



Pulse Cropping in South West Irrigation Cooperative

■ by Dr Peter White and Dr Jon Clements Department of Agriculture, CLIMA

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Deregulation of the dairy industry in 2000 provided the impetus for research into a range of alternative farming options for the South West Irrigation Area (SWIA). Production of high value pulse crops is one option that may allow farmers to diversify income out of dairying. The South West Irrigation Cooperative therefore approached the Department of Agriculture, WA to investigate pulse cropping options for the SWIA.

Preliminary research began in 2000 with faba bean, field pea, chickpea, lupini bean and niger to determine the relative potential of these species as spring-sown crops grown with irrigation. Research was undertaken in the area on Mr Tom Busher's farm in small plots on raised or flat beds and on Mr Rob Drennan's farm in a large bulk area on raised beds. The research was conducted by Dr Peter White, Mr Mike Baker and Prof Kadambot Siddique with the help of the South West Irrigation Cooperative.

The experiments had varying degrees of success and identified several important components of the production process that appear to be critical to the success of pulse cropping in this system. These were: soil preparation, weed control, water quality (salinity), watering procedures and root diseases. In addition, there appeared to be significant differences between species in their suitability for cropping in the area. Faba bean and field pea appeared better adapted to the heavy soils and less affected by over watering than chickpea. In contrast, chickpea was better adapted to the warm summer temperatures.

After the experience of 2000, a revised and simplified research program was



Mike Baker, Department of Agriculture in a plot of soybeans at the Harvey Agricultural College Research Station

undertaken in 2001. The same species were tested as in 2000 with the addition of several summer pulses from the program of Dr Jon Clements at CLIMA. The main purpose of these trials was to determine which species were best suited to the environment of the area and to establish a workable production system.

The trial has attracted much interest from passers-by. Chickpea again has shown that it has excellent potential in the area but research is still needed to determine planting times and watering regimes. Mung bean and soybean also demonstrated considerable potential with both showing excellent vegetative growth. Mung bean flowered early and had excellent pod set and seed development. The variety of soybean had large biomass but had later flowering. Soybean types with the right photoperiod and flowering response are available and fine-tuning the flowering time will be possible by trying a range of different cultivars. Species that also have potential are common bean and pigeon pea. Faba bean and field pea appear unsuited to the region unless planting times can be brought forward considerably.

\$1000 CLIMA Travel Awards

Two \$1000 awards are available for use as travel money this year by CLIMA postgraduate students and staff. Preference will be given to postgraduate students or early-career staff who propose to travel to a conference to present research results and/ or visit laboratories which will enhance their research.

Application:

Please submit a one page summary of your travel plans, addressing the selection criteria. Include information about any other support available for the travel and list any travel funding you have received in the last three years.

Selection Criteria:

- Travel will communicate research results to research colleagues
- Travel will increase opportunities for research collaboration
- Travel will enhance career opportunities of recipient

Send your application by 13th May to:

Professor Kadambot Siddique,
Director
CLIMA
UWA
35 Stirling Hwy
Crawley, WA 6009

Announcements

Beginner Statistics using Genstat - one day workshop

Monday 17 June
Agriculture Computer Labs, UWA
Dr Sarita Bennett CRC Plant-Based Management of Dryland Salinity
Limited Spaces
see page 3 for details

Lupins in Iceland

The 10th International Lupin Conference will be held in Iceland 19 - 24 June 2002. You can find further information on the conference homepage:
www.rala.is/lupin

From The Director



CLIMA's Board of management met in November last year and reviewed the six-month progress of

the CLIMA Research Alliance. The Board was pleased with the progress and direction of CLIMA. They also made a number of suggestions for the future directions and these are currently being implemented. The CLIMA partners pledged their continued strong support for the CLIMA Research Alliance.

Last December we submitted 38 full research proposals to GRDC on grain and pasture legumes. The development and submission of such a large number of proposals clearly indicates the strength and collaboration of CLIMA's four core partners (Department of Agriculture WA, The University of Western Australia, CSIRO and Murdoch University). We have also had strong support from the Chemistry Centre of Western Australia and Fisheries WA in developing these projects. In addition to this we have had significant cooperation from various research institutions in the eastern states and international institutions. GRDC has indicated it will support 13 of these proposals and we are currently preparing the Project Specification details on these projects. We also submitted two full proposals to RIRDC for their consideration, both of which were successful. We have received funding approval for a three-year large project between Bangladesh and Australia on Integrated Management of Botrytis Gray Mold in chickpea from the Australian Centre for International Agricultural Research (ACIAR). Agreement between Nepal and Australia on a lentil project supported by ACIAR was recently signed in Kathmandu.

CLIMA played a significant role in developing a proposal (Agrifood Biotechnology for Human Health) jointly with UWA medical researchers at the Royal Perth Hospital as part of the bid for a "Biotechnology Centre of Excellence". The bid involved many

plant biotechnologists and medical researchers from various institutions in Australia. Unfortunately the bid was not successful, but the CLIMA-Medicine researchers at UWA will meet soon to discuss how to proceed with the research ideas. The projects will focus on examining health benefits of antioxidants and flavonols found in legumes.

Late last year Associate Professor John Howieson, CLIMA's Annual Legume Pasture Program Leader resigned in order to refocus his time as the Director of Centre for Rhizobiology based at Murdoch University. However Associate Professor Howieson will continue his involvement in CLIMA activities at a subprogram level. A Pasture Legume Research workshop was held at CLIMA in February. Some 30 people from various institutions currently engaged in Pasture R& D in WA attended the workshop. Many of the recommendations from the workshop have been implemented; outcomes of the workshop are reported in this newsletter.

Professor Clive Francis, Deputy Director of CLIMA has taken up leadership of the Pasture Program. Professor Francis has considerable experience in Pasture research during his career at the Department of Agriculture WA.



Project negotiation meeting between the Indian Council of Agricultural Research, CLIMA and ACIAR. From left to right, Dr M Ali, Director IIPR, Kampur, India; Dr NB Singh, DDG, Crops, ICAR, New Delhi, India; A/Prof N Turner, CSIRO; Prof K Siddique, Director, CLIMA; Dr. Jens Berger, CLIMA; Dr C Pigggin, Coordinator, Crop Science, ACIAR.

In January two senior Executives from the Indian Council of Agricultural

Research (ICAR) visited CLIMA to discuss and develop a work plan for the extension of an ACIAR funded project between India and Australia. Dr Colin, Pigggin, ACIAR also attended the meeting. I am pleased that the meeting was successful and ACIAR extended the project for an additional three-year period.

“submission of such a large number of proposals clearly indicates the strength and collaboration of CLIMA's four core partners”

CLIMA's Industry Advisory Group (IAG) held its inaugural meeting on 20 March at UWA. It is the most important source of CLIMA's industry interaction, advice and feed back. The IAG's independent Chairperson is Mr Trevor Flugge. CLIMA made a deliberate decision to establish a large group (19 members) to draw on the widest possible advice and ensure all parts of the grain and pasture legume industries can be directly represented in the CLIMA structure. The next meeting of the IAG will occur in spring, 2002.

Last year we successfully held 22 seminars at fortnightly intervals coordinated by Dr Heather Clarke. This year's seminar series is organised by Dr Jon Clements and continues to be well attended by staff and students from various organisations. The success of these seminars depends on contributions and participation by scientists from our partner organisations. I encourage all of you to participate in the seminar series.

We have some exciting challenges ahead and I look forward to a productive and rewarding year. Please feel free to contact me if you would like to discuss any aspect of your work or suggestions on the future directions of CLIMA.

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NAPLIP Annual Collaborator Meeting - South Australia

■ by A/Professor Mike Ewing,
CLIMA

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CLIMA and the Department of Agriculture, WA were well represented at the annual Collaborators meeting for the National Annual Pasture Legume Improvement Program (NAPLIP) held at Tanunda in South Australia. The meeting was attended by scientists, growers and funding organisations (including current funders GRDC and AWI Inc. as well as RIRDC, MLA and DRDC that do not currently contribute directly to NAPLIP).

The annual meeting combines a review of past activities, integration of planning for the current year with an opportunity to discuss changes to strategic directions

and issues of policy that impact on NAPLIP and its outcomes.

A major topic of discussion was progress towards the commercial release of cultivars under advanced testing. It was agreed that commercial development of two hard seeded French serradellas (activity leader Brad Nutt) and a *Biserrula pelicinus* flowering later than Casbah (activity leader Angelo Loi) should be advanced for commercial release. It was also agreed that a cultivar of *Trigonella balansa* could advance to full 'duty of care' review, particularly looking at issues of animal performance under the supervision of SARDI.

A major topic of discussion involved the possibility of expanding the funding base

of NAPLIP through increased investment by AWI Inc. Much of that discussion revolved around how extra resources would add greatest value to the performance of NAPLIP. There was broad agreement that the resources could be best invested into:

- Adequately resourcing duty of care investigations to reduce risk of release of cultivars with unwanted traits.
- Expansion of effort in the early stage evaluation of diverse germplasm coming to provide innovative solutions to emerging farming systems problems and opportunities.
- Development of a more comprehensive activity to promote the products of NAPLIP by providing more comprehensive information on where new products fit into the spectrum of available cultivars and to highlight the impact of new cultivars on farm scale profit.

Delegates agreed that the organising committee had produced an extremely well focused and efficient meeting.

Table 1. Papers presented at NAPLIP by visitors.

Topic	Visitor/Presenter
Breeding as an Eligibility Requirement for PBR	- Doug Waterhouse
Potential Animal Health Risks with Melilotus, Gland Clover and Biserrula	- Dean Revell
FEH-1: A Herald Medic selection resistant to Group B herbicides	- John Heap
Demonstrating NAPLIP cultivars to enhance adoption by farmers	- Raid Naji
Reproductive strategies of annual legumes	- Hayley Norman

Staff Move On Up!

■ by Ms Sue Dodimead,
CLIMA

Congratulations to staff employed on CLIMA projects whose efforts have been recognized in the last six months. Ms Simone Chapple who works in the biotechnology lab was reclassified from level 4 to level 5 in December, 2001. In March, Dr. Jon Clements was reclassified from level 5/6 to level 7 and Dr Manisha Shankar from level 7 to Level 8.

More Staff News

Jemima was born on 1 March, 2002 weighing in at 3220 g (7 lb 2 oz) to proud parents **Penny Smith (CLIMA; UWA)** and Mark Adams. By all accounts she's a beautiful baby girl and already a staunch Richmond supporter. Congratulations Penny. We're keen to see some photos!

Beginner Statistics using Genstat

Monday 17 June
Agriculture Computer Labs,
UWA

Dr Sarita Bennett
CRC Plant-Based Management of
Dryland Salinity

This one day workshop will include:
• The use of Genstat for statistical analysis, and setting up your data for use in Genstat.

• Means, standard deviations, standard errors, variances, coefficient of variation, t-tests, analysis of variance

(ANOVA), regression analysis and correlation analysis.

Fees (included are the full day tuition, a course manual and lunch)

- Standard fee - \$175
- Core partner staff - \$145
- CLIMA or CRC Salinity associated staff - \$110
- Student - \$50
- CLIMA or CRC Salinity student - \$40

Limited spaces are available. To reserve yours, contact:

Dr Nancy Longnecker at CLIMA
Nancy.Longnecker@uwa.edu.au

CLIMA's Industry Advisory Group Meets For The First Time

■ by Mr Brendon Cant

Addressing CLIMA's first Industry Advisory Group (IAG) meeting, Trevor Flugge, Chairman of the IAG said, "Customer needs must be surpassed, not just met." He added that the market place ultimately determined what growers can sell and research and development efforts need to recognise this.

"A Research Alliance such as CLIMA, with its obvious scientific and technical expertise, must take a whole of product chain approach to strategy development and respond according to what drives the industry," he said. A Katanning farmer, the former AWB Limited Chairman suggested legumes had to be profitable in their own right, as most farmers would not grow them simply for their well known rotational benefits for following cereal crops.

CLIMA Director, Kadambot Siddique explained that the IAG was the most important source of CLIMA's industry interaction, advice and feedback. "We made a deliberate decision to establish a large advisory group, which comprises 19 members, to ensure we draw on the widest possible advice." Members of the IAG are: Trevor Flugge (Farmer), Dale Baker (GRDC WA Panel), Rob Sewell (Grain Pool WA), John Orr (PGH), Bruce Piper (COGGO), Rory Coffey (Milne Agritechs), Neil Ballard (Ballard Seeds), Chris Gillam (Farmer), Merv McDougall (Pulse Australia), Neil Young (WANTFA), Greg Kirk (AAAC), David McFerran (WAFF), David Thomas (Rabobank Group), Mary Nencke (AWIA), Graeme Robertson (Department of Agriculture), Richard Oliver (Murdoch), Hans Lambers (UWA), Mick Poole (CSIRO) and Kadambot Siddique (CLIMA).

Discussions at the meeting covered a wide spectrum of topics, with all participants making valuable contributions. The IAG will meet twice a year but Trevor pointed out that the

real benefit from the group will be in day to day interactions between industry and research. Members of the group represent different segments of industry and were encouraged to contact Siddique or researchers working on specific projects of interest and give industry feedback at all stages of research, from planning to commercialisation.

For example, Rory Coffey suggested "don't just focus on pulse crops. There are other opportunities. Look at the top end." He suggested that alfalfa (lucerne) is 'king of the castle' for fibre and there is an opportunity to catch a large percentage of a small market, with scope at the front end for development. "Dryland seradella and alfalfa crops can be competitive, bringing \$600- \$650 per tonne," he said.

"CLIMA, with its obvious scientific and technical expertise, must take a whole of product chain approach"

A critical area which was highlighted, was pulse disease, plus duty of care and the potential threats to new pasture species. Neil Ballard pointed out that if something caused Cadiz to crash, it would leave a huge void.

In discussing ways to facilitate private investment, Rob Sewell said "there is a need for a commercial approach." There was broad agreement on the importance of developing a new model for investment into research and development, plus partnerships for commercialisation. The group strongly supported taking this suggestion to the Board and progressing the idea of a new business model.

Notes From The North

■ by Dr Janine Croser, CLIMA

I arrived in Saskatoon on the 19th of February to take up a six-month term as a Postdoctoral Fellow within the Crop Development Centre at the University of Saskatchewan. Being a Canadian winter I knew it would be chilly here, but had not quite been able to imagine what 38°C below 0 felt like. Believe me, it is cold! My outdoor activities have become a series of fast scuttling from building to building. I am even finding myself looking forward to it only being -8°C this weekend! The benefit is that it is beautiful with the snow and you can ice skate outdoors.

I am employed as part of the pulse double haploid research group, led by Dr Monika Lülisdorf. My role is to continue research towards a microspore culture system in chickpea with the aim of developing DH breeding material. Members of the laboratory are also working on a microspore culture system for field pea and on interspecific hybridisation in lentil. It is hoped that the DH research can be extended to a collaborative project between the CDC and CLIMA/ Plant Sciences as of July 2002. To date the research has returned promising results, with a plant returned from microspore culture of field pea cultivar Highlight, and some advanced microspore-derived embryos returned from chickpea. Current research is aimed at optimising the conditions for embryo development and maturation in both chickpea and field pea. I look forward to returning to CLIMA and the sun in late September.



L- R Back Row: Kara Allen, Tim Dament
L-R Front Row: Janine Croser, Monika Lülisdorf, Gordana Radosavljevic

Pulses and Health the Theme in Madrid

■ by Dr Nancy Longnecker, CLIMA

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‘Pulses and Health’ was the theme of an event in Madrid organized by INIA and sponsored by the European Association for Grain Legume Research. Dr Nancy Longnecker from CLIMA attended in order to learn what is happening in Europe and use this knowledge in her work promoting pulses in Australian diets.

Many excellent talks were given, including:

- Dr Martine Champ (INRA, France) and Prof John Mathers (Univ Newcastle, UK) outlined scientific evidence for claims of health benefits of eating pulses.
- Dr Enriqueta Roman told of her experiences as a pediatrician at Hospital Severo Ochoa, Madrid where one of the most frequent complaints of children attending for medical examinations is constipation. In her studies of over 2600 children, those eating

more fruit, vegetables and pulses were much less likely to suffer from constipation.

- Prof Erik Jensen (Royal Veterinary and Agricultural University, Denmark) gave an overview of benefits to the environment of including grain legumes in farming systems.
- Ilmo Sr Francisco Simon Vila, Director General of MAPA, Spain, gave a thought-provoking finale in which he gave tantalizing results from a 15 year survey of over 6000 Spanish households which showed inverse correlations between pulse consumption and size of town, size of household and number of children in the household and a positive correlation between pulse consumption and head of household.

Nancy is working with collaborators Prof Paul Nestel, Baker Medical Institute; Prof Madeleine Ball, Uni Tasmania, Dr Stuart Johnson, Deakin

Uni and Dr Rachel Kelly, Food Science Australia) on a GRDC-funded project looking at the health benefits of eating chickpeas. She said, “We have found that many potential health benefits of eating pulses are cited in the literature. This is not surprising, given that pulses are a rich source of fibre and protein, low in fat, have a low glycaemic index and are high in many mineral nutrients, vitamins and phytochemicals. However there is much less actual scientific evidence for the health benefits of eating pulses compared to soybeans for which American authorities now permit specific health claims to appear on soy product packaging”.

The Australian researchers are addressing the paucity of scientific evidence for pulses by conducting dietary intervention and post-meal studies. In the coming year, Nancy will focus on the promotion of pulses with the public and with medical practitioners. She said that it was encouraging to talk to the European researchers and find that what we are doing here is on the right track.

CLIMA Postgraduates - Where are they now?

■ Dr Hayley Norman

I am working as a Pasture Ecologist with the Livestock Industry team at CSIRO’s Centre for Mediterranean Agricultural Research. The focus of our team is to explore opportunities and limitations to animal production from saline land or from new pastures species developed to reduce water recharge. The team has diverse research interests and includes an animal mineral nutritionist (Dr David Masters) and a



specialist in grazing behavior and feed quality (Dr Robyn Dynes). Fortunately for me they needed someone to identify the plants! Some of the saline pastures that we characterised last year contained more than 20 plant species.

I am especially interested in species diversity and the succession of plants found across a salinity and water-logging gradient. Revegetating saline land for animal production is likely to be complex given the heterogeneous nature of the environment and the dubious feeding quality of many of the plants that may persist. As a team we are presently refining technologies to estimate species selection and intake by sheep with a view to understanding how saline ecosystems can be maintained despite sheep targeting specific plants such as the annual legumes. The project also looks at the value of halophytic shrubs for meat and wool production and meat quality (with PhD student Kelly Pearce).

■ Dr Rongchang Yang

Since completing my PhD in October 1999, I have been employed as a Research Scientist for Grain Biotech Australia, a wheat breeding and biotechnology company based in Perth. I have been involved mainly in a project that has successfully developed transgenic approaches to engineering barley yellow dwarf virus (BYDV) resistance in wheat. My current research focus is on production of therapeutic peptides, including antibodies, in wheat.



Postcard from Export Grains Centre

■ by Dr Jane Gibbs

In early 2001, I relinquished my position in the Education Programme at CLIMA to join the Export Grains Centre Ltd in managing and implementing the development of a new plant breeding company, Canola Breeders Western Australia. The company, comprising the Export Grains Centre Ltd, the Council of Grain Grower Organisations and The University of Western Australia, was incorporated in June 2001, whereupon I took on the role of Project Manager, working with CBWA's Principal Research Scientist, Associate Professor Wallace Cowling and his canola breeding and research team.

Over this period I maintained my formal links with Faculty of Agriculture at UWA in the role of Faculty CATLyst, part of an exciting University-wide initiative involving the promotion of flexible teaching and learning. I have only recently resigned from this position to focus on project and policy

management, moving to combine the role of Project and Policy Manager at EGC with my position as Project Manager with CBWA.

EGC and CBWA have a common theme. They provide a commercially-focused environment which seeks to benefit Western Australian farmers through increased choice of world-class crop varieties. The environment provided by the companies is challenging and rewarding, and is one towards which I would hope to continue to contribute.

In keeping with my dual roles, I have two working locations - one at EGC in South Perth and one within the Faculty of Natural and Agricultural Sciences at UWA, reflecting the close working links between CBWA and UWA.

Chickpea, Pea and Lentil Coordination

■ by Ms Oonagh Byrne

The 2002 Chickpea, Pea and Lentil Coordination Meetings brought together agronomy news, variety evaluation trials and updates on research being conducted in WA, NSW, Victoria, and SA. It included representatives from around Australia, updating areas specific to each state, and a sharing of information between states. The delegation from WA included Mark Sweetingham, Tanveer Khan, Bob French, Kerry Regan, Heather Clarke, Oonagh Byrne, Jens Berger and Neil Turner. The meeting was successful in communicating pea, chickpea and lentil issues for the year 2001-2002 and acted as a good platform for the collaborative efforts between states. Delegates contributed to the meeting through short presentations, handouts and open forum discussion. The coordination meetings were held over four days (18-21st March), followed by the National Pulse Breeding and Quality Programs, in a joint session with GRDC and PA (Pulse Australia), on Friday 22nd March.

Lentil and Mushroom Cottage Pie

Serves 4

Total preparation time 55 minutes

Hands-on: 35 minutes

Hands-free: 20 minutes



1 cup (200g) dried green lentils (or 430g tin)
50g butter
1 large onion, chopped
300g mushrooms, chopped (or 220g tin)
1 cup (200g) grated cheese
150g cottage cheese
2 eggs, beaten
3/4 cup dry breadcrumbs
1 tbsp soy sauce
1 tsp each parsley, sage, rosemary and thyme

TOPPING

4 large potatoes, peeled and chopped
2 tbsp milk
1 tsp mustard powder
25g unsalted butter
Salt and pepper
1/4 cup grated cheddar or Edam cheese
1 tsp sesame seeds

Place lentils in a saucepan and add plenty of water. Bring to the boil; cover and simmer for about 30 minutes or until lentils are just tender. Drain.

Meanwhile, melt butter in frying pan and saute onion until transparent.

Add mushrooms; cook for another 2 minutes.

Add all other ingredients except those for the topping; stir gently over heat until eggs begin to set.

Spread lentil mixture into a large casserole dish.

Boil potatoes until soft. Mash with milk, butter and mustard powder; place on top of lentil mixture in casserole. Sprinkle grated cheese and sesame seeds over top.

Bake 1t 180°C for 20 minutes.

Newsletter Credits

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