
The aim of the Graham Centre is to foster research collaboration between Charles Sturt University and NSW Department of Primary Industries to address the key problems limiting the productivity and profitability of the grains and livestock industries (mixed farming systems) of Southeast Australia. A key aspect of this is to improve the communication, cooperation and collaboration between growers, advisers and researchers in our region. The Graham Centre has an important leadership role in achieving this.

We are pleased to announce our success in obtaining a new project funded by the Department of Agriculture, Fisheries and Forestry (DAFF) under the Carbon Farming Futures – Action on the Ground Program entitled ‘Enabling landholders to adopt profitable and sustainable carbon cropping practices’. The project will focus on opportunities that improve stubble management to increase soil carbon and will improve our understanding of the processes that influence the changes in soil carbon over time, in different environments, using various management practices. The project lasts for three years and is a collaboration consortium with Central West Farming Systems, FarmLink Research Limited, Holbrook Landcare Network, Rice Research Australia Pty Ltd, Rural Management Strategies Pty Ltd, Southern Farming Systems, Murrumbidgee Catchment Management Authority and Murrumbidgee Landcare.

The project has three parts: a collaborative field experiment located at 14 sites from the central west New South Wales to Victoria; training in soil biology and soil carbon; and communication including an annual growers technical forum and field days at all the sites. We are currently planning the activities with our grower groups—so watch our website for more details during the coming months.

This edition of the Innovator has a wide range of interesting articles about new and ongoing research. We have also listed some new scientific publications that highlight the depth of our research. We are encouraging our members to develop strong international links to improve the quality of research and create new funding opportunities—enjoy this Issue.

Professor Deirdre Lemerle
Recognition for outstanding research in climate change

Recognition for an outstanding presentation of research findings on climate change was recently awarded to Graham Centre member and Principal Research Scientist, Dr De Li Liu. Each year Emerald Group Publishing Limited invites editorial teams from journals from all around the world to nominate what they believe is the journal’s most outstanding paper, along with three highly commended papers from the previous year.

Dr Liu’s paper ‘A GIS-based climate change adaptation strategy tool’, published in the International Journal of Climate Change Strategies and Management was selected as a Highly Commended Award Winner at the 2012 Emerald Literati Awards for Excellence.

“It is an honour to receive this award,” Dr Liu said.

“Our research team has developed a geographic information system (GIS) based risk assessment tool for visualising climate change impacts in agricultural industries and evaluating eventual adaptation strategies.”

“To demonstrate how the tool works, we included a case study. The case study showed that selecting suitable genotypes of wheat is a key adaptation strategy to mitigate the impacts of climate change on wheat cropping.” The award winning papers were selected after consultation amongst the journal’s editorial team, many of whom are eminent academics or managers.

The 2012 winning papers have been added to the Emerald website and are freely available on the website for three months. [www.emeraldinsight.com/index.htm]

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Developing links with China

Graham Centre Director Deirdre Lemerle recently visited China to scope, develop and build collaborative research and training with several high-ranking Chinese agricultural institutions at the institutional level. Some links are already established. The location of the institutions covered a broad range of climatic zones and associated agro-ecosystems, and the different organisations provided a diversity of potential collaborative opportunities.

The trip coincided with a delegation from Wagga Wagga to build the Sister City relationship with Kunming, and strengthen ties between the two cities.

China is currently investing significant amounts of money into agricultural RD&E, especially in programs with international linkages, to address the challenges of climate change, food security, biosecurity (pests and weeds), increasing costs of production inputs (labour, water, pesticides, fertilizer), a skills and capacity shortage, and a widening divide between the rural and metropolitan communities. The same challenges are facing Australian agriculture.

Wagga Wagga Delegation to Kunming, Yunnan Province 29 April - 3 May

The delegation was co-organised by Wagga Wagga and Kunming Councils as part of developing the Sister City relationship, and included the Mayor (Kerry Pascoe), General Manager (Phil Pinyon), CSU delegates (Adrian Lindner, Jim Hardie, John Atkinson, Deirdre Lemerle), a local aboriginal dance group, and several business representatives.

The delegation was invited to visit the new campus of the Kunming University (President Mr Chen Shibo, Vice President Ms Xiong Jing), which has great facilities and plans to have 20,000 students within the next few years. At this stage there is no post-graduate training but this is planned for the future. An Agricultural College forms part of the University, and food security, biosecurity and environmental protection are issues of concern. They are keen to collaborate in the development of their post-graduate programmes, staff and student exchanges, and they want help with language.

Deirdre also visited the Yunnan Agricultural University and Yunnan Academy of Agricultural Sciences and there are considerable opportunities for collaboration across the Graham Centre priorities.

International recognition: Dr De Li Liu (right) is pictured with Dr Jianhua Mo from NSW DPI Yanco. Dr Mo is a co-author on the award-winning paper.
Areas of common interest and research capacity were discussed, including grazing systems and animal production. The aim is to build on the links already developed by Dr Guangdi Li. Weed scientist Dr Dongsheng Tang is keen to collaborate and will build links with Professor Weston and Dr Hanwen Wu. The application by Professor Gurr to the Australia-China Science and Research Fund, if successful, will be the basis for extending the research collaboration.

At the Yunnan Academy of Agricultural Sciences - Agricultural Environment & Resources Institute (Director Zhu Hongye), her discussions focussed on crop biosecurity, and integrated pest and weed management.

Yangzhou University, Yangzhou, Jiangsu Province 3-6 May

Yangzhou is located in a highly productive agricultural region (dryland and irrigated) where both summer and winter crops are grown, as well as various livestock enterprises (usually in feedlots). Production systems are high input/output and more technologically advanced with large farms compared to many other areas in China.

There is potential for collaboration with the College of Agriculture and the College of Animal Science & Technology, and possibly with the College of Veterinary Medicine in the future. Collaboration should focus on more basic and strategic research using laboratory and controlled-environment facilities.

The College of Animal Science & Technology will visit Australia in August 2012 to develop plans further with our scientists. Areas of research are to focus on pastures, forage, animal nutrition, reproduction, and feed technology.

Joint research collaboration with the College of Agriculture will focus on adaptation to climate change for rice and canola - strategic and basic research on genetics x physiology, and some wheat, and annual legumes. Also, some tillage x fertiliser and farming systems research collaboration is possible. A joint workshop in 2013 where five to seven Chinese scientists will come to Wagga Wagga (February/March or September/October) is being planned.

Chinese Academy of Sciences (CAS), Northeast Institute of Geography and Agro-ecology (NIGAE), Changchun, Jilin Province 7-9 May

This region has a very short growing season with mixed farming systems, and in summer, maize, rice, melons, some wheat and rapeseed/canola, and pastures with livestock (sheep, poultry, goats). Areas of common interest include: crop sciences (wheat, rice, maize, canola) and soil interactions; pastures, animal science and fodder conservation; systems integration including reduced tillage, wetland ecology integration of natural ecosystems in agricultural landscapes; and remote sensing.

The staff and students are very keen to collaborate with us. They have funds from the Chinese Academy of Sciences, the NIGAE, and the provincial government, and would like their graduate students to spend three years in China and one year abroad. Our support would be in supervision, use of our facilities, co-authorship of papers, staff and student exchanges and joint conferences was discussed. They are keen for our staff and students to work in China.
China Agricultural University, West Campus, Beijing, Friday 11 May

While visiting the China Agricultural University Deirdre had the opportunity to meet with researchers and observe their research projects including rice competition; herbicides for maize; *Cenchrus pauciflorus* seedbank dynamics in pastures; glyphosate tolerance of 44 species; a natural herbicide with fungicidal properties; allelopathy in upland rice; and herbicide safeners for oats. Opportunities for collaboration are being developed by Dr Hanwen Wu who attended the International Weed Science Congress in China in June 2012. Links with Yunnan Agricultural University weed scientists are to be developed by Professor Leslie Weston.

Deirdre also met with the team of Professor Yingjun Zhang and Associate Professor Yuping Tong, who have a strong and long-standing collaboration with Professor David Kemp. Their main focus is grassland ecology (lucerne/ryegrass survival, temperature, salinity, drought) and systems. New collaboration should focus on animal (sheep, beef, pigs) nutrition, breeding and health. They are keen to extend their current collaboration to include more animal input from CSU.

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Providing a snapshot of current nutrient management practices

A Meat and Livestock Australia (MLA) survey will provide valuable information that will assist in guiding MLA’s future investment in pasture nutrient management research and extension programs - in particular the five-year $3.6 m Phosphorus Use Efficiency program.

The Graham Centre social science team is participating in a 12-month MLA project being led by Helen Burns. The project will benchmark current soil fertility and nutrient management practices by livestock producers in the grazing and mixed farming zones of southern Australia.

A major part of this project is a comprehensive survey that seeks input from livestock producers in the target areas, to provide a snapshot of the current nutrient management practices, the role of soil testing, the resources and information sources that producers use for their nutrient management decisions, and who influences these decisions.


The survey takes about 30 minutes to fill out with no in-depth questions that require producers to check files and records.

Participants can enter a draw for one of two $500 gift vouchers from a major national retailer.

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Visit to Papua New Guinea

Professor Deirdre Lemerle and Professor Gavin Ash visited Papua New Guinea in April. They attended meetings with the University of Technology (Unitech) at Lae. The outline of an AusAID Public Sector Linkage Program application was developed with Unitech Department of Agriculture staff; this includes capacity building and staff and student exchanges. The application will be submitted to AusAID in September, with Professor Ash to lead the program.

Deirdre and Gavin attended the 44th Unitech Graduation Ceremony — a very colourful event.

Pictured right is Master of Philosophy graduate, Sinafa Robby, with Associate Professor Gariba Danbara.

The photograph below shows traditional dancers in ceremonial dress preceding the academic procession. Photos: D Lemerle.
Annual Graham Centre Field Day
Friday, 5 September
Further information:
www.csu.edu.au/research/grahamcentre/field-site/

Industry Information Forum:
Crops, Rumps and Woolly Jumpers - what’s the balance?
Wednesday 22 August
Further information:

Agribusiness Field Day
Wednesday, 17 October
www.csu.edu.au/research/grahamcentre/field-site/

Annual Graham Centre Beef Field Day
Friday, 10 August
Register online
www.csu.edu/research/grahamcentre/field-day/beef.htm
Targeting sheep health - Annual Graham Centre Sheep Field Day

The recent wet seasons have seen producers deal with health issues they have not seen for a number of years, and the same is expected over the coming spring.

With this in mind, the 2012 Graham Centre Sheep Field Day focussed on health and grazing management.

The morning session saw industry experts from Charles Sturt University, NSW Department of Primary Industries, the National Sheep Health Monitoring Program - Animal Health Australia, and the Livestock Health and Pest Authority discuss issues of key relevance to producers and the industry.

The 105 producers who attended the day heard the latest information and research results about parasite control, on-farm worm tests, vaccinations, the Abattoir National Surveillance Monitoring project and what the data means for their markets and bottom line, plant toxicology and why different grazing systems have come and gone.

Producers also participated in afternoon workshops addressing grazing management and introducing stock onto their farm, considering the risks and health issues.

“Since their inception in 2009 the Graham Centre Beef and Sheep Field Days have increased in size and importance and are now a key event in the diary of livestock producers across the Riverina and surrounding regions,” event organiser Ms Toni Nugent said.

The field day is run in conjunction with the Hume Livestock Health and Pest Authority, with sponsorship also contributed from Meat and Livestock Australia, Novartis Animal Health, Coopers Animal Health, Ancare and Landmark.

“This key support from industry highlights the importance of events such as these in showcasing research that is topical and relevant to producers, advisors and other stakeholders in the livestock industry,” Ms Nugent explained.

“The Graham Centre Field Days provide an opportunity for producers to meet and network with industry experts to further build and expand their knowledge base. The many questions the producers raised during the day led to excellent interaction with the speakers”.

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Good attendance: It was a full house at the 2012 Sheep Field Day, with 105 producers from across the region in attendance.
Photo: T Nugent.

Lucky winner: Michelle Scott from Gundagai is presented with a lucky door prize by Rob O’Dwyer from Landmark Wagga. Photo: T Nugent.
Onwards with EverCrop

The EverCrop project in southern NSW is continuing to get more out of dryland pastures with the sowing of six new pasture experiments in late May.

The new experiments were sown across south-west NSW, from Mirrool in the north to Burrumbuttock in the south; from Eurongilly in the east to Yanco in the west; and also included sites near Lockhart and Wagga Wagga.

EverCrop aims to better understand the role that perennial pastures, such as lucerne and phalaris, can have in mixed farming systems when they are used in rotation with crops.

The trials represent a change in focus from improving pasture establishment under cover cropping to better establishment of mixed pastures.

The new experiments centre around the perennials lucerne and phalaris, planted in conjunction with annual legumes such as subclover, strand medic and biserrula.

The species are sown either together or separately in alternate rows to assess whether better pasture swards can be achieved simply by changing the placement of seed.

These experiments cover a range of environments allowing the pasture species and sowing arrangements to be evaluated under different conditions.

Mary-Anne Lattimore, district agronomist at Yanco, says there is a great need for further work on pasture establishment, particularly in drier environments.

“In regions where annual rainfall is low, it is a real challenge to establish other pasture species with lucerne due to competition for moisture. It’s important to get the balance and plant numbers right so that you end up with a good productive pasture sward”.

The site Mary-Anne coordinates is at Yanco Agricultural Institute, the driest of the six trial sites, receiving an average of 400 mm rainfall annually.

Bob Thompson, district agronomist at Temora believes that annual medics will prove to be a very useful companion to Lucerne in the western wheat-belt.

“Annual medics reduce the potential for colonisation by problem weeds like capeweed, Thistles and Spiny Emex, while having a high tolerance to herbicides commonly used in newly sown lucerne swards”.

“The barrel medics occupy areas where there are few lucerne plants, in particular the bare areas at gateways and around watering points”.

Additional trials at Temora will evaluate the application of herbicides to seedling lucerne, perennial grass and annual medics.

Perennial grass seedlings will be evaluated for their tolerance to herbicides used to control annual ryegrass, wild oats and barley grass.

“Local farmers have expressed concerns about the practicalities of adopting perennial grass based pastures due to the difficulty in controlling these grass weeds.”

Janet Walker, district agronomist at Albury says local farmers are particularly interested in looking at alternative options, particularly grasses, to put in a mix with lucerne.

“These may give better ground cover over the season and also reduce the livestock health issues associated with a pure Lucerne stand”.

The EverCrop trial, sown at Burrumbuttock, will provide data on how the dry matter production and persistence of these mixes compare to a pure lucerne stand.

“Many farmers have already sown lucerne in a mix with phalaris or fescue, so the EverCrop data should show if this practice is beneficial economically”.

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**EverCrop**: Future Farm Industries CRC Research Director John McGrath (centre left) and CEO Peter Zurzolo (centre right) recently visited CSU Wagga and the Graham Centre Field Site. They are pictured here with Graham Centre members and DPI Pasture Agronomist Richard Hayes and DPI Principal Research Scientist Guangdi Li. Photo: T Nugent.
The Lockhart site is just west of town on a well-drained, red clay soil and was sown in late May into good moisture.

Lockhart agronomist Lisa Castlemann believes pastures often contain a number of species, both sown and volunteer, some desirable and some weeds.

“Legumes contribute the Nitrogen that in turn drives the grass component of a pasture, however without the most appropriate grass species there is an increased risk of getting undesirable volunteers such as barley grass, brome grass, silver grass and annual ryegrass.”

“This trial provides us with research at a local level on both species selection and sowing method”

Geoff Casburn district livestock officer sheep, believes the research carried out at the Graham Centre for Agriculture Innovation Wagga Wagga in combination with the other sites in the region will provide a good opportunity for producers and the EverCrop team to discuss these new ideas and the broader issues associated with better pasture establishment.

The project commenced in 2008 and involves collaboration between NSW DPI, CSIRO, the Future Farm Industries CRC and GRDC, as well as other partners across southern Australia.

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Editor’s note: This article has been run with permission from NSW DPI Ag Today.

Drought tolerant wheat fact or fiction?

There is a rich diversity of drought avoidance adaptations in annual plants to enable completion of their lifecycle without running out of water.

One drought avoidance trait in wheat, involves plants being able to accumulate a high concentration of water soluble carbohydrates in their stems that can later contribute to yield. Under favourable conditions, this accumulation is most likely to peak shortly after flowering, when the developing grain does not yet exert a significant demand on the plant’s photosynthetic resources.

Selection for increased carbohydrate accumulation looks to be a promising strategy for reducing the impact of terminal drought on Australian wheat production.

As part of his PhD research, Ben Ovenden is looking at the physiological relationships and genetic components of this trait. He aims to characterise the physiology of carbohydrate accumulation and relate them to important genome regions in two large mapping populations.

Identification of genome regions in these populations will provide the next step towards producing high water soluble carbohydrate accumulating cultivars, which should translate to higher and more stable grain yield under water deficit conditions.

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The incidence of *Taenia ovis* in foxes in the Riverina area

Kate Mitchell is currently undertaking a Graham Centre Internship grant with Drs David Jenkins and Nigel Urwin, School of Animal and Veterinary Sciences, Charles Sturt University.

The project aims to determine whether foxes play a role in the spread of sheep measles (*Taenia ovis*).

Sheep measles is a parasitic infection arising from infection with the intermediate stage of a tapeworm of dogs. The parasites establish in the muscle of the sheep resulting in the condemnation of offal (hearts) and carcases, causing major losses to the Australian sheep meat industry.

Currently abattoirs are bearing the economic loss associated with the condemnation of infected offal and carcases which anecdotally, according to abattoirs, is considerable.

The parasite is transmitted to sheep through tapeworm eggs excreted onto pasture with faeces from tapeworm-infected dogs. During this project tapeworms present in the intestines of foxes shot in the Riverina as part of
ongoing pest management strategies will be examined macroscopically and conclusively identified using molecular methods (PCR) unavailable in earlier studies on tapeworms carried by foxes.

Currently the role of foxes in the transmission of *Tovis* is undetermined. Previous studies have not identified *Tovis* in foxes. T. ovul is present in foxes in these studies where identified using morphological criteria, based on the length of hooks on the head of the tapeworms. This is unreliable as an identification method because of considerable overlap in hook lengths between the various *Taenia* species occurring in dogs.

The results will give a clearer idea of the role foxes play in the transmission of *Tovis*. Results from this study will contribute valuable information to a large MLA-funded study on sheep measles being run by Dr Jenkins. Data generated in this project identifying the tapeworms present in foxes will be published in a stand-alone paper or included in publications with data generated in the larger MLA study.

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Wheat will survive

The first study of its kind to rate and measure grain yield from perennial wheat crops has returned a positive result for the future delivery of a hybrid variety to suit local farming systems.

NSW Department of Primary Industries (NSW DPI) research agronomist, Richard Hayes, said field trials in Central West NSW evaluated 176 varieties of wheat and wheat grass crosses for three consecutive years.

“This study has provided conclusive evidence that some of these hybrids can remain productive after sowing and allow the harvesting of multiple grain crops for at least three years, Mr Hayes said.

Perennial cereals promise longterm gain

Perennial crops offer farming options for variable landscapes and environments and could help address climate variability by putting extra flexibility into farming systems.

Depending on the season, a perennial crop could be grazed or harvested for grain or both. Crops which are in the ground for several years can take advantage of every drop of rain which will help increase soil moisture use, reduce soil acidification and salinisation and have the potential to reduce erosion.

In lower rainfall areas, particularly in drought years, perennial cereals may allow farmers to vary their inputs, reduce costs and deliver environmental benefits.

NSW DPI trials have found that most of the successful perennial lines were highly resistant to leaf rust, stripe rust, stem rust and wheat streak mosaic virus.

That’s good news, not just for the productivity and survival of perennial wheat, but in ensuring that there are no negative disease impacts on conventional cereal crops.

“Amongst the perennial germplasm we uncovered desirable agronomic, diseases resistance and grain quality attributes which can potentially be used to boost qualities of existing material and bring perennial wheat closer to a commercial reality.

“We still have a way to go in developing varieties which farmers will be able to use with success, but the initial study has shown that 107 of the selections had the capacity for post-harvest regrowth.

“From a global perspective, there is a lot of interest as it’s the first trial outside the former Soviet Union to quantify the grain yield of perennial wheat hybrids.

“It is the first study to report the relative regrowth and grain characteristics of recently developed germplasm from The Land Institute and Washington State University in the US.

“The fact that three varieties out of 71 planted in 2008 were able to persist and produce grain every year for the last three years is a biologically significant result.

“NSW DPI research trials have now generated evidence which proves that a perennial wheat/wheatgrass hybrid is a feasible outcome.”

Perennial wheat is predicted have its first commercial application as a dual-use forage and feed grain crop.

Mr Hayes said it is expected that genetic gain will eventually deliver higher quality grain and yields comparable with conventional annual wheat crops.

“The development of a wheat-based perennial cereal from the present experimental germplasm is a long-term venture as we have to allow for the necessary breeding and evaluation in the target environments.

“Based on the current study the prospects for success are positive and there are likely to be substantial positive spin-offs for conventional annual cereal crops if the development of perennial crops were to continue.

“A defining characteristic of the germplasm collection in this study was the high level of variability in almost all the measured characteristics.

“Access to this variability could deliver benefits to conventional wheat breeding programs,
New projects

Financial Impact of Ovine Johne’s disease on the Processing Sector

Funding body: MLA
Project Leader: Dr Marta Hernandez-Jover (CSU)
Research Team: Dr Ian Links (NSW DPI), Associate Professor Gavin Ramsay (CSU) and Dr Tom Nordblom (NSW DPI), Mr Bruce Jackson and Mrs Rowena Bell (DPIPWE Tasmania, Tasmania Quality Meats)

Project Aim: To estimate the financial loss as a result of OJD, to producers and processors in Tasmania in sheep (>=2 years old) identified during the slaughter process, and to investigate potential associations between the severity of the carcass lesions with estimated OJD on-farm status, carcase quality and economic cost of the disease.

Exposure Assessment for *Mycobacterium avium* subspecies paratuberculosis

Funding body: MLA
Principal Investigator: Dr Marta Hernandez-Jover (CSU)
Research Team: Dr Jenny-Ann Toribio, Dr Navneet Dhand (University of Sydney) and Dr Jonathan Webber (JJ Webber Consulting)

Project Aim: To assess the likelihood of exposure of humans to MAP through the consumption of red meat and to identify mitigation strategies that could be applied to the management of red meat production and consumption to reduce this probability of exposure. This assessment will allow addressing potential commercial/trade concerns.

Perennial wheat breeding: NSW DPI researchers, Richard Hayes and Matt Newell, check out the progress of the perennial wheat breeding program at Cowra. The breeding program is using plants selected from a three-year field trial to identify varieties that offer the greatest potential to deliver commercial perennial wheat crops for local farming systems. Photo: AgToday.

providing new agronomic characters, such as grain quality and sources of new disease resistance.

“Clearly, some challenges lay ahead but the prospects are encouraging in this emerging field of research.”

On-farm trials were conducted at the Cowra Agricultural Research and Advisory Station and at Woodstock.

Ongoing research at Cowra is building on the three-year trial results to breed a perennial wheat and wheat grass hybrid.

The NSW DPI perennial wheat trials were funded by the Future Farm Industries Cooperative Research Centre as part of a collaborative project with Charles Sturt University, through Wagga Wagga-based EH Graham Centre for Agricultural Innovation, and CSIRO.

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International visitors: During May a delegation from the Association of South East Asian Nations (ASEAN) Member states toured Charles Sturt University and met with Graham Centre researchers and PhD students. The ‘meet and greet’ tour of facilities provided an opportunity for the delegation to gain a better understanding of agricultural, environmental, education and cultural perspectives. Photo: T Nugent.

International visitors: During May a delegation from the Association of South East Asian Nations (ASEAN) Member states toured Charles Sturt University and met with Graham Centre researchers and PhD students. The ‘meet and greet’ tour of facilities provided an opportunity for the delegation to gain a better understanding of agricultural, environmental, education and cultural perspectives. Photo: T Nugent.
Improving IWM practice in the Southern Region - Emerging weed issues
Funding body: GRDC
Project Leader: Professor Leslie Weston (CSU)
Research Team: Dr Rex Stanton, Dr Hanwen Wu (NSW DPI), Shane Hildebrand (CSU) and Professor Deirdre Lemerle.
Project Aim: This project will provide a better understanding of the biology of key emerging weed species and practical options for their management in crop and summer fallows in the Southern region.

Research into options for reducing nitrous oxide emissions from the NSW dryland grains industry
Funding body: DAFF
Project Leader: Dr Graeme Schwenke (NSW DPI, Tamworth) and Dr Guangdi Li (NSW DPI, Wagga)
Research Team: Dr De Li Lu (NSW DPI, Wagga)

Carbon farming for sheep-wheat farmers
Funding body: DAFF
Project Leader: Dr Andrew Moore (CSIRO)
Research Team: Dr Guangdi Li and Dr Mark Conyers (NSW DPI)

Perennial wheat feasibility study
Funding body: FFI CRC
Project Leader: Richard Hayes (NSW DPI)
Research Team: Dr Phil Larkin (CSIRO), Matt Newell (NSW DPI), Professor Len Wade (CSU)
Project Aim: The project will assess this germplasm in the field for perenniality and summer dormancy. Promising lines will also be evaluated for resistances to rusts, BYDV and WSMV.

Improved perennial grass cultivars
Funding body: FFI CRC
Project Leader: Dr Guangdi Li (NSW DPI)
Research Team: Graeme Sandral (NSW DPI)
Project Aim: New cultivars of cocksfoot, tall fescue and phalaris need to be evaluated more widely in the target area to provide alternatives to lucerne in phase farming systems.

Feedbase management of Lotus
Funding body: FFI CRC
Project Leader: Graeme Sandral (NSW DPI)
Research Team: Richard Hayes (NSW DPI) and Dr Guangdi Li (NSW DPI)
Project Aim: To introduce a new and more profitable feedbase system to livestock producers in the 600-850 mm zone on acid waterlogged soils. The new feedbase is centred on the use of Lotus corniculatus in perennial grass based pastures.

Phosphorus efficient pastures
Funding body: MLA and AWI
Project Leader: Graeme Sandral (NSW DPI)
Research Team: Richard Hayes (NSW DPI) and Dr Guangdi Li (NSW DPI)
Project Aim: To reduce by 30% the phosphorus requirements of pasture systems.

Enabling landholders to adopt profitable and sustainable carbon cropping practices
Funding body: DAFF
Project Leader: Professor Deirdre Lemerle (Graham Centre)
Research Team: Dr Iain Hume (NSW DPI), Toni Nugent (Graham Centre) and a large number of other CSU and NSW DPI scientists
Other research contributors: Central West Farming Systems, FarmLink Research Limited, Holbrook Landcare Network,
Rice Research Australia Pty Ltd, Rural Management Strategies Pty Ltd, Southern Farming Systems, Murrumbidgee Catchment Management Authority and Murrumbidgee Landcare Inc.

Project Aim: To test the relationship between different stubble/nutrient practices (burnt to fully incorporated with nutrients) and soil carbon and GHG emissions. Coordinated trails conducted on-farm by farmer groups will provide information and experience in stubble techniques and the benefits/costs of stubble for carbon farming.

Graham Centre honours board


David Jenkins

Position: Senior Research Fellow

Organisation: School of Animal and Veterinary Science, CSU

Career Brief

Following graduation from the University of London with a Bachelor Degree in botany and zoology and a Masters Degree in immunology, I travelled to Indonesia to join an Australian Development Assistance Bureau (now AusAid) project to work on hookworm infection in humans. I remained working in Indonesia, for two and a half years, before heading to the University of Melbourne Veterinary Clinical Centre (VCC) in Werribee, Victoria to begin a PhD. The topic of investigation was the immune response of dogs to tapeworm infections, with a view to developing a diagnostic blood test to detect dogs infected with hydatid tapeworms (Echinococcus granulosus). The outcome of my PhD studies was so promising that I was recruited to join a hydatid control program run through the African Medical and Research Foundation, Nairobi, Kenya and based in the Turkana district of north-west Kenya, adjacent to Uganda and Sudan. I worked there for two years field testing my diagnostic test for dogs. Under laboratory conditions the test had appeared really useful, but under field conditions in Turkana, where one of the dog’s main dietary items was human faeces, the test was less than useful because the dog’s blood contained cross-reacting antibodies generated by parasites in the human faeces and other parasites naturally infecting the local dogs.

I moved from Kenya to Canberra, something of a culture shock! I remained in Canberra for the next 18 years helping run a hydatid control campaign and undertaking field research into the role of wildlife in the transmission of hydatid disease. Four years ago I moved my research laboratory to the School of Animal and Veterinary Sciences at CSU. I am still working on the transmission of tapeworms infecting dogs with intermediate life cycle stages in sheep, but the emphasis has changed, and I now work mainly on sheep measles (Taenia ovis).

Research Activities

On moving to CSU I was funded by Novartis Animal Health to undertake a study into the intestinal worms of rural and peri-rural dogs. Currently I am funded by Meat and Livestock Australia (MLA) to re-visit the transmission of sheep measles. The sheep measles study is based in Tasmania, NSW and southern WA and will include determining the financial impact of the parasite on the sheep meat industry, determining on-farm risk factors associated with transmission and the role of wild carnivores (foxes and wild dogs) in transmission.

In addition, I am working closely with colleagues from the University of Melbourne VCC, undertaking studies (funded by the National Health and Research Council) on a recombinant vaccine that protects sheep against hydatid disease.

Teaching Activities

I teach parasitology to Animal Science and Veterinary students.

Professional Links

- Adjunct Associate Professor, School of Medicine, Australian National University
- Visiting Professor, Global Scholars Program, School of Medicine, St George’s University, Grenada
- Member and Chair of the International Organisation for Animal Health’s Ad Hoc Group on Zoonotic Parasites

A typical day for me includes…Dealing with emails and phone calls, reading journal articles, doing journal reviews, reading theses, writing papers, doing chores in my laboratory, preparing lectures, attending meetings…all the usual stuff.

My main project at the moment is…The MLA sheep measles study.

My favourite part of my job is…Travelling, meeting people and working in amazing environments, both in Australia and around the world.

When I am not in the office I like…to eat good food, drink good wine and go on holidays with my wife; fishing; renovating my house in Ganmain; gardening; reading trashy “who done it?” novels, watching rugby union games (Brumbies and Wallabies).

When I am driving I like to listen to…I like music very much. I have very catholic tastes in music and enjoy a wide range of styles and types. However, given the opportunity, I like to listen to Beethoven, Rolling Stones, Dire Straits, JJ Cale, and several of others…really loud! Only possible in the car!!
Graeme Sandral

Position: Pasture Agronomist and Ecologist - Livestock and Pasture Systems

Organisation: NSW Department of Primary Industries

Career Brief
I started in research at Condobolin in 1987 where I was part of a small team examining the development of new species and varieties of annual medic. I moved to Wagga Wagga in 1989 and undertook research examining the genetic differentiation of pasture legumes to broadleaf herbicides and later moved onto splitting my time between genetic improvement of pasture legumes species and management of pasture systems in cropping and permanent pasture settings.

Much of the genetic improvement research I have been involved with has focused on the domestication of wild species and this work has taken me to some very interesting parts of the world on plant collecting missions and some interesting situations like the time we got locked up in Kazakhstan. Clearly a career highlight!

Research Activities
Current research activities/projects are focused on:

1. Improving the phosphorus efficiency of pasture legumes. The aim of this research is to reduce the cost of livestock production by reducing the input requirements for phosphorus that accounts for 15 to 25% of on-farm costs in high rainfall livestock only systems.

2. Benchmarking the performance of recently developed varieties of Lotus corniculatus. The varieties of Lotus corniculatus I produced are derived from wild collections in north Africa and southern Europe. They have been crossed with elite breeding lines from INIA Uruguay in a recurrent selection program with the aim of producing a perennial legume more tolerant of drought conditions than White clover and more tolerant of acid soils than Lucerne.

3. Determining the tolerance and production potential of pasture species and varieties when exposed to aluminium and/or manganese stress. Acid soils can be somewhat of a hidden cost to many producers by reducing the carrying capacity of their land. The solutions include liming or using species that are more productive on acid soils. This research effort is aimed at providing farmers with much clearer choices on species and varieties that can be used on acid soils and in doing so will improve livestock carrying capacity.

Teaching Activities
I have had limited exposure to teaching as a guest lecturing at University of Western Australia on Farming Systems and Pasture Plant Ecology and Agronomy.

Professional Links
- Grassland Society of NSW

A typical day for me includes ...
I like to get in early, plan my day, clear the emails and then get into the planned work. The planned work varies and could mean taking measurements on 1 of our 16 on-farm experiments or writing scientific papers or reports of various kinds.

My favourite part of my job is ...
This is difficult choice as I enjoy many aspects of my job, but some of the more satisfying are bringing people together to work on a common research problem, and statistical analysis of research results as it’s at this point you finally get to establish what the real discoveries are from your research efforts.

When I am not in the office I like ...
(i) cooking for friends, (ii) having coffee with friends (iii) trading shares using programmed/coded systems, (iv) going to Melbourne often to express my dissatisfaction at the umpiring at the MCG or Etihad Stadiums, (v) playing touch footy on a Monday night with mates and Masters Aussie Rules on a weekend and (vi) fishing for Marlin off Bermagui.

When I am driving I like to listen to ...
Dire Straits, Eric Clapton, Chris Isaac, Fleetwood Mac, Nickelback, Coldplay, U2, Birds of Tokyo, Laura Marling, James Blunt, Don Iver, Stornoway and Brooke Fraser.

Favourite movies ...
Gran Torino, J Edgar, Red Dog, Master and Commander, The Fighter, Inside Job and The King’s Speech.
## EVENTS CALENDAR 2012

<table>
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<th>Date</th>
<th>What</th>
<th>Where</th>
<th>More information</th>
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| 19 Jul | Graham Centre Seminar - Diet may affect the sex of lambs...the role of high omega-3 diets on sex ratio in sheep. | 3.30-4.30 pm NSW DPI Conference Room Wagga Wagga Agricultural Institute | Leslie Weston  
E: leweston@csu.edu.au |
| 24-26 Jul | NSW Grasslands Conference  | Convention Centre CSU, Wagga Wagga | Nathan Ferguson  
E: nathan.ferguson@dpi.nsw.gov.au |
| 8 Aug | FarmLink Ag Tech Show  | Temora, NSW  
www.farmlink.com.au | |
| 9 Aug | Graham Centre Seminar - Sustainable Ecomaterials: from degradable agricultural films to value-added biobased products | 3.30-4.30 pm NSW DPI Conference Room Wagga Wagga Agricultural Institute | Leslie Weston  
E: leweston@csu.edu.au |
| 10 Aug | Annual Graham Centre Beef Field Day  | Convention Centre CSU, Wagga Wagga  
www.sheepconnectnsw.com.au | Toni Nugent  
E: tnugent@csu.edu.au |
www.sheepconnectnsw.com.au | |
| 23 Aug | Graham Centre Seminar - Rhizosphere signalling and the role of flavonoids in root microbe symbioses and root development | 3.30-4.30 pm NSW DPI Conference Room Wagga Wagga Agricultural Institute | Leslie Weston  
E: leweston@csu.edu.au |
| 5 Sept | Annual Graham Centre Field Day  | Graham Centre Field Site Cnr Coolamon & Prices Road  
www.sheepconnectnsw.com.au | Toni Nugent  
E: tnugent@csu.edu.au |
| 18-20 Sept | Henty Machinery Field Days  | Henty, NSW  
www.hmfld.com.au | |
| 10 Oct | Hart Bros Seeds Field Day  | Hart Bros Seeds, Junee  
www.hartbrosseeds.com.au | |
| 17 Oct | Graham Centre Agribusiness Field Day  | Graham Centre Field Site Cnr Coolamon & Prices Road  
www.sheepconnectnsw.com.au | Toni Nugent  
E: tnugent@csu.edu.au |
| 2013 15-19 Sept | 22nd International Grassland Congress/IGC2013 | Sydney  
www.igc2013.com | |

### Spring Edition of The Innovator

The Spring Edition of The Innovator will be available mid October 2012. Submission of articles for this edition closes on **Friday, 21 September 2012**. Please email articles to Toni Nugent or Sharon Kiss.

### CONTACTS

**Secretariat**  
Who’s who and how to contact us

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