In Australia, we produce enough food to feed our population. But is this sustainable and can the quality of food be improved? There is growing community demand for locally produced, high quality, clean, green and healthy food. The Murray Darling Basin produces 40% of our food and is referred to as the food bowl of Australia. Can this be maintained with the increasing costs of resources, including water, and the declining political support for rural industries and communities?

Food security means having enough food to enable a healthy diet. Australia has food security, but some of our neighbours in south-east Asia do not. We do not have the resources in Australia to feed our neighbours. But the Australian government does have the capacity to help, and this is an important aspect of regional security. Our researchers are currently working in countries like Laos, Cambodia and Vietnam with local scientists to support them in adopting technologies to produce their own food more efficiently and sustainably.

Australian food productivity (food produced per unit area of land) has consistently increased since the late 1800s and the early days of agricultural production. This is due to improvements in crop and animal genotypes and better management techniques, underpinned by strong investment in research. During the last 30 years ‘conservation agriculture’ has made enormous progress in protecting the environment and our natural resource base.

Contrary to popular belief, sustainable production levels have not plateaued and there is still considerable potential to maintain and increase this upward trend. Improvements will be based on new smart technologies and genotypes, better collaboration and systems integration.

There is enormous potential to improve the human health benefits of the food we produce, such as anti-cancer properties and nutritional attributes. Enhanced food quality is a real opportunity to value-add to the supply chain for Australian food producers, especially with the emerging markets of India and China and the growth of their middle classes.

Security of Australian food for Australian consumption requires a much stronger communication between producers and consumers and it is our job to make sure this happens. Australians must recognise the need to pay the true cost of producing high quality food to ensure food security now and in the future.

Professor Deirdre Lemerle
How could an early researcher benefit from three weeks at IRRI?

In his application to take part in a three-week course at the International Rice Research Institute, David Gale, a first year PhD student at Charles Sturt University Wagga, wrote that participation in the course would ‘aid [his] professional development broadly, in line with a desire to embark on a career improving global food security by undertaking agricultural research projects at a community level in developing countries.’

He knew what he wanted to get out of the experience, but David’s PhD project is investigating ‘the potential of compost to ameliorate metal toxicities and increase phosphorous availability in Vietnamese agricultural production systems’, so at one level attending a rice course in The Philippines was a perfect fit. What he was able to gain from the experience, however, was far more than just a tan line above the layer of mud on his legs.

David said the training he had the opportunity to engage in, ‘exceeded expectations because it covered such a diverse range of topics, engaged participants from a wide range of disciplines and countries, and focused on providing opportunities for participants to get their hands dirty.’

Where he entered the course expecting to just gain knowledge about rice breeding and production, David says he ‘came out understanding rice breeding and production because someone didn’t just talk about it, they let me try it.’

Whether it be transplanting rice by hand, selecting individual plants for use as parents in breeding a new line, emasculating flowers and artificially pollinating, or interviewing farmers about their production decisions and practices, David says he now has an in-depth understanding of how plant research, and extension, is undertaken to develop and distribute food crop varieties specific for those who need them most, through actually undertaking the involved steps.

On returning to Australia David reported that he considered the up-skilling he received in technical aspects of rice production as being important to his professional development, but that one of the most significant outcomes was that his participation in this course has given him a renewed drive to work in the field of international agricultural development research.

Contact: Mr David Gale
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Editors Note: David is presently working on the Australian component of his PhD project, in Wagga, looking at the effects of compost application to acid sulphate soils under the controlled conditions of the laboratory and glasshouse. In June 2014 David will head to Can Tho in Vietnam where he will undertake his field trials over the course of 12 months, looking at the benefits of compost application over a number of cropping seasons. Funding Source: The Crawford Fund.

Farewell to Ray Cowley

Ray has left the NSW Department of Primary Industries after almost 18 years to take up the position of National Canola Breeder with Pioneer Hybrid Australia, based in Wagga Wagga, NSW. Ray started with the Department in 1994 and worked in a number of areas including soil microbiology, barley chemistry, tissue culture in canola, acid soils (hydroponic screening), lupins and canola breeding. Ray did his undergraduate and completed his PhD at CSU, ‘Identification of genetic resistance to Diaporthe toxica in Lupinus albus’ in 2012. Best wishes in your new position Ray. Ray Cowley, left, is pictured with Dr David Luckett. Photo: Deirdre Lemerle.
Impact of crop cultivar and cultural practices on summer annual weed infestation

Certain crop species and cultivars can suppress weeds effectively at standard establishment rates, either due to their ability to compete effectively with weeds for valuable resources, or due to potential allelopathic effects associated with the crop or remaining residues following harvest.

Rotational crops noted for their weed suppressive effects are being evaluated at the Graham Centre field site, together with key cultural practices, including herbicide application, stubble burning, and tillage for their impacts on subsequent weed growth and weed seed viability on the soil surface or in the upper layer of soil under cultivation.

Treatments include various crops and cultivars established in replicated plots. Crop and weed biomass per plot are being assessed by visual ratings, stand counts and biomass collection. Weeds being evaluated include annual ryegrass (*Lolium rigidum*), fleabane (*Conyza spp.*), witchgrass (*Panicum capillare*), windmill grass (*Chloris truncata*), heliotrope (*Heliotropium europaeum*) and other weeds of significance.

The trial plots were sown to different crops last year and have been sown to barley (cv. Hindmarsh) this year to allow monitoring for carryover effects the following season. Adjacent to this area, the trial has been repeated this season.

Contact: Professor Leslie Weston
T: 02 6933 2429, E: leweston@csu.edu.au

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**Public debate - How can we best secure Australia’s future food security?**

14 August 2013, 6 pm
CD Blake Lecture Theatre, Charles Sturt University, Elizabeth Mitchell Drive, Tharwa, NSW

Food security is an issue of critical significance to Australia’s future. In the lead up to the 2013 Federal election the Institute for Land, Water and Society has arranged for the public to hear the views on this important issue.

The panel for the debate includes: The Hon. Sussan Ley MP, Federal Member for Farrer; Mr Gavin Hickey (Country Labor Party candidate for Farrer); Ms Jenny O’Connor (The Australian Greens candidate for Indi); and Ms Cathy McGowan, (Independent candidate for Indi).

Three CSU academics will address the issue from different perspectives.

Production: Professor Deirdre Lemerle, Director Graham Centre for Agricultural Innovation, Professor of Agricultural Innovation.

Health: Associate Professor Susan McAlpin, CSU School of Dentistry and Health Sciences.

Environmental/Social: Professor Allan Curtis, Professor of Integrated Environmental Management.

Sheep forum addresses efficiency of production

The Graham Centre's Sheep forum was held at Charles Sturt University on the 28 June, with over 100 people attending. The focus of this year’s forum was Efficiency of Production. Experts from Charles Sturt University, NSW Department of Primary Industries, Livestock Health and Pest Authority, Sheep CRC and industry addressed the topics of drench and insecticide resistance, including the economics and how it affects productivity and profitability.

Producers also saw how the region fairs with the results from a recent Hume LHPA drench resistance survey presented. Grazing late pregnant and lambing ewes on dual purpose crops, the importance of flexibility in sheep systems for risk management, fibre chop length and acidosis in sheep, and successful pasture establishment in cropping rotations were also on the agenda.

Visit the Centre’s website http://www.csu.edu.au/research/grahamcentre/field-day/sheep.htm to view presentations from the day. Copies of the proceedings are also available by contacting the Centre’s Public Relations Manager Toni Nugent.

Contact: Ms Toni Nugent
T: 02 6933 4402, E: tnugent@csu.edu.au

Regular monitoring: The most expensive drench is the one that doesn’t work. The second most expensive drench is the one that isn’t needed. Doing faecal egg counts to ensure worm burdens warrant treatment before reaching for the drench gun is vitally important. Photo: Toni Nugent.

Monitor worm burdens: Control costs such as faecal egg worm count tests make up only a small proportion of the total potential cost and can significantly reduce the impact of sheep worms on livestock health and productivity. Photo: Toni Nugent.
Students get a taste of science and agriculture

More than 150 high school students from across the Riverina gained an insight into the work of agricultural and veterinary sciences when they visited Charles Sturt University and NSW Department of Primary Industries on 14 June.

The Graham Centre’s Science and Agriculture Enrichment Day gives agriculture and primary industries students the opportunity to participate in work done by agricultural and animal scientists, and to learn more about career opportunities.

Students participated in workshops on cattle management, photosynthesis, proteins and effects on pH changes, parasites and a food sensory panel.

Contact: Ms Toni Nugent
T: 02 6933 4402, E: tnugent@csu.edu.au

New hub for Graham Centre

The Graham Centre’s new offices were officially opened by Mr Michael McCormack MP, Federal Member for Riverina on 22 May. This marks the beginning of a new exciting era for the Centre, with a place for DPI and CSU members and students, to meet, discuss and plan research activities.

The key role of the Centre is to foster collaboration and agricultural innovation that underpins the viability and profitability of our agricultural systems.

The Centre’s second Monograph ‘Water resource protection in Australia: Water quality and quantity as a feature of agricultural land management systems’ was also launched at the ceremony. Written by Professor Kath Bowmer, this is a major review of the subject area Professor Bowmer has worked on for many years.

Contact: Ms Kathryn Pitkin, Deputy Chancellor CSU, Mr Michael McCormack MP, Federal Member for Riverina and Dr Richard Sheldrake, Director General NSW DPI participated in the opening of the new Graham Centre offices. Photo: Sharon Kiss.
**Meat judging stars**

Student meat judges from Charles Sturt University (CSU) have claimed the title of the highest scoring Australian team at the Australian Intercollegiate Meat Judging Competition held in Wagga Wagga in July.

During the two-day competition 130 university students from Australia, Japan, United States, Pakistan and South Korea judged lamb, pork and beef carcasses along with cuts of meat. The team of 15 students from CSU’s School of Animal and Veterinary Science was beaten by one point by an international team from Kansas State University.

“This magnificent result is due to the commitment and hard work of the students and their coaches who have spent many early mornings training at the abattoir,” said CSU Professor of Animal Production and Graham Centre member Peter Wynn.

Four members of the CSU team, Ms Ebony Mull, Ms Laura Kemmis, Ms Tammy Heir and Ms Mikhalla Middleton have also been selected in the 10 member national training squad, and have the chance to earn a place in the Australian team to tour the United States in 2014.

The CSU Meat Judging team is supported by Rennylea Angus Stud and Wirruna Poll Herefords, Holbrook, Teys Australia, Junee Abattoir and Knight’s Meats and Deli, Wagga.

The Pakistan team was sponsored by ACIAR to assist in the development of the fledgling Pakistani meat industry. The group visited the Teys and Junee abattoirs and Jindalee feedlot, as well as Wirruna Poll Hereford stud owned by Ian Locke, and the commercial beef enterprise of Bruce Allworth. They also received instruction on animal handling from Dr Rebecca Doyle and Michael Campbell, School of Animal and Veterinary Science.

They were joined by a team of senior Indonesian beef cattle feedlot managers and scientists, who were involved with the same program. The aim of their visit was to discuss the possibility of setting up their own Intercollegiate Meat Judging organisation to train young undergraduates in Veterinary and Agricultural science in the areas of meat science and production. Members of the Graham Centre will play a major role in this program over the coming years.

Meat and Livestock Australia sponsored a team of both staff and students from Korean universities to undertake the same training, while our more frequent visitors from Japanese universities were similarly eager to learn about the Australian industry, which is very different to how beef is produced in Japan.

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**Poverty alleviation and grassland rehabilitation**

In early June, Professor David Kemp, Graham Centre and Charles Sturt University, and Drs Nick Austin and Peter Horne, ACIAR visited Mongolia at the invitation of the Mongolian Ambassador to Australia.

Mongolia is still a poor developing country that is growing fast as a result of mining developments. The poorest people in Mongolia are those involved in livestock production from the extensive grasslands.

There are many problems in Mongolia that have some similarities with the grassland issues of northern and western China where Professor Kemp and colleagues have been working for the past decade, and in Central Asia. Poverty alleviation and grassland rehabilitation are the common aims of much of the work being done there.

A review will be done of possible areas of future work by ACIAR in Mongolia.

Contact: Professor David Kemp  
T: 02 6365 7526  E:  dkemp@csu.edu.au
Olives help slow the ageing process

Ageing is a universal truth for every living being. One of the best examples of age specific diseases is Alzheimer’s disease (AD), where there is severe degeneration of brain cells, affecting the memory system.

Australia is facing a big challenge, with statistics showing one in every 10 people over the age of 65 years is affected by Alzheimer’s disease.

The Olive tree is one of the oldest cultivated trees. Research by PhD student Syed Haris Omar has found that olive extracts from the fruit and leaves shows potent antioxidant and enzyme inhibiting activities, which are responsible for the progression of Alzheimer’s disease.

Results from Haris’ research suggest the phenolic compounds from the plants are able to reduce the progression of Alzheimer’s disease, while improving memory and providing symptomatic relief.

Olives are one of the major ingredients in the Mediterranean diet and the health benefits are well documented. These new studies strengthen the evidence. The antioxidant and free radical scavenging activities are largely attributed to the phenolic compounds in olives, and are called olive biophenols.

Results from Haris’ in-vitro antioxidant and free radical scavenging research show that olive phenolic compounds scavenge the superoxide radicals as well as hydrogen peroxide radicals. In addition, he found that the olive leaf and fruit exacts are more potent than the pure phenolic compounds in terms of scavenging free radicals. The olive phenolic compounds, including extracts showed marked enzyme inhibition, which are responsible for the early progression of Alzheimer’s disease as well as memory loss.

On the basis of in-vitro results, olive extracts could be a promising therapeutic agent against Alzheimer’s disease.

Contact: Mr Syed Haris Omar, T: 02 6933 4569; E: somar@csu.edu.au
International Research for Food Security

Charles Sturt University (CSU) and NSW Department of Primary Industries (DPI) lead projects under the ‘Rice-based Systems Research (RSR) Program: Food Security in Lao PDR, Cambodia and Bangladesh’. The program focuses on improving rainfed and irrigated rice-based farming systems, as the mainstay of staple production throughout South and South-East Asia.

The RSR program is one of four programs developed by the Australian Centre for International Agricultural Research (ACIAR) under the Food Security through Rural Development initiative announced in the 2009 federal budget. ACIAR is a statutory authority that operates as part of the Australian Government’s development cooperation programs. The Centre encourages Australia’s agricultural scientists to use their skills for the benefit of developing countries and Australia.

“The portfolio comprises five large-scale biophysical projects, together with a suite of smaller policy-focused projects. The projects operate in Lao PDR, Cambodia and Bangladesh. Collectively, they span crop and livestock development, best practice management, technological advances, new cropping niches, targeted marketing and extension, and alternative evidence-based policy options,” ACIAR’s RSR Coordinator, Dr Caroline Lemerle, explains.

The RSR program invests $14.8 million over a five-year period (2009-2014).

Professor Len Wade from the Graham Centre and CSU leads the project ‘Developing improved farming and marketing systems in rainfed regions of southern Lao PDR’.

“This project aims to increase food supply and income from lowland and upland farming systems in the rainfed regions of southern Lao PDR,” said Professor Wade.

“These areas have significant potential for market surplus in rice, other crops and livestock.”

The research targets two lowland and two upland areas in the southern provinces of Savannakhet and Champassak. On-farm research in these areas has engaged with more than 300 farms in ten villages, including in the priority poor upland districts of Sepon and Phim.

Professor Wade visits the project’s on-farm and on-station trials on a regular basis.

The on-farm trials have an emphasis on resource management, direct seeding, short-duration post-rice crops such as pulses, vegetables or forages, and the integration of ruminant livestock. The on-station trials have taken a whole-of-system approach and looked at the interconnectivities of these diversified mixed-farming systems.

ACIAR recently awarded two small grants for study trips to the ‘southern Lao PDR’ project, which have strengthened the project’s in-country capacity building efforts. In the case of one grant, a group of eight Laotian delegates from the National Agriculture and Forestry Research Institute (NAFRI) and from provincial and district agriculture and forestry offices (DAFOs) in Savannakhet and Champassak have completed a two-week study trip to neighbouring Thailand.

Study trip delegates were selected for their promising capacity to implement improved forage systems in southern Lao PDR. Participants were introduced to advanced techniques in forage technology development, animal nutrition and feed analysis, and the on-farm application of these technologies.
The second study trip focused on lessons from Cambodia on crop establishment. Twelve delegates from NAFRI in Vientiane and southern Lao PDR spent one week in Cambodia exploring laser levelling, direct seeding, water availability and water management. They visited on-station and on-farm RSR project sites in the Cambodian provinces of Kampong Thom, Takeo and Kampot.

"The field trip was a great success," said Professor Wade. "Delegates were able to engage with each other and DAFO staff and farmers on-site, including making comparisons between new techniques and traditional on-farm practices. They not only came away with new ideas, but with broader networks for taking their ideas forward."

In the Spring edition of the Innovator we will take a closer look at another RSR project, led by Mr Geoff Beecher, NSW DPI, entitled ‘Improved rice establishment and productivity in Cambodia and Australia’.

This project aims to enhance rice system productivity in rainfed and irrigated lowland systems in Cambodia, especially in those that are direct seeded. The work is framed within the context of three major changes reshaping agriculture in Cambodia: the spread of direct seeding, the replacement of draught animals with mechanised forms of field preparation, and a significant increase in the proportion of irrigated rice.


Contact: Professor Len Wade
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Mr Geoff Beecher
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Editors note: This is the first article in a series of articles looking at international research for food security.

Expanding the frontiers for wool production

An audience of over 100 producers, students and company representatives were entertained by speakers addressing a wide range of topical issues currently confronting the sheep industry at a seminar ‘Expanding the frontiers for wool production’ at Hay, NSW on 23 May.

Duncan Fraser, incoming President of the National Farmers Federation (NFF), outlined some of the challenges he will be facing in his new role. It is clear that Australia’s global role in providing food for over 200 million people in the coming years will be dependent on continuing investment in research on environmental sustainability and production systems. This will include further investigation on animal health and efficiency of feeding animals, along with a focus on product quality. He also saw education through the school system as well as in the broader community, particularly in our expanding urban populations, as being a priority of the NFF.

Regional Veterinary Officer at Broken Hill, NSW, Dr Greg Curran, provided some graphic figures on the impact of heat stress and global warming on the productivity and reproductive efficiency of sheep flocks through the region. He also warned of new threats of viruses that are now endemic in sheep populations.

Jim Crossley, principal of Toms Lake at Booligal, has been selecting sheep on fertility for over 40 years. This has paid dividends in his lambing percentages and lamb survivability. The adoption of simple processes such as ‘wetting and drying’, together with a rigid culling policy, has increased the profitability of his Merino flock significantly.

Magnus Aitken, Manager of Steam Plains for the Paraway Pastoral Company, gave an excellent account of the advantages of shearing twice yearly on Parkways’ ‘bottom line’. The major advantages are achieved through greater total wool production and staple strength across the clip, higher fertility, better flock health, control of fly strike and doing away with crutching. Managing the flock in this way however, limits the use of chemicals, with withholding periods and the greater feed intake tending to increase micron. But the exposure to two different marketing periods gives more flexibility when it comes to selling the clip.

Paul Swan, Group Manager Market Intelligence and Trade reporting, AWI, presented an excellent summary of some of the novel research relating to wool garment wearability that is being explored by AWI. The health giving properties of wool are yet to be exploited and it is clear that this fibre
RESEARCH ACTIVITIES

will limit some allergic reactions on the skin, which would be very attractive for the high proportion of the population with sensitive skin. The development of new wool based sleep wear and bed coverings are just two of the markets AWI are developing.

Despite its challenges there is little doubt that wool will continue to play an important role in clothing our ever expanding world population, while at the same time having an increasing range of other uses in the home.

Contact: Professor Peter Wynn  
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Enabling landholders to adopt profitable and sustainable carbon cropping practices

Funding: DAFF Action on the Ground, $598,000

Project length: 30 June 2012 - 30 June 2015

Aims: To test the relationships between different stubble/nutrient practices and soil carbon.

Both field demonstrations/experiments: Designs have been developed and delivered to six farmer groups and CSU for 13 demonstrations/experiments in total. Eleven of these experiments have been established before sowing winter cereals. The two irrigated sites were not established, but will be established before sowing in the 2014 season.

Soil sampling has been completed and samples delivered to the Environment and Heritage Laboratory at Yanco. These samples are currently being analysed for carbon fractions by the latest mid infrared spectroscopy technique.

Social research: The social research team have completed most of their data collection talking to five groups of farmers (over 40 participants in total) and 8 individual interviews. These initial surveys will assess landholders’ knowledge, understanding and practices of stubble management. Over the next month the final group from Victoria and more individual interviews will be completed.

The next stage will be to analyse the data collected from all interviews. It is anticipated this will happen over the next six months.

Further surveys and interviews will be conducted during the project to assess the shift in landholders’ knowledge and understanding.

Contact: Dr Iain Hume  
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A genetic approach to internal parasite control in Australian Cattle

Funding: Meat and Livestock Australia, $175,000

Project length: 1 March 2011 - 31 March 2013

The primary objective of this project was to demonstrate that parasite resistance in cattle herds could be established and maintained via genetic selection without compromising enterprise profitability.

The control of the effects of internal parasites on production and profitability presents a significant cost to Australian beef cattle producers. Current methods of internal parasite control rely heavily on the strategic use of chemicals. The useful life of these chemicals is shortened by the rapid development of resistance by the parasites. Failure of these chemicals is widespread. In addition, there is growing pressure on cattlemen to reduce costs whilst remaining open to increasing scrutiny and traceability regarding safe, residue free food. There is also an increasing interest in organic food production with emphasis on chemical free production methods.

This project demonstrated that it is possible to select cattle with enhanced resistance to internal parasites in pasture based breeding herds in south-eastern Australia. Using faecal egg counts (FEC) of paternal half-sibling lines of weaner cattle as a phenotypic indicator of internal parasite resistance, it was possible to develop EBVs for parasite resistance for sires. The heritability of this trait was found to be 41%.

With 41% of the total variation in faecal egg output within weaner groups being due to genetics, there is ample
Sensory evaluation of puffed chickpeas - a study with Australian panel

Chickpea, one of the foundation crops of present day agriculture, is the second most largely cultivated legume in the world. Today, Australia is considered one of the leading exporters of chickpeas to Asian countries, including India. It has been found that consumer perception and preference could be one of the driving factors behind acceptance of these legumes in many parts of the world. So it is pertinent to understand the sensory aspects of Australian desi chickpeas and their consumer acceptance across three different cooking methods.

Soumi has selected a traditional cooking process called ‘puffing’, where chickpeas are subjected to a high temperature, for a short time, in an oil free medium. This results in light, crisp and tasty products. Sensory evaluations of these puffed chickpeas are one of the major components of her research. Soumi has been working with an Australian panel from CSU for her sensory evaluation. The 14-member panel had six women and eight men who participated enthusiastically in a six week long study. The panel included PhD students and lecturers in different schools from CSU as well as community members outside CSU.

The panel smelled, touched and tasted the different puffed chickpeas in the study, and through consensus, created a list of descriptors that characterised the sensory attributes of the selected Australian desi chickpeas.

For any successful sensory study, the sensory panel is one of the major contributors. Soumi said she was very happy with the energy and eagerness of her panel members and the way they participated in this study.

Puffed chickpea is a comparatively new product in the Australian market and most of the panel members had not heard of or tasted this snack food before the study. Some panel members have expressed an interest to take part in similar studies in the future.

Contact: Soumi Paul Mukhopadhyay
T: 02 6933 2085, E: smukhopadhyay@csu.edu.au

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Contact: Soumi Paul Mukhopadhyay
T: 02 6933 2085, E: smukhopadhyay@csu.edu.au

Genetic selection assists parasite control: It is possible to select cattle with enhanced resistance to internal parasites in pasture based breeding herds in south eastern Australia. Photo: Toni Nugent.

opportunity for selection if half-sibling sire-lines containing adequate numbers are made available. Breedplan, with its use of link sires, provides genetic linkages and large half-sibling sire groups from herds over a wide range of environments and management situations. The Angus Long Fed/CAAB Dollar index was very similar for animals with high or low parasite resistance EBVs. This gives an early indication that progress could be made in selection for parasite resistance without compromising progress with production traits.

NSW Department of Primary Industries, to explore and investigate the sensory qualities of Australian desi chickpeas and their consumer acceptance across three different cooking methods.

Contact: Dr Peter Honey E: phoney@csu.edu.au

Chickpea panelists: Consumer perception and preference could be a driving factor behind the acceptance of chickpeas in many parts of the world. Photo: Toni Nugent.
Richard Hayes

**Position:** Research Agronomist  
**Organisation:** NSW Department of Primary Industries

**Career Brief**

Richard began as a Technical Officer in the pastures section in 2000, working closely with the soils group on a crop/pasture project on the sodic clay soils of the Bland. In 2003 he became the Technical Officer employed on the GRDC/FFI CRC PastureSearch project evaluating perennial pasture species and cultivars across SNSW. In late 2005 he was appointed as a research officer in the Southern Farming Systems branch. Since then he has been NSW DPI’s key contact on a range of projects including the *Perennial Wheat Feasibility Study*, Developing lucerne for acid soils, Assessing the agronomic consequences of applying composted dairy waste, and more recently *EverCrop* (assessing the role and management of perennials in cropping systems) and *EverCrop Carbon Plus* (assessing the role of perennials in enhancing soil organic carbon in cropping environments). He also supports other projects led by others in the pastures unit.

**Research activities**

Developing perennial wheat, managing acid soils, enhancing nitrogen fixation in pastures, enhancing the performance of pasture mixtures

**Teaching activities**

Supervising post-graduate students

**Professional Links**

- Member of the Australian Society of Agronomy  
- Practicing Professional Woolclasser (everyone needs a hobby)

**A typical day for me include:** Get up early and deal with as many emails as possible. Then, if I am in the office, try to maximise the time spent analysing/reporting scientific results. Otherwise I am in the field helping the team measuring or managing the vast array of field trials that are currently in the ground across southern NSW.

**My main project at the moment is** EverCrop and EverCrop Carbon Plus. However, I also have a number of ‘Sunday’ projects which generally relate to the perennial wheat or acid soil research mentioned above.

**My favourite part of my job is:** 1) Field work; and 2) Analysing/reporting previous research initiatives. It is rewarding to see what the results of all the old data really mean - justifies the effort of collecting the data in the first place.

**When I am not in the office I like:** To be in the field doing some real work, or at home with the wife and tin lids - usually lighting fires at this time of year.

**When I am driving I like to listen to:** JJJ.

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**Agribusiness Field Day**

**Tuesday 15 October 2013**  
**NSW DPI, Wagga Wagga Agricultural Institute**

David Gale, PhD Student

Supervisors: Dr Jason Condon, Dr Greg Doran (CSU), Dr Chau Minh Khoi, Dr Duong Minh Vien (Can Tho University, Vietnam)

Thesis title: ‘The potential of compost to ameliorate metal toxicities and phosphorous availability in Vietnamese agricultural production systems’

Funding bodies
- Australian Postgraduate Award Scholarship
- 2013 Farrer Memorial Trust Travelling Scholarship

Career and studies till now
- 2007-2010 - BSc (Agriculture) (CSU)
- 2010-2011 - BSc (Honours) (CSU)
- 2011-2012 - Graduate Officer at NSW DPI, based at Camden and Gosford

Currently studying
Doctor of Philosophy

Research Interests
- Agricultural research projects at a community level in developing countries
- Soil - plant interactions

Professional Links
- Vice-chair NSW Farmers Association Young Farmers Council
- Secretary Agricultural Societies Council of NSW Youth Group
- Board member and Company director Agricultural Societies Council of NSW

A typical day for me includes: Out of bed at 6, in the office by 7:30 (harder to do in winter in practice)…

Only 4 months into my PhD, at the moment I’m still busily reviewing literature and planning experiments. In lots of ways this is fairly monotonous but the wins in finding an article which is very helpful or emphasises the value of my project to the body of knowledge are what make the whole process enjoyable.

Always lots of emails, and often some face-to-face meeting with supervisors.

… leave the office by 5:30, head home and cook dinner.

My main project at the moment is: Trying to stay on track to complete my literature review, and Australian laboratory and glasshouse work, before I go to Vietnam to undertake my field trial in June 2014 for 12 months.

My favourite part of my studies is: As pretentious as it sounds, the thing which motivates me to do what I do is that in a small way I’m contributing to solving global food security challenges.

When I am not studying I like to: Be in meetings! I love committees and meetings. Networking at different events.

When I am driving I like to listen to: 702 ABC Sydney.

PhD student David Gale is motivated knowing that he is in a small way, contributing to solving global food security challenges.

Spring Edition of the Innovator

The Spring Edition of the Innovator will be available October 2013. Submission of articles for this edition close on Friday, 13 September 2013. Please email articles to Toni Nugent or Sharon Fuller.
### EVENTS CALENDAR

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<th>Date</th>
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<tr>
<td>9 Aug</td>
<td><strong>Graham Centre Beef Forum</strong></td>
<td>Convention Centre, CSU, Wagga Wagga</td>
<td>Toni Nugent&lt;br&gt;&lt;br&gt;E: <a href="mailto:tnugent@csu.edu.au">tnugent@csu.edu.au</a></td>
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<td>4 Sept</td>
<td><strong>Graham Centre Cropping and Pasture Systems Field Forum</strong></td>
<td>Graham Centre Field Site, Coolamon Road, Wagga Wagga</td>
<td>Toni Nugent&lt;br&gt;&lt;br&gt;E: <a href="mailto:tnugent@csu.edu.au">tnugent@csu.edu.au</a></td>
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<td>15 Oct</td>
<td><strong>Graham Centre and NSW DPI Wagga Wagga Agricultural Institute Agribusiness and Advisor Field Day</strong></td>
<td>Wagga Wagga Agricultural Institute</td>
<td>Toni Nugent&lt;br&gt;&lt;br&gt;E: <a href="mailto:tnugent@csu.edu.au">tnugent@csu.edu.au</a></td>
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<td>2014 13 Feb</td>
<td>2014 Stubble Forum</td>
<td>Details to be advised</td>
<td>Toni Nugent&lt;br&gt;&lt;br&gt;E: <a href="mailto:tnugent@csu.edu.au">tnugent@csu.edu.au</a></td>
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