Report of travel to New Zealand to attend the 15th Australian Society of Agronomy Conference and visit two NZ Agresearch Institutes

M.R. Norton

Department of Primary Industries, c\- CSIRO Plant Industry, Canberra;
mark.norton@industry.nsw.gov.au

Purpose of travel

As Secretary of the Australian Society of Agronomy (ASA) it was essential that I attend the ASA biennial conference (held in Christchurch) to ensure the smooth running of this event. In addition, I delivered a conference paper and also visited the NZ Agresearch Institutes at Lincoln and Palmerston North to deliver a seminar about pasture grass drought survival and liaise with grassland science colleagues with a view to possible future research collaboration.

Itinerary

Overseas travel commenced on 14/11/2010 and finished on 24/11/2010. Between these dates I visited:

- Lincoln University to attend the conference of the ASA;
- Agresearch Lincoln for liaison with Drs Phil Rolston and Keith Widdup;
- Agresearch Palmerston North for liaison with Dr Zulfi Jahufer and other grassland scientists.

Benefits and outcomes of the travel

As the Secretary of the ASA my activities were focussed on ensuring the successful staging of the Society's conference. Through this conference, (Theme – 'Food security from sustainable agriculture') the media profile and importance of agronomy to the Australian economy, society and environment were raised. This is important given the Productivity Commission Review of Australian Rural Industry R&D, ongoing concerns about World Food Security and Murray–Darling Basin water use negotiations. My visits to Agresearch Institutes at Lincoln and Palmerston North were helpful to ensure the ongoing seed production of the most drought tolerant perennial pasture grass in Australasia, Kasbah cocksfoot, while establishing links with scientists who share my research interest in improving the drought resistance of pasture grasses.

Major activities

Activity 1

The 15th Australian Society of Agronomy Conference at Lincoln, New Zealand.

This conference was jointly staged by ASA, the NZ Grassland Association, the NZ Agronomy Society and the NZ Soil Science Society. This was the first time that the ASA Conference has been staged outside of Australia. Overall, there were 510 conference registrants from 14 different countries with 145 of these being Australian while 341 were from NZ. Of the other participants seven were from China, three each were from India and Tanzania, two each were from Brazil and Japan, while one each was from Chile, France, Indonesia, Ireland, South Korea, Russia and USA.

Professor Peter Cornish, a former scientist with NSW Agriculture, was awarded the most prestigious accolade of the ASA, the C.M. Donald Medal. Peter's subsequent Donald Oration extolled the benefits of undertaking farmer participatory research and his humility and enthusiasm inspired his listeners.

Conference plenary presentations covered a diverse range of topics including:

1. Can we feed the world in 2050? (presented by Dr Greg Edmeades, ex CIMMYT);
2. Agricultural productivity in Australia and New Zealand: trends, constraints and opportunities; (Dr Michael Robertson, CSIRO);
3. Promoting food security by supporting Agricultural R&D; (Prof. John Mullen, ex I&I NSW, now Charles Sturt University);

4. The Sustainable Use of Water Resources for Agriculture and Horticulture; (Prof. Brent Clothier, Plant & Food Research NZ);
5. Greenhouse gas fluxes in grazed pastures; (Dr Harry Clark, NZ Agricultural Greenhouse Gas Research Centre);
6. A postscript to "Peak P"– an agronomist's response to diminishing P reserves (Prof. Peter Cornish, ex NSW Agriculture, University of Western Sydney).

Topic areas of the concurrent sessions included: Climate Change–Future Farming; Simulation and Decision Support; Crop Production–soil water and WUE; Crop Production–N and P use; Pasture production–physiology and breeding; Crop Production–precison agriculture; Crop Production–development and herbicide management; Crop Production–nutrient management; Crop Production–high rainfall zone; Crop Production–physiology & breeding; Crop Production–dual-purpose crops; Managing nutrient loss and water quality; International crop–pasture systems; Forage crop production; Intercrops/cover and companion crops; Pasture production–IPM; Pasture production–spatial management; Dairy pasture production and management.

I presented a paper entitled, 'The effect of lime application to an acid soil on perennial grass establishment' in one of the above concurrent sessions.

The complete Conference proceedings can be viewed at: http://www.agronomy.org.au/proceedings/index.htm

Activity 2

On Friday 19 November, I visited the NZ Agresearch institute at Lincoln. While there I met with Drs Phil Rolston (pasture seed production researcher) and Keith Widdup (pasture grass breeder). I am collaborating with Dr Rolston to help in the improvement of seed production of the summer-dormant cocksfoot cultivar Kasbah. This is important for NSW because throughout the droughts of the 2000 decade Kasbah clearly had the best drought survival and production of any of the sown perennial grasses tested in NSW. Seed production of Kasbah is poor and to keep the cultivar in commerce research is needed to improve its seed production. Dr Rolston is essentially the only pastures researcher in Australasia with a primary focus on seed production. I first met Dr Keith Widdup in 2009 at the Summer Dormancy Workshop in the USA. At Lincoln, we visited one of his tall fescue breeding nurseries and discussed the techniques used for the measurement of summer dormancy (an important drought survival trait) expression in grasses.

On Monday and Tuesday 22 and 23 November, I visited the Palmerston North Institute of NZ Agresearch. This shares a campus with Massey University and other research/industrial organisations including Fonterra. There my visit was hosted and coordinated by Dr Zulfi Jahufer, the former NSW Agriculture white clover breeder (1989–1994) at Glen Innes. While at Palmerston North I met Drs Syd Easton (Centre Director), Derek Woodfield (breeder), David Hume (agronomist-endophyte specialist), Jimmy Hatier (pasture physiologist), Bruce Veit (biochemist), Alicia Scott (biotechnologist) & Warren Williams (legume breeder).

On the first day of my visit I gave a seminar attended by approximately 30 scientists entitled, 'Stories of summer survival and death – the case of cocksfoot'.

Although it is rare for summer droughts to actually kill pasture grasses in NZ there is a lot of interest in reducing productivity losses due to drought and this explains the high level of interest in my talk. I subsequently had good discussions with Jimmy Hatier and Warren Williams both of which could lead to some fruitful future collaborations. With Jimmy Hatier the potential collaboration could extend to a refinement of methods to measure summer dormancy in grasses, a field in which I have previously published. The discussions with Warren Williams focussed on his efforts to cross white clover with other more drought resistant Trifolium spp. with the objective of strengthening drought resistance in this species. Warren often uses annual Trifolium spp. as sources and he is confident that he understands the genetics of perenniality in this genus. I am

involved in the development of perennial wheat amphiploids but a key problem with these is their weak perenniality. It is possible that insights from Trifolium might help in strengthening perenniality in Triticum.

Activity 3

During the weekend (between 19/11/10 and 20/11/10) I visited the dairy farm of Mr J. O'Connor, Kokatahi, via Hokitika (West Coast, South Island). This high-rainfall (+2000 mm) zone is one of the cheapest places in the world to produce milk because feed production is pasture-based (white clover/ryegrass) and as the climate is mild it is possible for the animals to remain outside on the pasture all year. A high proportion of the local milk is exported in various milk powder forms produced by the local cooperatively-owned factory. Jerseys are the major diary cattle breed used there because of their high milk fat and ease of care (e.g. calving). A high level of mechanisation is used so that on Mr O'Connor's farm all day-to-day activities, including the milking of 200 cows (using a rotary dairy), were undertaken by one person.

General observations

Broadly speaking pastoral agriculture in NZ operates at a higher level of intensity than that occurring in most of Australia, probably because land prices are much higher. The mild temperate maritime climate with abundant rainfall or cheap irrigation means that farmers can economically apply high levels of input to their pastures. This greater level of investment seems to occur across the board, including education. Perennial ryegrass/white clover is the preferred pasture mix with white clover providing high quality feed and the majority of nitrogen (N) to the pasture. The N fixed by white clover is crucial to the low costs of production of NZ pastoral agriculture and this is currently threatened by the clover root weevil which is decimating many NZ pastures. Biocontrol measures to control the weevil have been undertaken and are described in the paper of Dr P. Gerard.

The research group at Agresearch Palmerston North constitutes one of the larger pastoral research agglomerations in the southern hemisphere. This group is dynamic and outward-looking with scientists of international origin (e.g. France, USA) or having been trained overseas. Moreover, the scientists who constitute this group cover a wide range of disciplines from the molecular to the macro level and we should be developing closer ties with them or we risk being left behind.

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