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L to R: Prof Doug McEachern, Deputy Vice-Chancellor (Research and Innovation UWA), Dr William D Dar, Director General (ICRISAT), Prof Alan Robson (Vice-Chancellor UWA), and Dr Peter Ninnes, Director (Resource Planning and Marketing, ICRISAT).

ICRISAT transforming rural livelihoods in the Semi-Arid Tropics

Mrs Erika von Kaschke
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The semi-arid tropics is a place of extremes. 800 million people, most of those among the world's poorest, call it home. Many make a living in agriculture with the odds stacked against them: unpredictable climate, low/erratic rainfall and poor soils, and inadequate physical and social infrastructure.

Dr William D Dar, Director General of the International Crops Research Institute for the Semi Arid Tropics (ICRISAT) is a man with a mission. During the past decade he has led ICRISAT to help impoverished nations. ICRISAT aims to improve the well-being of the poor of the semi-arid tropics; hence their excellence and relevance with the motto 'Science with a Human Face'. Dr Dar's transformational leadership has turned ICRISAT into a forward looking institute, which was ranked 'Outstanding' among the CGIAR centres consecutively in 2006 and 2007.

ICRISAT and UWA have a long standing collaboration. In recent years this involved the chickpea improvement project funded by COGGO in partnership with DAFWA, and Punjab Agricultural University. The COGGO supported project enables ICRISAT to develop early-maturing, disease-resistant desi chickpea breeding lines. Over 2,000 breeding lines have been developed and are being evaluated in WA. At the moment, an ARC Linkage project in partnership with COGGO and Sussex University is developing chickpea lines with salinity tolerance. About 55 salinity-tolerant lines were exchanged and are being screened in WA.

During their UWA visit, Drs Dar and Ninnes, Director, Resource Planning and Marketing (ICRISAT) discussed further collaboration with UWA on legumes, water research, plant breeding, climate adaptation, plant energy biology and postgraduate training.

Dr Dar provided a snap shot of the significant input ICRISAT has in agriculture in the semi-arid tropics, during his Food and Agriculture Lecture at IOA. Over the last 33 years, ICRISAT and its partners have developed 610 improved varieties and hybrids of its mandate crops and released them in 77 countries.

Dr Dar received a certificate of UWA's appreciation for his contribution to the world's semi-arid agriculture from W/Prof Doug McEachern, Deputy Vice-Chancellor, UWA (Research and Innovation).

UWA will continue to strengthen ties with ICRISAT to help alleviate the conditions of the poor living in the semi-arid tropics of Asia and sub-Saharan Africa. Both organisations hope to reduce poverty, increase agricultural productivity, enhance food and nutritional security and protect the environment of the semi-arid tropics. W/Prof Alan Robson, Vice-Chancellor, and other senior members from UWA will visit ICRISAT in September this year.

Director's column

Winthrop Professor Kadambot Siddique (ksiddique@fnas.uwa.edu.au)

The agricultural sector is showing greater resilience to the global economic crisis than other industries, because food is a basic necessity for mankind. Anticipated economic recovery, renewed food and feed, demand growth from developing countries (especially China and India) and emerging biofuel demand from developed countries, will drive the commodity price up in the medium to long term. Food security is high on the agenda for many Governments as evidenced by the first ever G8 Agriculture Ministerial in April 2009. There is a lot of discussion about the capacity of the global agricultural sector to meet the rising demand for food and feed. Is there new land that could be brought into production (for example northern Australia)? How can we make current agriculture more productive with minimal environmental damage? Will there be sufficient water for irrigation? What will the effects of climate change be? Most importantly, can agriculture adapt to climate change?

Agriculture not only provides food and fibre for the world, but also makes a direct and indirect contribution to the economic and social wellbeing of millions of people engaged in the industry. For example every Australian farm business is responsible for providing food for around 600 people each year – 150 of them in Australia and another 450 people overseas (Mick Keog, 2009). In this context we must recognise that it is not the individual farmers who are using the land and water, but it is those 600 people.

UWA, through its Institute of Agriculture, actively works with farmer groups (e.g. GGA, WANTFA), government agencies and community groups to enhance the economic and social conditions in rural areas. Important outcomes in this regard include: understanding the economics of agricultural systems and natural resource management; improved data on rural economic and social conditions/trends; risk assessment; and the analysis of agricultural and rural policy.

As part of our communication strategy and strengthening links with the industry, the Institute holds annual industry forums and public lectures. This year's Industry Forum focused on 'Healthy farming – stronger communities?' It brought together some excellent speakers representing farmer groups, agricultural consultants, industry, and academics within and outside UWA (see article on page 8).

Recently, we have signed Memorandums of Understanding (MOU) with a number of Universities/Institutes in the region; especially from India and China. The IOA has hosted several high level international and interstate visitors. We have showcased some of the research by postgraduate students, and provided a platform for academics and the industry to meet and exchange ideas.

Please join me in tracing some of the steps we are taking towards reaching our goals, as we present you with the latest edition of the IOA newsletter.

Keep in touch with what is happening at UWA in agriculture and natural resource management by visiting our website at www.ioa.uwa.edu.au.

IOA MISSION

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

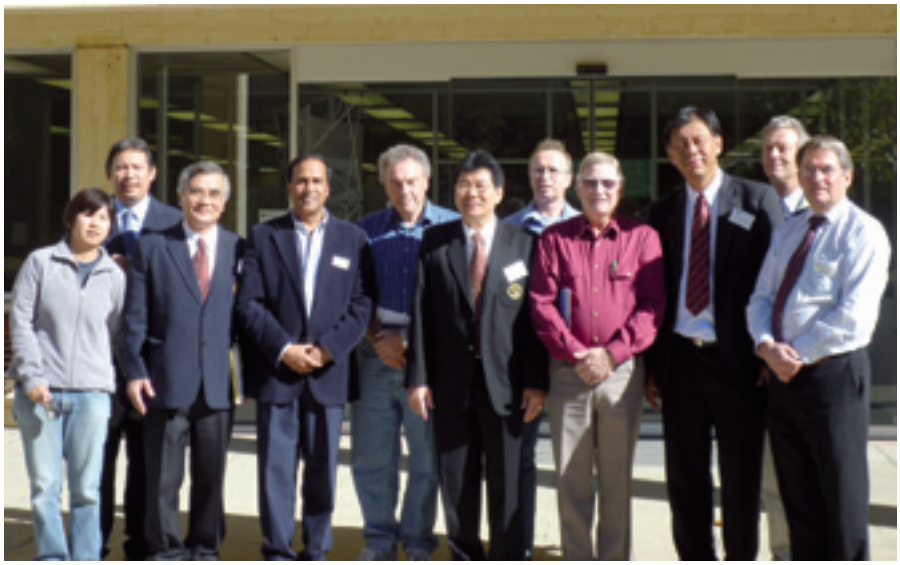
Chiang Mai University delegates visit UWA

On May 15, 2009, representatives from the Faculty of Natural and Agricultural Sciences (FNAS) had the opportunity to discuss future collaboration with a delegation from Chiang Mai University, Thailand.

Areas of collaboration identified includes: postgraduate training, staff exchanges and development of mutually beneficial research projects in agricultural and natural resource management.

The Chiang Mai University delegation consisted of Assoc/Professor Theera Visitpanich (Dean, Faculty of Agriculture), Assoc/Prof Dr Sampan Singharajwarapan (Dean, Faculty of Science), Professor Dr Nat Vorayos (Assistant President for Student Development and Research Affairs), and A/Prof Dr Pairote Wiriyacharee (Vice President for Planning, Financial and Property Management).

The UWA representatives were W/Prof Kadambot Siddique (IOA), W/Prof Hans Lambers (School of Plant Biology), Dr John Milton (School of Animal Biology), W/Prof Bob Gilkes (School of Earth and Environment), Assoc/Prof Dominique Blache (School of Animal Biology), and Dr Saowanuch Tawornpruek (Visiting Research Fellow from Kasetsart University, Thailand).



Prof Richard Hobbs received the ARC Laureate Fellowship 2009.

World class researcher lauded

Winthrop Professor Richard Hobbs received the Australian Research Council's (ARC) Australian Laureate Fellowship 2009 – Australia's most prestigious research award for his world-class research on issues that impact upon the world's ecosystems. W/Prof Hobbs joined the School of Plant Biology at UWA earlier this year.

The Australian Laureate Fellowship scheme is part of the Australian Research Council's National Competitive Grants Program. It supports excellence in research by attracting the best researchers and research leaders to key positions, and creating new rewards and incentives for the application of their talents in Australia.

W/Prof Hobbs, an ecologist with experience in Australia, United Kingdom and United States, is one of only 15 recipients of the Laureate Fellowship. His work on the impacts of land-use and climate change, invasive species, changed nutrient regimes and other factors that impact on the world's ecosystems is essential to the analysis and management of ecosystems in a rapidly changing world.

He completed a BSc in Ecological Science at Edinburgh, Scotland followed by an MA in Biology at the University of California, Santa Barbara, on a Fulbright Scholarship. He joined CSIRO Division of Wildlife & Ecology in WA in 1984. He later became Officer in Charge of the Western Australian laboratory in 1997. In 2000 he took up a Chair in Environmental Science at Murdoch University and was awarded an ARC Australian Professorial Fellowship in 2006.

"My particular interests are in vegetation dynamics and management, fragmentation, invasive species, ecosystem restoration, conservation biology and landscape ecology," he said.

"It's a great honour to be awarded one of the inaugural Australian Laureate Fellowships – it's like winning the research funding lottery. I'd like to thank everyone at UWA who has helped make it possible, and I look forward to making the most of the opportunities the fellowship provides," he said.

Farmer's contribution rewarded

It's the second time in two years that UWA has presented an honorary doctorate in agriculture to a farmer. In 2008 Mt Barker farmer, Dr Terry Enright received his honorary doctorate. This time Mr Alexander Campbell received an honorary doctorate.

The Vice-Chancellor of UWA, Professor Alan Robson, presented the honorary degree of Doctor of Science to Mr Campbell in recognition of his significant and sustained contribution to agriculture.

Dr Campbell has filled many roles including the chair of CRC Dryland Salinity and the presidency of WA Farmers Federation. Dr Campbell from Narrikup currently chairs the board of the UWA Albany Foundation and the South Coast NRM regional group, and the Joint-Venture Agroforestry Program.

He is also a director of the Rural Industries Research and Development Corporation (RIRDC). His involvement in the Great Southern community and in agriculture has spanned almost 50 years.

Dr Campbell shared the story about his lifelong journey in agriculture and research. He encouraged graduates to value networks, welcome interaction, and enjoy the challenges in shaping the future of humanity.

Dr Campbell was very pleased with the recognition and said "interactive research with end users ensures the quickest pathway to adoption but, more importantly, means that research activity is always relevant and meaningful".

Dr Alexander Campbell receiving his award from the Pro-Chancellor, Dr Penelope Flett at the Graduation Ceremony earlier this year. Photo credit: GFP Graduations.

UWA postgraduates explore new agricultural frontiers

Australia's brightest and best agricultural research was on display at the 'Frontiers in Agriculture Postgraduate Showcase 2009' at the UWA Institute of Agriculture.

Introducing eight postgraduate students from the Agricultural and Resource Economics, Earth and Environment, Animal and Plant Biology schools within FNAS, Chair in Agriculture and IOA Director, Winthrop Professor Kadambot Siddique, described their work as extremely relevant to the future of WA and Australian agriculture.

"The research findings showcased demonstrate the quality and breadth of research being conducted at UWA through the IOA and its collaborating partners," W/Prof Siddique said.

Ms Annaliese Mason's research on canola genetics will enhance and broaden the gene pool of the state's canola varieties. Her research on the genetic implications of crossing canola with closely related Brassica species aims to improve qualities such as disease resistance and drought tolerance.

She's also involved in creating a new oilseed crop from canola and Brassica species, termed a 'Super Brassica', which is predicted to have increased vigour and the potential to exploit more marginal cropping environments.

Careful observation of the Mukinbudin area, where he grew up, inspired Mr Dion Nicol to shed some light on the impact of bicarbonate toxicity as a chemical constraint on subsoil.

His agronomic and ecophysiological studies of *Cullen ceinerum* and *C. graveolens* as potential pasture legumes in low rainfall regions of the southern Australian grainbelt are particularly relevant to WA growers.

Ms Jennifer Carson explored interactions between micro-organisms and rock mineral fertilisers in organic pastures. She investigated whether changing the soil's mineral composition altered the structure of its microbial community and if different minerals supported microbial communities with different structures. Her current research on the use of ground rocks as a source of phosphorous and potassium for organic beef pastures in WA will be valuable to WA's beef producers.

Ms Trina Jorre de St Jorre's work has demonstrated the benefits of introducing novel rams to ewes.

While it's been known that the sudden introduction of rams induces ovulation in Merino ewes within two to three days and this is a cost effective, efficient way to synchronise mating and lambing within the flock, Ms Jorre de St Jorre's research showed that isolating ewes and rams wasn't necessary if the rams were 'novel'.

Her work examined the time needed to make rams 'novel' from a ewe's perspective and has great value for sheep producers looking to optimise and better manage reproduction.

Mr Gus Rose also has an interest in sheep. This interest grew into a study of the labour requirements for sheep and cropping during the production year and the implications for farm profitability. The profitability of professional sheep managers is particularly relevant to WA sheep producers.

Mr Ahmed Ali is researching pectinase treatment of lupins for poultry. It has significant implications for the poultry industry, allowing producers to replace expensive imported feed with locally produced lupins, without compromising productivity, while reducing pollution from poultry excrement.

Ms Bronwyn Crowe grew up on the family farm at Dowerin. Her interest in conservation and farming steered her PhD thesis towards the design of conservation contracts, compliance monitoring and the provision of rewards, or the enforcement of penalties, for landholders.

Mr Sudheesh Manalil's work on the genetic basis of herbicide resistance and the impact of different application rates to the development of herbicide resistance, is particularly timely and relevant.

W/Prof Tony O'Donnell, Dean of FNAS, summed up the presentations, saying UWA's growing international reputation for cutting-edge agricultural research attracted the brightest and best minds from Australia and overseas.

"UWA graduates are in high demand, with employment prospects in agriculture and related natural resource management areas remaining strong, despite the global economic downturn," Prof O'Donnell said.

Ms Alexandra Wells. (photo courtesy of *Farm Weekly)*.

Mulesing: yes or no?

Ms Alexandra Wells
(wellsa02@student.uwa.edu.au)

Mulesing is a subject that can probably cause the most heated and emotional debates in the animal industry. This practice involves slicing the skin off a sheep's rear to prevent fly-strike.

Ms Alexandra Wells, a third year PhD student within the School of Animal Biology at UWA has designed a survey to test the waters about farmers' views on this practice. "So far people feel strongly either way. In general, nobody likes mulesing, and most farmers say that they would stop if there was an efficient alternative," she said.

She has taken these surveys to the Woolerama field day, and will be present at the Dowerin Field Days in August. If you are interested in completing this survey, please contact Ms Wells on 0423 166 951 or email wellsa02@student.uwa.edu.au

Postgraduate presenters: LtoR- Mr Sudheesh Manalil, Mr Dion Nicol, Mr Ahmed Ali, Mr Gus Rose, Ms Jennifer Carson, Ms Bronwyn Crowe, Ms Annaliese Mason, and Ms Trina Jorre de St Jorre with W/Prof Kadambot Siddique (Director, IOA).

GGA scholarship grows results for grower groups

Ms Susan Hall (susan.hall@uwa.edu.au)

The Grower Group Alliance (GGA) scholarships for 2009 were awarded to UWA fourth-year agricultural science students, Mr Tristan Cornwall and Ms Nadine Hollamby.

Aimed at creating closer partnerships between undergraduate students and grower groups, the two scholarships are awarded annually on a basis of the applicant's Honours research project idea, its ability to be undertaken with a grower group, and its relevance to current agricultural industry needs.

The scholarships benefit the grains industry through the development of projects with increased relevance and application for WA farming systems and improved employment opportunities for students. Successful applicants are selected by the GGA Strategic Advisory Group.

Mr Cornwall's project will screen a range of registered herbicides for use with low disturbance disc seeders immediately before sowing, to establish crop safety and weed control efficacy. His project adds value to current work being undertaken by the WA No-Tillage Farmers Association (WANTFA) by assessing critical early stages of the crop through plant and weed counts, crop damage and crop vigour ratings. His supervisors are Dr Ken Flower (UWA) and Mike Ashworth (WANTFA).

Ms Hollamby's project focuses on a new salt tolerant cereal created by crossing bread wheats with sea barleygrass, developed by a collaborative team from UWA, Adelaide University and the Future Farm Industries CRC (FFI CRC). She will compare the new amphiploid to current wheat varieties and investigate the timing and severity of salt stress on yield and grain quality. Her supervisors are Prof Tim Colmer (UWA) and Dr Ed Barrett-Lennard (DAFWA).

Each scholarship is worth $2000, with $1000 to be used for field research expenses and $1000 for the student.

Mr Tristan Cornwall and Ms Nadine Hollamby received GGA Scholarships.

Below: UWA IOA Director, W/Prof Kadambot Siddique, was awarded an Adjunct Professorship at BJFU by Prof Qixiang Zhang, Vice-President of BJFU. (L to R) Miss Yanxi Qin (Chief of Foreign Affairs); A/Prof Huitang Pan (College of Landscape Architecture); Prof Zhiqiang Zhang (Director of International Office); A/Prof Guijun Yan (UWA), Prof Fangyun Cheng (College of Landscape Architecture) and Dr Jiliang Xu (College of Natural Conservation).

UWA Agriculture consolidates its relationship with Chinese Universities

A/Prof Guijun Yan (gyan@plants.uwa.edu.au)

Winthrop Professor Kadambot Siddique, Professor Wallace Cowling and Associate Professor Guijun Yan visited Huazhong Agricultural University in Wuhan as part of their visit to China from April 18 to 30, 2009. The team kick-started a new Australia-China special project supported by DEST on 'Improving food and biofuel production in changing climates – development of new Brassica polyploids in Australia and China' (see separate article in this issue on page 6).

During their visit to Lanzhou University, W/Prof Siddique and A/Prof Yan discussed the progress of an existing five-year 111 project supported by the Chinese Government. In consultation with Professor Fengmin Li (Project Leader Lanzhou University) and colleagues they developed a project work plan for the 2009 and 2010 periods. This includes visits by UWA researchers to Lanzhou and Lanzhou researchers and students to UWA.

W/Prof Siddique and A/Prof Yan met with Prof Xuhong Zhou, the President of Lanzhou University and key Deputy Presidents. The delegation also visited the College of Pastoral and Agricultural Science and Technology at Lanzhou University and had discussions with Prof Nan Zhibiao and his team. During the visit, W/Prof Siddique delivered a public lecture as part of Lanzhou University's centenary celebration.

In Beijing an MOU with Beijing Forestry University (BJFU) was signed on behalf of UWA Vice-Chancellor, W/Prof Alan Robson. W/Prof Siddique was awarded an Adjunct Professorship from Beijing Forestry University during the visit.

W/Prof Siddique and A/Prof Yan also made a brief visit to Guangzhou University where they held meetings with the Vice-President of Guangzhou University, Prof Shuan Chen and other key Professors. They discussed the establishment of a joint Centre of Excellence in Abiotic Stress Tolerance of Crop Plants involving Guangzhou University, UWA and Lanzhou University. Prof Shuan Chen assured her support for the establishment of the joint centre at Ganhzhou University.

Following the above visits, A/Prof Guijun Yan stayed in China and worked as a visiting Professor at Lanzhou University for two months. He was engaged in teaching biometrics, genetics and plant breeding and helped to establish a plant breeding research group at Lanzhou University.

IOA Director W/Prof Kadambot Siddique delivered a public lecture as part of the centenary celebration of Lanzhou University.

What drives farmers?

W/Prof David Pannell (david.pannell@uwa.edu.au)

Policy makers, agricultural researchers, extension agents, environmental management bodies, NGOs and agricultural consultants had a snapshot of 'Understanding Practice Change by Rural Landholders' at a similarly named symposium held at UWA on July 8, 2009.

The symposium was presented by The Institute of Agriculture (IOA), the Centre for Environmental Economics and Policy and the Australian Agricultural and Resource Economics Society.

National and local experts addressed an audience of 150, including delegates from organisations dealing with agriculture, research, extension, water, environment and policy.

Professor David Pannell, from the organising committee, said, "The main aim was to make available the wealth of research information that has been produced on this topic. We wanted to help organisations to better meet the needs of farmers, or to account realistically for farmers' likely responses to research, extension and policy."

There is a vast research literature on the subject, but it is often under-utilised in practice. Delegates came away appreciating the complexity of the issue. "There are many factors that influence the way that farmers make decisions about their farming practices," said Prof Pannell. "These factors include the nature of the practices, like their profitability, riskiness, and complexity, and characteristics of the farmers themselves, like their goals, skills, and environmental attitudes."

This event follows a highly successful symposium on the same topic that the organisers ran in Melbourne in November 2008. That event attracted around

Participants at the Understanding Practice Change by Rural Landholders seminar.

400 delegates, including delegates from the public sector, regional natural resource management bodies, private consultants, media, agricultural input suppliers, universities, CSIRO and students. The symposium in WA included several speakers from the original event.

According to Prof Pannell practice change is an issue that is important to many groups and organisation servicing agriculture. "The aim of the symposium was to provide the key insights from past and current research and make them available in an understandable and useful form," he said.

Material from the events is available at www.ruralpracticechange.org.

New China-Australia collaboration on brassica research

Professor Wallace Cowling (wcowling@cyllene.uwa.edu.au)

Brassica genetics is the topic of a new China-Australia Research Collaboration grant awarded to UWA, Huazhong Agricultural University (HZAU) in Wuhan and Zhejiang University (ZJU) in Hangzhou (International Science Linkages programs – Australia China Special Fund for S&T Co-operation, Department of Innovation, Industry, Science and Research). The UWA team of Winthrop Prof Kadambot Siddique, Prof Wallace Cowling and Assoc/Prof Guijun Yan visited the Chinese leaders at HZAU from April 20-22, 2009 to attend the project inception workshop and discuss research exchange and publications. The group at HZAU is leading the world in the breeding of high ploidy Brassica. Seed of high ploidy Brassica plants was exchanged. Plants will be grown at UWA during the winter months, and in October 2009 two Chinese scientists will visit UWA to test the Chinese and Australian material for ploidy level and crossability.

Prof Wallace Cowling also visited Prof Zhou Weijun at Zhejiang University, the second Chinese university in the collaboration. Prof Zhou is a leader in microspore culture of Brassica. He will apply the skills of his team to culturing microspores from the high ploidy Brassica plants.

The ultimate goal is to breed a stable hexaploid Brassica – similar in concept to the stable hexaploid wheats that form the staple starch diet for humanity. If the China-Australia teams are successful in their work, a new stable and versatile oilseed Brassica may be developed. Several joint publications are planned over the next 18 months of the project.

L to R: Prof Ma Chaozhi (HZAU), Assoc/Prof Guijun Yan (UWA), Prof Meng Jinling (HZAU), W/Prof Kadambot Siddique (UWA), Prof Fu Tingdong (HZAU), Prof Wallace Cowling (UWA), Prof Li Zaiyun (HZAU), Prof Zhou Weijun (ZJU) during the project inception workshop at Huazhong Agricultural University, Wuhan.

W/Prof Tony O'Donnell, W/Prof Peter Davies, and Mrs Gae Plunkett (DAFWA) inspecting chickpea trials at the Frank Wise Institute Research Station(Kununurra).

Land of opportunity: Ord River Irrigation Area

The current area under agriculture in the Ord River Irrigation Area (ORIA) spans 14,000 ha (annual crops, sandal wood and tree crops). With the opening of stage II it is no wonder that the agriculture sector is looking towards new opportunities in ORIA.

During a visit to ORIA in May, Winthrop Professor Tony O'Donnell (Dean, FNAS), Winthrop Professor Kadambot Siddique (Director, IOA) and Winthrop Professor Peter Davies (Director, CENRM) explored opportunities to strengthen UWA's engagement in agriculture and natural resource management in the ORIA, especially during the Stage II development and beyond.

They explored potential research, postgraduate training and industry development opportunities in tropical agriculture and NRM in the region. They met with key Government Department officials, NGOs and growers in the region to assess research and training needs and opportunities, and investigated infrastructure requirements and associated funding opportunities to support a strong UWA presence in Kununurra.

One of the major challenges/opportunities is that ORIA is not degraded compared to other irrigation systems in Australia and hence this public asset should be protected.

The United Nations (UN) has included the Ord as a HELP (Health, Environment, Life and Policy) catchment. The need for a good tertiary education institution(s) involvement to support and underpin this initiative creates a golden opportunity for UWA. This would call for close collaboration with various agencies in the region as a high priority and will build on the excellent inter-agency links already operating.

Current DAFWA research in the area includes variety evaluation (sugarcane, mangoes, corn, chickpea, rice, soybean, GM cotton, wheat etc). UWA is involved in research on sandalwood, crops (e.g. chickpeas) and tropical river systems in the ORIA. Areas identified by UWA experts included, natural resource management, tropical river systems, soil water balance, nutrient cycling, crops and cropping system (including high value tree crops). Discussions are currently being held with various institutions and agencies on the concept of a 'Centre of Excellence in Topical Agriculture and NRM' in the region.

French connection

Four French agricultural students came to UWA to experience Western Australian agriculture. Ms Claire-Maëlle Fovet, Ms Solenn le Clanche (Université le Nirail, Toulouse), Maude Bertrand and Ms Amélie Misaine (SupAgro, Montpellier) with the Alpacas at UWA's Shenton Park Field Station.

University Sussex + UWA = Tim^2

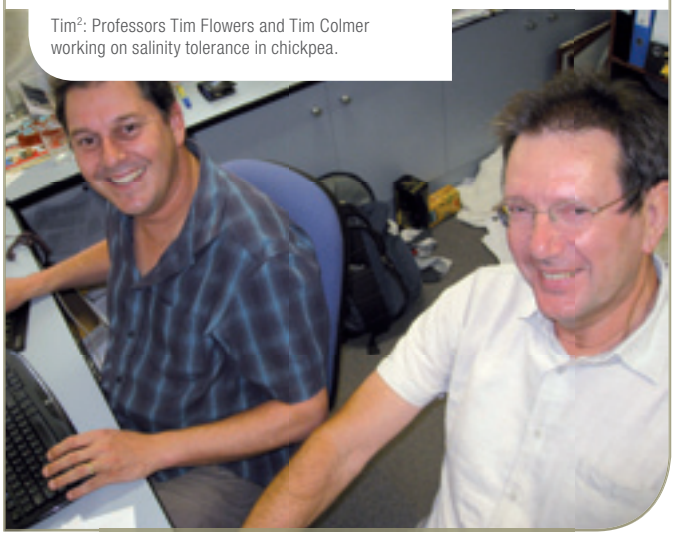
Two Tims are at the heart of the collaboration between the University of Sussex and UWA.

Prof Tim Flowers (University of Sussex) and Prof Tim Colmer (UWA) have been working together since 2004. Prof Flowers was appointed as Adjunct Professor within the School of Plant Biology in April 2003.

At the moment, Professors Colmer and Flowers are working on the Physiological and Molecular Characterisation of Salinity Tolerance in Chickpea in the ARC Linkage Project with COGGO and ICRISAT (Colmer, Siddique, Flowers, Gaur, Vadez, and Varshney). In another project, they are researching radial transport of oxygen, sodium and chloride in roots of rice: understanding mechanisms of tolerance to combined salinity and waterlogging.

Prof Flowers has also hosted a visit by Dr Natasha Teakle to Sussex, which resulted in a publication. Several other UWA collaborated publications have flowed through his pen. The two Tims have co-published six papers over the last four years.

Next year, Prof Flowers will host Prof Colmer at the University of Sussex for three and a half months of his study leave.



Tim^2: Professors Tim Flowers and Tim Colmer working on salinity tolerance in chickpea.

Dr Renuka Shrestha with Nepali women farmers in a lentil field. Dr Shrestha completed her PhD in 2005 on lentil adaption to drought at UWA with a John Allwright Fellowship from ACIAR.

CLIMA, ICARDA and ACIAR partnership deliver superior lentil varieties to Nepal

Professor Clive Francis (cfrancis@cyllene.uwa.edu.au)

A partnership between CLIMA, ICARDA and ACIAR has literally brought 'a gift' or 'good luck' to Nepal. This is an ACIAR supported project supervised by Professor Clive Francis (CLIMA).

Last year, the Nepal Agricultural Research Council (NARC) released ILL 7982 (FLIP96-50L) and ILL 6829 (FLIP89-71L) with the names Maheswor Bharati (named after the first coordinator of the national grain legumes research program) and Sagun (gift or good luck). These varieties were bred at the International Center for Agricultural Research in the Dry Areas (ICARDA), Aleppo, Syria and introduced to NARC, Nepal through International nurseries (LISN-SL 1996 and LIYT 1996).

These varieties were released for Kathmandu Valleys and similar environment, mid hills and river basin of Nepal where crop duration is about 30 days longer as compared to Terai/ inner Terai, the traditional growing area.

As *Stemphyllum blight* and wilt root rot are becoming severe in Terai/ inner Terai, popularization of these varieties play a significant role in lentil production in the mid hills where the incidence of these diseases is negligible. Maheshowar Bharati and Sagun matured in about 160 days with an average yield of 1450 kg/ha and 1350 kg/ha, respectively. These varieties are also performing well in Terai.

"Farmers of Lalitpur, Bhaktapur, Palpa, Dhankuta and Ramechap districts are very much encouraged to include lentils in their cropping system," Prof Francis said. Farmers preferred these varieties due to high yield (25-140% higher), large seed size (10-35%) and low wilt and root rot diseases as compared with check variety Simal (LG 7).

Another strength of Maheswor Bharati is that its short plant stature is resistant to lodging in excessive moisture and high fertility conditions.

Healthy farming – stronger communities?

Farms are at the heart of providing food security to the world. UWA Institute of Agriculture Industry Forum 2009, entitled 'Healthy farming – stronger communities?' explored a diverse range of issues, and challenges affecting farmers.

Speakers had innovative responses to these challenges, and agreed that "constant change is an ongoing reality". When the going gets tough farmers step it up as Mrs Jacqui Biddulph's Challenge Dairy case study showed.

Data sets on the full impact of family farms on the rural community are limited (A/Prof Bill Pritchard, University of Sydney). The facts are: the average age of farmers is increasing, young people have higher expectations and are moving to the coast. This and the decline in social amenities in some regions result in drive-in drive-out farming.

A positive attitude and forward thinking can create opportunities and change the rural landscape (Ms Wendy Newman, Heartlands Branding Group).

The focus is shifting from production on land to amenity (A/Prof Neil Argent). Victoria and New South Wales trends show people are buying land for lifestyle; driving subdivision. This is not the case in WA. In WA, agriculture still out performs its counter parts in other Australian states – despite adverse effects of market and recent droughts (Dr Nazrul Islam, DAFWA).

Farmers play an important role in the economy of small towns. Although they might do grocery shopping elsewhere, they prefer to buy fertiliser and farm implements locally (A/Prof Bill Pritchard, University of Sydney). Declining rural populations not only impact on the economy, but also the social welfare (Prof Matthew Tonts, UWA). Farmers should have a progression plan (Mr Julian Kreig, Wheatbelt Men's Health). One size does not fit all, especially where aboriginal agricultural and economic development is concerned (Mr Graham Ellis-Smith and Mr Oral McGuire).

Successful grower owned and driven groups like the Mingenew-Irwin Grower Group is one of the surest signs that agriculture is being proactive in securing the economic and social prosperity of rural communities (Ms Rachel Bagshaw, Mingenew-Irwin Group).

People are the centre of agriculture. Farmers have a passion and commitment to rural communities. For a more in-depth take on the Industry Forum, visit our website at http://www.ioa.uwa.edu.au/papers/industry-forum.

Ms Wendy Newman from the Heartlands Branding Group. (Photo courtesy of *Farm Weekly*).

Signing on South China Agricultural University

UWA has signed a Memorandum of Understanding (MOU) with South China Agricultural University (SCAU) on August 3, 2009.

SCAU is a national key university (100 year old university) located in Guangzhou City, adjacent to Hong Kong and Macao. Covering an area of more than 550 hectares, SCAU is renowned for agriculture and intends to develop into an advanced multi-disciplinary agricultural institute with distinctive tropical and subtropical features. The university treats agricultural sciences as its priority and life sciences as its highlight.

The UNDP, FAO and WFC have attached great importance to SCAU and established the Regional Sericulture Training Center for Asia and Pacific and China International Centre for Agricultural Training there.

Prof Alan Robson, Vice-Chancellor, UWA, and Professor Chen Xiaoyang, President, SCAU, shaking hands on the MOU.

Mapping the "hidden"

Roots are notoriously difficult to study because they are "hidden" in the soil. Now researchers have the opportunity to unveil the truth beneath the surface.

ROOTMAP is a three-dimensional root architecture model developed as a collaborative partnership between the Grains Research and Development Corporation (GRDC), the Department of Agriculture and Food WA (DAFWA), the Centre for Legumes in Mediterranean Agriculture (CLIMA), the UWA School of Plant Biology, and the Tasmanian Institute of Agricultural Research (TIAR).

This model was designed to simulate the way that water and nutrient uptake, and the growth of crop root systems, responds to the changing soil environment. It has been used to investigate a range of agronomic problems from water and nutrient dynamics at the micro-scale, up to field-scale simulations of crop water and nutrient use over many seasons.

"The strength of ROOTMAP is the capacity to investigate complex interactions between crop root systems and their below-ground environment," Dr Vanessa Dunbabin (University of Tasmania), program Co-creator said.

"Such studies are difficult, often impossible, to do in real soil. This recent collaborative project between UWA and the Tasmanian Institute of Agricultural Research (TIAR) has improved the way that the modelled root systems look," she said.

According to Assistant Professor Michael Renton, "these recent improvements to the graphical output capabilities of RootMap are important because they strengthen the capacity for ROOTMAP to be used as a visualisation, demonstration and teaching tool".

Ms Beena Anil.

The role of grower groups in promoting sustainable agriculture

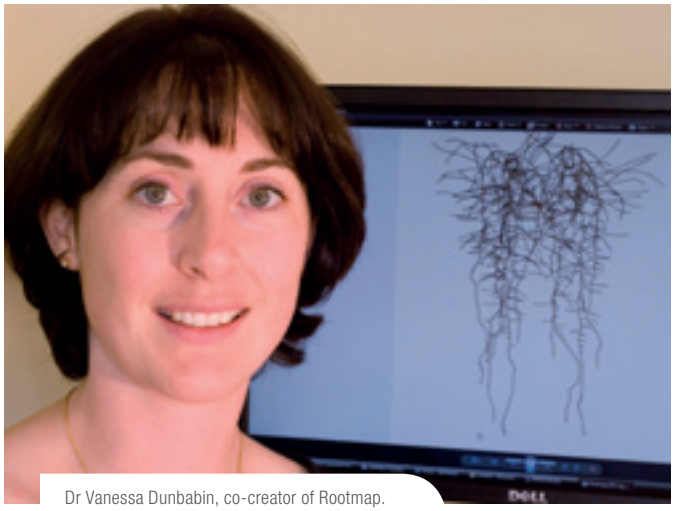
Ms Beena Anil (beenadiya@gmail.com)

What is the role of grower groups in promoting sustainable agricultural production? Ms Beena Anil, a PhD student from the School of Earth and Environment has started looking at the effectiveness of grower groups' in improving farmer knowledge, productivity and community wellbeing. She will analyse a range of activities of 45 grower groups operating across WA. Ms Anil will do more detailed research with three grower groups, focusing on their management structures, funding arrangements, extension strategies, research activities, and marketing.

This study will provide information on how grower groups can maximize their effectiveness in promoting sustainable agricultural production. The information could help grower groups to better target their activities, and develop policies and plans for their future development.

Ms Anil's PhD project is supervised by Professor Matthew Tonts, Institute for Regional Development (IRD) and W/Prof Kadambot Siddique, Director IOA. She will work closely with the Grower Group Alliance (GGA) project staff, located at the IOA. Ms Anil's PhD project is funded by UWA, IOA, School of Earth and Environment and Faculty of Natural and Agricultural Sciences (FNAS).

Ms Beena Anil can be contacted on tel: 0412 692 794.



Dr Vanessa Dunbabin, co-creator of Rootmap.

Back L to R: Mr Kelly Smith (Acting Director, International Centre), Prof GSLHV Prasada Rao (KAU), Prof Doug McEachern (Deputy Vice-Chancellor, Research and Innovation), W/Prof Kadambot Siddique (Director, UWA Institute of Agriculture) and A/Prof Karl-Heinz Wyrwoll (School of Earth and Environment). Front L to R: Mr KR Viswambharan, IAS Vice-Chancellor (KAU) and W/Prof Alan Robson, Vice-Chancellor (UWA).

Collaboration boost with Kerala Agricultural University

Collaboration between UWA and Kerala Agricultural University (KAU), India received a major boost when a Memorandum of Understanding (MOU) between the institutions was signed on July 30 2009. UWA will assist KAU in developing an integrated course (3+2) on 'Climate Change Adaptation'. The two universities will also collaborate on climate adaptation research strategies on rice and other important crops of Kerala. Academic staff exchanges and postgraduate research will be encouraged.

The KAU delegation consisted of Mr KR Viswambharan, IAS, Vice-Chancellor (KAU) and Professor GSLHV Prasada Rao, Co-ordinator, Centre for Climate Change Research (KAU).

During their visit, Mr Viswambharan and Professor Rao met with representatives from the Institute of Agriculture (IOA), International Centre, the various schools within the Faculty of Natural and Agricultural Sciences (FNAS), the International Centre for Plant Breeding Education and Research (ICPBER), School of Environmental Systems Engineering, various Centres of Excellence (Ecohydrology, Plant Energy Biology and Natural Resource Management), and CSIRO.

Professor Prasada Rao delivered an Occasional Seminar at the Institute of Agriculture.

Young Professionals in Agriculture Forum finalists (L to R) Ms Tess Metcalf and Ms Amy Goddard, both of UWA, Dr Mark Sweetingham of DAFWA, Ms Caris Peck and Ms Taya Clarke, both of UWA, WA Chief Scientist Professor Lyn Beazley, Mr Robert Alderman of UWA and AIAST WA President Dr Don Burnside.

UWA Young Professionals take top honours

Applying intellectual property in agriculture

Prof Michael Blakeney (m.blakeney@qmul.ac.uk)

The world of law and agriculture at UWA is bound to receive even more impetus after the appointment of Prof Michael Blakeney as Chair in Law at UWA. He specialises in the application of intellectual property rights (IPRs) to agriculture.

In 1998, together with a number of researchers from the Consultative Group for Agricultural Research (CGIAR), Prof Blakeney reported on The Use of Proprietary Biotechnology Research Inputs at Selected CGIAR Centers (with J.Cohen, C. Falconi and J. Komen) CGIAR, The Hague, March 1998. This report explained the importance for international agricultural research centres to avoid infringing the IPRs of third parties, and of securing the IPRs generated by the institutes themselves.

This report was followed by IP audits conducted at each of the sixteen CGIAR Centres, followed or paralleled by the formulation of IPR policies by the institutes and by the CGIAR. Prof Blakeney conducted the audits at the International Rice Research Institute (Philippines) the World Fish Centre (Malaysia) and the Centre for International Forestry Research (Indonesia).

Prof Blakeney's most recent applied research in this area, has been a Strategic Study on Product Stewardship and Liability in the Context of IPR, conducted for the FAO, which was completed early 2009 with Dr Rebecca Bratspies (CUNY, USA) and Dr Vibha Dhawan (TERI, India). The genesis of this study was the concern that CGIAR Centers and national agricultural research institutes should utilise the advantages of the IPR system, while preventing abuses and distortions of that system as applied to genetic resources in international public goods research in agriculture. The report addressed the formulation of IP policies to take advantage of these private sector opportunities, and acknowledged biosafety liability issues arising from the use of transgenic proprietary technologies.

A local extension of this work is a study which Prof Blakeney recently undertook for DAFWA on the liability issues arising from the utilization in the State of GM canola.

Prof Blakeney is the author of Intellectual Property Rights and Food Security, which was published in June 2009 by CABI and over the next two months he is giving a number of seminars at UWA in the Unit: Breeding and Biotechnology in Action, which is part of the MSc Degree in Genetics and Breeding, launched by the International Centre for Plant Breeding Education and Research (ICPBER).

Prof Michael Blakeney.

Final farewell to Professor Peter Graham

Dr David Chatel (dchatel@it.net.au)

UWA Agriculture lost one of its high achieving graduates in May this year. Professor Peter Graham (BScAgric 1960, PhD 1963) passed away unexpectedly in Minnesota USA following a minor shoulder operation.

Prof Graham studied under the late Prof Lex Parker at UWA and became a leading researcher and teacher in soil microbiology/nitrogen fixation. On completion of his doctorate he went to the University of Sydney as a lecturer/senior lecturer in the Department of Microbiology until 1971 when he joined the Centro Internacional de Agricultura Tropical (CIAT) in Colombia. In 1972 he was appointed Associate Professor and then Professor of Soil Biology at the University of Minnesota USA. At the time of his death in May he was still actively researching and teaching.

Throughout his time in the US he continued his strong association with South America and travelled there often researching and teaching. Prof Graham was fluent in Spanish and was able to attract and guide many young post graduates because of his communication and language skills. He also provided soil biology, especially nitrogen fixation, training courses in Mexico, Venezuela, Colombia and Uruguay. An indication of the respect he earned is the naming of the Peter H Graham Inoculant Laboratory Quito, Ecuador in 2000, honouring the research he coordinated during 12 years of a Bean/Cowpea project.

His interests included: bean and soybean cultivar improvement in the ability to nodulate and fix nitrogen; rhizobium strain selection for grain, pasture and prairie legumes; host and rhizobium tolerance of edaphic stress; inoculant formulation and production; rhizobium ecology and diversity/prairie fragmentation; and long distance education.

Prof Graham was a prolific publisher with 84 publications in peer reviewed journals, and 54 invited papers/book chapters. The publications he considered most significant covered the first application of computer techniques to the taxonomy of root nodule bacteria; and identification of a bean cultivar with enhanced ability in symbiosis (it has been used as a parent in all subsequent attempts to improve N fixation in beans); identification of a uniquely acid tolerant bean *Rhizobium* strain; and demonstration of strain differences in competitiveness in nodulation and inoculant mobility.

Prof Graham was a member of numerous key national and international committees/organisations e.g. the Subcommittee for the Taxonomy of Rhizobia (since 1982) and was appointed Co-Editor in Chief for the Americas and Africa of the journal "Field Crops Research" in 1999. He was expecting to continue in that position well into his retirement.
He is a significant loss to the research community.

Prof Peter Graham.

Prof Graham leaves his wife Rosemary and three children, Geoffrey, Michael and Michelle (all researchers in agriculture related fields).

Saying goodbye to Helen Spafford

W/ Prof Graeme B. Martin [Graeme.Martin@uwa.edu.au]

Dr Helen Spafford joined UWA's agricultural community early in 2001 with the remit of establishing 'integrated pest management' into the School of Animal Biology's teaching and research activities.

"Helen would probably define herself and an 'applied entomologist' and her personal research focus was on the development of biological control systems for managing weeds with insects. However, she operated at a much broader level, preferring to see pest management as an integrated issue, involving biological control and chemical control as well as environmental management," W/Prof Graeme Martin said.

She supervised many research students in this area and published about 40 journal articles. Dr Spafford will be most dearly remembered for being a truly outstanding teacher, able to take on subjects detested by students and then reversing their opinions to the point where they would applaud and offer gifts at the end of the semester. "We hope she will come back!"

Genome scientists at UWA for OECD Conference

The International Centre for Plant Breeding Education and Research (ICPBER) will host a conference on 'Exploiting genome-wide association in oilseed Brassicas: a model for genetic improvement of major OECD crops for sustainable future farming' at UWA from November 9-12, 2009.

This conference is sponsored by the International Organisation for Economics Co-operation and Development (OECD) Co-operative Research Programme on Biological Resource Management for Sustainable Agricultural Systems. Their financial support makes it possible for many of the invited speakers from OECD countries to participate in the conference.

The keynote speaker, Professor Carlos Bustamante, from Cornell University, USA, will speak on 'Association mapping – from humans to Arabidopsis and rice'.

he ICPBER was launched at UWA in August 2008 and aspires to "train professional plant breeders for tomorrow". This Centre seeks to attract international students into plant breeding and genetics, at BSc, MSc and PhD levels. They also offer in-service training by way of short courses/Master Classes for practising plant breeders or those in the seeds industry.

For more information, email Ms Sarah Mawson icpber@cyllene.uwa.edu.au

Salt grass strengthens Tokyo connection

The research on saltgrass has seen the collaboration between UWA and the Tokyo Agricultural University strengthen.

Mr Ghazi Abu Rumman, a PhD student in the School of Plant Biology worked with A/Prof. Shimpei Takahashi (Tokyo Agricultural University) during his 12 month research visit to UWA. They studied growth and physiological responses of saltgrass. Saltgrass is a halophytic grass being evaluated for use as turf on saline sites, to five salt levels in glasshouse experiments.

During his visit to UWA, Prof. Takahashi said "the excellence of research in the School of Plant Biology at UWA on salt-tolerant turf grasses was the reason I chose to undertake study leave here. The twelve months at UWA working with Prof Tim Colmer and Mr Abu Rumman has enabled us to study the ion concentrations in different parts of the plants".

The study evaluated how ions change in roots and shoots, and along different parts of the rhizomes. Rhizome ion relations had not previously been considered, yet planting of new sites often occurs from shredded rhizomes. "Salt grass retains good colour even when irrigated with saline water (up to sea water level) and low tissue levels of Na and Cl, but high K, even under 1.5 seawater level in the irrigation water," Mr Abu Rumman said.

Based on the significance of this research, Mr Abu Rumman was awarded a travel grant from the Grassland Society of South Australia to visit A/Prof. Takahashi in Tokyo for two weeks in October, to write-up a paper.

Mr Ghazi Abu Rumman (UWA) [pictured below] and A/Prof Shimpei Takahashi (Tokyo Agricultural University) [pictured bottom] studying physiological responses of saltgrass.

Dr Qin Yu.

Winning the weeds war

Dr Qin Yu (yuqin@plants.uwa.edu.au)

Herbicides are great at controlling weeds, but over-reliance can lead to resistance. Globally, about 319 biotypes of weed species have evolved herbicide resistance. Australia has the greatest problem. Dr Qin Yu, a Research Fellow at Western Australian Herbicide Resistance Initiative (WAHRI) within the School of Plant Biology, is working on revealing the physiological, biochemical and genetic characteristics of herbicide resistance, identifying resistance-endowing target site mutations and developing PCR-based markers for rapid diagnosis in herbicide resistant weed species.

"We have identified various resistance mutations in the ALS gene in several ALS herbicide resistant *L. rigidum* populations and developed PCR-based molecular markers for each mutation," she said. These markers have been successfully used in rapid diagnostic tests for target site based resistance and in pollen-mediated herbicide resistance gene flow study in *Lolium rigidum* populations. In particular, studies revealed diversity and complexity of the molecular basis of ACCase herbicide resistance in *L. rigidum* populations. Through a comprehensive and in-depth case study on clethodim resistance, it was evident that the specific mutation, the homo/heterozygous status of a plant for a specific mutation, and combinations of different resistant alleles plus herbicide rates are all important factors contributing to the overall level of herbicide resistance in genetically diverse, cross-pollinated Lolium species.

Glyphosate is the world's most important herbicide and paraquat is its alternative. The WAHRI team have confirmed the first global case of field-evolved multiple resistance to glyphosate and paraquat. "We determined that paraquat resistance is due to reduced paraquat movement to young leaves and glyphosate resistance is due to a point mutation in the target EPSPS gene, and reduced glyphosate translocation to young leaves (Yu et al. 2007b)," she said. The evolution of multiple resistances, especially to glyphosate and paraquat, indicates a further threat to the sustainability of glyphosate and paraquat.

Predicting the spread of plant and animal diseases

W/Prof George J. Milne (milne@csse.uwa.edu.au)

Prof George Milne.

Over the past five years a small group of computer scientists at UWA have been developing simulators which predict the spread of diseases among humans, animals and plants. The research team led by W/Prof George Milne, in the School of Computer Science and Software Engineering, have now produced simulation models, for foot and mouth disease, classical swine fever and bluetongue virus in animals, and for human pandemic influenza.

"Simulation models can predict the spread of disease among animal, human and plant populations and determine the benefit of interventions. We aim to minimise the number of animal and human hosts becoming infected or the spatial extent of disease spread in animal or plant communities," he said.

Field experiments are infeasible for most diseases. Traditionally, mathematical models were used to capture the dynamics of disease spread. It has inherent limitations i.e. an inability to capture population heterogeneity over the landscape. Simulation models allow for greater physical realism, creating 'virtual worlds' within which to conduct experiments on the effectiveness of mitigation interventions.

"To establish how a particular intervention may reduce disease spread we simulate the physical world without the intervention, determining the daily occurrence of infection transmission among the disease hosts. We repeat the simulated outbreak of a disease with the interventions activated. The difference in illness attack rates of individual humans or animals, and the spatial extent of disease incursion for animal and plant diseases, allows us to quantify the impact of the intervention," W/Prof Milne said.

W/Prof Milne and his team have examined the role of seasonality on the scale of a future outbreak of Classical Swine Fever in the feral pig population of tropical Queensland. The distinct weather impacted on the size and range of pig herds. The CSF model suggest that the time-of-year of virus introduction may have a significant impact on the scale of an outbreak and the difficulty in eradication. Current research conducted at the Centre for Infectious Diseases, University of Edinburgh is developing novel modelling techniques capable of capturing an outbreak of Bluetongue Virus; then using the resulting simulation technology to examine the efficiency of alternative vaccination strategies. Bluetongue is a complex disease to model; it is not transmitted via an insect vector. Initial results of this international research collaboration will be presented at the 12th International Symposium for Veterinary Epidemiology and Economics in South Africa in August.

The National Plant Biosecurity CRC is funding a new activity that aims to develop a generic plant disease and insect pest simulation environment, capturing disease and pest spread via wind or human transportation. It is designed for agricultural scientists to determine optimal surveillance and eradication schemes for future disease and pest incursions. Recent history has highlighted the importance of developing disease spread modelling technology prior to an outbreak.

Endeavour scholars undertaking agricultural research at UWA

Dr Rajasekaran Ravikesavan, Associate Professor from Tamil Nadu Agricultural University, Coimbatore, India, is currently a visiting Research Fellow at the School of Plant Biology for a period of six months.

This Plant Breeder by profession was awarded with Endeavour Research Fellowship by the Department of Education, Employment and Workplace Relations (DEEWR), Government of Australia, to take up a research programme on *Brassica napus*. His research is on 'Associating variation for flowering time in the Lynx x Monty DH population with CONSTANS and FLC candidate genes'. Variation in flowering time will be examined in a doubled haploid population under long/short day regime, and QTL's for flowering time will be identified. The project is supervised by Prof Wallace Cowling and W/Prof Kadambot Siddique. Collaborators include Dr Mathew Nelson and Dr Sheng Chen.

Dr Rajasekaran Ravikesavan is examining variation in flowering time in *Brassica napus*.

Dr Francesco Vinale is researching how to improve the resistance of plants against diseases.

Dr Francesco Vinale from the Department of Plant Pathology at the University of Naples, Italy is another recipient of the Endeavour Fellowship. He is hosted by W/Prof Krishnapillai Sivasithamparam and Professor Emilio Ghisalberti. Dr Vinale is researching how to improve the resistance of plants against diseases and phytopathogens. He is looking at the use of beneficial fungi and microbes to remove contaminants. This is also the focus of the University of Naples.

According to W/Prof Sivasithamparam, Dr Vinale has collaborated with UWA for many years on research dealing with novel antibiotics produced by bacteria and fungi. This is his third visit to UWA.

E-learning in plant breeding education

Prof William Erskine (william.erskine@uwa.edu.au)

Professor William Erskine, Director, International Centre for Plant Breeding Education and Research (ICPBER), attended a workshop of The Global Partnership Initiative for Plant Breeding Capacity Building (GIPB) hosted at Bioversity International in Rome, May 7-8, 2009.

Attendees aimed to develop the curriculum for an e-learning course in pre-breeding. The GIPB was formed at the Food and Agriculture Organization (FAO) of the United Nations, Rome, because of the worldwide shortage of plant breeders in both the developing and developed world.

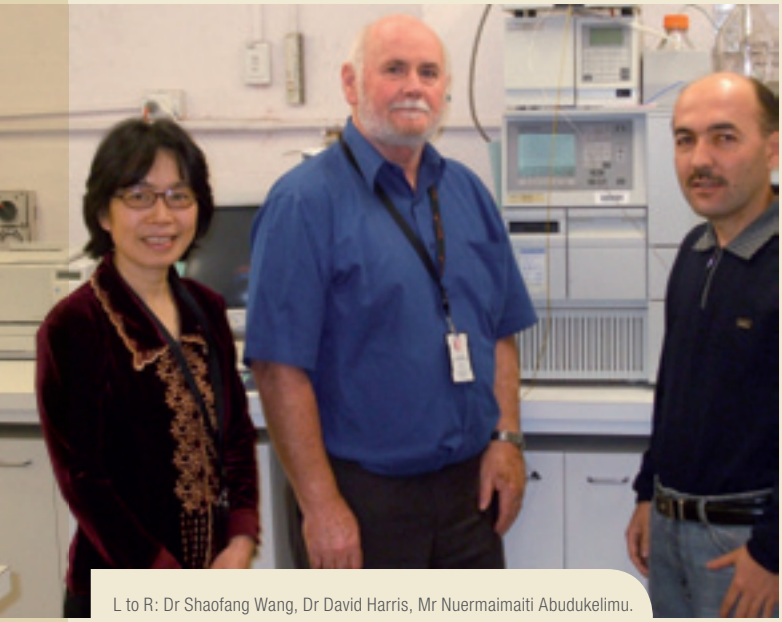
This e-learning course is targeted at developing-country breeders, gene bank managers, university professors, and associated fields, and will be also useful to students at the International Centre for Plant Breeding Education and Research (ICPBER) at UWA. Prof Erskine was invited to present the overview of 'Issues in Pre-Breeding' at the workshop.

The plan is now to link the GIPB e-learning activity with an initiative of the Australian Plant Breeding Educators Group to develop additional e-learning material Contextual examples linking theory with practice in plant breeding education, following the formation of this group at ICPBER in September 2008.

Prof William Erskine helped develop the curriculum for an e-learing course in pre-breeding.

Understanding the chemical components of lupin seed

Dr Shaofang Wang (swang@chemcentre.wa.gov.au)



L to R: Dr Shaofang Wang, Dr David Harris, Mr Nuermaimaiti Abudukelimu.

Lupin is the third largest crop in WA. Traditionally it was used as animal feed, and recently as an ingredient in fish feed. Its special food characteristics and health benefits give lupin great potential for human use as a food additive, and as a health supplement.

But the knowledge of the chemical constituents of lupin seed, except for lupin alkaloids, is limited. The Centre for Legumes in Mediterranean Agriculture (CLIMA), UWA, ChemCentre and Chinese Academy of Sciences, China, have funded research (with Dr Shaofang Wang, Dr David Harris (ChemCentre) and Winthrop Professor Kadambot Siddique (IOA) to identify various chemical components in lupin seed and to understand their biological activities. Recently a visiting scientist Mr Nuermaimaiti Abudukelimu from Xinjiang Physics and Chemistry Institute of Chinese Academy of Science, China, conducted research on lupin seeds at ChemCentre. He studied the chemical profiles of various solvent extracts using liquid chromatography mass spectrometry (LC-MS) and high performance liquid chromatography (HPLC). By using modern chromatography, major constituents from lupin solvent extracts were isolated and their structures revealed by various spectroscopic methods including Mass Spectrometry (MS), Nuclear Magnetic Resonance (NMR), and Infrared and Ultraviolet spectrometry. In addition, protein extracts from lupin seeds of four Australian species were investigated using a bioanalyser for their protein patterns.

"With our previous studies in phytosterols, carotenoids, fatty acids and alkaloids in lupin seeds, as well as flavonoids, saponins, combined with protein profiles studied in this project, we have a greater understanding of the chemical make-up of lupin seed. The above information should help to unravel the health benefits, and assist the food industry in using lupin as a food additive," Dr Wang said.

Alumni

Honourable Terry Redman
Minister for Agriculture and Food WA.

Hon Terry Redman

The Honourable Terry Redman, Minister for Agriculture and Food WA, is a proud graduate of UWA's Institute of Agriculture, graduating with a Bachelor of Science (Agriculture) in 1984.

After five years at UWA, Mr Redman taught at a number of agricultural colleges in WA including Narrogin, Morawa and Denmark. He enjoyed imparting his passion for agriculture to his students. Mr Redman spent nine years as Principal of Denmark Ag college – the youngest principal ever appointed to an Ag College in WA.

Mr Redman and his wife Marie have been small business owners in the area for seven years and prior to that, were partners in a family farming operation at the Porongurups for 14 years.

Mr Redman entered State Parliament in 2005 and is now the member for Blackwood-Stirling, which sees him personally represent the area from Denmark to Augusta to Boyup Brook.

In September 2008 Mr Redman was sworn in as Minister for Agriculture, Food and Forestry as part of the new Liberal-National State Government. Since being elected Minister, Mr Redman has set out clear priorities for progressive and profitable agriculture, food and forestry sectors – which remain the unsung heroes of the WA economy.

Mr Redman is particularly interested in an effective system of regional saleyards, encouraging the expansion of the Ord River Area, opening up market opportunities for more WA produce and promoting a positive image of the WA agriculture, food and forestry sectors.

The highlight for Mr Redman from his time at UWA, was the regional study tours where the educational value was surpassed only by the level of commitment to the local watering holes by his fellow students.

Mr Redman says, "I would encourage people from all walks of life to get involved with agriculture. Gone are the days of agriculture being seen as the poor cousin of other sciences – we are in a cutting edge, high tech and highly competitive industry. Agriculture and food will continue to be the cornerstone of our state economy and I am so keen to use the opportunity I've been given as Minister to make a real difference to our industries."

Emeritus Professor Ian Hume

Emeritus Professor of Biology, University of Sydney

Ian Hume completed his BSc (Agric) (Hons) at UWA in 1966 and his PhD in ruminant physiology with Professor Reg Moir in 1970. He spent a post-doctoral position in the Department of Animal Science at the University of Kentucky, USA. He then took an opportunity to teach a course 'Nutrition of Wildlife and Fish' at the University of California, Davis. After returning to Australia in 1973, Ian took up a lectureship in the Faculty of Rural Science at the University of New England. Ian was awarded the degree of Doctor of Science from that University in 1986 for his Dissertation 'Digestive Physiology and Nutrition of Herbivorous Mammals'.

The following year Ian moved to the University of Sydney to take up a Chair in Biology in the School of Biological Sciences. He was the Challis Professor of Biology from 1994 until his 'retirement' in 2003. Ian has authored or co-authored four books, co-edited three books, and written more than 170 scientific articles. He is an Honorary Life Member of the Comparative Nutrition Society (based in Washington DC) and the Australian Mammal Society. He won the Whitley Medal from the Royal Zoological Society of New South Wales in 2000 for his book *Marsupial Nutrition* (Cambridge University Press) and the Troughton Medal from the Australian Mammal Society in 2004 for his outstanding contributions to the study of Australian mammals, and was elected to a Fellowship of the Australian Academy of Science in 2007.

Ian says: "my training in Agricultural Science at UWA was the foundation for my academic success in a field related to but not in animal science. The BSc (Agric) degree had such a broad base across the sciences that I found it quite natural to move into a School of Biological Sciences. I often recall the banner identifying the Ag students' display at the 1984 UWA Science Exhibition in the basement of Winthrop Hall; it proclaimed in large letters that "Agriculture Integrates the Sciences".
I designed the banner, thinking at the time that it was slightly cheeky, but I realise now that it was true, and still is!"

E/Prof Ian Hume.

Mr Bill Crabtree.

Mr Bill Crabtree

Farmer

Mr Bill Crabtree completed a BScAg degree in 1984 and MSc (Agric) in 2002, both from UWA. He worked with the Department of Agriculture for 12 years, then lived in Canada on a job exchange in 1996, before becoming a Scientific Officer for WANTFA for 5 years and being a farm consultant for 6 years. He recently became a farmer.

Mr Crabtree became known as 'No-Till Bill' through his multi-award winning research and extension conducted throughout his career (WA Landcarer of the year in 1995 and GRDC's 2006 Seed of Light award). He has used his communication skills to lead nine farmer study tours to different parts of the world, including; North and South America, China, Africa and Europe. Mr Crabtree received an honorary Life Membership with WANTFA in 2003. Mr Crabtree has just released a book/CD on his work called *Search for Sustainability with No-Till Bill in Dryland Agriculture* (www.no-till.com.au).

New staff

Dr Amin W. Mugera

Dr. Amin Mugera was recently appointed as an Assistant Professor in the School of Agricultural and Resource Economics at UWA. Dr Mugera received his PhD in Agricultural Economics from Kansas State University (USA) in 2009. He specialises in: production economics, farm management, agricultural marketing, and agribusiness management. His past research focused on the dynamics of productivity growth in the Kansas farm sector; risks associated with labour management in agriculture; rural microfinance constraints and accessibility in Uganda; and fertilizer marketing cost analysis in Kenya.

Dr Mugera will be teaching an undergraduate module in commodity futures/risk management in the Agricultural Economics and Marketing course. He is also the Deputy Program Leader (Rural Economy, Policy and Development Program) of the UWA Institute of Agriculture (IOA).

Email: mugeraam@cyllene.wua.edu.au

Ms Megan Meates

Ms Megan Meates has joined the Grower Group Alliance (GGA) team as a project officer, and will work closely with Ms Susan Hall on GGA project activities. Last year she was a rural journalist for the Countryman, Geraldton Guardian and Mid West Times.

Ms Meates completed an Animal Science degree at UWA in 2005 and has since developed a passion for working in the agricultural industry. Ms Meates hopes her skills will be put to good use with the GGA. Her tasks include editing the monthly e-newsletter, the Calendar of Events and helping plan the GGA Annual Forum in August. She is also looking forward to meeting researchers, industry partners and growers from the 45 GGA grower group members in WA.

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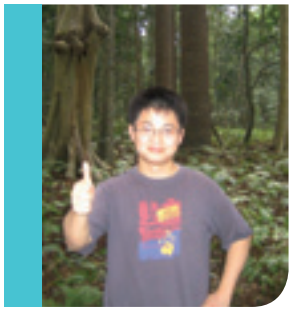

Dr Lei Gao

Dr Lei Gao recently joined UWA as a Research Fellow in the School of Agricultural and Resource Economics. He is working with Assoc/Prof Atakelty Hailu and Prof Michael Burton on recreational site choices for the Ningaloo region. Dr Gao was awarded his PhD in Computer Sciences from Donghua University (China) in 2006. Prior to joining UWA, he worked as a Research Scientist and then a Project Manager in an Australian hi-tech enterprise. Last year he was awarded a Senior Engineer title in Computer and Information Sciences, Shanghai, China. His current research areas include agent-based modeling and simulation, advanced analytics (complexity/mathematical modeling and optimization) on environment, social policies, supply chain management, and decision-making support, and intelligent information processing.

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Ms Susan Hall

Recently Ms Susan Hall has taken up the GGA project leadership from Tracey Gianatti. As the new leader of the Grower Group Alliance, she is excited about the challenges ahead. Susan has been working as Development Officer at the GGA for more than 18 months.

Susan is from a farming family and has a strong background in communications.

She also has experience working in public relations in the agricultural industry.

"I can see potential for improved communication networks between grower groups," she said.

Susan feels that working on enhancing the effectiveness of grower groups is an ongoing process, and there is much more one could do to enhance participation of farmer groups in collaborative projects.

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Dr Ricarda Jost

Dr Ricarda Jost is a Rresearch Ffellow in the School of Plant Biology. She is working with Prof Hans Lambers, A/Prof Patrick Finnegan and colleagues from UWA and Murdoch University on an ARC linkage project trying to answer the question: "Susceptibility to *Phytophthora cinnamomi* and sensitivity to phosphate in native Australian plants: why are they linked?".

Dr Jost was awarded her Dr. rer. nat. with 'magna cum laude' at the Martin-Luther University Halle-Wittenberg (Germany) in 2002. Since then she has been awarded a German Research Council funded postdoctoral fellowship in the German Plant Sulfur Group investigating 'The role of sulfur metabolism and sulfur rich peptides for pathogen resistance in Brassicacean species' before moving to the Australian National University in 2003 to work in the GRDC (Grain Research and Development Corporation) funded 'Functional Genomics' program on 'Gene expression induced by root mechanical impedance in wheat'.

She is currently trying to identify phosphate starvation signaling components in the model plant Arabidopsis that can be interfered with by either the phosphate analog phosphite, a protective agent against the plant pathogen *Phytophthora*, or by pathogen-derived molecular signals.

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Visitors to the IOA

NAME	VISITOR ORGANISATION AND COUNTRY	HOST	DATES
Prof Jingnan Guo	Chinese Academy of Agricultural Sciences	Assoc/Prof Guijun Yan	2009-2010
Prof Tertius Brand	University of Stellenbosch/Elsenburg Institute of Agriculture, South Africa	Dr John Milton Dr Irek Malecki	17 April 2009
Dr Roberta Marra	University of Naples, Italy	Prof Martin Barbetti W/Prof K. Sivasithamparam Assist Prof Hua Li	May to September 2009
Dr Francesco Vinale	University of Naples, Italy	W/Prof K. Sivasithamparam Prof Emilio Ghisalberti	May to October 2009
A/Prof Theera Visitpanich A/Prof Dr Sampan Singharajwarapan Prof Dr Nat Vorayos A/Prof Dr Pairote Wiriyacharee	Faculty of Agriculture University of Chang Mai, Thailand	W/Prof Kadambot Siddique	15 May 2009
Dr Prabhjot Sandhu	Punjab Agricultural University, India	Prof Martin Barbetti Prof K. Sivasithamparam Assist/Prof Hua Li	June to September 2009
Prof Richard Burns	School of Land, Crop and Food Sciences, University of Queensland	W/Prof Tony O'Donnell	22 June 2009
Prof Max Lu	University of Queensland	W/Prof Kadambot Siddique	8-9 July 2009
Prof Sanjay Vasant Deshmukh	University of Mumbai	W/Prof Kadambot Siddique	28 May 2009
Mr Entisar Elbahi	On behalf of the Libyan Ambassador	W/Prof Kadambot Siddique	10 June 2009
Dr William D Dar Dr Peter Ninnes	ICRISAT	W/Prof Kadambot Siddique	9-10 July 2009
Mr K.R. Viswambharan IAS Prof Prasada Rao	Kerala Agricultural University, India	W/Prof Kadambot Siddique	27-30 July 2009
Dr Nguyen Lap Dan Dr Nguyen Dinh Ky Dr Tran Van Hung Dr Nguyen Anh Hoanh Dr Pham Xuan Truong	Vietnam Academy of Science and Technology (VAST)	W/Prof Lyn Abbott	1-8 August 2009
Prof Chen Xiaoyang Dr Yu Rangcai Prof Huang Daqian Mr Wang Changming	South China Agricultural University (SCAU)	W/Prof Kadambot Siddique	3 August 2009
Dr Salem S. Alghamdi	Plant Production Department, College of Food and Agricultural Sciences, King Saud University	W/Prof Kadambot Siddique Prof Willie Erskine	3-7 August 2009
Prof Li Jiayang Dr Zhang Zhibin Prof Xue Yongbiao Prof Liu Shuangjiang Prof He Rongqiao Mr Zhang Shizhuan Mr Ning Bolun Prof Peng Hui	Chinese Academy of Science	W/Prof Kadambot Siddique	10 August 2009
Dr Yunbi Xu	Applied Biotechnology Center (International Maize and Wheat Improvement Center, Mexico)	W/Prof Kadambot Siddique Prof Willie Erskine	17 August 2009
A/Prof Sven-Erik Jacobson	Department of Agriculture and Ecology, University of Copenhagen, Denmark	W/Prof Kadambot Siddique	18 August 2009
Prof Jianxin Liu Prof Ruijun Long Prof Zushu Yan Prof Junhu Prof Yanzhang Gong Prof Yun Li Prof Guoping Zhang Prof Zhiying Ma Prof Zhougui Cao Prof Chongfa Cai	Zhejiang University, China Lanzhou University, China Northwest Agri & Forest University Huazhong Agriculture University Southwest University, China Zhejiang University, China Hebei Agriculture University Huanzhong Agriculture University	W/Prof Graeme Martin Dr Shimin Liu	25-27 August 2009
Dr Johann Strauss Ms Lisa Smorenburg	Sustainable production systems, Department of Agriculture: Western Cape, South Africa	Dr Ken Flower	15-19 September 2009

New PhD students

NAME	TOPIC	SCHOOL	SUPERVISOR(S)	FUNDING BODY
Mr Saud Alamri	Physiological and genetic influences on Hordeum marinum accessions, wheat and their amphiploids, under salt and waterlogging stresses	Plant Biology	Prof Tim Colmer	FFI CRC, Centre for Ecohydrology
Ms Mingren Shi	Simulation Modelling of the Evolution of Resistance to Phosphine in Lesser Grain Borer	Plant Biology and Animal Biology	Asst/Prof Michael Renton and A/Prof Helen Spafford	CRC National Plant Biosecurity
Ms Alison Mackie	Phylogeny, pathogenicity and epidemiology of potato spindle tuber viroid (PSTVd) and related pospoviroids in Australia	Plant Biology	Prof Martin Barbetti, Adj Prof Roger Jones, Dr Brendon Rodoni, Dr Simon McKirdy	CRC National Plant Biosecurity; Horticulture Australia
Ms Xintian Ge	Physiological specialisation in Hyaloperonospora brassicae (Downy mildew) and host resistance in Brassicas	Plant Biology	Prof Martin Barbetti, Prof Krishnapillai Sivasithamparam, Asst/Prof Hua Li	UWA; Kunming Floral World Bio-Tech Co Ltd (China); Institute of Agriculture
Mr Andrew Kennedy	Economic modelling of genetic selection strategies to improve robustness and reproduction efficiency in sheep production systems	Agricultural and Resource Economics and Animal Biology	W/Prof David Pannell, Prof Graeme Martin, Dr Andrew Thompson (DAFWA)	Sheep CRC

New research projects

TITLE	FUNDING PERIOD	FUNDING BODY	SUPERVISOR(S)
Developing a 3D movie generation system for use with ROOTMAP	2008-2009	University of Tasmania	Assistant Prof Michael Renton
Forecasting spread for rapid response	2008-2011	CRC Plant Biosecurity	Assistant Prof Michael Renton
Development of a salt and waterlogging tolerant wheat	2010-2011	Future Farm; CRC ex GRDC	Prof Tim Colmer, Adjunct Associate Prof Edward Barrett-Lennard and Dr Rafiq Islam (University of Adelaide)
Development of native plant industries for an innovative sustainable and profitable Great Southern Region	2009	Great Southern Development Commission	Dr Geoff Woodall
Assessment of sediment erosion and soil sampling methods applied in WA	2009	Department of Agriculture and Food WA (DAFWA)	Dr Karen Homes and Dr Neil Coles
Determining root longevity in an Australian perennial monocotyledon	2009	AINSE Research Training	Dr Michael Shane
Development of methods for freezing ratite semen as poart of a long term goal to develop a viable artificial insemination technology for ratites	2009	Australian Academy of Science: International Programs	Dr Irek Malecki
Pollen-mediated gene flow in weed species from adjacent farms into organic farms	2009	Department of Agriculture Fisheries and Forestry (DAFF)	Dr Roberto Busi, Prof Steve Powles and Dr Qin Yu
Optimal investment in R&D for Plant Biosecurity	2009-2011	CRC Plant Biosecurity	Prof Benedict White
Influence of High Temperature on Phenology, Metabolism and the Fate of Axillary Buds and Inflorescences in Grapevine	2009-2014	Australian Research Council; Gascoyne Table Grape Growers Association; Department of Agriculture and Food WA (DAFWA)	Assistant Prof. Michael Considine, Prof Jim Whelan, Dr Colin Gordon
Mechanisms and Manipulation of Seed Dormancy Maintenance in Annual Ryegrass and other Weed Species	2009-2011	Australian Research Council; Botanic Gardens and Parks Authority	Prof Steve Powles, Adjunct Prof Kingsley Dixon
Simulation Technology for Modelling Extreme Bushfire Behaviour	2009-2013	Australian Research Council; Fire and Emergency Services Authority of Western Australia; Landgate	Prof George Milne and Prof John Dold
Overcoming paraquat resistance: The potential for herbicide mixtures to reverse paraquat resistance	2009	Department of Agriculture, Fisheries and Forestry (DAFF)	Prof Stephen Powles
Identifying the basis of dual glyphosate and paraquat resistance in Lolium rigidum selected at reduced rates of glyphosate	2009	Department of Agriculture, Fisheries and Forestry (DAFF)	Prof Stephen Powles
Overcoming and avoiding metabolism based herbicide resistance in *Lolium rigidum*	2009	Department of Agriculture, Fisheries and Forestry (DAFF)	Dr Todd Gaines and Prof Stephen Powles

RESEARCH AND INDUSTRY RECOGNITION

Professor Alan Robson, AM:
Citizen of Western Australia

Mr Alexander Campbell:
Honorary Doctor of Science

Dr Patrick Bird OAM:
Medal of the Order of Australia

UPCOMING MEETINGS AND EVENTS

IOA EVENTS

UWA Ridgefield Open Day 2009
20 November 2009
www.ioa.uwa.edu.au

NATIONAL AND INTERNATIONAL EVENTS

Dowerin Field Days
26-27 August 2009
www.dowerinfielddays.com.au

19th Annual Combined Biological Sciences Meeting
Promoting biological science in Western Australia by encouraging the interaction of scientists, students, and industry from all of the life sciences.
28 August 2009
www.cbsmwa.org.au

Kwongan Colloquium 2009
Biodiversity in the wheatbelt: where do we go in the 21st century?
12-13 September 2009
http://www.plants.uwa.edu.au/alumni/kwongan
Hosted by: School of Plant Biology and Conservation Council, Science Divisions of Kings Park & Botanic Garden and Department of Environment and Conservation. Sponsorship from the Shire of York.

OECD Co-operative Research Program Sponsorship for the international conference 'Exploiting Genome-wide Association in Oilseed Brassicas', UWA
9-12 November 2009
www.icpber.plants.uwa.edu.au

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Not reported previously

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Chelmonska B, Jerysz A, Lukaszewicz E, Kowalczyk A and Malecki IA (2008). Semen collection from Japanese Quail (Coturnix japonica) using a teaser female. Turkish Journal of Veterinary and Animal Sciences **32**: 19-24.

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Malecki IA, Glatz PC, Anderson CA and Webb LE (eds.) (2009). Ratite Science for industry and conservation – Special issue of the Australian Journal of Experimental Agriculture, 2008, Volume 48 (10) 1247-1350. CSIRO Publishing, Victoria, Australia.

Book chapters

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(March–August)

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Doole GJ, and Pannell DJ (2009). Evaluating combined land conservation benefits from perennial pasture: lucerne *(Medicago sativa L.)* in Western Australia for management of dryland salinity and herbicide resistance, Australian Journal of Agricultural and Resource Economics **53**: 193–212.

Erskine W and Nesbitt H (2009). How can agriculture research make a difference in countries emerging from conflict? Expl Agric. **45**: 313–321.

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