Two new highly productive, dual purpose fodder legumes will be commercially released in 2006. 139465NM purple clover is a long-season annual, while HRN83-A sulla is a short-lived perennial with a two year life-span. Both are well suited to short-term break crops or phase pastures and can be used for grazing and high quality fodder production. The deep rooting system of both species allows extended periods of spring growth and drying of the soil to a greater depth than most other commonly used annual legumes (reducing the potential for ground water recharge and salinity).

Both the purple clover and sulla have been developed through a RIRDC-funded CLIMA project (UWA65A), established to develop new cultivars of both species and to overcome seed production difficulties previously limiting their commercial use.

HRN83-A sulla, developed by Mr Ron Yates and Mr Kevin Foster (DAFWA), provides a fodder legume option intermediate to regenerating annuals and longer-term lucerne pastures for areas with at least 500 mm annual rainfall. It is a highly erect selection from a Tunisian accession and was the most productive and highest seed producing sulla from over 60 genotypes in both Western Australian and eastern Australian trials. Sulla contains condensed tannins, conferring anti-bloating in sheep and is also thought to assist in the control of internal parasites in lambs but this is yet to be demonstrated under Australian conditions. It sets pods high in the canopy, has high pod retention at maturity and an aerial seeding habit, features enabling direct harvesting with conventional cereal harvesters. Efficient and relatively cost-effective seed dehulling technology for HRN83-A has also been developed.

139465NM purple clover has resistance to the common form of clover scorch, good seed production capacity, ease of harvest and ease of threshing. It is a single plant selection made by Mr Peter Skinner (DAFWA) from CPI 139465, a purple clover collected in 1995 by Prof. Clive Francis (UWA) in Turkey. Its late flowering makes it well suited to high rainfall (>550 mm, long growing season) areas of southern Australia.
FROM THE DIRECTOR

Professor Kadambot Siddique
ksiddiqu@fnas.uwa.edu.au

We are receiving some positive feedback from the industry regarding the 2005 season performances of recently released CLIMA grain and pasture legume varieties. Demand for seed of the new varieties exceeds supply and further seed bulk up will continue in the 2006 season. We are at an advanced stage in the commercial release of two new pasture legume species (Sulla and Purple Clover). Prof. Clive Francis and his team have developed two new varieties of Red Clover (Trifolium pratense cvs Genstar and Genstar Null). Both varieties have high biochanin A isoflavone and these are licensed to Novogen Ltd. Ms Margaret Campbell and Prof. Francis are also at an advanced stage in the commercial development of new varieties of alternative oilseeds (Mustard, Camelina, Golden Linseed and Crambe) during their visit to CLIMA. We have signed a new project agreement with ICRISAT and COGGO to screen ICRISAT’s chickpea core collection for salinity and boron toxicity tolerance (see picture). The “Seeds of Life project 2: East Timor” jointly funded by the Australian Centre for International Agricultural Research (ACIAR) and AusAID is progressing well. I will be visiting East Timor shortly to discuss the crop diversification and germplasm aspects of the project with the Project team. We have had some positive feed back from the Australian Research Council (ARC) regarding two ARC - linkage projects submitted late last year. The results of these project applications will be known in May 2006. In March we submitted a project entitled “Physiological and molecular characterization of faba bean germplasm for adaptation to drought-prone environments of Australia and China” to the Department of Education, Science and Training (DEST) under the China-Australia collaborative Program. The Institute of Crop Science at the Zhejiang University is our Chinese partner in the above project application.

In 2006, we have already published a number of high quality papers and several others are in press (see list of recent publications in this newsletter). I strongly encourage our researchers to publish their research findings in high impact journals. I have had a meeting with Professor Ian Small (Director of the new ARC Centre of Excellence, Plant Energy Biology at UWA) to explore the possibilities of collaboration between his Centre and CLIMA. Professor Ian Small was very positive about this and will be delivering a seminar at CLIMA in September. CLIMA has established collaboration with the newly formed WA Centre of Excellence in Genomics, Medicine and Food. Professor Craig Atkins will lead a project on using Proteomics and Metabolomic tools to characterize grain protein and its components during lupin seed development. This project will work very closely with Adjunct Professor Karam Singh’s group (CSIRO) who is also involved in the Centre. It is pleasing to know that two of our PhD students (Renuka Shrestha and Oonagh Byrne) received their PhD at a recent graduation ceremony at UWA. This year we have already had several national and international visitors to CLIMA and many more are expected soon. It is important that these visitors meet our researchers and we also encourage the visitors to deliver seminars during their visit to CLIMA.

continued from page 1

Peter Skinner lost in a purple clover bulk-up!

and it has also performed exceptionally well in northern New South Wales. Its high quality (76% digestibility in early September) and productivity, particularly late in the growing season, makes it well suited to high quality fodder production (silage or hay) systems. It is also well suited to phase farming systems, short term leys or as a green manure crop in crop rotations.

Expressions of interest to produce and market seed of both cultivars will be sought in April, 2006. Approximately 40 kg of pre-basic seed is available of HRN83-A sulla, while 190 kg is available of 139465NM purple clover. 139465NM purple clover will be released as a public cultivar, but a trademark will be sought on the cultivar name. PBR protection will be sought for HRN83-A sulla. For further information, contact Dr Phil Nichols (08 9368 3547) or Dr Clinton Revell (08 9368 3596).
FEATURE ARTICLES

EASTERN GRAINBELT FARMERS VISIT CLIMA

by Mr Brendon Cant

WA’s eastern grainbelt farmers have a wish list, but understand there are no silver bullets wrapped up in the one pulse crop or pasture legume. According to agronomist Travis Hollins, who recently led a visit to CLIMA by 20 farmers from Beacon and Wialki, the most pressing wishes are for cold and disease tolerant chickpeas and lupins suited to local soil types and environments.

“Lupins have averaged only 600kg to 800kg in the last 10 years. The superior anthracnose resistance in the new Albus variety Andromeda is not necessary in our low rainfall district and its yields can’t outdo the anthracnose susceptible Kiev mutant, due to its late maturity.

“We're becoming more confident with desi chickpeas on some of our heavier soils, especially with the new varieties Sonali, Rupali and Genesis all looking promising,” Mr Hollins said.

During the visit, growers met with several researchers, who demonstrated some of their work in the glasshouses. One of them, Dr Ping Si, is trying to reduce the negative effects of some herbicides on pulses in her GRDC funded project in collaboration with the National Pulse Program, the WA Department of Agriculture and Food (DAFWA) and the WA Herbicide Resistance Initiative (WAHRI) at UWA.

“While chickpea and narrow-leaved lupin are priorities in the new GRDC funded project, field peas, lentils and faba beans will also be screened for herbicide tolerance,” Dr Si said.

This project follows previous GRDC supported research to induce and identify lupin mutants highly tolerant to metribuzin in the anthracnose resistant variety Tanjil. The grower group also heard how Pearl, or mutabilis lupins, could in the near future boost WA’s lupin industry, which is the world’s largest. Dr Jon Clements said that because of Pearl lupin’s high protein (43 per cent) and oil (18 per cent), increasing interest in lupin protein isolates and higher protein feed markets, they may have a role to play.

“Currently, with GRDC funding, we’ve bred low alkaloid, early flowering genotypes with reasonable agronomic attributes and we expect a first cultivar release by late 2008.” With low overnight eastern wheatbelt temperatures in spring interfering with early pod set in chickpea and reducing yield by up to 15 per cent, Dr Heather Clarke said that while important to avoid cool conditions at flowering, delaying sowing pushed pod fill into October, when terminal drought conditions led to poor and unstable yields.

“Effectively, this double jeopardy prompted GRDC funded research at CLIMA to develop more robust varieties that flower earlier and set pods while moisture is abundant,” she explained to the farmers. The outcome was the release of desi chickpea varieties Sonali and Rupali, which set pods up to two weeks earlier.

Working with wild germplasm from the Middle East, which has resistance to ascochyta blight and budworm, and tolerance to cold and drought, Dr Clarke is crossing chickpea and its distant relatives using the latest biotechnology techniques.

“When breeders want to cross two species that are genetically wide apart it can be difficult,” she said. Collaborating with Canadian and Indian researchers, with GRDC support, we’re rescuing the hybrid embryos before they are aborted, like ‘test tube babies’, by growing them in the laboratory until they are able to return to the glasshouse. Resulting progeny can then be used in conventional breeding programs.” The farmers concluded their tour with a visit to the CLIMA Genetic Transformation Laboratory where they heard about methods developed by CLIMA for genetically modifying a range of grain legumes, including narrow-leaved lupin, chickpea, lentil and faba bean. Dr Susan Barker described some of the work being done by PhD student Mr Teguh Wijayanto on transforming narrow-leaved lupin to provide resistance to a range of fungal pathogens.
In spite of depressed prices and negative sentiments from some in the Agribusiness world, growers are maintaining their grain legume crop areas in 2006.

Alan Meldrum from Pulse Australia has heard this from the many growers who attended the recent round of GrainPool Update meetings. “I expected there to be an indication of a general decline in planting intentions, but the opposite happened. Growers recognize the lack of profitability at current prices, but realise the consequences of reducing grain legumes in their rotations.”

Growers from Yuna to Broomehill, and Koorda to Lake King said they would be maintaining their lupin and field pea areas. The current level of stored subsoil moisture combined with the rotational benefits of legumes was the basis for this confidence. Increasing cereal areas at the expense of legumes is risky due to the increased costs of Nitrogen fertilisers and higher incidences of cereal root and foliar diseases, particularly rust. These risks increase for 2007 if there is less land planted to grain legumes in 2006.

Field pea areas will increase, driven by the success of Kaspa last year, while lupin areas will be dependent on the break of the season. “Good early rain will see lupin areas remain substantially the same as in 2005”.

Chickpeas will be of particular interest as growers try the new desi and kabuli varieties. Both Sonali and Genesis 836 are readily available if you’re a Desi grower, while Almaz and Nafice supplies are good for the Kabuli growers.

Grain legumes are the cornerstones of our broadacre cropping rotations. With seasonal prospects underpinned by the extensive summer rain, growers should be able to plant grain legumes with confidence in 2006.

Congratulations to Dr Oonagh Byrne who received her PhD from the University of Western Australia at the autumn graduation ceremony on 29th March 2006. Oonagh, a long-term CLIMA researcher until recently, was supervised by Dr Penny Smith (ex. UWA), Dr Guijun Yan (UWA) and Dr Darryl Hardie (DAFWA). Her thesis was entitled “Incorporation of pea weevil resistance from wild pea (Pisum fulvum) into cultivated field pea (Pisum sativum)”, and she was funded by the Grains Research and Development Corporation. Oonagh is proud Mum to eight month old Sinéad, and is writing research papers in her spare time. She hopes to return to full-time research in the near future.

Congratulations also to Dr Renuka Shrestha who received her PhD in absentia from the University of Western Australia in March 2006. Renuka was supervised by Professor Kadambot Siddique, Adjunct Professor Neil Turner and Associate Professor David Turner and her thesis title was “Adaptation of lentil (Lens culinaris Medikus) to rainfed environment – response to water deficits”. Renuka’s PhD study was supported by the Australian Centre for International Agricultural Research (ACIAR) through a John Allwright Fellowship. Renuka has also published several scientific and conference papers from her thesis. She is currently working as a Research Agronomist with the Nepal Agricultural Research Council (NARC) based at Kathmandu.
ENCOURAGING FUTURE SCIENTISTS

by Dr Fucheng Shan

The great ancient Chinese philosopher Confucius said: “Tell me and I will forget. Show me and I will know. Let me do it and I will understand”.

To encourage high-quality students into University education scientific studies by helping young Australian generations to understand science, GRDC established an Industry Placement Scholarship Initiative in WA 3 years ago (started initially in Tasmania 3-5 years ago). As part of this project, CLIMA researchers Dr Fucheng Shan, Dr Julia Wilson and Ms Junhong Ma, recently accommodated a year 12 student Ms Ritu Garg, from Mt Lawley Senior High School, for a one-week short placement on the Introduction to Molecular Genetics.

The researchers organised a tight schedule to familiarise Ritu with the UWA academic study environment. It included a tour of research facilities and a brief introduction to theories on molecular markers, genetics, legume crossing and their application in practical breeding. The hands-on experience was the focus of this placement and Ritu learned that any research involving plants has a large manual labour component! She successfully extracted quality DNA from chickpeas and lupins and generated RAPD markers. She was also exposed to data analysis. To apply genetic theory to practical plant breeding, she experienced hands-on interspecific hybridisation between chickpea and its wild relatives. She also rescued these hybrids in the laboratory using innovative tissue culture techniques.

Ritu impressed the researchers with her positive attitude towards science, great curiosity, and solid results obtained during such a short time. The practical approach and theory behind Australian agricultural research and development has attracted her interest. “The DNA extraction and generation of molecular markers are so interesting that they deepened my interest in genetics,” Ritu said. We hope that Ritu will return to UWA to undertake her undergraduate studies in Agricultural Science.

Further information on the Scholarships can be obtained from Project Officer Mr Colin Hawke chawke@fnas.uwa.edu.au.

AWARD TO JOHN SLATTER

by Mr Alan Meldrum

Well known Pulse Australia extension agronomist Mr John Slatter was recently awarded the GRDC Seed of Light for his work in the pulse field in Northern NSW and Queensland.

Held in Goondiwindi, the GRDC Grains Research Update was the opportunity for John to receive the award at the conference dinner.

John’s enthusiasm and tireless work to prove the worth of Pulses in the Northern region has resulted in Chickpeas becoming a very profitable part of the winter cropping rotation. He has also contributed substantially to the Mungbean industry in the summer cropping regions of north eastern Australia.

John has always taken a keen interest in pulse developments in WA and up until recently had responsibility for the direction of Pulse Australia’s activities in the state.

Humbled and surprised by the award, John thanked his colleagues and friends throughout Australia for their support in the promotion of pulses for farm profitability.
ACIAR BGM CHICKPEA PROJECT REVIEWED IN AUSTRALIA AND BANGLADESH

by Prof. Kadambot Siddique and Mr Bill MacLeod

The ACIAR project on Integrated Management of Botrytis Grey Mould (BGM) in Chickpea was recently reviewed in Australia and Bangladesh. This is a joint project between CLIMA, Bangladesh Agricultural Research Institute (BARI), the International Crops Research Institute for the Semi-Arid Tropics (ICRISAT), India, NSW DPI, Victorian DPI, University of Melbourne and the Department of Agricultural Extension Bangladesh. The project is funded by the Australian Centre for International Agricultural Research (ACIAR).

The overall objective of the project is to enable farmers, particularly those in Bangladesh and Australia, to better manage outbreaks of BGM in order to increase the yield of chickpea and stability of that yield over seasons. The specific objectives of the project are to:

1. Assemble and screen a wide range of chickpea germplasm against BGM, under field conditions at sites in Bangladesh and Nepal, where there is reliable disease pressure, and to subsequently confirm that this resistance is transferable by screening promising lines under Australian conditions.
2. Produce and distribute seed of less BGM susceptible chickpea germplasm to farmers in Bangladesh.
3. Fine-tune and demonstrate (on-farm) integrated disease management packages in Bangladesh and Australia.
4. Train Bangladeshi scientists in recently evolved on-farm research and development techniques, foliar disease resistance screening and breeding. Also, to provide training in integrated crop management for chickpea to extension workers and farmers in Bangladesh.

The project which will have been operating for 3 years in June 2006 was recently reviewed in Melbourne and in Bangladesh. The external reviewers of the project were Dr Barbra Howlett (Melbourne University) and Professor IPS Ahlawat (Indian Agricultural Research Institute, New Delhi). From CLIMA, Professor Kadambot Siddique (overall leader of the project) and Mr Bill MacLeod (Project officer) participated in the review.

The project has so far achieved excellent outcomes, particularly in:

- identifying chickpea germplasm (> 10) with superior resistance to BGM,
- improved integrated crop management packages in Bangladesh (15 to 50% greater yield than the farmer practices), and
- improving the skills and expertise of Bangladeshi farmers, extension workers and scientists in integrated crop management and disease resistance breeding strategies.

We believe that the review went extremely well, with some positive feedback already received from the reviewers on the professional way in which the project was presented (written, oral and field sites).

We are seeking an extension of the project for another 3 year term and are expecting the recommendations of the review team to be presented to ACIAR soon.

NEW FACES

Ms Helen Bowers joined CLIMA in March as a Research Assistant working on the GRDC funded project ‘An international collaboration to develop a protocol for interspecific hybridisation in chickpea’, with Dr Heather Clarke and Prof. Kadambot Siddique. Her knowledge and skills in seed development and in vitro plant culture will be invaluable to the project.

Helen has a Bachelor of Environmental Science from Curtin University of Technology and did her honours project at Kings Park and Botanic Gardens on ‘Dormancy alleviation and germination of Hibbertia species for land restoration’. Her research interests are in plant physiology and genetics, with a strong focus on sustainability and rehabilitation of land in Western Australia.

Helen replaces Dr Julia Wilson on the chickpea project, while Julia transfers her interspecific skills to lupin hybridisation at CLIMA. Assisting Helen in the glasshouse a few mornings per week is Ms Chelsea Fleming. Chelsea is an undergraduate student at UWA who likes to start her mornings with an hour or two of chickpea crosses before class! Welcome Helen and Chelsea, to the team at CLIMA.
Phytoplasma are phloem-limited pathogens associated with many damaging plant diseases. One of the phytoplasma species most commonly found in Australia is ‘Candidatus Phytoplasma australiense’. In Australasia, it is associated with diseases of cabbage tree (Cordyline australis), common bean (Phaseolus vulgaris), papaya (Carica papaya), pumpkin (Cucurbita maxima), strawberry (Fragaria x ananassa), grapevine, Citrus paradisi and chickepa (Cicer arietinum).

In September 2004, symptoms of diminished leaf size, pallor, rugosity, leaf deformation, shoot proliferation and severe stunting were observed in plants of red clover (Trifolium pratense) within plots containing otherwise vigorously growing plants. These plots were at DAFWA’s Medina Research Station just south of Perth, and belonged to a project selecting perennial pasture species suited to south-west Australian conditions. Symptomatic plants were dug out, potted, kept in insect-proofed glasshouses at ~20°C, and used as tissue sources for serological and PCR tests.

Symptomatic red clover leaf samples were tested by enzyme-linked immunosorbent assay (ELISA) or tissue blot immunosorbent assay (TBIA) using antibodies to a large number of viruses previously found infecting pasture legumes in the region and also sent to ICARDA for testing. The results were all negative. Also, sap inoculation tests using leaf extracts from symptomatic red clover plants failed to cause any infection in a range of standard plant virus indicator hosts.

The possibility that the symptoms observed in perennial pasture legume species and symptoms of the disease in Red Clover paddy melon at the Medina site might be caused by a phytoplasma rather than a virus was then investigated. When tested using PCR, diseased samples from all species with these symptoms were positive for a phytoplasma resembling ‘Candidatus Phytoplasma australiense’. This association was confirmed for red clover and paddy melon by subsequent nested PCR and sequence analysis. This is the first time that ‘Ca. Phytoplasma australiense’ has been reported infecting these hosts.

The plots with symptomatic plants had been growing for 2 or more years and many plants were still asymptomatic. The disease was, therefore, spreading slowly. The symptoms were severe in affected plants, and so symptomatic plants should be rogued out to diminish infection sources for spread to nearby plants or plots. Further research is needed to identify the insect vector and establish which additional alternative hosts are important as reservoirs of infection other than paddy melon.

CLIMA EXTENSION

CLIMA’s Industry Advisory Group (IAG) met at the recently renamed Western Australian Department of Agriculture and Food (DAFWA), South Perth on 24th March, to review grain and pasture legume industry needs and R&D planning. After the meeting, members took a tour of some of DAFWA’s research facilities where a number of researchers described project work being done there on pasture and grain legumes, supported by DAFWA and a range of funding bodies.

The research areas overviewed during the DAFWA visit were:

- Genetic Resource Centres, with Mr Richard Snowball (legume pastures) and Dr Bevan Buirchell (lupins)
- Breeding and selection of annual pasture legumes, with Mr Brad Nutt
- Breeding and selection of pulses, with Dr Tanveer Khan
- National pulse breeding programs, with Ms Kerry Regan
- Breeding and selection of perennial legumes, with Mr Ron Yates

- Fungal diseases in pulses, with Mr Bill MacLeod
- Viral diseases in pulses, with Adj. Prof. Roger Jones
- Seed processing and industry development, with Dr Clinton Revell and Mr Peter Skinner
- Supporting industry research: the prototype lupin dehulling plant, with Dr Peter White and Mr Leigh Smith
- Supporting lupin breeding with molecular biotechnology, with Dr Hua’an Yang
- Grain legume quality, with Mr Peter Burridge
MEETINGS

13th Agronomy Conference 10-14th September, 2006

The Australian Society of Agronomy invites you to join us in Perth for our 13th conference, “Ground-breaking Stuff”. The theme draws on our foundations in the soil, implies a strong relevance to practical agriculture and, at the same time, smacks of scientific breakthrough and application. It captures the excitement we feel in developing this timely conference.

For all the details please visit the Agronomy Society website www.agronomy.org.au/events/2006

The conference starts Monday and concludes Wednesday evening with a dinner and cruise on the Swan River. We have a range of exciting Field Tours planned for Thursday. There are six plenary sessions, each with invited and volunteer papers and posters and two special features: A Young Researchers and Farmers Forum and the Donald Oration, recognising an eminent contribution from a senior member of our profession.

Further details about the scientific program, plenary sessions and the invited speakers and their topics are on the website.

Abstracts in the six conference themes are invited and should be submitted via the website by 28 April 2006.

Early bird registration is available on the website.

FOCUS 2006 “Pulses in the Feed Industry” 16th – 18th October, 2006

The conference venue is the Corowa RSL Club, 300km north of Melbourne and 53km west of Albury on the banks of the Murray River.

The field day will be on Wednesday 18th at three sites:

Rutherglen Research Centre.
Baker Seed Co. Rutherglen.
Gary Drew’s farm at Brocklesby NSW.

Conference enquiries to:
Trevor Bray,
Pulse Development Officer South East,
Pulse Australia;
e-mail: pulse.trevor@bigpond.com
Phone: 02 6963 6926


The 7th Australasian Plant Virology Workshop will be held on Rottnest Island, Perth, Western Australia.

The Australasian Plant Virology Workshop Series exists so that plant virologists and researchers working on phytoplasma and viroids from Australia and New Zealand have the opportunity to get together on a regular basis. The research areas covered range from basic and molecular to ecological and applied. Researchers from other countries are welcome to attend and contribute.

For an international dimension and research benchmarking, and to bring in the latest ideas in the discipline, some key overseas researchers are invited to participate.

Further information from Prof. Mike Jones, SABC, Murdoch University
e-mail: M.jones@murdoch.edu.au
Phone: (+61) 08 9360 6116/2424

WHAT’S NEW ON CLIMA’S WEBSITE

• Updated 2006 CLIMA seminar program
  www.clima.uwa.edu.au/seminars

• Press releases since the last newsletter
  “Professional body picks a pulse fellow” (December)
  “BGM a blight on chickpeas” (January)
  “Lucrative market sprouts for WA pea growers” (January)
  “Future feed replaces poisonous past” (April)

• Updates to links to Grower Group Alliance events calendars
  www.clima.uwa.edu.au/links

• Meetings Diary – updated for 2006
  www.clima.uwa.edu.au/links
RECENT CLIMA RESEARCH PUBLICATIONS

Since the December 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/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


Review Articles, Books and Book Chapters


Conference Publications


Technical Publications


MEETINGS DIARY

13th Australasian Plant Breeding Conference, Christchurch, New Zealand
April 18th - 21st, 2006 http://www.apbc.org.nz

International workshop on crop and forage production using saline waters in dry areas, University of Birjand, Iran
May 7th - 10th, 2006 http://www.namstct.org/anniranw.htm

International Scientific Conference on Desertification and Drylands Research, Tunis, Tunisia

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

13th Australian Society of Agronomy Conference, Perth, Western Australia
September 10th-14th, 2006 http://www.agronomy.org.au

Faba Bean 2006: International workshop on faba bean breeding and agronomy, Córdoba, Spain
September 25-27th, 2006 anam.torres.romero@juntadeandalucia.es Anna María Torres

FOCUS 2006: “Pulses in the Feed Industry”
October 16th - 18th, 2006 pulse.trevor@bigpond.com Trevor Bray

VIIth Australasian Plant Virology Workshop, Rottnest Island, Western Australia
November 9th -12th, 2006 M.Jones@murdoch.edu.au Mike Jones
VISITORS AND TRAVEL NEWS

VISITOR HELPS IN CHARACTERISING GERMPLASM
by Dr Fucheng Shan

Distinguished scientist Dr Ruairidh Sackville Hamilton visited CLIMA from 22nd February to 1st March. Dr Sackville Hamilton is the Head of the Genetic Resources Centre at the International Rice Resources Institute (IRRI) based in the Philippines. GRDC funded his visit as part of the GRDC funded project “Lupin germplasm characterisation” (UWA 38203000). During this visit Dr Sackville Hamilton helped Dr Fucheng Shan with writing a Maximin computer program (run with the GenStat package) to establish a lupin core collection based on molecular, ecogeographical and phenological data. To characterise the Australian Lupin Collection (more than 2000 wild accessions/land races) we are aiming to select key representatives in a manageable number (core collection) for eventual evaluation for a range of agronomic traits. Dr Sackville Hamilton also met with a number of other WA legume researchers.

Dr Sackville Hamilton presented a CLIMA seminar on “Strategies for allele mining within large collections”, providing valuable information on characterisation and utilisation of large germplasm collections. The potential for future collaborations in the evaluation and management of genetic resources was also discussed.

INDIA: PROJECTS ASSESSED

by Adj. Prof Neil Turner

From 17 to 24 January 2006, Professor Kadambot Siddique and Adjunct Professor Neil Turner from UWA, Dr Tanveer Khan and Mr Alan Harris from DAFWA and Mr Geoff Smith from COGGO visited India.

Prof. Siddique and Mr Smith visited pulse buyers and the WA Trade commissioner in Mumbai while Adj. Prof. Turner met with Dr Vincent Vadez, crop physiologist, at the International Crops Research Institute for Semi Arid Tropics (ICRISAT), to discuss a new project (CLIMA – ICRISAT – COGGO) being conducted at ICRISAT on ‘Improvement of Salinity and Boron Toxicity Tolerance in Chickpea (CGO 4-2005).

Subsequently, Dr Khan, Prof. Siddique, Adj. Prof. Turner, Mr Harris, Dr Pooroan Gaur, Principal chickpea breeder at ICRISAT, Dr Vadez and Mr Smith attended meetings at ICRISAT at which an agreement to conduct the above project was signed by Prof. Siddique, Director of CLIMA, on behalf of the University of Western Australia, Dr Dyno Keatinge, Deputy Director General of ICRISAT, on behalf of ICRISAT, and Mr Smith, CEO of COGGO, on behalf of COGGO.

The meeting also reviewed progress on the new project and on the existing project ‘Accelerated Genetic Improvement of Desi Chickpea: An International Partnership between CLIMA, ICRISAT and COGGO’ (CGO 3-2004), and examined the trials of both projects in the field and glasshouse. Both projects are progressing quickly and satisfactorily, making the visit extremely worthwhile.

TRANSFORMING PHASEOLES

Dr Jesus Arellano has been working at CLIMA on a 6 months fellowship granted by the National Autonomous University of Mexico (UNAM), arriving in February and departing in August. He works on several research projects that use the genetic transformation approach to study nitrogen metabolism in legumes at the Centre of Genomic Sciences at UNAM. These include the genetic transformation of Lotus japonicus cv Gifu, with a genic construction that carries the coding region of the alfa subunit of the enzyme glutamine synthetase (GS) of common bean (Phaseolus vulgaris), under the control of the leghemoglobin promoter of Glycine max (pLbc3Gm). This is to study the behaviour of the enzymes related with the cycle GS/GOGAT when GS is over-expressed in the nodule. He has been working over the last 4 years with indirect regeneration and genetic transformation of P. vulgaris with the aim to develop a repetitive regeneration-transformation method that permits the introduction of foreign genes into common bean via Agrobacterium tumefaciens.

Dr Arellano is at CLIMA to work with the transformation group on genetic transformation of P. vulgaris, by using the successful methods that have been developed at CLIMA for genetic transformation of Lupinus and other pulse crops.
ACCELERATING DESI CHICKPEA IMPROVEMENT

by Dr Tanveer Khan and Mr Alan Harris

Dr Tanveer Khan and Mr Alan Harris visited ICRISAT to record observations of trials conducted under the auspices of the CLIMA – ICRISAT – COGGO accelerated chickpea improvement project (CGO 3-2004). Dr Khan and Mr Harris examined the entire range of genetic material being specially developed for WA and made selections for importation to WA. Mr Harris also learnt a number of skills including disease screening, crossing and “bargaining in local bazaars”! Leaving Mr Harris to do the hard work under hot sun at ICRISAT, Dr Khan headed to cooler climates of Northern India to visit the Punjab Agricultural University (PAU), Ludhiana, where he observed the similarity between the WA grainbelt and the Punjab State in the growing season temperatures. The chickpea breeding objectives have much in common including a need for chilling tolerant and ascochyta resistant varieties. Dr Khan was warmly welcomed and shown a range of experiments including entomological research and chickpea breeding. He also gave a seminar on Pulse Breeding in Western Australia. The potential for collaborative work with PAU and CLIMA on variation of ascochyta blight resistance and chilling tolerance was discussed.

CENTRAL & SOUTHERN INDIA CHICKPEA FARMING TRENDS

by Mr Alan Harris

On the visit to ICRISAT in January 2006, it was noted that chickpea farming in Central and Southern India is going through a rapid shift. With the recent ICRISAT release of two short season kabuli varieties KAK2 and ICCV2, both with medium seed size characteristics and resistance to Fusarium wilt, growers in the Andhra Pradesh region are taking advantage of good kabuli prices and planting these varieties rather than the traditional desi varieties. Kabuli chickpeas are providing farmers with excellent profit opportunities as potential yields of 1 to 1.5 tones/hectare and prices double that of desi varieties are driving the current trend.

In addition to the new kabuli varieties, ICRISAT’s chickpea breeding program is now focusing on large seeded short season kabuli varieties of seed size 55 to 60g per 100 seeds. The increasing area under kabuli production at the expense of the desi varieties could over a period of time see the gap between local production and local demand for desi type increase markedly. This in turn could lead to upward pressure on the desi prices. Increased prices for desi type and an expanding Indian market and new ascochyta resistant chickpeas could be an impetus for a recovering Western Australian chickpea industry to get back up and running to production levels higher than those prior to the arrival of ascochyta blight in 1999.
<table>
<thead>
<tr>
<th>Name</th>
<th>Dates</th>
<th>Institution</th>
<th>Main Purpose of Visit</th>
<th>WA Contacts</th>
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<tbody>
<tr>
<td>Dr Ken Street</td>
<td>December 17-January 5</td>
<td>ICARDA</td>
<td>Discussions on plans for new ACIAR project in Central Asia and Caucasus. Meeting with Gene Bank manager – Georgia.</td>
<td>Prof. Clive Francis, UWA</td>
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<tr>
<td>Prof. Cary Fowler</td>
<td>January 30</td>
<td>Global Plant Diversity Trust, Rome</td>
<td>To explain mechanism of conservation of genetic resources. To meet GRDC Chairman – one of the Trusts major sponsors.</td>
<td>Prof. Clive Francis, UWA</td>
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<tr>
<td>Dr Jesus Arellano</td>
<td>February - August</td>
<td>Centre of Genomic Research, National University of Mexico</td>
<td>Learn the CLIMA legume transformation method. Use this technology to establish a transformation method for Phaseolus vulgaris.</td>
<td>Ms Simone Chapple, Dr Susan Barker &amp; Prof. Craig Atkins, UWA</td>
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<tr>
<td>Dr Nasser Hosseni</td>
<td>March - September</td>
<td>College of Agriculture, Karaj, Iran</td>
<td>Sabbatical leave: To study abiotic stress in chickpea.</td>
<td>Prof. Kadambot Siddique Dr Jairo Palta and Dr Jens Berger</td>
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<tr>
<td>Assoc. Prof. Marianne Sarrantonio</td>
<td>February 10 - 20</td>
<td>University of Maine, USA</td>
<td>Meet soil scientists and systems researchers; Present CLIMA Seminar:</td>
<td>Dr Debbie Thackray, UWA</td>
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<td>Dr Ruaraidh Sackville Hamilton</td>
<td>February 23 – March 1</td>
<td>International Rice Resource Institute (IRRI), The Philippines</td>
<td>Exchange ideas on germplasm characterisation and utilization; assistance with use of software Maximin to establish a Lupin core collection; discuss potential collaboration.</td>
<td>Dr Fucheng Shan, UWA</td>
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<td>Dr Bob Redden</td>
<td>March 2</td>
<td>Australian Tropical Food Crop Centre</td>
<td>To update CLIMA Researchers on Vavilov Institute and Central Asia Republic meetings.</td>
<td>Prof. Clive Francis, UWA</td>
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<tr>
<td>Dr Maqbool Ahmad</td>
<td>March 30-31</td>
<td>SARDI, Adelaide, SA</td>
<td>To discuss pulse genetic enhancement matters with interested parties at CLIMA, DAFWA and Murdoch</td>
<td>Dr Tanveer Khan, DAFWA</td>
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<tr>
<td>Ms Gulnaz Asia</td>
<td>May-November</td>
<td>Nuclear Institute for Agriculture and Biology, Faisalabad, Pakistan</td>
<td>International Atomic Energy Agency (IAEA) supported trainee on “Waterlogging and salinity tolerance in grain legumes”.</td>
<td>Prof. Kadambot Siddique and Dr Tim Colmer, UWA</td>
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<td>Dr Ram Singh</td>
<td>April 2 - 9</td>
<td>Department of Crop Science, University of Illinois, USA.</td>
<td>Interspecific crossing projects – lupin and chickpea.</td>
<td>Dr Jon Clements, UWA</td>
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<tr>
<td>Dr Daina Simmonds</td>
<td>April 4-7</td>
<td>Agriculture and Agrifood, Canada</td>
<td>Discuss transformation technology and present CLIMA seminar.</td>
<td>Prof. Craig Atkins, UWA</td>
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</table>
A CLIMA travel grant assisted CLIMA’s pasture legume sub-program PL1 leader Mr Richard Snowball (DAFWA) to attend an International Workshop on Fodder Fabaceae and their Symbionts held in Algiers between 19th and 22nd February, 2006. Although most of the presentations were in French, the meeting wasn’t too daunting as the organisers had provided a personal interpreter and also some of the presentations used English text. Participants came mostly from Algeria, Tunisia and France and there were guest speakers also from Portugal, Spain, Belgium, Sardinia and Syria. The three days of formal presentations were followed by a one day visit to the field.

Dr Aissa Abdelguerfi and his wife Meriem and several of their students managed the Workshop extremely well. Richard presented a paper on “Contribution of Mediterranean germplasm to annual pasture legume improvement in Western Australia” and other papers looked at pasture legume diversity, specific research activities in Trifolium, Medicago, Hedysarum and Vicia in the region, Rhizobial research, particularly in relation to genetic diversity, molecular technology and cytogenetics, and the role of pasture legumes in systems. In particular, the presentation of Dr David Crespo from Portugal was extraordinarily informative, entertaining and inspiring to anyone with an interest in how a degraded landscape can be transformed into a highly productive, natural (chemical free) and diverse pasture and grazing system. The presentation from Dr Claudio Porqueddu was also informative particularly in terms of how Western Australian pasture research has contributed to improving pasture systems in Sardinia.

The possibilities for new collaboration between Western Australia and Algeria and Tunisia are now enhanced as a result of participation in this Workshop, as is Richard’s French!