

Presidents address- Warwick Lissaman

'Breach Oak'; SEDDON

2014: Only a month ago it was Election year, in the run up to the election we started to debate what is important to NZ; sadly that moment has long since passed. Will we ever have the great national debate that we sorely need; where does NZ pitch itself on the world stage and how we ensure that is possible; Sustainability in all its facets.

Post-election what has remained is 'Perception', for agriculture this means perception of water ways, nitrogen, phosphate, contaminants, irrigation, animal welfare; and continued perception pressure applied to the rural community.

I pose the question Is there any other nation that exports so much of its GDP that has such a, regulated labour market, resource management regulatory government sector and administration sector?, sadly NZ as a nation spends more on 'lotto' than on 'kiwi saver' and our investment in R&D and science has serious shortfalls.

As a Nation we are charged with doubling NZ export receipts by 2025; in order to achieve that two things are a given, (1), this is not possible without science, (2) also agriculture must lead the pack, so if anyone of us has a seated comfortable position, it's time to get up and do your bit to get the productive sectors growing- we all need to deliver.

Various estimates suggest correcting nutrient deficiencies could lead to 20% output gain; and if system is sorted then double that is achievable, but in same space we have a fertiliser market never more confusing for the farmers; recent changes that 'proof of', now rests in hands of sellers, doesn't stop the product being sold as a growth enhancer, or the sales pitch making the user a believer, at which point they stop asking questions. How frustrating is as a scientist or researcher when you are constantly asked to spend limited resources in effect proving the same position in a different way, and then having claims of unfair treatment and that science is missing the point, thrown in your face.

Yes it might be interesting to measure it, but scientists don't have time or funding to take on every "interesting" thing that people come to them with, even if they think it is reputable. Marketing people dressed up as pseudo independent researchers need to front up with the data or be thrown out. A single analysis of one season isn't proof. What you're observing could be due to something completely separate to what they are doing, base line data of soil fertility, soil type, and botanical composition is always needed, sellers have to be challenged: where is the data on beneficial fungi and bacteria if these associations are going to be offered.

Claims that 'science doesn't understand that to measure you have to first observe', come a close second in my book, to the phrase, 'in order to see you must first believe'; you need to observe and measure at the same time! If you stand around for 10 years observing, you are bound to believe, and you've lost a whole lot of data and, what you eventually measure can't be used as a reflection of what you saw years ago. You don't have anything to compare it to now, or any record of what's gone on in the meantime, replication is required as is multiple years data. It is fair to say that the audience for these marketing angles is lay people who are then tasked with the dirty work of applying pressure on the scientific community; sometimes researchers need to be blunt, and tell the farmer or interested bystander, they need more info to really judge the validity of what is being done.

I have one simple message to our farmers, while you continue to purchase nutrients in expensive packaging and formulations, profit margins for the seller will remain; with profit margins comes marketing budgets and more and more advertorials disguised as news stories.

Changing tack; In our nation, there are only around 40,000 farmers and horticulturalists, add spouses/family and we are well short of 100,000 people, nothing compared to population of Auckland alone. We don't help ourselves as we have so many groups pursuing their own agendas and in reality a unified Rural NZ Inc. strategy is what is missing, the strategy needs to include farmers, processors, marketers, scientists, academics, educators and politicians; it also must discuss the types of people we want in a future, more rural focus in our education system is required, a good example is lifting the teaching of "farms:science:food"; by incorporating examples into history, social studies and economics.

This is only the first step to attracting NZ best business and science brains for the future. In striving to produce high quality foods and agricultural products, the use of technology will be heavy, and require significant investment; requiring bottom line cash flows to enable increasing agriculture's productivity index through innovation and drive year upon year; collaborating with the other 3.8 million New Zealanders is going to be essential; we will not achieve on our own.

Biosecurity at the border but also on farm will continue to require more investment, challenging the allocation of the research investment share.

Unifying NZ Inc. will require contribution from all, industry re-structure will play its part, many theorise that the sector will have, a large and a growing number of overseas owned corporate entities, a diminishing family farm sector and a large but generally irrelevant lifestyle component. The key elements of economies of scale, quality of governance, international and domestic connectivity will determine success.

The large corporate entities would dominate, producing the bulk of the milk, meat and wool exports and control the processing of these products. Livestock would be finished on crops designed to produce specific flavours in the meat; components in the milk etc; most agricultural research would be funded by the large corporate farms and will be done privately. Government and university research will focus on issues of national interest rather than farm production or management subjects.

This industry structure maybe sooner than we think, or could some time away, as family farm may evolve in ways we haven't considered, and remain a strong player; what is a given, is that the future of livestock production will depend on research, innovation, development and technical skills in a wide range of scientific fields, predominately engineering, plant breeding, genetics and animal nutrition.

How does this stack up in the world context; In 2013 the international grassland congress was held in Sydney, the opportunity to consider how NZ fits into the whole was one not to miss; across the globe individuals and governments are grappling with the need to increase food production by 70% for the nine billion people expected by 2050, and sustainable grasslands are raised as the pre-eminent driver to achieve this.

These versatile ecosystems, generate a diverse array of goods and services that are useful to humankind. It is widely recognised that grasslands support high quality livestock produce, chiefly from ruminants, and by maximising pastures as the primary diet, grasslands provide alternatives to concentrate feed. This reduces the inefficient use of arable land and increases the food that is directly available for human consumption from cereals. In addition to sustaining cultural values and the provision of food, grasslands provide critical ecosystems services that regulate, support and underpin the environment that we live in. These include climate regulation, water storage, nutrient cycling, erosion control, pollination and biodiversity. (1)FAO

Projections of crop production have focused almost entirely on cereals and food crops (including intensive animal feed crops). In contrast, the contribution of grasslands, permanent pastures, forage crops and crop residues are ignored. This is particularly surprising, given that grasslands and permanent pastures amount to 3.5 billion ha globally – more than twice the total area of croplands. (1)

One of international approaches has been to establish Global Farm Platforms in different regions of the globe which exemplify diverse livestock production systems. Strategies will be discussed of how to produce livestock in the most sustainable manner. This approach, it is claimed, will begin rewriting the rule book on global livestock production by matching the correct animal phenotype to the correct environment,

feeding systems and health plans to ensure sustainable and responsible production where yield is not the sole metric and maximum efficiency within the system is taken into account. (1) Big ticket research; with interesting commonality to messages already given at this conference.

Plot trials of promising germplasm are to be carried out on indigenous and exotic plant species from similar ecological regions for their potential as animal forages. The project will exemplify that sustainable intensification will only be achieved by maximising efficiency within the system. Precision farming, new plant varieties, use of organic amendments and bio-energy cropping. reducing and replace inorganic-N inputs with biologically fixed-N, increased use of self-selection grazing fodder rather than cut-and-carry suited fodders ,drought-tolerant forages. N-fixing legumes and crops to supply high quality protein and reduce reliance on economically and environmentally expensive concentrates.

The underlying principle is to measure the environmental impact of livestock production on water, air and soil on each platform with a view to maintaining natural biodiversity and ecosystem services. There is potential at each farm platform to examine how use of different plant species affects the provision of ecosystem functions and services, including carbon storage, nutrient cycling, resistance to invasive species, biodiversity maintenance, and prevention of soil erosion. Around the globe, smart use of supplements fed to animals is going to critical to gains, plant extracts can alter the rumen microbial population to use nitrogen and energy more efficiently. (1) *FAO report*

So what are sustainable grasslands in the New Zealand context and how is this different from the international context, and where does NZ Grassland Agriculture sit?

I think right at the top; the talk is about adapting systems to regional locations; what better place to study this in a country as diverse geographically as we are; but importantly, that upon closer inspection this report can be interpreted as winding back the clock; and that farming NZ style is seen, as no longer grassland farming but rather intensive agriculture; so we either wait for the facts to support these interpretations, or we pre-empt the need for facts, we need to be seen to be doing as well as talking, across the whole industry.

*Parsons & Rowarth*, defined sustainable production systems as needing to address five factors,

- maintaining and enhancing productivity
- Decreasing risks to production
- Protecting the potential of natural resources and prevent the degradation of soil and water quality
- Be economically viable
- Be socially acceptable

Future forages must use nutrients and water more effectively for production and provide measurable benefits to environmental quality, including higher rates of carbon (C) sequestration in grassland soils. Root mass and shape will create significant opportunities. Increased technologies must be combined with knowledge of ecology, agronomy, genetics and biotechnology to prevent intensification having a detrimental effect on the environment.

Plant possibilities revolve around capturing more energy from the sun with optimal nutrient availability and water; sustainable grazing management will come from optimising the net energy and Carbon capture by the system. Alternative plant types as temperatures warm and rainfall is less predictable, mean that new species will be of interest as will old species with new traits and associations with fungi, manipulations of plant hormones etc.

What are the forage needs of the pastoral sector, whether it be intensive or hill country, today, and has it changed?

In 1982, then NZGA President Jim Inglis; first having accepted we have a future, 'succumbed to the temptation to look at what we may achieve in the short to medium term (the reality for most of us), in terms of high and/or cheaper production', pointing to the fact that most of NZ's grazing land is un-cultivable pasture, winter spring rainfall is probably the most reliable element, and farm production will

be determined by forage quality and quantity during this period; the grazing management and plant species are key, whilst recognising longer term plant breeding and selection as vital.

*Moot* has called for an Ideal legume map to be developed across land and soil classes, with management packages developed to manage a range of legumes for persistence and livestock performance; research is needed to understand how legumes cope with climate change and environmental impact of increased legume content in pastures.

Whether it be breeding plants or adapting roots for improved drought tolerance, nutrient harvesting, adaptation to salinity issues, water logging or taking advantage of air verses soil temperature activated plants, opportunities in winter / early spring has step change written all over it.

Integrated farming systems, right plants for right places, farm systems development; and innovation driven by need to adopt technologies that make a difference to the bottom line. Little has changed between the messages of today compared with the need for differential treatments to optimise production messages of the 1980's, the researchers of the time had the vision but the technology was not quite there, in the messages of today, the difference is now we have the innovative technologies to make precision farming a reality; or do we; -only if they make a difference to the bottom line.

The latest iPhone, is only the latest model for a matter of months; when our agriculture technologies are developed, one major breakthrough means tools down and need to profit at the engineering level for a while. Look at direct drilling technologies; what has changed in last 5 years? No-one has created a light weight drill for hill country, the drill developed for the flat has a bigger tractor put on front and dragged around. IT never sleeps; I worry that we innovate by jumping up in ugly steps, rather than a continuum. How often does the iPhone produce a new model; compare that to the last time a new direct drill entered the market? Sure, agriculture volume sales won't create profits on their own but new technologies must continually enter the market place that deliver a return on their retail price.

To sum up; sustainability in all its forms and environmental perception will be attached to everything we do. Look at the international focus as well as our NZ Inc ideals. Science is a core building block of that agenda, not an after-thought or add-on. Our farmers long we have tried to implant our system on the land resource we have. Systems developed by previous farm ownership; our personal experiences elsewhere and our passion. How often does science get to be involved in the core farm system set up; the farm business consultant, the banker, the livestock agent, the fertiliser rep all get in the door before the agronomist or production consultant.

Finally, a message to our research, extension and industry and farming communities. Your advice/voice on its own won't make change, we must learn to trust one another. No-one can do everything on their own. There is a need for focus; a unified rural NZ Inc strategy would go a long way to uniting us and have us working as a team. Whilst markets need competitors, NZ Inc needs a team approach. Be assured the world is a big place, we have plenty of competitors out there; we do need competition to drive us long, however, two processors competing for our produce won't help NZ Inc.

Stealing market share from your competitor doesn't help rural NZ Inc. anywhere near as much as increasing (e.g. the re-grassing rates) across the whole. Step change is still possible; on farm research regularly identifies opportunities - such as renovation with the right species mix, right management and right animal class. It is up to researchers, extension and industry to work with farmers to implement step change across the whole system.

Step change involves ongoing adoption of research and technology; this requires bigger investment from our farmers that is true; (not insurmountable). But equally one good idea isn't enough; new versions with new features are constantly needed as are new ways of getting uptake.

Family must extend outside the NZGA conference and one final thought, we must think about where does NZGA pitch itself for 2025, we need the right mix of people, but the team to lead one vision is quite different from the team to lead the other extreme; just like we as a nation have to debate where we are headed, we as NZGA should do likewise to ensure our long term position.

## References

- (1) FAO report 2013 E-Conference on Sustainable Grasslands;  
<http://www.fao.org/nr/sustainability/grassland/en/>  
[http://www.fao.org/fileadmin/user\\_upload/nr/sustainability\\_pathways/](http://www.fao.org/fileadmin/user_upload/nr/sustainability_pathways/)
- Crofoot, A.N. 2011. *Proceedings of the New Zealand Grassland Association* 773: 5-7
- Crush, J. 2009. *Future Food Farming*: 38-39
- Edmeades, D.C.; Feyter, C.; O'Connor, M.B. 1984. *Proceedings of the New Zealand Grassland Association* 45: 98-106
- Emerson, A.; Rowarth, J.S. 2009. *Future Food Farming*. 124p
- Emerson, A.; Rowarth, J.S.; Scrimgeour, F. 2014. *New Zealand Agriculture An Economic Perspective*. 215p
- Eisler, M.C.; Lee, M.R.F. 2014. *Nature* 507: 32-34. <http://www.go.nature.com/8d9vjx>.
- Garden, J.P. 2013. *Proceedings of the New Zealand Grassland Association* 75: 11-14
- Gillingham, A.G. 1982 *Proceedings of the New Zealand grassland Association* 43: 161-170
- Gillingham, A.G.; Richardson, S.C.; Riley, J. 1984 *Proceedings of the New Zealand Grassland Association* 45: 92-97
- Inglis, J.A. 1983. *Proceedings of the New Zealand Grassland Association* 44, 1-3
- Lambert, M.G.; Luscombe, P.C.; Clark, D.A. 1982. *Proceedings of the New Zealand Grassland Association* 43: 153-160
- Lissaman, W.J.; Casey, M.; Rowarth, J.S. 2013. *Proceedings of the New Zealand Grassland Association* 75: 27-32
- Martin G. 2013 <http://www.ioa.uwa.edu.au/future-farm-2050>
- MacFarlane, M.J.; Sheath, G.W. *Proceedings of the New Zealand Grassland Association* 45: 140-150
- Moot, D.J. 2014 NZX Heartland Agronomy, August 2014:p69
- Rijswijk, K. 2013. *Proceedings of the New Zealand Grassland Association* 75: 221-22
- Rowarth, J.S. 2013. *Proceedings of the New Zealand Grassland Association* 75: 15-18
- Stafford K. 2009. *Future Food Farming*: 23-30
- 22<sup>nd</sup> International Grassland Congress 2013, Sydney, Australia: [www.internationalgrasslands.org](http://www.internationalgrasslands.org)