

EDUCATION AND TRAINING

Education is a cornerstone of the CRC for Sustainable Rice Production. It is administered as a separate program (Program 5) but it has links to all research programs through its role in administration of postgraduate students and in transfer technology.

The research aspects of the education and training program are reported in this section along with the general aspects of education and training in the Rice CRC.

PROGRAM 5

EDUCATION, SKILLS DEVELOPMENT AND TECHNOLOGY TRANSFER

**Program Leader:
Dr Philip Eberbach
Charles Sturt University
Wagga Wagga**

Expediting the findings of research to achieve grower outcomes is a major focus for the CRC for Sustainable Rice production. Program 5 has as its core business the transfer of knowledge generated by the other programs into practice. To achieve this, the Program:-

- * provides information about new research to the community;
- * provides vocational training to people involved in grain production and processing;
- * facilitates tertiary training at the undergraduate level;
- * finances research training at the honours and postgraduate level; and
- * conducts research into information adoption to improve the realisation of knowledge into practice.

Along with conducting its major avenues of business, over the summer of 2002/2003 Program 5 conducted a summer students program. This program was aimed at year 2-3 undergraduate students and enabled the successful scholars to gain some experience of the rice industry.

5.1 Sustainable rice production through farmer education and community awareness (5101)

**Sub-Program/Project Leader:
Mr Warwick Clampett
NSW Agriculture, Griffith
Mr John Lacy
NSW Agriculture, Yanco**

The aim of this Sub-Program is to raise awareness of Rice CRC objectives and progress with the farming community. This has been facilitated through the network of NSW Agriculture District Agronomists.

The main focus for the agronomist team was the education and training of farmers in the project “Targeting better NIR test sampling through remote sensing”.

Objectives

- * Increase rice yields by improving the accuracy of panicle initiation test sampling, nitrogen topdressing and crop uniformity using aerial imagery.
- * Identify zones of similar biomass to target NIR tissue test sampling to each zone and relate nitrogen topdressing rates to each zone.
- * Educate farmers in the benefits of aerial images and image interpretation.
- * Identify the factors responsible for crop biomass variation.

Progress

Although low irrigation allocations limited rice areas, particularly in the Murray Valley, each district had farmers who volunteered to participate in the project. There was **good collaboration** between the district and retail agronomists. Word of mouth resulted in a higher than planned number of imaged crops. Terrabyte Services from Wagga Wagga were engaged to carry out the aerial imaging.

There were 179 farmer participants, mainly from the Murrumbidgee Valley, who aerial imaged 450 crops with a total area of 14,000 ha.

The protocol for identification of the crop location, taking the images, distribution of the images, education of farmers in the interpretation of the images and tissue test sampling and in targeted nitrogen topdressing was **generally very successful**.

There were minor problems. The images for some crops were too late to be of use while some crops could not be located by the aircraft. Solutions have been found. In future images will be emailed rather than post mailed. Irrigation company maps will be used to locate crops instead of farmer maps.

The project was evaluated at District Agronomist meetings and at a meeting of the steering committee in February 2003. Feedback was excellent. Quotes include:-

- “There was more crop variation than I thought”;
- “I was surprised by cut and fill areas showing up after 20 years”;
- “The aerial images are an excellent tool at PI meetings”; and
- “The variation is often not due to nitrogen”.

In the 2003/2004 season there is expected to be even greater interest in the project.

5.2 Extension and information technology methods

**Sub-Program Leader:
Mr A (Tony) Dunn
Charles Sturt University
Wagga Wagga**

The development of sustainability in Australian rice: implications for agricultural extension (5204)

**Project Leader:
Mr A (Tony) Dunn
Charles Sturt University
Wagga Wagga**

Objectives

To analyse sustainability in terms of conflicting values and interests, and identify potential avenues for agricultural extension to facilitate sustainable rice farming.

Progress

Ethnographic field work continued throughout the year. Data was collected through the participant-observation of interactive extension events and interviews with farmers, researchers and extension agents. This field work phase neared completion while work on the concluding phase, a network analysis to be conducted by survey, was initiated. In addition to field work in the immediate study area, an overseas visit to the Institut National de la Recherche Agronomique (INRA) also yielded data pertinent to the analytical framework of the project, agricultural extension and the sustainability of rice production in multi-functional landscapes. A report of the INRA visit was posted onto the Rice CRC website.

A refereed paper was presented to the Bureau of Rural Science Conference “The Triple Bottom Line” in February 2003 and a further refereed paper detailing the theoretical and methodological cornerstone of the project was accepted for the 1st Australian Farming Systems Conference (September). These papers will be published soon.

5.3 Sustainable rice production through skills development

**Sub-Program Leader:
Mr Geoff Creek
Murrumbidgee College of Agriculture
Yanco**

This Sub-Program operates at two levels. The first aims at developing the skills base for industry participants at all levels. The second is to increase awareness of the rice industry and particularly rice research, through schools and the community.

Sustainable rice production through skills development (5301)

**Project Leader:
Mr Geoff Creek/Mr Andrew Sanderson
Murrumbidgee College of Agriculture
Yanco**

Objectives

To create and provide accredited skills training for the production and processing sectors of the rice industry.

Progress

The Education Officer attached to this project resigned to develop education programs for the irrigation sector.

The opportunity was taken to re-focus this position to completely integrate education for growers and the industry. The position was aligned with the District Agronomists serving the rice industry.

The re-focusing has allowed better development of resources for rice short courses and rice discussion groups. This will assist development of accredited skills-based courses for farmers, agribusiness and the processing sector.

Rice CRC education officer (5302)

**Project Leader:
Mr Geoff Creek/Mrs Robyn Troidahl
Murrumbidgee College of Agriculture
Yanco**

Objectives

The project aims to deliver information to school students, the general community and international visitors on the rice industry, rice research and Rice CRC Programs. Specific objectives are to:-

- * develop specific display materials and presentations;
- * arrange visits;
- * coordinate or participate in presentations for schools, community groups and international visitors.

Progress

There was a decline in the number of groups visiting the Yanco Agricultural Institute (YAI) for an overview of rice research and the involvement of the Rice CRC. Japan was still the main country from which these tour groups came. Delegations of scientists, politicians and farmers from Korea, Malaysia and Chile have visited, often staying for up to a week and with an itinerary which is much more comprehensive in its coverage of the rice growing region.

A small number of secondary school groups visited the YAI, studying rice as part of the Agriculture, Food Technology or Geography syllabus.

There has been a substantial increase in the number of e-mail, post and telephone inquiries requesting specific rice related information.

A number of hands-on promotions on rice biodiversity were made throughout the rice season.

Outcomes

- * “Bidgee BioBuzz” – this annual event is held in the Murrumbidgee Irrigation Area (MIA) to expand school children’s awareness of biodiversity issues. The Rice CRC used the “Crop Critters” program to enlighten the children on the range of invertebrates likely to be found in a rice bay and discuss water quality issues.
- * Henty Field Days – the Rice CRC promoted the rice industry and in particular biodiversity through advertising the “Crop Critters” program.
- * 2003 Rice Field Days – this year at Jerilderie the static display that was purpose built for the 2002 Sydney Royal Easter Show was set up to allow the rice growers to view the display and ask questions. The feedback received was positive.
- * 2003 Royal Easter Show – this year the Rice CRC combined with Ricegrowers’ Association of Australia (RGA) to promote the rice industry. Unlike the 2002 display, the site was a commercial one and also promoted SunRice products.

5.4 Professional development for sustainable rice production (5401)

**Sub-Program/Project Leader:
Dr Philip Eberbach
Charles Sturt University
Wagga Wagga**

The Sub-Program’s principal function is the provision of training at the tertiary level. The Program sponsors two education officers at Charles Sturt University in the areas of rice agronomy and cereal technology. The specific objectives of the Sub-Program are to:-

- * provide undergraduate and postgraduate course material and the experiences necessary to assist in the professional development of students intending to work in the rice production and processing industries;

- * provide postgraduate study opportunities within each of the Rice CRC research programs; and
- * provide training and education opportunities at the postgraduate level to enable the extension and research personnel already employed with the rice industry to further develop their qualifications and experience.

Progress

Since the appointment of the two education officers, course material has been produced to assist in teaching at the tertiary level rice agronomy and the science behind food processing. Both areas are now attracting a reasonable numbers of students, *many of which have expressed interest in gaining further experience in industries relevant to rice production via application to the summer students and honours program.*

In conjunction with developing course material to support student education in rice agronomy, Dr Siva Sivapalan has developed a strong interest in investigating methods to reduce the effect of turbidity on germination of paddy rice through a series of summer student projects. He was awarded a Charles Sturt University Competitive Research Grant in 2003 to support his interest in this area. Dr Chris Blanchard has been particularly research active in areas relevant to rice production and processing and has supervised numerous PhD and honours students in areas ranging from the genetics of cold tolerance in rice, to investigating the molecular mechanisms of starch quality.

Visiting scientist program, conference attendance and scientific visits (5403)

**Project Leader:
Dr Laurie Lewin
CRC for Sustainable Rice Production
Yanco**

Objectives

To provide opportunities for scientific exchange with international scientists through facilitating exchange and conference attendance.

Progress

The Rice CRC has supported many opportunities for exchange of scientific information on an international basis through international conference attendance, study tours, sponsoring visiting scientists etc. (*See Cooperative Linkages, Utilisation and application of the research, Publications, Public Presentations chapters*). Some general information is provided.

- * Funds were provided for CRC officers to attend over 10 international conferences. Several CRC staff also participated in international conferences which were relevant to their work for the CRC, but their trips were not directly supported by CRC funds.

- * CRC staff also received financial support to participate in 4 international study tours.
- * The Rice CRC directly sponsored visits by two international scientists to Australia and arranged to sponsor a third visitor, however this visit was postponed to take place in the 2003/2004 financial year.

CRC training program (5404)

**Project Leader:
Dr Laurie Lewin
Rice CRC/NSW Agriculture
Yanco**

The Rice CRC acknowledges the value in provision of training opportunities that add to the vocational and scientific training offered through the narrow area of participation in the CRC.

CRC participants are provided with opportunities for exposure to other areas of the rice industry through events such as the field trip component of the Annual Symposium. The CRC also hosts visits from students enrolled with partner universities to broaden their knowledge of the rice industry and the research environment.

Leadership training has remained an important area for the CRC this year. CRC PhD student, Mr Herb Chiou, participated in the “Science at the Shine Dome - Early-career researchers program” in May 2003 in Canberra. The CRC had previously sponsored Mr Andrew Eamens (PhD student) to attend the same course in May 2002. The Rice CRC has also been successful in nominating PhD student, Sandra Oliver, to attend the 2003 CRC Leadership and Career Development Course in Melbourne in September 2003.

5.5 Studentships

**Sub-Program Leader:
Dr Philip Eberbach
Charles Sturt University
Wagga Wagga**

Postgraduate student scholarships and work experience (5501)

**Project Leader:
Dr Philip Eberbach
Charles Sturt University
Wagga Wagga**

In 2002/2003 the CRC supported 17 postgraduate students as shown in the Table below.

	2002/2003 Student Numbers
PhD Scholarship Package	11
PhD Top Up Award	4
Masters Scholarship Package	2

During 2002-2003, five of the CRC PhD students have completed their thesis and been awarded their PhD's and we anticipate a similar number of graduates continuing over the next several years. It is encouraging to see that of our current graduates, *almost all have professional science-research positions, several in areas relevant to the rice industry.*

*** Postgraduate Student Conference**

The Rice CRC sponsored a postgraduate students' conference in February 2003 which provided a forum for students to showcase their research to peers and supervisors, as well as an opportunity to practice their presentation skills. The postgraduate conference was held in conjunction with the Rice CRC's Annual Symposium, and 11 CRC students took the opportunity to present their work to an audience of more than 40 delegates. All presentations were of a high standard, and the best presentations were awarded grants of up to \$500 to assist them in attending professional conferences.

Summer student program (5503)

**Project Leader:
Dr Philip Eberbach
Charles Sturt University
Wagga Wagga**

Six students successfully completed a summer studentship supported by the Rice CRC for the season of 2002/2003. This has been a very successful program aimed at encouraging students to take up employment in agriculture or continue their studies in agriculture-related fields.

Honours student program (5505)

**Project Leader:
Dr Philip Eberbach
Charles Sturt University
Wagga Wagga**

Program 5 received a number of applications from honours students wishing to undertake honours projects in areas of relevance to the rice industry. Six scholars were appointed for 2003, however four of these withdrew before the completion of their scholarship for personal reasons. It is interesting to note that of the four withdrawals, three of these were students who had successfully completed a summer studentship with the Rice CRC and had decided to continue studying for an honours degree.

5.6 External communications (5601)

**Sub-Program/Project Leader:
Ms Carol Huggins/Mr Grant Webster
Rice CRC
Yanco**

Objectives

The project aims to promote awareness and understanding of the Centre and its achievements among rice and irrigation industry participants, the broader community and government at all levels.

Specific objectives are to:-

- * acquaint the community with Rice CRC philosophies and emphasise the vital nature of its research activities, extension services and education programs;
- * market the uptake of Rice CRC research outcomes by industry;
- * support and enhance the Rice CRC's linkages; and
- * develop and maintain a strong, productive relationship with the print and electronic media.

Progress/Outcomes

There have been some difficulties experienced in maintaining communications staff positions since the resignation of Mr Michael Cook last year, therefore communications output in the form of press releases has been somewhat reduced over the last twelve months. However this has now been rectified with the appointment in late June of Mr Grant Webster as the CRC's new Communications Officer, ably assisted by Mrs Jan Hubatka as his part-time assistant.

Despite the absence of a full-time Communications Officer in the past twelve months, the Rice CRC has still been active in the communications area, albeit at a reduced level.

During the 2002/2003 financial year the Rice CRC:-

- * conducted its 2003 Annual Students Conference and Annual Symposium (which included local media coverage);
- * participated in the 2003 Annual Rice Field Day at Jerilderie;
- * co-hosted a site with the Ricegrowers' Association of Australia and SunRice at the 2003 Sydney Royal Easter Show;
- * participated in the 2002 Henty Field Days;

- * continued the conduct of the “crop critters” biodiversity education program (under Project 5302), which also included participation in the “Bidgee BioBuzz” program (non-CRC school-based education program on biodiversity for students in the MIA);
- * produced five CRC press releases;
- * submitted two items for the CRCA’s media release promotion on CRC research;
- * assisted The Crawford Fund in promoting a visit by the Director-General of the International Rice Research Institute, Philippines (IRRI) to Australia’s rice growing region (which involved distributing press releases and coordinating interviews with regional print, radio and television media); and
- * published two Rice CiRCle newsletters (internal publication) and one Rice Update newsletter (external publication distributed to over 2,000 rice growers).

CRC participants were also very active in promoting their work through presentations at conferences, seminars and workshops to industry, associated clients and the general community (See “*Public Presentations, Public Relations and Communications*” chapter).

Currently funded students (continuing or completing studentship in 2002/2003)

<i>Name</i>	<i>Project Commence-ment Date</i>	<i>University</i>	<i>Type of enrolment</i>	<i>Supervisor and Associate Supervisors</i>	<i>Funding source(s) CRC/Uni etc</i>	<i>Thesis Title (Related CRC Sub-Program)</i>
Mr Nicholas Addison	Oct 02 Withdrew Mar 03	Charles Sturt Univ	Honours ¹	Dr Siva Sivapalan (CSU)	CRC	Reducing the impact of muddy water on rice crop establishment (5.5)
Mr Sanjeev Alfred	30-7-01	Univ of Sydney	PhD	Assoc Prof Bruce Sutton (SU)	CRC	Assimilate transfer in rice anthers (3.2)
Mr David Allen	July 2002	Univ of Technology Sydney	Masters	Dr Noel Merrick (UTS)	CRC	Conintuous salinity imaging along canals and drains (1.4)
Ms Louisa Best	2-1-01	Charles Sturt Univ	PhD	Dr Shahbaz Khan (CSIRO L&W) Dr Asitha Katupitiya (CSU)	CRC	Risk based spatial modelling to identify regional soil salinity trends in irrigation areas (1.4)
Mr Andrew Brown	1-3-01	Charles Sturt Univ	PhD	Mr Tony Dunn (CSU) Dr Ian Gray (CSU) Dr Warren Muirhead (CSU)	CRC	Understanding the channels of communication: improving the adoption of research findings by farmers (5.2)
Mr Andrew Burll	Oct 02 Withdrew Mar 03	Charles Sturt Univ	Honours ²	Dr Stuart Helliwell (CSU) Dr Mark Stevens (NSWAg)	CRC	Isolation & identification of factors affecting oviposition site selection in the rice bloodworm <i>Chironomus tepperi</i> (5.5).
Mr Jeffrey Castro	1-3-01	Univ of Sydney	PhD	Prof Robert (Bob) Gilbert (SU) Dr Melissa Fitzgerald (NSWAg) Dr Matthew Morell (CSIRO PI)	CRC (Part)	Customising molecular architecture of starch for rice quality - biochemistry aspects (3.4)
Mr Herbert Chiou	19-3-01	Univ of Sydney	PhD	Prof Robert (Bob) Gilbert (SU) Dr Melissa Fitzgerald (NSWAg)	CRC (Part)	Customising molecular architecture of rice polymers for rice cooking - characterisation aspects (3.4)
Ms Tienneke Cowan ³	Dec 2001 to Dec 2002	Univ of Sydney	Honours	Dr Lindsay Campbell (SU) Mr Rob Williams (NSW Ag)	CRC	Precision of rice sampling with considerations to device and variation within a rice field (2.2)
Mr Ben Dal Broi	Feb 03	Univ New England	Honours ⁴	Dr Liz Humphreys (CSIRO L&W)	CRC	Effect of water management & layout on rice growth, development & yield. (5.5)
Ms Jennifer Dang	1-7-99 to Jan 03	Univ of Sydney	PhD	Dr Les Copeland (SU) Mr Phillip Williams (SunRice)	CRC	New rice-based food products (4.5) (<i>Thesis submitted July 2003</i>)
Mr Greg Doran	29-1-01	Charles Sturt Univ	PhD	Dr Kaye Spark (CSIRO L&W) Dr Phil Eberbach (CSU) Dr Stuart Helliwell (CSU)	CRC	The determination of the role of sediments in the persistence of pesticides in rice floodwaters and drains (1.3)
Mr Andrew Eamens ⁵	19-4-99 to Nov 02	Charles Sturt Univ	PhD	Dr Chris Blanchard (CSU) Dr Narayana Upadhyaya (CSIRO PI) CSU/NSW Ag	CRC & CSU	Investigation of the molecular mechanisms of starch quality (3.4) (<i>Thesis submitted</i>)

¹ Mr Addison was a summer student with the Rice CRC in October 2002 and progressed to an Honours scholarship, from which he subsequently withdrew.

² Mr Burll was a summer student with the Rice CRC in October 2002 and progressed to an Honours scholarship, from which he subsequently withdrew.

³ Ms Cowan has received her Honours degree [B.Sc.Agr.(Hons)] and has now started a PhD with the University of New England.

⁴ Mr Dal Broi was a CSIRO/CRC summer student in October 2002 and progressed to an Honours scholarship with the Rice CRC.

⁵ Mr Eamens has submitted his thesis and has accepted a postdoc research position at the University of York in Northern England.

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Mr Tursun Kerim	4-5-2000	Aust. National Univ	PhD	Dr Jeremy Weinman (ANU) Prof Barry Rolfe (ANU)	CRC	Characterisation of the developmental pathway of pollen maturation in rice anthers (3.2)
Mr Vincent Lanoiselet	6-8-01	Charles Sturt Univ	PhD	Dr Gavin Ash (CSU) Dr John Harper (CSU)	CRC	Stem diseases of rice (2.4)
Mr Zhongan Li	7-12-01	Univ of Sydney	PhD	Assoc Prof Bruce Sutton (SU)	CRC	Control of callose synthesis and dissolution in rice anthers (3.2)
Ms Anita McGarrigle	Oct 2002 Withdrew Dec 02	Univ of Sydney	Honours	Dr Adrienne Grant (SU) Assoc Prof Bruce Sutton (SU)	CRC	Are excess nutrients responsible for explosive growth of nuisance algal colonies in rice fields? (5.5)
Ms Sandra Oliver	20-2-01	Charles Sturt Univ	PhD	Dr Rudy Dolferus (CSIRO PI) Dr Liz Dennis (CSIRO PI)	CRC & CSU	Identification and characterisation of genes affected by cold treatment of rice anthers (3.2)
Mr Craig Perkins	1-1-02 Withdrew July 2002	Charles Sturt Univ	Honours ⁶	Dr Phil Eberbach (CSU)	CRC	Root systems dynamics in aerobically grown rice culture (5.5)
Mr John Smith	Jan 2002	Univ of Qld	Masters	Assoc Prof Shu Fukai (QU) Dr Ken Fischer (QU) Dr Russell Reinke (NSW Ag)	CRC & RIRDC	Screening reproduction-stage cold tolerance for NSW Rice Improvement Program (2.2)
Ms Skye Wassens	5-3-01	Charles Sturt Univ	PhD	Dr Robyn Watts (CSU) Prof Alistar Robertson (CSU)/Dr Will Osborne (Univ of Canberra)	CSU & CRC	Conservation biology of the endangered Southern Bell Frog (2.4)
Ms Kahli Weir	1-3-01	Charles Sturt Univ	PhD	Dr John Oakeshott (CSIRO) Dr Robyn Russell (CSIRO) Dr Stuart Helliwell (CSU) Dr Chris Blanchard (CSU)	CRC	Enzymatic bioremediation for pesticide residues in irrigation tailing water (1.3)
Mr Zhong Kai Zhou	4-1-2000	Charles Sturt Univ	PhD	Prof Kevin Robards (CSU) Dr Stuart Helliwell (CSU)	CRC	Starch-lipid interactions and their role in ageing processes in rice (4.5). <i>(Thesis submitted)</i>

⁶ Mr Perkins was a CRC summer student in 2001/2002 and progressed to an Honours scholarship with the Rice CRC, from which he subsequently withdrew.

Previously funded studentships

<i>Name</i>	<i>Project Commencement and Finish Dates</i>	<i>University</i>	<i>Type of enrolment</i>	<i>Supervisor and Associate Supervisors</i>	<i>Funding source(s) CRC/Uni etc</i>	<i>Thesis Title (Related CRC Sub-Program)</i>	<i>Award</i>	<i>Graduate Employment</i>
Ms Ayesha Burdett	1-8-99 to 25-5-2000	Univ of Melbourne	Honours	Dr Mark Stevens (NSW Ag) Prof David MacMillan (MU)	CRC	Acute and chronic toxicity of three rice field herbicides to non-target aquatic invertebrate fauna (2.4)	BA/BSc Hons I (Zoology)	Temp employment with CSU
Ms Fabienne d'Hautefeuille	Oct 2000 to Sept 2001	Univ of Technology Sydney	Masters	Dr Noel Merrick (UTS)	UTS CRC	Heterogeneity of a field site using 3-dimensional resistivity imaging (1.4)	MSc	DIPNR
Mr Robert Duncan	17-8-98 to Aug 01	Univ of Sydney	Masters	Prof Graeme Batten (CSU) Dr Lindsay Campbell (SU)	CRC	An investigation of factors influencing the deposition of iron and zinc in rice grain (2.3)	<i>Thesis yet to be submitted</i>	Heritage Seeds
Ms Zara Evans	1-3-99 to 1-12-99	Univ of Sydney	Honours	Dr Lindsay Campbell (SU) Dr Graeme Batten (NSWAg)	SU	Amino acids, mineral elements and the quality of rice (2.3)	B.ScAgr Hons II 1	Dalgety Wesfarmers
Mr Tim Farrell	1-8-98 to Aug 02	Univ of Qld	PhD ⁷	Assoc Prof Shu Fukai (QU) Mr Rob Williams (NSWAg)	Self - funded	Genotypic variation and expression of low temperature tolerance in rice (2.2)	<i>Thesis yet to be submitted</i>	University of Queensland
Ms Sussan Fernandes	1-7-98 Withdrew 7-6-2000	Univ of Sydney	PhD	Dr Liz Dennis (CSIRO) Dr Lindsay Campbell (SU)	CRC	Molecular basis of cold-induced male sterility in rice (3.2)	<i>Withdrew</i>	Withdrew to pursue non-scientific research career path.
Mr Thusitha Gunawardena	1-4-99 to Aug 01	Univ of Qld	PhD	Dr Shu Fukai (QU) Dr Pax Blamey (QU) (linked to cold program)	ACIAR & CRC	Spikelet sterility in rice (<i>Oryza Sativa L.</i>) induced by low temperature and nitrogen fertilisation (2.2)	PhD awarded - PhD in Crop Physiology/Agronomy	Research Officer, School of Land & Food Sciences, Univ of Qld
Mr Manoj Gupta	3-7-2000 Withdrew 11-01-2001	Univ of Sydney	PhD	Dr Norm Darvey (SU)	CRC	Microspore culture of japonica rice (3.3)	<i>Withdrew</i>	-
Mr Stefan Hansen	1-1-99 to 1-12-99	Charles Sturt Univ	Honours	Dr Stuart Helliwell (CSU) Dr Mark Stevens (NSWAg)	CRC	Examination of the rice snail, <i>Isidorella newcombi</i> , as a biomonitor for pesticide contamination of aquatic systems (2.4)	B.Appl Sc (Chem) Hon I	Oil refining company, Wagga Wagga

⁷ Mr Farrell was originally a Masters student who changed to a PhD and is self funded.

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Ms Rama Heidari	1-6-98 to Nov 01	Charles Sturt Univ	PhD	Dr John Oakeshott (CSIRO) Dr Gavin Ash (CSU) Dr Robyn Russell (CSIRO)	CRC	Kinetic properties of esterases hydrolysing organophosphorus and carboxylester insecticides (1.3)	PhD awarded, graduated April 2003.	ANU
Ms Karen Herbert	Feb 1999 Withdrew 10-3-2000	Univ of Sydney	PhD	Assoc Prof Bruce Sutton (SU) (linked to cold program)	CRC	Pathways of assimilate transport within the rice anther (2.2)	<i>Withdrew</i>	-
Ms Anita Hodson	July 2000 to 1-3-2001	Univ of Technology Sydney	Masters	Dr Noel Merrick (UTS)	CRC	Groundwater Flow and Solute Transport Simulation Model at Stotts Farm, MIA (1.4)	MSc	Hydrologist, Egis Consulting
Mr Nijat Imin	1-7-2000 to Sept 01	Aust. National Univ	PhD	Prof Barry Rolfe (ANU) Dr Jeremy Weinman (ANU)	RIRDC/ CRC	Investigation of molecular mechanisms causing cold-induced male sterility in rice – A proteomic investigation (3.2)	PhD (ANU)	ANU
Mr Suraj Parkash Kapila	26-7-99 Withdrew Oct 2001	Univ of NSW	PhD	Assoc Prof Michael Wootton (UNSW)	CRC	Cold disinfestation of rice (4.3).	<i>Withdrew October 2001.</i>	-
Mr Vincent Lanoiselet	1-4-98 to 31-3-99	Charles Sturt Univ	Honours	Dr Ric Cother (NSWAg)	CRC	The production, germinability and infectivity of survival structures of <i>Rhynchosporium alismatis</i> , a candidate mycoherbicide for the control of <i>Alisma lanceolatum</i> and <i>Damasonium minus</i> in rice (2.4)	Ingenieur Degree (French)	NSW Ag/CSU/CRC (Project 2407)
Mr Joshua Lloyd	30-7-01 to Feb 02	Univ of Technology Sydney	Masters	Dr Noel Merrick (UTS)	CRC	A numerical groundwater management model for salinity mitigation at irrigated farm scale (1.4)	Graduated May 2003	Possible employment as hydro-geologist in Perth
Mr Jeffrey McCormick	17-01-01 to Dec 01	Univ of Sydney	Honours	Dr Lindsay Campbell (US) Prof Graeme Batten (CSU)	CRC	Optimising a nutrient solution for rice (2.3/5.5)	B.Sc.Agr. 1st class Honours. Awarded Sibella Macarthur Onslow memorial Prize	Agronomist, Wagga Wagga

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Ms Megan McLachlan	Nov 1999 to 31-3-01	Univ of Technology Sydney	Masters	Dr Noel Merrick (UTS)	CRC	Data Collection report for the modelling of groundwater dynamics & salinity at Stotts farm, MIA (1.4)	MSc	Scientific Officer, Sydney Water
Mr Gulled Mahamud	30-7-01 to Feb 02	Univ of Technology Sydney	Masters	Dr Noel Merrick (UTS)	CRC	An analytical groundwater management model for salinity mitigation at irrigated farm scale (1.4)	Graduated May 2003	Groundwater Engineer with Murray Irrigation, Deniliquin
Mr Mohammad Ezaz El Mamun	4-5-98 to Nov 01	Univ of Sydney	PhD	Assoc Prof Bruce Sutton (SU) (linked to cold program)	CRC	The role of callose in cold damage of rice pollen (3.2)	PhD	Postdoctoral fellow with Univ of Sydney
Mr Golam Moustafa	1-1-2000 Withdrew Mar 2000	Univ of Sydney	PhD	Dr Norman Darvey (SU)	CRC	-	<i>Withdrew</i>	-
Ms Elaine Murray	1-10-98 Withdrew from Masters Jan 2000	Charles Sturt Univ	PhD ⁸	Mr Tony Dunn (CSU) Mr Ken Eustace (CSU) Coleambally Irrigation Cooperative Limited	CRC	Enhancing information exchange in farming communities (5.2)	<i>Withdrew</i>	Coleambally Irrigation Cooperative Limited
Ms Sandra Oliver	14-2-2000 to 31-12-2000	Charles Sturt Univ	Honours	Dr Chris Blanchard (CSU) Mr Paul Roffey (CSU)	CRC	Investigation of genetic diversity in rice cultivars (3.4/5.5)	B.Appl Sc Hons I Univ medal	PhD funded by CSU and CRC
Mr Xu Peng	1-8-98 to Aug 01	Univ of NSW	PhD	Dr Yaping Shao (UNSW) Mr Charles Demetriou (NSW DIPNR)	CRC	A new integrated system for modelling land salinisation – with emphasis on the prediction of salinity in irrigation areas (1.4)	Thesis submitted	(looking for postdoctoral position)
Mr Wayne Pitt	9-2-98 to Aug 01	Charles Sturt Univ	PhD	Dr Gavin Ash (CSU) Dr Ric Cother (NSWAg)	CRC	Studies on the host range and aggressiveness of <i>Rhynchosporium alismatis</i> in rice fields (2.4).	Thesis submitted	unemployed
Ms Liesl Schiller	1-1-2000 to Apr 02	Univ of Sydney	Masters	Dr Mark Stevens (NSW Ag) Assoc Prof Richard Russell (SU)	CRC	The population dynamics of mosquitos in rice fields and associated habitats in the MIA, NSW (2.4)	MSc(Med)	National Registration Authority for Ag & Vet Chemicals

⁸ Converted from PhD to Masters 5/99 following Ms Murray taking up position with Coleambally Irrigation Cooperative Limited (Land & Water Management Plan). Ms Murray subsequently withdrew from her Masters in January 2000.

<i>Name</i>	<i>Project Commence-ment and Finish Dates</i>	<i>University</i>	<i>Type of enrolment</i>	<i>Supervisor and Associate Supervisors</i>	<i>Funding source(s) CRC/Uni etc</i>	<i>Thesis Title (Related CRC Sub-Program)</i>	<i>Award</i>	<i>Graduate Employment</i>
Ms Alexa Seal	1-12-98 to Jun 02	Charles Sturt Univ	PhD	Prof Jim Pratley (CSU) Dr Terry Haig (CSU) Dr Laurie Lewin (CRC)	CRC	Allelopathic potential in rice to control arrowhead in NSW rice crops (3.2)	Thesis submitted	-
Mr David Smith	3-4-98 Withdrew Jun 1999	Charles Sturt Univ	Masters	Dr Liz Humphreys (CSIRO) Doug Godwin (CSIRO) Dr Philip Eberbach (CSU)	CRC	Using models to quantify the benefits of crops after rice (1.2)	<i>Withdrew</i>	CSIRO Land & Water
Ms Sarah Spackman	2-2-98 to Aug 01	Charles Sturt Univ	PhD	Dr David Lamb/Dr John Louis (CSU) Mr Jon Medway (CSU)	CRC	Using airborne multispectral imaging to manage within-paddock variability in rice production (2.1)	<i>Thesis yet to be submitted</i>	Bundaberg Sugar
Ms Stephanie Vaughan	22-2-99 Withdrew 30-12-99	Charles Sturt Univ	PhD	Dr Melissa Fitzgerald (NSWAg) Dr Chris Blanchard (CSU)	CRC	Investigation of suncracking in rice (3.4)	<i>Withdrew</i>	-
Ms Ella Whitelaw	1-1-02 to Dec 02	Charles Sturt Univ	Honours	Dr Chris Blanchard (CSU)	CRC	Study of variation in rice starch synthesis genes (5.5)	B.App.Sci (Hons) 1st class honours	PhD with CSU
Ms Andrea Wilson	30-3-98 to Dec 01	Charles Sturt Univ	PhD	Dr Mark Stevens (NSWAg) Dr Robyn Watts (CSU)	CRC & CSU	Effects of different management regimes on aquatic fauna in Australian rice fields (2.4)	PhD awarded, graduated April 2003.	Associate Lecturer, CSU
Ms Briony Wiltshire	Jan 2000 to Dec 2000	Univ of Sydney	Honours	Dr Lindsay Campbell (SU) Prof Graeme Batten (CSU)	CRC	Grain nutrient content of low phytic acid rice (2.3)	B.ScAgr Hons	Artificial insemination work with rare sheep, England Sheep Centre, England

MILESTONES

	Milestone	Year 4	Year 5	Year 6 - 2002/2003	Yr 7
5.1	Farmer education and community awareness				
	Extension officer awareness	X ✓	X ✓	X ✓	X
	Extension program development	X ✓	X ✓	X ✓	X
5.2	Extension & information technology methods				
	Appointment of research student				
	Baseline extension study				
	Subsequent studies	X ✓		X ✓	X
	Evaluation of novel extension technology	X ✓			
	Appointment of post doctorate fellow	X converted to postgraduate			
	Comparison with existing techniques	X ✓	X ✓	X ✓	X
5.3	Skills development				
	Industry education officer appointed				
	Training needs analysis completed				
	Training courses developed for:				
	- production				
	- industry	X ✓	X ✓		
	- leadership	X ✓	X ✓	✓	
	- facilitation	X ✓	X Not attempted	✓	
	Training courses run	X ✓	X ✓	X ✓	X
	Information officer appointed				
	Display material arranged	X ✓	X ✓	X ✓	X
5.4	Professional development				
	Lecturers appointed:				
	- production				
	- cereals				
	Students appointed	X additional 7 students	X 35 "current" students	X ✓	X
	Tertiary courses developed and presented	X ✓	X ✓	X ✓	X
	Scholarship coordination	X ✓	X ✓	X ✓	X

X = To be completed (in some cases this exercise is spread over several years).

✓ = Achieved (if not achieved, status provided.)

NB: After obtaining approval from the CRC Secretariat, comments on milestones for Years 1 to 3 inclusive have been removed from this table. Please refer to previous Rice CRC Annual Reports if you wish to view this information or contact the Rice CRC for additional information.