



July to September 2009

Head of School's Report



Thank you and Goodbye to Renu Sharma

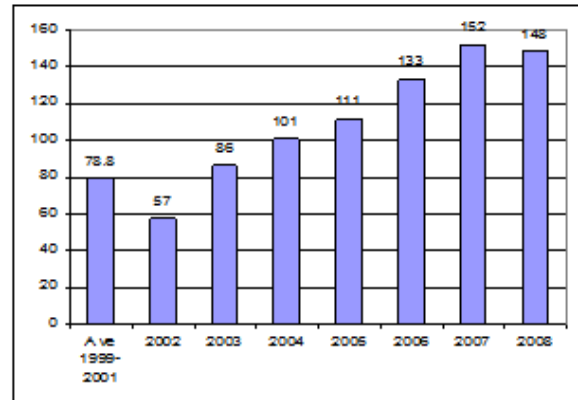
We sadly say goodbye to Dr Renu Sharma who has been a wonderful School Manager since 2004. She has accepted a position as General Manager of the International Centre for Radio Astronomy Research (ICRAR) (for the Square Kilometre Array SKA).

Staff Forum

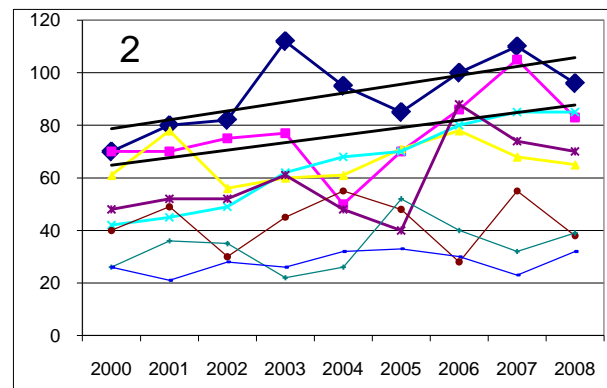
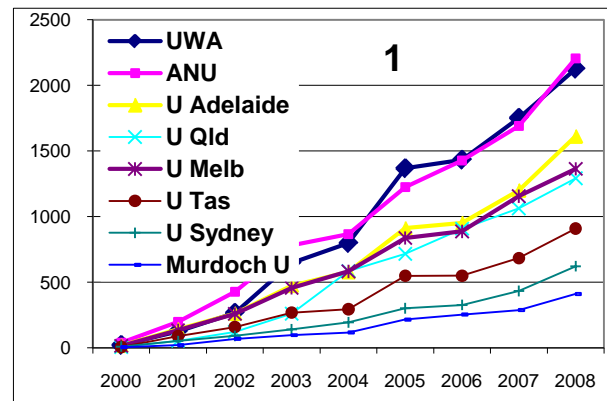
The Plant Biology Staff forum was held on the 14th September. I gave a presentation highlighting facts about the school. Here is a snapshot:

- 22 Academic teaching staff
- 2 Permanent Visiting Staff based at Kings Park
- 40-45 Academic research staff
- 1 Laureate Fellow
- Approximately 120 postgraduates (half from outside Australia)
- Operational budget approximately \$4.0M (2009)
- Research income \$9.6M (2008)

Journal (C1) publications 2002 – 2008



UWA Plant Sciences Citations (1) and Publications (2) are among the highest in the Group of 8 Australian Universities





July to September 2009

Major/emerging strengths

Cropping systems

Weeds and herbicide resistance
Plant breeding and genetics (canola, legumes)
Plant pathology and integrated pathogen management
Crop and pasture physiology (mineral nutrition, water relations, salinity and waterlogging)
Floriculture (water-wise and nutrient-efficient native species)
Modelling

Marine Systems

Seagrass ecology
Fish ecology
Habitat mapping

Natural Terrestrial Systems

Restoration ecology
Minesite rehabilitation
Oldfield restoration
Physiological ecology
Mineral nutrition
Plant water relations
Salinity and waterlogging
Modelling

The School is actively seeking participation from Alumni and community members for donations towards research scholarships through the Kwongan Foundation and through the UWA Office of Development

<http://www.plants.uwa.edu.au/foundation>

Acting School Manager



The school has been steadily growing in staff and student numbers and research income. Our collaborations with external parties have produced great dividends for improved quality in our teaching, supervision of students, and national/world recognition in our three research areas.

Our new School Manager, **Alan Luks**, will start in early November. We look forward to his input in assisting the school to reach even greater heights.

Renu has left us with her thoughts about Plant Biology -

Plant Biology – A Garden

I am a gypsy, a traveller.....

As I travel through this garden, that's so calm and serene

With plants proud and tall, waters running deep and pristine

The soil, so rich that it nurtures every form of life and more

The air, filled with twitter of happy birds, is so pure

Here every flower is nurtured to its full bloom

Every day is fun filled with no sign of gloom!

I stay a little while to admire this splendour

Nurtured by its fruits, I now travel further

The garden, I know will grow more beautiful and strong

Every traveller would like to stay here life long

But the gypsy in my heart urges me to move on

To explore a new path, less travelled and unknown

My deepest gratitude as I farewell this garden with a heavy heart

I carry the best memories of my life, as I depart!

Dr Renu Sharma, 9 September 2009



July to September 2009

Upcoming Events

TechNet 2009 National Conference

"Sustain: People, Places Resources":
Showcasing the professional community within WA. It will provide an enormous opportunity for general, technical, and scientific staff to present their own achievements and to listen to the accomplishments of others.

25th to 27th Nov 2009, UWA Club.

<http://technet09.ecu.edu.au>

Plant Biology Seminar Series

<http://www.plants.uwa.edu.au/page/13134>

News

Postgraduate Representatives 2009

Leon Hodgson and **Eli Bradbury**, together with **Rachael Ord** from Kings Park; will be the new postgraduate representatives for 2009/2010. A huge thank you to the previous reps - **Foteini Hassiotou** and **Ghazi Abu Rumman**; and **Lucy Commander** and **Donna Bradbury** from Kings Park.

Kwongan Colloquium 12/13th Sept

The Kwongan Colloquium and Field Trip were held in York, proudly sponsored by

the York Shire, and opened by the Shire President Cr. Pat Hooper.

There were 72 attendees, with 11 interesting presenters speaking on various aspects related to biodiversity in the wheatbelt.

The day closed with the awarding of an inaugural Kwongan Medal by the Hon. Hendy Cowan to Cicely Howell from the River Conservation Society. Cicely, along with her husband, organised the program for the field trip the following day.

The field trip was attended by over 40 people. They visited the York Regional Herbarium that has over 2000 specimens of local flora collected by volunteers; Mt. Hardey Reserve which is a significant example of a remnant Salmon Gum community; the Allen Road revegetation project; and White Gum Farm in the Needling Hills, where the River Conservation Society has undertaken surveys revealing unique and important flora.

The next Colloquium is planned to be held in Busselton over the weekend of 18/19th September 2010.

If you missed out this year, then make sure you put this date in your calendar now to enjoy a weekend away from the City!



July to September 2009



Medal presented to her by the Hon. Hendy Cowan



Prof. Richard Hobbs talking about Salmon Gums at the Kwongan Field Trip

Conference in Prague

Eleftheria Dalmaris (co-authors: Erik Veneklaas and Pieter Poot) presented part of her PhD work at the 2nd European Congress for Conservation Biology held in Prague, Czech Republic, from 1st September to 5th September. The title of

the paper was "Physiological and morphological variation among *Eucalyptus wandoo* Blakely provenances from contrasting environments". The trip was made possible with a travel award from Future Farm Industries CRC.

Ancient History Contributes to Restoration Ecology

Richard Hobbs has co-authored an article in *Science* about the role that ancient history plays in restoration ecology. Written descriptions, photos, maps and paintings, and paleoecological records such as tree rings, rodent middens and sediments are used to help assess degraded or damaged landscapes. Researchers can establish benchmarks from the historical data, however with effects from climate change, it may no longer be possible to achieve these benchmarks.

Science Vol. 325. no. 5940, pp. 567 – 569

Centre for Marine Futures

After a very long wait, staff and students have now relocated (or are currently in the process of moving) to their new offices in the WATRI building on Fairway.

The following staff and students are located in the WATRI building:

Jessica Meeuwig, Gary Kendrick, Di Watson, Kris Waddington, Peter Barnes, Euan Harvey, Ben Piek, Antony Payne, Alex Grochowski, Sam McMillan, Derek



July to September 2009

Walker, Ben Ford, Jillian Ooi, David Rivers, Heather Taylor, Sueli Amprino, John Statton, Margie Mohring, Tim Langlois, Dan Smale, Mark Westera, John Clough, Anne Brearley and Marion Cambridge.

The Marine Futures project won the "WA Coastal Award for Excellence 2009" for Coastal / Marine Research or Education.

The award recognised the large (ambitious) spatial scale of the project, its impact on increasing the broader community's understanding of what lies beneath the blue surface, and the level of excellent research.



Heather Taylor, Jessica Meeuwig and award

Frontiers in Agriculture

Three Plant Biology postgraduate students participated in the 'Frontiers in Agriculture Postgraduate Showcase 2009', organised by the Institute of Agriculture (IOA). **Annaliese Mason,**

Dion Nicol and **Sudheesh Manalil Velayudhan** displayed their research.

Awards

Science and Innovation Award

Natasha Teakle was one of 13 industry winners for young people in Agriculture, Fisheries and Forestry. She was presented with her award at a formal dinner at Parliament house in Canberra on the 15th September. Natasha won the Australian Meat Processor Corporation (AMPC) award. AMPC is a national Research and Development Centre, representing all processors active in the red meat processing industry, and they support research that will benefit the red meat industry.

Natasha is using her award to study the physiological and genetic traits of legumes that can tolerate marginal soils. The aim of her project is to learn more about how the legume *Melilotus siculus* survives in salty, waterlogged conditions. This will involve collaborations with scientists from the United States using the latest sequencing technology to identify genes contributing to salt and waterlogging tolerance. Natasha's research will help livestock producers expand into marginal areas and could contribute to the development of new salt-tolerant crop and pasture species.



July to September 2009



Burke and Kevin Collison

UWA Research Development Award

Rachel Standish was granted a UWA Research Development Award to study the influence of belowground mutualisms

on the competitive interactions among jarrah forest plants. Rachel will use the award to fund a glasshouse experiment using microcosms.

Best Papers for 2008:

Roberto Busi: Best Early Career Researcher Publication for 2008

Matthias Boer: Runner-up Early Career Researcher Publication for 2008

Patrick Mitchell: Best Postgraduate Student Publication for 2008

New Staff Joining Plant Biology

Dr Bruce Webber is an Adjunct Associate Professor from CSIRO Entomology working on Managing Species and Natural Ecosystems within the Climate Adaptation National Research Flagship.

In collaboration with Dr John Scott, Dr Webber is studying a variety of research topics related to the management of invasive plant species in a changing climate.

In particular, his work plans to investigate the effect of predicted changes in temperature, rainfall patterns and atmospheric carbon dioxide on invasive plant species.

Title	Surname	First Name	Position
Dr	Armstrong	Jean	Adjunct Associate Professor
Dr	Armstrong	William	Adjunct Professor
Mr	Dong	Zhi Gang	Honorary Research Associate
Dr	Fortescue	Jeanie	Honorary Research Associate





July to September 2009

Ms	Martinez	Neree	Research Officer
Dr	Palta	Jairo	Adjunct Associate Professor
Prof	Raven	John	Visiting Professor
Prof	Walker	Diana	Senior Honorary Research Fellow
Dr	Yates	Colin	Adjunct Associate Professor

New Postgraduate Students Joining Plant Biology

Surname	First Name	Type	Supervisor	Project Title
Ge	Xintian (Cynthia)	PhD	Barbetti, M; Li, H; Sivasithamparam, K	Management of the downy mildew pathogen <i>Hyaloperonospora parasitica</i> through development of durable host resistance to races of the pathogen occurring in southern Australia
Kurniasih	Budiastuti (Tuti)	PhD	Colmer, T	TBA
Moniodis	Jessie	PhD	Jones, C; Plummer, J; Ghisalberti, E; Barbour, E	Elucidation of genetic and physiological factors controlling sesquiterpene production in Sandalwood
Owen	Mechelle	Phd	Powles, S.	Herbicide resistance
Saul-Gershenz	Leslie	PhD	Lambers, H.	Sexually deceptive orchids and the interactions with their pollinators
Trueman	Amanda (Mandy)	PhD	Hobbs, R	Towards effective management of degraded ecosystems in the highlands of Galapagos
Wang	Xing	PhD	Pearse, S; Lambers, H	Cluster roots

Postgraduate Students Submitted

Surname	First Name	Type	Supervisor	Thesis Title
Chai	Tsun-Thai	PhD	Finnegan, P; Colmer T	A GmAOX2b antisense gene suppresses growth and reproductive development in soybean (<i>Glycine max</i> L.)
Hassiotou	Foteini	PhD	Veneklaas, E; Ludwig, M; Evans, J	Effects of sclerophylly on photosynthesis and gas diffusion
Hovey	Renaë	PhD	Kendrick, G; Cambridge, M	Linking Seagrass restoration and replanting to the biology of seagrass survival and growth
Kroiss	Lori	PHD	Ryan, M; Barker, S; Moody, M	The potential for genetic interaction between planted pastures of <i>Cullen australasicum</i> and natural populations



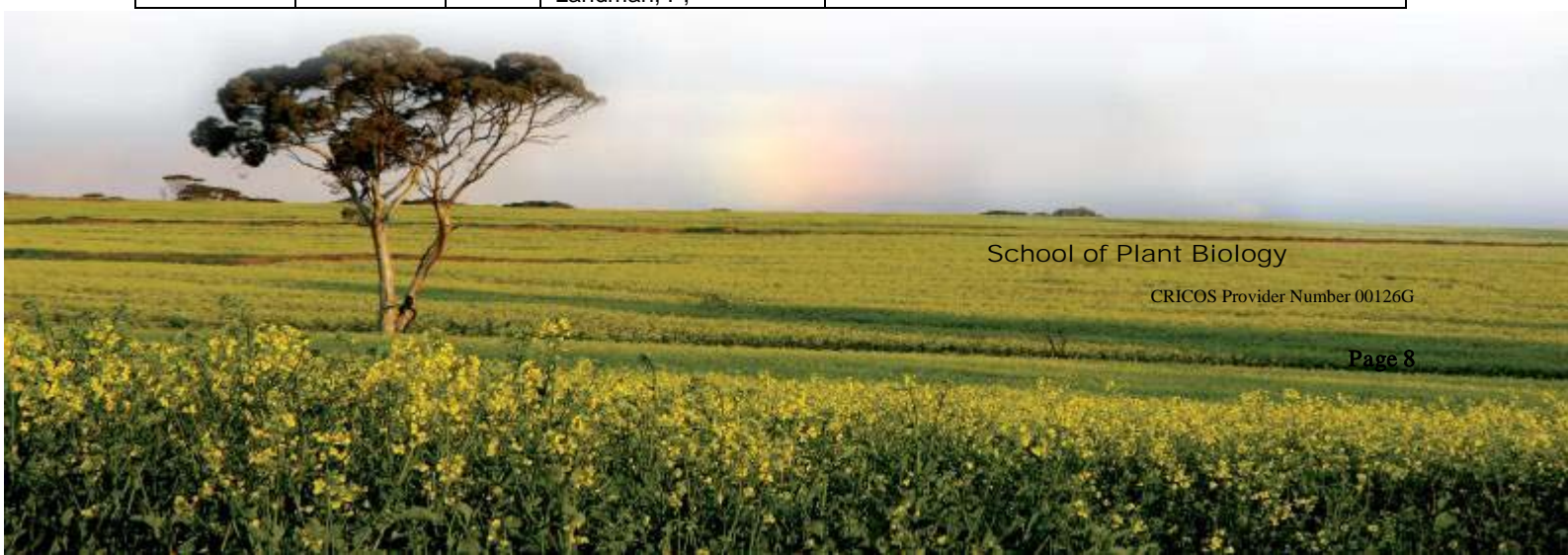


July to September 2009

				of <i>Cullen</i> species
Nio	Song Ai	PhD	Colmer, T; Wade, L	Osmotic adjustment and growth response of wheat (<i>Triticum aestivum</i> L.) under water deficit
O'Rourke	Tiernan	PhD	Barbetti, M; Sivasithamparam, K; Ryan, M	Analysis of root rots in subterranean clover in southern Western Australia
Pekin	Burak	PhD	Grierson, P; MacFarlane C; Boer, M; Wittkuhn, R	Fire history and productivity of the jarrah forests of south-western Australia
Scanlon	Tim	PhD	Ryan, M; Wade, L	Decline in Subterranean Clover-Based Pastures in Western Australia: Causes and Solutions
Siteo	Alexandre Manuel	MSc	Lambers, H	<i>Proteaceae</i> and <i>Myrtaceae</i> species diversity and their distribution in relation to soil type and soil nutrient availability in South-West Australia
Szota	Christopher	PhD	Lambers, H; Veneklaas, E; Koch, J	Root morphology, water relations and development of jarrah (<i>Eucalyptus marginata</i>) in response to soil constraints at restored bauxite mines in south-western Australia

Postgraduate Students Completed

Surname	First Name	Type	Supervisor	Thesis Title
Bougoure	Jeremy	PhD	Grierson, P; Brundrett, M; Ludwig, M; Sivasithamparam, K	The role of mycorrhizal fungi in nutrient supply and habitat specificity of the rare mycoheterotrophic underground orchid, <i>Rhizanthella gardneri</i>
Davies	Kathi S	PhD	Ryan, M; Ewing, M	The ecology of herbaceous perennial legumes
Delacy	Caine Robert	PhD	Harvey, E; Choat, H; Babcock, R	Latitudinal patterns in reef fish assemblage structure: the influence of long-term and short-term processes
Grigg	Alasdair M	PhD	Lambers, H; Veneklaas, E; Dixon, K; Jasper, D	An ecophysiological approach to determine problems associated with mine-site rehabilitation: a case study in the Great Sandy Desert, north-western Australia
Hendrati	Rina	PhD	Plummer, J; Barbour, E; Byrne, M	Developing systems to identify and deploy saline and waterlogging tolerant lines of <i>Eucalyptus occidentalis</i> Endl.
Jassogne	Laurence	PhD	Lambers, H; McNeil, A; Chittleborough, D	Characterisation of porosity and root growth in a sodic texture-contrast soil
Mcintyre	Rebecca	PhD	Grierson, P; Adams, M, Landman, P;	Soil biogeochemistry and flooding in intermittent





July to September 2009

			Robertson, A	streams of the semi-arid Pilbara region
Mitchell	Patrick	PhD	Lambers, H; Veneklaas, E; Burgess, S	From conduits to communities: plant water use strategies and evapotranspiration in a semi-arid ecosystem in south-western Australia
Rodriguez	Caren	PhD	Smith, P; Atkins, C	Study of Macromolecules in phloem exudate of <i>Lupinus albus</i>

Visitors to the School

Dr. Jeannine Lessmann visited Plant Biology. She is from the Marine Science program at Eckerd College in St. Petersburg, Florida and specializes in restoration ecology of intertidal marine communities. She spends much of her time studying halophytic macrophytes in restored mangrove forests, salt marshes, and occasional seagrass beds. Her work experiences have included time in freshwater systems, such as cypress swamps, as well as time outside of Florida in varied systems that include the Chesapeake Bay, southern California, southern Louisiana and the Mississippi Deltaic Plain, and northern Europe. She also teaches numerous courses in marine science, marine botany and restoration ecology to students attending Eckerd, a small liberal arts college on the Gulf of Mexico.

Title	Surname	First Name	Institute	Visiting
Dr	Cheung	William	University of East Anglia, UK	Langlois, T
Mr	Faivre	Nicolas	Centre for Agricultural and Environmental Engineering Research, France	Grierson, P
Dr	Lessmann	Jeannine	Marine Science and Biology, Eckerd College, Florida	Kendrick, G
Assoc / Prof	Pedersen	Ole	Freshwater Biological Laboratory, University of Copenhagen, Denmark	Colmer, T
Dr	Pharmawati	Made	Udayana University, Indonesia	Finnegan, P
Dr	Saito	Takami	Japan	Lambers, H
Ms	Wang	Yanmei	Chinese Academy of Science	Pang, J; Lambers, H
Dr	Zulak	Katherine	Department of Biological Sciences, University of Calgary, Canada	Plummer, J; Jones, C





July to September 2009

Staff/Student Travel

Month	Name	Destination	Reason	
July	Considine, Michael	England	British Science Council Researcher Exchange Program	
	Finnegan, Patrick	USA	Conference	
	Hobbs, Richard	Darwin, Albuquerque	Darwin Centenary Symposium and Ecological Society of America Conference	
	Nio, Song Ai	Wagga Wagga	External supervisor	
	Stingemore, Jessica	Canberra	Genetic Analysis for Population Studies	
Aug	Angessa, Tefera	Dongara	Western Region Barley Committee Meeting	
	Boer, Matthias	Brisbane	INTECOL	
	Busi, Roberto	Dijon, France	XIII International Conference on weed biology	
	Hallett, Lauren	Brisbane	INTECOL	
	Harvey, Euan	Adelaide, Melbourne, Sydney	Meetings	
	Hobbs, Richard	USA	INTECOL	
	Kendrick, Gary	Brisbane	INTECOL	
	Krauss, Siegy	Brisbane	INTECOL	
	Lugg, Rosemarie	Dongara	Western Region Barley Committee Meeting	
	Munday, Christine	Dongara	Western Region Barley Committee Meeting	
	Nelson, Matthew	Cairns	14th APBC	
	Standish, Rachel	Brisbane	INTECOL	
	Wibisono	South Sumatra	Samples from Mangium plantation	
	Sept	Angessa, Tefera	Sunshine Coast	14th Australian Barley Technical Symposium
		Barbetti, Martin	Melbourne	ACIAR project meeting
		Bennett, James	Melbourne	CRC National Plant Biosecurity Science Exchange 2009
		Boer, Matthias	Gold Coast	2009 AFAC-Bushfire CRC Conference
Chen, Sheng		Melbourne	16th ARAB Conference	
Cowling, Wallace		Melbourne	16th ARAB Conference	
Cowling, Wallace		Cairns	14th Australasian Plant Breeding Conference	
Erickson, Todd		Melbourne	Native Seed Forum	
Ganesalingam,		Melbourne	16th ARAB Conference	





July to September 2009

	Aanandini		
	Hobbs, Richard	NSW	University of Wollongong
	Long, Rowena	Melbourne	Native Seeds Forum
	Mackie, Alison Elizabeth	Carnarvon	CRC National Plant Biosecurity Science Exchange 2009
	Renton, Michael	Brisbane	CRC National Plant Biosecurity Science Exchange 2009

Research

Cropping Systems

Jiayin Pang: Can novel perennial herbaceous deep-rooted pasture legumes function as biological irrigators?

New perennial pasture legumes are urgently required for the low-rainfall regions of the Australian wheatbelt, as the only widely grown perennial legume, lucerne, is poorly adapted to low-rainfall or drought conditions. The integration of perennial species into agricultural systems of south-western Australia may allow these systems to more closely mimic natural ecosystems.

Hydraulic redistribution is the process of water movement from relatively moist to dry soil layers using plant root systems as a conduit. In a Mediterranean climate, the availability of both water and nutrients is enhanced in winter, but there may be a “nutrient drought” in summer, where deeper roots are active in the lower, wetter, nutrient-poor soil layers, but the nutrient-containing surface layers are dry.

A glasshouse experiment has been investigating whether hydraulic redistribution could be shown in novel deep-rooted perennial legumes. They could have high potential to be used as effective biological irrigators. They could be used in mixed-species pastures to provide soil moisture to some annual legumes such as subterranean clover whose root systems develop shallower in the WA wheatbelt. The experiment will also quantify the role of hydraulic redistribution on nutrient acquisition from drying soils, for example, phosphorus and potassium.

Annaliese Mason is researching how to improve canola by using wild relatives to cross with it. Her thesis title is “On the road to a Super Brassica crop species: investigating problems of infertility and instability through cytogenetics”. Cytogenetics is the study of chromosomes and cell division.

Dion Nicol is studying “Cullen” a native pasture species that has the potential to be a low input summer pasture for low rainfall areas. He is also interested in the impact of bicarbonate toxicity in subsoils on agricultural plants.





July to September 2009

Sudheesh Manalil Velayudhan studies herbicide resistance; the genetic basis of resistance and the development of resistance with varying application rates of herbicide.

Natural Terrestrial Systems

Rachel Standish is researching the effect of soil fertility on the restoration of jarrah forest after bauxite mining. Rachel collaborates with Professor Richard Hobbs, Associate Professor Mark Tibbett and Mr Tim Morald (both from the School of Earth and Environment), Dr John Koch (Alcoa of Australia) and Dr Stephen Vlahos (BHP Billiton Worsley Alumina).

Mine sites offer the ultimate playground for this research because it is possible to manipulate nutrient supply (P and N fertilisers) over large areas. Fertilisers are required to replace the nutrients that are lost during the mining process and to 'kick-start' recovery of the vegetation. However, the risk of over-fertilising this inherently nutrient-poor ecosystem needs to be managed as well. This project aims to determine the optimal fertiliser regime for the return of most jarrah forest species and their mycorrhizal fungi.

There is a pointy end to this research too: to test the prediction that plants from nutrient-poor soils generally display traits associated with resource conservation. The growth and nutritional responses of 12 jarrah forest species to increasing soil P and inoculation with arbuscular mycorrhizal fungi indicated that this

prediction was true for some species whereas others, including jarrah, displayed traits associated with a ruderal (fast-growing) strategy. Indeed, the jarrah forest is fertile ground for further research on plant-soil interactions!



Rachel spreading fertiliser on a plot recently restored to jarrah forest after bauxite mining at Legless, Willowdale.

Kwongan Foundation

The Kwongan Foundation, for the Conservation of Australian Native Plants, was established in March 2006.

The objectives are to:

- * implement the gathering and sharing of knowledge about our unique flora
- * enable planning on a long-term basis for conservation of these plant species
- * attract world-class researchers to WA
- * facilitate conservation objectives of the community, industry and Government





July to September 2009

- * help provide a secure basis for the State's tourist industry
- * discover many valuable compounds for medicine and industry
- * involve community groups helping with this challenge

The Foundation provides essential income to support promising young researchers in this urgent field of community need

All this cannot be achieved without your valuable support. All donations make a measurable difference. Please consider a contribution (tax deductible) to the Foundation. All donations of \$5000 and above will entitle you to become a Patron of the Kwongan Foundation.

For more information please contact
W/Prof Hans Lambers
hans.lambers@uwa.edu.au

Contact Information

Please email articles for the next E-Bulletin to the Plant Biology Administrative Officer

plantbio@plants.uwa.edu.au

PLEASE LET US KNOW ANY CHANGES TO YOUR ADDRESS OR EMAIL DETAILS

Do you have something interesting to share? Please let us know.

If you would like further information on any of the articles, please contact the Plant Biology Administrative Officer plantbio@plants.uwa.edu.au or phone 6488 2206.

Alumni

All Alumni are invited to share their success stories with Plant Biology Staff and Students. Please email information to

plantbio@plants.uwa.edu.au

We look forward to hearing from our Alumni!

