New Zealand Grassland Association

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Grassland News

"Fuelled by science and tempered by experience"

NEW ZEALAND GRASSLAND ASSOCIATION INC

What's in this Issue

Welcome to the final newsletter of 2010. This year's conference started with a bang when a 4.9 aftershock occurred during the welcoming reception. The conference was very successful, with over 500 attendees from around the globe. As a joint conference with the Australian Society of Agronomy it provided plenty of variety in papers and an opportunity to network with scientists in quite different areas of expertise.

A highlight for many was the farmer/agribusiness workshop series which were well attended and covered a variety of relevant topics ranging from identification of insect pest in pastures, to achieving 300 g/day liveweight gain from lambs, improved pasture utilisation, and optimising water and nitrogen in a cropping system.

Tea break at the lamb finishing field day

Look out in future newsletters for summaries of some of the Conference sessions. Two are introduced here, organic production systems and managing nutrient losses.

Conference Awards

NZGT Farmer awards—dairy farmers Craige and Roz Mackenzie, lamb finishing Grant Ludemann

Ray Brougham Memorial Trophy—John McKenzie (General Manager, PGG Wrightson Seeds)

NZGA Honorary Life membership—Tom Fraser, AgResearch

Pat Garden and overseas visitor

In this Issue

Professor Tom Walker
1916 - 2010

- President NZGA 1963-4
- Founder Grassland Memorial Trust (now NZ Grassland Trust)
- Inaugural recipient of the Ray Brougham Memorial trophy

It was with sadness that NZGA members attending this year's conference heard the news that Prof Walker had passed away at home, with family and overlooking his much loved garden.

He is remembered for a long and valued contribution to the NZ Grassland Association and we extend our sympathies to his family.

A fuller resumé of Profs contribution to both NZ science and NZGA is on page 5.

Resource efficiency

Jacqueline Rowarth, Massey University

Organic production systems aren't the silver bullet to the world's problems; sad in the eyes of some, reality in the eyes of others.

This might seem to be a strange conclusion from a session based on energy and water, but it is the reality of production per unit of food, and when one adds in land area required, understanding occurs.

A missing paper (author not able to travel) meant that the Energy Balance and Resource Use in Farming session had proper time for discussion in what was otherwise a packed conference programme. After papers on urbanisation of land use (Rutledge et al.), energy use on different types of farming system (Norton et al.), soil properties on different types of farming system (Carey et al.) and life cycle assessment of water use (Page et al.) participants were able to consider the main issues identified.

Daniel Rutledge (Landcare Research) showed that urbanisation is occurring at a faster rate on class 1 and 2 soils than on any other. Class 1 soils occupy only 0.7% of the total in New Zealand, and Class 2 only 4.5%. These are the soils with least physical restrictions on use and hence greatest flexibility of use – and are where horticulture tends to operate. Rutledge emphasised the need for appropriate policies on land-use management planning to ensure that future generations enjoy the same range of options for their food production as we do today. (His conclusions supported those of the 'Collisions of Land Use Forum' held at Massey in August with support from the Royal Society of New Zealand and AGMARDT, and are being incorporated into the 'Issues Paper' under preparation for the RSNZ.)

With limited good land, how should we best be using it to ensure sustainability? While there are on going calls against what is termed conventional agriculture, the data do not support greater sustainability with a move away from it.

From a study of energetic intensity efficiency over 6 years, Solis Norton (University of Otago) showed that organic farms used less energy but produced less output. When one adds to this the studies from Europe which indicate twice as much land per unit of production required (and the New Zealand data which tends to indicate a 40% difference in production, whether agriculture or horticulture) then clearly at current yields feeding more people would require extra land. In fact, David Tilman, University of Minnesota, has calculated that an extra 1.5 to 2 billion hectares of land under production are required by 2050 to feed the projected 9 billion people at current global yields. More land in production means decreased carbon in forests and in soil. Is this sustainable?

The argument from some is that non-conventional agricultural systems allow soil carbon to increase. Peter Carey (Land Research Services) produced data from a survey across New Zealand comparing organic and conventional farms. They found few differences in soil properties, including soil carbon and soil biology, to do with management. They attributed most variation in soil properties to soil type and land-use.

The mood of the participants in the session is summed up by Emily Crofoot, long time supporter of NZGA. "All this debate about which method and trying to prove one is better than another is taking too much time. We need to focus on rigorous research towards true sustainability – and that means economic as well as environmental. Rapid adaptation to changing pressures will remain as New Zealand's competitive advantage."

Mitigating the environmental effects of nitrates

David Stevens, AgResearch

This is an on going question that continues to be unravelled as more research findings are presented at the annual NZGA Conference.

The majority of nitrate leaching from our grazed pastures occurs under urine patches. Nitrification inhibitors are suggested as a method to reduce these losses. The state of knowledge continues to develop. This was in evidence as different studies highlighted the role of added knowledge and 'potential best practice' approaches. Jim Moir helped expand our knowledge on two issues. The first was the potential use of nitrification inhibitors in sheep systems, helping to quantify potential losses and mitigation of those losses. The second was in providing further evidence of potentially high readings of nitrate leaching experimentally, when using shallow (250mm) lysimeters.

Rogerio Cichota demonstrated a modelling approach where the outputs of a nitrification inhibitor were modelled from lysimeters data and then applied to assess the effectiveness of DCD at different times of the year. This highlighted the interaction between temperature and effectiveness of DCD. The effectiveness in summer was poor even if applied very soon after the urine deposition.

Graham Doole moved the comparison to another level by modelling the impacts of DCD on a Waikato dairy farm, assuming a 10% increase in pasture production from the DCD application.

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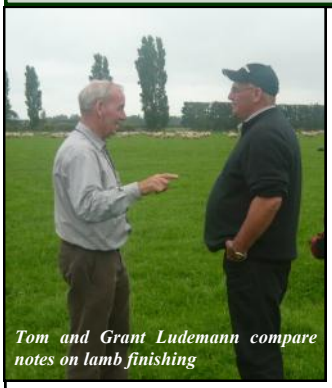
When optimised over a whole farm production did increase and nitrate did decline even with increasing stocking rate.

However the economic benefit, a primary driver for farmers, was relatively small at the current price of DCD.

Finally Kevin Macdonald presented data from a two year farmlet study of nitrification inhibitors. We know that results always look best in compartmental experiments and are always dilutes as we approach the whole farm system level. Kevin proved that with this work, showing that in Taranaki conditions the benefit of nitrification inhibitors could not be measured or harvested either as a reduction in nitrate leaching or in extra production. The research highlighted two factors, one is the complex interaction which occurs at a whole farm level and the other is the evolution in the current state of knowledge around nitrification inhibitors, highlighted by discussion on a change in thinking as to when the best application times for nitrification inhibitors may be.

Given the continued evolution of knowledge about the impact and role of nitrification inhibitors in grazing systems it seems prudent to continue to be cautious in interpreting and applying the results from this technology.

Thomas John Fraser — Nomination as Honorary Life Member of the NZGA



Tom and Grant Ludemann compare notes on lamb finishing

"Uncle Tom… Tom Fraser, is a legend* in his own time. He has spent his working life in government employment evaluating pasture plants and transferring the latest knowledge to farmers. In doing so he has shaped pastoral agriculture – working with researchers, students, farmers and industry personnel to increase understanding of farming systems and the role pastures play.

Tom's first job, following a Diploma in Agriculture (Lincoln College1965), was as Farm Manager for Lands and Survey sheep and beef properties in Southland. In 1969 he joined DSIR Grasslands focussing on pastoral systems in *'summer-dry'* east coast of New Zealand. He became a leader in the use of grazing ruminants for the evaluation of pastoral plants. His work resulted in a vastly improved understanding of feeding value of pasture plants and their contribution via animal products to economic return from farming. This resulted in a change in industry practice.

When AgResearch formed in 1992, Tom became a scientist in Farming Systems. In the new terminology his 'strategic systems research' was focussed on economic, environmental and social benefits for New Zealand farmers. His work included applied research in every region of New Zealand, funded from Producer Boards.

Tom's contribution to the pastoral sector has been not only through the knowledge generated by his research, but also in his capacity to promote farmer uptake of the results. He is well known and respected throughout the farming community for his long period of involvement in farm discussion groups and monitor farms. He has an ability to distil complex issues into clear key messages, and to deliver these in farmer-friendly language that are easily understood, always aided with his dry sense of humour. He has used media, farmer field days and seminars to increase understanding of pasture management in the industry. He has also developed and delivered farmer workshops on Pasture quality, Forage Master and FlockMaster.

Tom's work has been acknowledged by the appropriate societies in various ways through his career:

- 1984 NZGA Best Conference paper presentation
- 1990 Ministerial Award for Excellence in Techno logical Development
- 1997 The NZIAS/AgResearch Technology Transfer Award
- 1999 Canterbury Branch NZIAS Significant Achievement Award
- 2004 NZGA Technology Transfer Award

He has been a strong supporter of the NZGA, contributing to the special publications and to conferences by presenting papers on a regular basis. In 2000 he was elected as President of the New Zealand Grassland Association. Tom is someone who can easily identify with, and be accepted by, both researchers and farmers. He combines both practical know-how and scientific rigour to ensure credibility and respect across the full spectrum of NZGA members.

It is fitting that NZGA acknowledges the legendary Tom Fraser for his work by inviting him to become a Life Member.

** Bologna, J. 1996. Masters thesis Acknowledgements:*

"I would also like to thank the legendary Tom Fraser (AgResearch Lincoln). Two weeks after I arrived in New Zealand somebody told me that if I wanted to be on the "safe side" of pastures management in the South Island I must be on Tom Fraser's "side of the fence". Working with Tom was a memorable experience and I am very grateful for his friendly support and advice over this time. At this stage I can confirm that his excellent personal and technical reputation is truly justified."

Farewell to the Prof

Deric Charlton

For most of the past 94 years New Zealand has been fortunate to have Professor Tom Walker around, usually talking about soil fertility.

"Prof", as many of us knew him, gained a nationwide reputation for his great enthusiasm for legumes and nitrogen fixation in pastures and his expertise in gardening. In some years Tom delivered around 100 lectures to groups all over the country, supported mainly by fertiliser companies. He also frequently appeared on radio and television; most notably on the television programme *Maggie's Garden Show* for several years as the vegetable gardening specialist, showing us how to grow great vegetable crops in his hillside garden near Halswell. He also featured on the local CHTV's *Homes and Gardens* helping with regional problems. He was gardening correspondent for the *Christchurch Star* during 1972-1992 and for *The Press* from 1992 onwards, and a consultant for Wrightson from 1972 to 1984. I once heard that every year he kept up to 13 relatives and friends well supplied with vegetables of all sorts.

In 1994 Tom Walker received the inaugural Ray Brougham Trophy from the New Zealand Grassland Trust and was made an honorary NZGA Life Member in 1996. He also received the Bledisloe Medal at Lincoln University in 1996, the Rutherford Medal from the Royal Society of New Zealand in 1998, and the Order of New Zealand in 2000.

I first knew Tom as our lecturer in crop production at Kings College, Durham University in Newcastle upon Tyne, back in 1958 when he was one of the effective team that the Kiwi Dean of Agriculture, Mac Cooper, had developed there in the School of Agriculture. From him I learned of the potential transpiration rates at Lincoln College, and the green footsteps that Tom observed not long after he had applied molybdenum as a trace element on one pasture plot – he had walked back over his trial area to the gate and his footsteps showed up afterwards.

I listened to his enthusiastic deliveries about soil fertility then and never forgot his sound advice – "If you want to educate, you have to entertain!" With that pleasant resonant voice, Tom always did!

Early years in Britain

Thomas William Walker (known also to many as John or Johnny after the Scottish drink) was born on 22 July 1916 in Shepshed, near Loughborough, Leicestershire, England. From 1928-35 he was a scholarship boy at Loughborough Grammar School, and in 1935 he was awarded the Royal Scholarship in Chemistry at the Royal College of Science, Imperial College of Science and Technology at London University.

Profs White and Walker

In 1937 he obtained a first class honours degree in chemistry and a chemical physics honours degree, and in 1939 he received a PhD in Agricultural Chemistry (Soil Science) and was awarded a post-doctorate fellowship by the Salters Institute. Tom was not allowed to serve in the armed forces, so he worked at the Rothamsted Experimental Station in Harpenden from 1939-1941, where he was involved in fertiliser research, specialising in alternative forms of phosphate for use in Britain, as the Allies were cut off at the time from their Pacific Island sources by the Japanese forces.

Tom moved to the University of Manchester in 1941 where he was a lecturer and adviser in agricultural chemistry, responsible for soil and other nutrient problems in Lancashire and Cheshire. From 1946-1952 he worked as principal soil chemist in the National Agricultural Advisory Service in the West Midlands, after the service was nationalised in 1946, but moved to Lincoln College, New Zealand in 1952 where he was appointed Professor of Soil Science.

He returned to Britain in 1958, lured by Mac Cooper, to be Professor of Crop Husbandry, giving colourful presentations on climate and nutrient effects on pasture and forage crops, well illustrated from New Zealand and British examples.

However, the depressing and dreary wet weather, coupled with the lure of fishing in Canterbury rivers, lured him back to New Zealand in 1960 and his previous chair in soil science, where he remained until "retiring" in 1979.

Tom never really did retire, however, as he continued to build a nationwide reputation for his expertise in gardening and his enthusiasm for legumes and nitrogen fixation in pastures.

Tom's fertiliser research and philosophy

Tom Walker began his fertiliser research in 1939 at the start of World War Two. The first man-made fertilisers had been made at Rothamsted in 1837 by treating bones with sulphuric acid. A scarcity of bones led to rock phosphate being substituted and the result was called Superphosphate. Field trials on pastures and crops later confirmed the superiority of superphosphate.

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Tom was then based at Manchester University where he was responsible for investigating soil, crop and animal problems for farmers in Lancashire and Cheshire, developing routine soil-testing methods and eventually analysing 30,000 soil samples a year. When the war ended he became soil chemist for the West Midlands, the major grass-growing area in England. At this time it was the practice to recommend heavy applications of nitrogen (N) fertiliser on grassland and ignore contribution from clovers. Tom, however, carried out several pasture trials with varying clover content and found that while pure grass swards gave straight-line N responses, clover swards gave much smaller responses. The grasses responded well to N but clovers were suppressed by competition for light, and most of that "gained on the swings was lost on the roundabouts", especially when protein, rather than dry matter yields, was measured!

Tom felt that the ten years worked on extension work in England were his most valuable working years, because he had close contact with the farming community and their problems. He was therefore sad when Britain opted for heavy nitrogen fertiliser use. When he moved to Lincoln College in New Zealand he was already a converted fanatic for biological nitrogen fixation by clovers, as opposed to N fertiliser.

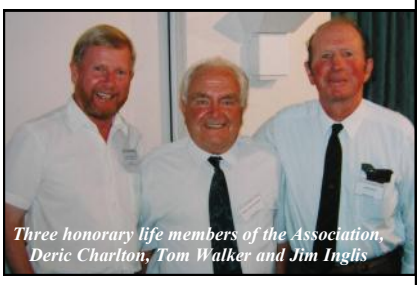
While at Lincoln he researched effects of sulphur, phosphate and molybdenum on establishment and growth of clovers, maintaining his pasture interest. He defined the principle of pasture production in New Zealand as the "maximum production of dry matter consistent with optimum nitrogen fixation." Tom believed this made sound economic sense because of the high-energy costs of making N fertiliser and its environmental effects when used at higher application rates. Tom reckoned American workers had shown that most meals eaten in the USA cost more energy to produce than they supplied – clearly unsustainable. The reason for low energy costs of food production in New Zealand was primarily because of reliance on N fixation, he felt.

Tom Walker opposed the use of natural gas to manufacture urea in Taranaki because this raised the energy costs of food production. He agreed that there was a place for intelligent N use, but he always argued that farmers seeing their grasses respond readily to N could easily be persuaded to apply more, to the detriment of the clover content.

"The more stock we carry, the more likely we are to pollute the air with ammonia and methane, and the groundwater with nitrate. The more N we use, the worse the pollution," he felt. "Here is another reason to vote for clover! As the interest grows in living in a clean environment, our promotion of nitrogen fixation is the one lesson we can teach the rest of the world."

Tom was a vehement critic when he found a product that didn't perform to its advertised standard and once had Lincoln College in legal bother when he described a liquid fertiliser as "an expensive way to buy a 44-gallon drum!" He was no fan of organic farming, describing it as a marketing gimmick, and never hesitated to explain his reasons.

NZGA attendance



Three honorary life members of the Association, Deric Charlton, Tom Walker and Jim Inglis

In recent years Tom and Edna were regular attenders at NZGA Annual Conferences, and his opinions continued to be given and respected during discussion sessions. Tom was the inaugural Ray Brougham Trophy recipient from NZGT at Hanmer Springs in 1994 and two years later at Waitangi he was made an NZGA honorary Life Member. On that latter occasion he gave a hilarious acceptance speech that included a candid description of his health upsets while travelling – I'll say no more!

We remained firm friends over the years and I even managed to impress him once, at Gisborne in 1983, when I tried to emphasise the importance of white clover to this country by showing a slide (remember them?) during my presentation on white clover, of former All Black colleague Robert Burgess with a clover leaf on his shirt instead of the silver fern! Tom told me afterwards that he'd often wanted to do that but hadn't dared to!!

Executive Officer Comment

AGM News: - The NZGA executive will stay the same for the next year: Anders accepted a second term as President, Jacqueline as Vice President and David Stevens was re elected for another term.

The members present at the AGM approved a rise in the cost of the annual subscription to NZGA to $85 GST inclusive. We have made every attempt to reduce our running costs, such as increased email etc. but the price of printing, postage etc. keeps increasing resulting in this decision. We hope members continue to support us in the future.

Proceedings: - Watch the mailbox for these as they will be mailed out soon.

Subscription Accounts: - We still have some members in arrears so please check your files for any unpaid invoices.