



THE UNIVERSITY OF
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The UWA Institute of Agriculture

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(LtoR): Mr Ayman Mohsin, Mr Hussein AL Daini, Mr Ahmed Naji Qasim, W/Prof. Kadambot Siddique, H.E. Sheikh Humam Baqir, Mr Faked Al Mohsen, Mr Mahmoud Hasan, Mr Araz Sidqi, Ms Deborah Pyatt

Sheik meets with Iraqi postgraduate students at UWA

As the first three Iraqi students are about to graduate from UWA (two with a Master of Agricultural Science and one student with a Master of Food Science), they were honoured with an invitation to meet with His Excellency Sheikh Humam Baqir Hamoudi, Chairman of the Foreign Affairs Committee of the Council of Representatives of Iraq, during his recent visit to UWA.

The sheik led a delegation of senior executives to meet with Winthrop Professors Paul Johnson, (Vice-Chancellor, UWA), Kadambot Siddique, (Director, IOA and Hackett Professor of Agriculture Chair, UWA), Mr Mark Stickells (Deputy Director, Energy and Minerals Institute, UWA) and Ms Deborah Pyatt (Manager International Sponsored Student Unit, UWA).

The visit was facilitated by the strong links between The UWA Institute of Agriculture and the Iraqi Ministry of Agriculture: "Thanks to funding support from AusAID and ACIAR, UWA currently provides English language training and postgraduate studies in agriculture and related areas for 14 Iraqi Ministry of Agriculture staff,"

said Professor Siddique, "and over the past five years we have also delivered five training courses to Ministry staff (*Integrated Plant Disease Management, Soil Fertility and Land Management in Iraq, Crop Improvement for Iraq* – twice – and *Use of GIS in Iraq*)." IOA's involvement in two projects in Iraq ('*Development of Conservation Cropping in the Drylands of Northern Iraq*' and '*The Iraq Salinity Project*') in partnership with ICARDA (Syria) has further strengthened the relationship.

Mr Fahad Almohsen and Mr Ahmed Naji were among the students to meet with the Sheik in a relaxed atmosphere. "He broke the traditional journeyman's bread with us – made from rosewater, pistachio and nougat," said Mr Almohsen, "and when he heard that I am about to graduate and return to Iraq he gave me his business card and offered to help me with the transition."

The students emphasised their desire to apply what they have learnt at UWA back home: "When we return to Iraq, we want to work in the field with farmers; we want to advise them and teach them the new technologies like zero tillage," said Mr

Ayman Mohsin. "This is the best contribution we can make to help improve the livelihoods of rural people in Iraq and reduce Iraq's dependence on imported food."

Current total production of major grains in Iraq is estimated to be 50 per cent lower than twenty years ago. Professor Siddique cited poor productivity as a major cause for this decline. "Poor productivity is related to a combination of the lack of widespread availability and use of modern, improved, crop varieties, and also poor crop management practices."

The solution, according to Professor Siddique, lies in enhanced capabilities of Iraqi research programs through joint research and specialised training programs. "The courses and programs UWA is providing to Iraqi scientists and students help them to catch up and to pass on new knowledge," he said. "Their academic achievements speak for themselves and pave the way for redevelopment of Iraq's agricultural sector and for further joint research programs with UWA in agriculture and related areas."



Director's column

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

The past few months have brought an abundance of exciting developments, both for The UWA Institute of Agriculture and for the wider farming community.

The good winter rainfalls in June provided a promising start to the planting season for most WA farmers. However, continued winter rainfall is urgently required if the promise of the good season break is to be realised. The 2012 WA winter planted crop area is estimated at 7.03 million ha with a production forecast (July estimate by the Grains Industry Association of WA) of 11.71 million tonnes – less than the 2011 production of 16.31 million tonnes.

Students in agriculture and related disciplines at UWA have continued to demonstrate excellence both in their academic and industry-related activities: UWA students collected the top three prizes at this year's Young Professionals in Agriculture Awards (cf page 11); the depth of talent at UWA was also evident at the Faculty's Annual Prize-giving ceremony, where 13 students were recognized for their outstanding achievements in agriculture and related areas.

This year's IOA Postgraduate Showcase 'Frontiers in Agriculture' (cf page 4) presented research findings in a wide range of agriculture-related areas and attracted a record audience, who rated the presentations and gave them a big 'thumbs up'.

Our first batch of Iraqi students have just completed their Masters studies in Agriculture at UWA and have done us proud: they are returning home and are inspired and equipped to implement the new knowledge and skills they have learnt to help rebuild the Iraqi agricultural sector.

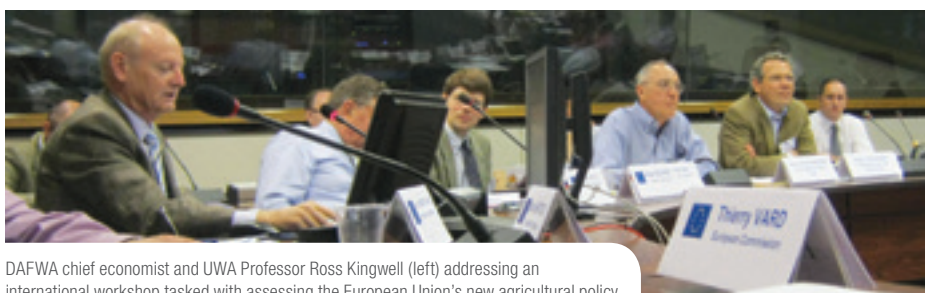
Congratulations from IOA to all the students – domestic and international – on their outstanding achievements!

Student achievements are, of course, also a reflection of the quality of their teachers, and of the guidance, dedication, and support they have received in their learning. We are fortunate to have many outstanding teachers and scientists at UWA, who continue to receive distinctions and awards in recognition of their excellence (cf page 17), and who give generously of their time in the many valuable outreach programs and extension activities for the community at large.

At the Institute level, we are also fortunate to have an outstanding level of expertise and dedication from staff and External Advisory Board members. The Institute welcomes two new members to its External Advisory Board: long-time supporter Mr Rod Birch who will now contribute his expertise to the Board as a grain grower from WA's northern grain belt; and Mr Ben Sudlow, Manager of Fertiliser Sales and Marketing at CSBP. Mr Sudlow replaces Dr Stephen Loss on the Board. On behalf of IOA I would like to thank Dr Loss for his valuable contributions and wish him all the best in his new role at ICARDA in Jordan.

I am also pleased to welcome Mr Mike Perry to the newly created position of IOA Business Manager (cf page 15) and Winthrop Professor Tim Colmer as the new leader of IOA's Plant Production Systems Program. As Professor Colmer will also take on the role of Head of School, Plant Biology, from 2013, the integration of the two roles is set to strengthen further the partnership between IOA and the School of Plant Biology. I would like to thank the outgoing Program Leader, Winthrop Professor Stephen Powles, for his tireless contribution to making this program a success over the past five years.

On a personal note, I am honoured and humbled to have been appointed to the Hackett Professor of Agriculture Chair. I would like to thank Professor Alan Robson for recommending my name, and the Vice-Chancellor and Executive for the confidence and trust placed in me to fill this prestigious position at UWA. I acknowledge many colleagues and friends for their great support and their contributions, and look forward to building upon the successes we have achieved to date in agriculture and related areas at UWA.



DAFWA chief economist and UWA Professor Ross Kingwell (left) addressing an international workshop tasked with assessing the European Union's new agricultural policy

UWA Professor invited to talk on EU policy change

Each year the European Union provides \$55 billion Euros in support of its farmers as part of its Common Agricultural Policy (CAP).

A revised CAP will operate from 2013 onwards and the European Commission (EC) is preparing to assess the impact of the revised CAP. As part of this process, an international two-day workshop was held at EC headquarters in Brussels on 6-7 June 2012, to discuss how farm modelling might be used in assessing the impact of the CAP.

Professor Ross Kingwell (School of Agricultural and Resource Economics, UWA and IOA), also chief economist at the Department of Agriculture and Food, WA (DAFWA), addressed attendees from Europe's main research centres and universities engaged in farm modelling, statistical collection and data management.

"The European Union has moved away from price supports towards decoupled payments," Professor Kingwell said. "Rather than receive payments

based on their level of farm production, farmers will receive government payments for provision of environmental and landscape services. Elements of the new CAP, however, are still under review, and the European Commission will use farm modelling to help design and refine their agricultural policies and indicate their likely impacts in different countries and regions in Europe."

Professor Kingwell and Professor James Richardson, from Texas A&M University, were two international experts invited to share their knowledge with 50 other participants.

Professor Kingwell emphasised that the impact of a policy change is determined by a number of factors: "Depending on the nature of the policy change, farm businesses and their environment can be affected differently and some changes can occur quickly or slowly."

Professor Kingwell's address was very well-received, sparking many questions. Many attendees were greatly surprised by the size and nature of farm business operations in Australia and enjoyed seeing Australian examples of the use of farm modelling in policy assessment.

What's new at the UWA Future Farm 2050

ioa.uwa.edu.au/future-farm

Winthrop Professor Graeme Martin (Email: graeme.martin@uwa.edu.au)



Students from John Curtin College of the Arts visiting the UWA Future Farm

With the completion of major infrastructure projects on the UWA Future Farm at Ridgefield, and the development of 5-year budget and business plans, moves to take up the full farming activities are well underway.

It is intended for the Farm Manager, Ms Kristy Robertson, to participate in the cropping program next season and to take increasing responsibility for the management of animals, with the relocation of sheep and goat activities from the Allandale farm to Ridgefield planned to take place at the end of 2012.

But this is not the only change on the horizon: "The current arrangement in which we lease much of Ridgefield to our neighbours, Kane and Rebecca Page, will expire at the end of the 2014 season," says Winthrop Professor Graeme Martin

who carries responsibility for the UWA Future Farm project. "However, from that point on, we expect to be still cooperating with the Pages as we continue the development of the Future Farm project and its range of activities in mainstream agriculture and in ecosystem management".

The Allandale cashmere goat herd, home of the best cashmere genes in Australia, will migrate to Ridgefield during 2012. Although cashmere is a tiny industry in Australia, it has an important function at UWA: "UWA is custodian of the genetic diversity," explains Professor Martin, "and the goat herd offers a range of advantages in terms of enterprise diversity (meat, fibre), in terms of farm management (weed control), and with respect to attraction of international research students from countries where goats are far more important than sheep."

The internationally celebrated Allandale Temperament Flock will also migrate to Ridgefield as 2012 progresses. "This flock is a major national research resource," says Professor Martin. "It represents the result of more than 20 years of genetic selection and is critical for a range of PhD projects. It attracts national funding and international collaborators."

Besides the plans surrounding cropping and livestock at the UWA Future Farm, there have been further developments of the Ridgefield infrastructure: "Construction has begun on a large graded-catchment dam in the north-west corner of the farm," says Professor Martin. "The dam is designed to contain sufficient water for all stock for two years, based on worst 2-in-100 rainfall events, and it should be completed in time to collect water during the 2012 winter rains."

The ALVA House (see also IOA News, April 2012 edition, page 2) is set to be ready for occupancy by the farm manager shortly. The final step yet to be completed is landscaping, which is managed by the Faculty of Architecture, Landscape and Visual Arts (ALVA) and on track to be completed in time for spring.

In addition to these activities, Professor Martin and his team have made time to start an active Outreach Program for secondary school students: "Under the '*City Kids Come to the Country*' High School Science Project, students are participating in the ecosystem restoration program on the farm in July and August, planting trees that they have nurtured in their schools."

Further planned outreach activities on the UWA Future Farm include a visit from PICSE students in December as part of their orientation to Natural and Agricultural Sciences – Opportunities, degrees, research and careers. International students from the Ngee Ann Polytechnic (Singapore), the North West Agriculture and Forestry University (China) and the South China Agricultural University will also visit in August and September.

Agriculture on Youtube

www.youtube.com

TOPIC	ACCESS FROM
Preserving glyphosate through diversity (AHRI)	www.ahri.uwa.edu.au/AHRI-Videos-2012
Sustaining herbicides with harvest weed seed management (AHRI)	www.ahri.uwa.edu.au/AHRI-Videos-2012
National Soil Quality Project	Youtube search function, keywords 'GRDC Soil Biology'

IOA Postgraduate Showcase 2012 – a smorgasboard of excellence in research

Ms Lindy Brophy (Email: lindy.brophy@uwa.edu.au)

Climate change, biochar, bread quality, nutrition for alpacas and the role of farmer groups could hardly be more diverse subjects, and yet they illustrate the huge range of research being done within IOA.

Selected PhD candidates from four Schools within the Faculty of Natural and Agricultural Sciences highlighted their research in June at the UWA Institute of Agriculture 2012 “Frontiers in Agriculture” postgraduate showcase. The showcase was attended by over 85 people representing the agricultural industry, collaborating organisations, academics, media and students.

Institute Director Winthrop Professor Kadambot Siddique said research and teaching related to agriculture assumed an ever-increasing importance in the quest to feed a growing world population and the need to be environmentally sustainable in the face of dwindling natural resources and climate change.

“The Institute works with the agricultural and natural resource management sector to improve workforce skills, and to generate new knowledge which will assist industry stakeholders, underpin local and regional prosperity, and exercise responsible stewardship of the environment,” he said.

Eight postgraduate students presented their research at this year’s forum.

Animal Biology researcher Kirrin Lund encountered alpacas during her fourth year research project on the animals’ energy metabolism and behaviour. She moved on to a PhD with some unanswered questions from that project. Nearing the end of her research, she has found some of those answers – and acquired two alpacas of her own. Kirrin was supported by the Rural Industries Research and Development Corporation; her supervisors are Associate Professors Dominique Blache, John Milton and Professor Shane Maloney.

Indonesian-born Annisa developed an interest in genetics during high school but a reluctance to dissect animals led her to plant genetics. The Plant Biology researcher presented her findings on heat tolerance in *Brassica rapa*, a species cultivated as a leaf vegetable, a root vegetable and an oilseed. Annisa has an AusAID scholarship and her work is part of an ARC Linkage project. She is supervised by Winthrop Professors Wallace Cowling and Neil Turner and Dr Sheng Chen.

Also in Plant Biology, Mechelle Owen, who grew up on an orchard in Carmel and a farm in York, has been researching herbicide resistance in the



The Postgraduate showcase presenters with (LtoR) Dr Narelle Moore, Mr Bruce Piper, W/Prof. Graeme Martin, Mr Neil Young, W/Prof. Kadambot Siddique

WA grain belt. Her work is supported by the Grain Research and Development Corporation (GRDC), through the Australian Herbicide Resistance Initiative. Her supervisors are Winthrop Professor Stephen Powles and Dr Danica Goggin.

Eduardo Dias De Olivera from Brazil and Donkor Addai from Ghana both looked at adaptation to climate change. Eduardo’s project in Plant Biology studied wheat responses to elevated carbon dioxide, high temperature and terminal drought with the aim of identifying traits associated with climate-ready wheat. Eduardo’s research is funded by UWA, CSIRO Plant Industry and the Department of Agriculture, Fisheries and Food (DAFF), and he is supervised by Winthrop Professor Kadambot Siddique, Dr Jairo Palta (CSIRO) and Dr Helen Bramley. Donkor from Agricultural Resource Economics, studied the economics of technical innovation for adaptation by broad acre farmers in WA. Donkor’s work is funded by UWA and the Future Farm Industries CRC. His supervisors are Winthrop Professor David Pannell, Professor Ross Kingwell, Adjunct Professor Michael Ewing and Assistant Professor John Finlayson.

Beena Anil, from Earth and Environment, focused on agricultural extension, working on grower groups and their emergence, their role in farmer learning and future challenges. She

has a UWA Scholarship and is supervised by Professor Matthew Tonts and Winthrop Professor Kadambot Siddique.

In the same school, Daniel Dempster studied biochar and the nitrogen cycle. He has recently submitted his thesis and taken a break from academic life to work on the family wheat and sheep farm east of Northam. His PhD was funded by the GRDC and he was supervised by Associate Professor Deirdre Gleeson, Professor Daniel Murphy and Winthrop Professor Lyn Abbott.

Shuo Wang, a Chinese national who grew up in Germany and the US, began his tertiary education in computer science. As an undergraduate in Minnesota, he used visualisation techniques to understand seismology and convection problems. He came to WA to apply his knowledge to breads and has been led to fascinating discoveries about bread microstructures. At UWA, in Earth and Environment, his PhD project investigates how changing the processing of dough can lead to improved bread quality. Shuo’s research is supported by UWA, CSIRO, the Department of Agriculture and Food, WA (DAFWA) and GRDC. His supervisors are Winthrop Professor Klaus Regenauer-Lieb, Dr Sumana Bell (Centre for Grain Food Innovation) and Dr Ali Karrech (CSIRO).

Careers Night a winner with Ag students and Industry

A record number of students flocked to the Agricultural Careers Night held at UWA on 22 May, to find out more about the many career options in agriculture and related industries.

Organised by the WA Division of the Ag Institute Australia (AIA), the careers night featured a speed-dating format in which key players in the industry introduced themselves in 5-minute intervals to small groups of students. Seasoned professionals and recent graduates representing agribusiness, the banking sector, animal feeds, government, grain handling and marketing, grower groups, mining and universities outlined the skills and qualities they are looking for and the career paths and opportunities open to Agricultural Science graduates; UWA (through IOA) and Curtin University showcased additional exciting career opportunities for students pursuing postgraduate qualifications in agriculture and related areas.

"It was great to be able to compare what different employers can offer and I was really impressed with how flexible they all are and how much support they offer to ensure they recruit and retain the best people for the job," said Trent Butcher, who is completing a UWA honours program in Animal Science this year.

The event attracted students in agriculture, horticulture, natural resource management, animal science and veterinary science from UWA, Curtin and Murdoch University.



Connecting students with industry and employers: the Agricultural Careers Night

Young alumni couple with vision for agriculture

Ms Emma Wilson



Emma and Ben Wilson with their son Jebediah

A shared passion for agriculture led Ben and Emma Wilson (nee Glasfurd) to complete a Bachelor of Agricultural Science degree at UWA, where they met during their studies.

Following their graduation (with Honours degrees) in 2003 and 2005, they both obtained jobs in the industry, Ben as an agronomist with Elders

and Emma as a Project Coordinator with the Liebe Group.

After their wedding in 2008 they moved to Ben's family farm in Quairading. Ben now works with his father, Ian, to run the farm and Emma manages the farm accounts and cares for their 1 year old son, Jebediah, while also working part time as a

Natural Resource Management Officer with the Shire of Quairading.

"The Bachelor of Agriculture degree at UWA has given us an excellent understanding of industry research, including how research projects are developed and carried out," said Emma, "and by taking different pathways with our careers we have extended our skills and knowledge in a range of areas which has been really beneficial to our current farming business."

"The academic training we received at UWA has been essential to gain perspective on industry research surrounding weed biology, cropping systems, plant breeding and livestock management and it has given us the knowledge to select and adopt the most suitable technologies, varieties and management practices with confidence," explained Emma.

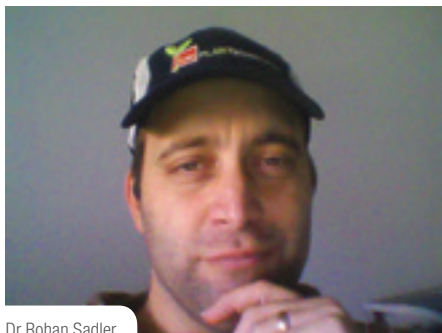
Ben is looking forward to using the knowledge gained to achieve maximum diversity on the farm, and plans to experiment with precision farming, crop rotations and a range of different crops. They also run 1100 breeding merino ewes for diversity and to utilise the saline areas of the farm.

In their view, adaptability is the key to farming success and with their combined knowledge and experience they see a positive future for themselves in agriculture.

Photo courtesy Emma Wilson

Picking the best investments in Biosecurity R&D

Dr Rohan Sadler (Email: ropo.sadler@gmail.com)



While research and development (R&D) drives improvements in agriculture, it is also expensive and funds are limited. So how to choose among the various R&D investment proposals?

This 'million dollar question' was tackled – with a focus on biosecurity – in a project between UWA's School of Agricultural and Resource Economics (SARE) and the CRC for National Plant Biosecurity (CRCNPB).

The team of Professor Ben White (leader), Dr Rohan Sadler, Mr Hoda Abougamous (PhD student), Ms Veronique Florec (research officer) and Miss Liz Venter (Honours student, 2010) completed two case studies to investigate the impact of different R&D investments on biosecurity.

"The biosecurity risk varies between geographical regions and often depends on climate, topography, food availability, and on the size and configuration of (existing) landscapes and transport networks with regard to pest dispersal," explained Dr Sadler.

Using bio-economic modelling, one study focused on the Area Wide Management (AWM) of the Queensland fruit fly (Qfly); the second study on AWM of WA's grain production, transport and storage network.

The Qfly model, QFAWM, considered investments occurring in one of four 'strategic buckets': surveillance, eradication, post-harvest control, and border control.

"Investment in surveillance was of interest as the benefits of surveillance are in delivering earlier detection of a previously unobserved, but nascent pest population," explains Dr Sadler. "While this leads to more outbreaks being declared, the earlier detection also means that populations are smaller at the time of detection and hence easier to eradicate. This in turn means shorter periods of loss of pest-free market status."

In economic terms, the net benefit of engaging in the AWM scheme amounted to \$33 million a year, with the optimal surveillance rate (i.e., trap density) greatest in high production value regions such as Mildura.

The grain network model, GRANEWM, included modules for contracting with grain producers to provide improved on-farm biosecurity, which has become a concern for two reasons: the spread of phosphine resistant pest populations across WA, and the mounting rates of on-farm storage, as producers hold grain to await the best marketing opportunity.

"Again we defined strategic investment buckets," explained Dr Sadler: "Storage technology, landscape pest ecology and management, phosphine alternatives, and detecting grain pests."

Each strategic bucket was allotted benefits, with each benefit associated with a set of parameters in GRANEWM. This approach enabled the benefits of R&D to be valued under a variety of phosphine resistance scenarios, and, from there, risk-minimising R&D portfolios were identified.

In terms of their investment appeal, grain pest detection and pest ecology emerged as the clear winners in this project: "They were low-cost and acted in synergy, compared to the other investment options," remarked Dr Sadler and concluded with an observation about the significance of the study as a tool: "While this was a simplified case study and conducted 'after-the-fact', the methodology employed was objective and can be readily applied as an aid to future R&D decision-making at the national scale."

'Down to Earth' Farmers' Forum

More than sixty central grain belt growers flocked to Northam in June to participate in a 'get the dirt on carbon' seminar and hear key findings from a three-year research project focused on helping improve the sustainability of Australian farms.

UWA scientists Professor Daniel Murphy, Dr Andrew Wherret and Associate Professor Louise Barton, presented research outcomes from the Soil Carbon Research Program (SCaRP), the National Biochar Initiative and the Nitrous Oxide Research Program (NORP). Mr Mick Keogh, from the Australian Farm Institute, spoke about the Carbon Farming Initiative and its implications for producers in the central wheatbelt.

The SCaRP is analysing soil samples from more than 3,500 sites across the country to identify which land uses and management practices can increase the levels of carbon, or at least slow down the rate at which it is lost," said Professor Murphy.

The NORP is measuring nitrous oxide emissions across Australia and trialling cost-effective measures to reduce emissions.



Assoc./Prof. Louise Barton speaking at the Farmers' Forum at Northam

"The research will underpin practical adaptation techniques and farming systems that can assist farmers and industries to lower greenhouse gas emissions and increase productivity," said Associate Professor Louise Barton.

The Forum was co-hosted by The UWA Institute of Agriculture and the Department of Agriculture,

Fisheries and Forestry (DAFF) under the Australian Government's \$46.2 million Climate Change Research Program (CCRP), which provides funding for research projects and on-farm demonstration activities under the three priority areas of reducing greenhouse gas emissions, improving soil management and research into adaptation management practices.

Student exchange visit to Japan advances lupin research at UWA

Ms Monica Kehoe (Email: monica.kehoe@agric.wa.gov.au)

A student exchange scholarship visit to Japan has provided new insights for lupin research in Western Australia.

Ms Monica Kehoe, a PhD student at the School of Plant Biology at UWA, studied for four weeks in Sapporo, Japan, under an exchange scholarship from



Ms Kehoe inspecting Mandelup and Jenabillup lupins in the glasshouse at Hokkaido University

the Australasian Plant Pathology Society (APPS), the Phytopathological Society of Japan (PSJ) and the Australia-Japan Foundation.

"I was lucky enough to work with the Plant Pathogen Interactions Group at Hokkaido University," she said. "Thanks to Professor Ichiro Uyeda and Dr Kenji Nakahara, and with the help of other postgraduate students in the group I conducted an experiment that has provided me with results I would otherwise have been unable to obtain."

Ms Kehoe's project investigates *Bean yellow mosaic virus* (BYMV), the primary cause of Black Pod Syndrome (BPS) in narrow-leaved lupins. "I was able to infect two varieties of WA narrow-leaved lupin with the Japanese strain of the virus, and make use of the group's infectious clones containing a fluorescent protein. This allowed me to see the virus in the plants as early as seven days after infection and to observe the location of the virus within the plants."

The differences which Ms Kehoe observed in the way the Japanese BYMV and Western Australian BYMV interact with narrow-leaved lupins will provide valuable information for her project in the search for solutions to the threat BPS poses to lupin production in Western Australia.

Ms Kehoe's PhD project at UWA is supervised by Professor Roger Jones (School of Plant Biology) and Adjunct Associate Professor Bevan Buirchell (CLIMA and DAFWA); she is supported by a studentship stipend from GRDC and conducts her research at the South Perth facilities of DAFWA.

International Co-operative Research Exchange at UWA

Dr Elena Limnios (Email: elena.limnios@uwa.edu.au)

2012 is the United Nation's International Year of Co-operatives (IYC) and this will be acknowledged at UWA in an international research exchange in November this year.

The research exchange is an initiative of the Sustainable Co-operative Enterprise Project being undertaken by The UWA Business School and The UWA Institute of Agriculture.

The three-year project investigates the resilience of the co-operative business model through a study on the impact of organisational and financial structures, governance and management practices, and member communication and engagement.

The project leaders, Winthrop Professors Tim Mazzarol, Geoffrey Soutar, John Watson, Kadambot Siddique, Assistant Professor Joanne Sneddon, and Dr. Elena Limnios, have developed an international network of 40 research partners in universities and research institutions across Europe, the United States and China. "We all use a common methodology to examine co-operative business models through case study analysis covering a range of industry sectors and geographical locale," says Dr Limnios, "and we expect to publish an edited book on the project in 2013."

The project is funded under an Australian Research Council (ARC) Linkage Grant between The University of Western Australia, Co-operatives WA,

Co-operative Bulk Handling, the Capricorn Society and Ravensdown Fertiliser Co-operative.

"We look forward to welcoming some of our international research partners and other stakeholders," says Dr Limnios.

The research exchange will be held on 8 November and explore:

- The sustainability of the co-operative and mutual enterprise;
- Financing the co-operative business; member loyalty, identity and value recognition;
- Governance and leadership including member share capital and voting rights;
- Social capital formation of co-operatives and mutual enterprises;
- Innovation within co-operative and mutual businesses; and
- The role of co-operative and mutual businesses in economic development.

An experts panel discussion open to industry will be held in the afternoon, followed by the WA Co-operatives Conference on 9 November, which is open to the public.

For further information about the research exchange and the Sustainable Co-operative Enterprise Project visit www.cemi.com.au/node/109 or contact Dr Limnios via email elena.limnios@uwa.edu.au

Computer simulation creates a buzz in fruit fly war

Professor Mark Reynolds (Email: mark.reynolds@uwa.edu.au)



Prof. Mark Reynolds

Fruit flies pose a major threat to Australia's \$6.9 billion horticultural industry and scientists from UWA, DAFWA and the Plant Biosecurity Cooperative Research Centre (PBCRC) are turning to computer simulation to manage the problem.

The team of four consists of project leader Professor Mark Reynolds (School of Computer Science and Software Engineering, UWA), Dr Juan J. Garcia Adeva, UWA research engineer who creates simulation technology, and DAFWA entomologists Dr John Botha and Dr Darryl Hardie who are providing expert pest knowledge.

Professor Reynolds explains the need for the project: "The Queensland fruit fly (*Bactrocera* spp, also referred to as 'Qfly') can thrive in most commercial fruits and vegetables and this multitude of hosts helps it spread rapidly between habitats."

This was illustrated as early as 1989, by Western Australia's first incursion of Qfly, which quickly spread throughout the Perth metropolitan area and cost \$8 million to eradicate.

"The speed of dispersion and the associated high costs highlight the need for a robust approach with which we can estimate and predict the worst-case scenario for fruit fly spread following an incursion," explains Professor Reynolds. "The *Bactrocera* simulator is designed to achieve this: it contains several sub-models that consider population growth, time, host quality, seasonality, means of spread and the speed of spread of *Bactrocera* spp after it is detected in a new habitat."

The real beauty of this simulator, however, is that it allows users to enter (real) data into the sub-models, and can potentially be used to simulate and predict the spread of any *Bactrocera* species. "This type of decision support can be applied at all levels of government within Australia and allows a national approach to any incursion," says an enthusiastic Professor Reynolds.

The simulation technology is currently being tested for accuracy and usefulness, by carefully matching actual outbreak data against the predictions of the simulator.

"Analysis from a fruit fly outbreak in Perth during 2011 indicated a good match between the outbreak data and the predictions, but unfortunately there were insufficient data to provide conclusive results. Our evaluation will continue in the near future with data from traps in Victoria where incursions of Qfly are becoming more frequent."

Pakistani scientist visits IOA to tackle zinc deficiency

Mr Shahid Hussain (PhD Scholar)
(Email: id.hussain@yahoo.com)

Pakistani PhD candidate Shahid Hussain was lured to UWA by the opportunity to work with IOA's high profile scientists and UWA's sophisticated research facilities related to zinc biofortification.

Zinc is an essential nutrient for normal growth and reproduction by both plants and humans. Widespread zinc deficiency in the soils of Pakistan and Western Australia, if not corrected, produces grain containing low or marginal levels of zinc.

"In Pakistan, about 40 per cent of children and women are suffering from zinc deficiency, and approximately 90 per cent of the total population are at risk of zinc deficiency," said Mr Hussain. "People in rural areas are affected worst, as their diet consists mainly of (low zinc) cereal grains."

With the help of a PhD research fellowship funded by Pakistan's Higher Education Commission Mr Hussain was able to join Winthrop Professor Zed Rengel's research group for six months and work on the project 'Phenotyping the doubled-haploid mapping population of barley for uptake and remobilisation of zinc'.

"The research project conducted at UWA will help me and other Pakistani scientists to further expand research activities in Pakistan to identify QTLs and molecular markers of enhanced zinc loading into cereal grains," said Mr Hussain. "Moreover, the research work will further strengthen the research collaboration between scientists of both countries to overcome human zinc deficiency in Pakistan."



Mr Shahid Hussain and W/Prof. Zed Rengel

Intellectual Property focus on the marketing of agricultural products



Prof. Michael Blakeney

Professor Michael Blakeney
(Email: michael.blakeney@uwa.edu.au)

UWA Professor Michael Blakeney (Faculty of Law, UWA) has led a team of investigators in a European-Union-funded project to examine the ways in which agricultural products could be marketed by producers in ten sub-Saharan countries on the basis of their origin. Case studies were undertaken of Oku White Honey from Cameroon, Okoumé timber from Gabon, cocoa from Ghana, Kenyan black tea, Mauritian brown sugar, Nigerian yams, Rwandan coffee, yêtt de Joal (dried snails) from Senegal and cloves from Zanzibar.

"Their origin confers unique qualities to these products," said Professor Blakeney, "and as the production of these foods had declined in most cases, their branding on the basis of their origin was proposed as a means of arresting that decline." The results did confirm that origin-branding boosted the market appeal for the produce studied and Professor Blakeney pointed out the wider application of this research: "One of the objectives of the project was to develop a replicable methodology by which to analyse industries in other countries in the African, Caribbean and Pacific (ACP) grouping," he explained, "and while the primary export market for the products studied is the European Union, the principles we discovered are applicable generally, particularly for Australian wine."

The results of these case studies have been combined with studies of Ethiopian fine coffee, Moroccan Argan oil, Ugandan coffee and South African Rooibos tea and published in a collection edited by Professor Blakeney and his colleagues.

This methodology has also been carried forward by Professor Blakeney in a study of "Geographical Indications and the International Trade in Australian Wines" published in 'International Trade Law and Regulation', 2012 (pp.70-78).

3rd Australia-China Wheat Genetics and Breeding Workshop attracts over 100 scientists

Associate Professor Guijun Yan (Email: guijun.yan@uwa.edu.au)

In May 2012, more than 100 wheat researchers flocked to Shijiazhuang, the capital city of Hebei Province in China, for the third Australia – China Wheat Genetics and Breeding Workshop (ACWGBW) which aimed to facilitate the collaboration between the two countries in the area of wheat genetics and breeding.

"China and Australia are both key players in terms of global wheat production," says workshop organiser Associate Professor Guijun Yan "and for the past 30 years Australian wheat yields have increased each year by 1-2 per cent per year, with approximately half of this increase due to the introduction of new cultivars."

"Breeding superior wheat cultivars is well underway in both countries," explains Associate Professor Yan, "but Chinese wheat breeding programs have operated largely independently, and have not used much exotic germplasm, which (partly) explains why the Chinese wheat gene pool is quite unique compared to that of other countries."

At the two-day workshop 16 key cereal geneticists and breeders shared their wheat research with delegates and spoke about successful collaborations between the two countries.

After the workshop, participants visited the major wheat production areas of the North China Plain and wheat breeding laboratories and plots of the Hebei Academy of Agriculture and Forestry Sciences, Shijiazhuang Academy of Agriculture and Forestry Sciences and Chinese Academy of Science.

Plans for the fourth ACWGBW in Australia in mid-2013 are underway, following the success of the previous three workshops.

The Third ACWGBW was co-organised and sponsored by The University of Western Australia (The UWA Institute of Agriculture and School of Plant Biology) and the Hebei Academy of Agriculture and Forestry Sciences with support from the Chinese Academy of Science (State Key Laboratory of Plant Cell and Chromosome Engineering, Institute of Genetics and Developmental Biology), Shijiazhuang Academy of Agriculture and Forestry Sciences, and the Agricultural University of Hebei.



Participants at the Third Australia-China Wheat Genetics and Breeding Workshop at Shijiazhuang, China

Warm-season legumes for milder winter environments?

Assistant Professor Jon Clements (Email: jon.clements@uwa.edu.au)

Crop diversification is desirable for the Western Australian grain belt as farmers look to widen rotations to provide better disease and weed management and to explore new profitable crop options. Summer legumes sown during the autumn-winter or late-winter to spring periods show promising potential to help achieve this.

These are the early indications from a CLIMA funded-study undertaken by Assistant Professor Jon Clements: "While a species has its natural temperature range limits, studies have shown that a wide range of genetic diversity can exist to allow selection for cold tolerance (or heat tolerance) within a species," said Assistant Professor Clements, "but the germplasm of warm season crops, particularly legumes, has never been investigated in regions like the northern wheat belt, where mean daily minimum temperatures are lower than optimum for the species but rarely fall below 7°C."

With this in mind, Assistant Professor Clements (CLIMA) began sourcing a set of navy bean and soybean germplasm from a range of donors including the USDA, Russia, Canada and Queensland genebank collections and breeder material.

During 2011, a field trial was sown at the end of May at a trial site in Dongara kindly provided by focal farmer Chris Gillam. The trial included several phaseolus bean varieties, a range of soybean germplasm and a cultivar of lupin as a control.

"The phaseolus beans yielded up to 1.2 tonnes/ha, and although this was less than half the yield achieved for narrow-leafed lupin that year, the high seed price for dry bean and green beans – \$1000 and \$3000 respectively – suggests that phaseolus bean crops have commercial potential." The best soybean in this trial yielded about 400kg/ha and this showed the more immediate potential of phaseolus beans in comparison.

Additional lines of commercial quality phaseolus bean provided by breeder Professor Rob Melis (University of KwaZulu-Natal) and recently imported from South Africa, are included in the test material as potential high value legume crops in the northern wheat belt.

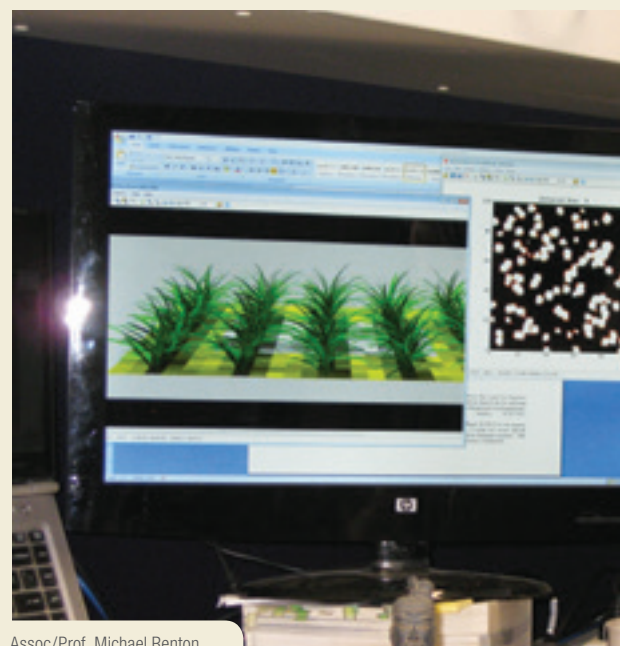


Prof. Rob Melis (University of KwaZulu-Natal) and Asst. Prof. Jon Clements (CLIMA, UWA) viewing bean varieties growing at Dongara, Western Australia on Chris Gillam's (farmer) property during winter in 2011

Photo courtesy William Erskine

Winning the weed war with

Assoc/Prof. Michael Renton (Email: michael.renton@uwa.edu.au)



Assoc/Prof. Michael Renton

The quest to improve cropping systems through weed management has received a major boost through four new models that assist in understanding, predicting and managing weed numbers.

Associate Professor Michael Renton and his team have created a range of models which simulate different aspects of weed dynamics and work together to support improved weed management decisions.

"Weeds reduce yields and are therefore an important factor in every agronomic system," explains Associate Professor Renton. "The weed seedbank is of particular concern as seeds can lie in wait for months or years until conditions are suitable."

The long-term fluctuations in weed numbers are affected by the complex interaction of a large number of factors, including seed dormancy, crop competition, the impact of herbicides, weather events, and even the effects of seed-eating insects and microbes.

To help understand, predict and manage this complex system, Associate Professor Renton and his team have integrated existing knowledge and hypotheses gained from observations, literature, experiments and field trials, into a computational model of that system:

"By synthesising this information in a model, we can build a reasonable representation of the way things will work in a much wider range of interacting conditions and over a much longer time period than would be possible using field trials or experiments," explains Associate Professor Renton.

Instead of trying to make one model that does everything, Associate Professor Renton has helped create a family of models which specialise in simulating different aspects of weed dynamics and complement each other. The models are:

A development of an older bio-economic model RIM (Resistance and Integrated Management or Ryegrass Integrated Management), that allows users to try out various

n ecological modelling!



combinations of weed treatments and observe their predicted impacts on ryegrass populations, crop yields and long-term economic outcomes.

LUSO (Land Use Sequence Optimiser), funded by the Grains and Research Development Corporation (GRDC), is a bio-economic model and optimisation framework for analysing the drivers of tactical and strategic decisions regarding 'break-crops' and land-use sequencing within agricultural systems. LUSO does this by simulating the dynamics of weed populations, plants' disease loads and soil nitrogen levels over many years, together with their effects on yield and profit.

PERTH (Polygenic Evolution of Resistance To Herbicides), developed with support from GRDC through the Australian Herbicide Resistance Initiative (AHRI), and of the Rural Industries' Research and Development Corporation RIRDC through the CSIRO, is a tool for analysing the effect of different long-term management options on the risk of evolving herbicide resistance in agricultural systems, accounting for the effects of weed biology and ecology, population dynamics, and the genetics underlying resistance.

PERTH simulates the dynamics of weed population numbers and genetics over many years, together with their effects on crop yield.

The Weed Seed Wizard, funded by the Co-operative Research Centre for Australian Weed Management and the GRDC, is a tool that can help researchers, farmers and consultants manage weed populations in real agricultural contexts. The Wizard uses detailed and specific paddock management and weather records, and simulation of important aspects of seed biology, in order to track and predict the number, ages, soil depth, dormancy levels, viability and germination of seeds in the soil, and thus the weeds appearing at different times within and across a number of years.



(LtoR) Mr Robert Jeffery, Mr Joseph Steer, Miss Fiona Young, Hon Mia Davies, MLC, Miss Danielle Whyte and Mr Greg Paust, Executive Director, Regional Operations and Development, DAFWA, at the Young Professionals in Agriculture award ceremony

Photo courtesy DAFWA

Young Professionals in Agriculture Forum highlights outstanding work of UWA graduates

The 2012 Young Professionals in Agriculture Forum was held in March 2012 with the top prizes claimed by UWA graduates.

The event showcases the work of young professionals in agriculture and natural resource management, and the awards acknowledge the work of tertiary students studying agriculture-related subjects at WA universities and who have completed an undergraduate degree.

This year, seven finalists submitted a research paper and delivered a presentation at the forum.

Ms Danielle Whyte, who graduated last year with a double major in Agricultural Science and Commerce, received the top award for her research into herbicide resistance in wild radish populations. This award represents Danielle's second major distinction in less than a year: In 2011 Danielle represented UWA at the CHOGM dinner and panel discussion focusing on Women in Leadership (see IOA News, April 2012, page 10).

When asked why she chose herbicide resistance in wild radish populations as her research topic, Miss Whyte said: "I wanted something relevant to the industry, and most farmers think it is interesting." She now works as an agronomist for Landmark at Merredin.

Second prize went to Miss Fiona Young for her work on assessing whole-farm benefits of twin-sowing. "My research revealed how and in what situations twin-sowing is likely to be highly profitable and where and when it's likely to be widely adopted," said Miss Young who now works for ConsultAg in Perth.

For Miss Young, too, this represents the second award in less than a year: In 2011 she became the recipient of the Sir Eric Smart Scholarship for Agricultural Research, which helped her research ways of improving the productivity and profitability of wheat, barley, lupins or canola growing on WA's light soil types.

The third prize was awarded to Mr Robert Jeffery for his research into the effect salinity tolerance has on the germination of pasture legumes; the award for best presentation went to Joseph Steer for his study of how the genetic aspects of both the wool and faeces of sheep relate to flystrike.

Agriculture and Food Minister Terry Redman congratulated the winners and commended them on the high level of their presentations. "The State's agriculture and food industry is clearly in good hands with graduates like these. With their hard work, talent and enthusiasm they will no doubt make the most out of the many interesting and rewarding career opportunities that keep on proliferating across diverse areas of agriculture, as the global demand for food and fibre increases."

The annual event is hosted by the Department of Agriculture and Food and the WA Division of the Ag Institute Australia.

Local high school students shine at BIO Conference in Boston



Miss Abbey Mardon with WA Chief Scientist, Prof. Lyn Beazley, at the International BioGENEius Challenge in Boston, USA

Local high school students, Abbey Mardon and Tess Douglas, represented WA at the International BioGENEius Challenge finals in Boston on 18 – 20 June 2012, presenting their high-level biotechnology research to a panel of top American science experts.

The event was held in conjunction with the world's biggest biotechnology conference, BIO 2012, and after arriving in Boston, the two West Australian students were joined by the additional 12 finalists from the US and Canada.

The following day was the official judging which involved students completing 4 x 6 minute poster presentations to pairs of judges which was followed by a nine minute question time.

Abbey was mentored by Dr Sasha Jenkins from The University of Western Australia's Institute of Agriculture (IOA) and School of Earth and Environment. Her research investigated enhancing the removal of biological phosphorus in the waste treatment process in piggery farms. "Her project is of practical value to the livestock industry," said Dr Jenkins. "It will help improve the waste treatment process in piggeries, and increase profits through reduced fertiliser costs, thereby enhancing the competitiveness of the Australian livestock industry."

Tess was mentored by UWA PhD candidate Kelsey Kennedy in a project that will aid the development of new devices that can detect and remove breast cancer.

"Abbey and Tess were outstanding Ambassadors for WA and UWA speaking confidently about their research and forming new friendships with the other competitors," said Miss Pauline Charman from UWA's Centre for Learning Technology, who accompanied the girls on their trip to Boston. "They were thrilled to attend the BIO Conference's prestigious keynote luncheon together with 3,000 Conference delegates, and this represented an exciting culmination of their months of research."

Tess and Abbey qualified for the International BioGENEius Challenge by winning the Western Australian BioGENEius challenge earlier this year. The annual WA competition is facilitated by the Department of Commerce and presents an inspirational opportunity for some of the state's top science students in Years 8-12 to work alongside experienced scientists and participate in real-life laboratory projects. Participating students spend up to a year undertaking a biotechnology research project under the guidance of world-class scientists.

WA Minister for Science and Innovation John Day, commented on the important role of initiatives such as BioGENEius: "We need to ensure that students are encouraged at all levels to become the next generation of scientists and scientific thinkers in order to continue the development and growth of science and innovation in Western Australia – and the BioGENEius Challenge provides an excellent incentive and vehicle that helps achieve this."

UWA has a strong track-record of mentoring BioGENEius WA participants: Both WA finalists this year were mentored by UWA scientists and one of this year's WA semi-finalists, Year 11 student Thomas Gambuti, was a semi-finalist for the second year running, researching agricultural projects under the mentorship of Dr Natasha Teakle (see also IOA News August 2011, page 11).

Improving soil productivity by managing soil biology

A new soil quality monitoring project will help grain growers across the nation to better manage soil from a sustainability and production point of view, through a greater understanding of the soil's micro-organisms, the functions they perform, and how managing the system can affect grain yield.

As part of the GRDC Soil Biology Initiative, the Soil Quality Monitoring Program and the website (www.soilquality.org.au) are expanding to include grain-producing areas across Australia, following a five-year pilot period in Western Australia. Researchers working on soil biology projects will be helping to populate the site with regional information. They will also be encouraging grower groups to gather, test and submit their own soil data.

Dr Andrew Wherret outlines the background of this project: "Soil is the most diverse habitat on Earth, with 90 per cent of the world's organisms living in soil. With the advent of molecular techniques and DNA-based approaches, we are now able to identify and study the functions and processes of diverse microbial communities. Sequencing of microbe DNA, for example, enables the identification of genes associated with nitrogen fixation."

Dr Wherret likens the microbial population to the eye of the needle, through which all nutrients must pass to be absorbed by plants: "The interactions between different micro-organisms and their effects on plants' capacity to grow well are sometimes described as the last frontier of agriculture," says Dr Wherret.

While farmers in the past have been aware mainly of harmful (disease-causing) micro-organisms, there is now an increasing awareness of the beneficial microbes. "There is a range of organisms which improve water holding capacity and nutrient advantage, and farmers can improve soil quality through management practices."

The web platform www.soilquality.org.au will enable farmers to record their own data and measure against benchmarks and will provide a guide – traffic light system – and economic calculator to estimate the economic costs and benefits of possible measures.

Dr Wherret sums up the benefits of the project and website: "It provides data, prompts action and gets growers thinking about nurturing microbes as well as crops. Farmers may use it to confirm current practices or to identify better suited practices, and over the time the accumulated data and results will help develop new inoculants and products to improve the soil."

Agriculture students shine at Faculty Prize Giving Ceremony

The hard work and outstanding achievements of students in the Faculty of Natural and Agricultural Sciences (FNAS) were recognised on 10 May this year in the faculty's annual Prize Giving Ceremony.

IOA congratulates the following students enrolled in agriculture and related areas on their achievements:

NAME	PRIZE
Mr Thirumurugan	Henry Seeligson Prize in Agriculture, for the highest weighted average mark calculated from three eligible 2nd year units completed within one calendar year by a student enrolled in an agriculture-related Bachelor program.
Miss Cheryl Day and Mr Gohd Ghazali	W.H. Vincent Prize in Agriculture for the highest weighted average mark calculated from three eligible 3rd year units completed within one calendar year, by a student enrolled in an agriculture-related Bachelor program.
Mr Doraid Amanoel and Miss Fiona Young	Eva Sobotka Prize in Agriculture, for the highest weighted average mark calculated from four eligible 4th year units, achieved by a student enrolled in an agriculture-related Bachelor program.
Mr David Zadow	David Evans Memorial Prize in Agriculture, for the best essay submitted in the 3rd year unit ' <i>Agricultural Economics and Marketing</i> '.
Miss Sarah Metcalfe	Alan Meyer Posner Memorial Prize in Soil Science, for the highest mark in the 3rd year unit ' <i>Land, Soil and Water Systems</i> '.
Miss Sarah Metcalfe and Mr Liam Ryan	Mary Simpson Prizes in Soil Biology, for the highest mark achieved by a female student and the highest mark achieved by a male student in the 3rd year unit ' <i>Soil Biology and Plant Nutrition</i> '.
Mr Doraid Amanoel	J.W. Paterson Prize in Agriculture, for the highest mark in the 3rd year unit ' <i>Industry Experience (Part 1 and 2)</i> ' achieved by a student enrolled in an agriculture-related Bachelor program.
Mr Joseph Steer	Caroline Stewart Young Memorial Prize in Agriculture, awarded to a student who has completed the requirements of an agriculture-related Bachelor of Science degree and who has shown through their research project the most enthusiasm and promise in Agriculture.
Miss Danielle Whyte	Walter Harper Prize, for the greatest contribution to the success of formal and informal activities of the faculty, by a student enrolled in any (FNAS) Bachelor degree.



Mr Doraid Amanoel receiving the J.W. Paterson Prize from W/Prof. Kadambot Siddique

UWA Ag Science BBQ a taste of things to come

Assistant Professor Michael Considine
(Email: michael.considine@uwa.edu.au)



Despite cramming for exams and last minute assignments more than twenty UWA Ag students attended the first Agricultural Science Student Industry event in May this year: a simple classic 'barbie'.

Several senior industry members chatted casually to the students; Mr Terry Hill (Executive Director, DAFWA), Mr Gavin Foord (Executive Manager, FruitWest) and Ms Natalie Moore (Liaison Officer, DAFWA; Secretary, Ag Institute Australia) all greatly enjoyed the interaction. Assistant Professor Michael Considine (School of Plant Biology and IOA) introduced the staff and guests and told students there would be more events building on this idea to bring industry and students together, such as a fortnightly e-letter, with links to other relevant events, and a monthly seminar series of invited industry guests.

"There are three purposes to these initiatives," said Assistant Professor Considine: "To give students better opportunities to interact and network with industry members; to communicate events and opportunities such as jobs and work experience, and; to ultimately promote agriculture as a fantastic and rewarding career, with all its diversity."

The benefits of these initiatives were also recognised by the Society of Students in Natural and Agricultural Sciences (SNAGS) who helped promote the event through the SNAGS Facebook group.

Order of Australia for CLIMA researcher in Timor-Leste

Adjunct Professor Harold Nesbit (Email: h.nesbit@bigpond.net.au)



Mr Rob Williams displaying roots of the high-yielding *Ailuka 2* cassava variety in Timor-Leste

Mr Rob Williams, an Adjunct Senior Research Fellow at UWA's Centre for Legumes in Mediterranean Agriculture (CLIMA), has become the latest UWA agricultural scientist to be awarded a Medal of the Order of Australia (OAM) on the Queen's Birthday in June, 2012.

Mr Williams has dedicated himself to the agricultural development of Timor-Leste for the past 10 years and is currently CLIMA's Research Advisor on the Seeds of Life program (SoL) in Timor-Leste. His leadership has led to the release of high yielding varieties of maize, rice, sweet potato, cassava and peanuts by the Timor-Leste Ministry of Agriculture and Fisheries (MAF), including the prized *Ailuka 2* cassava variety pictured here.

Leaving a safe career-path in Australia, Mr Williams and his wife, Dr Catharina Williams-Van Klinken departed for Timor-Leste in September, 2002, to contribute their skills and knowledge in a developing country. Mr Williams soon found work with the aid organisation World Vision and gained significant knowledge of agriculture in Timor-Leste and a good understanding of the constraints to agronomic productivity.

"Rob is a recognised mentor for agricultural development in Timor-Leste," says Adjunct Professor Nesbitt, Coordinator of the SoL project. "Under his guidance, the SoL research program has achieved excellent skills development within the MAF while simultaneously raising agricultural productivity." Professor Nesbitt also applauded Mr Williams' outstanding success regarding penetration of technology into farmers' fields: "Rob makes sure that researchers, agricultural extension personnel and farmers are all familiar and comfortable with relevant approaches so that technologies are not only developed but productively adopted by farmers." This aspect is of particular importance for the long term goals of the project: "The long-term SoL plan is for technology development to be completely owned and operated by Timor-Leste MAF personnel," explains Dr Nesbitt, "and with Rob's commitment, expertise and engagement we are well underway to achieving this and making the project a success." (For further details about SoL refer to IOA News, Vol 15, December 2100, page 11).

Congratulations Rob Williams!



Prof. Anu Rammohan and her colleague interviewing villagers in Andhra Pradesh, India

Food security in rural India

Professor Anu Rammohan (Email: anu.rammohan@uwa.edu.au)

Despite making significant economic and agricultural productivity improvements, food insecurity and malnutrition still present key policy challenges in India.

In an Australian Research Council and Australia-India Institute funded project, Professor Rammohan from the UWA Business School and her colleagues from the University of Sydney and Tata Institute of Social Sciences (India) aim to provide answers to three questions at the heart of the global food security debate:

- How do higher prices impact on food security/insecurity amongst different rural population segments?
- In what ways do institutional environments and livelihood strategies interact to create food security outcomes?
- What institutional arrangements should policy makers promote to help ensure food security resilience?

Data has been collected from randomly selected rural Indian households, including landless and landholding families, farmers and non-farmers, and the employed and non-employed, across eight strategically selected border districts in eight Indian states. "We have completed one round of the household survey and we are going back to the field later this year to collect institutional data," said Professor Rammohan.

A measure of households' food security status was constructed using the respondents' own perceptions and households were classified into three categories: chronically food insecure, mildly food insecure, and food secure. The study then used multivariate logistic analysis to examine the likelihood of a household being in one of these categories as a function of the household's socio-economic characteristics.

Across the eight sample populations the proportion of food secure families ranged from less than 5 per cent in East Medinipur (West Bengal) to over 75 per cent in other districts.

Amongst the findings were that social safety nets – provided through access to different types of Public Distribution System (PDS) cards – were important to a household's food security status. Households with an APL (Above Poverty Line) card were more likely to be food secure, and this, combined with the lack of significance of the other types of PDS cards provides some confirmation that the targeted PDS system may be working well in our study areas," said Professor Rammohan.

David Lindsay inducted into WA's Agricultural Hall of Fame

Senior Honorary Animal Biology Research Fellow Emeritus Professor David Lindsay has been recently honoured for his inspiring influence on WA's agricultural industry with induction into Western Australia's Agricultural Hall of Fame.



E/Prof. David Lindsay

Professor Lindsay spent 33 years as a teacher and researcher at The University of Western Australia – much of that time as Dean of Agriculture and Professor of Animal Science.

His research input has helped combat practical problems associated with poor fertility and survival in the state's sheep industry, and his research group has become the focus for international research in the field of reproductive physiology. He also led research into the use of the fodder shrub *Tagasaste* to rejuvenate thousands of hectares of infertile sands in the West Midlands. Professor Lindsay's work has done much to bridge the gap between science and practical sheep farming throughout Australia.

The Agricultural Hall of Fame was established in 1999 under the auspices of The Royal Agricultural Society of Western Australia and pays tribute to men and women who have had a significant impact on the present and future of agriculture, and shaped its history.

IOA appoints Business Manager



Mr Mike Perry

The UWA Institute of Agriculture (IOA) welcomes Mr Michael Perry as its inaugural Business Manager.

Originally a research agronomist with the (then) Department of Agriculture, Mr Perry first worked on the management of canola, rice, barley, wheat and lupins, including some of the first physiological and agronomic research on lupins – a new crop in the 1970's. Michael subsequently held several senior management positions at DAFWA including Acting Manager Plant Research and Development, and Program Manager, Pulses and Oilseeds.

A private consultant for the past 14 years, Michael has acted as Program Manager for the GRDC's national programs including the National Wheat and Barley Molecular Marker Programs and Barley Breeding Australia (BBA); other major clients have included UWA, DAFWA, and other industry groups. Michael has been Technical Advisor to the Council of Grain Grower Organisations Ltd (COGGO) since 2000.

Michael brings an extensive knowledge of the research funding cycle with which he has been involved – initially as a researcher – since the 1980's. He is also familiar with joint venture business structures and Intellectual Property negotiations including germplasm exchange agreements and Materials Transfer Agreements (MTA).

Besides his new part-time appointment (Tue-Fri) at IOA, Michael keeps himself busy with ongoing work for COGGO and for Coretext, the GRDC's grower publication.

Michael is a graduate of UWA, completing a Bachelor of Science (Agriculture) with First Class Honours in 1969.

Success for UWA Post Docs



(LtoR) Asst/Profs Abbie Rogers and Fiona Gibson

Two home-grown PhD graduates recently overcame international competition to be appointed to Assistant Research Professor positions in the Centre for Environmental Economics and Policy (CEEP). Dr Abbie Rogers and Dr Fiona Gibson completed their PhDs within the School of Agricultural and Resource Economics and have been working as Research Associates within CEEP, analysing multi-faceted environmental problems within an economic framework.

Their new positions are funded by the National Environmental Research Program. Dr Rogers' work will relate to the Marine Biodiversity Hub and Dr Gibson will work within the program's Environmental Decisions Hub. Both researchers have a background in environmental policy and planning and are looking forward to seeing the impact of their work on national environmental decision making.

Congratulations Abbie and Fiona.

Alumni

Professor Mohammad Reza Jalal Kamali, aka 'Jalal'

Jalal completed a Master of Plant Science at UWA in 1995, followed by a PhD in Plant Breeding at UWA in 1999, both under the supervision of Dr Rodger Boyd.

He returned to Iran in 2000 and served as Wheat Breeder, Deputy Director-General and Head of the Cereal Research Department of the Seed and Plant Improvement Institute of Iran, the oldest and largest plant breeding and agronomy research institute in the country.

In September 2007 he joined the International Maize and Wheat Improvement Center (CIMMYT) as Senior Scientist and Head of the centre's office based in Karaj, Iran. Currently he is Wheat Breeder and Principal Scientist as well as Head of the CIMMYT-Iran Office.

Jalal's main research interest is physiologically-based wheat breeding, focused on mechanisms of tolerance to biotic stresses such as drought, heat, salinity and cold. Jalal says that doing his postgraduate studies at UWA opened up new horizons and provided a strong foundation for his personal development and professional career.



Prof. Mohammad Reza Jalal Kamali

Global Herbicide Resistance Challenge Conference – Fremantle 2013

Herbicide resistance in crops and weeds is a major issue in global and Australian agriculture. To address the resistance threat, AHRI will host a UWA-sponsored international, multidisciplinary research conference in Fremantle, WA, from 18-22 February 2013.

Global authorities on herbicide resistance will focus on state-of-the-art resistance science, addressing resistance from the molecular and biochemical, through to agro-ecological and socio-economic issues.

The more applied aspects of resistance and weed control in global crops will be the focus on Thursday 21 February. One-day registration (value \$275) is available.

Early bird registration closes on 1st October, 2012.

Graduate student attendees may be eligible for reimbursement of their registration. For further information and to register, visit herbicideresistanceconference.com.au or contact Conference Chair Lisa Mayer via email: lisa.mayer@uwa.edu.au

Melbourne-based AHRI Research assistant visits UWA

Weed Research Assistant Ms Charlotte Aves is a member of the AHRI team based at The University of Melbourne, where she works on the long-term Harrington Seed Destructor trials throughout the eastern states cropping zones.

Paddock spray trials focused on summer weed control are also part of Ms Aves' main responsibilities. Ms Aves is based at UWA for six weeks until late August 2012 to help set up a GRDC-funded research project on wild radish control.



Ms Charlotte Aves

Top British soil scientist joins UWA



Prof. Andrew Whiteley

A leading UK scientist is set to join the School of Earth and Environment and IOA under the WA Government's Research Fellowships Program, aimed at attracting world-class expertise to WA.

At UWA, Professor Andrew Whiteley will lead an expert team in soil rehabilitation research and examine new ways to rehabilitate degraded mine site environments and increase agricultural production.

"I'm delighted to receive a prestigious WA Fellowship and join the world-class and vibrant science base at UWA," he said. "WA represents a globally unique biodiversity hot-spot but with strong economic requirements from the environment. My research will work at this interface by developing new DNA-based environmental diagnostic technologies as well as developing innovative ways to engage WA residents through 'citizen science' projects."

Professor Whiteley is expected to take up his position at UWA in October.

Seed persistence toolkit for farmers

Dr Rowena Long (Email: rowena.long@uwa.edu.au)



Dr Rowena Long near Albany, collecting gorse (*Ulex europaeus*) – a weed of national significance

Photo courtesy Marta Gorecki

A 'Seed Persistence Tool Kit' research project at UWA has delivered promising results in the quest to enable farmers and land managers to predict how long weed seeds will persist in soil.

"Seeds can remain dormant in the soil long after weeds are removed, and act as a reservoir for re-invasion into crucial agricultural land and environmentally sensitive areas," said lead researcher Dr Rowena Long. "Accurate estimates of seed persistence are essential to determine the appropriate length of eradication programmes: if seed persistence is underestimated, eradication programmes end prematurely and weeds reinvade; similarly, when seed persistence is overestimated, time, money and labour are wasted in pursuing a problem that no longer exists."

Enter the 'Seed persistence toolkit' research project, funded by the National Weeds and Productivity Research Program and managed by the Rural Industries Research and Development Corporation (RIRDC) for the Australian Government.

The project comprised laboratory and field experiments over a 12-month period, using seeds of 22 weed species collected from the south-west of Western Australia.

Seeds were tested for a range of persistence-related properties in the laboratory, including germination responses, response to accelerated ageing and the antimicrobial content of seed coats.

"Much more work is needed to understand how weed seeds respond to their environment and which of the many soil, site and climate characteristics are the key drivers of seed persistence for different weed types and habitats," emphasised Dr Long. "Long-term field trials are needed to verify the accuracy of predictive models to ensure they are robust and informative for policy makers and land managers," she said.

To support a more long-term view of the problem, the research team also established two five-year seed burial trials to verify the accuracy of persistence predictions made from the laboratory studies.

Researchers hope the study will allow land managers to collect seed and soil samples, send them to a laboratory together with climatic and other data, and run tests to determine how long those weed seeds are likely to persist at that site.

More information on the RIRDC Weeds Program is available at www.rirdc.gov.au/weeds

New face at GGA

Ms Rebecca Wallis has joined the Grower Group Alliance (GGA) as Project Officer.

A UWA graduate and winner of the second prize at the 2011 Young Professional in Agriculture Awards, Rebecca was previously employed by CSBP and the Department of Agriculture and Food.

Rebecca will be a direct link between WA's 42 broadacre grower groups, and research and industry partners; supporting collaboration between industry, and the communication of new technologies and farming practices.

The GGA is a non-profit, farmer-driven organisation connecting grower groups, research organisations and agribusiness in a network across WA. The GGA acts to add value to the activities of grower groups by maximising the opportunities for collaboration and information sharing. It is funded by the Grains Research and Development Corporation and hosted by The UWA Institute of Agriculture.



Miss Rebecca Wallis

Research and industry recognition

NAME	AWARD
W/Prof. Kadambot Siddique	2012 Hackett Professor of Agriculture Chair, UWA (awarded upon the retirement of the previous incumbent, W/Prof. Alan Robson), in recognition of outstanding leadership in agricultural education and research
W/Prof. Rana Munns	Citation Award as part of the 2012 Thomson Reuters Australia Citation & Innovation Awards presented in Canberra for her research on plant salinity tolerance
E/Prof. David Lindsay	Induction into Western Australia's Agricultural Hall of Fame (see also page 15)
W/Prof. David Pannell	Quality of Research Communication Award (AARES)
Dr Muhammad Farooq	Research Productivity Award 2011 from Pakistan Council for Science and Technology
Mr Rob Williams	Order of Australia (OAM) (see also page 14)

New research funded projects

TITLE	FUNDING PERIOD	FUNDING BODY	SUPERVISORS
Adapting to climate change – a risk assessment and decision framework for managing groundwater dependent ecosystems with declining water levels	2012	Murdoch University ex Griffith University ex National Climate Change Adaptation Research	Prof. Peter Davies, Assoc/Prof. Barbara Cook, Asst/Prof. Peter Speldewinde, Asst/Prof. Paul Close
Policy (measuring and managing methane emissions from livestock: from lab to landscape)	2012 – 2014	University of Melbourne ex CSIRO Sustainable Agriculture Flagship Cluster	Prof. Phil Vercoe
Comparison of open-circuit calorimeters and micrometeorological methods	2012 – 2014	University of Melbourne ex CSIRO Sustainable Agriculture Flagship Cluster	Prof. Phil Vercoe
Cross validation of micro meteorological measurement techniques, tracer techniques and respiration chamber protocols	2012 – 2014	University of Melbourne ex CSIRO Sustainable Agriculture Flagship Cluster	Prof. Phil Vercoe
Landscape evaluation of methane emissions from ruminant livestock – campaign in North West Western Australia	2012 – 2014	University of Melbourne ex CSIRO Sustainable Agriculture Flagship Cluster	Prof. Phil Vercoe
The effect of antimicrobials on the anaerobic digestion of piggery waste	2012	Dept of Agriculture, Fisheries and Forestry (DAFF)	Dr Sasha Jenkins
Environmental decisions hub	2012 – 2014	University of Qld ex Dept of Sustainability, Environment, Water, Population and Communities DSEWPC/NERP	W/Prof. David Pannell
Phosphorus-efficient pasture systems	2012 – 2015	CSIRO ex Meat and Livestock Australia	Assoc/Prof. Megan Ryan
Mitigating greenhouse gases with nitrification inhibitors and biochar in fallows	2012 – 2015	DAFF	Dr Ken Flower, Dr Sudheesh Manalil
Determination of factors responsible for aphid-borne pea seed-borne mosaic virus epidemics in pea and development of effective virus management tools	2012 – 2015	ARC Linkage Project; Partners: DAFWA	Prof. Roger Jones, Asst/Prof. Michael Renton, Ms Brenda Coutts
Farming in a biodiversity hotspot – harnessing native plants to reduce deleterious off-site phosphorus flows	2012 – 2015	ARC Linkage Project; Partners: DAFWA	W/Prof. Hans Lambers Assoc/Prof. Meg Ryan, Dr Edward Barrett-Lennard Assoc/Prof. Philip Brookes, Prof. Mark Tibbett
Functional network analysis of plant metabolism in response to salinity and temperature through targeted proteomics	2012 – 2015	ARC Linkage Project; Partners: Agilent Technologies, DAFWA	W/Prof. Andrew H. Millar, Adj/Prof. Rudolph Grimm, Dr Thomas Biddulph
Identifying the biochemical and molecular bases of 2,4-D herbicide resistance in the economically important weed <i>Raphanus raphanistrum</i> (wild radish)	2012 – 2015	ARC Linkage Project; Partner: Nufarm Australia Ltd.	W/Prof. Stephen Powles, Mr Andrew Wells
Characterisation of a major quantitative trait locus on wheat chromosome 3BL responsible for <i>Fusarium</i> crown rot resistance	2012 – 2016	ARC Linkage Project; Partners: InterGrain Pty Ltd, National Institute for Agricultural Research, France, Shijiazhuang Academy of Agricultural and Forestry Sciences, China, CSIRO (PI)	Assoc/Prof. Guijun Yan, Dr Chunji Liu, Dr John Manners, Dr Catherine Feuillet
Grazing into the future – building soil health and carbon with pasture management	2012 – 2015	DAFF	W/Prof. Lyn Abbott, Asst/Prof. Natasha Pauli
Carbon farming futures filling the research gap – does increasing soil carbon in sandy soils increase soil nitrous oxide emissions from grain production?	2012 – 2015	DAFF	Assoc/Prof. Louise Barton, Prof. Dan Murphy
New chemistry for wild radish control	2012 – 2015	Grains Research and Development Corporation (GRDC)	W/Prof. Stephen Powles, Assoc/Prof. Michael Walsh

Current and upcoming visitors to IOA

VISITOR	VISITORS' ORGANISATION, COUNTRY	HOST DETAILS/PURPOSE	DATES
Dr Marga Joy	Unidad de Tecnología en Producción Animal CITA de Aragón, Spain	Asst/Prof. Zoey Durmic	Jan – Dec 2012
Mr Thomas Giansetto	Ecole Nationale Vétérinaire de Toulouse, France; visiting intern	Asst/Prof. Zoey Durmic	Jun – Aug 2012
Mr Yannis Cadieu	Ecole Nationale Vétérinaire de Toulouse, France; visiting intern	Asst/Prof. Zoey Durmic	Jun – Aug 2012
Miss Eleonor Germain	Agrocampus Ouest, Paris, France; visiting intern	Asst/Prof. Zoey Durmic	Sep 2012 – Feb 2013
Mr Pirouz Shakeri	Isfahan University of Technology, Isfahan, Iran; visiting intern	Asst/Prof. Zoey Durmic	Oct 2012 – Apr 2013
Ms Jenjira Mongon	Chiang Mai University, Thailand; Royal Golden Jubilee PhD Scholarship (Thailand Research Fund)	W/Prof. Tim Colmer	18 Jun – 15 Dec 2012
Dr Tanveer-ul Haq	University College of Agriculture, Dera Ghazi Khan, Pakistan	W/Prof. Tim Colmer	Jun 2012 – May 2013
Dr Jose Carlos Jimenez-Lopez	Spanish High Council for Scientific Research	W/Prof. Karam Singh, W/Prof. Kadambot Siddique	Jul 2012 – Jun 2014
Prof. Hugh T. Blair	Deputy Head, Institute of Veterinary, Animal and Biomedical Sciences, Massey University, New Zealand; visiting scientist	W/Prof. Karam Singh, Asst/Prof. Jonathan Anderson	18 Jul – 31 Aug 2012

New postgraduate students

PHD	TOPIC	SCHOOL	SUPERVISOR/S	FUNDING BODY
Mr Umair Khan	Waterlogging tolerance in barley	Plant Biology and IOA	W/Prof. Timothy Colmer, Assoc/Prof. Patrick Finnegan	Endeavour Postgraduate Award
Mr Hamad Khan	Salinity tolerance in chickpea	Plant Biology and IOA	W/Prof. Tim Colmer, W/Prof. Kadambot Siddique	Endeavour Postgraduate Award
Mrs Chandima Ranawana	Assessing the role of transpiration in ameliorating leaf temperature in wheat	IOA and Plant Biology	W/Prof. Kadambot Siddique, Dr Helen Bramley, Dr Jairo Palta (CSIRO and UWA)	Endeavour Postgraduate Award; UWA SIRF
Ms Rushna Munir	Waterlogging tolerance in chickpea	Plant Biology and IOA	W/Prof. Tim Colmer, W/Prof. Kadambot Siddique	UWA-Pakistan Flood Reconstruction Scholarship
Mr Muhammad Masood Azeem	Assessing climate change vulnerabilities of Pakistan's agriculture and the capacity building for poverty reduction	Agricultural and Resource Economics and IOA	Prof. Steven Schilizzi, Asst/Prof. Amin Mugeru, W/Prof. Kadambot Siddique	UWA-Pakistan Flood Reconstruction Scholarship
MASTER OF SCIENCE	TOPIC	SCHOOL	SUPERVISOR/S	FUNDING BODY
Mr Bahram Mirfakhraei	The response of <i>PHOSPHATE TRANSPORTER 1</i> gene transcript patterns to phosphate status in <i>Hakea prostrata</i>	Plant Biology	Assoc/Prof. Patrick Finnegan, Dr Ricarda Jost	self-funded

Publications (March – 10 July 2012)

Refereed journals

Anjum SA, Farooq M, Xie X, Liu X-J, Ijaz MF (2012). Drought-induced modulation in lipid peroxidation, proline contents, antioxidative enzymes, growth and yield of two contrasting pepper cultivars. *Scientia Horticulturae* **140**: 66-73.

Bashir MK and Schilizzi S (2012). "Have policies in Pakistan been effective for improving food security?" Wanted: Disaggregated policy assessment. *World Applied Sciences Journal* **17** (9): 1182-1191.

Chen YL, Dunbabin VM, Diggle AJ, Siddique KMH and Rengel Z (2012). Assessing variability in root

traits of wild *Lupinus angustifolius* germplasm: basis for modelling root system structure. *Plant Soil* **354**: 141-155.

Cox BA and Jones RAC (2012). Effects of tissue sampling position, primary and secondary infection, cultivar, and storage temperature and duration on the detection, concentration and distribution of three viruses within infected potato tubers. *Australasian Plant Pathol* **41**: 197-210.

Fang X, Phillips D, Verheyen G, Li H, Sivasithamparan K and Barbetti MJ (2012). Yields and resistance of strawberry cultivars to crown and root diseases in the field, and cultivar responses to pathogens under controlled environment conditions. *Phytopathologia Mediterranea* **51** (1): 69-84.

Farooq M, Irfan M, Aziz T, Ahmad I and Cheema SA (2012). Seed priming with ascorbic acid

improves drought resistance of wheat. *Journal of Agronomy and Crop Science* DOI:10.1111/j.1439-037X.2012.00521.x.

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Mir RR, Zaman-Alla M, Sreenivasulu N, Trethowan R and Varshney RK (2012). Integrated genomics, physiology and breeding approaches for improving drought tolerance in crops. *Theor Appl Genet* DOI 10.1007/s00122-012-1904-9.

Molyneux N, Rangel da Cruz G, Williams RL, Andersen R and Turner NC (2012). Climate change and population growth in Timor-Leste: Implications for Food Security. *AMBIO* DOI 10.1007/s13280-012-0287-0.

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Pannell DJ (2012). Environment protection: challenges for future farming, *Australian Farm Business Management Journal* 8 (2): 19–26.

Perring MP, Standish RJ, Hulvey KB, Lach L, Morald TK, Parsons R, Didham RK and Hobbs RJ (2012). The Ridgefield Multiple Ecosystem Services Experiment: can restoration of former agricultural land achieve multiple outcomes? *Agriculture, Ecosystems & Environment* <http://dx.doi.org/10.1016/j.agee.2012.02.016>.

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composition, water relations, chlorophyll contents and membrane permeability in two salt-stressed wheat genotypes. *Archives of Agronomy and Soil Science* **58**: 247–256.

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Vadez V, Krishnamurthy L, Thudi M, Anuradha C, Colmer TD, Turner NC, Siddique KHM, Gaur PM and Varshney RK (2012). Assessment of ICCV 2 × JG 62 chickpea progenies shows sensitivity of reproduction to salt stress and reveals QTL for seed yield and yield components. *Molecular Breeding* **30**: 9–21.

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Books

Serraj R and Siddique KHM (2012). *Conservation Agriculture in Dry Areas*. Special issue of Field Crops Research 132: 1–214. Elsevier B.V, Amsterdam, The Netherlands.

UPCOMING MEETINGS AND EVENTS

Dowerin Field Days

29–30 August 2012
Dowerin, WA
www.dowerinfielddays.com.au

International Co-operative Research Exchange

8 November 2012
UWA
elena.limnios@uwa.edu.au

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To advance research, education, training and communication in agriculture and resource management, for the benefit of mankind.

CONTACT DETAILS

Editor: Uly Fritsch
Email: uly.fritsch@uwa.edu.au
The UWA Institute of Agriculture
Tel: +61 8 6488 3756
ioa.uwa.edu.au

The University of Western Australia
M082, 35 Stirling Highway
Crawley, WA 6009