



# BEANSTALK

Centre for Legumes in Mediterranean Agriculture Newsletter

## IN SEARCH OF ANNUAL PASTURE LEGUMES IN THE MEDITERRANEAN



Dr Clinton Revell collecting pasture seed in Cyprus

by Drs Clinton Revell and Hayley Norman

CLIMA-assisted travel to the Mediterranean by researchers Drs Clinton Revell (Department of Agriculture WA) and Hayley Norman (CSIRO), who were joined by DAWA researcher Dr Angelo Loi, has resulted in valuable additions to pasture legume seed and rhizobia collections in addition to providing a better understanding of the growth of annual pasture legumes in their natural environment, and strengthening established links and fostering new links with research institutes in Sardinia, Cyprus and Greece. The institutes involved in this DAWA/CLIMA initiative included:

- Centro Studio Pascoli Mediterranei (University of Sassari).  
**Dr Claudio Porqueddu, Dr Antonello Franca and Dr Leonardo Sulas.**
- Istituto Zootecnico of Bonassai (Sardinia). **Dr Maria Sitzia**
- Agricultural Research Institute of Cyprus.  
**Dr Ioannis Papastylianou**
- Greek Gene Bank.  
**Mr Stelios Samaras**

In Sardinia, they inspected a number of pasture and grazing experimental sites with Dr Maria Sitzia, Dr Claudio Porqueddu

and Dr Leonardo Sulas. They also visited a number of commercial sheep dairy farms with Dr Antonello Franca and discussed farming systems with the producers. All three researchers presented seminars about their respective research interests at the University of Sassari.

Hayley, Clinton and Angelo then travelled to Cyprus for a targeted legume seed and rhizobia collection, assisted by Dr Ioannis Papastylianou. In the past, Cyprus has yielded some promising new species for Australian agricultural systems however much of the material flowers too late to set seed in our low rainfall wheatbelt. They therefore collected in the low rainfall plains and coastal areas of Cyprus, collecting 190 accessions of annual legumes from a total of 44 sites. While in Cyprus, Angelo and Hayley presented seminars about their research following an invitation from the head of the Agricultural Research Institute of Cyprus. Cyprus has little cultivated pasture (except small areas of irrigated lucerne) but farmers practice extensive fodder conservation (cereal hays and straw) for sheep and cattle feed-lots. Pastures are considered to be 'organic' systems and may assume increasing importance.

*continued on page 2*

### Contents

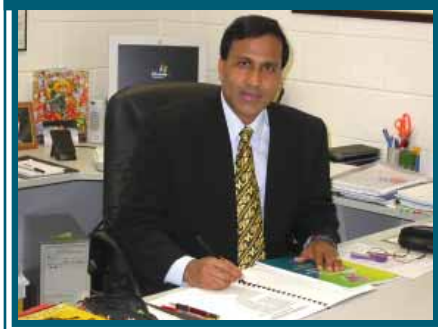
FROM THE DIRECTOR .....	2
FEATURE ARTICLES	
Pasture legumes in the Med .....	1&2
Lupins for eastern growers.....	4
Neil takes a bow.....	4
Pulse breeders meet .....	5
Siddique in the spotlight.....	5
Penny moves on.....	13
RESEARCH REPORTS	
Wild chickpea relatives .....	6
Improved inoculation technology .....	6
CLIMA EXTENSION	
IAG meeting .....	7
What's new on CLIMA's website .....	7
Recent CLIMA Research Publications .....	8
Meetings Diary .....	10
VISITORS and TRAVEL NEWS	
Spring flush of CLIMA visitors.....	9
Tissue culture specialist .....	9
Collaboration on chickpea pathogen ..	10
Reindeer and carbon monitoring!.....	11
Table of CLIMA Visitors .....	12
Weddings and Babies.....	13

## CLIMA CHRISTMAS PARTY 2005

**Date:** Tuesday 20th December  
**Time:** 5.00 – 9.00pm approx  
**Where:** New University Club, end terrace (with room to play on Riley Oval)  
**Music:** Live band  
**Cost:** \$20 in advance to Greg Madson; Children under 13 free  
**Santa Claus:** Please bring a present (\$10 max) for Santa to give your child  
**Details:** Greg Madson  
 gmadson@fnas.uwa.edu.au

CLIMA SEMINAR SERIES 2006  
 Please contact Debbie Thackray  
 djthack@clima.uwa.edu.au  
 to suggest topics and speakers for 2006.

## FROM THE DIRECTOR



**Professor Kadambot Siddique**

ksiddiqu@fnas.uwa.edu.au

There have been several recent changes to the CLIMA Governing Board, Industry Advisory Group (IAG) and Program Management Team (PMT). Adjunct Professor Karam Singh has replaced Mr Mick Poole as the CSIRO representative on the CLIMA Governing Board and IAG. Professor Craig Atkins (UWA) has been appointed as Leader of CLIMA's Subprogram GL4 (Grain Quality, Utilisation and Product Development) to replace Dr Penny Smith (UWA). Dr Jens Berger (CSIRO) has replaced Adjunct Professor Neil Turner as Leader of Subprogram GL3 (Agro- Ecological Adaptation). I would like to thank Mick Poole, Neil Turner and Penny Smith for their valuable contribution to the Centre since its inception in 1992.

CLIMA IAG at its October meeting unanimously agreed to continue its role until the Agricultural Research Western Australia (ARWA) structure is in place and /or a similar advisory group has been developed. The next IAG meeting will take place at the Department of Agriculture Western Australia (DAWA) in March 2006. CLIMA Governing Board at its December 13 Meeting will commence active discussion on CLIMA's transition to ARWA. I will be representing CLIMA in the ARWA Pulse,

Oilseed and Pasture planning group.

CLIMA Program Management Team (PMT) has allocated \$130,000 core funds in 2005-06 for grain and pasture legume research activities that will benefit CLIMA and its stake holders. Successful projects are listed in the following table and I would like to congratulate all successful applicants.

CLIMA's Biotechnology Committee met in November under the Chairmanship of Adjunct Professor Karam Singh and identified several strategic areas for future investigation. These are currently being developed as concept proposals.

Professor Craig Atkins, Dr Heather Clarke and I attended and presented invited lead papers at the 4th International Food Legume Conference (IFLRC) in New Delhi, India during October. About 600 delegates from 35 countries attended. CLIMA was well recognised throughout the conference presentations as a Centre of excellence in legume research. The 5th IFLRC will be held in 2010 and I was elected as the Chair of the International Organising Committee.

CLIMA's external funding got a boost in September with the approval of a new project "Seeds of Life project 2: East Timor" jointly funded by the Australian Centre for International Agriculture Research (ACIAR) and AusAID. The project is initially for a period of 5 years (2005-09) with a total budget of \$7,402,300. The major goal of the project is "improved food security in East Timor". The project will use improved crop varieties and associated technologies which result in increased food production. We have appointed several consultants to the project including Dr Harry Nesbitt, Dr Rob Williams, Mr Brian Monaghan, Mr Alex Dalley, Mr Julian de Meyer, Ms Naomi Kinsella and Dr Ron Parkin.

The project will work closely with the Ministry of Agriculture Forestry and Fisheries (MAFF),

East Timor and 5 Consultative Group for International Agricultural Research (CGIAR) Centres. I will spend 10% of my time on this project as parts of UWA's commitment. CLIMA has currently 37 externally funded active projects with a budget of more than



*Prof. Craig Atkins and Dr Jens Berger have joined CLIMA's Program Management Team*

\$4.5 million. This is a remarkable achievement and I am convinced that strong support from staff, associates and funding bodies have contributed to this success.

UWA has appointed Dr Harry Nesbitt as Adjunct Professor and Dr Brett Glencross as Adjunct Associate Professor within the Faculty of Natural and Agricultural Sciences (FNAS) and CLIMA. Dr Neil Turner's Adjunct Professorship has been renewed for another three years. Congratulations to all and I look forward to their continued association with CLIMA.

CLIMA has had a successful 2005 in terms of commercial releases of a number of new legume varieties, attracting competitive research grants, successful completion of several PhD students, publication of many high quality scientific papers/review articles, interaction with the industry and international visitors to the centre.

I thank CLIMA staff, associates, Governing Board, IAG and funding bodies for their excellent efforts and support throughout the year and wish you all a very happy festive season and prosperous 2006.

*continued from page 1*

The next collection area was the Greek islands of Milos, Folegandros, Sikinos, Naxos and Ios where Mr Stelios Samaras of the Greek Gene Bank greatly facilitated access. The Greek islands of the Cyclades have a dry climate similar to southern Australia and are considered an important source of new genetic material. Several of the more recent pasture releases have originated from these parts of the Mediterranean. Again, the low

rainfall parts of these islands were targeted, where annual legumes are relatively difficult to find but are likely to fill a niche in dryland farming systems. Folegandros was a very harsh island and had received little rain in recent years. Soils in these islands were mostly in the range of pH (water) 6.5-9. Over 150 accessions were collected from a total of 57 sites.

Overall there were some 30 species of annual

legumes collected and the material should provide good prospects for new cultivars in dryland farming systems of southern Australia. The dominant species were *Hymenocarpus circinnatus*, *Trifolium spumosum*, *Trifolium cherleri*, *Trifolium tomentosum*, *Trifolium campestre*, *Trifolium nigrescens*, *Biserrula pelecinus*, *Trigonella balansa*, *Lotus halophilus*, *Ornithopus compressus* and *Lotus ornithopoides*.

## CLIMA Allocates \$130,000 Internal Research Funds

Each year, CLIMA allocates core funds to research and travel projects. Proposals are judged by the CLIMA Program Management Team, based on value to the CLIMA research alliance, quality of science, and value to the industry. Congratulations to all successful 2005-2006 applicants.

Title	Submitted by	\$ Allocated
Development of molecular markers for anthracnose resistance in <i>Lupinus albus</i> for practical albus lupin breeding.	Dr H. Yang Dr Kedar Adhikari	10,000
<b>Travel</b> - International Seminar on management of insect transmitted plant viruses occurring in the semi-arid tropics - ICRISAT - February 2006.	Dr Roger Jones	1,500
<b>Travel</b> - 13th Australian plant Breeding Conference, Christchurch NZ, April 2006	Ms Kerry Regan	1,000
Phytochemical profiling of chickpea ( <i>Cicer arietinum</i> ).	Dr E.E. Swinny Dr David Harris	10,000
<b>Travel</b> - Lead speaker IFLRC - Delhi October 2005	Prof Craig Atkins	1,800
International <i>Lupinus mutabilis</i> (pearl lupin) collaboration with Peru and Chile.	Dr Jon Clements	10,000
Generating an EST sequence library of Narrow- leafed lupin breeding.	Dr Penny Smith Prof Richard Oliver	11,000
<b>Travel</b> - 13th Australian Plant Breeding Conference, Christchurch, NZ, April 2006.	Dr Fucheng Shan	1,500
Assessment of the molecular responses by fish to inclusion of grain meals as dietary protein sources.	Dr Brett Glencross	8,000
Enhancing doubled haploid research in the cool season legumes by investigating haploidy in the tropical legumes cowpea and winged bean.	Dr Janine Croser Dr Tanveer Khan	3,300
Exploring genetic variation in <i>Cicer</i> leaf and root exudates for better resistance to pests and improved nutrition.	Dr Heather Clarke Dr Erik Veeklaas	10,000
"eVariety" profiler for pastures.	Dr Perry Dolling Dr James Fisher	8,000
<b>Travel</b> - 13th Australasian Plant Breeding Conference, Christchurch, NZ, April 2006.	Dr Phil Nichols	2,870
<b>Travel</b> - Germplasm collection of pasture legumes in Israel, June 2006.	Dr Phil Nichols	2,500
<b>Travel</b> - 14th Australian Nitrogen Fixation Conference, NSW, November 2005.	Dr Mathew Denton	1,785
Identifying annual legumes to complement warm season grasses.	Mr Geoff Moore Mr John Titterington	7,000
Development and calibration of techniques to estimate plant selection by sheep grazing perennial pastures (saltbush or C4 perennial grass) with an annual legume component.	Dr Hayley Norman Mr Dean Revell Mr Dean Thomas	10,000
Identify anticancer activity compounds from legumes	Dr Shao Fang Wang, Prof Peter Leedman, Mr Kevin Foster, Prof Clive Francis, A/Prof John Howieson	5,000
<b>Travel</b> - 13th Australasian Plant Breeding Conference Christchurch, NZ, April 2006	Mr Ron Yates	2,450
<b>Travel</b> - 13th Australasian Plant Breeding Conference Christchurch, NZ, April 2006, Visit AgResearch, Palmerston North, NZ.	Dr Kioumars Ghamkhar	3,200
<b>Travel</b> - Diversity of Fodder Fabaceae and their Symbionts - International Workshop, February 2006.	Mr Richard Snowball	2,500
Molecular characterisation of <i>Trifolium spumosum</i> germplasm collection.	Dr Kioumars Ghamkhar	4,000
The XIVth International Plant and Animal Genome Conference San Diego, USA, January 2006	Dr John Klinger	2,500
Enhanced capacity for plant chemistry analysis associated with duty of care for new pasture plants.	Dr Clinton Revell Dr Ewald Swinny	9,000
Development of the perennial legume <i>Lespedeza cuneata</i> for sustainable agriculture in WA.	Mr Ron Yates	1,500

## FEATURE ARTICLES

## TWO NEW ALBUS LUPINS FOR EASTERN AUSTRALIA

by Dr David Luckett

At the recent Open Day for the EH Graham Centre for Agricultural Innovation at Wagga Wagga, two new albus lupin varieties were commercially released by NSW DPI: Luxor and Rosetta. They are the first albus varieties in Australia with *Pleiochaeta* Root Rot resistance, and they also have significantly improved yields.

*Pleiochaeta* Root Rot (PRR) is the most common and widespread pathogen of albus in the eastern states and the old varieties are susceptible, Kiev Mutant in particular. *Pleiochaeta setosa* can cause a large number of seedling deaths especially in cool, wet conditions, heavy soils, and after late sowing. Seedling losses result in reduced yield potential and poor performance. Luxor is very resistant to PRR and is almost as good as the best germplasm (accession P25758 from Crete). In NSW state-wide trials Luxor yields 7% better than Kiev Mutant and Ultra (in the absence of disease). Rosetta has 11% greater yield and has moderate PRR-resistance. Both new varieties flower later than Kiev Mutant and are taller, Rosetta especially so. Rosetta is most suited to the high-rainfall zones in eastern Australia but Luxor is preferred if the PRR disease pressure is expected to be high. The grain quality of Luxor and Rosetta is equivalent to the other albus varieties in Australia which makes them ideally suited to all existing markets for human food and animal feed.

Luxor and Rosetta are named after places in the Nile valley of Egypt. Graintrust, the commercial partner for Luxor and Rosetta, are using the variety names to help build product recognition in the important Middle-eastern market. Luxor and Rosetta are protected by PBR and will attract an end-point royalty. Luxor was produced from a cross made at Wagga between Kiev Mutant and Lucky-1 (a selection from a French variety). Rosetta was selected at Wagga from a cross between Start (a Russian variety) and P23277 (a Ukrainian breeding line) made by Dr Bevan Buirchell at DAWA in Perth. Unfortunately, Luxor and Rosetta are not recommended for Western Australia since both are susceptible to anthracnose;



Results of a growth-room experiment screening for *Pleiochaeta* Root Rot resistance in albus lupins.

top: susceptible control (Kiev Mutant)

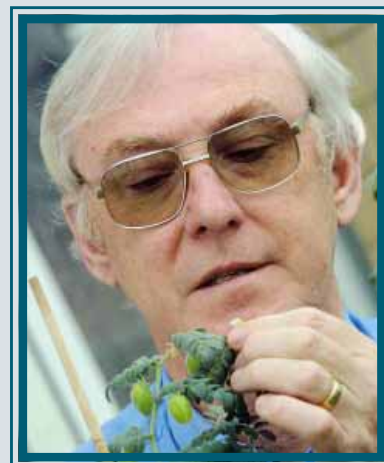
middle: Rosetta (moderately-resistant);

bottom: Luxor (resistant).

Photos: Ray Cowley

this fungal disease is not present in lupin crops in eastern Australia. The next aim of the Wagga albus breeding program is to pyramid anthracnose resistance into the high-yielding backgrounds as a pre-emptive strategy against the disease becoming widespread in eastern Australia.

Albus breeding at Wagga is part-funded by growers through the GRDC.



## NEIL TAKES A BOW

Adjunct Professor Neil Turner is retiring from CSIRO after more than 20 years with the organisation, most recently as Chief Research Scientist at CSIRO Plant Industry. Prior to taking up that position he was the Research/Program Leader and Officer-in-Charge of the Dryland Crops and Soils Research Unit of CSIRO Plant Industry, Perth; Crop Physiologist at the CSIRO Plant Industry in Canberra; and Crop and Tree Physiologist with the Department of Ecology and Climatology at the Connecticut Agricultural Experiment Station, USA. A tribute detailing Neil's contributions to agriculture and official recognition of these can be found in the current issue of *Australian Journal of Agricultural Research* (56:(11) i-iii).

Neil has been heavily involved with CLIMA for more than a decade, during its early development, as seconded scientist and sub-program leader during the CRC phase, and as sub-program leader of the GL3 "Agro-ecological adaptation" sub-program since CLIMA entered its current non-CRC phase. He will be stepping down from this position in January and will be greatly missed for his very positive and supportive work in our Program Management Team. However, his presence will still be very real as he has held an Adjunct Professorship with UWA since 1998 and may be found at his desk at CLIMA following up on many areas of continued interest to him (see travel article in this newsletter).

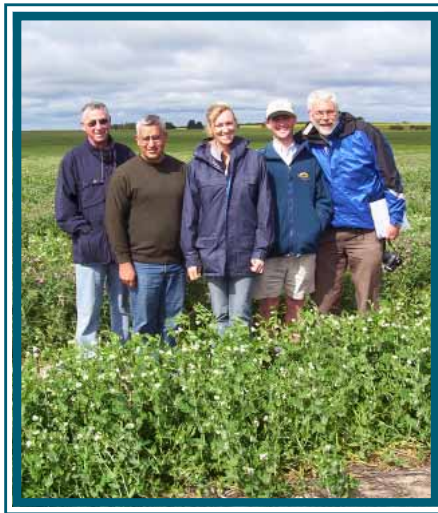
This article is partly adapted from *AJAR* Vol 56: (11) tribute.

## NATIONAL PULSE BREEDING PROGRAMS MEET IN WA

by Ms Kerry Regan

Breeders and coordinators of the national field pea (AFPIP), chickpea (CICA) and lentil (CIPAL) breeding programs met in WA in September. Ms Kerry Regan, Dr Tanveer Khan, Mr Phill Chambers and Mr Tim Pope hosted the visit.

Lentil breeder, Dr Michael Materne, chickpea breeder, Ms Kristy Hobson, and South Australian coordinator, Mr Larn McMurray, visited trials in the northern agricultural region (Bolgart, Mingenew and Morawa) and attended the launch of the ascochyta resistant desi chickpea, Genesis 836, at Yandanooka. The group was joined by field pea breeder, Mr Tony Leonforte and New South Wales field pea coordinators, Dr Eric Armstrong and Dr Steve Moore, at Merredin. The tour continued through Lake King to



*Coordinators for the National Field Pea Improvement Program (l-r), Steve Moore, Tony Leonforte (breeder), Kerry Regan, Larn McMurray and Eric Armstrong*

Scaddan and Esperance, and culminated with a day tour of field peas, faba beans and chickpeas at Mr Neil Wandel's farm.

The tour is a first for the national pulse breeding programs, which officially commence in January 2006. Bringing together all the coordinators during the spring time provided an excellent opportunity to compare the performance of breeding lines across Western Australia and other states. The group also had an opportunity to discuss operational plans with the new breeding programs, promising breeding lines with potential for commercialisation, and seasonal issues, such as frosts in WA and bacterial blight epidemics in NSW. A similar tour will be held in another State in 2006.

## NATIONAL FABA BEAN IMPROVEMENT PROGRAM MEET IN WA

by Mr Mark Seymour

Dr Jeff Paull (University of Adelaide) and Dr Ian Rose (NSW DPI) travelled to WA in September to meet up with Mr Mark Seymour and Mr Tim Pope who form the WA team members of the National Faba Bean Improvement Program (NFBIP). The group visited S3 and S4 trials at Dongara,

Mingenew in the northern wheatbelt and the S2 trial at Bindoon.

The visit gave the breeders the opportunity to see their latest released lines and potential releases grown under WA conditions. Of particular interest was the

performance of Cairo in the Geraldton region, and the widespread incidence of *Cercospora* in many of the trials.

The visit was capped off by a seminar by both Ian and Jeff, outlining the way forward for NFBIP over the next few years.

## PROF. SIDDIQUE IN THE SPOTLIGHT

by Mr Brendon Cant

Congratulations to CLIMA Director, Professor Kadambot Siddique, who is now a Fellow of the Australian Academy of Technological Sciences and Engineering (ATSE).

The citation recognised his outstanding contribution to Australian and international agriculture, particularly his innovative research and leadership in production agronomy, crop physiology, germplasm development and breeding of grain legumes (pulses) and cereal crops of benefit to the grains industry in Australia and overseas.

Dean of the Faculty of Natural & Agricultural Sciences at UWA and Chair of the CLIMA Governing Board, Professor Alistar Robertson, said CLIMA's big strength, under Siddique's direction, is successfully linking basic research to applied plant breeding and production agronomy.

"CLIMA has reaped the benefits of the respect scientific and farming communities here and overseas have for Siddique, who has developed and commercially released nine pulse varieties during the past eight years in Australia.

"A rare talent, combining the highly refined skills of researcher and scientist with a commercial savvy that enables him to identify and develop paths to market, Siddique also leads, inspires and empowers others," Professor Robertson said.



*Professor Kadambot Siddique receives the Fellowship from Dr John W Zillman, AO (President of ATSE) in Canberra*

## RESEARCH REPORTS

## WILD RELATIVES HOLD THE KEY TO RESISTANCE

by Dr Fucheng Shan

Low genetic variation of chickpea, which is the only cultivated Cicer species, is one reason why global chickpea yield improvement has been slower than in cereals.

GRDC funded research at CLIMA has studied all known annual wild relatives of cultivated chickpea from the world's gene banks to transfer a more diverse genetic heritage into commercial crops. About 200 annual wild Cicer accessions have been characterised using DNA markers.

Although desi chickpeas can sell for up to \$A450 per tonne in WA, crops are often ravaged by diseases such as ascochyta blight, and new diseases must also be anticipated. Ted Knights, chickpea breeder at Tamworth Agriculture Institute, says phytophthora root-rot seriously threatens Australia's chickpea industry, with an estimated 100,000 hectares at

risk this year. Affected areas could suffer yield losses greater than 20 per cent at the regional level in any one year and above 50 per cent at the grower level. A

root-rot resistant variety developed by crossing chickpea with a wild cousin is just one possible way wild relatives can improve crops.



*Dr Fucheng Shan with wild cicer in the foreground and cultivated chickpea in the background.*

Knowledge of where wild species grow and their diversity has, effectively, mapped global 'hot spots', making further collection and future research easier. Successful crop improvement depends on genetic diversity of this germplasm. Characterising the world's wild Cicer collections, using DNA markers, has shown that they have much wider genetic variation than cultivated Cicer and are potential gene donors to help chickpea win its battle against pests, diseases and other constraints.

*Note: See also "Interstate collaboration to battle chickpea root pathogen" article later in this newsletter.*

## IMPROVED NODULATION WITH GRANULAR TECHNOLOGY

by Mr Rory Coffey

New granular inoculant technology developed by local scientists Drs Steve Carr and Angelo Loi has significantly decreased the risk of failed nodulation in both crop and pasture legumes. The new inoculation technology, developed by ALOSCA Technologies Pty Ltd, has now been commercially used for two seasons and has developed strong interest from growers throughout WA.

Rhizobia have traditionally been applied as peat based inoculants to enable legumes to fix nitrogen. The major limitation of peat-based inoculation is the massive death rate of rhizobia after seed is inoculated. Drs Carr and Loi solved the problem of high death rates of rhizobial cells, by encapsulating them inside a unique clay product, ALOSCA. The clay protects the cells from drying out and dying and maintains them in a suspended state ready to be activated when the soil wets up.

One key advantage of ALOSCA is more flexibility with seeding programs. For example, farmers have increased confidence with dry sowing, knowing that the rhizobia will survive until rainfall commences. ALOSCA is a dry granular product and has many operational, handling and application advantages, making its use much easier than the old style peat inoculants.

Mr Chris Poole and Dr Anabel Viva-Marfisi from ALOSCA Granule Technologies are collaborating with staff at the Centre for Rhizobium Studies at Murdoch University in planning further field research to establish the full extent of the usage benefits ALOSCA offers. Some of these include under-sowing hard-seeded

pasture legumes with cereal crops; rejuvenation techniques on old pasture stands to improve nodulation and N fixation; and new disease control options through seed-dressing pulse legumes made possible because the rhizobia are encapsulated in clay and not applied to the seed surface.



*Angelo Loi and Steve Carr of ALOSCA*

## CLIMA EXTENSION

### INDUSTRY GROUP VIEW CLIMA ACTIVITIES AT CSIRO

by Dr Debbie Thackray

CLIMA's Industry Advisory Group (IAG) met at CSIRO, Wembley on 28th October, to review grain and pasture legume industry needs and R&D planning. After the meeting, members took a tour of some of CSIRO's research facilities where a number of CLIMA researchers described project work being done there. Lunch under the trees provided further opportunities for researchers to discuss their work with IAG members.

The research projects presented during the CSIRO visit were:

- "Overview of legume research at the Centre for Environment and Life Sciences", with Dr Karam Singh.
- "Host responses and mechanisms leading to tolerance to lupin alkaloids by *Myzus persicae*", with Dr Stuart Seah, Ms. Jenny Reidy-Crofts and Dr Owain Edwards.
- "Multiple aphid resistance in *Medicago truncatula*", with Dr John Klingler.
- "Blue Green Aphid Resistance in *Medicago truncatula* – Reciprocal Grafting", with Mr Robert Creasy.
- "Improving pulse adaptation to Mediterranean Australia" with Dr Jens Berger.
- "High, stable lupin yield", with Dr Jairo Palta.
- "Pasture/livestock interactions", with Dr Hayley Norman, Mr Dean Thomas and Ms Di Mayberry.
- "Plant defence gene discovery in model legumes", with Lingling Gao, Jonathan Anderson, John Klingler, Rick Horbury, Hayley Cassarotto, Joel Gummer, Owain Edwards and Karam Singh.



CLIMA IAG members with some of the scientists demonstrating legume research at CSIRO.

### WHAT'S NEW ON CLIMA'S WEBSITE

[www.clima.uwa.edu.au](http://www.clima.uwa.edu.au)

- **Press releases since the last newsletter** [www.clima.uwa.edu.au/news](http://www.clima.uwa.edu.au/news)
  - "Breeding with cousins" (September)
  - "Speeding up natural selection" (October)
  - "Curing coloured beans" (November)
- **Links to DAWA and Grower Group Alliance events calendars** [www.clima.uwa.edu.au/links](http://www.clima.uwa.edu.au/links)
- **Meetings Diary – updated for 2005** [www.clima.uwa.edu.au/links](http://www.clima.uwa.edu.au/links)

## RECENT CLIMA RESEARCH PUBLICATIONS

Since the September 2005 newsletter, we have been notified of the following publications by CLIMA researchers and associates. Conference papers and posters are not listed here, but are included in the 2003, 2004 and 2005 CLIMA publications lists which are on the website: [www.clima.uwa.edu.au](http://www.clima.uwa.edu.au) under "publications".

We encourage all CLIMA staff and associates to forward **2 hard copies** of your CLIMA-related publications to Prof. Kadambot Siddique. Journal papers, refereed conference papers and book chapters attract considerable research income payment to CLIMA from its University partners.

### Scientific Journals

- Barbetti, M., Si, P. and Nichols, P. (2005). Genetic basis for and inheritance of resistance to Race 1 and Race 2 of *Kabatiella caulivora* in *Trifolium subterraneum* ssp. *subterraneum* and ssp. *yanninicum*. *Euphytica*, **144**: 237-246.
- Berger J. D., Buck, R., Henzell, J.M. and Turner, N.C. (2005). Evolution in the genus *Cicer* - vernalisation response and low temperature pod set in chickpea (*C. arietinum* L.) and its annual wild relatives. *Australian Journal of Agricultural Research*, **56**: 1191-1200.
- Brennan, R.F. and French, R.J. (2005). Grain yield and cadmium concentration of a range of grain legume species grown on two soil types at Merredin, Western Australia. *Australian Journal of Experimental Agriculture*, **45**: 1167-1172.
- French, R.J. and Buirchell, B.J. (2005). Lupin: the largest grain legume crop in Western Australia, its adaptation and improvement through plant breeding. *Australian Journal of Agricultural Research*, **56**: 1169-1180.
- Oliver, Y.M., Lefroy, E.C., Stirzaker, R. and Davies, C.L. (2005). Deep-drainage control and yield: the trade-off between trees and crops in agroforestry systems in the medium to low rainfall areas of Australia. *Australian Journal of Agricultural Research*, **56**: 1011-1026.
- Shrestha, R., Siddique, K.H.M., Turner, N.C., Turner, D.W. and Berger, J.D. (2005). Growth and seed yield of lentil (*Lens culinaris* Medikus) genotypes of West Asian and South Asian origin and crossbreds between the two under rainfed conditions in Nepal. *Australian Journal of Agricultural Research*, **56**: 971-981.
- Taylor, G.B. (2005). Hardseededness in Mediterranean annual pasture legumes in Australia: a review. *Australian Journal of Agricultural Research*, **56**: 645-661.
- Thackray, D.J., Ward, L.T., Thomas-Carroll, M.L. and Jones, R.A.C. (2005). Role of winter-active aphids spreading *Barley yellow dwarf virus* in decreasing wheat yields in a Mediterranean-type environment. *Australian Journal of Agricultural Research*, **56**: 1089-1099.
- Turner, N.C. and Asseng, S. (2005) Productivity, sustainability, and rainfall-use efficiency in Australian rainfed Mediterranean agricultural systems. *Australian Journal of Agricultural Research*, **56**: 1123-1136.
- Turner, N.C., Davies, S.L., Plummer, J.A. and Siddique, K.H.M. (2005). Seed Filling in Grain Legumes Under Water Deficits, with Emphasis on Chickpeas. *Advances in Agronomy*, **87**: 211-250.

### Conference Publications

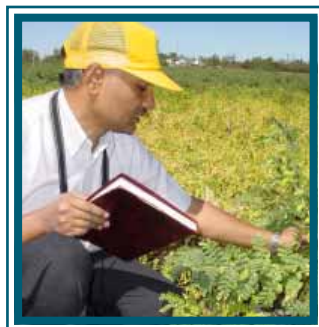
- Bennett, I.J, Bunn, E., Clarke, H. and McComb, J.A. (Eds.) 'Contributing to a Sustainable Future'. *Proceedings of the Australian Branch of the IAPTC & B*, Perth, Western Australia, 21-24 September 2005.
- Clarke, H., Wilson, J., Kuo, I., Croser, J., Lulsdorf, M., Mallikarjuna, N. and Siddique, K. (2005). Embryo rescue and plant regeneration of selfed chickpea (*Cicer arietinum* L.) and its wild annual relatives. In Bennett, I.J, Bunn, E., Clarke, H. and McComb, J.A. (Eds.) 'Contributing to a Sustainable Future'. *Proceedings of the Australian Branch of the IAPTC & B*, Perth, Western Australia, 21-24 September 2005. pp.56-64
- Croser, J., Lulsdorf, M., Davies, P., Wilson, J., Sidhu, P., Grewal, R., Allen, K., Dament, T., Warkentin, T., Vandenberg, A., Siddique, K. (2005). Haploid embryogenesis from chickpea and field pea – progress towards a routine protocol. In Bennett, I.J, Bunn, E., Clarke, H. and McComb, J.A. (Eds.) 'Contributing to a Sustainable Future'. *Proceedings of the Australian Branch of the IAPTC & B*, Perth, Western Australia, 21-24 September 2005. pp.71-79, 81-82.

## VISITORS AND TRAVEL NEWS

CLIMA experienced a spring flush of visitors this year, details of which are in the visitor list in this news letter. Some of the visitors are pictured below:



*Dr Bassam Bayaa, Senior Consultant Legume Pathologist with the Integrated Gene Management Project at ICARDA, Syria came to CLIMA in October to discuss the ACIAR project "Plant health management for faba bean, chickpea and lentil" and also presented a seminar on ICARDA pulse disease research.*



*Dr Pooran Gaur, Senior Chickpea Breeder from ICRISAT, India, visited in September, for discussions on the joint chickpea breeding project between ICRISAT and CLIMA, funded by COGGO.*



*Dr Abu Bakr, Chief Scientific Officer, Plant Pathology, from the Bangladesh Agricultural Research Institute, visited CLIMA in September as part of the ACIAR funded project "Integrated management of BGM of chickpea in Bangladesh and Australia". He is pictured (right) presenting his poster, with another CLIMA visitor Dr Suresh Pande (ICRISAT), at the Australian Plant Pathology Society annual conference.*



*Mr Harmohinder Dhammu (DAWA), Dr Ashwani Kumar Basandrai (currently visiting CLIMA on a Crawford Fund Fellowship) and Mr Bill MacLeod (UWA/DAWA) examining chickpea plants for disease at DAWA's Centre for Cropping Systems, Northam.*

## INTERACTIVE VISIT BY TISSUE CULTURE SPECIALIST DR SERGIO OCHATT

by Dr Janine Croser

CLIMA scientists Drs Janine Croser and Heather Clarke recently hosted a visit by Dr Sergio Ochatt, Head of the Tissue Culture Division of the Centre de Recherches INRA, in Dijon, France. Dr Ochatt's visit was co-sponsored by CLIMA and the Organising Committee for the International Association for Plant Tissue Culture and Biotechnology, Australian Branch Conference, which was held in Perth from the 22nd-24th September.

Dr Ochatt is Chair of the Management Group for the European Union "COST Action 843, Agriculture and Biotechnology", has authored more than 50 Journal articles in the field of cell biology and is a consultant to the Food and Agriculture Organisation (FAO) on biotechnology. He has particular expertise in legume protoplast and somatic embryogenesis research and has worked on doubled haploidy and transformation.

During his visit, Dr Ochatt participated in a CLIMA workshop titled "Cell Biology for Legume Improvement: Progress and Prospects 2005". This workshop was designed to give Australian researchers the opportunity to interact with Dr

Ochatt and to identify potential areas of common interest. The workshop attracted 30 attendees from across CLIMA's partner organisations and from Victoria and South Australia. Subjects covered included programmed cell death, transformation, doubled haploidy and interspecific hybridisation. At the conclusion of the workshop, Dr Ochatt presented a very interesting seminar on "Biotechnology and widening of the genetic variability in protein legumes".

An important aspect of his visit was Dr Ochatt's time spent with individual researchers discussing their projects, particularly those with a focus on cell biology. All those who interacted with Dr Ochatt were very impressed with the breadth of his knowledge, and a number of key common interest areas between INRA and CLIMA were identified.

A successful outcome of this visit has been a joint application for Department of Education, Science and Training funding via the French/ Australian Science and Technology program for funds to establish further collaboration between CLIMA and INRA on legume cell biology. It is

hoped that CLIMA scientists will be in a better position to integrate their research with future European Union Framework projects via this improved linkage.

During his visit Dr Ochatt also had the opportunity to meet some of the locals!



## INTERSTATE COLLABORATION TO BATTLE CHICKPEA ROOT PATHOGEN

by Ms Nola D'Souza

Ms Nola D'Souza, Postgraduate PhD student with CLIMA affiliates the Australian Centre for Necrotrophic Fungal Pathogens (ACNFP) at Murdoch University, recently had the opportunity to go to Tamworth as part of a collaboration with members of the Dept. of Primary Industries NSW. Her project is to genetically dissect resistance to *Phytophthora medicaginis*, a major root pathogen of chickpea in eastern Australia, using the model legume *Medicago truncatula*. Part of that project is to determine genetic markers for *Phytophthora* resistance from segregating chickpea populations bred in NSW.

During the four day trip in October, Principal Chickpea Breeder Mr Ted Knights showed the resources available for developing populations at the Tamworth Agricultural Institute, including a *Phytophthora* "nursery" where inoculum is maintained in the soil for field assessment of inbred chickpea lines. Principal Plant Pathologist Dr Kevin Moore also demonstrated their plant scoring techniques, adapting them to glasshouse-screened *Medicago* accessions sent from WA for field assessment. Nola assisted in field scoring trials of chickpea and *Medicago* planted in the nursery and obtained samples for DNA extraction back at Murdoch University. The exchange of field and laboratory knowledge about the pathogen



*Nola D'Souza with Ted Knights and Steve Thomas, both of DPI NSW, scoring chickpea and Medicago plants in the Phytophthora nursery at the Tamworth Agricultural Institute NSW.*

*Picture by Kevin Moore*

assisted in the understanding towards combating the effects of *Phytophthora* root rot on chickpea.

Nola is funded by the GRDC and was sponsored for the trip by her supervisors,

Professor Richard Oliver (ACNFP – Murdoch University) and Adj. Prof. Karam Singh (CSIRO Plant Industry).

*Note: See also "Wild relatives hold the key to resistance" article earlier in this newsletter*

## MEETINGS DIARY

*2005 Agribusiness Crop Updates, Sheraton Hotel, Perth, Western Australia.*

**February 16th – 17th , 2005**

[http://www.agric.wa.gov.au/pls/portal30/docs/FOLDER/IKMP/FCP/CU06\\_EXPRESSIONS\\_INTEREST\\_SHEA\\_1NOV05.HTM](http://www.agric.wa.gov.au/pls/portal30/docs/FOLDER/IKMP/FCP/CU06_EXPRESSIONS_INTEREST_SHEA_1NOV05.HTM)

*3rd International Conference on Legume Genomics and Genetics, Brisbane, Australia*

**April 9th – 13th , 2006**

<http://www.iclgg3.org/>

*13th Australasian Plant Breeding Conference, Christchurch, New Zealand.*

**April 18th-21st , 2006**

<http://www.apbc.org.nz>

*1st International Ascochyta Workshop on Grain Legumes, Le Tronchet, France.*

**July 3rd- 6th, 2006**

[http://www.grainlegumes.com/default.asp?id\\_biblio=350](http://www.grainlegumes.com/default.asp?id_biblio=350)

*Faba Bean 2006: International workshop on faba bean breeding and agronomy, Córdoba, Spain.*

**September 25-27th, 2006**

[anam.torres.romero@juntadeandalucia.es](mailto:anam.torres.romero@juntadeandalucia.es)

*VIIIth Australasian Plant Virology Workshop, Rottnest Island, Western Australia.*

**November 9th -12th, 2006**

[M.Jones@murdoch.edu.au](mailto:M.Jones@murdoch.edu.au)

## LEGUME GENOMICS AND GENETICS MEETING

<http://www.iclgg3.org/>

by Prof. Richard Oliver



3RD INTERNATIONAL CONFERENCE ON  
**Legume Genomics and Genetics**  
9-13 APRIL 2006

G E N E S T O C R O P S

The Third International Conference on Legume Genomics and Genetics is fast approaching. It will be held in Brisbane 9-13th April 2006 and the early bird registration deadline is 6th February 2006. This is one of the most important conferences in the international plant

molecular biology calendar. Its theme is "Genes to Crops" and this encapsulates the concept of the complementary aims of presenting both the latest research in legume genetics as well as the application to crop breeding, crop protection and agronomy. A particular feature will

be a session highlighting the needs of breeders.

The event is expected to attract over 350 delegates and will offer a combination of a stimulating plenary program featuring the world's leaders in genomics research, a diverse poster program, and enjoyable social activities!

The Conference will be held at the Brisbane Convention & Exhibition Centre, a modern and centrally located venue supported by a team of professionals committed to service excellence. Delegates may also wish to take advantage of South East Queensland's wonderful climate and position and visit local attractions pre- or post- conference.

## IMPROVING THE LEGUME DIET FOR REINDEER?

by Adj. Prof. Neil Turner



Adjunct Professor Neil Turner spent a week during November at Levi in the Arctic Circle of Finland (Lapland). No! He wasn't looking for improved legumes species for reindeer (which eat lichens gathered from trees and the ground below the snow) or improved cold tolerant chickpea, but was at a meeting of the CarboEurope Integrated Project on which he is an Advisory Board member.

CarboEurope IP is the largest project funded by the European Commission with 67 institutions involved in measuring the carbon flux of Europe. This is achieved with over a hundred flux towers measuring

the fluxes at ground level, five 300 m towers measuring the fluxes above the boundary layer and aeroplanes sampling the air at various levels above Europe at least twice weekly. Results are used by researchers and in policy making.

The annual meeting of the 150 people involved in the measurements was this year held at the most northerly site of measurement in Finland. In addition to reporting results and planning measurements for 2006, participants went out in sub zero temperatures (it never reached zero for the whole time within the Arctic Circle) to see the snow covered

sites of measurement above a fen and a forest and to visit the most northerly site where trace gases and weather conditions are collected year round for the World Meteorological Office. It was impressive to see the sophisticated equipment collecting data every 30 seconds when the outside temperature was -7\_C (and which falls to -35\_C in the middle of winter) and everything was covered by snow and ice. Lunch was in the snow by a frozen lake sitting on reindeer skins around a roaring fire. The meal was of course reindeer! And no Neil didn't see the Aurora Borealis (Northern Lights - others saw them fleetingly) or Santa Claus.

## CLIMA VISITORS AUGUST - DECEMBER 2005

Name	Dates	Institution	Main Purpose of Visit	WA Contacts
Dr Ashwani Kumar Basandrai	August 26 - December 18	CSK Himachal Pradesh Agricultural University, India	The Crawford Fund Fellowship. Epidemiology and integrated management of BGM in chickpea.	Prof. Kadambot Siddique and Mr Bill MacLeod, UWA / DAWA
Ms Nadia Bazihizina	August - October	University of Florence, Italy	Post graduate experience in pasture systems research.	Mr Richard Snowball, DAWA
Ms Francesca Natalia	October - December	University of Florence, Italy	Post graduate experience in pasture systems research.	Mr Richard Snowball, DAWA
Dr Ivan Takunov	October 1-9	All Russian Lupin Research Institute Russia	Update on collaborative Research arrangement.	Dr Mark Sweetingham, Prof. Clive Francis, DAWA / UWA
Ms Nadia Misnikova	October 1-9	All Russian Lupin Research Institute	Documentation officer and interpreter.	Dr Mark Sweetingham, Prof. Clive Francis, DAWA / UWA
Dr Bassam Bayaa	October 6-10	ICARDA, Syria	Discuss ACIAR project "Plant health management for faba bean, chickpea and lentil"	
Mr Ali Shehadeh	October 10	Assistant Curator of the ICARDA pasture legume genebank.	Strengthen connections with pasture researchers, discuss possible joint projects, inform pasture researchers of germplasm developments at ICARDA.	Mr Richard Snowball, DAWA
Ms Patrizia Guantini	October 10 - December 23	University of Florence, Italy	University Graduation Thesis, Agricultural Science undergraduate.	Dr Jon Clements, UWA
Dr TianXiu Qian	November	Academy of Medical Sciences, Beijing	Working with Dr ShaoFang Wang at the Chemistry Centre WA on identification of bioactive compounds with anticancer activity from medicinal plants.	Dr ShaoFang Wang, CCWA
Mr Simon Johnson	November 24	Regional Director, Western Australia Trade Office, Mumbai, India	To discuss the current and future collaboration between CLIMA-UWA and Indian agricultural research, development and educational institutions.	Prof. Kadambot Siddique, UWA

## WEDDING BELLES!

CLIMA associate Dr Nancy Longnecker finally tied the knot with longtime partner Raimo Kuparinen on Saturday 26th November (left). In a friendly and informal ceremony at South Beach, 70 guests including Nancy's mom Joan from the US, sister Dot who lives locally and the happy couple's daughter Emma looked on, whilst CLIMA newsletter's graphic designer Paul Ricketts snapped away.



It was a popular date as a number of CLIMA staff were at Kings Park attending the wedding of CLIMA researcher Dr Julia Wilson and her fiancée Steve Easton. Julia has had a big year, having also been recently awarded her PhD.



Congratulations to all of you!

## BABY NEWS

Congratulations to CLIMA staff member Fucheng Shan and wife Huixin Liang on the birth of Jason Yuming Shan. A brother for Yuting and Jackie, he was born 18th October and weighed 3.1kg.



## PENNY MOVES ON



After 11 years at UWA, and having been actively involved with CLIMA throughout that time, Dr Penny Smith will be moving on in the New Year to take up a new position

as Senior Research Fellow in the School of Biological Sciences at the University of Sydney. She will be working with Professor David Day (previously of UWA) the Dean of Science at University of Sydney. Penny will also be associated with the Sydney node of The ARC Centre of Excellence in Plant Energy Biology (based at UWA) but will continue her work on microRNAs through her new ARC grant and her work on lupin seed development/ composition through her grant on lupin allergens from the Grain Foods CRC.

Penny will be sadly missed, having been a great supporter of CLIMA research and leading CLIMA's sub-program GL4 "Grain quality, utilization and product development". So, it's great news that she will continue to work with Simone Chapple (CLIMA/UWA) on plant transformation projects and hopes to be associated with other molecular projects being developed by CLIMA. We wish her all the best in her new position.

## NEWSLETTER CREDITS

### Volume 6, Number 3 December 2005

#### EDITOR

Dr Debbie Thackray [djthack@clima.uwa.edu.au](mailto:djthack@clima.uwa.edu.au)

#### Contributing authors:

Mr Brendon Cant	<a href="mailto:brendon@iinet.net.au">brendon@iinet.net.au</a>
Mr Rory Coffey	<a href="mailto:coffey@alosca.com.au">coffey@alosca.com.au</a>
Dr Janine Croser	<a href="mailto:jcroser@clima.uwa.edu.au">jcroser@clima.uwa.edu.au</a>
Ms Nola D'Souza	<a href="mailto:NDsouza@murdoch.edu.au">NDsouza@murdoch.edu.au</a>
Dr David Lockett	<a href="mailto:david.lockett@dpi.nsw.gov.au">david.lockett@dpi.nsw.gov.au</a>
Ms Kerry Regan	<a href="mailto:kregan@agric.wa.gov.au">kregan@agric.wa.gov.au</a>
Dr Hayley Norman	<a href="mailto:Hayley.Norman@csiro.au">Hayley.Norman@csiro.au</a>
Prof. Richard Oliver	<a href="mailto:R.Oliver@murdoch.edu.au">R.Oliver@murdoch.edu.au</a>
Dr Clinton Revell	<a href="mailto:crevell@agric.wa.gov.au">crevell@agric.wa.gov.au</a>
Mr Mark Seymour	<a href="mailto:mseymour@agric.wa.gov.au">mseymour@agric.wa.gov.au</a>
Dr Fucheng Shan	<a href="mailto:sfc@cyllene.uwa.edu.au">sfc@cyllene.uwa.edu.au</a>
Prof. Kadambot Siddique	<a href="mailto:ksiddiqu@fnas.uwa.edu.au">ksiddiqu@fnas.uwa.edu.au</a>
Dr Debbie Thackray	<a href="mailto:djthack@clima.uwa.edu.au">djthack@clima.uwa.edu.au</a>
Adj. Prof. Neil Turner	<a href="mailto:neil.turner@csiro.au">neil.turner@csiro.au</a>

CLIMA M080  
Faculty of Natural and Agricultural Sciences  
The University of Western Australia  
35 Stirling Highway  
CRAWLEY WA 6009  
Email: [clima@cyllene.uwa.edu.au](mailto:clima@cyllene.uwa.edu.au)  
Website: [www.clima.uwa.edu.au](http://www.clima.uwa.edu.au)

#### LAYOUT

Paul Ricketts  
DUIT Multimedia  
[duit@cyllene.uwa.edu.au](mailto:duit@cyllene.uwa.edu.au)

© CLIMA 2005

#### DISCLAIMER

While every effort has been made to ensure the accuracy of the information in this newsletter, the Centre for Legumes in Mediterranean Agriculture (CLIMA) cannot accept any responsibility for the consequences of the use of this information. The Newsletter provides you with a brief explanation of research and other activities in progress and is a guide only.