



First year Agriculture students during orientation

Student numbers grow in agriculture and environmental sciences at UWA

Mr Ray Ryken-Rapp (Ray.Ryken-Rapp@uwa.edu.au)

Today's world is more than ever looking to science and innovation for sustainability in agriculture and food production to feed the increasing population.

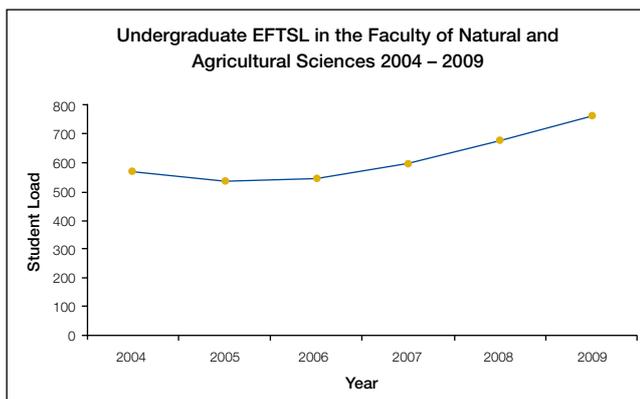


Figure 1

Whilst population growth is fuelling the demand for food, rapid industrialization in major economies is increasing the demands on agriculture to produce fibre, fuel and industrial raw materials. Yet, at the same time, the world's finite supply of agricultural land and water are declining under the pressures of climate change, urbanization and human-induced degradation. Against this backdrop of rapid demand growth, changing climate, declining natural resources, restrictive trade policies, and regional disturbances, agriculture must respond by increasing its productivity.

This makes it even more pleasing to see a continued positive trend of students entering agricultural and environmental sciences at UWA to undertake that challenge. At the commencement of Semester One there were 62 new enrolments in agricultural and natural resource management sciences. The Faculty of Natural and Agricultural Sciences' (FNAS) annual enrolment loads as illustrated in Figure 1 (expressed in Equivalent Full-Time Student Load (EFTSL)) shows the trend in faculty undergraduate student loads since 2004.

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Director's Column



Global economic growth is predicted to slow down during the beginning of the 2009-18 periods; however it will slowly recover after 2010.

Agricultural production, consumption and trade will provide new opportunities for investment and economic growth. Recent Australian Bureau of Agricultural Resource Economics (ABARE) outlook indicates that Australian farm exports will steer through global financial recession, rising by four percent to \$32.1 billion next financial year. ABARE also predicts that Australian farm export earning would rise to \$37.8 billion by 2013-14.

While addressing the Committee for the Economic Development of Australia (CEDA) WA's Premier Colin Barnett highlighted agriculture's increasing importance to the State's economy.

Mr Terry Redman, Minister for Agriculture, Food and Forestry; and Minister Assisting the Minister for Education WA delivered a far ranging address to the Rural Media Association on 12th March, focusing on his new mantra "Making every hectare count" and five priorities are:

- Improving long term profitability of food and agriculture;
- Effectively manage land and water assets, climate variability and bio-security;
- Build capacity of industry to adapt and grow;

- Improving market access for WA products; and
- Promoting positive profile of WA agriculture and food sectors.

Hopefully both Federal and State Governments will increase the much needed strategic direction and funding for agricultural education, research and development to address some of the challenges and improve farm productivity, sustainability and profitability.

Each year provides one with a renewed opportunity to build upon the previous year. March 2009 marks the second anniversary of the reinvigoration of the Institute of Agriculture at UWA. We have made several achievements over the past two years, and our efforts are sharply focussed towards enhancing UWA's contribution to agriculture and natural resource management in WA, and selected national and international settings.

Our partnership with International Crop Research Institute for the Semi Arid Tropics (ICRISAT) have strengthened further after a formal review of the Council of Grain Growers Organisation Ltd (COGGO) funded chickpea breeding and associated projects in India (more on page 5). Collaboration with Indian institutions was also strengthened early this year with the signing of a Memorandum of Understanding (MoU) between UWA and Punjab Agricultural University (PAU).

UWA prides itself on research excellence. In terms of scientific publications and its impact during 2001-07 period, UWA's agricultural researchers have excelled both nationally and internationally in agronomy, agricultural economics and policy, agricultural soil sciences, plant sciences, and agricultural dairy and animal sciences (see page 9) Several researchers and students were recognised for their work. Ms Annaliese Mason received the Mike Carroll Travelling Fellowship award for her *brassica* research (see page 4).

Professors Lorenzo Faraone and John Dell won the Eureka prize for developing a colour near infra-red spectrometer that has potential application in agriculture (see page 6).

The School of Agricultural and Resource Economics academics (SARE) won the jackpot at The Australian Agricultural and Resource

Economics Society (AARES) conference, taking home four prizes (see page 11).

Research priorities for agriculture, food production and sustainability will require inter- and multi-disciplinary approaches. Partnership on long-term strategic research and effective collaboration between universities, industry and government will be critical to address some of the global challenges facing agriculture.

IOA's key role is bringing together UWA's agricultural research, teaching, training and communication activities; integrating complementary activities across disciplines and organizational units, and provides a focus for leading-edge research and development.

Our emphasis is to foster national and international linkages and alliances that bring new knowledge and expertise to WA, and allow WA to share its knowledge with the world.

Student numbers grow in agriculture and environmental sciences at UWA

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UWA graduates remain in high demand. Employment prospects in agriculture and related natural resource management areas are staying strong despite the world wide economic downturn. It is also pleasing to see the numbers of students that are returning to UWA to undertake postgraduate studies, for which the Faculty is highly regarded.

Sazwan, a first year student from Malaysia, said he chose to study agriculture at UWA because of the big emphasis the Malaysian government places on agriculture. "UWA has a solid international track record in agriculture teaching and research", he said.

Another first year student, Helena from Western Australia, said that she chose agriculture because she believes, "It will open up a lot of opportunities to meet global challenges and pave a future career".

Malaysian Agriculture Minister visits UWA



BACK L TO R: Mr Mohamed Kamal (Press Secretary to Minister), Dr Harisah bt Munip (Agriculture Counsellor in Australia, Malaysian Consul Sydney), Prof Kadambot Siddique (Director IOA, UWA), Mrs Hamidah Ashari (Malaysian Consul-General, Perth) and Dato' Dr Baharom bin Jani (Deputy Secretary General (Development), Ministry of Agriculture and Agro-Based Industry) and Prof Steven Smith (Plant Energy Biology, ARC Centre of Excellence, UWA).

FRONT L TO R: PhD students Miss Alene Tawang (School of Animal Biology), Mrs Noraini Jaafar (School of Earth and Environment), The Hon Dato' Mustapa Mohamed (Minister of Agriculture and Agro-based Industry), Mr Isharudin Md. Isa (School of Earth and Environment), Ms Mashitah Shikh Maidin (School of Animal Biology) and Mr Saiful Haamdani (School of Plant Biology).

Recently, agricultural links between Malaysia and UWA strengthened, culminating in a visit by the Honourable Dato' Mustapa Mohamed', Minister of Agriculture and Agro-based Industry of Malaysia in December 2008.

The Minister met with Professors Alan Robson (Vice-Chancellor), Robyn Owens (Pro Vice-Chancellor (Research and Research Training) and Kadambot Siddique (Director, IOA) and Mr Dave Norman (International Centre).

Collaboration between UWA and the Universiti Putra Malaysia (UPM), in particular, commenced in 2006 when Professors Alan Robson (UWA Vice-Chancellor) and Alistar Robertson (former Dean FNAS) visited UPM. In return, a high level delegation from UPM visited UWA in February 2007 under the leadership of Prof. Dr. Nik Mustapha bin Raja Abdullah (Vice-Chancellor, UPM

This was followed up by a technical visit by Professors Kadambot Siddique and Graeme Martin to UPM in June 2007. These visits opened up collaborative opportunities in research and training of relevant UPM staff to PhD level especially in agriculture. Prof Siddique is currently a visiting Professor and an external examiner for the agricultural science degree program at UPM.

During the Malaysian Minister's visit to UWA he also met six of the eight Malaysian PhD students in FNAS and reinforced the strong connection with UWA. The Minister pledged further continued support from the Malaysian Government on capacity building and collaborative research projects of mutual interest. This year already shows promising numbers from Malaysia, with four undergraduates commencing their agricultural science degree at UWA.

Huge crop diversity in the land of the Incas

Dr Jon Clements (clem@cyllene.uwa.edu.au)

Mr Enrique Tapia visited CLIMA at UWA during December 2008 as part of a Crawford Fund training award.

Mr Tapia is an agronomist at the National University of the Altiplano, Puno, Perú. His visit is part of research into developing the Andean lupin or pearl lupin (*Lupinus mutabilis*) in Australia. Mr Tapia says that through this research they hope to assess the genetic diversity of the lupin species to learn more about the habitats that it is most adapted to, and also plant characteristics that are associated with increased harvest index and yield.

In a GRDC-funded research (with Dr Jon Clements and the Department of Agriculture and Food with Dr Bevan Buirchell), the Andean lupin is being bred for Australian conditions. It is hoped that the preliminary collaborative studies between Peru and Australia about genotype by environment interactions in the Andean lupin will lead to a larger project where more detailed work will be conducted on the very diverse germplasm within that lupin species and the approximately two hundred related lupin species from South and North America.



Mr Enrique Tapia (National University of the Altiplano) and Dr Jon Clements discuss Andean lupin breeding in Perth.

Sustaining productive agriculture for a growing world

Agriculture expert lauded in India

Pioneering PhD research at UWA not only helped launch a major Australian export industry, it also won the researcher a prestigious award in India recently.

Professor Kadambot Siddique, Chair in Agriculture and Director of UWA's Institute of Agriculture, was presented with a gold medal in February from the Indian Society of Pulse Research and Development by Dr APJ Abdul Kalam, a former President of India, at the Indian Institute of Pulses Research in Kanpur.

Professor Siddique began exploring the potential of chickpea adaptation when, after beginning agricultural studies in India, he started postgraduate work at UWA in 1981.

His work was the starting point for the Australian chickpea industry, now valued at more than \$200 million annually. It also created research links that tie UWA to Turkey, Bangladesh, East Timor, Iraq, Oman, China, India, the US and Canada.

Professor Siddique said he was delighted to receive the award from Dr Abdul Kalam.



R to L: Dr APJ Abdul Kalam (Former President of India) giving the Gold Medal and award to Prof Kadambot Siddique; Dr Mangala Rai, Secretary Department of Agriculture, Research and Education (DARE) and Director General of Indian Council of Agricultural Research (ICAR) and Dr Masood Ali, Director of the Indian Institute Pulse Research (IIPR) were also present at the occasion.

"I am humbled and honoured to receive this award," Prof Siddique said. "It also recognises the important contributions made by a team of scientists and postgraduate students with whom I have had the privilege to work and collaborate."

Mason builds on UWA Super Brassica research in France



PHOTO: Brendon Cant & Associates

At the Mike Carroll Travelling Fellowship award presentation held at UWA are Mrs Helen Carroll, Ms Annaliese Mason, recipient of the Mike Carroll Travelling Fellowship for 2008, Prof Graeme Martin, Chair of Animal Science at UWA and Prof Tony O'Donnell, Dean FNAS.

Ms Annaliese Mason, agricultural science PhD student at UWA was awarded the prestigious 2008 Mike Carroll Travelling Fellowship.

She will spend six weeks in France researching how to combat potential problems of abnormal chromosome associations in Super Brassica plants.

Announcing the winner at a ceremony at FNAS, Mrs Helen Carroll said the Fellowship honoured her deceased husband, former Director General of the WA Department of Agriculture, Dr Mike Carroll.

"Recipients are chosen on their academic abilities, relevance of studies to an important area of Australian broadacre agriculture, their potential to benefit from the experience and their enthusiasm to impart the findings of their travels to the scientific, farming and wider community on their return to WA," Mrs Carroll said.

In her PhD research at UWA, Ms Mason assessed the pollen of 84 plants from 12 cultivar/species crosses, establishing that most first generation hybrids produced abnormal gametes.

To create a super Brassica plant she conducted a unique crossing plan involving two generations of hybridisation and all three species. This resulted in canola with two genomes (sets of chromosomes from different origins) and Indian mustard with two genomes, giving a first generation hybrid which is crossed with Ethiopian mustard with two genomes to produce a super Brassica plant with three genomes. Her PhD supervisors are A/Prof Wallace Cowling, Dr Matt Nelson and Dr Guijun Yan.

2007 winners were Mr Weihua Chen and Ms Megan Chadwick. Mr Chen spent three months at The University of Adelaide, experimenting on transport of phosphate in plants, and Ms Chadwick attended Utah State University, USA, and presented on behaviour based management of livestock on farms at a conference.



The project review team visiting ICRISAT.

Prof Kadambot Siddique (ksiddique@fnas.uwa.edu.au)

The final review of UWA/DAFWA/ICRISAT chickpea projects, funded by the Council of Grain Growers Organisation Ltd (COGGO), showed that not only are breeders and researchers in India and WA, on track, but these projects are excelling.

The project review team visited the International Crops Research Institute for the Semi Arid Tropics (ICRISAT) from 19 – 21 January to view project activities and discuss progress of the projects. The review party consisted of representatives from COGGO (Mr Geoff Smith, CEO and Michael Perry, Scientific Consultant), ICRISAT (Drs CLL Gowda, Pooran Gaur, Suresh Pande, Vincent Vadez and others), DAFWA (Drs Tanveer Khan and Mark Sweetingham), UWA (Professors Doug McEachern, Kadambot Siddique and Tim Colmer), University of Sussex (Prof Tim Flower) and Punjab Agricultural University (Dr JS Sandhu).

The formal review process started with opening remarks from Prof Doug McEachern, Deputy Vice-Chancellor (Research and Innovation)). Project supervisors, Prof Kadambot Siddique and Dr CLL Gowda, presented an overview of achievements and addressed relevant “Terms of Reference of the Review”. This was followed by detailed presentations by the principal researchers, Drs Tanveer Khan and Pooran Gaur.

One of the projects, Accelerated Genetic Improvement of desi Chickpea is in its fifth and final year. COGGO called their International Partnership with DAFWA, UWA-CLIMA and ICRISAT “outstanding” and commended the team for their timely project outputs.

During the visit, the reviewers examined field experiments on screening against *ascochyta blight*, the chickpea germplasm, aimed at WA. Other chickpea breeding and agronomy experiments, including salinity tolerance, were also inspected.

According to Prof Kadambot Siddique, disease resistance work on chickpea is progressing extremely well both at ICRISAT and Punjab Agricultural University (PAU) and will enable importing the most desirable lines for evaluation in WA. “Related projects on salinity tolerance and chilling tolerance will help introduce valuable germplasm to the breeding program on chickpea; some of this application has already started”, he said.

Mr Mike Perry (COGGO) said that by any standards this has to be judged as an outstanding project because of the leadership, communication – internal and with COGGO, confidence building, reporting, and delivery against targets.

“I was a researcher for 15 years and a research administrator for 20 and I can think of few projects that have run so well and delivered so much in such a short frame of time”, he said. Mr Perry also pointed out some of the issues that needed attention and conveyed COGGO’s wishes to continue a new phase of the project.

At the conclusion of the review Dr William Dar, Director General of ICRISAT, met with the review team and offered ICRISAT’s full support to the existing and future projects. Dr Darr has agreed to visit UWA in 2009.

Studying attitudes

Ms Aprille Chadwick has won the RSPCA Humane Animal Production Scholarship 2008.

Through this scholarship she will focus her PhD research on the attitude of goat producers in Western Australia towards least stressful artificial insemination (AI) techniques.

Ms Chadwick featured in the 2008 Institute of Agriculture’s postgraduate showcase, “Frontiers in Agriculture”. Her Master’s degree looked at using less stressful methods for semen collection in AI.

Her RIRDC-funded research showed that clean, green and ethical methods improved animal welfare, reduced costs, improves accessibility to the animals, was more acceptable to society, and had an opportunity for greater adoption.



Ms Aprille Chadwick won the RSPCA Humane Animal Production Scholarship 2008.

Minister Redman visits UWA

The Honourable Terry Redman, Minister for Agriculture, Food and Forestry; and Minister Assisting the Minister for Education WA, visited the IOA and FNAS on 4 February, 2009. The Minister was welcomed by Professors Alan Robson, Tony O'Donnell and Kadambot Siddique.

The Minister had the opportunity to formally meet with IOA Program Leaders, and Heads of the Schools within FNAS. During the morning tea, Mr Richard Bennett, a PhD student, and Ms Tracey Gianatti, Project Leader of the Grower Group Alliance (GGA) were among a group of people who met with the Minister. Mr Bennett took the opportunity to explain the potential utilisation of native perennial grasses and legumes as pasture plants in the grainbelt.

Ms Gianatti said that she had highlighted the importance of farmer



Prof Tony O'Donnell (Dean, FNAS, UWA), Hon Terry Redman (Minister for Agriculture, Food and Forestry; and Minister Assisting the Minister for Education), Prof Alan Robson (Vice-Chancellor, UWA) and Prof Kadambot Siddique (Director, Institute of Agriculture, UWA).

groups during her discussion with the Minister. "I had the chance to communicate to him the extent of the Grower Group network and their activities", she said.

At the conclusion of the visit Minister said "It is particularly good to see the passion and commitment the staff within IOA and the Faculty has for their work".

Eureka Prize winner offers agricultural value



Professors John Dell (right) and Laurie Faraone (middle) received the Defence Science and Technology Organisation Eureka Prize for Outstanding Science Award from Hon Mr Warren Snowden, Minister for Defence Science and Personnel.

The Development of an advanced colour near infra-red spectrometer, has won Professor Laurie Faraone, Professor John Dell, and the Microelectronic Research Group at UWA the Inaugural Defence Science and Technology Organisation Eureka Prize for Outstanding Science Award.

This technology is mainly intended for combat situations, but is good

news for the agriculture sector. This sophisticated optics allows for calibration to measure grain moisture, and protein and soil nutrient levels. Another bonus is the size of the spectrometer's package: fast, accurate, portable, robust and low cost.

The Microelectronics Research Group, led by Prof Faraone, developed a filter which enables creation of colour images. The filter enables scanning

smaller areas. This means less data is required to generate images and improved real-time use of infrared.

This technology could be used in biopsy-free skin cancer testing, real-time soil monitoring and characterisation of grain during harvesting. This work has attracted \$1.5 million funding from the Grain Research and Development Corporation (GRDC) to measure starch, protein and oil for sorting the grain and getting the best value for it. The original program was funded by the US Defence Department at the Defence Advance Research Projects Agency.

Future applications of this technology will include monitoring of soils for carbon sequestration.

Lupin-enriched bread can lower blood pressure

Dr Jonathan Hodgson (jonathan.hodgson@uwa.edu.au)

Bread enriched with lupin kernel flour, instead of wheat flour, reduced blood pressure in a group of overweight men and women with normal to high-normal blood pressures. This simple change in diet may help to reduce blood pressure and cardiovascular disease risk.

Lupins are an important grain crop in WA. This State supplies approximately 70% of total world lupin production. Most of the crop is sold for use in intensive animal industries, but there is potential for increased use for human food. An increase in demand for lupin and lupin ingredients for use in foods is likely to be largely driven by evidence for health benefits.

Our recent clinical trial investigated the potential for benefit of lupin kernel flour-enriched bread on blood pressure. The trial was conducted at UWA within the Centre for Food and Genomic Medicine – a State Government of Western Australia supported centre.

Available data from previous trials in humans suggest that replacing refined carbohydrate in the diet with either

protein or fiber may benefit blood pressure. Lupin kernel flour is rich in protein and dietary fibre and contains very little starch (carbohydrate). “We anticipated an increase in both protein and fiber intakes, at the expense of refined carbohydrate, may benefit blood pressure”, Dr Jonathan Hodgson, (School of Medicine and Pharmacology, UWA) said. The aim of this study was to determine the effects on blood pressure of a diet moderately higher in dietary protein and fiber, where this is brought about by the substitution in bread of wheat flour with lupin kernel flour.

Eighty-eight overweight and obese men and women were recruited to a 4 month study. Most participants, like a large proportion of the Australian population, fell in the normal to high-normal blood pressure range.

Participants were randomly assigned to replace 15 to 20% of their usual daily energy intake with white bread or lupin kernel flour-enriched bread. The background usual bread intake in the participants was approximately 10 to 15% of daily energy intake- a small change from their usual diet. Eating the

protein and fibre-enriched lupin bread resulted in modestly higher protein and fibre intakes by about 14 g/d and 13 g/d respectively.

Blood pressure measurements were taken at the start and end of the study. Eating the lupin-enriched bread, compared to the white bread resulted in a 3 mm Hg lower systolic blood pressure.

Results suggest that a diet moderately higher in dietary protein and fiber can significantly reduce blood pressure. It confirmed lupin kernel flour’s potential as a novel food ingredient to bring about these outcomes. This approach may be a relatively simple and acceptable dietary measure to help reduce cardiovascular risk in overweight and obese individuals.

This research has recently been published in the American Journal of Clinical Nutrition (2009; Vol. 89).



WAHRI expertise in Orlando



Dr Roberto Busi, a Research Associate and Mr Sudheesh Manalil, a PhD student, both from WAHRI (Western Australian Herbicide Resistance Initiative, UWA), presented their work at the Weed Science Society of America’s (WSSA) annual meeting at Orlando, Florida from 9-13 February.

Dr Busi presented a paper on “Use of below-label herbicide rates can lead to evolution of herbicide resistant weeds”. He also presented a second paper in the main conference entitled “Response to selection with sub-lethal glyphosate doses in *Lolium* vs. *Avena* populations”.

Mr Sudheesh Manalil made two oral presentations at the conference entitled “Rapid herbicide resistance evolution in *Lolium* from recurrent selection at reduced rate of diclofop-methyl in a wheat crop (and lab), and “Shifting herbicide sensitivity towards susceptibility through recurrent selection at low rate of diclofop-methyl in a susceptible *Lolium rigidum* population”.

Dr Roberto Busi and Mr Sudheesh Manalil at the WSSA annual meeting in Orlando, Florida, USA.

Sustaining productive agriculture for a growing world

Punjab Agricultural University and UWA collaboration



Prof Doug McEachern (UWA) exchanging MoU with Prof Manjit Kang (PAU).

Prof Kadambot Siddique (ksiddique@fnas.uwa.edu.au)

Punjab Agricultural University (PAU), Ludhiana, India, and UWA recently signed a MoU.

PAU is a premier institution in India established in 1962 on the pattern of Land Grant Colleges of the USA. Over the years UWA has had several high quality postgraduate students from PAU complete their PhD's in agriculture and related areas. Currently UWA is collaborating with PAU on four research

projects on chickpea and canola improvements (disease resistance and salinity tolerance).

Professors Doug McEachern, Deputy Vice-Chancellor (Research and Innovation) and Kadambot Siddique (Director, IOA) participated in the MoU signing ceremony along with colleagues from COGGO, DAFWA and ICRISAT. Prof Manjit Kang, Vice-Chancellor of PAU welcomed the team and assured

full cooperation with UWA and partners from WA.

Prof Doug McEachern said that UWA was keen to collaborate with key Indian Universities, especially with PAU in areas of mutual interest in agricultural research, education and technology exchange "Collaboration strengthens relationships, ensuring flow of people and science between universities", Prof McEachern said.

Engineering salinity solutions

Ms Georgina Holbeche
(holbeg01@student.uwa.edu.au)

Salinity represents one of the greatest threats to agricultural production and the environment in Australia. An array of innovative new plant-based solutions and engineering options provide alternative approaches to salinity management in the grainbelt of Western Australia.

One of these promising engineering solutions comes from Ms Georgina Holbeche, a final year PhD student in the School of Earth and Environment working on deep drainage as an engineering option. This research is aimed at lowering the encroaching water table in order to reclaim salt-affected land. Ms Holbeche's PhD is supervised by Prof Bob Gilkes.

Ms Holbeche works alongside researchers from the Department of Agriculture and Food Western Australia (DAFWA). However difficult, they are cutting deep drains into the landscape, penetrating the water table, allowing excess water in the profile to be drained.

"Deep drainage has proven highly effective in some areas, but it is an expensive technique", states Ms Holbeche. She said that a greater understanding of the science related to deep drainage will make it more predictable. "I'm hoping that by understanding the fabric, geochemistry and hydrology of the materials associated with these drains, we can work towards a user-friendly predictive tool", she said.

Ms Holbeche's research will shed new light onto an alternative approach to salinity management. "With the salinity crisis only predicted to get worse, new research and technologies may be our best defense", she said.

A deep drain in the northern agricultural region of WA



Sustaining productive agriculture for a growing world

UWA Leads the Way in Agricultural Research

Professor Tony O'Donnell (tony.odonnell@uwa.edu.au)

Like a growing number of professions, universities are subject to internal and external scrutiny as they continue to seek ways to benchmark and assess their performance. Agriculture and agricultural research has long been recognized as a major strength at UWA nurtured over many years by a succession of innovative agricultural scientists.

The recent Operational Priorities Plan for the University (2009-2013) identifies Plants, Animals, Agriculture and Environment (including Management of Natural and Agricultural Systems) as one of the University's six strategic research areas. As part of our strategy to grow agricultural and environmental research and teaching at UWA, we have analyzed the impact of our research publications over the period 2001-2007. The analysis compared UWA's research performance with all other Australian universities listed in the Thomson Reuters University Science Indicators (36 universities) database and also with a group of four internationally recognized universities positioned above UWA on the Shanghai Jiao Tong University Rankings (<http://www.arwu.org/rank2008/EN2008.htm>). This international group included the University of Wisconsin Madison (US), the University of Toronto (Canada), the University of Bristol (UK) and the University of Sheffield (UK). For agricultural sciences our international benchmark was the University of Wisconsin Madison, which is widely recognized as one of the world's leading agricultural universities.

Through the Institute of Agriculture, UWA uses advances in fundamental and applied science to inform its teaching and to develop collaborative research initiatives with industry and grower groups to deliver cutting edge technologies for farmers both regionally, nationally and internationally. The data presented in Table 1 clearly shows the strength of this research base and its standing nationally and internationally. In USI subject fields directly related to agriculture (Agronomy, Agricultural Economics & Policy, Agricultural Soil Sciences, Plant Sciences, and Agricultural Dairy and Animal Sciences) UWA produced more indexed publications than any other Australian

university and in three of the five areas out-performed all of the international benchmark universities.

A measure of the impact of our research is provided by the number of times these publications are cited. Again, in Agronomy, Agricultural Economics & Policy and in Agricultural Soil Sciences our cited works rank #1 in Australia and against the international benchmark universities. In plant sciences our citations rank second to ANU in Australia with both Australian universities ranking behind the University of Wisconsin Madison. For Agricultural Dairy & Animal Science,

UWA is ranked # 6 on both the number of outputs and citations and #8 relative to the international benchmark universities. All of the Australian universities are positioned behind the University of Wisconsin Madison and the University of Bristol in this field. This is an excellent performance that testifies to the standing of agricultural sciences at UWA. As the new Dean of FNAS, figures such as these testify to the quality of the research done at the University and make me excited about the future for agricultural and environmental science, teaching and research at UWA.

Table 1
UWA's Research performance in agricultural and environmental research*

Subject	Institution	# Papers	Rank (Australia)	# Cites	Rank (Australia)	International Benchmark ¹
Agronomy	UWA	241	1	1443	1	1
	Queensland	200	2	694	3	5
	Adelaide	155	3	746	2	4
	Melbourne	81	4	475	4	6
	Sydney	81	5	420	5	7
Agricultural Economics & Policy	UWA	54	1	179	1	1
	ANU	27	2	77	2	3
	UNE	25	3	69	3	4
	Sydney	17	4	29	7	7
	Melbourne	15	5	27	8	8
Agricultural Soil Sciences	UWA	238	1	1058	1	1
	Adelaide	123	2	703	2	2
	Queensland	91	3	326	6	6
	Sydney	85	4	515	3	3
	Melbourne	60	5	392	5	5
Plant Sciences	UWA	622	1	5336	2	3
	ANU	531	2	5568	1	2
	Adelaide	492	3	3665	3	5
	Queensland	447	4	2581	5	9
	Melbourne	404	5	3274	4	7
Agricultural Dairy & Animal Sciences	Queensland	135	1	289	4	6
	New England	123	2	503	2	4
	Melbourne	121	3	410	3	5
	Sydney	109	4	504	1	3
	Adelaide	56	5	183	5	7
	UWA	41	6	117	6	8
	Murdoch	28	7	89	8	10
	Monash	26	8	116	7	9

* Publication impact of Australian Universities over the period 2001-2007. Data only presented for the top 5 Universities (# papers) in each of the subject fields. The top 8 are shown for Agricultural Dairy and Animal Science. Analysis prepared using the Thomson Reuter's University Science Indicators database.

¹ International benchmark refers to the performance of 4 international universities in each of the selected fields. All of the Universities, University Wisconsin Madison (US), University of Toronto (Canada), University of Bristol (UK) and University of Sheffield (UK) are positioned above UWA on the Shanghai Jiao Tong University Rankings.

Sustaining productive agriculture for a growing world

Excellence in science rewarded

Adjunct Professor Karam Singh, Senior Principal Research Scientist and Research Program Leader in CSIRO Plant Industry, recently received an inaugural CSIRO Newton Turner award for science excellence.

Dr Singh has had a close association with researchers at UWA for the last 10 years, particularly with (CLIMA and members of the ARC Centre of Excellence in Plant Energy Biology) at UWA. His current research activities use model plant systems (*Arabidopsis* and *Medicago truncatula*) to analyse plant responses to stress.

Dr Singh will use his award to undertake study leave in Dr Giles Oldroyd's group at the John Innes Centre (JIC) in Norwich (UK). Dr Oldroyd's group has developed extensive platforms for reverse genetics in *M. truncatula*. Dr Singh plans to use these platforms to isolate mutations in genes that his team have implicated in plant defence to insects and pathogens. Dr Oldroyd's group is also a leader in plant signalling pathways used for symbiotic interactions and a second aim of the study leave is to explore how plants distinguish between friends and foes. The JIC is the leading research centre in Europe for plant science. Dr Singh's study leave should open up further opportunities for collaborative research that would benefit CSIRO and UWA.



Adjunct Prof Karam Singh was awarded the CSIRO Newton Turner award for science excellence.



Students attending the UWA Residential Camp

Bringing science home

Ms Samantha Greene (sgreene@fnas.uwa.edu.au)

Science can be a bit "out there". The Western Australian Primary Industry Centre for Science Education (PICSE) Activity Centre made sure that their 2008 action packed program really brought science "home" to student.

In August, the vacant role of the Science Education Officer was taken up by Ms Samantha Greene, formally a teacher at Mercy Catholic College. Ms Greene jumped straight in the deep end visiting 30 schools and 1500 students during term three to promote careers in agriculture and the PICSE Scholarship Camp.

In November, a highly successful teachers' Professional Development was held at UWA with the theme Gene Technologies. The 24 attending teachers were very enthusiastic about engaging with an area that is marked for inclusion in future Biology courses for years 11 and 12.

In December, 19 successful scholarship applicants came to UWA for a Residential Camp. They were inspired in their studies of science by a number of academics from the FNAS team and visiting staff from research organisations like DAFWA, CSIRO and BGPA.

The camp was followed by the Industry Placement program in January, an incredible opportunity for the scholarship students to work with primary industry scientists to see what really happens in the field. The students expressed their appreciation for being selected to be a part of the program and for the experiences of their Industry Placement at the Reporting Back Session held at the end of January.

The program had the support of GRDC, UWA, DAFWA and DET to make these events possible. Currently, planning is underway for the expansion of the program as PICSE becomes a national body and for the many exciting activities to take place in 2009.

If you would like any further information about this program, or are interested in becoming involved as a sponsor or partner please contact: Ms Samantha Greene, PICSE Science Education Officer, Tel: (08) 6488 1788.

Success for UWA agricultural economists

The Australian Agricultural and Resource Economics Society (AARES) is a thriving organisation with 600 members. It held its annual conference in Cairns in February, and announced its latest round of prizes.

In the past, the School of Agricultural and Resource Economics at UWA has picked up an award or two from AARES, but this year was outstanding. Four prizes headed west, including two of the most significant ones.

Dr Graeme Doole, Research Fellow in the Centre for Environmental Economics and Policy, won the award for the best published article for 2008 in the *Australian Journal of Agricultural and Resource Economics*. His paper, "Optimal management of annual ryegrass (*Lolium rigidum* Gaud.) in phase rotations in the Western Australian Wheatbelt", reported on work he completed during his PhD at UWA. Dr Doole also won the "Heading West" award, to cover travel costs to the conference.

ARC Federation Fellow, Prof David Pannell, won the award for Quality of Research Discovery, for a paper called "Public benefits, private benefits, and policy intervention for land-use change for environmental benefits", published in the American journal, *Land Economics*. This describes a framework for choosing policy mechanisms to encourage land-use change by farmers for the benefit of the environment. It is being used by a number of environmental managers around Australia, and in The Netherlands and Canada.

Professor Pannell also won the award for Quality of Research Communication, for his paper, "More reasons why farmers have so little interest in futures markets", from the international journal *Agricultural Economics*. This was co-written with Canadian colleagues and has generated a lot of interest from people involved in price risk hedging in agriculture.



Dr Graeme Doole (left) and Prof David Pannell.

In pursuit of research opportunities

Ms Bronwyn Crowe (croweb@are.uwa.edu.au)

Postgraduate students and staff of the School of Agricultural and Resource Economics (SARE) headed into the grainbelt of WA in pursuit of research opportunities and collaboration late last year.

The trip was one of the outcomes of the FNAS Postgraduate workshop held in June 2008, aimed at enhancing the postgraduate experience at UWA. "We thought a field trip would be more useful and practical than a retreat style event", Ms Crowe said.

The group visited Curtin University's Muresk Institute and their farm, the Avon Catchment Council, and Karakamia Sanctuary, a privately owned and managed wildlife sanctuary in Gidgegannup.

Local researchers and staff presented their work at the frontier of agricultural economics and extension to students, who in return shared their own work. For most of the SARE international students the visit to Muresk was their first opportunity to see the size of broad scale agriculture in Australia. Muresk Institute staff talked about their research about extension work with farmers in developing countries, which lead to a great exchange of ideas with our own extension enthusiasts.

"With my interest in agriculture extension, the trip to Muresk was very useful to me especially with Dr Roy Murray-Prior sharing about an agri-business approach to extension in the Philippines", Ms Karen Baroga said.

The Avon Catchment Council demonstrated applying investment decision tools produced from research at the School's Centre for Environmental and Economic Policy. Dr Maksym Polyakov, a newcomer to WA, said "It was very interesting to see WA broadacre agriculture. The presentation about current NRM issues in the WA wheatbelt delivered by the staff of Avon Catchment Council was an invaluable experience.

Karakamia Sanctuary is part of the Australian Wildlife Conservancy, a charity using tax deductible donations from the public to fund conservation, research and education programs on private land.

"We all had a great day of exchanging research ideas and findings as well as building networks for working together in the future", Ms Crowe concluded.



UWA School of Agriculture Resource Economics students and staff with Dr Peter Tozer and Dr Roy Murray-Prior from Muresk.

Sustaining productive agriculture for a growing world

Aquaculture and Native Fish Breeding



Dr Craig Lawrence (right) and A/Prof Phil Vercoe at the Aquaculture facility

Dr Craig Lawrence (clawrence@fish.wa.gov.au)

The Aquaculture & Native Fish Breeding Laboratory at UWA's Shenton Park Field Station is the largest recirculating aquaculture research system in Australia. It is a collaborative facility designed, constructed and managed by scientists from UWA and the Department of Fisheries.

Primarily, it provides world class facilities for students and scientists from UWA and Department of Fisheries that enable them to pursue leading edge aquaculture and aquatic science research projects.

The facility consists of over 100 aquariums and over 50 large tanks. Most of them hold 20 000 litres of water. The large number and capacity of research tanks enables scientists and students to conduct trials that replicate conditions found in commercial and natural environments. The facility also has water chemistry, microscopy, data logging, web cam and security monitoring equipment.

Currently researchers are working on aquaculture of a range of freshwater fish and crayfish species, breeding critically endangered species of fish and crayfish and producing native fish for restocking water bodies.

In the past students have worked on a variety of projects; for example, nutrition and diet development for fish and freshwater crayfish, reproduction and genetics of fish and freshwater crayfish and spawning and larval rearing of fish.

"We always encourage anyone who wishes to pursue aquatic science or aquaculture related projects and encourage strategic research partnerships with industry and the community", Dr Lawrence said.

GRDC PhD Scholarship awarded

Prof Lyn Abbott (labbott@cyllene.uwa.edu.au)

Mr Daniel Dempster from the School of Earth and Environment (UWA) was awarded a GRDC Honours Scholarship in 2008, and he has now been awarded a GRDC postgraduate scholarship for research on biochar at UWA.

Biochar is the substance that remains from heat-induced anaerobic decomposition of organic matter. There is conflicting evidence as to the role of biochar as a soil amendment. When added to soil, biochar has been shown to affect microbial populations and associated plant nutrient capture.

Mr Dempster's research will examine changes in microbial community composition and function and soil organic matter fractions associated with biochar addition to soil. Soil organic matter fractions will be assessed by examining differences in soil labile, recalcitrant and dissolved organic carbon fractions. "The aim is to evaluate the potential of biochar to enhance soil carbon storage and biological fertility in sandy soils and, in doing so, minimise nutrient leaching losses from soil organic matter decomposition and fertiliser application", Mr Dempster said.

"The potential role of biochar in sequestering carbon in soil is a controversial topic and this study will provide scientific understanding of mechanisms that are involved in interactions between existing soil organic matter and biochar", Mr Dempster said.



Mr Daniel Dempster was awarded a GRDC postgraduate scholarship

Sustaining productive agriculture for a growing world



Postgraduate students at Rottnest

Rottnest Island Postgraduate Summer School 2009

Mr Kevin Foster (kfoster@agric.wa.gov.au)

The 2009 cohort of Postgraduate Students from the School of Plant Biology went on the 10th Rottnest Island Postgraduate Summer School (RIPSS) from 8 – 11 February.

This annual event is designed to give postgraduates within the School a chance to get to know each other and learn about their area of research. The RIPSS is coordinated by the students themselves and hosted by the School at no cost to students.

"I have attended numerous retreats, conferences and peer reviewed workshops during my career in Agriculture, but this forum was very different to my other experiences. The RIPSS

was an excellent environment for the postgraduates especially those in their 1st year", Kevin Foster said.

Students presented their ideas and practiced their presentation "craft" to an audience with a broad scientific base. They received excellent feedback from fellow students and academic staff on their research and gained practice answering questions within a relaxed environment.

"This was a rare opportunity for students and supervisors to interact with and get to know each other outside the campus environment and ideal to network with the other postgraduates. It was also a great chance to corner one of the "guest speakers" or visiting scientists from other research institutions as a potential referee for papers or PhD theses!", Mr Foster said.

Top soil quality website transformation

The DAFWA/UWA Soil Quality website (www.soilquality.org.au) was transformed into one of the top soil quality websites, boasting new and better features following its relaunch in early 2009.

This website is the end product of a 'Healthy Soils' project conducted by UWA and DAFWA staff from 2005 – 2008. This benchmarked up to 25 soil properties across nearly 1300 sites throughout WA's grain growing regions. Analysis of soils included basic physical and nutritional assessments to in depth biological measurements of labile carbon, microbial biomass and biological soil nitrogen supply. Dr Andrew Wherrett from UWA says, "Detailed analysis for a wide range of soil quality indicators provides a 'snapshot' of soil performance at a point in time. The long term aim of revisiting these sites will relate variations management and climatic to changes in soil quality."

Website users can detect potential production constraints within a

growing region by examining individual soil quality indicators. Users can enter in specific soil analysis data and compare these results to those obtained through the 'Healthy Soils' project. "Growers involved with the project can access individual results by entering a unique WebID, giving them a better understanding of soil biological functioning through the 'relationships' section", Dr Wherret said.

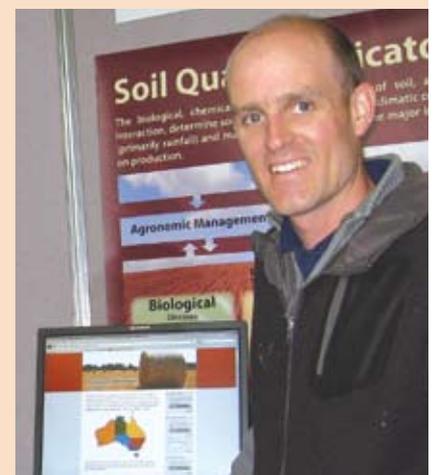
Users can now register with www.soilquality.org.au, allowing personal soil analysis results storage and claim sample sites from the 'Healthy Soils' project.

Access to information is a significant part of www.soilquality.org.au. A range of fact sheets available to view and download. These provide information on a range of soil issues – from potential management and production constraints, to interpretive guidelines and possible management solutions.

Another first is the 'Organic Matter Biomass' calculator. "Many don't realise how much crop residue is needed to achieve significant changes in soil

carbon levels. This calculator gives the growers a realistic idea of what is needed for a specific increase."

Andrew believes www.soilquality.org.au is a top device for addressing soil based issues in Australian agriculture. "Access to good information allows growers to make more confident and profitable farm management decisions."



Dr Andrew Wherret

Sustaining productive agriculture for a growing world

Alumni



Dr Bill Bowden

**Principal Research Officer,
DAFWA**

Dr Bill Bowden began his career as a cadet with the Western Australian Department of Agriculture in 1961 and has worked for the Department ever since. He graduated with a BSc. (Agric.) from UWA, and returned in 1968,

graduating with a PhD in soil chemistry in 1973.

In 1980, Dr Bowden received a Reserve Bank Fellowship and worked on fertiliser dissolution, placement and effectiveness while on sabbatical at the New England University in Armidale. He was a Sub-program Leader in the CRC for Legumes in Mediterranean Agriculture (CLIMA) from 1992 to 1997.

In 2006, Dr Bowden was awarded the Donald Medal by Australian Society of Agronomy for his impact on the science and practice of agriculture in Australia. He recently received the 2009 Grains Research and Development Corporation (GRDC) Western Region Seed of Light award for his contribution to the development of agriculture, and the professional development of three generations of agricultural scientists.

Dr Bowden has over 40 year's experience with plant and soil, research, development and extension in WADA. "I have deliberately placed myself in the gap between research and extension (what I call "development"). If research results are to be used widely by the industry, they must be put in a framework which extends them beyond the site, season and management specificities".



Mr Richard Snowball

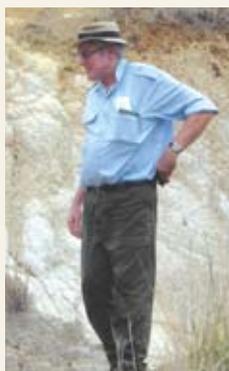
**Research Officer, Department of
Agriculture and Food Western
Australia**

Mr Richard Snowball completed his honours degree in 1982. He then spent a short time working on the dung beetle project at CSIRO, Floreat before taking up a research position with the

Department of Agriculture in Albany working on harvesting technologies of field crops. In 1986 he joined the pasture science group at DAFWA head office where he continues to work in the area of genetic resources.

He took over the role of Curator of the pasture genebank from Bill Collins in 1996, and soon after began a period of germplasm exploration that took him to many overseas destinations. From the Azores to Israel and the Aegean Islands to Eritrea he undertook nine missions, adding significantly to the collection of pasture legumes. The genebank is now in an enhancement phase where the value of the collections is being improved. Mr Snowball works closely with CLIMA/UWA researcher Dr Kioumars Ghamkhar in the development of Core Collections to improve conservation and breeding outcomes.

Richard says, "Above all else, working in agriculture and genetic resources has allowed me to help others. From poor farmers in remote corners of the globe to our own farmers and fellow researchers, conserving and providing germplasm for the present and future has been particularly satisfying".



Dr Richard Greene

**Senior Lecturer and Graduate
Advisor in the Fenner School
of Environment and Society**

Dr Richard Greene grew up in Perth, WA. He was a keen member of the army reserve and swimmer at Perth's beaches during his university studies. After completing a BSc (with honours in Physical and Inorganic Chemistry) in 1970, he undertook a PhD in Soil Science (1971-1975), also at UWA.

He then joined the Victorian

Department of Agriculture. From 1975 to 1985 Dr Greene worked as a soils research officer at the Irrigation Research Institute, Tatura. From 1985 to 1993 he worked as a Senior Research Scientist in the CSIRO Division of Wildlife and Ecology, firstly at Deniliquin, NSW, and later in Canberra, ACT. In 1993 he joined the Australian National University as a Lecturer in Soil and Land Management in the Geography Department.

Currently, Dr Greene is a Senior Lecturer and Graduate Advisor in the Fenner School of Environment and Society. Besides co-ordinating two courses in Soil and Land Management, he supervises several PhD, Masters and Honours students.

His fondest memories of UWA are his days as a postgraduate student in the Department of Soil Science and Plant Nutrition, conducting research and socializing with his fellow students and departmental staff, and the great discussions with his supervisors Professors Alan Posner and Jim Quirk. "My strongest advice to current postgraduate students is to get on with your research, and don't get distracted by petty work politics; there is plenty of time for that later in the work force", he said.



Dr Sue Hatcher

**Senior Research Scientist,
NSW Department of Primary
Industries, Orange, NSW**

Dr Sue Hatcher completed her Bachelor in 1989 and her PhD (Animal Science) in 1995. She then worked with the Australian Wool Research and Promotion

Organisation (AWRAP)/International Wool Secretariat (IWS)/The Woolmark Company based in Fremantle as their WA Wool Grower Communications Officer. During those years opportunities became available to participate in various research projects involving early stage wool processing particularly consignment building and mill quality assurance.

In February 1997, Dr Hatcher left WA for a Livestock Research Officer position, specialising in Merino Breeding with NSW Agriculture based in Orange NSW. In the last 12 years her varied research program has included wool metrology and fibre identification, applied research of the genetic, economic and industry constraints impeding fine wool production across Australia and linking Merino breeding to wool processing.

"The focus put on science and its communication during both my undergraduate and postgraduate studies at UWA have been of enormous benefit in my career. There is no point in conducting science if the outcomes of the research aren't able to be effectively communicated to the targeted end user of the work. The skills I gained in this area while at UWA have been invaluable in extending the outcomes of my work to the wool industry", Dr Hatcher said.

New Staff



Dr David Minkey

Dr David Minkey was appointed as Executive Officer of The Western Australian No-Tillage Farmers Association (WANTFA)

Dr Minkey possesses a broad background in the Western Australian cropping industry, together with extension skills and a wide-ranging

knowledge about managing weeds in no tillage farming.

He was most recently employed by the Western Australian Herbicide Resistance Initiative (WAHRI) where he specialised in herbicide resistance and weed management. His academic career includes undergraduate and postgraduate studies at UWA with a PhD in Weed Seed Ecology. He has a strong extension background, having assisted in the teaching of the national integrated weed management training for farm advisors.

"I hope to encourage the adoption of sustainable and profitable broad-acre cropping systems and look forward to a new role on the UWA campus," Dr Minkey said.

Email: david.minkey@wantfa.com.au



Dr Todd Gaines

Dr Todd Gaines is a Research Associate at the School of Plant Biology

He will be working with Prof Stephen Powles and WAHRI on an ARC Linkage Grant on pyroxasulfone resistance evolution.

Todd grew up on a dryland winter wheat farm in eastern Colorado, USA and received his BSc in Soil and Crop Science in 2004 and his MSc in Plant Breeding and Genetics in 2006, both at Colorado State University. He recently obtained his PhD in Weed Science from CSU.

Last year he received the Outstanding Graduate Student Award for an M.S. or Ph.D. candidate in weed science from the Weed Science Society of America (WSSA). His research experience includes pollen-mediated gene flow in wheat using herbicide resistance as a marker, and the molecular mechanism of glyphosate resistance in Palmer amaranth.

Email: tgaines@cyllene.uwa.edu.au



Mrs Lisa Mayer

Mrs Lisa Mayer was appointed as Communications/ Administration Officer with WAHRI

During the last five years she has worked within the Western Australian agricultural industry in the area of communication. Her recent work

experience includes a role as Communications Officer with the GRDC funded Local Farmer Group Network and Grower Group Alliance projects, where she was instrumental in the development of extension and communication tools to deliver information to farmer groups.

Mrs Mayer has a BA (Applied Science, Agriculture) from The University of Western Sydney. She has experience across the meat, live animal and dairy industries, and the WA cropping community. She has worked for the Meat and Livestock Corporation, Dalgety Australia, and the Australian Poll Hereford Society. Lisa is delighted to be back at UWA and looks forward to further developing the communications role in WAHRI.

Email: lisa.mayer@uwa.edu.au



Dr Chunbo Ma

Dr Chunbo Ma is a lecturer in the School of Agricultural and Resource Economics

He was awarded his PhD in Ecological Economics from the Rensselaer Polytechnic Institute (USA) in 2007. Prior to joining the School of Agricultural and

Resource Economics, Dr Ma was working as an Alcoa Foundation research fellow at the Erb Institute in the University of Michigan (USA). His current research areas include energy economics, environmental policy and risk evaluation, and environmental sociology.

Email: chunboma@gmail.com Tel: 6488 2534



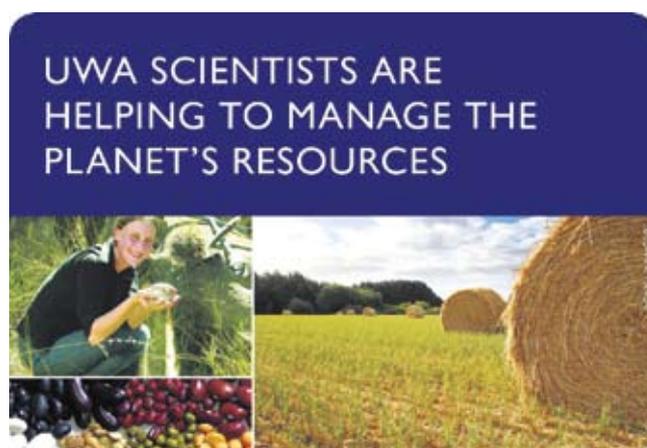
Dr James Fogarty

Dr James Fogarty is a lecturer in the School of Agricultural and Resource Economics

He was awarded his PhD in Economics from the UWA in 2006. Prior to joining the School of Agricultural and Resource Economics, Dr Fogarty was

working as a private sector economist. His main research themes relate to investigating economic aspects of wine and food production and consumption. He is currently sharing the lecturing responsibilities for the third year unit Biometrics, where students learn about statistical methods such as ANOVA and linear regression.

Email: j.fogarty@aciltasman.com.au Tel: 6488 2539



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Research and Industry Recognition

NAME	AWARD
Prof Lyn Beazley	Made Officer of the Order of Australia for her work in scientific research, education and outreach
Ms Aprille Chadwick	Won RSPCA Humane Animal Production Scholarship 2008
Mr Daniel Dempster	Awarded GRDC Postgraduate Scholarship
Dr Todd Gaines	Received Outstanding Graduate Student Award from Weed Science Society of America (WSSA)
Adjunct Professor James Ridsdill-Smith	Appointed Principal Scientist of CRC National Plant Biosecurity (Feb 2008) Elected Secretary/Treasurer of the Council of the International Congresses of Entomology (July 2008)
Adjunct Prof Karam Singh	Inaugural CSIRO Newton Turner award for science excellence
Prof Kadambot Siddique	Gold medal from the Indian Society of Pulse Research and Development
Dr Helen Spafford	2008 FNAS Teaching in coursework teaching award (undergraduate or postgraduate) 2008 FNAS Excellence in postgraduate teaching award – PhD/Masters
Prof Zed Rengel	2008 FNAS Teaching in coursework teaching award (undergraduate or postgraduate)
Dr Michael Renton	2008 FNAS Excellence in postgraduate supervision – honours/4th year project

Visitors to Institute of Agriculture

NAME OF THE VISITOR	VISITORS' ORGANISATION AND COUNTRY	HOST DETAILS	DATES
Assoc Prof Jorg Bohlmann	University of British Columbia	A/Prof Julie Plummer and Dr Chris Jones	April 2009
Dr Yiming Guo	Huazhong Agricultural University	A/Prof Wallace Cowling Dr Sheng Chen	January 2009 – January 2010
Ms Chi Yingjun	Visiting student from China	Dr Patrick Finnegan	Nov 2008 – Jun 2010
Dr Qixian Wang	Institute of Agricultural Information at the Chinese Academy of Agricultural Sciences	Dr Megan Ryan, Dr Jiayin Pang and Prof Hans Lambers	January 2009 – January 2010
Prof Jianming Yang	Zhejiang Academy of Agricultural Sciences, China	Dr Guijun Yan	January – April 2009
Ms Ana Luiza Muler	State University of Campinas, Cidade Universitaria, Brazil	Prof Hans Lambers	March 2009 – Feb 2010
Dr Roberta Marra	University of Naples (Visiting Scientist on Endeavour Award)	A/Prof Martin Barbetti	May – November 2009
A/Prof Ole Pedersen	Freshwater Biological Laboratory, University of Copenhagen	A/Prof Tim Colmer	August 2009 – February 2010
Made Pharmawati	Udayana University, Indonesia	Dr Patrick Finnegan	August 2009 – February 2010
Prof Yingnan Guo	Chinese Academy of Agricultural Sciences	Dr Guijun Yan	2009 – 2010
Dr Hulya Sipahi	Central Research Institute for Field Crops The Ministry of Agriculture and Rural Affairs, Turkey	Dr Kioumars Ghamkhar	December 2008 – March 2009

Upcoming meetings and events

IOA Events

Frontiers in Agriculture: Postgraduate showcase 2009

23 June 2009

IOA Industry Forum 2009

31 July 2009

www.ioa.uwa.edu.au

National and International Events

Dowerin Field Days www.dowerinfielddays.com.au

26-27 August 2009

OECD Co-operative Research Programme Sponsorship for the international conference *Exploiting Genome-wide Association in Oilseed Brassicas*, UWA

www.icpber.plants.uwa.edu.au

9-12 November 2009

Sustaining productive agriculture for a growing world

New PhD students

NAME	TOPIC	SCHOOL	SUPERVISOR(S)	FUNDING BODY
PhD Students				
Ms Cathy Bondonno	Flavonoids and cardiovascular health	Medicine and Pharmacology	Dr Jonathan Hodgson	NHMRC, ARC and Department of Agriculture and Food, WA
Ms Aidilla Mubarak	Relationship of flavonoids to nutritional and antioxidant properties in fruit	Plant Biology	Dr Michael Considine	Malaysian Ministry of Higher Education, ARC and Department of Agriculture, WA
Ms Annisa Annisa	Molecular genetic diversity in oilseed Brassica rapa	Plant Biology	A/Prof Wallace Cowling and Dr Sheng Chen	AusAID
Miss Maheswari Jayakannan	Salinity tolerance and salicylic acid effects	Earth and Environment	Prof Zed Rengel, Dr Tissa Senaratna, Dr Olga Babourina and Prof Krishnapillai Sivasithamparam	IPRS and UPAIS
Ms Alexander Martin	Wine quality and soil terroir	Chemistry	Prof John Watling Prof Zed Rengel	APA
Ms Frances Leng	Do reptiles benefit from hardwood profitable perennial farming systems?'	Animal Biology	Dr Harriet Mills, Prof Dale Roberts and Dr Patrick Smith	Future Farm Industries CRC
Ms Kerrie Burns	The role of Bio-char in sustainable land management and the mitigation of climate change	Centre for Land Rehabilitation & Earth and Environment	A/Prof Mark Tibbett	APA, FFI CRC and Carbon Crucible
Ms Shuhui Deborah Lin	Targeted adaptation of hydrocarbon degrading soil microbes to assist the remediation of petroleum hydrocarbon impacted Australian soils	Centre for Land Rehabilitation & Earth and Environment	A/Prof Mark Tibbett	APA and Western Power
Ms Hazel Gaza	Characterization of Arabidopsis thaliana glycine-rich RNA-binding protein 8 (AtGRP8) gene under drought stress using knock-out and over-expression mutant lines	Plant Biology	Dr Patrick Finnegan, and Dr Martha Ludwig	SIRF, UIS
Ni Luh Arpiwi	Improving oil yield in <i>Millettia pinnata</i>	Plant Biology	A/Prof Julie Plummer, Dr Guijun Yan and Dr Liz Barbour	Indonesian Department of Higher Education and Forest Products Commission
Ms Christine Kershaw	Integrating economic methods into Natural Resource Management planning and policy	Agricultural & Resource Economics	Professor David Pannell	APA, Future Farm Industries CRC
Mr Donkor Addai	Economic Analysis of Novel Perennial Costed Farming Systems	Agricultural & Resource Economics	Professor David Pannell	APA, Future Farm Industries CRC
Mr Daniel Dempster	Viability of biochar use in agricultural soils	Earth and Environment	Dr Dan Murphy, Dr Deirdre Gleeson and Prof Lyn Abbott	GRDC
Mr Rizal Ariffin	Soil carbon storage in agricultural ecosystem	Earth and Environment	Dr Dan Murphy and Professor Tony O'Donnell	Malaysian Ministry of Higher Education
Mr George Swella	Conservation cropping	Plant Biology	Professor Kadambot Siddique, Dr Ken Flower, & Dr Phil Ward (CSIRO)	SIRF, IOA, FNAS and Plant Biology
Mr Luke Abatania	Technical efficiency in Ghanaian agriculture	Agricultural & Resource Economics	Dr Atakelty Hailu	Vice Chancellor's special scholarship to Ghana University

New research projects

TITLE	FUNDING PERIOD	FUNDING BODY	SUPERVISOR(S)
Quantifying a prototype machine to destroy weed seeds during the grain harvest operation	2009-2011	GRDC	Prof Steve Powles and Dr Michael Walsh
SaltCap and SaltDecide	2008-2011	FFI CRC	Dr Ray George , Adjunct A/Prof Ed Barrett-Lennard and Dr SJ Bennett
Improving food and biofuel production in changing climates – development of new brassica polyploids in Australia and China	2009 - 2010	International Science Linkages (ISL) - Australia-China Special Fund for S&T Cooperation Funding Agreement	A/Prof Wallace Cowling, Prof Kadambot Siddique, Dr Guijun Yan and collaborators from Huazhong Agricultural University and Zhejiang University.
Optimising biodegradation and removal of organic and inorganic pollutants in wastewater using constructed wetlands	2008-2011	Australian Research Council (ARC) Linkage	Prof Zed Rengel and Dr K Meney
Biofiltration of stormwater	2009-2010	Department of Water WA, Perth	Prof Zed Rengel
Strengthening the capacity of the counterpart organisation to both assess the flow of antioxidants and omega-3 fatty acids within the ecosystem of the Tibet Plateau and defining their protective roles in the health of Tibetan pastoralists.	2009-2010	AusAID	Dr Philip Vercoe and Dr Shimin Liu
Breakthrough methods for antioxidant research in grape: implications for nutritional quality	2009	British Council	Dr Michael Considine
Weed Seed Wizard	2008	CFC for Australian Weed Management	Dr Michael Renton
Modelling transplant growth in <i>Posidonia</i> species	2008	Cockburn Cement Ltd	Dr Michael Renton
Quantifying and predicting agricultural systems- protein in wheat	2008-2009	Department of Agriculture and Food WA	Dr Michael Renton
Development of conservation cropping systems in the drylands of Northern Iraq	2008-2011	ACIAR	Prof Kadambot Siddique
QBA – Animal welfare objectives measures research program – Qualitative behavioural assessment as an integrated measure of welfare	2007-2010	Murdoch University ex Meeat and Livestock Australia	Dr Dominique Blache
Drought tolerance of novel perennial legumes	2008-2010	Rural Industries Research and Development Corporation	Dr Megan Ryan
Greenhouse gas abatement and feed efficiency	2009	Sheep CRC Ltd	A/Prof Phil Vercoe and Dr Zoey Durmic
Water resources and freshwater biodiversity	2008-June 2013	Australian Federal Government (the Department of Climate Change)	Prof Peter Davies

Publications 2008

(not reported previously)

Refereed journals

Balint T and Rengel Z (2008). Nitrogen efficiency of canola genotypes vary between vegetative and grain maturity stage. *Euphytica* **164**: 421-432.

Balint T, Rengel Z and Allen D (2008). Australian canola germplasm differs in nitrogen and sulphur efficiency. *Australian*

Journal of Agricultural Research **59**: 167-174.

Beausoleil N, Blache D, Stafford KJ, Mellor DJ and Noble ADL (2008). Exploring the basis of divergent selection for 'temperament' in domestic sheep. *Applied Animal Behaviour Science* **109**: 261-274.

Beeck CP, Wroth J and Cowling WA (2008). Additive genetic variance for stem strength in field pea (*Pisum sativum*). *Australian Journal of Agricultural Research* **59**: 80-85.

Beeck CP, Wroth JM, Falk DE, Khan T and Cowling WA (2008). Two cycles of recurrent

selection lead to simultaneous improvement in black spot (*Mycosphaerella pinodes* Berk. & Blox) resistance and stem strength in field pea (*Pisum sativum* L.). *Crop Science* **48**: 2235-2244.

Blache D, Maloney SK and Revell D (2008). Use and limitations of alternative feed resources to sustain and improve reproductive performance in sheep and goats. *Animal Feed Science and Technology* **147**: 140-157.

Blache D, Martin GB and Maloney SK (2008). Towards ethically improved animal

Publications 2008

(not reported previously)

experimentation in the study of animal reproduction. Reproduction in Domestic Animals **43** (Supplement 2): 8-14.

Borger CPD, Yan G, Scott JK, Walsh MJ and Powles SB (2008). *Salsola tragus* or *S. australis* (Chenopodiaceae) in Australia – untangling taxonomic confusion through molecular and cytological analyses. Australian Journal of Botany **56**: 600-608.

Busi R, Yu Q, Barrett-Lennard R and Powles SB (2008). Long distance pollen-mediated flow of herbicide resistance genes in *Lolium rigidum*. Theoretical & Applied Genetics **117**: 1281-1290.

Chen S, Nelson MN, Ghamkhar K, Fu T, Cowling WA (2008). Divergent patterns of allelic diversity from similar origins – the case of oilseed rape (*Brassica napus* L.) in China and Australia. Genome **51** (11):1-10.

Christophersen CT, Wright A-DG and Vercoe PE (2008). In vitro methane emissions and acetate: propionate ratio are decreased when artificial stimulation of the rumen wall is combined with increasing grain diets in sheep. Journal of Animal Science **86**: 384-389.

Digby S, Masters D, Blache D, Blackberry M, Hynd PI and Revell D (2008). Reproductive capacity of Merino ewes fed a high-salt diet. Animal **2**: 1353-1360.

Duke SO and Powles SB (2008). Glyphosate: A once-in-a-century herbicide. Pest Management Science **64**: 319-325.

Dziminski MA, Vercoe PE and Roberts JD (2008). Variable offspring provisioning and fitness: a direct test in the field. Functional Ecology doi: 10.1111/j.1365-2435.2008.01480.x

Fateh E, Chaichi M R, Sharifi Ashorabadi E, Mazaheri D, Jafari AA and Rengel Z (2008). Effects of organic and chemical fertilizers on forage yield and quality of globe artichoke (*Cynara scolymus* L.). Asian Journal of Crop Science **1**: 40-48.

Forhead AJ, Lamb CA, Franko KL, O'Connor DM, Wooding FBP, Cripps RL, Ozanne SE, Blache D, Min D and Fowden AL (2008). Role of leptin in the regulation of growth and carbohydrate metabolism in the ovine fetus during late gestation. Journal of Physiology **586**: 2393-2403.

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