NZ GRASSLAND ASSOCIATION
Fuelled by Science, Tempered by Experience

GRASSLAND NEWS www.grassland.org.nz

Dec 2013

ISSN 1179-4216

Thought from the President

Warwick

At the Tauranga conference some of our young agricultural talent presented industry case studies; it made me think - is the co-op the way to capture the game changing changes needed? Are they in fact innovative enough, given that we ask them to shift bulk commodity product in the most efficient way; i.e. max the benefit to the NZ farmer /shareholder from the agricultural commodity that leaves the farm. Can one entity then take that commodity, brand it, market it, feed-back market information and give advice to the farmer about production and business issues, so in effect do everything for us?

Perhaps more thought needs to go into venture capital arrangements where we, the co-op, invest in private companies to take the commodity product that leaves the co-op processing plant; and the co-op retains its focus on the processing. Somehow we need to create capital to fund the in-market activities. Asking farmers to forgo returns while co-ops look for opportunities cannot be the most efficient way forward; and it risks losing focus on processing efficiency and secure supply.

That is no different to what has to be thought of for developing step change in NZ farming systems. Innovative ideas need innovative financing and joint venture thinking. How many investment opportunities are sold with 300% returns? Dry land farming offers that now; yet the farmers and or banks are hesitant to extend their debt as short term cash flow requirements or bank reports prefer safety first.

Farms should only be servicing a debt level that allows for full development of best forage system and re-investment in maintenance and enhancement, and a management wage. The balance of the debt should be shared by the shareholders; the farmer, the NZ govt, the processing co-op, the fertilizer co-op, the merchandise Co./co-op, business to business service providers; no return until the business can afford it. Your accountant will want you to perform, so will your bank; the supply and processing co-ops have your account which is what they want; and all will understand that they get a return on their investment when the farm starts delivering and you will be supported to deliver. This will happen when they understand the need to have your future business is more important than your current business, step change will occur.

As is always the case it's about the people, people, people involved. We all need to listen, in order to learn; to realise an opportunity. Nothing can be achieved in isolation, each is an individual and when it is time, and when the format is right for that individual, action will happen. Innovation from adoption will flourish, just as it has always done. The challenge is to do it earlier in ones career. To do this we need more cashflow at the farm gate and an understanding of the true synergy return of a whole farm team approach.

Warwick presenting on his farm at an annual legume field day the week after conference

Processing and marketing will add value to a product, but will only create returns at the farm gate that deliver step change opportunities, if, and only if production advances continue to be made on farm and costs to supply are accounted for. This is an example of the true synergy approach, and why relationships with industry and researchers are critical.

On 90% of NZ pastoral farms, we are yet to get the forage system right, i.e. a forage system based on the best plants for animal productive performance in that location, this must be the fundamental key to farm success.

The measure of weight of lamb weaned to weight of ewe mated as a measure of ewe efficiency is wonderful if that ultimately is the best use of that forage system. Kilogram of product/ha, or kg product/ha/no. of days of lactation, may create a measure of efficiency far more appropriate, due to a completely different forage system. Changing a cultivar of

ryegrass or half the genetic makeup of your lambs by buying a different ram breed will not make fundamental step change as could be delivered from getting a forage system change to occur.

What plant breeders have done is identify the attributes that make a difference once the forage system is right. Unfortunately too often the innovation the plant breeders have delivered does not make the game changing step that the farmers think it will, as they are playing with the wrong forage species or wrong animal enterprise for maximising a particular forage; this is often driven by financial realities of the volatile market returns for our products.

Each supplier of services to the farm is wanting to know how they can supply you with more, how many more products they can have under their brand attached to your farm; just like on the farm we are being encouraged to add value to our brand, sometimes we need to pool our products, diverse as they maybe, under one brand, and now for an administration step that is a shareholder also, and efficiencies might just flow through; perhaps what is needed is a % allocation to each step, the opportunity to be part of this product is available to those who are prepared to put their capital at risk and share the profits with the supply chain. At that point each step will understand that without real reward there will not be a supply chain.

Why should accountants, engineers, 'business to business service providers' be the ones who return the highest rate of return per fulltime labour unit equivalent, and those who produce the products, risk their capital, and provide the jobs and wages this economy requires, return the least; a significant lack of value added is coming from these business to business service providers. How these professionals use the sum of the parts approach to their cost plus business model, verses valuing the synergy of the whole is very evident. Interestingly the numbers of lawyers, accountants, advisors who are shareholders in primary industry businesses reflects their understanding of this opportunity, unfortunately it also reflects the realisation of the cashflow benefits of the business to business service sector for easy money, and it is not in their interest to change that.

What I know is that one entity on its own will not do everything I need, and it's the synergy of the parts being worth more than the sum of the parts, only when they are all shareholders will that be real.

Perhaps the way the value is attributed to each needs to be looked at by others who are not accountants; and would then, the decisions that have been made by our rural co-operatives government funding entities, research providers and banking sector create the step change and innovative farming systems required to enable the government's economic growth agenda.

Take care over the festive season

Warwick

Legume field day, post NZGA Conference 2008

Graham Kerr and Warwick Lissaman

Over 80 people attended the recent Beef+Lamb Farming for Profit Field day on the property of Warwick & Lisa Lissaman at 'Breach Oak', inland of Seddon in South Marlborough. This was based on a recently completed SFF project that began when the LOC from 2008 NZGA annual conference in Blenheim wanted to use the conference as a catalyst to create innovation. The interest in legumes for summer dry Marlborough followed on from the field day and the key to the success of this project was the on going input and tech-transfer from Derrick Moot and Dick Lucas of Lincoln University.

Warwick, President of NZGA, spoke about the learnings and experiences with sowing legumes as a way to improve farm profitability through providing high quantities of high quality feed on the property. Dick Lucas, annual legume specialist, and a life member of NZGA, also spoke, with day facilitated by consultant Greg Sheppard.

'Breach Oak' is a 400ha farm, or 360ha effective with about 30% of the farm cultivatable. Whilst total rainfall is only 600mm, the soils can be very wet in winter, and summers are variable, typically very dry due to high evapotranspiration rates.

Warwick, President of NZGA, spoke about the learnings and experiences with sowing legumes as a way to improve farm profitability through providing high quantities of high quality feed on the property.

Warwick has been moving to 'legume farming' as for his farm system they can have large advantages:

- They can grow large quantities of seasonal feed compared to traditional grass based pastures, allowing higher stocking rate;
- Feed quality is significantly better, particularly through late spring into summer, so per head stock performance is better;
- They fix nitrogen, at around 25kgN/t DM produced improving overall productivity for both the legume and also for following pastures/crops.

The key has being implementing these into a farm system that is profitable. In addition part of Warwick's aim is to

match different legume species to different soils and topography, to get the best performance.

A key philosophy has been not looking at pastures from a 'stock policy' viewpoint but instead looking at how to get the best out of the pastures, and then matching a stock policy to them.

So what has been the key learnings to date – and Warwick stresses there have been mistakes, and there is plenty still to perfect:

- The farm is typical of many dryland systems - pastures are dominated by volunteer annual species and inherently nitrogen deficient, low base levels of nutrient status need to be corrected, and when this is done in conjunction with legume introduction a legume dominant phase can be exploited. To introduce without best practice prior is a recipe for a half baked result and one does not farm for long enough to be able to afford to repeat everything.
- Lucerne (a perennial) suits their situation very well, and is their ***number one legume*** species. They have around 40ha of it, and aim to have 60-70ha.
- Sub clover is their ***number one annual legume,*** and suits their system very well. They have been testing a number of cultivars to see what suits each part of their farm best.
- There are a number of other annual legumes they have been trying, as they believe the high cool season yields of these have potential.

Two of these he singled out were Balansa clover (*Trifolium balansae)* and Gland clover *(Trifolium glanduliferum)*. He is mixing both of these with sub clover (and often other legumes) to both increase spring production on the farm, but also to see what performs best.

Balansa is tolerant of wet soils, high yielding, with peak growth Oct-Nov. Gland is a very early maturing annual, flowering late September, which may suit areas that dry out early, such as Northern faces.

Other species under investigation include Persian clover, WCxCC hybrid; strawberry clover; red clover, T. *tumens,* all as options other than white clover.

Warwick also presented information on the extra stock performance from the legume-based pastures. Stocking rates of ewes and lambs are higher through spring, as are lamb growth. The result is significantly extra profits, and estimated a 300% or 3-fold return on investment is possible – making these a key consideration in terms of where dryland farms should be putting their investment dollar.

But it was stressed that managing annual legume pastures are a different way of thinking. Pastures need to be allowed to seed (being annuals) in the first spring – so grazing is limited year one. After that they may need to be allowed to reseed every 4-5 years, depending on plant species and management. The easiest way to do this is have 4 or 5 separate areas (or paddocks), and allow one to reseed every year. In a good growth year, when feed is plentiful, a greater area can be allowed to reseed – which can allow you to graze more annual pasture in a spring when feed is tight.

Warwick highlighted the need to do your own on farm trials to really discover the opportunities this thinking can create.

Dick Lucas talked about how the reseeding needs to be monitored. So you need to understand how the plants grow and behave, it's plants 101, but you need to know your plant and how it works to get the best out of it; also, the need to substitute some of the grass in your traditional pasture seed mix for more legume!!

Information online - www.grassland.org.nz

EO - Marie Casey

The question is often raised at field days, at industry meetings and even in research planning meetings - where do farmers get their information? The answer is increasingly important as everyone wants to know how effective any expenditure on technology transfer or even marketing is.

There are any number of ways of getting new research to the wider industry and everyone is familiar with most of them from the marketing flier or mail drop, to media articles, various field day formats and field day handouts, books, email, websites, text messaging, youtube, twitter…….

What does this have to do with NZGA? One of the most important aspects for anyone, be it a farmer, a student or a new seed rep, is how to find credible, unbiased information that you can trust.

The NZGA website - which you could consider as providing information straight from the horses mouth - shows that many are choosing to access science directly. We know this from the good attendance and great interaction we get at our conferences but also through the increasing numbers accessing the website. Over the last year the average number of visitors to the site is over 1500/month, with a total of 4-4500 page views/month.

If you haven't visited the website for a while the papers from the Tauranga conference are available.

Jacqueline continues the theme of science communication in her Presidential address in the next article.

Presidents Address 2013 - Fuelled by science

Jacqueline Rowarth

Security of food supply, sustainability of food production and safety in food processing – the three Ss of food – have featured in the news globally over the last twelve months. New Zealand has not been immune, and was the focus mid-year. The repercussions are still being felt. A successful pathway to the future will include improved understanding of agriculture and science – which means education at all levels is required. The role of the New Zealand Grassland Association continues to be information exchange and hence education – fuelled by science and tempered by experience.

Food security

Security of food supply is reflected in food prices. Over the twelve months to June 2013, the food price index has increased 0.6%, the consumer price index 0.7%, but the average salary increased by 1.7%% (Statistics New Zealand 2013a). This means that the cost of living, including food, as a proportion of income decreased. The popular belief, however, is that food is expensive, and that an increasing number of families are experiencing food insecurity. On-going news items about child poverty overlook the fact that "poverty" in New Zealand is defined (The Children's Social Health Monitor 2012) as less than 60% of the national median income rather than any concept of being able to afford the necessities of life. The fact that New Zealand residents took 2% more overseas trips in July 2013 than in July 2011 (and 15% more than in July 2012 – though this might have reflected winter school holidays starting later this year) supports the suggestion that New Zealanders have increased discretionary income.

A further factor to consider in food insecurity is what people choose to put in their supermarket baskets. The top 10 items (identified in 2009 – but still quoted):

1. Coca-Cola 1.5 l
2. Wattie's spaghetti 420 g
3. Coca-Cola 2.25 l
4. QB Nature's Fresh white toast 700 g
5. Wattie's baked beans 420 g
6. Dole bobby bananas (850 g)
7. Tip Top super soft white toast 700 g
8. Sprite lemonade 1.5 l
9. QB Molenberg original toast 700 g
10. Coke Zero 1.5 l

Also of interest is that the "typical" basic weekly basket (Statistics New Zealand data collection) includes pineapples, avocados, exotic breads, dried apricots, frozen berries and chicken nuggets. Recent reports from supermarkets (e.g., Hartman Strategy 2013; Woolworths 2013) indicate that trends observed in New Zealand reflect those in other developed countries. Hartman Strategy (2013) reports that basic ingredients are now "pasta sauce"; cooking dinner from scratch occurs only 32% of the time, and "scratch" includes pasta sauce. Research from the US published in 2013 (from data collected in 2012) indicates the average American spends only 32 minutes a day preparing and clearing up after food, in contrast to 75 minutes a day eating and drinking (New Zealanders spend 85 minutes), and 170 minutes a day watching television (New Zealanders spend 128 minutes).

Cooking shows designed to recreate interest in food appear to affect consumption (indicated by increases in obesity) rather than preparation. The problem with the current focus in cooking shows is that they are about perfection in look and taste; normal people are becoming discouraged. New Zealanders throw away approximately 2 kg of food per person a week on average and are in the top category for wastage with North America. This has been suggested to reflect a lack of understanding about food provenance and costs of production (Institution of Mechanical Engineers 2013).

Sustainable production

The costs of food production continue to rise. Farm expenses increased (twice as rapidly as the Consumer Price Index) – directly through power and fuel as well as labour, also through fertiliser which has since reduced in price, and both directly and indirectly through compliance costs – National Animal Identification and Tracing (NAIT) scheme, effluent management and time spent on paperwork, for instance. Ministry for Primary Industries Farm Monitor Reports (Ministry for Primary Industries 2012) predicted that the last season would give little in the way of surplus for farm reinvestment – and the drought removed it (DairyNZ calculates that on average the drought cost $100 000 per dairy farm). 2014 is already being predicted by farm consultants (e.g., AgFirst Waikato) as the big year for compliance, particularly to do with water and effluent management.

Of the five points of sustainability (Smyth & Dumanski 1993), it is the third that tends to feature in the minds of urban society:

1. Maintain and enhance productivity
2. Decrease risks to production
3. Protect the potential of natural resources and prevent degradation of soil and water quality
4. Be economically viable
5. Be socially acceptable

However, for the farmer, point 4 is vital, and the cost of compliance is increasing debt. At the same time, the farmer-owned co-operatives are struggling. Fonterra dominated the news in August, but wasn't the only company involved in international difficulties.

The agribusiness papers that are part of this conference involved three comparative case studies of three companies – nine companies in all. All three case study papers were updated between submission and going to press because of significant changes in, for example, ownership structure and strategy; these changes are on-going and indicate the challenges of trying to do what the govern-

ment is urging – increasing exports (Macdonald & Rowarth 2013. Rowarth *et al*. 2013; Scott *et al*. 2013; Wilson & Rowarth, 2013).

New Zealand's investment in South East Asia alone has grown steadily from $0.7 billion at December 2007 to $2.2 billion at 31st December 2012 (Statistics New Zealand 2013b). Meanwhile ASEAN investment in New Zealand was $2.4 billion at 31st December 2007 and $3.5 billion at 31st December 2012.

ASEAN investment in New Zealand includes Bright Dairy's 51% ownership of Synlait, Olam's 25% ownership of Open Country Dairy, and Vinamilk's 19% ownership of Miraka.

Key drivers of this increasing interest in New Zealand dairy among Asian players have been identified by Forsyth Barr as security of supply of high quality milk in an increasingly competitive international market and guaranteed DIRA (Dairy Industry Restructuring Act) raw milk.

All of the New Zealand investments overseas reflect money that could have been retained and invested in New Zealand, in research and development and in infrastructure and food processing plants, thereby preventing some of the new entrants into the market creating direct supply chains to their home countries.

Farmers are already the biggest investors of research in New Zealand through taxes, rates, levies, retentions and their own investigations. The question must be asked whether their investment overseas is well spent or whether investing in New Zealand, and on farm, would have been more effective, particularly given increasing concerns about sustainability.

In July this year the Ministry for the Environment (MfE) released data on "river conditions" showing that over the past decade at 90% of the sites tested, most of the MfE's key indicators were either stable or improving.

However, headlines such as "Latest water quality trends 'red letter day' for farming" were balanced by "water quality to worsen says Fish & Game" and "Waikato river in serious decline". The latter failed to point out that although an increase in nitrate had been recorded in the last decade, the peak (measured in 2009) was 27 times below the potable limit for nitrate-N.

Education

The general problem in understanding of sustainability reporting seems to be an ongoing lack of science and relativity. Participation in science subjects at school and university has decreased in developed countries as the curriculum has broadened and the proportion of students staying on at school and entering university has increased. New Zealand has had fewer than 100 graduates (of approximately 22 000) a year in agricultural science for the past decade, and only between 2000 and 2500 in the "natural sciences". Global shortfalls in STEM graduates (Science, Technology, Engineering and Mathematics) mean an increase in salaries, which in turn are decreasing the likelihood of students staying on at university for postgraduate study.

This is unfortunate given the increasing challenges in sustainable food production – grassland research needs great people enjoying great careers in order to contribute to global sustainability (Rowarth 2013). Factors behind the decrease in STEM students include (Westgate 2007) (1) shortage of specialised STEM teachers, (2) poor image of science and scientists, (3) perception of science as a hard subject and (4) lack of knowledge about STEM careers. All of these factors are true, but schoolchildren still take the sciences if they want to be doctors or veterinarians (Hipkins *et al.* 2006).

The challenge, then, is to make STEM careers as attractive as the medical professions by showing the students that the rewards are high. After graduation from a bachelors degree, applied science graduates are being offered approximately $48 000, plus SUV, computer and mobile telephone.

In contrast, staying on for honours/masters and then Doctoral studies extends the time on no real income. Five years later and the applied science graduate could be completing a PhD with a post-doctorate salary of $65 000, whereas the classmate who joined the industry could be on a salary package approaching $100 000.

Overall, the opportunity cost of doing a science degree, and then putting in the postgraduate study that leads to a science career, is a huge barrier and loss of earning power that the young are now calculating.

Government intervention to acknowledge the cost, plus a formal programme of in-work supported PhDs on salary (ensuring opportunity costs are offset) made, is required to make a difference.

Safety in processing

The flurry of interest in food contamination over the last few months has raised concern about food safety, agro-terrorism and communication ability. Although most of the issues reflected an increase in testing ability and awareness rather than danger, agro-terrorism could be more prevalent in future. Professor David Dausey, Chair of the Public Health Department at Pennsylvania-based Mercyhurst Institute of Public Health, has warned that increasing global supply chain complexity, including different countries and multistages of processing, means greater risk of unintended or intentional product contamination. He points out that food recalls have increased dramatically over recent years, averaging six a day in America alone during the first quarter of the year.

The average direct cost of a recall is US$10 million. A recall adds costs to food companies, but so does testing. The question of what is sensible in terms of precaution is being asked overtly. Professor John Brooks, AUT, has explained that when contaminants occur in a product at very low level and very infrequently, testing is ineffective in assuring safety, and the cost is prohibitive. Understanding the likelihood and impact combination will be of increasing importance in the future, and the role of science communicators is vital.

Professor Sir Peter Gluckmann, Prime Minister's Chief Sci-

ence Advisor posted this comment to his website a few days in advance of Fonterra's Whey Protein recall: "better science communication could go some way to resolving such confused debates. Public perceptions of risk, trust in authorities, and the general discomfort with uncertainty need to be addressed with openness, integrity and professionalism." He believes that there should be science advisors in all big organisations, ready to explain and educate.

Pathway to the future

The New Zealand Grassland Association is part of the education network in New Zealand. It exists to share knowledge and best practice for agriculture, and embraces the five points of sustainability (Smyth & Dumanski 1993).

Tom Fraser, the Ray Brougham Trophy/award recipient for 2012, covered 40 years of NZGA in his talk – the time he had been in government-funded research. Although he tried to put all university lecturers out of work by suggesting that students wouldn't need to do Agronomy 101 if they read the NZGA proceedings, his point was the wealth of information presented over the years and lodged in the proceedings and on the website. There is also considerable information for policy analysts.

This year the range of papers covers farmlet, field, pot, decision support models and business, pests, persistence and people. Most are aimed at making a difference to the bottom line of the farm business. The effect of implementation will be known only with measurement, but monitoring and reporting are part of being able to justify action and farming systems. The alternative could be inappropriate regulation being imposed, with implications for economic viability on farm and unintended restrictions on New Zealand's economic development. Increased investment in scientific research, both facilities and people, is required to ensure that critical research can be performed and then brought to conferences for discussion.

The final message is the same as last year (Rowarth 2012):

The evidence is clear. Times will continue to be interesting and we must move away from time consuming wrangles, establish an Agri-Food Board and concentrate together on what New Zealand does best: fresh, minimally processed, high quality food produced in scientifically-founded sustainable fashion in the knowledge that New Zealand farmers are superb managers of intensive production systems, allowing considerable national income to be gained not only from exporting food, but also from tourism based on the managed farmland as well as native landscapes.

… with an important addition:

Achieving this requires pastoral agriculture to be fuelled by science and tempered by experience. It requires the grassland community, with all the different backgrounds, knowledge and perspectives of the members, to be working as one towards the future. The New Zealand Grassland Association is the foundation.

NZGT Award winners Tauranga 2013

Grassland Regional Award

This award recognises exceptional service to grassland farming in the region where the NZGA Conference is held. This years recipient was Martin Hawke. Martin commenced work in the Bay of Plenty region in the 1970's. As part of MAF, he helped develop and manage the Tikitere Agroforestry Research area and became New Zealand's recognized authority on agroforestry. In 2004, Martin left AgResearch and set up his own research servicing company. He has continued to conduct field experiments dealing with soil fertility and pasture improvement. The award recognized Martins commitment to continue servicing the field research needs of the region; and the robust and accurate way he has conducted his work over many years.

Ray Brougham Trophy

This award was instituted in memory of Dr Ray Brougham. and is awarded annually to a person who has made an outstanding national contribution to the New Zealand grassland industry.

This year the award was made to Dr Syd Easton, Emeritus Scientist at AgResearch, for his contribution to 40 years of science and leadership in forage breeding and endophyte technology. Through this work, his contribution to the NZ pastoral sector has been significant.

After graduating from Massey University, Syd joined DSIR in1972 as a researcher. He then won an NRAC fellowship to work in France and completed his PhD in plant quantitative genetics at the University of Paris. Syd's plant breeding achievement is marked by a succession of successful cultivars, some of them breaking new ground. He bred the first late-flowering NZ adapted perennial ryegrass cultivar that improved forage quality in late spring. He also bred the first NZ lucerne cultivar that combined grazing tolerance and resistance to blue-green aphid and bacterial wilt; and tall fescue cultivars that have improved palatability and seedling vigor.

Syd led a multi-disciplined endophyte research programme until his retirement in 2011. Within this programme, he made a key contribution to understanding the genetic interaction between the host plant and endophyte. He gained international recognition for this host-endophyte work.

NZGT Farmer Awards

The two farmer awards went to Peter Jensen and Rick Burke. Peter Jensen is a dairy farmer who has long been active in the region including roles as Chairman BOP fertiliser director from 1990's 2003, Board of FMG, Chair of Dexcel, Past Deputy Chair of NZ Dairy Board and a long time advocate of science.

Rick Burke, Katikati sheep and beef farmer involved in the wider industry such as Beef+Lamb Farmer council chair for mid-northern North Island and the local organising committee for the Tauranga conference.