distributed less widely in space and losses of N would be greater per unit of N cycling and in total.

The overall challenge for New Zealand is that we are dependent on selling food overseas, and are being urged to increase global food supply and associated revenue. Food contains protein which requires N. Exporting N means that more N is needed in total and as a consequence there is more N cycling in total in the system. It is the total N input nationally and not animals urine, that should be the focus of attention.

Looking for solutions that might improve efficiency of C or N use per animal, without also thinking if this reduces total C and N use across the country will not provide the answer. Producing the same amount of food in total by feeding fewer animals better does little to reduce total N required. The calculations should be on a country basis, not animal.

Solutions to reduce N impacts per unit food production must focus on reducing the true inputs of N (fertiliser N, and nitrogen fixation, and imported food N) while maintaining production. Research to improve N use efficiency in the whole system of food production, as well as in each biological component (plant, animal and soil) is underway, but will take time. In the meantime, understanding the issues, rather than grasping at straws, will assist farmers to make progress.

Gore 2012 Awards

Three NZGA Executive members, both past and present, were honoured at the recent Gore conference. The NZ Grassland Trust presents four awards each year at the conference; the Ray Brougham Trophy recognising an outstanding national contribution to the NZ grassland industry; the Regional award recognising exceptional effort above and beyond the normal career contribution to the regions pastoral industry and finally two farmer awards for excellence in grassland farming. In addition the NZGA also periodically considers a member worthy of Life membership for their contribution both to the pastoral industry and to the Association.

NZGA Life Member

This honour was awarded to Waikawa farmer and NZGA past president Maurice Yorke. Maurice and his wife Mereee regularly attend conference; Maurice thinks he has only missed 2 since becoming a member. Maurice became a member at the Invercargill conference in 1978 as the representative of the

Progress Valley Farm Discussion group who won a regional award for grazing excellence. He maintained a keen interest in the progress of NZGA and was voted onto the Executive committee in the early 1990's, culminating with his official service as President in 1997. Maurice has always supported research and had early winter grazing management trials on his farm in the Catlins. He continues his commitment to the NZGA with perennial attendance at the conferences.

Ray Brougham Trophy

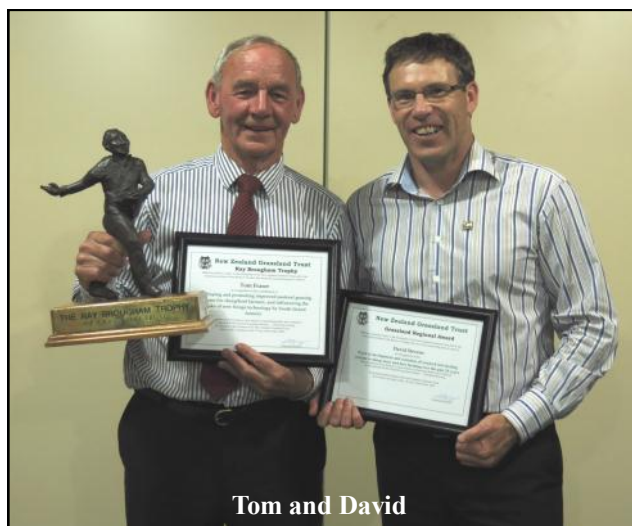
The 2012 recipient of the Ray Brougham Trophy was AgResearch senior scientist Tom Fraser. Currently Tom's role is as Impact Leader for Forage Systems, a title that nicely sums up his contribution to grassland science. He is well known to many farmers in both islands through his forthright and often humorous presentations at monitor farms, field days, and workshops.

The award was given in recognition of Tom's outstanding

achievements and leadership in developing and promoting pastoral grazing systems for sheep and beef farmers. Tom has spent his working life evaluating pasture plants and their impact on farming systems, and transferring that knowledge to farmers. In doing so he has had a profound impact on pastoral agriculture – working with researchers, students, farmers and industry personnel to increase understanding of farming systems and the role pastures play.

Tom completed a Diploma in Agriculture at Lincoln College in 1965 and began his career as a farm manager for Lands and Survey sheep and beef farms in Southland so it is more than fitting that he received the award in Gore 47 years later.

He then moved to DSIR Grassland at Lincoln and work in forage evaluation, dryland pasture and plant breeding. He has the ability to relate well with both farmers, agribusiness and researchers and can combine the practical with the scientific rigour when talking to farmer groups. He has delivered well over 600 presentations on a wide range of topics including pasture quality, pasture establishment, feed planning, brassica management, lamb growth and more recently, climate change and greenhouse gas issues. He credits Ray Brougham with teaching him everything he knew about pastoral farming systems. Tom was both a past president of NZGA (2000) and was made a Life Member of the Association in 2010.



Tom and David

NZGT Regional Award

Current Executive member Dr David Stevens, senior scientist in the Innovative farm Systems group at Invermay, received the regional award to recognise his work in both research and extension of feeding systems for sheep, beef deer and now dairy farmers over the past 25 years.

David began his career working at Lincoln University as a technician where Professor Roger Field encouraged him to complete his Masters in Crop physiology, working with sugar beet. He moved to the DSIR Research Station in Gore in 1984 and continued work in pasture agronomy and evaluation.

With a growing interest in animal nutrition he travelled to North Carolina in 1995 to do his PhD investigating the impact of protein: energy ratios in forage in feed intake and animal growth. Returning from the US in 1998 to Invermay he has continued working in farm systems research focussing on nu-

trition and animal performance.

He continues to deliver extension through field days, involvement in Beef and Lamb Monitor and Demonstration farms, Deer Focus farms and involvement in SFF projects, both in the Southland Otago region and throughout the rest of the country.

NZGT Farming Awards

The NZGT farming awards were awarded to Jeff and Liz Chittock, managers of Jeff Farm, and Tapanui dairy farmers Alistair and Josanne Megaw.

The Chittocks have managed the 1932ha Salvation Army owned Jeff Farm, located between Clinton and Matakura, since 2001. The original owner, Edmund Jeff set up a trust and the farm was to be gifted to The Salvation Army upon his death, provided that it was used to train young people, who would not otherwise have such an option, for a career in the New Zealand agricultural industry. Now every year, four young people are offered a position living on the farm and, under the direction of manager John and his senior staff, are trained in practical farming skills. The course takes two years and competition for entry is strong.



According to John, the farm now runs 22,000 stock units; 70% sheep, 25% cattle and 5% deer. He says that for the last ten years, the prize-winning hoggets on the farm have been mated. John also says the farm is targeting over 145% for lambing ewes and at least 80% for the hoggets. 150 hectares of winter crop of chou and swedes is grown and 700 bales of baleage and 1,000 ton pasture and wholecrop silage is conserved.

In recent years Jeff Farm has done exceptionally well in the Southland and West Otago Ewe Competition. In 2006 and 2007 Jeff Farm won all the classes for which it was eligible; the farm won the Romney Award, the Superflock Award and the Overall Champion Award. This is an indication of how well the almost 2,000 hectare farm is now managed.

The Megaws are well known pioneers in the dairy industry in West Otago, moving south from the Waikato in 1993, at the beginning of the current dairy expansion. Their self-contained property milks 560 cows producing 330,000kg milksolids on an intensive feeding system. They have achieved high production on both a low input all grass system and in the current high input system. They built a wintering barn in 2010 and a rotary shed in 2011. In 2007 they won the Ballance Farm Environment award for Otago.

Recognised as a leader Alistair can be credited with helping many people during their conversion process to dairy in the area and the day to day management. Both Alistair and Josanne are prominent in the local area and are always willing to give their time to people who want to learn. Many of their farm staff go on to do very well in the dairy industry.

Levy Oration

The NZGA executive has begun a new tradition with the Levy Oration. This is named in recognition of the contribution of Sir Bruce Levy to grassland science.

Bruce Levy joined the Department of Agriculture in 1911 as a clerical assistant. His interest in plants came to the notice of AH Cockayne and he was transferred to the biological laboratory. He became known for 'extension' - communicating science to farmers. He took up Cockayne's campaign to improve pastures in NZ through topdressing with super and using improved pasture cultivars. In 1937 he founded the Grasslands Division of the DSIR and was Director of that division until he retired in 1951. At his retirement his old mentor Cockayne labelled him 'the evangelist of grassland farming'. He was a Life member of both the NZGA and NZSAP acknowledging his contribution to both pasture and animal research.

The contribution and philosophy of Levy fits well with the NZGA vision of 'fuelled by science, tempered by experience'. The Levy Oration is an opportunity to offer a leader in grassland research or farming the chance to speak at conference on their vision - past present and future.

Past president of NZGA, Mr Pat Garden, was invited to present the inaugural Levy Oration. He discussed the opportunity for innovation in grassland farming and the challenges for the future. The full speech is worth revisiting and is online at <http://grassland.org.nz/newsdetails.php?newsnum=40>.



Jacqueline and Warwick congratulate Pat Garden

Gore 2012 Field Tours



Leithen Valley



Nithdale

22nd International Grassland Congress

'Revitalising grasslands to sustain our communities'

Sydney, 15-19 Sept 2013

The aim of the programme is to look at issues facing grasslands around the world and to consider the latest research developments and solutions.

There are three conference streams

1. Improving production efficiency to revitalise grasslands
2. Improving grassland environment and resources
3. Grassland people, rights, policies, practices and processes

This is a great opportunity to experience an International grasslands conference - so close that the flights are cheaper than within the country.....

Submissions for posters close on 31 March. Earlybird registration (AUD 1265) is open and closes on 31 May although you are able to register up until the conference.

NZGA Farmer Travel Award

To encourage more of our farmer members to consider attending the conference NZGA is offering a number of Travel Grants to farmer members.

To be considered for this award (up to \$3000 GST inc), please submit an application in writing, to eo@grassland.org.nz or by snail mail to M Casey, 11 Montrose St, Mosgiel, DUNEDIN 9024., BY 3rd April.

Please include your full name, postal address, a brief description of your farm business, why you would like to attend, the history of your interaction with NZGA (e.g., years of membership, conferences attended, Local Organising Committee membership, service on National Executive), and preferably an email address or phone number. A post-conference report for this newsletter will be required (highlights only). The NZGA Executive has allocated an amount and this will be distributed depending on the numbers that apply.