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The UWA Institute of Agriculture

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Senator the Hon. Joe Ludwig (2nd from left) during his visit at UWA with (from LtoR) W/Prof Lyn Abbott, Dr Sasha Jenkins, Assoc/Prof Louise Barton and Dr Ken Flower.

Federal Minister visits grant winners at IOA

Winthrop Professor Lyn Abbott
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Federal Minister for Agriculture, Fisheries and Forestry, Senator Hon. Joe Ludwig, recently visited five new research grant winners at The UWA Institute of Agriculture to learn more about their projects on reducing greenhouse gas emissions from the land sector, sequestering carbon and enhancing sustainable agricultural practices.

Professor Phil Vercoe ('Identifying pasture species to reduce methane and emissions intensity in southern grazing systems'), Associate Professor Louise Barton ('Does increasing soil carbon in sandy soils increase nitrous oxide emissions from grain production?') and Dr Sasha Jenkins ('Mitigating greenhouse gas emissions in soils amended with livestock manure') represented colleagues who had secured funding under the Filling the Research Gap (FtRG), part of the

Australian Government Department of Agriculture, Fisheries and Forestry (DAFF) Carbon Farming Futures program.

FtRG projects target current research gaps around abatement technologies and practices, in particular in the priority areas of reducing methane emissions, reducing nitrous oxide emissions, sequestering carbon and improving modelling capability.

Dr Ken Flower ('Mitigating greenhouse gases with nitrification inhibitors and biochar in fallows') and Winthrop Professor Lyn Abbott ('Grazing into the future: soil health and carbon with pasture management') represented colleagues who had received funding under the Action on the Ground Program, which aims to assist the on-farm trial and demonstration of practices and technologies to reduce agricultural sector greenhouse gas emissions and/or increase carbon stored in soil. This is also funded by DAFF as part of its Carbon Farming Futures.

Each of these projects was developed in partnership with one or more industry organisations, including the Grains and Research Development Corporation (GRDC); Australian Pork Ltd (APL); Meat & Livestock Australia (MLA); Rural Industries Research & Development Corporation (RIRDC) Chicken Meat Program; Australian Egg Corporation Limited (AECL) and the Department of Agriculture and Food, WA (DAFWA); and with grower groups including the 'Liebe' and 'Bugs and Biology' groups.

"UWA's track record for innovative research and its successes in taking science out of the laboratory and into the paddock have established the university as a substantial force in meeting challenges arising from climate change," says Professor Abbott, "and the Minister's visit is a clear recognition of the important contribution UWA is making to productive and sustainable food production now and into the future."



Director's column

Winthrop Professor Kadambot Siddique AM, FTSE, Hackett Professor of Agriculture Chair (kadambot.siddique@uwa.edu.au)

The past 12 months have gone rapidly and it has been a year of tremendous activities, successes and challenges which were highlighted by the external review of IOA in October (see also page 15). The review team will make its recommendations to the Vice Chancellor in the near future.

In 2012, on the eve of UWA's centenary celebration, the disciplines of life and agricultural sciences at UWA have made a giant leap to move

into 26th position in the Academic Ranking of World Universities (ARWU). This represents the highest ranked position of any Australian university (see also page 8).

Much of the credit for this significant achievement goes to our world class scientists and their dedication, as reflected in a number of prestigious awards bestowed this year on scientists in agriculture and related areas (see also page 17).

2012 has also been a productive year in terms of research publications. To date we have published 153 refereed journal papers, 14 book chapters and 2 books.

Other significant contributions made by IOA this year include our high profile outreach activities: the 2012 Industry Forum (see also page 6) captured public and media interest alike and reconfirmed IOA's role in facilitating discussion on topical agriculture industry issues.

UWA's Future Farm 2050 is shaping up as an important outreach centre, both as a demonstration site for on-farm research and as a site connecting city high school students to modern agricultural systems. In addition, it generated significant national and international interest (see also page 3).

The Prime Minister's recent white paper on "Australia in the Asian Century" highlights the importance of Australia's engagement and partnership with leading Asian countries such as China and India. Many of IOA's activities are

linked to its extensive network of funding bodies and partner organisations both domestic and international: Our long-standing partnerships in China (e.g. Lanzhou University, Huazhong Agricultural University and Zhejiang University, see also page 12) have produced a growing number of joint research projects and publications, and continue to build capacity in education. Several cohorts of elite undergraduate students from leading Chinese universities participated in short-term study programs at UWA this year, engaging with UWA academics in agriculture and related disciplines.

Another milestone in capacity building activities has been our productive partnership with Iraq: 2012 marked the graduation of the first batch of AusAID funded Iraqi postgraduate students (enrolled in agriculture and related disciplines at UWA) eager to apply their knowledge to improve rural livelihoods in Iraq. The success of this program paved the way for a new agreement with the Kurdish Regional Governorate (see also page 4), which will see over 20 postgraduate students commence their studies at UWA over the next two years.

On a final note, I would like to thank the IOA External Advisory Board, Executive Team, Program Leaders, IOA members and staff for their outstanding support and hard work over the past 12 months. I look forward to 2013 to continue together in the quest to sustain productive agriculture through science, technology, innovation and education.

UWA architecture students transform Perth City Farm

www.perthcityfarm.org.au

A design project for first-year architecture students at UWA's Faculty of Architecture, Landscape & Visual Arts (ALVA) aims to transform Perth City Farm into an urban refuge.

Run by ALVA's Graduate Architect Mr Yasas Botenne, in collaboration with the Perth City Farm management team, students submitted drawings, representations and models to explore a number of architectural initiatives on the inner-city farm in East Perth.

These incorporate a 'green wall' design and a building with accommodation 'pods' or living units.

'Green wall' refers to a structure on which to create a garden of decorative and edible plants in urban spaces. Other benefits include unique visual aesthetics, improved surrounding air quality and potential improvement of the thermal properties of a building structure.

At Perth City Farm, the green wall is to make an entry statement to the site; have an educational purpose; and function as a food harvesting area.

The building is to serve as an urban oasis for weary city dwellers to relax, recharge their batteries and experience nature. In addition, it is to house new workshop space and serve as short-term accommodation for visitors to the farm.

"The standard of the submissions was truly outstanding," says Guest Juror and UWA Graduate Architect, Mr Domenic Trimboli. "The designs were not only environmentally friendly and sustainable, they were a blueprint for structures that can inspire, convey ideas, and become areas for contemplation and learning."

Mr Botenne and Mr Trimboli attribute much of the success of this project to the support from City Farm Managers Mr Michael Forte and Ms Julie Broad, and to the assistance of architecture student Sandy Anghie.



One of the designs submitted for incorporating a green wall into a building fabric.

What's new at the UWA Future Farm 2050



Key stakeholders and Chinese delegates inspect the new dam at the UWA Future Farm in August.

Winthrop Professor Graeme Martin
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Farm Manager, Ms Kristy Robertson, is taking parental leave and UWA welcomes Mr Steven Wainewright as her replacement for the next 18 months.

Steven grew up on a sheep property in Victoria, with his parents also operating a trucking business. From a young age he has had a passion for agriculture, and worked on a large broad acre farm throughout his secondary school and undergraduate studies.

After completing a Bachelor of Agriculture at the University of Melbourne, he worked in the ruminant feed industry throughout Victoria and Queensland and he recently completed a Master of Tropical Animal Science degree at James Cook University, Townsville. "I am excited to become involved in the projects operating at The UWA Future Farm and assisting in the transition of areas of the farm into a commercial operation," says Steven, "and I look forward to working with farmers, academics and other industry groups in this role to further advance the UWA Future Farm as an industry leader in cutting edge agriculture."

Steven and wife Raquel have moved into the 'ALVA house', and as they are the first occupants of this state-of-the-art residence, data from the production of electricity by solar system and the consumption of electricity and water (monitored on the web page) will become meaningful.

During the last quarter, the UWA Future Farm has been buzzing with outreach activities: At the end of August key stakeholders travelled to the Farm to gain an oversight on activities and progress. The party included Madam Wang Yiner (Consul General, People's Republic of China, Perth), Winthrop Professor Paul Johnson (Vice Chancellor, UWA), Hon Terry Waldron MLA (Minister for Sport and Recreation; Racing and Gaming, Deputy Leader of the Parliamentary National Party of Australia (WA) and Member for Wagin), Hon Hendy Cowan (Chair, Indian Ocean Climate Initiative Stage 3 Project Board), Mr Dexter Davies (Principal Policy Advisor to the Hon Terry Redman MP, Minister for Agriculture and Food; Forestry; Housing); Winthrop Professor Kadambot Siddique, members of the Pingelly Shire Council, students of the UWA Institute of Agriculture and other university staff. The tour was led by Winthrop Professor Graeme Martin who explained the specific projects, including the solar electricity system, the revegetation program, and the project using native shrubs to combat carbon emissions by livestock. Visitors had morning tea and lunch in the ALVA House, the construction of which was explained by Assistant Professor Patrick Beale (Faculty of Architecture, Landscape & Visual Arts) and they inspected the new dam that had been constructed under the supervision of Mr David Stanton (UWA Centre for Ecohydrology).

The UWA Future Farm also hosted a delegation visiting Western Australia for the 25th anniversary celebrations of the Zhejiang Province's Sister State relationship with Western Australia. The visitors,

led by Zhejiang Province's Director-General of Agriculture, Mr Shi Jixi. Mr Shi was impressed by the integrative nature of the UWA Future Farm Project, with the needs of the farmer family being considered as important as the various enterprises in the operation. The delegation were particularly interested in the trials run by Chinese PhD student, Ms Xixi Li, on the ability of *Eremophila glabra*, or 'Tarbush', to reduce methane emissions by sheep.

The outreach program for secondary school students also gathered momentum during winter and spring, with 220 students from five metropolitan high schools visiting UWA Future Farm so far. They planted more than 4,000 seedlings at the farm, including seedlings grown by the schools and those purchased from the nursery in Pingelly. The learning areas involved ranged from lower school 'Science, Society & Environment' to upper school Biology and Geography and topics included: re-establishing bio-diversity on farming land; changes in the landscape over a long time-scale; dryland salinity: causes and measuring creek water salinity; sustainable housing: design, provision of electricity and water; contact with 'real' sheep; climate change: reducing methane emissions from ruminants; meeting academic researchers and hearing about their career paths. Post-visit surveys established the farm visit and activities to be a clear winner across age groups and this outreach program is expected to expand further in 2013.



UWA Future Farm Manager Mr Steven Wainewright.

UWA's first visit to Kurdish Regional Governorate creates a buzz

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Few universities have visited the Kurdish region of Iraq to date – but a recent trip by UWA delegates to Erbil, Kurdish Regional Governorate (northern Iraq) may well have set a new trend, as the visit further cemented the strong links between UWA and Iraq and paved the way for more government-funded students to undertake their postgraduate studies at UWA.

Earlier this year, The University entered into an agreement with the Ministry of Planning within the Kurdish Regional Governorate, whereby the Ministry would provide scholarships for 20 postgraduate students (MSc and PhD) over a period of 5 years. Since other ministries (Higher Education and Agriculture in particular) have also allocated funds to send students overseas, a UWA visit to Erbil was organised to progress this venture.

In September 2012, Winthrop Professor Kadambot (Director, The UWA Institute of Agriculture), Dr Olivier Charpenay (Marketing Manager, UWA Centre for English Language Teaching) and Mr Paul Buist (Regional Manager for International Marketing, International Centre) met with government representatives, potential postgraduate students and staff at the Erbil office of Moves International.

In a busy three day schedule, the UWA representatives trained Moves staff about the courses and research programs offered at UWA, interviewed prospective students and gave a series of presentations about UWA, its English Language courses and the UWA Institute of Agriculture. UWA delegation met with representatives from the Ministry of Planning and the Ministry of Agriculture. "The Ministry of Agriculture was especially interested in UWA's research activities on dryland agriculture and specialist training programs,



(From LtoR): Mr Neil Russell (Moves International), Prof Jamal Ameen, Dr Ali Sindi, W/Prof Kadambot Siddique, Mr Paul Buist, Dr Olivier Charpenay.

including a combination of a short course in English followed by a relevant short courses in Agriculture," said Professor Siddique, "and some of the courses that could be offered through the UWA Institute of Agriculture seemed to align with their interests."

On the final day of their visit, Professor Siddique gave a special presentation to 19 potential PhD students from Mosul University (northern Iraq) in agriculture and related areas, all of whom have full funding support from the Ministry of Higher Education, Iraq. The UWA Institute of Agriculture and Mosul University are partners in an ongoing project on 'Conservation Agriculture' led by ICARDA with funding from ACIAR and AusAID. "UWA is one of the first universities to visit Kurdish Regional Governorate and it has been a privilege to meet with each of these students individually, and to nurture their interest in UWA as a first-class university," said Professor Siddique.

He also met with representatives from University of Sulaimani, Ministry of Agriculture, and Ministry of Planning and discussed potential collaboration between UWA and University of Sulaimani.

Professor Siddique described the Kurdish Regional Governorate as a new and promising region for UWA: "To date over 40 applications for postgraduate admission at UWA have been received. With the Kurdish Regional Governorate offering more than US\$100 Million for higher education over the next 2-3 years, UWA can make a significant contribution in revitalising and modernising Iraq's agricultural sector through providing relevant, world-class training to a growing number of Iraqi postgraduate students."

Professor Siddique invited Dr Ali Sindi (Minister of Planning, Kurdish Regional Governorate-Iraq) to visit UWA early next year to meet with UWA's Vice Chancellor and discuss further opportunities for collaboration.

UWA co-hosts International Conference on Germplasm of Ornamentals

Associate Professor Guijun Yan
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140 delegates from 11 countries gathered in China to discuss the development of germplasm for ornamental plants at The International Conference on Germplasm of Ornamentals (ICGO), held in Beijing from 16-20 July this year.

The theme of the symposium was sustainable development and utilization of ornamental resources, and this was explored through fifty

oral and forty poster presentations.

Sponsored by the International Society for Horticultural Sciences (ISHS), the conference was hosted by the Beijing Forestry University, The University of Western Australia and the Beijing Botanical Gardens.

Co-convenor Guijun Yan, Associate Professor at UWA's School of Plant Biology and IOA and Chair of ISHS's Ornamental Genetic Resources Working Group, was the driving force behind the conference. He was presented with a medal for his contribution to ISHS activities.



Assoc/Prof Guijun Yan was awarded a medal for his contribution to the activities of the International Society for Horticultural Sciences.

Photo courtesy Mr Chao Yu

New project focuses on effective use of water allocations for turfgrass in public open spaces

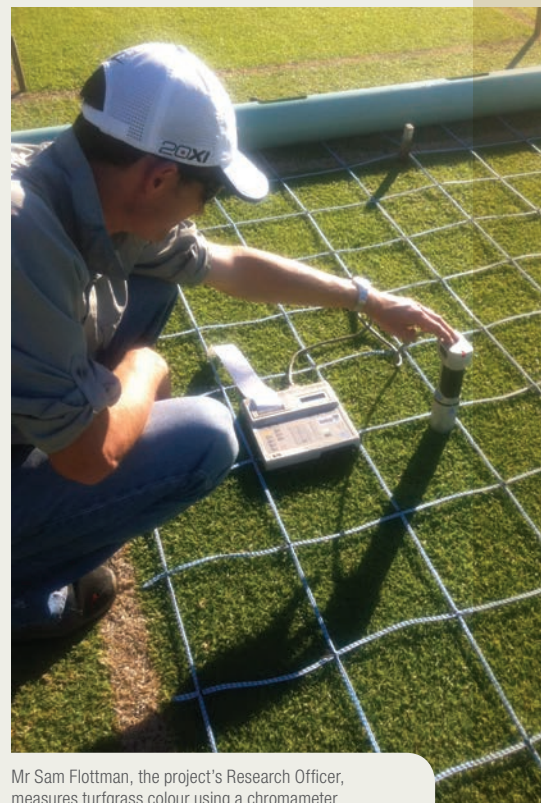
Associate Professor Louise Barton Email: louise.barton@uwa.edu.au

Maintaining turfgrass sports grounds is important for encouraging physical activity, and increasing evidence suggests well-designed and maintained green spaces are also needed for mental health and well-being. The UWA Turf Research program (www.plants.uwa.edu.au/research/turf) has been awarded funding to develop strategies to best manage turfgrass in open spaces using our limited water supplies.

Western Australia is currently experiencing a significant decrease in water resources due to changing and variable climate. Local government turfgrass managers, as well as golf course superintendents, are under continued pressure to restrict water use, while also maintaining high-quality surfaces for our local communities.

Water allocation is a key water planning method for irrigating public open spaces. "Due to the impact of climate change on water supplies, water planning is here to stay, and an adaptive approach to water supply and planning is required in Australia" explains Associate Professor Louise Barton from UWA's Turf Research program. "Understanding how to best manage turfgrass on current, and possible lower future water allocations, is critical for managing public open spaces."

While the amount of water allocated to turfgrass managers is set by the State Government, it is at the discretion of the turfgrass manager how to distribute the allocation most effectively during the irrigation season. Over the next three years the UWA Turf Research Program, led by Winthrop Professor Tim Colmer and Associate Professor Louise Barton, will investigate approaches to best manage current and future water allocations to turfgrass in public open spaces. The research is funded by Horticulture Australia Limited (HAL) in partnership with the Local Government and members of the Australian Turf Industry.



Mr Sam Flottman, the project's Research Officer, measures turfgrass colour using a chromameter.

New chickpea varieties to spark industry recovery

Mr Mike Perry Email: michael.perry@uwa.edu.au

Two chickpea varieties developed by Professor Tanveer Khan and Winthrop Professor Kadambot Siddique of the UWA IOA, and released at the Mingenew-Irwin Group (MIG) field day at Mingenew on 6th September 2012 are set to help re-establish the chickpea industry in Western Australia.

The 'desi' varieties were developed in a partnership with the Department of Agriculture

and Food WA (DAFWA) and the Council of Grain Grower Organisations (COGGO) using germplasm bred under the auspices of the GRDC National Chickpea Breeding Program and sourced from the NSW Department of Primary Industries and the Department of Primary Industry, Victoria.

The varieties 'Neelam' and 'Ambar' are the first commercial varieties to combine good seed quality, adaptation to WA conditions and high levels of

resistance to ascochyta blight, a disease that destroyed the burgeoning chickpea industry in the late 1990s.

The names of the two varieties follow a WA convention where chickpea varieties are identified using the language of the target market - in this case the Indian sub-continent - and refer to gems and precious metals found in Australia. Both names are from Hindi/Urdu, the most widely understood language group in India and Pakistan. Ambar stands for the gem "amber" and Neelam for "blue sapphire".

Both varieties are classified as resistant to the ascochyta blight disease and this resistance has been verified in other parts of Australia and also in India where the pathogen population is much more diverse. Both varieties should, therefore, require minimal or no fungicide application, greatly reducing the cost of production and their attractiveness to growers. Both varieties should play a pivotal role in rejuvenating the WA chickpea industry following the devastation caused by ascochyta blight - from which the industry has been struggling to recover.



Mr Bruce Piper, W/Prof Kadambot Siddique, local farmer Mr Ben Cobley and Prof Tanveer Khan at the launch of the new chickpea varieties in Mingenew.

Climate change and invasive species

As globalisation and climate change make it increasingly difficult to control invasive (pest) species, attempts to prevent incursions of invasive species may soon be doomed to failure.

This was the view that emerged at the WUN (World Universities Network) workshop 'Invasive species under climate change: economic impacts' which was held by the University of Alberta (UA), Canada, in September this year.

UWA delegates Research Assistant Professor Morteza Chalak and Winthrop Professor David Pannell from the Centre for Environmental Economics and Policy, worked together with scientists from five countries to explore the socio-economic and bio-physical impacts of invasive species.

Following their conclusion, that it may not be possible to prevent incursions of invasive species in the long-term, delegates agreed to contribute

to a paper on managing invasive species when invasion is inevitable. "We are shifting our perspective from prevention to management. Our research will focus on novel interventions, including adaptation, to help us manage invasive species effectively now and in the future," explains Dr Chalak who has recently won a UWA research collaborative grant. "I am excited and grateful to the University, because the funding will allow me to continue my collaboration with UA on this topic and to work on a new project."

Good rules make foreign investment in Australian agriculture a winning proposition

Foreign ownership of Australian agricultural land and agribusiness has attracted much political and media attention in recent months. At the UWA Institute of Agriculture's industry forum in July this year, the issue was debated in front of a record audience of over 100 farmers and industry representatives.

Now in its 6th consecutive year, the forum was officially opened by the Honourable Terry Redman, MLA, Minister for Agriculture and Food; Forestry, Housing, WA, and followed by a keynote presentation from Mr Mick Keogh, Executive Director of the Australian Farm Institute.

Mr Keogh attributed much of the public unease about foreign ownership of Australian farm land to the lack of information and reliable data. He considered the risks arising from market concentration to be far greater than those from foreign agribusiness ownership: "If a single buyer is able to gain monopoly, or near monopoly control, over a crucial asset or business in a supply chain, the buyer has the power to increase fees and charges or pay lower prices for agricultural commodities, with impunity."

Mr Duncan Calder, President of the Australia-China Business Council, WA, focused on the willingness of Chinese investors to adapt to Australian expectations and preferences, and on the opportunities generated by their flexible approach: "For Chinese investors, ownership of the land is not essential. They will invest in any proposition that makes financial sense and gives them security of supply." He identified three areas as key opportunities for Australian agriculture from Chinese investment: driving innovation in R&D; solving Australian skilled labour shortages; and helping Australian businesses raise capital for expansion and infrastructure. In his view, the key to maximise benefits, lies in being pro-active: "We need to be pro-active, work out what we want from investment and then set the rules accordingly."



Panel members (from LtoR) Mr Mick Keogh, Mr Michael Foss, Mr Duncan Calder and Mr Dale Park address questions from the audience.

Pastoralists' and Graziers' Association president Mr Rob Gillam urged for a paradigm shift in public perception: "We need to reorientate our thinking towards foreign investment and ask ourselves how we can work more with foreign investors to attract greater investment." He also echoed Mr Keogh's view that it was difficult to differentiate between the risks associated with foreign investment in agriculture and the risks in other sectors of the Australian economy.

Western Farmers' Federation President Mr Dale Park examined the public debate on foreign investment in Australian agriculture which he described as taking place in a 'fact-free' arena, due to the absence of (reliable) information and data about the extent of foreign ownership in Australian farmland.

Nuffield scholar and Bruce Rock farmer Mr Michael Foss discussed factors affecting corporate investment in farmland, which he had researched last year on his scholarship visit to Europe, USA and Canada. He pointed out that while ownership policies made Australia an easy place to invest in, corporate investors were more attracted to countries with higher productivity. He welcomed foreign investment because it could help reduce production risks to farmers: "Australian agriculture is starved of capital, so any investment in agriculture would be beneficial."

In summing up, Adjunct Professor Mick Poole suggested the general conclusion of the forum was that foreign investment should be welcomed, provided foreign investors abided by the same rules faced by other investors with respect to their business and employment practices and that the forum had not identified compelling arguments why this should not continue.

Professor Poole also referred to the recurring theme about the overriding need to attract fresh capital to agriculture which far outweighed any concerns about foreign sources of investment.

He also acknowledged the minority opinions expressed at the meeting, and suggested that concerns about foreign investors crowding out young Australians wanting to enter farming, or about the ability of smaller farmers to attract foreign capital to their enterprises, were not peculiar to foreign investment but to investment into agriculture generally.

Professor Poole concluded by calling on the audience to take the message that farming was an attractive investment into other arenas and commended UWA for its contribution, through this forum, to providing a factual basis to the foreign investment debate.

To view the full presentations, visit <http://www.ioa.uwa.edu.au/publications/industry-forum>

Mike Carroll Travelling Fellowship winner helps to speed up crop breeding

Miss Aanandini Ganesalingam Email: 10518265@student.uwa.edu.au

A UWA PhD student and Applied-Statistics-Wizard has succeeded in halving the computation time required for data analysis in plant breeding programs. In practical terms, this amounts to a time saving of an entire growing season for breeders focused on selecting (and breeding) varieties suitable for commercialisation.

Funding from the Mike Carroll Travelling Fellowship Award enabled the recipient Ms Aanandini Ganesalingam - also known as 'Dini' - to visit one of the oldest standing agricultural research institutes in the world - Rothamsted Research in England, and study 4 ½ weeks under the supervision of Professor Robin Thompson (and her current co-supervisor, Professor Alison Smith, University

of Wollongong, and Co-ordinating Supervisor Winthrop Professor Wallace Cowling, IOA).

Mixed model analysis forms the basis of variety selection for commercialisation and also for parents for the next cycle of breeding but the inclusion of variety ancestry information (pedigree data) in such analyses has led to lengthy computation times, which means analyses take four weeks or longer to complete.

"This poses a real problem for breeding program efficiency," Dini points out. "It is often hard to obtain results from the previous season's analysis before the planning of the next season's trial planting."

Dini succeeded in isolating the cause of these long computational times in mixed model analysis, and in finding a suitable alternative which halved the time to analysis. This represents a major outcome for (MET) analysis of plant breeding data sets, and the improved (MET) analysis times will make commercial selection more efficient for all crops and for all traits in Australian agriculture.

Dini attributes her success to the tremendous support she received in this project: "I would like to thank the Mike Carroll Travelling Fellowship for affording me such a rare opportunity to travel and undertake research at a world-class research institute in applied statistics. In addition, I am grateful to Professors Robin Thompson, Wallace Cowling, Alison Smith and Brian Cullis for their time, supervision and inspiration.

The Mike Carroll Travelling Fellowship, a memorial to the late Dr Mike Carroll, former Director-General of the WA Department of Agriculture, recognises his devotion to agriculture and selfless efforts to improve the lot of farmers, the wider agricultural community and scientific colleagues.



(LtoR): Miss Aanandini ('Dini') Ganesalingam with Mrs Helen Carroll at the Mike Carroll Travelling Fellowship Award presentation event in November, where Dini reported on her research visit to England.

PICSE wins over young students for Primary Industries

www.picse.net/UWA

The Primary Industry Centre for Science Education (PICSE) at UWA is going from strength to strength in attracting young students to primary industries.

As the largest high school outreach program in UWA's Faculty of Science, two PICSE Ambassadors were elected earlier this year: First-Year Agriculture student Brydie Creagh and Year 12 student Lachlan Hunter, from the W.A. College of Agriculture - Cunderdin, contributed their ideas about the development of an Agricultural Workforce Strategy to the 'Canberra Round Table' held in Canberra, as part of the PICSE National Advisory Board (NAB) meeting. One of the new initiatives arising from this meeting has been the launch of PICSE's new magazine: Science taking you places. [www.picse.net/resources/Science taking you places.pdf](http://www.picse.net/resources/Science%20taking%20you%20places.pdf)

Brydie and Lachlan also helped judge the entries in the Science Investigation awards for high-school students, held at UWA, and addressed the students about the opportunities they have had with PICSE.

Brydie's focus was on how to maintain and strengthen students' interest, once they are enrolled in an agriculture-related course, with a focus on how industry, university and student societies could work together to achieve this. Lachlan raised the question whether industry could play a role in bringing about a shift



Award winners of the PICSE Science Investigation competition for high school students.

in perception, so that more students looking at science-based careers will consider primary industries.

PICSE's success in attracting high achievers to study in an agriculture-related course at UWA, is highlighted by Miss Aanandini Ganesalingam, the 2012 Mike Carroll Travelling Fellowship winner (see above). Her introduction to primary industries was as a high school student during the first PICSE Industry Placement Scholarship Residential Camp held at UWA, where she developed a fascination for primary industries and applied science.

UWA in the world's top 100 research universities

Professor Robyn Owens Email: dvc@uwa.edu.au



Prof Robyn Owen (Deputy Vice Chancellor Research, UWA).

In 2012, one year before the official centenary of the University, UWA moved into the Top 100 global research universities, coming in at position 96 overall. The Academic Ranking of World Universities (ARWU) is the most prestigious of the various global rankings of universities. Established in 2003 by the Shanghai Jiao-Tong University, and stabilized in its methodology by 2005, this ranking focuses on externally verifiable data around research activities and achievements. In 2005 UWA was ranked at position 179 and we have steadily increased our ranking since then.

A key feature of the ARWU is the fact that it targets research excellence,

which means there is a heavy reliance on the performance of a small number of individuals, with prize winning and Highly Cited researchers accounting for 50% of a university's score.

Thirty percent of a university's overall score is attributed to staff or ex-students winning Nobel Prizes or Fields Medals (the Fields Medal is the mathematical equivalent of the Nobel Prize). In 2005, when Professor Barry Marshall, a current staff member and a previous student of the university, won the Nobel Prize for Medicine or Physiology, moving into the Top 100 became a real possibility for UWA.

Twenty percent of the score is based on the number of Highly Cited staff associated with the University. Highly Cited staff are defined as those who are among the Top 250 researchers worldwide in terms of citations to their work, over 21 broad fields of research. UWA has 13 Highly Cited researchers, with many of these working in the broad area of Plant and Animal Science.

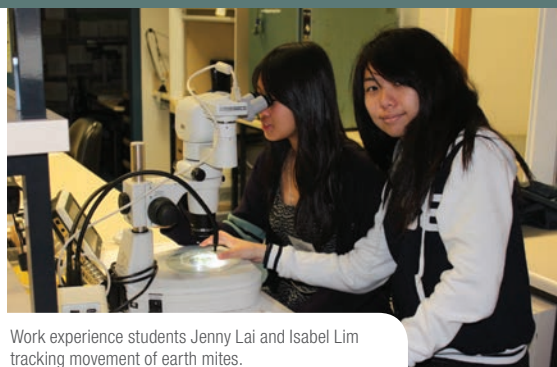
A further 20% of the score depends on a university's share of the global production of Nature and Science articles. Nature and Science are multi-disciplinary journals of very high prestige, and publications in these journals are considered key markers of the quality of work done at an institution. UWA currently produces fewer than 10 such articles each year and I am confident we can do more here.

A further 20% of the score is given by volume of total publications by each university, and the final 10% is a score that moderates the overall score according to the size of each university as measured by number of academic staff, so that small institutions are not too disadvantaged over large institutions.

In recent years, along with many other ranking systems, the ARWU has branched out and now produces a number of field and discipline rankings (mostly in the hard sciences), with the scores for these rankings based on the percentage of papers published in top 20% journals in the field or discipline.

UWA is currently ranked 26th in the world in the field of Life and Agricultural Sciences, between 51-75 in Medicine, and between 76-100 in Chemistry. These results are outstanding, and the position of 26th in the world in Life and Agricultural Sciences is the highest ranked position of any Australian university in any subject area.

We are very proud of our researchers and confident that we can build on these strengths as we move towards our longer-term goal of getting into the Top 50 Universities worldwide by 2050.



Work experience students Jenny Lai and Isabel Lim tracking movement of earth mites.

Work experience students warm up to bugs and science at UWA

Associate Professor Christian Nansen
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As part of a week-long work experience at UWA, two Year 10 students from Shenton College, Jenny Lai and Isabel Lim, participated in field work and conducted laboratory tests on the strength of mite-killing substances (miticides). "We think it is important to open our doors to high school students, so that they can learn about research methods and about the importance of biology and ecology in development of good practices regarding food production in WA," says Associate Professor Christian Nansen, the recently appointed GRDC-funded applied entomologist at the UWA Institute of Agriculture who mentored Jenny and Isabel during their work experience.

"On the first day, we went to a field site in York where we used a reversed leaf blower to sample red-legged earth mites from weeds in a canola field trial," says Jenni. "We transferred the mites to vials and brought them back to the laboratory, as we wanted to study their behaviour with a video-based tracking system."

By taking the students to an actual field site, rear their own mite colonies in the laboratory, and obtain hands-on experience with actual behavioral data collection, Jenni and Isabel developed an understanding of what is involved in conducting actual research. Careful labeling of samples, acquiring enough replications to enable statistical analyses, working with both field and laboratory equipment – are just some of the experiences they were exposed to, and Isabel and Jenny agree they'd like to come back for more.

"We placed individual mites on a microscope slide and a computer program is used to calculate their average speed, how far they move, and how often then turn in different directions," explains Isabel. "By studying their behavior under very controlled conditions, it is possible to learn about how the movement of different mite species is affected by their origin and host, and how they react to miticides," says Isabel.

Associate Professor Nansen points out the wider significance of this experience: "The long-term sustainability of food production in WA requires continuous education of students in crop protection, and UWA is highly committed to agricultural capacity building by enlightening students about interesting aspects of food-webs and pest management in agricultural systems."

Science for the Future Festival inspires Indonesia

More than 2000 participants from high schools and universities around Indonesia gathered in Jakarta, Surabaya and Yogyakarta to participate in the 'Science for our Future Festival' 2012, held from 8-13 October.

They included more than 100 gifted and talented mathematics and science students who tackled tough questions close to their heart in a lunch forum with presenters; over 1000 students from 20 high schools who were mesmerised and inspired by the experiments they watched; and approximately 500 academics and young scientists from 30 universities who came to attend a series of young researcher forums.

The forums were opened by His Excellency, Mr Greg Moriarty, Australia's ambassador to Indonesia and UWA Alumni. The key topics revolved around the value of international collaborations for achieving high quality research outcomes; funding research through industry or government partnerships; the changing shape of research and the emergence of interdisciplinary research; challenges of attracting and retaining

research talent; research that drives innovation, informs policy and addresses global challenges.

Leading academics from UWA gave presentations on the main themes for the festival: prevention, diagnosis and treatment of diseases; the importance of restoring and maintaining a balance within natural environments; the need to ensure sustainability of food supplies and the discovery and application of new knowledge about the physical world for the benefit of mankind.

Joined by Professor Sangkot Marzuki (Director - Eijkman Institute and President of the Indonesian Academy of Sciences) and Professor Dr Fedik Rantam (Airlangga University), the presenters again inspired thousands of young students to think about science differently, and imagine the contributions that their commitment to studying

science can make to their own lives, and that of their communities.

The festival succeeded, again, in highlighting the big and important global issues which affect our planet and the need for scientifically literate graduates in all areas of society, to address these global challenges successfully.

The festival - now in its third year, brought together the scientific and academic community in Indonesia, and is highly regarded in both countries, as reflected by the many dignitaries attending the festival gala dinner; including Indonesia's Minister for Education, Professor Muhammad Nuh, who opened the festival gala dinner, and His Excellency Mr Greg Moriarty, Australia's ambassador to Indonesia who represented UWA at the event.



Science for our Future Festival – Young Researchers Forum at the Australian Embassy in Jakarta: (LtoR) Ms Marie Grealy, Australian Embassy in Jakarta; Mr Shaun Wellbourne-Wood (UWA); Prof Barry Marshal, Nobel Laureate in Medicine 2005 (UWA); Prof Tim St Pierre (UWA – Physics); W/Prof Kadambot Siddique (UWA – Institute of Agriculture); W/Prof Brendan Waddell (UWA – Faculty of Science); Prof Carmen Lawrence (UWA – Psychology); Prof Sangkot Marzuki (Director – Eijkman Institute and President of the Indonesian Academy of Sciences).

Agriculture on Youtube

youtube.com

TOPIC	ACCESS FROM
Reducing emissions from Livestock Research program (featuring UWA Future Farm with Prof Phil Vercoe)	http://www.ioa.uwa.edu.au/future-farm-2050/news-and-events/videos
Demonstration farm takes science out of lab and into the paddock (National Adaptation and Mitigation Initiative) featuring UWA Future Farm with W/Prof Graeme Martin, Prof Phil Vercoe, Dr Ken Flower)	http://www.youtube.com/watch?v=TocKk2RsGvg&feature=plcp

Visiting European scientists investigate nitrogen use efficiency of winter cereals

Dr Szilvia Veres Email: szveres@agr.unideb.hu

Nitrogen (N) fertilization is a powerful management tool in increasing grain yield of crops. Cereals which take up and utilise nitrogen efficiently (in grain or silage production) will play an important part in increasing food production at lower costs, reducing carbon footprint and minimising negative environmental impacts. For wheat, the second most important food grain crop in the world, the use efficiency of nitrogenous fertilizers under field conditions is around 30%.

Visiting scientists at the UWA Institute of Agriculture, are working under the supervision of Dr Hossein Khabaz-Saberi and Winthrop Professor Zed Rengel, to characterise a large number of wheat and barley genotypes for N-use efficiency under glass house conditions and in field trials.

Assistant Professor Szilvia Veres from Hungary and Senior Assistant Marko Petek from Croatia, are measuring photosynthetic efficiency as well as studying the interaction between nitrogen and carbon metabolism in different genotypes to assess their N-use efficiency.

In addition, they are exploring possible links between N-use efficiency and genotypic differences in drought tolerance.

"In recent years droughts have become more frequent and more severe as a result of climate change," explains Assistant Professor Veres. "Climate change therefore has a profound influence on the agro-ecological conditions under which farmers need to develop strategies to ensure food security, sustainable management

of natural resources, and farm profitability. The characterisation of genotypic differences (in nitrogen and carbon metabolism) associated with crop development in a variable climate will provide important information for crop breeding programmes in Australia and internationally."

The research is supported by the Hungarian National Eötvös Fellowship, the Croatian Science Foundation and the Grains Research and Development Corporation (GRDC).



(From LtoR) Dr Szilvia Veres, W/Prof Zed Rengel and Dr Marko Petek monitoring their glasshouse trials on N-use efficiency of barley.

Lupin-based health foods to combat one of the world's most costly epidemic?

Ms Ullly Fritsch Email: ully.fritsch@uwa.edu.au

A UWA – EU project has started to research potential medicinal properties and applications of lupin (grain) in order to combat some of the most widely-spread medical conditions, including food allergy, obesity and diabetes.



Dr Jose C. Jimenez-Lopez.

Dr Jose C. Jimenez-Lopez, who has been awarded a Marie-Curie Fellowship to come to the UWA Institute of Agriculture and contribute his expertise to the project, outlines the scope of the project: "Our focus on the molecular aspects of lupin seed proteins examines not only their potential role in diabetes and obesity, it also investigates the connection between a specific class of lupin proteins' and food allergy."

This multi-disciplinary project is led by Winthrop Professor Karam Singh (The UWA Institute of Agriculture and CSIRO Plant Industry) in collaboration with UWA Professor Grant Morahan (Western Australian Institute for Medical Research (WAIMR)), Dr Penelope Smith (The University of Sydney) and Dr Juan D. Alché (EEZ – Spanish Council for Scientific Research).

These scientists from diverse disciplines aim to identify some of the key proteins in the lupin seed storage protein pool (Bconglutins), their molecular role and potential to increase insulin sensitivity and/or reduce appetite, and get insights about molecular aspects that Bconglutins play in food allergies.

The project builds on the results of the research work recently published (Foley et al. 2011, BMC Plant Biology 11:59) by Professor Karam Singh and colleagues through the identification and characterization of the different genes that constitute the four major families of lupin seed proteins, as part of the Centre for Food and Genomic Medicine (CFGM).

Dr Jimenez-Lopez believes that the results from this 3-year-project will have the potential to generate significant economic, social, environmental, health, and nutrition benefits in the longer term by helping design alternative lupin-enriched health foods and reducing the millions of dollars currently being spent on one of the world's most costly epidemic. In addition, findings may also help develop patented allergy diagnosis kits and allergy vaccines, and in breeding lupin lines with reduced levels of allergenic proteins.

The project is funded by the European Marie Curie research program FP7-Pleople-2011-IOF.

Book launch provides 'live insights' on 60 years WA agricultural history



(From LtoR) Prof David Lindsay, Dr Dick Lefroy and W/Prof Kadambot Siddique at the launch of "A Twentieth Century Shepherd; the letters of EHB Lefroy" at the University Club, 5 September 2012.

Courtesy Farm Weekly

On 5 September, six decades of WA agricultural history came to life in a new book, launched by Emeritus Professor David Lindsay, at The University of Western Australia.

The book "A Twentieth Century Shepherd; the letters of EHB Lefroy" represents a small selection of the correspondence of EHB (Ted) Lefroy, written during the time he was farming at Cranmore near Moora from 1909 until his death in 1969.

In launching the book at a gathering of family, colleagues and friends, Professor David Lindsay noted that the collection provided a slice of what was arguably the most important fifty years in the history of agriculture in WA, covering not only the struggle to understand and adapt to a harsh environment but also providing insight into the social, economic and political history of the times, written not from memory but by someone "in the middle of the fray."

The many boxes of correspondence were only discovered forty years after Ted's death. His son Dick Lefroy took on the task of editing the eclectic collection ranging from mundane items such as supply lists to exchanges with academics on practical genetics and the role of science in society. Most of the correspondence however was with fellow farmers and merino breeders on the trials of farming and the application of science to the improvement of Merino sheep.

In his will, Ted made a bequest to the Institute of Agriculture for "research into the breeding and care of Merino sheep in Western Australia". Since that time the EHB Lefroy Fellowship has supported postgraduate research on reproductive physiology, clover disease, mating behaviour, plant animal interactions and rumen microbiology.

The launch was hosted by Winthrop Professor Kadambot Siddique, Director of the UWA Institute of Agriculture, and attended by 18 of Ted's grandchildren and great-grandchildren, including brothers and UWA agriculture graduates Ted (1974) and Rod (1976).

"A Twentieth Century Shepherd; the letter s of EHB Lefroy" published by Hesperian Press, is available from Dr RB Lefroy, 5 Edwyna Street Mosman Park 6012, RRP \$25 P&H \$8.



IOA display at Dowerin Field Days.

UWA has finger on pulse(s) at Dowerin Field Days 2012

Ms Ully Fritsch Email: ully.fritsch@uwa.edu.au

A large and diverse audience flocked to the UWA Institute of Agriculture's (IOA) display at the Dowerin Field Days 2012. IOA scientists, students and staff were on hand to answer a wide range of questions regarding new crops (quinoa), nutrition, plant breeding programs, climate change, greenhouse gas emissions and the carbon trading scheme, and sustainable farming practices.

Assistant Professor Jon Clements, a researcher from UWA's International Centre for Plant Breeding Education and Research (ICPBER), was in high demand for his knowledge and expertise in legumes and quinoa: "I was surprised by the number of farmers who asked my advice about putting in a crop of quinoa and/or legumes in the grain belt. Farmers are definitely keen to diversify their crops and spreading their risk; they are informing themselves about new cultivars, new markets and new opportunities, and it is very rewarding to be able to provide them with the facts and data they need in order to make good decisions."

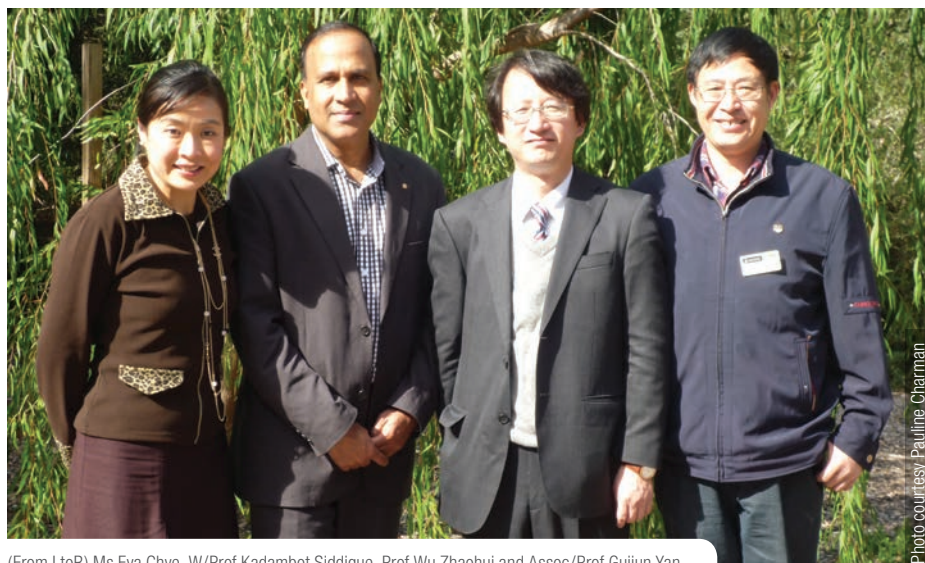
First-year Science student Rachel Asquith provided her perspective about the study of agriculture under UWA's new undergraduate course structure which commenced at the start of the year, while PhD student Max Bergmann could explain about the wide range of opportunities in agriculture at postgraduate level.

A slide presentation enabled visitors to trace the progress made at UWA's Future Farm in Pingelly, as a site for several new research projects (see also page 3) and a site where the insights gained from recent research into animal nutrition and its role in methane emissions are put into practice.

Farmers were not the only group interested in the IOA display: young visitors were drawn by a multitude of squirming soil bugs visible under the microscope, while health-conscious food lovers prized the 'Passion for Pulses' cookbook and tested their knowledge in a pulse seed identification quiz.

"Our display and our team had something to offer for everybody, and that in itself is perhaps one of the most important messages to convey," says IOA Director Winthrop Professor Kadambot Siddique: "Events like the Dowerin Field Days, establish and strengthen relationships between scientists, growers, community and industry; and such interaction is vital for sustaining productive agriculture in the coming decades."

UWA to join “Three Brothers” research partnership with China



(From LtoR) Ms Eva Chye, W/Prof Kadambot Siddique, Prof Wu Zhaohui and Assoc/Prof Guijun Yan.

Photo courtesy Pauline Charman

Ms Bronwyn Aitken Email: bronwyn.aitken@uwa.edu.au

The UWA Institute of Agriculture is set to collaborate with long-time research partner Zhejiang University and new partner Tarim University, under the umbrella of the ‘Three-Brothers’ initiative.

Professor Wu Zhaohui, Vice President (Research) at Zhejiang University, spent a week at UWA in August as a participant of the Go8-C9 Executive Shadowing Program where he shadowed Professor Robyn Owens, Deputy Vice-Chancellor (Research). During his visit he met with Winthrop Professor Kadambot Siddique, Associate Professor Guijun Yan and Assistant Professor Michael Considine to discuss the possibility of developing the ‘Three Brothers’ initiative with The UWA Institute of Agriculture.

The ‘Three-Brothers’ program was founded by the Ministry of Education in China in 2005 with the aim of supporting tripartite relationships between high-performing foreign universities, elite Chinese universities and emerging Chinese universities based in the Western Provinces of China.

Two of the most well-known tripartite relationships were formed between New Zealand’s Massey University, Peking University and Shihezi University in 2008, and New Zealand’s Lincoln University, China’s Zhejiang University and Guizhou University in 2010.

The meeting with Professor Wu was very productive and it was agreed that UWA would join the project to collaborate on research areas of common interest, which will include the exchange of researchers from each institution to participate in academic visits to each partner.

“The program will provide opportunities for joint research and publications, high-level staff exchanges, joint training and the exchange of PhD and Masters students,” said Winthrop Professor Kadambot Siddique, Director of The UWA Institute of Agriculture.

The field research will take place at Tarim University in Southern Xinjiang as its location is unique. Xinjiang Province owns typical desert arid oasis agriculture with abundant light and heat resources conducive to the development of agricultural facilities and horticulture. Tarim University also focuses on resource conservation; breeding of new varieties such as date, pear and walnut; fruit and vegetable cultivation and new technology integration for the ‘Xinjing Jujube Garden’: a National Science and Technology Support Project funded by the Chinese government.

Further discussions and information exchanges have since commenced and an agreed framework and common focus will be developed in detail when UWA hosts Professors from Zhejiang University and Tarim University in November.

UWA’s International Relations (North and Southeast Asia) office initiated the dialogue between Professor Wu and the UWA Institute of Agriculture as a way of broadening UWA’s relationship with the Zhejiang University.

“Zhejiang University is a long-term partner and friend of UWA, with joint research and education links across a number of faculties. The “Three Brothers” collaboration will serve to enrich and expand our international links with China,” said Eva Chye, Principal Adviser – International Relations (North and Southeast Asia).

Renowned UWA Agricultural Scientist honoured with China’s highest award

Winthrop Professor Neil Turner from IOA recently received China’s highest award for ‘foreign experts who have made outstanding contributions to the country’s economic and social progress’.

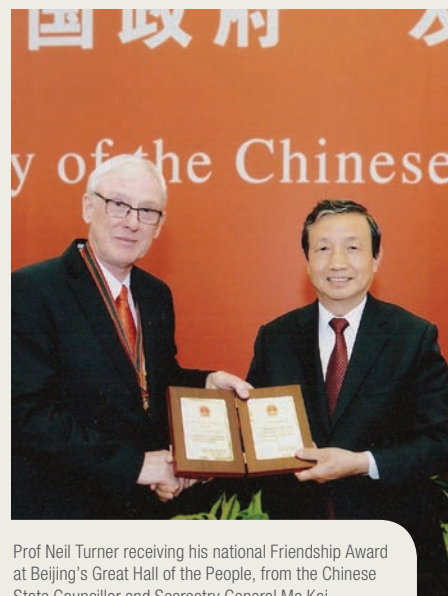
The prestigious national Friendship Award recognises the outstanding contribution and service Professor Turner has made to the joint UWA and Lanzhou University (LZU) program in Lanzhou.

Professor Turner is one of the world’s leading expert in dryland agriculture and has worked for almost three decades with dryland farmers in Western Australia, which has similar rainfall to the Loess Plateau in China.

For the past five years he has spent one month per year at LZU, and helped farmers increase production and income from the rainfall on their farm, mentored postgraduate students and collaborated with staff at LZU’s Key Laboratory for Grassland and Arid Ecology.

The Australian Academy of Technological Sciences and Engineering (ATSE) Fellow and former Chief Research Scientist at CSIRO acknowledged the work of his colleagues at IOA and at LZU in the successes achieved already. “I look forward to continuing to visit Gansu to assist LZU and to work with farmers to further improve their yields and water use,” he said.

The annual award was established in 1991 and to date, the Chinese government has bestowed the award on 1249 foreign professionals working in industry, agriculture, energy and healthcare.



Prof Neil Turner receiving his national Friendship Award at Beijing’s Great Hall of the People, from the Chinese State Councillor and Secretary General Ma Kai.

Bangladesh Agricultural Scientists visit CLIMA

Professor William Erskine Email: william.erskine@uwa.edu.au

Bangladesh Agricultural Scientists, Dr Md. Rafiqul Islam Mondal (Director General, Bangladesh Agricultural Research Institute, BARI), Dr M. Zainul Abedin (Coordinator in Bangladesh for International Rice Research Institute, IRRI), and Dr. M. Matiur Rahman (Rice-Pulses Project Coordinator, IRRI) visited UWA in connection with the CLIMA ACIAR project: Introduction of short duration pulses into rice-based cropping systems in western Bangladesh. The visitors discussed project progress and possible future collaboration with CLIMA, IOA and the School of Plant Biology. They also visited Murdoch University, CSIRO and the Department of Agriculture and Food, Western Australia (DAFWA). Keen interest was expressed by visitors to develop further collaborations on capacity building of Bangladeshi scientists through short-term training and postgraduate study. During their four day stay (1-4 October, 2012), the visitors saw the grain belt and field trials.



Prof Tanveer Khan (right) explains chickpea field trials at York to visitors (right to left), Dr M Matiur Rahman, Prof William Erskine, Dr M Zainul Abedin and Dr Rafiqul Islam Mondal.



Prof Ben White exploring the sites of Wuhan, the biggest city in central China and home of Huazhong Agricultural University.

Agricultural Economists visit China

Professor Ben White, Professor Michael Burton and Assistant Professor Chunbo Ma from UWA's School of Agricultural and Resource Economics (SARE) and IOA recently visited the College of Economics and Management, Huazhong Agricultural University, China, to develop research collaborations, explore potential joint undergraduate programs, and postgraduate supervision between the two universities.

The visit was hosted by the Dean of the College, Professor Zhang Anlu, and the Deputy Dean, Professor Zhang Chi and coordinated by Professor Yinying Cai.

Professor White presented seminars to college staff and postgraduate students on agric-environmental policy, farm risk measurement and farm input demand. Professor Burton presented a series of three seminars on non-market valuation using choice modelling, covering case studies relating to consumer preferences for GM food and low carbon lamb production, and Assistant Professor Ma presented a seminar on preferences relating to green electricity generation.

The Huazhong postgraduates presented seminars to college staff, students and the visitors on the development of agricultural land; preferences for agriculture-environmental schemes; farmer preferences for canola varieties and consumer preferences for GM free rice.

The above visit is yet another illustration of the ever-strengthening partnerships between UWA and some of China's most prestigious universities. The close ties are also reflected by the steady stream of visitors to and from China: In 2012, close to 70 top students from three Chinese universities participated in a four-week study program at UWA, to explore educational and research opportunities. In November a high-level delegation from Huazhong Agricultural University visited UWA.

Obituary Ralph Owen Slatyer:

16 April 1929 – 26 July 2012

Mr Mike Perry Email: michael.perry@uwa.edu.au



Photo courtesy of Australian Academy of Science

UWA agriculture graduate and Australia's first Chief Scientist, Ralph Owen Slatyer, has died. Born in Melbourne in 1929, Ralph Slatyer grew up in Perth attending Perth Modern School and Wesley College, before completing a Bachelor of Agricultural Science at The University of Western Australia in 1951. He subsequently joined CSIRO and began

a lifetime of work as an eco-climatologist researching the impact of climate and soil on plant production. In 1968 he was appointed as foundation professor at The Australian National University's new Research School of Biological Sciences. In 1989 he was appointed by then Prime Minister Bob Hawke as Australia's first Chief Scientist and in this role he was responsible for the development of the Co-operative Research Centre program that continues to this day. He undertook many national science-leadership roles including chairman of the World Heritage Committee, Australia's ambassador to UNESCO, chairman of the Australian Science and Technology Council, and chairman of the Prime Minister's Science Council. He was awarded an honorary Doctor of Science degree by The University of Western Australia in 1960, and was a member of the Royal Society, and the US National Academy of Sciences. Ralph Slatyer was one of UWA's most distinguished agricultural science graduates.

Symposium brings leading Soil Scientists to UWA



(LtoR) Mr Andrew Beveridge (CRC CARE); W/Prof Kadambot Siddique; Prof Ravi Naidu; W/Prof Lyn Abbott; Prof Don Sparks and Prof Nanthi Bolan.

A symposium focusing on the role of soil in achieving agricultural productivity gains brought six renowned agricultural scientists together at UWA on 12 November 2012, where they shared their knowledge with over fifty participants.

The Symposium was co-hosted by the UWA Institute of Agriculture (IOA) and the Cooperative Research Centre for Contamination Assessment and Remediation of the Environment (CRC CARE). Presenters comprised Professor Ravi Naidu, Managing Director, CRC CARE, and Director of the Australian Research Centre for Environmental Risk Assessment and Remediation (CERAR); Professor Don Sparks, S. Hallock du Pont Chair in Plant and Soil Sciences at the University of Delaware, USA; Winthrop Professor Lyn Abbott, IOA; Professor Gary Pierzynski, Professor of Soil and Environmental Chemistry, Kansas State University, USA; Winthrop Professor Kadambot Siddique, Hackett Professor of Agriculture Chair and Director, IOA; Professor Nanthi Bolan, Research Chair of Environmental Science, University of South Australia.

The speakers addressed a wide range of issues and challenges, including soil carbon storage, environmental sustainability, soil ecosystem services and biological aspects of soil health, in relation to food security.

The audience responded well to the message that soil health is a prerequisite for sustainable agricultural production and that science, technology and innovation all offer valuable tools to support Australian farmers in maintaining and developing healthy soils.

The presentations can be accessed via http://www.crccare.com/education/training/soil_health.html.



W/Prof Lyn Abbott with students during her visit to Kerala Agricultural University.

Collaboration in climate change education: an ongoing success story

Winthrop Professor Lyn Abbott Email: lynette.abbott@uwa.edu.au

The collaboration between UWA and one of India's top 50 universities, Kerala Agricultural University (KAU) has gone from strength to strength in the Integrated Masters program (3 plus 2) 'Climate Change Adaptation and Mitigation' which was developed following an MoU between the two universities in 2008.

Now in its third year, the course has attracted hundreds of applicants annually, of whom 20 high-performing candidates are accepted for admission.

In September, Lyn Abbott, Professor at UWA's School of Earth and Environment and IOA, travelled to Kerala to meet with scientists and students from KAU and Kerala Veterinary and Animal Sciences University (KVASU) and to deliver a series of 12 lectures on 'Organic Agriculture and Soil Health' to the second cohort of first-year students.

Her lectures form part of IOA's ongoing education outreach commitment with KAU while the lecture contents reflect Kerala's commitment to the organic farming policy first adopted by the previous State Government.

"It is inspiring to see the students' level of interest and enthusiasm for this course," said Professor Abbott, "and I have every confidence that the education they receive at KAU in collaboration with UWA, will serve them well in addressing the challenges of food production in a changing climate."

Colombian agricultural conference sparks new collaboration (between UWA and the University of Antioquia)

Associate Professor Dominique Blache
Email: dominique.blache@uwa.edu.au

In July this year, The Faculty of Ciencias Agrarias (Faculty of Agricultural Sciences) of the University of Antioquia, Medellin, Colombia, celebrated its 50-year anniversary. The main event at the celebration was a two-day international conference on 'Perspectives for the Colombian Agricultural Sector in Relation to Globalization'. Speakers from countries including Japan, the USA, Australia and Brazil debated the impact of globalization and international trade regulations on

all aspects of agricultural production. Associate Professor Dominique Blache, from UWA's School of Animal Biology and IOA, gave an invited plenary presentation on 'Global Trade and Animal Ethics and Welfare' to an audience of more than 450 academics, undergraduate and postgraduate students, representatives of industry associations and livestock producers from all over Colombia.

Professor Blache's trip was supported by ICETEX (www.icetex.gov.co), a governmental organisation that enhances educational initiatives.

As part of his visit, Associate Professor Blache

also conducted a one-day intensive course on Animal Ethics and Welfare for postgraduate students at the Faculty of Agricultural Sciences, which comprises 80 academics and about 1000 undergraduate and postgraduate students.

"I see my visit as the first step towards the establishment of a long-lasting collaboration between UWA and the University of Antioquia, says Associate Professor Blache. "Already several academics, such as Professor Tatiana Ruiz-Cortez who is teaching Animal Biology and Reproduction, have expressed an interest to spend their next sabbatical at the UWA Institute of Agriculture."

UWA Institute of Agriculture's performance under review



(From LtoR) front: W/Prof John Dell; Mr Robert Roche; back: Dr Julian Hill; Dr Jeremy Burdon

This year marked the fifth anniversary since the re-establishment of the UWA Institute of Agriculture in March 2007, and in line with UWA policy, an external review was conducted over three days in late October to assess IOA's performance and to assist with the Institute's future directions.

The Review panel comprised Winthrop Professor John Dell (Chair), Dean, Faculty of Engineering, Computing and Mathematics, UWA; Dr Jeremy Burdon, Chief, CSIRO Division of Plant Industry; Dr Julian Hill, Ternes Agricultural Consulting Pty Ltd; and Mr Robert Roche (Executive Officer), Research Services, UWA.

The panel interviewed a cross-section of external stakeholders, wider university members, IOA Executives, the External Advisory Board, Program Leaders, staff and postgraduate students. The review panel will report their recommendations in the near future.

Obituary Peter Alan Portmann 27/10/1947 – 21/7/2012

Professor William Erskine Email: william.erskine@uwa.edu.au

Peter Portmann joined the Department of Agriculture and Food, Western Australia (DAFWA), as a Plant Breeder responsible for barley and oat breeding in 1969 on completing his Bachelor of Agricultural Science in Adelaide. He was responsible for barley breeding at DAFWA until 1991. In this period he formed a major productive partnership with Professor Rodger Boyd at The University of Western Australia (UWA). Rodger was a plant breeder in the then Agriculture Faculty, also working on barley. Between them they set up a complementary relationship with Peter in the Department focusing on the production of new barley varieties, while Rodger worked on barley germplasm enhancement, passing to the Department improved genetic resources incorporating adaptation traits including disease resistance etc.

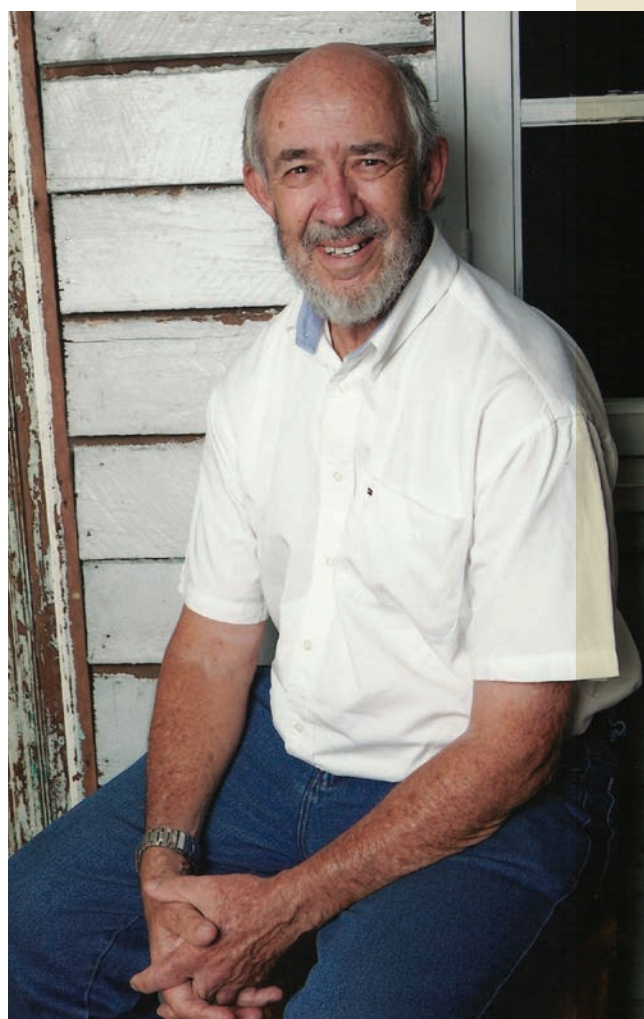
Peter was a successful breeder contributing to the release of 25 barley and oat varieties, many of which have been the foundation of the oat milling and barley malting industries. Peter will also be remembered for his development of automation and computer systems which dramatically increased the operational capability of the DAFWA plant breeding programs. Many of his innovations continue to be used throughout Australia today. Peter's dynamic leadership helped develop the

DAFWA plant breeding team to become world class.

Peter was ahead of his times. Way back in the early 1990s he began exploring the prospect of developing plant breeding programs that were run on a business model independent of the constraints of public funding. Twenty years later, we now see this process happening all over Australia.

Over the years Peter completed several consultancies abroad: Iraq in 1982, Botswana and Zambia in 1987, and at ICARDA, Aleppo in 1992. On the basis of these experiences he was well-placed for his second major role with the University of Western Australia - to be Course Leader in AusAID-funded courses for Iraqi breeders - Crop Improvement for Iraq – Theory and Practice conducted by the International Centre for Plant Breeding Education and Research (ICPBER) over five weeks in 2010 and again in 2011. Both courses were a great success and Peter's patience, raconteur style and sense of fun were extremely well received by the Iraqi students. Peter also undertook a review of UWA's involvement in barley germplasm enhancement over the years and made some solid recommendations for the future.

Peter died in July 2012 after a short illness.



Dr John P. Hammond

Dr Hammond has recently arrived from the UK to commence his appointment as an ARC Future Fellow, at UWA's School of Plant Biology.



As part of a project funded by the UK Department for the Environment, Food and Rural Affairs (DEFRA), Dr Hammond has managed fertiliser trials in horticultural and broad-acre crops, generating data for new fertiliser recommendations and crop-fertiliser response models. Through DEFRA-funded projects he has also investigated novel fertilisers based on struvite, a phosphate-rich mineral recovered from sewage, and on fertiliser placement, which is not widely used in the UK.

At the catchment scale, Dr Hammond developed an empirical model to apportion the sources of phosphate in UK rivers and lakes. This work identified phosphate losses from sewage and agriculture as the main sources of phosphate in these systems, where excess phosphate is a major pollution concern.

As part of Dr Hammond's fellowship, he will be continuing his work into understanding the genetic regulation of plant adaptations to low Phosphorus (P) availability. In this field, Dr Hammond has identified genes and genetic markers in Brassicas and potato important for plant adaptations to low phosphate availability.

Dr Hammond is also keen to continue work into other aspects of plant nutrition, including optimising crop management practices and fertiliser requirements for optimal yield and quality and identify optimal root architectural traits for improved acquisition of P.

New postgraduate students (since July 2012)

STUDENT NAME	TOPIC	SCHOOL	SUPERVISOR(S)	FUNDING BODY
PhD				
Ms Rushna Munir	Chickpea (<i>Cicer arietinum</i> L.) responses and adaptation to waterlogging stress	Plant Biology & IOA	W/Prof Tim Colmer, W/Prof Kadambot Siddique	UWA Pakistan Flood Reconstruction Scholarship
Ms Monica Kehoe	Unraveling the cause of black pod disease of narrow-leaved lupin and developing a control solution	Plant Biology & IOA	Prof Roger Jones, Adj/Assoc/Prof Bevan Buirchell	ARC Studentship GRDC Studentship Top Up
Ms Brenda Coutts	Studies on the epidemiology and control of virus disease of oilseeds, legumes and vegetables in WA	Plant Biology & IOA	Prof Roger Jones, Prof Martin Barbetti	DAFWA
Ms Eviness Nyalugwe	Understanding resistance phenotypes to oilseed Brassica viruses: strain specificity, inheritance, field deployment and usefulness	Plant Biology & IOA	Prof Roger Jones, Prof Martin Barbetti	UWA SIRF
Mrs Hoai-An Nguyen	Developmental analysis of transformation in the legume narrow-leaf lupin	Plant Biology, ICPBER & IOA	Assoc/Prof Susan Barker Prof William Erskine	AusAID
Ms Leila Heidarvand	Genetic characterization of Mn Tolerance in Wheat genotypes	Earth & Environment & IOA	W/Prof Zed Rengel, Asst/Prof Hossein Khabaz-Saberi	University International Stipend
Ms Qiu Xiaoyan	Molecular endocrinology of stress hormones	Animal Biology & IOA	Assoc/Prof Dominique Blache, Res/Prof Shimin Liu, W/Prof Graeme Martin	University International Stipend
MASTER OF SCIENCE	TOPIC	SCHOOL	SUPERVISOR/S	FUNDING BODY
Mr Luis De Almeida	Screening common beans (<i>Phaseolus vulgaris</i>) for cold tolerance	Plant Biology, CLIMA & IOA	Asst/Prof Jon Clements, Prof William Erskine	John Allwright Scholarship from ACIAR
Mr Najeeb Hamed Alharbi	Water use efficiency and drought tolerance of common bean under cool temperatures	Plant Biology, CLIMA & IOA	Asst/Prof Jon Clements, Prof William Erskine	Government Kingdom of Saudi Arabia
Ms Tadhamin Ailewe	Evaluation of tolerance of different legume species to waterlogging stress	Plant Biology, CLIMA & IOA	Prof William Erskine, Dr Imran Malik	AusAID

New research funded projects

TITLE	FUNDING PERIOD	FUNDING BODY	SUPERVISORS
Farming in a biodiversity hotspot – harnessing native plants to reduce deleterious off-site phosphorus flows	2012 - 2014	ARC Linkage Project	W/Prof Hans Lambers, Assoc/Prof Megan Ryan, Prof Edward Barrett-Lennard, A/Prof Philip Brookes, Prof Mark Tibbett
Unleashing the power of genomics for lupin marker development and crop improvement	2011 – 2013	GRDC	Assoc/Prof Matthew Nelson, W/Prof Karam Singh, Dr William Erskine, Asst/Prof Jonathan Anderson
Mitigating the greenhouse gas potential of Australian soils amended with livestock manure	2012 - 2014	Australian Pork Limited (APL) ex DAFF Carbon Farming Futures – Filling the Research Gap	Dr Sasha Jenkins
Managing soil-borne diseases with a focus on rhizoctonia	2012-2013	GRDC	Mr William McLeod Prof Martin Barbetti
Long term no till farming systems	2012	GRDC	Asst/Prof Ken Flower, Dr David Minkey
Investigating the effects of stock handling training in sheep feedlots	2013-2014	Meat & Livestock Australia Research Program	Dr Samantha Bickell

Current and upcoming visitors to IOA

VISITOR	VISITORS' ORGANISATION, COUNTRY	HOST DETAILS/PURPOSE	DATES
Prof Scott Jeffrey	University of Alberta, Canada	SARE and CEEP	Jul 2012 – May 2013
Miss Nina Christiansen	University of Southern Denmark, visiting PhD student	W/Prof Tim Colmer	Sep 2012 – Jan 2013
Mr Dennis Konnerup	Aarhus University, Denmark, Danish postdoc fellowship	W/Prof Tim Colmer	Jul 2012 – Jul 2014
Dr Guiyan Chu	China Agricultural University, Beijing	W/Prof Graeme Martin, Res/Prof Shimin Liu	Sept- Dec 2012
Ms Kristin Fischer	Julius Kühn Institute, Germany, visiting PhD student	Assoc/Prof Matthew Nelson	11 Oct – 20 Dec 2012
Mr Naghmeh Besharat	Wageningen University, The Netherlands, visiting Masters student	Assoc/Prof Matthew Nelson	31 Aug – 15 Jan 2013
Ms Liselotte Jelsma	Visiting Masters student – Wageningen University, Netherlands	Asst/Prof Marit Kragt	Sep 2012 – Mar 2013
Ms Clara Gómez Paccard	Universidad Politécnica de Madrid, Spain, visiting PhD student	W/Prof Lyn Abbott Dr Zakaria Solaiman	Oct 2012 – Jan 2013
W/Prof Christine Foyer	University of Leeds	Asst/Prof Michael Considine	3-7 Dec 2012

Research & Industry Recognition

NAME	AWARD
W/Prof David Pannell	Elected Fellow to the Australian Academy of Social Sciences
W/Prof Stephen Powles and W/Prof Hans Lambers	Finalists for the WA Scientist of the Year 2012 award
W/Prof Neill Turner	Friendship award (see also page 12)
Dr Muhammad Farooq	Return Fellowship from Alexander von Humboldt Foundation, Germany
Emeritus Prof Walter Stern	Inaugural Fellowship awarded by the Australian Society of Agronomy (ASA) for contributions to agronomy, and to support the careers of Fellows.
W/Prof Kadambot Siddique	WA Finalist for Australian of the Year Award 2013

UWA IOA Publications 2012 (July- November)

Refereed journals

- Abaasa E, Hill PW, Roberts P, Murphy, DV and Jones DL (2012). Microbial activity differentially regulates the vertical mobility of nitrogen compounds in soil. *Soil Biology and Biochemistry* **53**: 120–123.
- Adhikari KN, Edwards OR, Wang S, Ridsill-Smith TJ and Buirchell B (2012). The role of alkaloids in conferring aphid resistance in yellow lupin (*Lupinus luteus* L.). *Crop and Pasture Science* **63**: 444–451.
- Anderson WK, Flower KC and Siddique KHM (2012). Yield and soil improvement in rainfed crop production. *Indian Journal of Agronomy* **57**: 209–216.
- Aryamanesh N, Byrne O, Hardie DC, Khan T, Siddique KHM and Yan G (2012). Large-scale density-based screening for pea weevil resistance in advanced backcross lines derived from cultivated field pea (*Pisum sativum*) and *Pisum fulvum*. *Crop and Pasture Science* **63**: 612–61.
- Banning NC, Lalor BM, Cookson WR, Grigg AH and Murphy DV (2012). Analysis of soil microbial community level physiological profiles in native and post-mining rehabilitation forest: which substrates discriminate? *Applied Soil Ecology* **56**: 27–34.
- Bashir MK, Schilizzi S and Pandit R (2012). Are the determinants of food insecurity for landless households different from that of other rural households? Pakistan *Journal of Agricultural Science* **49** (3): 393–400.
- Beausoleil NJ, Blache D, Stafford KJ, Mellor DJ and Noble ADL (2012). Selection for temperament in sheep: domain-general and context-specific traits. *Applied Animal Behaviour Science* **139**: 74–85.
- Beltran JC, Pannell DJ, Doole GJ and White B (2012). A bioeconomic model for analysis of integrated weed management strategies for annual barnyardgrass (*Echinochloa crus-galli* complex) in Philippine rice farming systems. *Agricultural Systems* **112** (1): 1–10.
- Beltran JC, Pannell DJ, Doole GJ and White B (2012). Economic implications of herbicide resistance and high labour costs for management of annual barnyardgrass (*Echinochloa crus-galli* complex) in Philippine rice farming systems. *Crop Protection* **31**: 31–39.
- Bennett RG, Colmer TD, Real D, Renton M and Ryan MH (2012). Phenotypic variation for productivity and drought tolerance is widespread in germplasm collections of Australian Cullen species. *Crop and Pasture Science* **63**: 656–671.
- Busi R, Gaines TA, Walsh MJ and Powles SB (2012). Understanding the potential for resistance evolution to the new herbicide pyroxasulfone: field selection at high doses versus recurrent selection at low doses. *Weed Research* **52**: 489–499.
- Chalak M and Pannell DJ (2012). Optimising control of an agricultural weed in sheep-production pastures. *Agricultural Systems* **109**: 1–8.
- Clipson N and Gleeson DB (2012) Fungal biogeochemistry: a central role in the environmental fate of lead. *Current Biology* **22** (3): R82–R84.
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- Dajadi, Abbott, LK and Hinz C. (2012). Synergistic impacts of clay and organic matter on structural and biological properties of a sandy soil. *Geoderma* **183–184**: 19–24.
- Doole G and Pannell DJ (2012). Empirical evaluation of nonpoint pollution policies under agent heterogeneity: regulating intensive dairy production in the Waikato region of New Zealand. *Australian Journal of Agricultural and Resource Economics* **56** (1): 82–101.
- Du Y-L, Wang Z-Y, Fan J-W, Turner NC, Wang T and Li F-M (2012). -Aminobutyric acid increases abscisic acid accumulation and desiccation tolerance and decreases water use but fails to improve grain yield in two spring cultivars under soil drying. *Journal of Experimental Botany* **63** (2): 695–709.
- Durmic Z and Blache D (2012). Bioactive plants and plant products: Effects on animal function, health and welfare. *Animal Feed Science and Technology* **176**: 150–162.
- Fang X, Kuo J, You MP, Finnegan PM and Barbetti MJ (2012). Comparative root colonisation of strawberry cultivars Camarosa and Festival by *Fusarium oxysporum* f. sp. *Fragariae*. *Plant and Soil* **358**: 75–89.
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- Glanville HC, Hill PW, Maccarone LD, Golyshin P, Murphy DV and Jones DL (2012). Temperature and water controls on vegetation emergence, microbial dynamics, and soil carbon and nitrogen fluxes in a high Arctic tundra ecosystem. *Functional Ecology* DOI: 10.1111/j.1365-2435.2012.02056.x
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- Hawken PA, Luckins N, Tilbrook AJ, Martin GB and Blache D (2012). Genetic selection for temperament affects behaviour and the secretion of adrenal and reproductive hormones in sheep subjected to stress. *Stress*. (Published on-line 7 May 2012) DOI: 10.3109/10253890.2012.690114.
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Book Chapters

Cheema ZA, Farooq M and Khaliq A (2012). Application of Allelopathy in Crop Production: Success Story from Pakistan. In: Cheema ZA, Farooq M and Wahid A (Eds). *Allelopathy: Current Trends and Future Applications*. Springer-Verlag, Heidelberg 69121, Germany, pp. 113–144.

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Books

Cheema ZA, Farooq M and Wahid A (Eds) (2012). *Allelopathy: Current Trends and Future Applications*. Springer, Heidelberg, Germany ISBN 978-3-642-30594-8.

UPCOMING MEETINGS AND EVENTS

International Conference

Global Herbicide Resistance Challenge
18 – 22 February 2013
Perth, Australia
www.herbicideresistanceconference.com.au

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