



## Report to the 'Promotion of Agriculture to Schools Network'

October 2005

A National Scoping Study of the Promotion of Agriculture to Schools, convened by the Promotion of Agriculture to Schools Network and undertaken by Scarlet Consulting and funded by the Australian Wool Education Trust with in-kind contributions from national stakeholders.









- Campaign for Australian Agriculture, National Farmers Federation
- Cotton Education Kit, Cotton Australia
- CRC for Sugar Industry Innovation through Biotechnology Education Program
- Dairy Australia - Primary Schools Resource Kit, Farm visits, and 'Just a Little Bit' website
- Dairy CRC, Resources for Science and Biology
- Grains Research and Development Corporation Teacher Resources
- CSIRO Education - Lab On Legs, CSIRO - Pastures from Space
- Lessons in Food, National Food Industry Strategy (NFIS) Ltd
- Lord of the Weeds, Ghastly Guests, Weed Warriors, CRC for Australian Weed Management
- National Collaborative Centre for Building Future Human Capacity in Primary Industry
- Primary Industry Councils across Australia
- Rural Skills Australia
- Sheep CRC, Schools educational resource development
- Young Gourmet Gastronomy Challenge 2005, Radio National's Bush Telegraph

#### **1.2.2 New South Wales/ACT**

- Camden Park Environmental Education Centre
- Fairfield City Farm
- Farmarm and Milking Barn (Sydney Royal Easter Show), Yass
- Tocal and Murrumbidgee Agricultural Colleges
- Royal Canberra Show, Royal National Agricultural Society, ACT
- Sydney Royal Easter Show Education Program, Royal Agricultural Society of NSW

#### **1.2.3 Northern Territory**

- Grow to Learn - Learn to Grow, Department of Primary Industry, Fisheries & Mines
- Royal Darwin Show, Royal Agricultural Society of Northern Territory
- Taminmin High School

#### **1.2.4 Queensland**

- Active-Ate (Queensland Department of Health)
- Ag-Ed Program, Royal Agricultural Society of Queensland
- Barnyard Babies
- Biloela Senior High School
- Food and Fibre Trail, Queensland Farmers Federation
- Learning through Landcare, Landcare Discovery Centre, Toowoomba
- Primary Industries Week, Primary Industries Week Inc., Queensland
- Queensland Association of School Tuckshops
- Queensland Museum's Bio-Bus
- Rural Discovery Day, Primary Industries Week Inc.
- Science Teachers Association Queensland, Agaware and partners
- Scots PGC College Sustainability Centre, Warwick
- St Columba's PS, Brisbane and South Burnett Catholic College, Kingaroy
- The AgAware Group
- Wilsonton Agricultural Field Studies Centre, Toowoomba
- Wine College, Stanthorpe

### 1.2.5 South Australia

- Ag Learning Centre, Royal Adelaide Show, Royal Agricultural Society of South Australia
- Australian Schools Wine Show
- Cleve Area School (School-Community partnership)
- Urrbrae Agricultural High School
- Working in Wool (Industry Induction), Rural Skills Australia

### 1.2.6 Tasmania

- Bridgewater High School, Summerville City Farm and Landcare Centre
- Cropping a Career (Industry Induction), Rural Skills Australia
- Rural Careers And Education Project, Rural Skills Australia
- Skilling the Cradle Coast Community, University of Tasmania, Burnie
- Woodbridge School Sustainability Program, Woodbridge
- Working in Wool (Industry Induction), Rural Skills Australia

### 1.2.7 Victoria

- Bendigo Sheep and Wool Show Education Program
- Collingwood Children's Farm
- Golden Cow, Tongala
- Kitchen Garden, Collingwood College and Stephanie Alexander Kitchen Garden Foundation
- Landlearn, Department of Primary Industries
- Primary Skills Victoria
- RAS*farm* Education Program, Royal Melbourne Show, Royal Agricultural Society of Victoria
- Urban Rural Links Program
- Teaching Farms, Country Education Project
- Land and Food Resources, University of Melbourne
- Victorian Landcare Centre, Creswick
- Warrambeen Landcare Education Centre, Rokewood (Alcoa and Greening Australia)

### 1.2.8 Western Australia

- Cunderin Agricultural College and Curtin University Muresk Institute of Agriculture
- Denmark High School
- 'Growing Knowledge - Food, Fibre and Farming', Agriculture Western Australia
- Kondinin Group
- Landcare Education, Department of Education and Training
- Royal Perth Show, Royal Agricultural Society of Western Australia
- Tammin Alcoa Landcare Education Centre
- Woolpro in Schools, Agriculture Western Australia

## 1.3 Aggregating the range of approaches to education about agriculture

This study identifies a range of key complementary approaches to promoting agriculture to schools. Whilst many of the different approaches apply across the curriculum, for the purpose of this study, the different approaches have been aggregated into six categories:

- 1) Arousing curiosity about agriculture
- 2) Promoting agriculture through science, mathematics and technology
- 3) Promoting agriculture through studying society and the environment (including Landcare)

- 4) Promoting agriculture through agricultural and horticultural studies
- 5) Promoting agriculture through careers education
- 6) Promoting agriculture through studying health and physical education.

#### **1.4 Characteristics of Best Practice in Promoting Agriculture to Schools**

Certain characteristics are common to successful programs and projects involving education about agriculture. These should be considered when developing a national strategy. They include:

- Face-to-face interaction between students and credible farming/industry representatives
- Program/project involves teacher professional development
- Value for money
- Quality resources that are integrated into the curriculum Key Learning Areas (KLAs)
- Strong partnership with the State Agriculture Department
- State Agriculture Department sees education as important, and going beyond the farm gate.
- Strong partnership with agricultural industries
- Strong partnership with the local farming and business community
- Access to up-to-date resources and information about agriculture, and linkages to current agricultural issues and events (e.g the impact of climate change)
- Credible, technically accurate and enthusiastic presenters
- Flexible delivery approach (for different schools, different states and different industries)
- One-stop-shop 'quality' website (avoids having to leave the site to find additional information)
- Program/project provides for experiential learning (Practical - 'hands-on')
- Greater science process skill development than simply the in-class model
- Qualitative and quantitative data collection and interpretation
- Program/project provides students with opportunities to engage in 'systems thinking'
- Passionate or dedicated 'Program driver' (Principal, Deputy Principal or head teacher) who recognises the value of studying agriculture and providing for a wide range of learning
- Complementary skill set among teachers
- A relevant vibrant interaction between students, teachers and the community
- Program has a strong educational component and is not seen by teachers as a wasted day
- Continuity – teachers know what to expect and support the program or project each year.

#### **1.5 A National Strategy for Education about Agriculture**

A national approach to education about agriculture would increase the level of understanding and awareness of all Australians about the important role of agriculture and its contribution to a sustainable future.

A National Strategy would share in the very best and most innovative ways of involving industry, schools, teachers and students in education about agriculture by:

- Identifying issues critical to successful education about agriculture practice;
- Developing strategies and resources to support schools and teachers to become more effectively involved in education about agriculture across all major industries; and
- Establishing evaluation criteria to measure and monitor the processes and outcomes resulting from the Strategy.

This report commences the process of developing a National Strategy and provides a sound basis for direction.



### 1.5.1 Current response

The current response to the problems facing educators about agriculture is described in this report as a fascinating range of activities and initiatives, all of which are undertaken by people with passion and enthusiasm often with very limited resources. What is being done at the moment should be applauded given the limited resources available.

### 1.5.2 Features of current response

The following features come out of the current response to the problem.

- **Variability** – This is fine, and should continue, but there are good ideas that should be available for others to follow. Each response is state-based even if the funding is national. It is envisaged that responses will remain state-based while ever we have a state based education system.
- **National inputs** – Some of the initiatives are funded by national funds, either Commonwealth or industry, however the response still tends to be variable depending on the state arrangements. This should be borne in mind when encouraging future funds from national organisations. An expectation shouldn't be built up to the organisation that exactly the same thing will happen in each state.
- **Industry input** – this is extremely variable and probably dependent on a few enthusiasts rather than an overt policy.
- **Funding models** – the following funding models seem to be occurring:
  - Private. User pays with or without sponsorship. In this case the user is the school itself or in other cases, the host for the initiative, eg the RAS.
  - Government funded. This can be through a state government in association with industry however there are no state/Commonwealth partnerships in place. Commonwealth funded programs occur usually independent of state governments.
  - Industry. Research and Development Corporations are starting to fund some of these initiatives but it has been limited to date.

### 1.5.3 The Ideal

The following concepts are likely to be part of the ideal situation.

- A national network of people and organisations interested in effectively promoting agriculture to schools needs to be further developed and sustained into the future.
- Some idea of best practice for the various target audiences can be developed from this report.
- The above two issues should lead to good market knowledge for those organisations and individuals wishing to enter this market so that they do not have to reinvent the wheel.
- There should be some idea of what the pitfalls may be with these initiatives – what have been the money-wasters in the past. For example, the development of copious folders and guidebooks which are never used, CDs which are never used etc.

From all of the above, there should be some guidelines for funders to examine and also provide the basis for applications to funding authorities for future initiatives.

**A national strategy should make it easier for R & D Corporations to improve the management of education about their sector, and about sustainable land management in particular, from a national perspective.**

## 2 Introduction

This study focuses on the need to develop a national strategy to enable more effective and targeted expenditure on the promotion of agriculture to schools. This study recognises the reality of the city-country divide in Australia in 2005. Therefore, the pursuit of a national strategy to promote agriculture to schools will not involve trawling through the negative messages that are often brought up about the lack of awareness and understanding of agriculture and education about agriculture. Instead this scoping study identifies the range of positive initiatives that are making a difference and are likely to be core components of a future national strategy for promoting agriculture to schools.

In July 2005 the National Farmers Federation (NFF) announced it is developing a strategy called the "Campaign for Australian Agriculture". The strategic approach of the NFF complements what the 'National Agriculture Scoping Network' is trying to achieve. According to the NFF, "as well as fostering greater understanding, its new strategy will ensure that positive images and messages are promoted about rural Australia. These include: the rural way of life, agricultural innovation, the resilience of farmers in the face of adversity, the strong emphasis on sustainable production, the commitment to the highest standards of animal welfare, and the vital contribution to the nation's economy."

This study identifies a range of key complementary approaches to promoting agriculture to schools. Whilst many of the different approaches apply across the curriculum, for the purpose of this study, the different approaches have been aggregated into six categories:

- 1) Arousing curiosity about agriculture
- 2) Promoting agriculture through science, mathematics and technology
- 3) Promoting agriculture through studying society and the environment (including Landcare)
- 4) Promoting agriculture through agricultural and horticultural studies
- 5) Promoting agriculture through careers education
- 6) Promoting agriculture through studying health and physical education.

### 3. Case Study – Wool Education in Australian Schools

Wool is an integral part of the Australian way of life. It would be reasonable to expect all Australians to have some knowledge and appreciation of where wool comes from and the range of products in which wool is used. It is also appropriate to promote the high regard farmers place on animal welfare and the range of rewarding careers available in the wool industry either as producers, researchers, geneticists, agronomists, woolshed staff, animal welfare staff, processors or manufacturers etc. But unless we have a comprehensive, best practice, wool education program in place, then we cannot assume that all Australians have adequate knowledge to make informed decisions about the major issues facing the wool industry.

Using some of the model education programs identified in this study it is possible to build up a picture of what a comprehensive, national best practice wool education program might look like. As suggested in the Executive Summary it would be most appropriate for the wool industry to support a national approach to education about agriculture and share in the benefits of access to a coordinated national network of industries, education about agriculture programs and education sector participants. A national 'best practice' wool education program would cover all the key curriculum areas (except for health and physical education) and incorporate the key characteristics of successful programs identified in 1.5.

#### 3.1 Arousing curiosity in wool

Wool industry funds should be used to support credible farmers who provide quality educational experiences for primary aged children through infotainment programs. Jane Southwell's *Farmarm* program is the ideal introduction to agriculture for young children and their parents. Jane conducts 200 school visits annually displaying quality stock bred on her Yass farm. Jane also runs a Program at Sydney's Royal Easter Show (with access to 715,000 people) and has received industry sponsorship to take her program to the Royal Adelaide Show in 2005. (Also see 4.1).

#### 3.2 Promoting wool through Science, Mathematics and Technology

##### 3.2.1 Woolpro in Schools

The Western Australia Department of Agriculture, in partnership with the Education Department and the Primary Industry Training Council, developed the original WoolPro in Schools program to provide in-service training to teachers and deliver industry information and management tools for the highest quality education about agriculture.

In 2004 Dr Harry Freemantle, University of Western Australia, undertook a feasibility study into a national rollout of the 'WoolPro in Schools' program. Dr Freemantle's report identifies the numerous strengths of the program and recommends that a wide coalition of government and industry partners, in conjunction with Australian Wool Innovation and the Australian Sheep CRC should look to expand the program into other states.

Some of Dr Freemantle findings and recommendations include:

- Woolpro is a strong and successful program given industry-wide support
- Other states do not have a package that is as comprehensive and up-to-date

- Base the Woolpro in Schools program in the Department of Agriculture/Primary Industries where there is a comprehensive knowledge base and current resources
- Funding needs to be increased to meet the demand both in WA and other states
- Adequately resource the national program with a minimum of five persons per state plus a national coordinator
- Set an achievable timeframe for the rollout (Year 2 and Year 5 targets identified)
- Develop a dedicated website for the program.

As a practical training project, Woolpro in Schools provides opportunities for students to be involved in real life research and problem solving in the wool production industry. Aligned with the Sheep and Wool sector of the Agriculture Training Package, participants gain formal qualifications as they progress through the program.

All schools participating in the program are using the manual 'A Guide to Grazing Systems and Animal Production', developed as part of the original WoolPro in Schools. The manual offers the latest technology and techniques available for the management of sheep and cattle. It also contains teacher guidelines and student activities. The manual has been modified for each local State or Territory conditions.

WoolPro has strong curriculum links in Science and Technology:

- Investigating Scientifically Levels 1 - 6
- Life & Living (Structure & Function) Levels 2 - 4
- Natural & Processed Materials (Structures, Properties & Uses) Levels 1 - 4
- Technology Process (Investigating) Levels 1 - 5
- Materials Levels 1 - 6
- Enterprise Levels 1 - 5
- Technology in Society Levels 1 - 3

### **3.2.2 Sheep CRC Schools Educational Resource Development**

The Sheep CRC's education program provides national co-ordination in developing resource materials for school students, incorporating CRC-developed information. The resources are delivered through professional development for teachers. The program's focus is to encourage more secondary students to undertake post-secondary training in sheep and wool leading to a career in the industry. The inclusion of a schools program into the Sheep CRC provides an education pathway from schools through vocational and industry training and into tertiary study. This complements the career pathways currently available within the industry.

#### **Sheep industry schools package**

This resource package will contain careers information on separate CD versions for school teachers and careers advisers. Learning activities mapped to curriculum requirements will be incorporated into the careers CDs and into the AWI produced Futurefleece CD. A hard copy of the school activities will be distributed as a booklet, as well as posters of sheep breeds and wool and meat supply chains.

The package will be supported by running professional development workshops for teachers in each state, and by the careers information package also being available in a mini disc CD format

for students and on the AWI and MLA web sites. The project is funded by MLA and AWI and will be complete for rollout from January 2006.

### **School Industry Links Project**

This project aims to improve the uptake of science and technology training and careers for mainstream senior high school students, by raising the awareness of the science that underpins livestock production. This will be achieved by providing a sheep industry resource package detailing how science has been used in the development of the industry, and its role in maintaining the competitiveness of the industry in future. The sheep industry resource package will be mapped to curriculum for science subjects in senior high school to encourage teachers to use the resource for teaching all science subjects. There will also be professional development workshops for science teachers to show them how the industry applies research and development, and to optimise the use of the resources. Students will also be able to apply to attend industry camps to further their study, and industry placement with an agriculture researcher will be organised for selected students.

The project will be integrated with an existing program developed by the University of Tasmania led by Dr David Russell. Dr Russell has already developed packages for industries including dairying and grains (also see 5.3). It is funded by AWI with a funding proposal pending with the AWTA Wool Education Trust.

### **Professional Development**

Professional Development opportunities will ensure teachers are exposed to the CRC-developed learning materials. Separate professional development workshops will target science teachers for the Schools to Industry links program and agriculture teachers for the sheep industry schools package. AWI and MLA fund the professional development workshops. One workshop will be run in each state by July 2006.

### **Support package for RYAG camp**

RYAG Sheep (Rotary Youth Agriculture – Sheep) is a four-day program for year 10 and 11 students providing an overview of the Sheep Industry. Sheep CRC has assisted by developing resource materials and programming suggestions, coordinating the camp activities, writing a report and preparing a package for other organisations wanting to run student camps for the sheep industry. A camp held in Armidale in September 2005 received extremely positive feedback from all participants.

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### **3.2.3 Pastures from Space**

The CSIRO's 'Pastures from Space' website ([www.pasturesfromspace.csiro.au](http://www.pasturesfromspace.csiro.au)) is a good resource for students and teachers to better understand the use of remote sensing as a management tool for matching stock numbers to pasture carrying capacity in pursuit of a sustainable farming future. This website lends itself to the promotion of 'systems thinking'.

### 3.3 Promoting wool through studying Society and Environment

Wool industry funds could be used to support a national education about agriculture network that shares knowledge of the best available, peer-reviewed, wool educational resources for studies of Society and Environment. One example is the Worksheet Activity '**On the Sheep's Back**', available from the Western Australia Department of Agriculture. This activity allows students to explore the impact of the wool industry on local communities and the economy and consider what affects the wool market. The activities cover:

- Consideration of the impact of increases and decreases in the price of wool;
- Links between wool producers and the local community (considering economic and social impacts); and
- Three aspects that can have an effect on wool prices.

The curriculum links within **Society and Environment** include:

- Investigation, Communication and Participation (Activity 3): Levels 3-6
- Place & Space
  - Features of Places (Activities 1-7): Levels F-7
  - People & Places (Activities 1-7): Levels 1-5
- Culture
  - Cohesion & Diversity (Activities 2-3): Levels 3-7
- Natural and Social Systems
  - Economic Systems (Activities 1-3): Levels 3-5

Other quality resource materials include the Kondinin Workboot Series Book – Wool.

### 3.4 Promoting wool through agricultural and horticultural studies and careers education

A Wool Industry Induction Program operates in Tasmania and South Australia. Based on Lesley Richardson's "Working in Wool" model [Rural Skills Australia (RSA), Tasmania] the program aims to provide young people with an opportunity to experience work in the wool industry. This first hand experience assists students to determine their interest and suitability for a career in this industry. Pathways for a future in the industry are investigated and students are encouraged to set goals. Vocational placements are made available with wool producers, agricultural service sector, science and research areas.

In 2005 Jane Bartlett, RSA, organised a five-day South Australian program for 14 and 15 year-old students who had expressed some interest in working in the wool industry. Jane, an RSA Industry Liaison Officer as well as an agriculture teacher accompanied the students for the duration of the program. The Wool Industry contributes significantly to the cost of running the program. Topics covered/activities include:

- Occupational Health and Safety
- Before program and after program career planning
- VET in schools
- Traineeships and Work experience
- Introduction to Industry mentors and direct contact to industry leaders.
- Evaluation (Have you changed your ideas and do you now understand the career pathways available to you?).

- Site visits as part of the program included the Michel wool processing facility - usually a closed facility because of occupational health and safety issues.

### 3.5 A special story from South Australia's Working in Wool program

One Year 9 girl participating in the 2005 'Working in Wool' induction program had planned to leave school and become a jillaroo. Now she wants to do a PhD in Animal Science. The girl blossomed during the program. Her parents said she was not the same girl they sent away. The professor at the University of SA was so impressed with how switched on she became, and how she asked so many good questions, that he invited her back at any time. She now has a direct contact for work experience at the University. On returning from the induction program the student found that her vocational work experience placement was on a White Suffolk stud. Straight away she was on the computer researching the breed before her placement.

### 3.6 Wagin Woolorama

Commencing in 2003, the Department of Agriculture, WA, has produced resources for teachers for use in conjunction with the Wagin Woolorama - WA's premier sheep event. AgWA staff would contact the teachers and take the resources out to the school to facilitate their use. This strategy enjoyed success because it involved teacher professional development rather than just producing resources for education about wool (also see 6.3).

### 3.7 Bendigo Sheep and Wool Show Schools Program

Andrew Ternouth runs a successful Schools Program in conjunction with the Bendigo Sheep and Wool Show in July each year. The Program aims to develop an integrated structure to link sheep and wool industry educational programs from a primary level right through to a practical judging level - using the show and the current **schools program** as the focal point.

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### 3.8 Accessing information about wool

Students can access a wide range of websites to source information about the wool industry.

These include:

- Australian Wool Innovation ([www.wool.com.au](http://www.wool.com.au))
- Woolwise (Wool Cooperative Research Centre) [[www.woolwise.com](http://www.woolwise.com)]
- CSIRO Livestock Industries ([www.csiro.au](http://www.csiro.au))
- Australian Sheep and Wool Industries on the web ([www.aussiesheep.com](http://www.aussiesheep.com))
- The Woolmark Company ([www.woolmark.com](http://www.woolmark.com))
- Wool Industry Promotions Association ([www.ozwool.com](http://www.ozwool.com))
- The Wool Network's online tour of wool marketing ([www.woolnetwork.com.au/aboutus/cliptour.php](http://www.woolnetwork.com.au/aboutus/cliptour.php))
- Myfuture is Australia's web-based careers information service. It is a joint initiative of the states and territories. Under 'the facts' section of the website there is substantial information about careers in agriculture, including sheep and wool. ([www.myfuture.edu.au](http://www.myfuture.edu.au))

## 4 Arousing curiosity about agriculture

### 4.1 Farmarm

Jane Southwell is a sixth generation farmer and fine wool producer from Yass (near Canberra) who has extensive experience in arousing curiosity in children of Primary School age. Jane is President of the Group Seven Show Societies in her region and a councillor on the Royal National Capital Agricultural Show Society. Jane believes that arousing young children's curiosity is the vital first step in promoting agriculture.

Jane has developed the Junior Steward Programs for young people wanting to know more about farm animals. Her **farmarm** (*farm animal resource management*) initiative offers a vitally important link between commercial producers and an increasingly urban-based society. Her commitment to presenting quality stock in all **f.a.r.m's** displays and using every opportunity to educate and inform visitors, sets her business apart from most other mobile farm operations. **F.a.r.m.'s** education program "From the Paddock to the Playground", which includes the outstanding Marvellous Milk presentation and the award-winning "Patting Paddock" are amongst her proudest achievements. In 2004 Jane made 200 visits to schools and other groups with her "Patting Paddock". 2005 was Jane's fourth year of taking her "Milking Barn" to Sydney's Royal Easter Show where 715,000 people actively participated in the one-hour program. (A Farmyard Nursery also operates at the Sydney Royal Easter Show).

The Royal Agriculture Society supports Jane. Her major sponsor is Nestle. Nestle is so delighted with the educational focus, that the company is sending Jane and the Milking Barn to the 2005 Royal Adelaide Show. Representatives from the United States have also been out to look at Jane's model. Jane has a background in financial administration in the not-for-profit sector, knows the expectations of sponsors and knows what she wants to achieve – she has important experience in how to meet the needs of sponsors.

Other partners in Jane's school visits program include Canberra Milk (dairy farmers) and Landmark (formal agreement with local store).

The Milking Barn is a major display. The key success factors of the display are:

- 1) Credibility (Jane is a practicing farmer)
- 2) Hands-on (the best way to educate)
- 3) Info-entertainment (transfer of information in an entertaining way)
- 4) Participative (involves a Question and Answer Session).

The interaction involves information exchange on topics including the difference between beef and dairy cattle and butter making. All participants wear microphones for quality audio feed.

In Jane's experience the level of interest of city people is very high. The only way primary school children get any education about agriculture is if a teacher in a Primary School wants to cover it. Parents ask searching questions about agriculture. Their questions cover topics such as pasteurisation, homogenisation, animal welfare, safety of agricultural produce, bird flu and the transmission of viruses from animals to humans.



Jane provides schools with a range of products. The program is tailored to what the school can afford. The uniqueness of the product includes the fact that Jane only uses quality animals bred on the farm. The poultry are bred specifically for the education purpose (show breeds not laying breeds).

Jane runs a training day for volunteers in her program. These volunteers are most often students with an interest in agriculture as a career. The training day provides the volunteers with background on the big issues facing agriculture and also covers why promoting agriculture is so important. Jane trains her volunteers to listen carefully to the audience and to pick up on opportunities to engage with the audience. During one school visit to a Primary School in Canberra the Commercial Attache to China got to touch a Merino in full wool. He had facilitated the buying of large quantities of wool but had never had the opportunity to feel the wool on a live sheep.

According to Jane, professional development is urgently needed for teachers. Jane uses Kondinin resources and her business partner (a former teacher) is developing curriculum materials. Lesson plans will be available from the website. "What Kondinin has achieved needs to happen at a national level, we need to do a much better job at resourcing the teachers."

The farmer in the classroom concept (during the second week of August) is something Jane would like to see picked up. This requires industry support. "Currently we don't do industry any favours and only go out into the public arena in response to something going wrong". Jane also attends the RSPCA open day each year. This event attracts 4,000 - 5,000 people.

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## 4.2 Kondinin Group

Kondinin Group is a not-for-profit farmer owned and directed organisation. Established during 1955 in the Western Australian wheatbelt by a group of farmers looking for better information, Kondinin Group has grown to become Australia's leading independent agricultural research and publishing organisation.

10,000 farmer members across the country drive the Group aiming to improve agriculture by sharing reliable and practical information. An additional 15,000 people in agriculture regularly access the Group for information.

Feedback on publications, Research Reports and the quality of the Group's services is provided by Kondinin Overview Groups representing farming communities across Australia. The Kondinin Group network of farmers, agribusinesses, consultants, researchers and staff are committed to ensuring farmers have access to the best information available. The Group has offices in Perth, Western Australia, Wagga Wagga, New South Wales and Toowoomba, Queensland.

#### **4.2.1 The Workboot Series**

As a premier provider of information for agriculture Kondinin Group produces, promotes and markets an agricultural series of educational materials for children called THE WORKBOOT SERIES. This is a collection of books and teacher resource kits about Australia's primary industries, and is designed to educate children about the role and diversity of agriculture in Australia and the key issues and challenges confronting farm enterprises.

Each book tells the story of a farming industry, including sections on the source, the producer, the product, the consumer and the environment. The books show all aspects of the industry to allow children to gain a balanced view of the production process and where they fit into that chain as consumers.

Published to date are books on wool, wheat, dairy, cotton, honey, timber, rice, vegetables, beef, seafood, agroforestry, potatoes and eggs, and resource kits for wool, wheat, dairy, cotton, honey, timber, rice and seafood. A book on chicken is being developed, along with revised editions of the wheat book and resource kit.

Kondinin Group's educational resources are sent, at various draft stages, to industry and education specialists throughout Australia, ensuring their accuracy, independence and relevance. This has given the books an excellent reputation with teachers throughout Australia, and over 110,000 copies of the books have been distributed nationally.

The Dairy book was awarded Notable Children's book status in 1996 by the Children's Book Council and the Timber, Rice, Vegetables, Beef, Seafood and Agroforestry books were each short-listed for the Australian Awards for Excellence in Educational Publishing during the year of their release. The Rice and Seafood books went on to win their category in these awards during 2002 and 2004 respectively.

The teacher resource kits help teachers use the books to develop a farming theme in their classrooms, and contain the relevant book, lesson notes, photocopiable activity pages across the key learning areas and product samples where possible.

The kits are also developed in consultation with teachers, education consultants and industry representatives across Australia, and are linked to the national outcome profiles for ease of planning.

The resource kits for Wheat, Dairy, Cotton and Timber have all been short-listed for the Australian Awards for Excellence in Educational Publishing.

#### **4.2.3 Taking Agriculture to the Classroom**

Kondinin Group co-ordinates an initiative called *Taking Agriculture to the Classroom* where corporate companies are invited to donate class sets of Workboot Series books and kits to schools throughout Australia.

Most recently, companies and organisations such as the National Food Industry Strategy, McCain's Foods, Jumbuck Pastoral Company, Co-operative Bulk Handling, South Australian Farmers

Federation and the Loose Leaf Lettuce Company have supported the initiative by donating books and kits into schools.

In 2004 the Kondinin Group organised for Mrs Janet Holmes a Court, Patron of Taking Agriculture to the Classroom, to share her experiences as a beef producer with school children from Kelmscott, Western Australia and Fitzroy Community School, Melbourne, Victoria. Mrs Holmes a Court's Heytesbury Beef operation owns and manages over two hundred thousand head of cattle across eight stations spanning the East Kimberley, Victoria River and Barkly. Since 1995, 'Taking Agriculture to the Classroom' has provided more than 4 500 primary schools with sets of the Workboot Series books and teacher resource kits.

#### **4.2.4 Kondinin and the future**

In the future, Kondinin Group has the potential to develop further resources to promote children's learning about agriculture. These would meet the needs of primary and secondary school and include:

- Information-based resources about primary industries, as part of the Workboot Series collection of books about agricultural enterprises.
- Information-based resources supporting the Workboot Series titles, such as books on irrigation and conservation farming. These would be pitched at a different target audience, most likely upper secondary school.
- Curriculum-based teaching resources.
- Interactive resources including CD-ROMs and web-based resources.

Through its national network of farmers and agribusinesses including manufacturers and suppliers, Kondinin also has the ability to continue co-ordinating a national 'Taking Agriculture to the Classroom' week.

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### **4.3 Campaign for Australian Agriculture**

The National Farmers' Federation is developing a strategy to give metropolitan Australians the opportunity to gain a greater and more positive understanding of rural Australia.

NFF's long-term strategy will aim to use awareness-raising activities and education to reconnect metropolitan Australians with the source of their clean, fresh and safe food and fibre. NFF's research suggests that there is an underlying positive attitude and empathy toward farmers in metropolitan Australia. This positive sentiment provides NFF with a good base on which to foster deeper understanding and trust between country and city Australia.

As well as fostering greater understanding, the strategy will ensure that positive images and messages are promoted about rural Australia. These include: the rural way of life, agricultural innovation, the resilience of farmers in the face of adversity, the strong emphasis on sustainable

production, the commitment to the highest standards of animal welfare, and the vital contribution to the nation's economy.

Promoting rural Australia is an important part of any strategy to attract and retain workers and families on farms and in rural communities. Research released by the Australian Farm Institute this year shows that Australian agriculture supports about 1.6 million jobs. In other words, more than 17 per cent of all jobs in Australia are supported in some way by Australian agriculture. More than half the jobs created by agriculture are actually located in Australia's six State capital cities. They may not understand rural Australia, farm production methods or farming families, but urban communities rely just as heavily today on rural enterprise for their food, clothing, and perhaps even their job. NFF is confident that with a united effort from rural Australia, we can reverse this worrying trend in relation to the disconnect between many Australians and the sources of their food and fibre.

In order to secure the future, the NFF must confront the city-country divide and work hard to:

- improve the perceptions of agriculture and regional Australia;
- raise awareness and understanding of food and fibre production systems; and
- promote the unique business and social opportunities offered by rural and regional living.

Government policies are also needed that recognise the urban-regional divide and provide incentives to promote the flow of investment, business and population into regional Australia. The strategy will set out to address a range of questions including:

- What can we do to bridge the city-country divide?
- What role can individual farmers play in promoting positive perceptions of farming and rural Australia?
- What is the most effective way to educate people about agricultural issues?
- How can we learn from the overseas experience?
- How can we adopt a long-term strategic approach to address these issues?

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## **4.4 Education Program at the Sydney Royal Easter Show**

### **4.4.1 Education of School Groups**

Education of schools groups is a significant distributor of agricultural information throughout the Show. Approximately 20,000 students visit each year and they are involved in a range of activities. The school specific education include the following:

- Production of Schools Resource Kits on the Internet
- Development of an intensive marketing program
- Further development of Demonstration Kitchen sessions

- Further development of Sensory Analysis of Food sessions
- Continuation of District Exhibit talks
- Continuation of Working Dairy, sheep and beef cattle talks
- Continued development of an interactive education centre – The Hub.

The school resource kit is available on the Easter Show website

[www.eastershow.com.au/schools.htm](http://www.eastershow.com.au/schools.htm). This website allowed teachers to print off the worksheets that they required, and also customise them if they felt it was necessary. All secondary worksheets had to be rewritten in accordance with the latest state syllabus. The curriculum areas targeted with resource material in 2005 were:

#### **Primary**

Science and Technology  
Human Society and Its Environment

#### **Secondary**

Design and Technology  
Food Technology  
Agriculture  
Science  
Mathematics

#### **4.4.2 Education of the General Public**

The Hub was designed to give visitors of all ages an interactive Show experience coupled with educational messages, the depth of which was dependent on the interest of each individual. The theme of this year was: "*Where is Agriculture? It is virtually everywhere.*" School students and the general public came face to face with the diversity of agriculture in this country, the important role it plays in our everyday life and the enormous and positive impact it has on our society.

The inclusion of the Nestle Milking Bar Milking Barn gave children of all ages the opportunity get up close to a cow and even have the opportunity to milk one. The House that Agriculture built gave visitors an appreciation of the important role of Agriculture in our everyday life.

The Backyard (stage) Program was continued again this year with a vast range of topics discussed and various subjects, processes and skills demonstrated. The talks and demonstrations overall were well received, with the more popular ones involved the presentation of animals or an activity the audience could become involved in, such as those by the CSIRO.

The Hub saw the continuation of the passport program, which worked very well and helped to direct the traffic around the various education parts of the Showground. Over 24,000 education passports were handed out during the Show, where children undertook ten interactive activities to increase their understanding of the role of agriculture and caring for the environment around them. The response to the passport program by teachers, parents and children was again very positive and they were given the opportunity to learn some important lessons.

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## **4.5 RASfarm Education Program, Victoria**

Paul and Maree Jamieson deliver the Victorian RASfarm Education Program. Both are qualified primary school teachers, with over 20 years practical farming experience. Visiting Schools in a purpose built vehicle accompanied by some of their farmyard friends, the pair employ a comprehensive, interactive combination of teaching materials to demonstrate the importance of agriculture to primary school children of all ages.

### **4.5.1 A Taste of the Farm**

A Taste of the Farm is suitable for primary school children of all ages and grade levels. This program encourages participants to handle and play with a variety of domestic farm animals including lambs and ewes, ducks, geese, chickens, goats, llamas, calves and piglets in a supervised environment. The session begins with a short talk about the various animals, their domestic uses and potential outputs, animal care and feeding, and also includes time for children to ask questions.

### **4.5.2 RASfarm Education Kits**

Each School participating in either RASfarm program may also purchase the RASfarm Education Kit. The Kit enables teaching staff and students to prepare in advance for each RASfarm visit so as to derive maximum value from this experience. Each RASfarm Education Kit contains a number of agriculturally-themed modules, incorporating reading packs and worksheets on relevant curricula including Science and SOSE, which can be tailored to suit children from Grades Prep to Six.

### **4.5.3 Royal Melbourne Show - Show School's Day Young Explorers' Trail**

In 2005 the RAS introduced the Young Explorers' Trail. The trail provides students with an opportunity to explore the various aspects of the Royal Melbourne Show at their leisure and in an educational manner. The trail covers five main topic areas: Grains, Vegetation, Livestock, Technology, and Environment. Each stop is designed to provide several key learning outcomes in a fun and interactive way. The 2005 Trail is designed for upper primary and junior secondary students, however, teachers of younger children can use the trail as a basis to supplement their own instruction and teaching on the day. A series of activities has been produced to reinforce back in the classroom the key agricultural and scientific concepts introduced at the Show.

### **4.5.4 RAS Show Schools Competition**

The RAS conducts School-based categories over a range of competition areas. The competitions allow students to develop their skills in ring craft, animal husbandry, teamwork and communication whilst providing them with exposure to their specific industry.

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#### 4.6 Primary Industries Week (Queensland)

Primary Industries Week is a celebration of all that primary industries offer to the Queensland economy and the quality of life for all Queenslanders. Primary Industries Week 2005 included - a Guinness Book of World Record attempt at most diverse fruit salad ever created at the Feast of the Senses Market Day Extravaganza (topping the list at 79 fruits), AgForce 'City meets Country' Golf Day, Fresh Futures - careers in agriculture forums, Queensland Farmer's Federation Climate Forum, Rural Discovery Day, Enterprising Women in Rural Industries Trade Show, Living the Queensland Lifestyle Expo at Redlands, Science in the Burnett - Research Station Open Day, DPI&F Fishing Clinics, Rockhampton Food and Wine Trail and Signature Dish Launch, Forestry Fire Awareness Days and more. Primary Industries Week 2006 dates are 25 March - 1 April.

[Primary Industries Week Inc. is a not-for-profit organisation committed to building and enhancing public awareness and understanding of the value and importance of primary industries in Queensland. Established in 1998, PIW Inc. has been integral in organising the annual celebration that is Queensland's Primary Industries Week. Member organisations include: AgAware, AgForce, Brisbane Markets Limited, Canegrowers, Cotton Australia, Department of Primary Industries and Fisheries, Nursery and Garden Industry Queensland, Queensland Farmers Federation, The Royal National Association, Rural Press Club and the Queensland Chicken Growers' Association].

**Contact:** Primary Industries Week Inc

#### 4.7 Rural Discovery Day (Queensland)

Rural Discovery Day is aimed at primary school students from years 4-7 and provides an opportunity for South-East Queensland students to discover some of the realities of our primary industries. Presentations are scheduled in 20-minute sessions throughout the day to which class groups are rotated giving full access to the range of participating industries. In 2005 about 1300 primary students from 16 schools attended the one-day event. Six local High Schools provided about 80 students to assist with the teachers and children.

Industry groups who presented at Rural Discovery Day 2005 included AgAware, AgForce Cattle, AgForce Grains, AgForce Sheep & Wool, Australian Banana Promotions, Barnyard Babies (animal petting), BCS Coffee, Brisbane Markets, Canegrowers, Cotton Australia, CSIRO, DPI&F Make an animal smile, DPI&F Fire Ants, DPI&F Fisheries, NRMSEQ, Nursery & Garden Industry of Queensland, Peanut Company of Australia, PetPEP, Queensland Beekeepers, Rainbow Coffee, Sugar CRC and Sunny Queen Eggs.

Department of Primary Industries and Fisheries (DPI&F) have some specific activities for schools, mainly the Fire Ant program and an Animal Welfare program. Activities can be downloaded from the DPI&F website.

**Contact:**

Primary Industries Week Inc

#### **4.8 Food and Fibre trail, Queensland**

The Food & Fibre Trail is an educational initiative of the Queensland Farmers' Federation (QFF) in partnership with the Department of Primary Industries and Fisheries and the Royal National Association. QFF funds the AgAware Group to help with the initiative.

The Trail consists of presentations to year 4-7 students on various aspects of primary production in Queensland. The program informs students and their teachers about the importance of agriculture to the economy, and the management of natural resources by farmers, whilst providing an interactive learning experience. It is strongly supported by the key farm organisations and farmers who make the presentations about their operations.

Presenters provide a 20-minute, fun session on their commodity, with hands-on learning opportunities. Online classroom material on agriculture is available at [www.qff.org.au](http://www.qff.org.au) and free AgAware learning modules can be obtained from The AgAware Group (see 6.1).

The Trail is held at the EKKA (Royal Queensland Show) over two-days. Schools can book for one day, participating in up to 5 presentations. Upon their arrival at the Showgrounds, schools are provided with a sample bag and Food & Fibre Trail 'passport' that is stamped at the end of each presentation. Information sheets, samples and promotional material may be collected for their sample bag.

Senior agriculture students from high schools and colleges are trained as trail guides to assist the teachers find their way through the Trail and encourage informal learning opportunities along the way. In 2005 about 1300 primary students attended over the two days. The event enjoyed the support of 54 guides who came from four local High Schools. Barnyard Babies is a local mobile farm group that also works with the above events.

**Contact:**

Queensland Farmers Federation

#### **4.9 Ag-Ed Program, Queensland**

With the support of RASQ the Ag-Ed Program commenced in 1994 and is now in its eleventh year. The 'classroom without walls experience' runs at both the Toowoomba and Beaudesert Agricultural Shows. This year 2,500 students from 57 schools participated along with 30 industry presenters. Gold Coast is looking at introducing a similar Ag-Ed program in 2006. The status of the Dalby Show program is not known.

Samantha McConnell-Green is a trained teacher who coordinates the program on behalf of RASQ. The program targets Grade 5 to Grade 10 students and teachers, but is flexible enough to cater for interested teachers at both ends beyond that range. The program produces a curriculum resource package that sells for \$15. Teachers can purchase a resource package and nominate the four (or more) preferred half-hour industry presentations for their students. The cost of participating in up to four sessions on any one day is \$3.50 per student.

The 2005 industry presentations included Quarantine sniffer dogs from the Department of Primary Industries, Cotton Australia and Beekeeping. Quality presenters with a passion for their topic are a



key feature of the industry presentations. For example, Reg Moore is a practicing teacher and beekeeper that has been popular for all eleven years of the program.

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#### 4.10 Urban Rural Links Program, Victoria

The former City of Essendon initiated the Urban Rural Links program in 1993, where 400 students and teachers from urban schools visited the Shepparton region to learn about food production and the threats posed by land degradation. As part of an exchange program country schools visited Melbourne, sharing experiences and learning about environmental problems in urban areas.

The objectives of the Urban Rural Links Program are to:

- Promote closer links between rural and urban communities.
- Develop understanding of land degradation and its relationship to sustainable agricultural.
- Promote a cooperative approach towards sustainable agriculture and conservation of natural resources.
- Provide opportunities for people from urban and rural communities to take positive action to overcome land degradation.
- Promote and strengthen Landcare as a key component of environmental management within rural and urban communities.

These are achieved by:

- Establishing links between urban and rural Councils, communities and schools.
- Promoting and strengthening the Landcare ethic within urban and rural communities.
- Providing skills, knowledge and opportunities within the schools curriculum for students to become actively involved in Landcare activities.
- Developing a wider awareness and understanding of the links between sustainable agricultural production and the conservation of natural resources.
- Providing opportunities for rural based communities to meet and mix with urban communities that generally have a broader ethnic and cultural composition.

A strength of the Urban Rural Links Program lies in the Steering Committee, which comprises representatives of urban and rural municipalities, Department of Primary Industries/Department of Sustainability and Environment, Museum Victoria, Victorian Catchment Management Councils and the Department of Education and Training.

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#### 4.11 Teaching Farms, Country Education Project, Victoria

The Country Education Project (CEP) is a statewide organisation that supports the provision of education within rural communities across Victoria. CEP covers approximately 400 educational communities who are: at least 130 kilometres from the CBD of Melbourne and at least 25 kilometres from a regional population centre of at least 10,000. It has been in existence for well over twenty years and in that time has been involved in supporting, facilitating and co-ordinating a number of innovative and responsive programs for young people throughout rural Victoria.

CEP has a number of objectives including:

- Building capacity of rural communities through provision of high quality education
- Promoting a broad education provision through innovative thinking
- Supporting partnerships as a way to supporting education provision
- Advocating at all levels for the ongoing support and need of rural education provision.

A committee of management manages the Country Education Project. The Committee comprises representatives from numerous rural settings from across Victoria.

##### 4.11.1 Teaching Farms Program

The Teaching Farms program provides a wide range of opportunities for young people to gain a greater understanding and experience of rural and farming life. The Department of Primary Industries, Department of Education and Training, Country Education Project and Victorian Farmers Federation jointly support the program. Young people in Year 5 to Year 8 from a "city" school spend up to seven days in a rural location, being hosted by a farming family, attending school with their host and getting involved in a number of activities relevant to rural life. Host and visiting schools can develop on-going partnerships and integrate into their curriculum relevant studies of agriculture and urban-rural connections. LandLearn and the Victorian Landcare Centre provide supporting resources.

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#### 4.12 Golden Cow - Tongala Dairy Industry Training Centre

The Golden Cow was established in 1994 to inform and educate tourists, students, farmers, and industry personnel the dairy industry and associated environmental issues. The 'Golden Cow' is now known as the Tongala Dairy Industry Training Centre. It offers Adult education, children's holiday programs, conducts school tours and is a functional mini farm. The educational elements of the Centre include:

- **A Working Dairy** with six breeds of dairy cows. Students see the milking process first hand, visit the vat room, discuss the processes of pasteurisation and homogenisation, and explore milk production by state on a 3-D map of Australia.
- **Hand Milking** - students are given the opportunity of a hand milking demonstration in a recreated 1900's dairy shed with one of the 'house cows'.

- **Nestle Display Area** - display of milk and milk products and where they fit in the healthy food pyramid. Exploration of Nestle' products (Nestle' is adjacent to "The Golden Cow").
- **Feed Calves and Animals** - students can feed the calves and interact with them.
- **Goldie, The Golden Cow** - students meet Goldie, the mechanical cow and a former TV celebrity who featured on Peter Russell-Clarke advertisements promoting butter.
- **Irrigation Model** - a 3-D model (6 metres x 2 metres) which shows flood irrigation. Students can lift the bay outlets and watch the water flood down the bays. Water allocation, lasering and check banks are also explored.
- **Watertable Watch Test Well** - Students see the level of the watertable at "The Golden Cow." "Safe," "Caution" and "Dangerous" watertable levels are explored. This area is linked to the salinity pit.
- **Salinity Pit** - a 3-D interactive model showing two farms: one is affected by salinity and the other property has a healthy watertable level. The model has a cutaway view of the soil profile, which shows the level of the watertable on each farm.
- **Video** - A day in the life of a dairy farmer, which is a short 8-minute video to show the students how a dairy farmer lives.

Teacher resources and student activities can be downloaded from the Golden Cow website.

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### 4.13 Collingwood Children's Farm (Melbourne, Victoria)

In 1979, a Community Committee, with support from the former Collingwood City Council, leased a small area of the convent (run by the nuns of the Order of the Good Shepherd) for a Children's Farm. The Committee hoped children living in an urban environment, often without backyards, could learn to care for animals and nature and also have fun outdoors. Members of the Greek Elderly Citizens and the Turkish Welfare Group helped clear weeds and carve out the community garden plots.

Since the 1980's, state and local governments have funded some of the Farm's costs. State and Federal Labour governments supported a successful bid for a much larger area of land. Now the Collingwood Children's farm Committee of Management manages this Crown Land site. Service clubs and philanthropic trusts help out, but always the largest part of operational costs comes from entry fees, donations and through the work of volunteers. The philosophies of Permaculture, Landcare and organic farming guide what happens on the farm.

#### 4.13.1 Zones of Activity

Zones of activity have been created at the farm. The orchard is downhill from the duck yard. Water from the duck pond flows first into a drain lined with reeds that filter the nutrients. It then passes down the slope through underground pipes and is distributed throughout the orchard to fertilise the trees and produce good quality fruit. Most of the fruit is sold or used in food prepared

for 'Family Days'. The chooks and ducks clean up any fallen fruit, reducing the carryover of pests and diseases to the new season's fruit.

#### **4.13.2 Education**

Collingwood Children's Farm offers an educational, interactive farm experience for all age groups and school levels. Trained staff lead the tours where children can milk the cow, bottle feed the lambs (seasonal), learn how to correctly approach and handle farm animals and experience 'life on the farm.' All animals are bred on site. Organic Heritage Orchards and Gardens showcase the Permaculture principles of growing vegetables, fruit trees and herbs.

For many young children Collingwood Children's Farm is their first experience with farms and farm animals. Early childhood farm tours have been specially designed, taking into account the development needs and interests of young children.

#### **4.13.3 Collingwood Farmer's Program**

This program has been in operation at the Farm for about 18 years. It first commenced in a very unstructured way with a few local kids coming down to ride the horses. Those young people would work around the Farm helping with the chores or clearing away blackberry bushes. These days the program is much more structured due to its popularity, the number of horses and the safety concerns that occur when working with large animals and children.

The program operates on Saturdays and Sundays for children aged between 8 & 16 years of age who live in the City Of Yarra. Horse care and riding are a major focus within the program but before anyone gets to handle the horses, the farm chores must be done. Children work closely with Farm staff on a wide variety of Farm activities including: animal care, cleaning pens, grooming, vaccinating, leading and handling, horticulture, sowing & collecting seeds, propagating, planting & harvesting, fundraising, preparing and serving food, cooking, running activities, Landcare, planting trees, revegetation work, worm farm and composting.

For many inner city children their involvement in this program is the first contact with large animals, open space, and working outdoors in a supportive and educational structure. Staff are on hand to offer their speciality skills, support, encouragement, nurturing and many become positive role models for the children.

The Collingwood Farmer's Program operates with help from parents and volunteers. Parents of participants play an active role by supporting the Farm with its Family Days and fundraising events. Each year a Gymkhana is held at the Farm. For the young farmers, it is a chance to participate in an official horse show and showcase their skill and talent.

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#### **4.14 Fairfield City Farm, NSW**

Fairfield City Farm is a farm-based attraction, close to the heart of Sydney, where everyone can get up close to a range of native and farmyard animals. Daily shows include animal feeding, cow milking, sheep shearing and a working dog show.

In 1984 Fairfield City Council took up the lease on the land and created Fairfield City Farm to conduct educational programs. In 1989 a soil conservation education program started and in 1995 the City 'Landcare in Your Own Backyard' garden opened - now the Permaculture Garden.

Fairfield City Farm is an approximately 580 acre farm-based attraction located less than an hour from the centre of Sydney's CBD. It has facilities that cater for corporate functions and private parties as well as offering a wide range of excursions for Infants, Primary and High Schools. An experienced, informative Tour Guide is provided for each group of approximately 30 students. Tours offer students "hands-on" learning experiences and worksheets are available for each Tour.

Fairfield farm also has a range of mobile farms, demonstrations and activities. At least two staff members travel with all mobile farms. Each display lasts four hours. The mobile farms include a Domestic Animal Display, Native Animal Display, Spectacular Sheep Shearing and Cow Milking.

**Contact:**

Fairfield Farm

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W: [www.cityfarm.com.au/cityfarm/index1.html](http://www.cityfarm.com.au/cityfarm/index1.html)

#### **4.15 Kindling Kingaroy Friendships – St Columba's Primary School, Brisbane**

St Columba's PS, an inner Brisbane school, has for several years run a program with South Burnett Catholic College, Kingaroy, to promote mutual understanding. This is a whole-of-year program. In 2003, teachers at the school were planning the years' learning experiences for their Year 4 students, when they realised that the word 'drought' really meant nothing to inner city Brisbane children. The school linked with a Year 3 class at South Burnett Catholic College in Kingaroy and began corresponding with their country penpals.

'Rural Discovery Day' (see 4.7) provided the opportunity for the Brisbane students to begin gathering knowledge about primary industries. The students spent a day at the RNA showgrounds, attending expert sessions and learning about life on a dairy farm at Kilcoy, fire ants, horses, sugarcane farming, cotton growing, fruit growing, pig raising and farm safety.

A school camp in Kingaroy helped the Brisbane students learn first hand about primary industry. The Kingaroy students travelled to Brisbane where they met with the St Columba's students and had a day together at the Ekka (Queensland Show). According to the teachers the whole exercise helped to develop respect, appreciation and an understanding of others and their lifestyles.

**Contact:**

St Columba's Primary School

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## 5 Promoting agriculture through Science, Mathematics and Technology

### 5.1 'Skilling the Cradle Coast Community for the 21st Century.'

Dr David Russell from the University of Tasmania, School of Agricultural Science, at the Cradle Coast Campus is leading a number of projects that use science and technology to increase high school and college student participation in education, training and subsequent employment in the local region. Many aspects of these projects, particularly engaging teachers with agricultural industries, provide useful models for promoting agriculture in schools.

The program's aims include:

- To increase the interest and relevance of science to students.
- To increase student awareness of careers in science-based industries.
- To develop professional development courses for teachers.
- To provide trained and highly educated personnel to meet the needs of current and emerging industries in the Cradle Coast region.

A two-day professional development program took teachers from six North-West high schools (and one from Victoria!) through: Tasmanian Alkaloids, Ashgrove Cheese, Simplot field and processing operations, House of Anvers, Serve-Ag, Botanical Resources Australia, Cradle Coast Campus, and the Tasmanian Institute of Agricultural Research. After dinner two young scientists talked about their research and career pathways in gene technology and genetics.

Since the start of 2005, Skilling the Cradle Coast has been involved in a variety of different activities across a range of schools. The number of schools involved in the Project has grown from nine to fifteen and the Project activities have continued to develop in order to provide the most effective support possible for students and teachers. As part of Skilling the Cradle Coast a professional learning opportunity titled "Science in Context: Cradle Coast's Food and Extractive Industries" gave teachers the chance to get 'behind-the-scenes' at a number of science-based local companies and find out what really happens in the world of a working scientist.

Teachers have become more aware of the science that is happening constantly along the Coast, the scope of careers represented in the science field and the diversity of opportunities available for young people who study science beyond high school and college. Professional Learning programs like this one also provide a context for the teaching that occurs back in the classroom - activities and units can be built around real-life industries, with realistic applications and relevant, up-to-date knowledge of what is actually happening in industry. The Program also offers in-school science orientation and professional development sessions focusing on science in the Essential Learnings, laboratory skills and curriculum development.

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### 5.1.1 Strengths of the Skilling the Cradle Coast program:

- Program is firmly grounded in the science of agriculture and offers teachers a high quality professional development opportunity.
- Program is well-funded (particularly at the federal level) and well-resourced with projects in Tasmania as well as South Australia and Western Australia. Beginning in 2001 the program is currently funded until 2006.
- Strong and diverse partnerships exist between the University of Tasmania and funding bodies including DEST, GRDC, Uni of Western Australia, Ian Potter Foundation, DOTARS and other industry partners.
- Strong links between tertiary sector and primary or secondary schools. The University links with secondary schools through student camps, school visits and teacher workshops. Also the development of teaching resources eg. CD-ROM.
- Agriculture is promoted through camps where students view agricultural industries and through school visits where university staff visit High Schools and Colleges to make available information regarding agricultural science careers and training.
- Industries allow students to visit premises to view agricultural work practices. School institutions allow teachers to attend agricultural science professional learning sessions and allow students to attend camps.
- Good links:
  - <http://www.hobart.tased.edu.au/default.htm> (particularly the science of beer, milk and wine)
  - <http://www.launc.tased.edu.au/online/sciences/agsci/index.htm> (website based on the CD version of the "Chemistry and Physics in Tasmanian Agriculture" resource pack)
  - <http://agsci.eliz.tased.edu.au/> (aspects of experimental design - hypothesis formation, student worksheets, modelling, etc)

## 5.2 National Collaborative Centre for Building Future Human Capacity in Primary Industry (Dr David Russell, University of Tasmania, 2005/2006)

*"Exciting students to get involved in science, careers in agriculture and tertiary education".*

### 5.2.1 A National Scoping Study

Dr Brendan Nelson, Minister for Education, Science and Training, is funding this six month study as a special national initiative to connect young people and science teachers in schools with industries and universities. Warren Truss (former Minister for Agriculture, Fisheries and Forestry), Richard Colebeck (Parliamentary Secretary to the Minister for Agriculture, Fisheries and Forestry), Mark Baker (MP, Braddon), Terry Enright (Chair of Chairs of Rural R&Ds), GRDC, University of Tasmania (UTas) and University of Western Australia (UWA) strongly support this study.

This study will assess the national support for a National Collaborative Centre that will manage a national roll-out of a holistic package, designed and tested to promote primary industry science based careers to high school students. This package will be based on the successful case studies conducted in Tasmania (2000 – 2005) and Western Australia (2003 – 2005) supported by UTas, DEST, GRDC, UWA, local industries and education departments.

The major stages of the study are: Research; Round table discussions with Industry, Rural R&D's and Government; National Forum for Collaborators; Costed operational submission.

### 5.2.2 The National Need

Strategic positioning is needed to promote the development of tertiary science education in schools and universities to meet emerging employer needs in Primary Industry. It is clear that in 5-10 years there will be an extreme need for such graduates in the increasingly global knowledge economy – where Australia must feature far more prominently. The key issue is this – Australia must start the change process now. A crucial element is to improve communication between and through industry, tertiary educators and students/teachers.

### 5.2.3 A National Collaborative Centre

The proposed model for the establishment and operation of the Collaborative Centre is based on the effective approach of the UTas/DEST projects: relationship building between partners with similar needs. The Centre will be based at UTas Cradle Coast. Partners will include other universities, leading primary industries, Research Development Corporations, DEST and schools. The Centre would have roles in strategic thinking, managing program activities, policy debate and communication to stakeholders.

The Centre will have a Leadership Hub at the UTas Cradle Coast campus that will provide quality assurance for the investments. In each State there will be groups of partners to implement the UTas/DEST strategies in schools, industries and at universities. These State-based groups will be closely linked to the Hub to ensure that the strategies retain their integrity and that experiences from each State are shared between the projects and amongst all industry and education partners.

### 5.2.4 The Process

The model developed by Dr David Russell involves five underpinning strategies, each one linking schools, universities and primary industries together. The Centre will help the States adopt these strategies and shape them appropriately to meet different local priorities throughout Australia, as well maintaining quality assurance.

A Board of Management will ensure all partners are represented in the decision making process. There will be equal involvement from the key sectors. It is crucial that industry leaders play key roles in promoting and fostering the strategies in their industries.

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### **5.3 Encouraging Students into Science and Careers in Primary Industry in Tasmania and WA" funded by GRDC (2003 - 2009)**

#### **5.3.1 Background**

This program is designed to increase retention of students into post-compulsory science education and then subsequently address a current and predicted skill shortage in Primary Industry, and in particular the Grains Industry.

#### **5.3.2 Aims**

- The initial aim of this program is to encourage high school students to continue on to Year 11/12 science studies and then into tertiary science courses. This aim will focus particularly in the sciences relating to agriculture, with the goal of illustrating a range of career paths available in Primary Industries. An integral part of this program will be the development of strategies to foster connections between Year 7 - 12 schools, Primary Industry, the University of Western Australia and the University of Tasmania.
- The long-term aim is to service a skill shortage, which is now emerging from a number of agricultural businesses and their service providers nationwide. There is evidence from many of these businesses, that future growth and sustainability will demand increased quantity and quality of human resources. Much of this demand will be for increased knowledge and skills in science and technology.
- Concurrently, with the increase in demand for science graduates in Primary Industry, there is a decrease in student participation in science education and training. This program will encourage students to establish career paths in these areas.

#### **5.3.3 Expected outcomes (benefits) to the Australian grains industry**

The project will develop an understanding of the importance of science/agriculture/the grains industry to the local community, the school community and the farming community. Using Tasmania as a pilot community, we will be able to provide the GRDC with a well-tested package to deliver in WA (and as a model for other states), to achieve the objectives of:

- Broadening the horizons of science students, so that they understand the importance of the science of Agriculture and hence the Grains Industry to their future career options;
- Raising the profile of tertiary agricultural science training;
- Increase recruitment into University Agricultural Science courses;
- Promoting career opportunities in the Grains Industry and Agriculture in general.

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## 5.4 Regional Partnerships in Science, Education and Industry (Tas/WA) - funded by ASISTM (2005 - 2006)

This project is providing a cluster of remote schools (Years 5 - 12) with the opportunity to develop innovative methods for the delivery of science to students, using the context of primary industry. This will be achieved by building mutually beneficial and long-term relationships between regional and remote schools with local industries, the Imaginarium Science Centre and UTas.

The project will deliver sustainable outcomes to students in schools by:

1. Utilising teacher associates, non-school organisations and reinvigorated teachers to build student research teams between cluster schools, to collaborate on common topics. This will be facilitated by bringing selected students to science camps.
2. Developing a science mentoring program; tertiary students (TasSTAR) working with secondary students and secondary students working with primary students with the aim of "firing-up" interest in science.

The project will deliver sustainable outcomes to teachers in schools by:

1. Reducing the professional isolation of science teachers in remote schools (many such schools have only one or two trained young science teachers) by providing a centralised science industry-based, professional learning forum for all cluster schools.
2. Delivering curriculum workshops, in which teachers interact with curriculum officers and industry scientists, to produce curriculum resources that support the "Essential Learnings".
3. Participating in a team that translates these resources into an on-line or CD-ROM format, which would contain a significant level of interactivity for students.
4. Building strong relationships between enthusiastic teachers, both within Tasmania and WA, by offering brief interstate teacher exchanges, with the aim of reinforcing inter-school scientific investigations.

Curriculum workshops following on from the professional development sessions will bring teachers from regional schools to develop classroom materials. Outcomes from the project will be published on an interactive CD-ROM.

Partners in the project are:

- Albany Senior High School (Albany) WA
- Hellyer College (Burnie) TAS
- King Island District High School (Currie, King Island) TAS
- Mountain Heights School (Queenstown) TAS
- Penguin High School (Penguin) TAS
- Rosebery District High School (Rosebery) TAS
- Smithton High School (Smithton) TAS
- The Don College (Devonport) TAS
- Ashgrove Cheese Farm
- Botanical Resources Australia
- Department of Agriculture, Western Australia
- Imaginarium Science Centre
- Serve-Ag

- Tasmanian Alkaloids
- The University of Western Australia, Faculty of Natural and Agricultural Sciences
- University of Tasmania, School of Agricultural Science

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**5.5 Grow Smart Careers in Science**

*Grow Smart Careers in Science* aims to address local skill shortages in areas such as horticulture and viticulture. Visiting scientists will work with local teaching staff to inform students about science, science-based careers, and relevant tertiary science qualifications. Other elements of the project will include: a science project officer conducting science presentations with senior secondary students; a two-day training program for teachers; a five-day industry camp for selected students; and student placement with industry every January. Selected teachers will work with tertiary researchers to produce CDs of teacher resources. A second phase of *Grow Smart Careers* will involve an expanded network and a national coordinating committee to promote education and training in horticultural careers.

**Coordinator:** Riverland Horticultural Council Inc

**Partner organisations are**

Browns Well District Area School (Paruna)	SA
East Murray Area School (Karoonda)	SA
Glossop High School (Glossop)	SA
Karoonda Area School (Karoonda)	SA
Lameroo Regional Community School (Lameroo)	SA
Loxton High School (Loxton)	SA
Renmark High School (Renmark)	SA
Swan Reach Area School (Swan Reach)	SA
Waikerie High School (Waikerie)	SA
Flinders University, Faculty of Science and Engineering	
Riverland Horticultural Council Inc	
SA Department of Education and Children's Services	
University of Tasmania, School of Agricultural Science	

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## 5.6 Grow to Learn - Learn to Grow (Northern Territory)

The Dept Primary Industry, Fisheries & Mines (DPIF&M) formerly DBIRD has funded the entire operational costs of the Grow to Learn – Learn to Grow project (G2L). The finance for equipment and infrastructure has come from the Katherine Research Stations regional services.

Sponsorship in the form of prize money was donated by local Katherine businesses. Seed and irrigation was also supplied by local businesses. Funding for cattle education supplied by Edge network/MLA as well as DPIF&M. The Program is largely directed at graziers and stockmen with some involvement of primary and high schools.

In 2005 the G2L project was redesigned to incorporate the Department of Education, Employment & Training (DEET) NT curriculum and the Essential Learning areas. The project ran for a school term. A program that teachers could follow was added to the resource material. This program reached all the required learning outcomes for the students. The G2L project provides teachers with resource material as well as technical assistance on a weekly basis. When the school project was run as a pilot in 2004 there was no resource material provided. 2005 saw the introduction of a structured pilot written into the NT curriculum framework for education.

Schools are invited to participate in the G2L Project. Katherine Research Station Staff also give school talks and lead excursions to the Research Station. In the Northern Territory through the VET program the Research Station is linked with Katherine High School. High school students also visit the local agricultural college for practical based learning.

On a small scale the G2L project has been successful due to the financial and resource support of Katherine Research Station, local schools and local business. The “community” and “kids” tends to be a good formula for the NT. G2L involved 14 teachers, seven schools (including two indigenous community schools) and approximately 175 students.

2005 sponsors included:

- Katherine Mitre 10
- Elders Katherine
- Yandilla Park Agribusiness (all three supply prize money)
- Top End Rural CRT
- Landmark
- Terranova seeds (supplied equipment)

### 5.6.1 Strengths of this program:

- A good example of a small local community - government, industry and the schools - working well together on a limited budget. Support came from local schools, other NT Government departments, Indigenous organisations and DPIF&M.
- A range of other interested parties, including Indigenous support organisations, are assisting in the future development and funding of the project.
- Strong partnerships have developed between the Katherine Research Station (KRS) and local Katherine primary and high schools.

### 5.6.2 Future Directions in the Northern Territory

A status report by L Coutts (December 2004) recommends a four-tier network Strategy for G2L.

- 1) Develop and maintain network with schools. Appoint a facilitator.
- 2) At Local Research Station Level develop network with local schools.
- 3) At Territory level, initiate development of a formal commitment to education about agriculture in NT schools within DPIF&M and between DPIF&M and NT DEET. Develop an education web-page on the DPIF&M website. Review all available agricultural resources Australia wide, initiate resource sharing agreements and link appropriate resources to the outcomes in the NTCF.
- 4) Maintain links with National Networking Committee to facilitate information flow and resource development and sharing.

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## 5.7 Get into Genes

The Australian Centre for Plant Functional Genomics (ACPFPG) and the Molecular Plant Breeding CRC (MPB CRC) jointly deliver *Get into Genes*, a secondary school workshop that explores the role of gene technology in agriculture and specifically in crop improvement.

*Get into Genes* includes presentations on genetics and molecular biology and their role in plant breeding programs. It also involves four interactive workstations where students extract DNA from wheat, investigate cross breeding, try making a DNA fingerprint (gel electrophoresis) and explore molecular markers and restriction enzymes. The workshop concludes with an explanation of genetic engineering in agriculture. Located at each station is a guide indicating the procedure for each experiment, together with a question sheet and a general information handout explaining the science. *Get into Genes* is presented by the ACPFG and MPBCRC's Education team – this consists of young scientists and trained science communicators.

*Get into Genes* is closely linked with the secondary school curriculum and is fully supported by teaching materials. Sessions are predominantly held at the Plant Genomics Centre, at the University of Adelaide's Waite Campus. However, it is also being delivered to schools throughout rural SA and a strategy is being developed so the workshop can be delivered to other states throughout Australia. Thus far, over 700 students have been to the Plant Genomics Centre for the *Get into Genes* workshop, and over 200 students have been visited in rural areas.

### 5.7.1 Other Education / Communication Activities

The ACPFG and MPB CRC have also been hosting professional development workshops for secondary teachers. Each workshop has been developed to either suit the requirements of the teachers or to act as a tool to inform teachers of the latest plant biotechnology research. Many 'Gene Technology for Growers' workshops have been run for 'farmer' audiences providing information on the science behind molecular plant breeding and genetic engineering. These workshops have been delivered at the Esperance and Ravensthorpe Cropping Updates, Minnipa

Agricultural Centre, Yorke Peninsula Growers Group and many more. The workshop has also been delivered at many Rotary and community functions. The ultimate aim is to provide credible information and allow community members to make informed decisions about the role of gene technology in agriculture.

Another initiative arising from the collaboration has been the development of interactive displays. These are an integral part of their outreach communication / education programs and have been delivered at Field Days, Careers Fairs and Royal Shows throughout Australia. This display allows people to see DNA extracted from wheat. It serves to engage the general public in discussion about the role of gene technology in the production of improved wheat, barley and pasture varieties.

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## 5.8 Biotechnology Online - School Resource

The Biotechnology Online School Resource is produced and maintained by the Australian Government agency Biotechnology Australia. Biotechnology Online provides balanced and factual information about biotechnology and was very deliberately designed to fit with Australian State and Territory Science curriculums with cross-over into Studies of Society and the Environment, to allow for broader discussion of issues. The themes covered by the website include What is biotechnology?, Human uses, Environment, Food and Agriculture and Careers.

This resource aims to address the need for Australian secondary schools (particularly Years 9 and 10, up to Years 11 and 12) to have access to up-to-date information on biotechnology. It enables schools to supplement their current educational resources with an online resource that contains informational text, case studies, worksheets, online and off-line activities for students, and advice to teachers to enable them to become familiar with applications of modern biotechnology. The resource should enable teachers and students to understand the differing points of view on current practices, and the ethical and moral questions that form a part of present debate on biotechnology.

The first version of Biotechnology Online was produced in 2001 in collaboration with curriculum-development bodies, science teachers and state and federal education departments.

### 5.8.1 Biotechnology Australia

Biotechnology Australia is an Australian Government agency, responsible for co-ordinating non-regulatory biotechnology issues. It encompasses five Australian Government Departments:

- Department of Industry, Tourism and Resources
- Department of Education, Science and Training

- Department of the Environment and Heritage
- Department of Agriculture Forestry and Fisheries
- Department of Health and Ageing.

Biotechnology Australia also works closely with the following agencies:

- CSIRO
- Office of the Gene Technology Regulator
- Food Standards Australia New Zealand

The Gene Technology Information Service can be contacted toll free on **1800 631 276**.

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## **5.9 Cooperative Research Centre for Australian Weed Management (Weeds CRC)**

### **5.9.1 Education and Training**

Weeds CRC is improving current weed training and developing new initiatives to increase awareness of weed issues and provide skills in weed management at all levels, from the wider community to specialist weed managers.

Weeds CRC has developed an Education Program Operational Plan. The three main tasks are to:

- 1) Educate the next generation of weed researchers and managers
- 2) Develop the skills of weed professionals
- 3) Increase awareness of Primary and Secondary students.

### **5.9.2 Lord of the weeds - A Secondary student program**

Weeds CRC runs a national competition called 'Lord of the Weeds'. The competition offers schools total prize money of \$3500. Accompanying teacher resources have been developed. These include suggested lesson activities, proformas to assist students writing the report, a marking guide and appropriate contacts for teachers.

Students investigate a weed-infested area and then write a report addressing key criteria. In addition to certificates, students submitting reports receive personalised feedback. This makes the 'Lord of the Weeds' a unique and personalised national competition for secondary school students.

### **5.9.3 Ghastly guests - An upper primary unit of work**

'Ghastly guests' is a resource for upper primary teachers nationwide. The unit includes suggested lesson activities with accompanying worksheets and teacher resources. Activities in the unit are linked to the curriculum in each state and territory and can be downloaded as pdfs from the CRC's website. The unit is divided into three sections:

- **What are weeds?** Students complete activities that introduce and describe weeds discovering some basic weed issues and developing their interest to find out more about this topic.
- **Why are weeds such ghastly guests?** The activities in this section provide the opportunity for students to investigate weeds by completing a range of scientific experiments and activities. Students will discover the different adaptations of weeds, weed seed dispersal, weed seed dormancy and plant competition. The experiments and activities in this section are also designed to enable students to develop scientific investigative skills such as: designing and carrying out fair tests; predicting; observing; designing models; recording; evaluating procedures; presenting; and analysing data collected to form conclusions.
- **Final projects.** Students apply the theory that they have learnt by completing some assessable projects.

#### 5.9.4 Weed Warriors

Weed Warriors is an innovative national education and awareness program supported by the Weeds CRC, aiming to empower the community and bring the weed message to the next generation of land and water managers. The program targets the middle years of schooling, but can be adapted to all levels of education. It utilises biological control as the vehicle to introduce weed studies into school curriculum. The Weed Warriors program includes a combination of classroom and field based activities that enable students to answer questions about local weed issues and to contribute to the stewardship of local places. An important aspect of the Weed Warriors program is the establishment of mentor-student relationships, linking schools with key stakeholders in environmental management in their local area.

#### 5.9.5 Weed wipeout game

Weed Wipeout is an interactive game for junior secondary students where the player is in a position of managing a farm with some weed problems. The player is required to make decisions regarding the most appropriate weed management strategy, and then discovers the results of these decisions. Humorous and unexpected events appear, keeping the job at hand very interesting.

The game simulates real life with the player using their bank account to deal with the weed problems on the farm. Players are exposed to problems such as build up of herbicide resistance, the costs and time involved in managing weeds and other problems that are associated with managing a farm. This game was developed with purpose of providing a fun and enjoyable way to learn about weed management.

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## 5.10 CSIRO Education

CSIRO Education involves over 700 000 students, parents and teachers each year in activities that encourage appreciation of science. CSIRO jointly produces the *Totally Wild* science TV program, which has a viewing audience of over 400 000 each week. There are nine CSIRO Science Education Centres across the nation that provide hands-on classes for more than 220 000 students. These workshops are both in the Centres, and through each Centre's *Lab on Legs* travelling program operating throughout Australia. CSIRO's Double Helix Science Club offers two magazines – *The Helix* (circulation 13 000) and *Scientrif .c* (circulation 12 000), as well as events and activities for members. We also offer a range of other programs for students and teachers.

### 5.10.1 CSIRO Science Education Centre's 'Lab on Legs'

This program aims to give teachers of Years 4 to 8 students a unit of work on "Working Scientifically". In order to maximise the benefits for the students the program should involve one or two hours of pre-visit work and a few hours post-visit work. The program aims to clarify for teachers and students such terms as fair tests, variables, controls, hypotheses, conclusions and really develop a thorough understanding of how to design experiments and analyse results. Some of the experiments involve agricultural issues and concepts.

CSIRO's Science Education Cyber-Centres (CSIROSEC) have staff who visit regions with "Lab on Legs", offering a range of hands on science programs at schools (minimum 3 sessions per day). Groups of up to 30 students cost \$180 and groups of up to 60 students cost \$318. Additional students above 30 cost \$6/student up to a maximum of \$318 in total. All sessions are 90-minute science programs with an introductory show and lots of hands-on experiments. 'Gene Technology in Action' workshops are designed for Years 8 to 10 and Years 11-12. The workshops introduce students to DNA science, including basic genetics, the applications of gel electrophoresis, extracting DNA from pea plants, cloning, GM foods, and the implications of gene testing).

#### Contact:

CSIRO Education

Ph 1300 363 400 (local call)

W: [www.csiro.au/index.asp?type=educationIndex](http://www.csiro.au/index.asp?type=educationIndex)

### 5.10.2 Kaleen Village Farm, ACT

This project aims to develop the Kaleen High School Village Farm as a model sustainable ecosystem. Emphasising permaculture and organic techniques, the farm will provide space for field analysis and allow students to apply science and technology skills and processes in a practical environment. Students will be engaged with inquiry, ideas and evidence and link classroom science with the broader community. The project will serve as a contextual model for using sustainable agriculture in science and technology teaching and learning. Its structure and achievements will be widely reported through professional journals, websites and conferences.

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## 5.11 Denmark High School, Western Australia

Science in schools needs to be engaging and meaningful for all students. While science is essential for developing scientific skills and conceptual ideas that will prepare and motivate capable students to become scientists, there is also a need for all students to become scientifically literate members of society. For this, they need to be offered programs that connect their school science to their everyday lives, providing them with opportunities to use the science they learn to address issues and concerns that are relevant to them. At Denmark HS the science curriculum was developed to cater for the specific needs of the students attending that school. Strong working partnerships exist with the local community and government agencies.

Denmark is a small town on the south coast of WA approximately 400 kilometres from Perth. It has a permanent population of about 5,000. The area has strong links to the fishing industry and recreational fishing is a popular activity. Local farmers are facing issues of land salinity and are exploring solutions and alternatives. Tourism is a growing industry, with the forests and beaches making the town a popular tourist destination.

Secondary students in Denmark and the surrounding areas are serviced by a high school that caters for students in years 8–10. Most students continue their Years 11 and 12 studies in Albany. Denmark has a campus of the WA College of Agriculture that draws students from across the State.

The school offers units in aquaculture to students in year 10, enabling them to achieve the outcomes of the Working Scientifically, Natural and Processed Materials, Energy and Change, and Life and Living strands of the Science Outcome Statements. The integrated nature of the program models real-life experiences in science, while still maintaining a focus on students' learning and their achievement of the science outcomes.

Fisheries WA is actively supporting research into the development of a cooperative aquaculture industry with farmers, who are facing the effects of salinity – land is becoming unsuitable for traditional crops and farm dams are too salty for livestock. They are facing a generational change in the use of their land. Research into the use of salty dams for trout farming has indicated the potential for this to become a significant industry in the State. However, further research is required; farmers' attitudes to the adoption of less traditional farming practices need to be addressed; and farmers' knowledge of and skills in aquaculture practices need to be enhanced. With students learning through an aquaculture context, opportunities are being provided to address these issues.

### 5.11.1 Benefits to students

This program offers students a broad range of advantages including:

- Motivation: they have an interest in fish and fishing, so learning science through working with these animals is relevant, meaningful and interesting.
- Local relevance. As the farming community moves from agriculture to aquaculture this program helps to increase the knowledge base supporting development of the local industry.
- Authentic science: students are actively engaging in investigations that contribute to local scientific knowledge.
- Economic importance: students can make a contribution to the future growth of the area.

- Challenging science: students strive to achieve higher level outcomes.
- Connections between learning areas: students achieve outcomes across several areas.

The school administration recognises the change in students' attitudes towards science and schooling that occurred as a result of their involvement in this program. One girl who saw little value in schooling in year 9 has changed her attitude in year 10. Her motivation was illustrated by her keenness to maintain the monitoring of the fish after school hours and during school vacations. There was also an increase in the number of students pursuing courses beyond year 10 with the intention of a career in aquaculture.

The success of the program in year 10 is leading the school to explore:

- opportunities for students to continue their studies of aquaculture in post-compulsory schooling through TAFE at Denmark – other members of the community are also being encouraged to participate
- further links across the curriculum, particularly in Technology and Enterprise
- the formation of a cooperative model for other schools. Modern communications technology enables schools to work collaboratively on scientific research. Groups of students in one school can investigate aspects of fish growth and development and share their experimental design and results with students in other schools. In this way, they become part of a more significant scientific research project and engage in higher order analytical thinking.

### **5.12 Scots PGC College Sustainability Centre, Warwick, Queensland**

Scots PGC College is setting up (retrofitting) a house and a 1.5-hectare block as a model sustainability centre at the College. An ASISTM Grant is supporting the development of the centre. The school is the only non-Brisbane centre for the Queensland Environmentally Sustainable Schools Initiative (QESSI), and encourages networking with any regional interested schools.

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### **5.13 Biloela Senior High School**

Biloela SHS has a project that integrates agriculture into the science curriculum for middle school students. The program has run for two years and is evolving successfully. An ASISTM grant has helped to develop the program. Both Agriculture and Science outcomes are included in the project. The program involves professional development for science teachers to develop confidence to teach Agriculture.

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### **5.14 AgAware, STAQ and partners - Soil/water/pest management processes**

Agaware is working with the Science Teachers Association Queensland and other partners, including Natural Resource Management South East Queensland (NRMSEQ), Queensland Natural Resources and Mines (Qld NR&M) and Catholic Education to achieve professional development for teachers and resources for schools based around soil/water/pest management processes.

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### **5.15 Queensland Museum Bio-Bus**

The Queensland Museum has recently launched a "Bio-Bus" that takes programs about Biotechnology to schools throughout the State. The BioBus travels directly to schools in 30-35 centres each year. The exhibition introduces students and community visitors to a wide variety of biotechnology examples in the areas of environment, human health, agriculture and investigating with DNA - both existing applications and future possibilities. It provides an interactive exhibition program, accompanying student laboratory program and teacher professional development. The audience for the BioBus is primarily Year 9 to 12 science students. Projections show that the biotechnology industry will provide 2,500 Queensland jobs by 2010 and 10,000 by 2025.

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### **5.16 Cotton Australia Education Resources**

Cotton Australia has a website providing information for educators and students of all ages. A Cotton Education Kit is available for secondary school students and teachers, a series of fact sheets provide more detailed information, and the Kids Fact Sheets Book caters for younger students. Website: [www.cottonaustralia.com.au](http://www.cottonaustralia.com.au)

In July 2005, Niel Jacobsen from Dane Consulting completed a report for Cotton Australia entitled "How do we get people onto our farms? - the role of Cotton Australia. The report has implications for a national approach to promoting agriculture to schools. It reinforces that regardless of the type of industry, three constant themes keep emerging in the search for effective attraction and retention strategies: (1) Skills recognition and training; (2) Career pathways; and (3) Good working environment.

## 6 Promoting agriculture through studies of society and the environment

### 6.1 The AgAware Group

Whilst the AgAware Group produces resource materials across a range of curricula (particularly science), they provide us with a good opportunity to look at societal issues related to agriculture, and are therefore included here largely for the purpose of discussion.

The AgAware Group has developed strategies and resource materials for curriculum, schools, teachers, students, parents, primary producers and agribusiness, post-secondary education, Government and the broader community. By encouraging school students and the broader community to acquire further understanding and insights into modern agriculture the AgAware Group, and its partners, aim to increase understanding of the role of agriculture in our society and highlight the inter-dependence and connections of rural and regional Australia with urban Australia. The AgAware Group has developed a collaborative alliance with the Queensland Schools Authority as well as strong working links with agribusiness, grower organisations, the DPI&F and EQ and community groups. An external evaluation of the AgAware Group by Dr Jeff Coutts, University of Queensland, confirms the impact and effectiveness of the group's work. AgAware is a joint initiative of Queensland Department of Primary Industries, Education Queensland and agricultural industries.

#### 6.1.1 AgAware Partners in Learning

The following bodies have contributed to the development and continuation of the AgAware Group:

- Queensland Department of Primary Industries and Fisheries (DPI&F)
- Education Queensland
- AgForce
- Queensland Fruit and Vegetable Growers
- Grains Research Foundation
- Cotton Australia
- Queensland Dairyfarmers' Organisation
- Queensland Pork Producers Inc.
- Queensland Chicken Growers Association
- Queensland Country Women of Australia
- Queensland School Curriculum Council
- Canegrowers

#### 6.1.2 AgAware key messages:

- A. Agriculture comprises a range of activities for producing animal and plant products essential in satisfying human needs for food, fibre and shelter. Specialised forms of agriculture produce products and services that assist human health, recreation and leisure.
- B. Modern agriculture utilises and incorporates a set of principles for environmental sustainability.

- C. Agriculture comprises a range of interconnected enterprises known as agribusiness which incorporate primary, secondary and tertiary industry and involve the synthesis, refining, marketing and distribution of agricultural products.
- D. Agricultural industries make significant contributions to both the domestic and national economies, and create employment opportunities in support industries and services in rural, regional and metropolitan areas.
- E. Successful modern agriculture requires applying acquired specialised knowledge and skills from many disciplines, and an understanding of the many factors that impact on agricultural viability.
- F. Agriculture has made, and continues to make, significant contributions to Australian society, history and culture at a local, national and international level.
- G. Agriculture continues to undergo rapid change through the development of new technologies, new products, new industries and new markets.

### 6.1.3 A selection of AgAware Learning Modules:

- Level 1: Years 1–2 The growth & care of chickens  
Using a **technology** focus, activities are designed to help students understand the needs of living things, especially animals.
- Level 1: Years 1–2 Helping Farmer Sustain  
This module uses the school grounds and the planting and care of seeds to help develop an understanding of the concepts of sustainability in farming. The focus is **on environmental education and SOSE**.
- Level 2: Years 2–3 Farming at school: growing vegetables  
**Focus on Science, Studies of Society & the Environment**
- Level 4: Years 6–7 Agribusiness: How important is agriculture in your life?  
Activities are designed to help students understand their links to agricultural production through the agri-chain, and the importance of agriculture to the Australian economy.
- Level 4: Years 6–7 From sun to shop  
Examines the **scientific** basis of sustainable farming and protection of the environment. Students are involved in decision-making that involves consideration of farms as ecosystems as well as ecosystems as a whole.

### 6.1.4 Strengths of this model:

- Strong partnerships established and maintained
- Good reputation for delivering
- Production of well-targeted, quality resources right across the curriculum
- Clear focus on promoting the importance of agriculture

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## 6.2 LandLearn - Victoria's education about agriculture program

LandLearn provides a structure and support for schools to incorporate studies of sustainable agriculture, natural resource management, and food production in a holistic, integrated curriculum program. Support is provided through a comprehensive professional development program for teachers about agriculture; curriculum resources and student activities to enhance engagement with teachers.

LandLearn's vision of success is: "School communities (students, parents & teachers) who understand and value sustainable agriculture and associated industries as the producers of their food and fibre and for their contribution to the economy. Environmental practices and student activities around the school and local community reflect this knowledge and understanding of sustainable natural resource management."

LandLearn aims to achieve the following goals:

- Studies of sustainable agriculture, natural resource management and food industries embedded in schools' curricula
- Future consumers and decision-makers who understand, and value the role of agriculture and food production industries and their contribution to Victoria's, and Australia's economies
- Informed, interested and skilled future workforce for environmental management, agriculture, food production and associated industries
- Active participation by schools in local natural resource management projects
- Partnerships between schools and community groups, such as Landcare, and between urban and rural schools.

### 6.2.1 Key messages for teachers

- Education about sustainable agriculture and environmental management has a place in schools' curriculum.
- Environment education engages students in active, hands-on learning that can include participation in on-going community-based projects.
- Support and resources are available.

### 6.2.2 Key messages for students

Caring for our land and its' resources is a shared responsibility. · Action and learning now is an investment in your future - a future with:

- A sustainable environment
- Innovative food and fibre industries supplying Australia and the world
- Viable rural and regional communities
- Challenging, valued and purposeful work.

Across the general teacher population, there is growing knowledge and respect for LandLearn as an education program and increasing use of curriculum designed to achieve LandLearn outcomes. LandLearn has achieved a level of recognition and engagement with the education sector that continues to grow. The project planning decision to focus delivery on a Professional Development program for teachers has resulted in a high level of participation by, and change in, students (Program evaluation, 2005). "LandLearn is the only program undertaking work of this nature focussed on sustainable agriculture." Partnerships and collaboration to deliver integrated activities for schools have achieved more holistic curriculum outcomes.

### 6.2.3 Strengths of this model:

- This program is firmly embedded in the Department of Primary Industries from where it receives the bulk of its support.
- Good networks and linkages established (eg industry, Rural Skills Australia)
- Good reputation for delivering quality teacher Profession Development programs
- Produces a regular well-regarded, quality newsletter
- Clear focus on promoting the importance of agriculture.

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## 6.3 Growing Knowledge – Food, Fibre and Farming in Western Australia

Agriculture Western Australia has an extensive website with a large area dedicated to providing education about agriculture information. A number of the educational resources have been developed from departmental technical information and presented as easy to understand fact sheets. The site contains an overview of the following industries and links to more information:

- Dairy
- Grains
- Horticulture
- Meat
- Wool
- Sustainable agriculture
- Biosecurity

Resources for Teachers are grouped according to 1) Primary teachers, 2) Science teachers, 3) Society and Environment teachers, and 4) Salinity in the Classroom. There are also links, Case studies, Careers in Agriculture and a Teacher Newsletter (Issue No. 8 was released Term 2, 2005. Topics include biosecurity, lessons in food, resources and activities and new websites).

### 6.3.1 Strengths of this model:

- This program is strongly embedded in the Department of Agriculture from where it receives the bulk of its support.
- Good quality resource materials easily accessible from the AgWA website
- Clear focus on promoting the importance of agriculture.
- AgWA also established and supported an 'Ag Ed Taskforce' comprising representatives from Kondinin Group, Cooperative Bulk Handling, Universities, Lockridge Senior High School and Farm, KelmScott Senior High School, Ag Ed Teachers Association and Rural Skills Australia.

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## 6.4 'Learning Through Landcare' Queensland

The Landcare Discovery Centre in Toowoomba is a community educational service provided by the Queensland Murray-Darling Committee Inc. New sponsorship in 2005 from Education Queensland is taking the 'Learning Through Landcare' program to fifty teachers statewide.

The Landcare Discovery Centre continues to develop its highly successful partnership with Education Queensland through the Toowoomba Technology, Mathematics and Science Centre of Excellence. Focused on achieving real environmental outcomes, as well as the option of being accredited towards teachers post-graduate studies, the innovative and ongoing *Science Through Landcare* program.

'Learning Through Landcare' assists schools to participate in an innovative local environmental research and monitoring project. Benefits of the program include free professional development workshops, resource material, assistance from scientific or technical mentors, support from landcare education officers and tickets to the Discovering Landcare Conference in Toowoomba in October for two teachers and five students.

The Landcare Discovery Centre hope to attract rural and remote schools to the 'Learning Through Landcare' program by subsidising some travel, accommodation and registration costs for the conference.

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## 6.5 Tammin Alcoa Landcare Education Centre, Western Australia

In 2005 the *Tammin Alcoa Landcare Education Centre* is celebrating its 15<sup>th</sup> anniversary of operation. Situated on the edge of the Wheatbelt town of Tammin, the Centre has become a blueprint for similar centres across Australia.

Productive partnerships between Alcoa World Alumina Australia, the Shire of Tammin, Department of Education and Training, Department of Agriculture, South Tammin Catchment Group and Tammin community members, have enabled the project to expand since its inception in 1990.

The *Tammin Alcoa Landcare Education Centre* allows participants to increase their knowledge and skills in environmental management in an authentic environment, with training taking place at various field sites. Students, teachers and community members participate in hands-on activities and learn about water resources, environmental destruction, soil and waste degradation and sustainability. By educating people about land degradation and its consequences the Centre aims to bring a new level of knowledge and understanding into future generations in pursuit of a society dedicated to preventing environmental problems.

Landcare Education Programs at Tammin emphasise using the great outdoors as a classroom and participants are immersed into the world of agriculture and the practices being used to address a range of environmental issues. Courses are held on-site at a variety of locations and use fun and informative hands-on activities to develop an understanding and awareness about natural resource management. 'Tammin Alcoa Landcare Education Centre' won the 2001 National Wespac Landcare Education Award.

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## 6.6 Department of Education and Training, Western Australia

### 6.6.1 Landcare education and 'Landcare in Your Hands' website

Website: [www.eddept.wa.edu.au/deo/MIDLANDS/Landcare/liyh/index](http://www.eddept.wa.edu.au/deo/MIDLANDS/Landcare/liyh/index)

The content on this website was originally published as 'Landcare in Your Hands' in 1991 by the Community Landcare Branch of the Department of Agriculture Perth, Western Australia, (now Agriculture WA). This publication was a joint project between the Department of Agriculture, the Ministry of Education (now Education Department WA), the National Soil Conservation Program (now Natural Heritage Trust) and the Alcoa Landcare Project.

The cost of reprinting and distributing the publication to all schools was prohibitive and so this resource is now available on the web. Whilst converting the data there have been major editorial changes to the resource to reflect 1) changes to the Education Department of Western Australia's Curriculum Framework, and 2) new information on Natural Resource Management and results of trials that were being conducted at the time of the 1991 publication. Topics include: Soils, Landcare, Vegetation, Pest Control and Pesticides, Water, Integrated Catchment Management, Land and Stream Salinity, Tree Farming, Economic Advantages to Conservation, Erosion control, Sustainable Management Practices, Eutrophication and Groundwater Modelling.

### 6.6.2 Avon Salinity Education Kit (87 pages)

This educational kit has been developed in partnership with the Department of Education and Training's Landcare Education Program and the Avon Catchment Council. The website also contains 16 issues of the Landcare Education Newsletter 'Ear to the Ground'.

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## 6.7 The Victorian Landcare Centre

Located at Creswick, near Ballarat, the Victorian Landcare Centre was established in 1992 to provide quality environmental education programs to schools and the general community. The Victorian Landcare Centre is part of the Victorian Department of Primary Industries (DPI). Programs have been developed to cater for a wide range of environmental education, with emphasis placed on meeting CSFII and VCE requirements and hands on learning. Self-guided programs are encouraged and field equipment is provided when requested.

Professional development sessions for educators are run throughout Victoria. These sessions cover a range of environmental themes. Teacher training is also available on request to support teachers in delivering environmental education to their students. Staff offer assistance with excursions and unit development. This free service provides educators with ideas and activities to assist in running all types of environmental education in their area. Specialty topics include water quality, forest studies, landscape interpretation and soils.

In November 2005 the Victorian Landcare Centre will launch 'Farm Forestry - Trees at Work' - a new curriculum resource for secondary schools. The resource will be available for download at [www.dpi.vic.gov.au/privateforestry/education](http://www.dpi.vic.gov.au/privateforestry/education)

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## 6.8 Warrambeen Landcare Education Centre, Victoria

Alcoa and Greening Australia developed Warrambeen Landcare Education Centre in conjunction with Ian and Trish Taylor. Ian and Trish run Warrambeen, a 165-year old property running 16,000 sheep on 4000 hectares. Warrambeen has been in Trish Taylor's family for more than a century. Warrambeen Landcare Education Centre is equipped with equipment, landcare displays, and other resources. Greening Australia has developed a Teacher Resource Kit that provides numerous environmental activities for school visitors. All activities are linked to the CSF curriculum and are designed to assist teachers in making the most of a visit to Warrambeen. Warrambeen also provides accommodation.

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## 6.9 Camden Park Environmental Education Centre

Camden Park provides field study activities to support the curriculum of schools, to promote environmental education and to support schools in the implementation of the Environmental Education Curriculum Statement. The centre is situated on the Elizabeth Macarthur Agricultural

Institute, a 1600-hectare grazing property owned by NSW Agriculture and managed for rural research objectives. As such, the Centre is in a unique position to offer environmental education programs in an authentic rural setting within one hour's travel of Sydney.

Staff work with teachers to develop syllabus-relevant, challenging fieldwork designed to enhance classroom learning. They also work with communities in their schools, assisting them in the conduct of environmental audits and the development of their School Environmental Management plan. The Centre supports school-based initiatives related to environmental education such as the sustainable schools program and the St Helens Park Primary School Park Ranger program.

Programs are designed to be hands-on, student centred and attempt to cater to all learning styles and abilities. These programs are varied and utilise existing facilities, resources and expertise. Many programs include student contact with farm animals as well as wild, native and introduced fauna. All key learning areas are taught, with a focus on Human Society and it's Environment (HSIE), Science and Technology, Science, Geography, Biology and Agriculture.

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**6.10 Woodbridge School – Woodbridge School Sustainability Program**

The whole School Sustainability Program coordinated by Nel Smit at Woodbridge School is the first of its kind in Tasmania. The Program addresses the school as a system, implementing sustainable practices both through the curriculum and through environmentally sound operational practices, communicating the purposes of sustainability to all staff, students and the community. Day to day practical tasks focus on biodiversity, resource conservation, energy efficiency and waste reduction. The holistic approach involves practical problem solving and partnerships, working together with sound habits to create sustainable futures. Woodbridge School Sustainability Program won a 2005 Tasmanian Award for Environmental Excellence.

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**6.11 Bridgewater High School, Summerville City Farm and Landcare Centre**

The Bridgewater High School Farm has been developed over the last 12 years into a whole community resource now known as the Summerville City Farm and Landcare Centre. The centre runs agriculture and landcare programs for primary schools, secondary schools and the community as well as professional development for teachers. The farm has a cattle stud and a sheep stud.

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## 7 Promoting agriculture through agricultural and horticultural studies

Specialist Agricultural High Schools and schools with farms continue to play an important role in promoting agriculture. In South Australia, despite a decline in the number of high schools with a farm and the number of Agriculture and Horticulture teachers, agricultural schools continue to be progressive. Urrbrae Agricultural High School and Cleve Area School deserve consideration.

### 7.1 Urrbrae Agricultural High School

Urrbrae Agricultural High School (UAHS) is the only South Australian designated special interest State school with a focus on agriculture and the environment. The school plays a vital leadership role in landcare and education about agriculture for the whole state in terms of providing direction, information and professional development to teachers and schools.

The school offers senior certificates in agriculture, horticulture, animal studies and environmental studies, all of which have the landcare ethic embedded, and provide clear pathways to university or TAFE studies.

Urrbrae is unique in Australia because it is the only school to have an urban constructed wetland that serves as a stormwater retention basin to improve the water quality of the Patawalonga River. This wetland is a cooperative between the school and the local Mitcham Council. A learning centre on the wetland attracted over 12,000 student visits since opening in 1997.

The school's landcare learning activities have been implemented in a range of on-ground action projects on the school site, as well as in the nearby and broader South Australian community. Some of the key projects the school is involved with are the Urrbrae Conservation Volunteers, revegetation of the Kangaroo Island habitat of the endangered Glossy Black Cockatoo, Urrbrae trails program as ecotourism guides, native animal program as breeders of endangered species, catchment mapping of the Urrbrae Wetland catchment and Bushcare action projects in the nearby Waite Conservation Reserve. UAHS uses several planning tools including a Strategic plan for the Environment focus of UAHS and an environment policy which ensure an ongoing commitment to environmental programs within the school.

At Urrbrae Agricultural High School agriculture is a compulsory subject at Junior School level and students have the opportunity to develop knowledge and skills in a wide variety of plant and animal enterprises. The major topics studied in Year 8 include:

- The farm environment - factors affecting production, farming zones in SA, and farm safety.
- Vegetable production - vegetables in the human diet, climatic and soil requirements, soil preparation, fertiliser requirements, pests and diseases, maturity and harvesting.
- Poultry production - the industry, feeding and watering, pest and disease control, record keeping, meat bird production, incubation and brooding, housing and poultry.
- Ornamental horticulture - Types of garden crops, planning the garden, native and exotic plant propagation, plant structure and physiology.

At Year 11 and 12 Urrbrae offers a number of special interest Certificate courses within the South Australian Certificate in Education to assist students prepare for their chosen vocation. Each course has prescribed core compulsory subjects at SACE Stage I and II level.

National Vocational, Education and Training (VET) and TAFE modules have been included within many of the subjects to allow students dual recognition by Secondary Education and Industry/TAFE.

The specialist Courses offered are:

- Urrbrae Certificate in Agriculture
- Urrbrae Certificate in Horticulture (Amenity)
- Urrbrae Certificate in Environmental Studies.
- Urrbrae Certificate in Animal Studies.

### **7.1.1 Ag Learning Centre at the Show**

The Agricultural Learning Centre is run in conjunction with the Royal Adelaide Show. Students from across the state man different stations for the public to learn about agriculture, like sheep, cattle and kelpie puppy dogs. Year 10 students at Urrbrae Agricultural High School are among the volunteers.

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## **7.2 Cleve Area School, South Australia**

Cleve Area School is located on South Australia's Eyre Peninsula and draws students from a wide radius including Kangaroo Island, Mid North and Eyre Peninsula. The Cleve Area School is a specialist school for dryland agriculture that manages a 400-hectare farm. Students take part in a number of cutting-edge farming practices with the community, including no till and yield mapping.

Rural Solutions SA consultant Linden Masters is based at Cleve where he delivers the 'Your Soil's Potential' program to local grower groups. Linden is also Agricultural Education and Innovation Manager at Cleve Area School, two days per week. Linden introduced the Year 11 and 12 Agricultural Studies students to the same program as the farmers, giving the students the opportunity to learn about something that was also happening on many of their own farms. Linden uses 'Challenge 2020' resource materials developed for farmers by Rural Solutions SA - topics include "Crop establishment", "Crop monitoring" and "Root and leaf diseases". Cleve Area School has a strong approach to good farming practices including building a feedlot, soils work and Property Management Planning.

Since taking up the role at the end of 2003, Linden Masters has helped lift the school's specialised agriculture course from being in danger of closing to becoming renowned for educational leadership. Student numbers have grown from twelve Year 11s and two Year 12s in 2003 to 16 Year 10s, 15 Year 11s and eight Year 12s in 2005. In 2003 four students came from outside the district, now there are 12 students from across the state of SA.

The Cleve program allows students to apply their textbook learning and to share the information with their parents, increasing the family's knowledge of the importance of their soil. Using data collected on 15 local farms, students examine and discuss actual subsoil constraints. Real examples closely link classroom theory to practical application. Students are shown how to interpret soil tests, with the chemistry behind cation exchange and electrical conductivity being keys in examining transient salinity and sodic subsoils.

In 2005 Cleve Area School won the South Australia Westpac Landcare Education Award with its high quality teaching embedded in the curriculum.

### **7.2.1 Managing the teacher workload**

According to Linden, teaching agriculture - with a strong real life practical component (setting up experiments etc) - requires 25-30% more time than the average teacher's workload. Spreading the workload is vital. One teacher of Chemistry and Science takes just one Agriculture subject. At Cleve Area School there are five staff members in the Agriculture faculty with different complementary skills, but all with strong practical skills in agriculture. Between them the teachers have expertise and university degrees in agriculture, animal science, aquaculture, agriculture business management, farming and community development.

One staff member notes, "teachers are pressed for time. I don't get the chance to catch up on the latest happening or innovation in agriculture. Because Linden works three days a week for Rural Solutions SA he has his finger on the pulse, and he connects the school community with the latest information." Cleve Area School's relationship with Rural Solutions SA allows Linden to bring to the partnership a knowledge of what is happening in the bigger picture of agriculture and knowledge of what is happening in the district.

### **7.2.2 School-community partnership**

At Cleve Area School the partnership with the community is very strong - the school is always looking to find ways to involve the community. However, the partnership needs a driver. Interaction between the farming community and the students has seen several focus community events held at the farm where students and farmers are treated as equals. Events such as "Weaning more lambs," sheep nutrition in feed lots and a salinity forum with Bioclip wool harvesting as a feature at the open day.

The opportunity provided by a clay-delving field day involving 60 farmers is a case in point. The field day leader, who clearly recognised the importance of the students to the future of agriculture, spoke one-on-one to the students for thirty minutes whilst the farmers waited.

### **7.2.3 Sponsorship - Friends of the Ag course**

Over 30 companies support the school with sponsorship and expertise. The largest supporter/partner is Rural Solutions SA. SARDI has conducted experimental sites on the farm including a granular zinc product trial for use as educational sites. Students participated in the new variety trials at the Eyre Peninsula field days and a formal relationship with the Minnipa Research foundation will see the Grain and Graze project add further momentum to students learning. Two Year 12 students used a GPS system to spray then sow their crop using controlled

traffic, then taught the Year 11 students how to use it. The same two students clinched the deal with the John Deere National manager for a \$180 000 Tractor and state-of-the-art GPS unit. EzeeOn supply an air seeder on a hugely discounted lease agreement. Caltex supply \$2000 fuel annually. Hi Fert donate five tonnes of fertiliser, and the school also receives a donation of \$3000 of salt blocks for stock from Olsens.

#### **7.2.4 A challenging curriculum**

Agriculture at Cleve Area School is taught primarily as a practical and organic science. It is a successful program because it provides that next layer to classroom education - practical experience. The Cleve model sets a curriculum that builds from Year 9 to Year 12, starting with the individual components of agriculture in Year 9 right through to systems thinking in Year 12. In Year 9 six months study of agriculture is compulsory (one lesson per semester). In Year 11 there is one full subject (also available is Chemistry, Metal work, Ag English and Ag Maths - spreadsheets etc). The students are continually challenged. The Year 11's do a high portion of Yr 12 work, and the Year 12's do some first year Uni work. One 2005 Year 12 student received full marks for his research assignment based around the farm feedlot. Once a term each class of students goes on a local bus trip to visit the farms of very innovative people. Farmers and their skills are also brought into the classroom. A Maths teacher brought in a farmer who had shared with the students his historical data on the micron range of his wool clip. He also explained the importance of statistics and the use of the bell curve to his farming operation. Cleve Area School values honesty, respect, trust and friendship. The students have responded because these values are honoured. New Mexican educators commented on how well the school provides students with leadership positions.

#### **7.2.5 Future opportunities**

Cleve has all the catchment management issues within a short drive of the school. Whyalla Year 12 Geography students visited Cleve Area School and took part in an excursion developed for Cleve Year 9 and 10 students called "reading the landscape".

Linden says it is important that the school's vision for agricultural education is built around using the farm as an educational resource rather than seeing the farm used as a work experience site for the students.

Future plans may include augmenting other schools for Years 9 and 10, with the aim that these students would come to Cleve in Years 11 and 12. The Boarding house if full and the overflow of students would need to stay with local families. The homestead on Sims farm also provides opportunities down the track for students from other schools to stay on farm and take part in a hands-on five-day course on dryland agriculture.

Other schools are looking to adopt the Cleve Area School model, including one York Peninsula Area School. Another innovation is for students attending private schools in Adelaide to complete a study block whilst staying on the farm.

One SA Education Director said "Linden, we need to capture what is happening here at Cleve because every subject needs to be reinvigorated in this way."



### 7.2.6 Quotes from Andrew Smith, Ag teacher, Cleve Area School

- "Cleve Area School is ahead of other schools in teaching Landcare, largely due to the partnership with Rural Solutions."
- "Cleve Area School's most recent partnership is with Minnipa Research Centre. Cleve Area School is hoping to connect with Roseworthy and Waite in the future. One of our goals is for our students to continue in a lifetime of learning because they are familiar and connected to other people and institutions where they can access the education/training/knowledge they need."
- "I think every Ag teacher needs a Linden in their school. Someone who is connected to the web of information in Agriculture and is an outside feeder to the ag teachers."
- "Ag is one of the few secondary subjects which is changing so quickly. A Chemistry teacher can teach the same lessons for 10 years but an Ag teacher needs to update every couple years and be able to connect to what's going on in Agriculture."
- "Our aim is to try and be ahead of where the farmers are, so that when students come out of the school what they learned in Year 10 is still a current issue. Examples include, using software programs to analyse soil test results and make recommendations on fertiliser rates; measuring subsoil moisture to decide on what crops to plant; and staying in touch with the GM debate."

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## 7.3 Taminmin High School, Northern Territory

Taminmin High School is a Registered Training Organisation with a long history of strong partnerships and a clear focus on education about agriculture. Initiatives include:

### 7.3.1 Show Team

Taminmin has a 'Show Team' that prepares the school's livestock for competition in the Fred's Pass Rural Show. Students compete in the goat and cattle handling sections and also in the Young Rural Achiever competition. The school has enjoyed a great deal of success in these competitions.

### 7.3.2 Years 8 and 9 agriculture studies

In Year 8 and 9 students are introduced to the world of agriculture as a practical science that seeks to understand the living resources required for our current society and how to manage them sustainably. Year 8 Agriculture focuses on food and fibre production including: responsibility for a chick and layer chicken husbandry; plant production and soil assessment; and, safety and tools on the school farm. Year 9 Agriculture focuses on the anatomy and husbandry of turkeys; plant production and, safety and tools used on the farm.

### 7.3.3 Year 10 agriculture studies

Year 10 Agriculture integrates animal husbandry and plant production processes. It is specifically designed for students to develop the practical skills appropriate to local agricultural situations. The unit also promotes the sustainable use of resources. The main focuses of the unit are: goat anatomy and husbandry; plant production (both hydroponically and by soil); fertiliser trials; and, safety and equipment use on the farm.

### 7.3.4 Years 11 and 12 agriculture studies

Taminmin High School is a Registered Training Organisation delivering nationally accredited VET courses in a range of industry areas to Taminmin students and students enrolled at other high schools in the Darwin region.

#### Course Outline

This course examines the use, modification, and manipulation of soils, animals, plants, and climate. Because of the environmental orientation of agriculture, students investigate its social and economic support structure, and the need to respond to ecological concerns in such a way as to ensure that sustainable systems are developed.

#### Stage 1 Agriculture Study Outline

Topics studied may include:

- The principles and introductory management of soils, plants and animals.
- Agricultural ecosystems.
- Rural sociology and Agricultural economics.
- Machinery, Technology, Construction and Design Farm safety and chemicals.
- Regional agriculture.

**Stage 2** Agriculture focuses on agricultural/horticultural management.

### 7.3.5 Bushcare Nature Conservation Award – Woodside Reserve

Taminmin High School was awarded the 2001 NT Landcare Awards - Nature Conservation Award for excellence and innovation in implementing nature conservation activities on land outside formal parks and reserves. Taminmin High School is custodian of 180 hectares of tropical woodlands & wetlands known as Woodside Reserve. It is an important conservation zone in the region. This land has been designated as a Natural Resource Area for both students and the broader community. Taminmin High School has been using the area as an outdoor classroom for students undertaking Environmental Studies, Biology, Horticulture and Geography. Students, staff and land management agencies have worked cooperatively to develop a Management Plan for the area to ensure the protection of the Reserve and the ongoing education of future landcarers.

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## 7.4 Wilsonton Agricultural Field Study Centre

Wilsonton Agricultural Field Study Centre was established in 1986 on five hectares of land adjacent to the site of the now newly established Toowoomba State High School - Wilsonton Campus. The Centre was created in response to widely held views that schools in the Toowoomba district with its economy strongly linked to a diverse range of agricultural enterprises, should be offering programs to students that reflect the value of the contribution to be made by education about agriculture.

The Centre provides practical resources and facilities to support the teaching of the agricultural curriculum in State High Schools on the Darling Downs. This involves the delivery of subjects such as Agricultural Science and Agricultural Mechanics in the Junior School, the BSSSS subject Agricultural Science and vocational education subjects as Agricultural and Horticultural Practices. Students from the three feeder high schools in the Toowoomba district, namely Toowoomba SHS, Harristown SHS, and Centenary Heights SHS are transferred to and from the Centre with the Centre's bus, where they complete their weekly agricultural practical activities. These activities are linked to the theoretical work performed back at their base school.

The Centre also develops resources for other schools eg Primary school visits and various community groups eg: - Landcare, Greening Australia.

Primary/Pre schools and special education groups, as well as school groups from outside the Toowoomba district, community groups, other government bodies and local industry, are encouraged to use the Centre.

The following diagram provides an overview of the approaches taken at Wilsonton Agricultural Field Studies Centre (courtesy of John Martin, Head of Department).



#### 7.4.1 Resources at the Wilsonton Centre

Resources at the Centre include:

- fruit orchard eg: stone fruit as well as a range of various fruit crops eg. citrus, avocado, pears, apples etc.
- field trials and cropping area eg: wheat, barley, potatoes, sweet corn.
- improved pastures, native pastures and fodders crops
- laying hens, broilers, poultry breeds
- range of agricultural machinery and equipment
- fat lamb production sheep herd displaying various breeds
- commercial nursery used in conjunction with T APE
- small units in aquaculture and bees
- beef cattle production - this includes the showing of led steers, a commercial crossbred herd, a small Murray Grey Stud and a Dairy Cow
- landscaped gardens of various types eg: native, scented, conifer, formal etc
- large workshop, stocked with welding equipment, small and multicylinder motors
- an agricultural library including, reference books and magazines, videos, a small computer laboratory with internet access, computer software and prepared slides.

#### 7.4.2 Comments from John Martin, Head of Department

- Wilsonton is a Resource Centre where students can engage in practical learning experiences beyond the classroom.
- An enormous amount of learning can be done through agriculture, including:
  - Integration across many subjects
  - Vocational side (many pathways)
  - Aligning school with industry
- The Centre caters for Certificate I in Horticulture and Certificate II in Agriculture (Rural Operations). These are currently run only through schools, but will involve a partnership with TAFE in 2006.
- Students using the Field Studies Centre include:
  - State School students
  - Primary School students
  - Private School students
  - 'At Risk' students (as part of ETRF - Education Trainer Reform for the Future)
  - Kids with disabilities (also part of ETRF - students provided with a structured work experience day). The ETRF Program will be more structured in the future and incorporate literacy and numeracy curriculum exercises.
- Covering the costs of Professional Development is a big issue. Queensland requires \$300/day to cover a replacement teacher. (This cost, plus the bus transport cost has to be shared by the participating students).
- There is an urgent need to educate careers teachers about the opportunities in agriculture.

#### 7.4.3 The Primary School - Agaware link

Good links exist with Primary School Principals and Deputy Principals; in particular Mike Richards, DP, Harristown Primary School. To strengthen the engagement process, ASSISTM funding has been applied for to take Mike and John off-line to develop and promote the program to a cluster of schools.

The Field Studies Centre offers and runs a teacher PD program. It covers a 14-week theme-based unit or program of integrated study. It is an outcome-based unit of work, closely tied to the KLA's of Science, SOSE etc (similar to Agaware education modules).

The program starts with an 'Awareness type' day - come and have a look at the farm (includes an animal show).

The most important aspect is having the right people delivering the programs:

1. The school has got to want to do it.
2. Need dedicated staff to work with that program (need a driver in a school).
3. Ownership - train the teachers so that that can run the program without WFC staff.

#### **7.4.4 Learning and gaining knowledge through agriculture.**

- Ag knowledge – where wool comes from (wool vs cotton)
- Team building (drafting sheep)
- Building a sheep pen (problem solving and teamwork)
- During the program the teachers also develop their own ideas and strategies. For example: (1) The marketing chain for vegetables. Teachers need to have their imagination stretched, then they can run with an idea. (2) Students responded very well to a teacher initiative to 'make a farm from a range of materials and develop a farm plan'.
- WFC also uses the expertise of the agricultural resources nearby.
- Southport State HS is looking to run the same type of program using the local agricultural expertise in their area.
- Have a look at the Mining Industry. They produce resources; they run in-service training; they take the materials and the in-service training to the schools.
- 90% of the people at shows in Qld showing or leading cattle are school kids." (pers comm).

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#### **7.5 New Wine College at Stanthorpe, Queensland**

The Queensland College of Wine Tourism, currently being built, will function as a wine industry training centre and will operate as a commercial vineyard, winery, tourist centre, seminar and function facility - all based on site at Stanthorpe State High School. The first intake of students is expected in early 2006.

The college will involve all levels of business in the wine industry, including hospitality and tourism, viticulture, wine making and marketing and cellar door operations.

The result will be a hands-on learning institution that collaborates with local wine producer expertise and forges partnerships with business to create a hub of knowledge, creativity and innovation for the Queensland wine industry.

Seven participating Queensland schools, collectively known as the 'Gateway Schools', will be part of the wine tourism project and will use the new college for their studies. They are Stanthorpe State High School, Centenary Heights State High School at Toowoomba, Kingaroy State High School, Murgon State High School, Nudgee College, Sheldon College in the Redlands and Tamborine Mountain State High School - schools that already have links to the state's wine regions.

The initiative is a partnership between Education Queensland, Southern Queensland Institute of TAFE and the University of Southern Queensland. Students will be able to gain qualifications from entry level through to Diploma and Bachelor degree across the spectrum of skills underpinning the wine industry, including viticulture, food processing (wine), tourism, hospitality and business. The State Government is involved in joint funding of the \$2.5 million stage one of the project in collaboration with DEST, Stanthorpe Shire Council and the Queensland Wine Industry.

**Contact:**

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Principal Stanthorpe State High School  
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## 7.6 Lockridge Senior High School Farm, WA

Lockridge Senior High School Farm is situated within the Perth metropolitan area near the Swan Valley, Western Australia. The school farm operations began in 1982 with vegetable growing at the Pyrton Training Centre nearby. This transferred, in 1984, to a small site on the school grounds. The farm has grown since then to now cover 25 hectares. Along with this growth in size has come diversification in the farm enterprises and facilities. The farm is a leading Western Australian Charolais Cattle, Brahman Cattle and White Suffolk Sheep stud. The Farm also runs an Ag Ed Resource Centre.

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## 7.7 KelmScott Senior High School and Hillside Farm, WA

The 93-hectare Hillside farm is owned by CALM, WA, and leased to the City of Gosnells and the Education Department. The Department of Education manages 53 hectares of farm land for student learning programs. The farm promotes ecological and sustainable practices through educational and recreational facilities. The property is available to local community user groups and students of the WA Department of Education from across the metropolitan area.

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## 8 Promoting agriculture through careers education

### 8.1 Rural Skills Australia

Rural Skills Australia (RSA) manages a project promoting agriculture in Schools throughout Australia, with the exception of the Northern Territory. The primary objective of this program, funded by the Department of Education, Science and Training (DEST), is to increase the take-up of Structured Workplace Learning (SWL) and School Based New Apprenticeships (SBNA) in schools, with the emphasis being on agriculture.

The project has been operating since 2001 and is due to end in October 2005. Over the life of the project there have been significant achievements in both the primary objectives and the promotion of rural and related industries within schools.

A number of models have been developed and were presented to DEST in September 2005. These will be made available on the DEST web-site. The contact and project officers are:

- Geoff Bloom - Executive Director, RSA
- Garry Tongs - Schools to Industry Project Officer, RSA
- Beth Russell - RSA Queensland (based with AgForce)
- Alicia Wilson - RSA New South Wales (based in Warren)
- Ross Cardile - RSA Victoria (based with VFF)
- Emma Kiffin-Petersen - RSA Western Australia (based in Perth)
- Jane Bartlett - RSA South Australia (based with SAFF)
- Lesley Richardson - RSA Tasmania (based with TFGA)

Indicative figures pointing to the success of this and other programs promoting rural and related industries to schools and industry are that:

- In 1994 there were 74 trainees commencing Certificate II in Agriculture in Victoria.
- In 2004 there were 2412 commencements across all sectors in Victoria alone.
- In 2004 there was an estimated 12,000 commencements nationally in Certificates II, III and IV, across Agriculture, Horticulture, Natural Resource Management and Animal Studies.

Agriculture is a hard sell. New Apprenticeship Centres (NACs) don't understand agriculture. NACs can place many young people into retail and service industries, particularly in large, franchised, companies. One farmer can usually only take one employee.

Certificate II in Agriculture covers competencies that include wool. There are no courses in wool/sheep alone.

Australia must promote agriculture as a viable career. The perception is that agriculture equals farming, yet there are so many more opportunities for a career in one of the support industries to agriculture. Whilst the ABS reports that the number of farmers is declining there has been a two per cent increase in the rural workforce in the last two years.

There has been a massive move to school-based Vocational Education and Training (VET) in recent years. University students with VET increased from 38,000 in 1997 to 73,000 in 2004.

### **8.1.1 Beaufort Secondary College - Rural skills passport**

In this case study provided by Ross Cardile (RSA Victoria) a teacher approached Ross, who engaged with local farmers through the Victorian Farmers Federation. A network of farmers has been set up who can now take students under the SBNA where students can acquire competencies during their time on the farm. The University of Melbourne's Institute for Land and Food Resources (ILFR) is also involved.

This initiative provides benefits for industry as well. It builds farmer skills on how to employ, how to communicate, etc. It also helps to build rural communities.

### **8.1.2 ON Track CD rom**

- Launched over four weeks in 2002
- Sent to every High School in Australia by Rural Skills Australia
- Aimed at hooking career decision makers
- Second production run co-sponsored by Westpac
- Available on-line at <http://www.ruralskills.com.au/ontrack/index.html>

### **8.1.3 Rural Careers and Education Project, Tasmania**

#### **Project Overview**

The project is funded by DEST and managed by RSA. The Tasmanian Farmers and Graziers Association (TFGA) takes a pro-active approach to promoting agricultural careers to young people through this project. It is a good example of industry engagement and a formal approach to work experience. The model could be developed further to achieved SWL and SBNA objectives.

'Partnerships for Productivity' and 'Industry Induction' Models have been developed that underpin the ability to engage, encourage, and motivate young people to take up a career in our industry and will assist in expanding Tasmania's agricultural work force of the future.

#### **Working in Wool**

The 'Working in Wool' Program was developed based on these models. 'Working in Wool' is an innovative and dynamic solution to the issue of declining numbers of young people in the wool industry. The Program is underpinned by wool industry partnerships that provide students with an insight into the diverse range of career and qualification opportunities available to them. In 2004 seventeen year 11 and 12 students from around Tasmania participated in the first Program.

The 2005 Tasmanian 'Working in Wool' Program ran during April and May at the Campbell Town Show (the first sheep show was held here in 1839. Locals proudly claim it to be the oldest agricultural show in the British Commonwealth). The first South Australian 'Working in Wool' Program took place in June 2005 (see 8.1.4).

During the Program students are taken from the boardroom to the factory, the research laboratory to the farm, the warehouse to the wool shed and the tractor to the computer. These programs guide students from the classroom into the world of agricultural work and training to give them a taste of what the industry is about and career opportunities that are available.



### **Cropping a Career**

Cropping a Career aims to provide young people with an opportunity to experience work in the vegetable and associated cropping industries. This first hand experience will assist students to determine their interest and suitability within these industries. Vocational placements will be available with crop producers, vegetable processors, agricultural service sector, science and research areas. 20 Tasmanian students participated in the first program in March 2005.

Expansion of this program to include SWL and SBNA will encourage students to involve themselves in vocational education and training which will take them from being 'unskilled' and working in the industry to being highly skilled and knowledgeable.

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#### **8.1.4 Wool Industry Induction Program (South Australia)**

This program is based on the Tasmanian 'Working in Wool' model. 'Working in Wool' aims to provide young people with an opportunity to experience work in South Australia's wool industry. This first hand experience assists students to determine their interest and suitability for a career in this industry. Pathways for a future in the industry will be investigated and students are encouraged to set goals. Vocational placements are made available with wool producers, agricultural service sector, science and research areas.

Schools were invited to nominate students for the Program. The five-day program involved 13 students (3 girls, 10 boys; 14-15 year-olds) who had expressed some interest in working in the wool industry. Jane Bartlett and an Ag teacher from Naracoorte accompanied the students. Students were charged \$140 each to participate. This does not even cover the accommodation cost (\$150) let alone all the meals and travel.

Significant in-kind support came from industry. (Michel Wool Works put on lunch, Elders put on a BBQ, Landmark put on a BBQ, TAFE sponsored a meal, etc).

Topics covered/activities included:

- Occupational Health and Safety
- Before program and after program career planning
- VET in schools
- Traineeships
- Work experience
- Introduction to Industry mentors and direct contact to industry leaders (State Wool Managers for Landmark and Elders, TAFE, University). Ross Pollock (AWI) is on the Program Steering Committee.
- Site visits included the Michel Wool Works processing facility (usually a closed facility because of OH&S issues).
- Evaluation (Have you changed your ideas and do you now understand the career pathways available to you?). Evaluation from all the students was extremely positive.

### Special stories out of the program

One Year 9 girl had planned to leave school and become a jillaroo. Now she wants to do a PhD in Animal Science. The girl blossomed during the induction program. Her parents said she was not the same girl they sent away. The professor at the University of SA was so impressed with how switched on she became, and how she asked so many good questions, that he invited her back at any time. She now has a direct contact for work experience at the University. On returning from the induction program the girl found that her vocational work experience placement was on a White Suffolk stud. Straight away she was on the computer researching the breed before her placement. Jane found that face-to-face contact is vital for these young people.

#### 8.1.5 Australian Schools Wine Show

Jane Bartlett runs the Australian Schools Wine Show, held at the National Wine Centre of Australia, University of Adelaide. The wine show targets the provision of information for those interested in a career in the industry.

In South Australia, a lot of schools make wine. However, in most cases there is no formal training component, little credit for what the students are doing and no recognition for competencies gained during training.

Each year awards are presented to:

- Viticulture school of the year
- VET school of the year
- VET student of the year.

Year	Schools	Entries	
		Students	Bottles of wine
2003	15	80	40
2004	n/a	120	50
2005	32 (27 from SA)*	250	84

\*Five interstate schools entered wine in 2005. Teachers from interstate attended the event.

Industry support comes from:

- University of South Australia
- Wolf Blass
- State Wine Industry Council

Judging categories added in 2005 included:

- A food products competition
- A wine label competition

Schools value the awards because they help to showcase what the schools have to offer and can lead to important alliances with industry. As a result of winning the 2004 South Australian Viticulture School of the Year, Gladstone High School is involved in vineyard development in association with the Southern Flinders Grape Growers Association and wine making with Taylors Winery.

### 8.1.6 Lessons from Primary Industry Skills Council Workshop

Jane Bartlett facilitated a workshop for the SA Primary Industry Skills Council. The workshop also involved the South Australian Department of Further Education, Science and Technology (DFEST). The workshop was made up of three groups:

- industry representatives
- teachers
- students (from both city and rural areas).

The students were asked what is that would hook you into looking at agriculture as a career. The students provided important feedback on how to communicate with them about careers.

Key messages included:

- "We will only be interested if someone local comes and talks to us about it".
- "We listen to the footy coach, the netball coach, mum and dad and our teachers - in that order".
- "If an AFL footballer told us, or it was printed on the ground of an AFL football match, then we would take notice."
- "We would like to experience the industry. So a work placement would be important."
- "We would not go to a recommended website to explore a career. We sit at a computer all day. We may look briefly at a CD rom."

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### 8.2 The Australian Network of Industry Careers Advisers (ANICA)

The Australian Government, through DEST, is establishing the ANICA program to operate from November 2005 to December 2008. Tenders to provide these services closed in August. The new network will comprise:

- 57 Regional Industry Careers Advisers, located throughout Australia, and
- 10 National Industry Careers Specialist (NICS) organisations (aligned with the industry and sector groupings of the National Industry Skills Councils) – agriculture will be included in the Agrifood NICS.

### 8.3 Primary Skills Victoria

Primary Skills Victoria (PSV) is an incorporated body funded by the Victorian Learning and Employment Skills Commission (VLESC) to provide advice to the state government's Office of Training and Tertiary Education concerning the training needs of rural and related industries. The PSV Council draws industry members from across agriculture, horticulture, animal management and conservation both on its governing council and its standing committees within each sector. It also has a close working relationship with farmer organisations such as the VFF, Local Learning and Employment Networks (LLENs) in regional areas as well as TAFE institutes providing training to the farming community.

PSV is part of a network of advisory bodies covering all States and Territories. This network is recognised by State and Federal governments as the peak advisory body on training matters on behalf of industry. PSV identifies current and future vocational education and training needs of agriculture, horticulture, fishing industry and animal care & management. It is funded jointly by government and industry.

The PSV Board works closely with training providers to make training more accessible by promoting the benefits of training for career achievement and success in business. PSV works to improve training by regular industry consultation, analysing future needs of primary industries and survey and research projects so as to ensure appropriate training is available for people in primary industries, inform employers and students about training options and make sure training meets industry needs. PSV works towards increasing participation in training by marketing and promoting new training programs, demonstrating the benefits of training and increasing industry's access to training so as to enable people to take full advantage of flexible training options and increase industry profitability and productivity.

The Board staff monitor and assess the quality of training being delivered by regular consultation with the training provider network and working with industry members to implement effective training assessment. PSV also influences the training system by arguing for increased training resources from state government and establishing industry committees to resolve training issues to achieve an industry-directed training system.

Primary Skills Victoria help improve the quality and relevance of agricultural training and play an important role in identifying gaps and plugging holes in agricultural training programs and packages. For example, PSV identified that a national training module in catchment and land management had neglected to cover water and fodder conservation. PSV also played a major role in getting VET in schools re-accredited.

Organisations that PSV has worked closely with, or for, during the past few years include:

- Prevention of Cruelty to Animals Project: The Bureau of Animal Welfare, DPI, Attwood.
- The Horticulture Resource Guides: Development of resource materials for the Victorian Horticulture Teachers Network and horticulture industry associations.
- Sustainable Water Short Course: Working with the Institute of Land and Food Resources, East Gippsland TAFE
- Office of Training and Tertiary Education: Providing a range of feedback reports on industry requirements for training, known as an Annual Training Plan or Strategic Dialogues, and examining issues associated with Existing Workers
- The Industry Training Partnerships Project was a joint project between PSV and The Victorian Horticulture Training Network, with contribution from Swinburne University of Technology.

PSV covers five broad Training Packages (Animal Care and Management, Amenity Horticulture, Rural Production, Conservation and Land Management, and Seafood). These training packages in turn cover many additional industries. PSV staff have analysed the latest statistics from the Office of Training and Tertiary Education covering the period January 1, 2003-August 31, 2003 and January 1, 2004-August 31, 2004,. A report is available at <http://www.psv.com.au/statistics.htm>

### 8.3.1 Attracting young people to primary industry

ABS statistics record a much higher proportion of the 65+ age cohort still working in the industry and a much lower percentage of the younger cohorts 15-19 and 20-24 year-old age groups within the industry compared with the national averages for all of industry.

Delivery of agricultural programs both within the TAFE system and via VET in Schools programs has shrunk dramatically from around the time of the establishment of TAFE institutes in the state and the demise of the Technical school system in the 1980's. It is of interest to note that in the late 70's and early 80's there were around 65 wool teachers alone within Technical schools around the time of the establishment of TAFE colleges, today in regional TAFE institutes there are around 5. Similar statistics are quoted for staff in regional areas teaching the initial Apprenticeship in Farming for the early 80's compared to the present day. This reduction in regional delivery for the sector is not totally attributable to this shift; it is a factor along with many others. These include: -

- The lack of encouragement of parents and the strongly negative views of many secondary teachers concerning careers in primary industries.
- Minimal exposure to primary industry during student's school careers.
- Salaries in other industries appear more attractive.
- Increasing isolation in rural areas with the reduction in general services.
- Lack of entertainment in regional areas and the desire of young people to relocate to regional and metropolitan centres.
- The 'negative image' of the farmers themselves and that of the rural media.

Some sectors are suffering a more severe shortage of labour than others, e.g. the dairy industry. A survey of secondary school students conducted by RMIT's Centre for Workplace Culture Change found that while large numbers were interested in trades and the helping professions, agriculture and dairy rated very low. Of the 700 Victorian secondary school students surveyed only 15 indicated that they would be interested in a career in the dairy industry.

Poor perceptions of this industry will be hard to turn around but it is essential that this be achieved to redress the low numbers of the younger cohort in the industry in this state. Other states have excellent examples of delivery at the secondary level and the Council would like to see the commonwealth contribute to this through its Technical School initiatives in Victoria.

**The Council is convinced of the value of students in secondary schools being given early exposure to the industry to provide positive experiences so that they have a greater understanding of the employment opportunities and career paths within the industry itself and other associated industries.**

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## **8.4 Local Learning and Employment Networks, Victoria**

Local Learning and Employment Networks (LLENs) are a Victorian Government initiative. They bring together education providers, industry, community organisations, individual and government organisations to improve education, training and employment outcomes for young people in communities across Victoria.

LLENs play a central role in implementing the Victorian Government's post-compulsory education and training reform agenda. The LLENs are based largely on local government area boundaries. Membership of a Local Learning and Employment Network is drawn from any individual or organisation with an interest in post-compulsory education, training and employment within the area covered by that LLEN.

For more information visit: [www.llen.vic.gov.au/lLen/](http://www.llen.vic.gov.au/lLen/)

## **8.5 Career Education Association of Victoria**

Annual Career Education conferences provide an ideal opportunity to expose career teachers to agriculture. However, it is a concern that on most occasions Careers Days equate to Course Days!! At the 2004 Hobart Careers Expo 11 out of 78 were education industry stands.

## 9 Promoting agriculture through studying health and physical education.

### 9.1 Kitchen Garden

#### 9.1.1 The Kitchen Garden at Collingwood College and The Stephanie Alexander Kitchen Garden Foundation

The Kitchen Garden at Collingwood College began as a pilot project in 2001. The project is an initiative of food writer and food activist Stephanie Alexander, in collaboration with Collingwood College school staff. The Kitchen Garden aims to educate young children about the pleasures and benefits of fresh food and influence their food choices for life, and in doing so exploring a preventative approach to the issue of childhood obesity. It is intended as a model for all Australian primary schools.

Approximately 120 children participate in the Kitchen Garden at Collingwood College during Years 3 to 6. The project attempts to positively influence behavioural and attitudinal change in young children through heightening awareness of the importance and joy that can be gained from growing, preparing and sharing food. There are two unique factors about the Kitchen Garden at Collingwood College. The first is *the intrinsic link between the garden, the kitchen and the table*. The emphasis is on learning about food and about eating it. No part of the program can exist without the other. The second is the project is *embedded in the curriculum*. It is a compulsory part of the school's program for four years of a child's life.

Stephanie attends one cooking class per week at the school to pass on her skills and passion to the students, kitchen staff and volunteers, and provides vision and guidance to the project overall. She is also actively involved in spreading the message of the Kitchen Garden's successes through the media and at festivals, conferences and functions around the country.

Stephanie has established a Foundation to further spread the philosophy of the kitchen garden.

Staff and volunteers are convinced that changes in food choices do not come about as a result of cautionary advice, charts or pyramids, but by example and by positive experiences. Evidence suggests that 'school-based programs' (when and where they are happening) with an emphasis on nutrition and 'healthy' are having little effect. What children are receiving is persuasive messages from the manufacturers of processed, high-fat, high-salt, high-sugar foods delivered via the 11,800 television ads for food the average child watches every year (Nutrition Unit Flinders University, SA, 1997).

In 2001 when the pilot project started Collingwood College (Prep to Year 12) serviced a predominantly low-income area. Its students represented 36 different nationalities. About 67% of the children resident at the school qualified for Education Maintenance Allowance and Youth Allowance (many of them lived in the adjacent housing commission flats). They did not normally have opportunities to tend a garden, and many did not have a sense of where fresh food came from. (This demographic is changing however as the surrounding inner-city suburbs move from light industrial to 'gentrified'.)

Not all of the problems the Kitchen Garden seeks to address however are restricted by socio-economic boundaries. Of equal importance is cultural deprivation. Many families regardless of economic status have abandoned the idea of eating together regularly as a family group and see nothing wrong with their children's diet consisting largely of high-fat, high-sugar snacks. Without the regular stimulus of meals shared with their siblings and parents, children miss out on discussion and on the sharing of ideas. A US study concluded that those children encouraged to talk at the table did better at school, had higher self-esteem, better social competence and had better prospects of getting a job.

Convenience foods have proliferated, fewer and fewer children have ever dug in the ground, or picked fresh apples or green beans, or even shopped in a fresh food market as opposed to a supermarket where almost everything is untouchable, packaged and displayed under unnatural lighting in sterile cabinets. Without tactile experience of ripeness, they lose contact with quality and become unquestioning consumers.

Collectively these things are producing children (and young adults) who have no connection with the growing cycle of food on the planet, no concern for the way things are grown and little understanding of how to ensure their own health and well-being.

#### **9.1.2 Outcomes sought and already observed include:**

- To influence positive attitudes in students towards food: it can be fun, and is an integral part of life; respect for the environment; respect for each other; appreciation of cultural diversity; self-esteem.
- To increase students knowledge of: how things grow; how fresh, seasonal and minimally processed and packaged food is cooked; the connection between food, wellbeing and the environment.
- To introduce students to foods hitherto unknown and untried. by involving students in preparing these foods, in discussing their characteristics and in developing an awareness of flavour and texture, the students develop new ways of thinking about foods which just happen to be 'healthy' and 'good for them'
- To increase students skills in: gardening; cooking, planning, relating to others socially, including teamwork and sharing.
- To build & maintain stronger relations with the community through volunteer participation in garden and kitchen classes, and drawing upon the skills and expertise of wider school and local community in delivery of the project where possible.
- To inspire other schools to institute similar programs, and ultimately to convince policy makers that a kitchen garden should be part of every Australian primary school.

#### **9.1.3 Related Projects:**

##### **THE EDIBLE SCHOOLYARD, Berkeley, California. USA.**

This project was the inspiration for the Kitchen Garden at Collingwood College and has a global reputation. This project was established in 1994 by well-known US restaurateur Alice Waters in collaboration with the Martin Luther King Jr Middle School. The project was established to provide urban public school students with a one-acre organic garden and a kitchen classroom. Using food systems as a unifying concept, students learn to grow, harvest and prepare nutritious seasonal



produce. In a study completed in June 2003 by Harvard Medical School, it was found that students who made the greatest gains in overall understanding of ecological principles made significantly greater gains in the numbers of servings of fruits and vegetables they reported eating. The preliminary report states that "The findings from this study suggest that teaching students about where food comes from and how it is prepared - along with changes in the food they are served and what they are taught about nutrition - may be an important contributor to overall diet change".

Website: [www.edibleschoolyard.org](http://www.edibleschoolyard.org)

### **FOCUS ON FOOD CAMPAIGN, UK**

The Royal Society for the encouragement of Arts, Manufactures and Commerce is responsible for this five-year education initiative which aims to encourage children to develop a lifelong appreciation of food and its preparation. With media support, the Focus on Food Campaign's ultimate vision is to see the UK Government write food education back into the National Curriculum. The program, which could not operate without the corporate support of Waitrose, explores the many opportunities for using food learning as a teaching medium for a broad base of subjects as well as equipping young people with the practical and social skills they need to live and work. It combines an outreach program, featuring the Cooking Bus, with education materials, teacher training schemes, a research program and a Focus on Food Week. Under the direction of innovative education professionals, the initiative is backed up by a three-year academic study based at the University of Reading, which is investigating the effects of a program of food learning in selected primary schools.

Website: [www.waitrose.com/focusonfood](http://www.waitrose.com/focusonfood)

#### **9.1.4 Does the Kitchen Garden work?**

Anecdotal evidence is showing that the students involved have a new connection with the land and a new understanding about what it is to nurture the soil and the seeds planted. They understand the concept of living sustainably, show a willingness to experiment with foods, a heightened self confidence, readily absorb and recall related information and display a wonderful appetite for more. Pending funding, from 2006 the Stephanie Alexander Kitchen Garden Foundation will be collaborating with the School of Health & Social Development at Deakin University on the evaluation of an extended pilot project to include Collingwood College and three more Victorian primary schools. Over the past four years Collingwood College has had the assistance of research students (La Trobe University, University of Adelaide) to conduct and collate: student surveys annually to ascertain the changes in student attitudes to eating and preparing food; regular parent interviews to ascertain whether attitudinal and behavioural changes are taking place inside the home; recording of attendance rates in target age group over four year period; regular teacher, cook and gardener reports; photographic and video recording of the development of project, and documentation via website.

#### **9.1.4 What does a Kitchen Garden cost?**

At Collingwood— the equivalent of one senior teacher's salary per annum. The largest project expense is wages for outstanding, passionate part-time specialist kitchen and garden staff. This expense is one of the defining factors of the program and contributes significantly to its ongoing success. Beyond that garden materials (seedlings, soil, class materials, tools etc) and kitchen materials (ingredients to supplement garden produce, cooking equipment, cleaning materials etc)

are required on a weekly basis. In the first year construction of the garden was a major expense, even though much of the labour was supplied by volunteers and the students themselves. Funds to operate The Kitchen Garden at Collingwood College have come from numerous sources: Department of Education & Training, Victoria (\$42,500 over 4 years), Education Foundation, Education Trust, Pratt Foundation, Kids & Families Foundation, City of Yarra, Rotary Collingwood, Department of Human Services, ANZ Felton Bequest, supplemented by a myriad donations in kind. Gardeners for the project have come through Cultivating Community, a not-for-profit community garden organisation which has supported the Kitchen Garden financially, in-kind and through connections with its network of volunteers and suppliers.

### 9.1.5 The Stephanie Alexander Kitchen Garden Foundation

The Stephanie Alexander Kitchen Garden Foundation was established in order to investigate how best to grow the pilot project to other schools and to raise funds from government, philanthropic and corporate sources to continue funding the Collingwood College model beyond 2005, and a small group of new schools in Victoria initially. The Foundation has a special interest in involving schools with different socio-economic and geographic profiles, eg. regional and rural schools.

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W: <a href="http://www.kitchengardenfoundation.org.au">www.kitchengardenfoundation.org.au</a>	E: <a href="mailto:collingwood.co@edumail.vic.gov.au">collingwood.co@edumail.vic.gov.au</a>
	W: <a href="http://www.collingwood.vic.edu.au">www.collingwood.vic.edu.au</a>

## 9.2 Dairy Australia

Dairy Australia has an extensive range of resource material available for students, teachers and child care professionals. Dairy Australia's new **Primary Schools Resource Kit** has information about dairy farming and dairy products. A booklet entitled 'How now, Aussie Cow' is complemented by activity sheets, a map and a cow poster. (website: [www.dairyaustralia.com.au](http://www.dairyaustralia.com.au)).

Dairy Australia is also responsible for the 'Just a Little Bit' nutrition resource education website ([www.justalittlebit.com.au](http://www.justalittlebit.com.au))

## 9.3 Lessons in Food

Lessons in food is a 'one stop shop' for teachers and careers advisers in schools who would like to give students a taste of what the Australian food industry is all about. It's a database of over 300 resources that have been produced by Australian food businesses, food industry associations or other relevant organisations, which contain a variety of information – such as how the food industry works, what type of careers are available, how food gets from paddock to plate etc.

Information can be searched for on the basis of:

- The title of a resource if you know it (eg. FoodWorX)
- The company that produces the resource (eg. Nestle, Kraft)
- The media used (eg. video, publication, DVD)

- The industry sector (eg. dairy, seafood, meat)
- The education level it's suitable for (eg. junior primary, senior primary)
- The subject it can be used in (eg. social science, mathematics, health).

Lessonsinfood.com was created by the National Food Industry Strategy (NFIS) Ltd, an industry-led Australian Government-backed organisation established to act as a catalyst for change in the Australian food industry. NFIS Ltd is implementing a five year (2002-2007) blueprint for increased exports, increased innovation investment and improved productivity and skills in the industry. Another related resource is an on-line newsletter available at [www.foodbiz.net.au](http://www.foodbiz.net.au)

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#### 9.4 Queensland Association of School Tuckshops

Queensland Association of School Tuckshops (QAST) provides a professional, responsive and proactive membership organisation with strong alliances with government, industry and like-minded organisations. On the QAST website [www.qast.org.au](http://www.qast.org.au) you can find:

- Newsletters and fact sheets
- Reviews of new resources
- Information about workshops and training for a variety of groups
- Information on special research projects about food services in schools

#### 9.5 Active-Ate, Queensland Department of Health

Active-Ate is a school-based program designed to increase knowledge and awareness of healthy eating and physical activity among primary students and the wider school community. It also promotes the adoption of healthy eating practices and physically active lifestyles by children.

Active-Ate aims to:

- meet the needs of teachers, by addressing Key Learning Areas
- address the essential components of the Health Promoting Schools framework (ie. ethos, school environment and curriculum)
- be easy and interesting for schools to use
- coordinate current health promotion work in this area.

Active-Ate's website is [www.health.qld.gov.au/ActiveAte](http://www.health.qld.gov.au/ActiveAte)

#### 9.6 Young Gourmet Gastronomy Challenge 2005 - Farm to table

In 2004 Radio National's Bush Telegraph invited schools across Australia to get involved in a new radio series and on-line challenge. These schools are now taking part in the 'Young Gourmet Gastronomy Challenge 2005', a wider non-radio event in which they'll grow, harvest, process and market fresh produce from their region. The challenge is for the school to grow, produce, package, market and sell "regional food" using traditional or artisan growing or production methods. Bush Telegraph showcased six schools from around Australia who are working on the

challenge, then chose two to track through 2005 — Huonville High School in Tasmania and Trinity College in South Australia. Young Gourmet (YG) aims to be a resource about food used by teenagers as they move from child to adult. By showing the integral part food plays in all our lives, YG intend to help you make independent, informed choices. The challenge ground rules:

- Only students can be in charge of growing or farming one of the raw ingredients
- Only students can be “hands-on” using the artisan methods employed
- Only students can be the ones who engage in direct marketing and promotion
- Only students can take the pictures and write the reports
- The challenge team will need access to a digital camera, a computer and the Internet.

Some of the schools that participated in producing a regional food, include:

School	Product
Canobolas Rural Technology High School, Orange, NSW	Goat Milk Cheese
St Mary's Star of the Sea College, Wollongong, NSW	Mushrooms
Darlington State School, Beaudesert, Qld	Organic Qld blue pumpkins
St Hilda's School, Southport, Qld	Market garden herbs & vegetables
Trinity College North and South Schools, Gawler, SA	Gourmet pies
Westminster School, Marion, SA	Organic food range
Geeveston District High School, Tas	Fresh herbs & salad greens
Huonville High School, Tas	Organic apple products
Daylesford Secondary College, Victoria	Bull boar sausage
Traralgon Secondary College, Victoria	Fruit and vegetables
Harvey Senior HS and WA College of Agriculture, WA	A range of dairy and fruits

The YG website is [www.younggourmet.com](http://www.younggourmet.com)

## 9.7 Canobolas Rural Technology High School, ORANGE NSW

The Orange district is diverse agriculturally with livestock enterprises including: sheep raised for wool, meat and milk; cattle for beef and dairy; Angora goats for mohair; fairy goats for milk, milk powder and cheeses; Boer goats for meat; pigs and poultry; alpacas and aquaculture.

Canobolas Rural Technology High School provides excellence in education about agriculture through quality teaching, employment and technology that leads to industry standards in agricultural production. The agricultural students at the school are very committed to the Young Gourmet 'Farm to Table' Challenge. The school's nominated product, goat cheese, is an extension of the successful animal management of the school's Cabalo Dairy Goat Stud. It is a prominent stud run by the school with the highest disease free accreditation status. Animals from this stud are also consistent broad ribbon winners at Royal Shows.

The project extends community involvement in the school and several cheese makers who know the region have agreed to demonstrate the basic cheese-making techniques. A team of taste-testers has been assembled, comprising discerning staff members and young gourmets of the student body.

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## 10 What can we learn from other Education Programs?

### 10.1 Cluster Schools Program for Regional On-ground Projects

The South Australian landcare-based Cluster Schools Program for Regional On-ground Projects is an excellent model that is no longer funded. It was based within the Department of Water, Land and Biodiversity Conservation and worked with schools and their communities to support them in cooperative projects that addressed local natural resource management issues.

The program worked to empower schools and their communities to take on long-term ownership in addressing environmental issues. To achieve this the program worked with key school and community people providing them with skills and knowledge and a process-based tool kit that could be applied generically to environmental projects they worked on together at the time and in the future.

Training for key school and community people was based around the School and Community Landcare Projects Best Practice Manual developed by the program. The manual covered how to:

- Identify a vision and long-term goals
- Plan and implement projects
- Monitor and evaluate projects
- Work together as a team
- Link with local resource people
- Gain access to funding.

South Australia's experience shows that projects that include these elements are more likely to be successful and lead on to longer-term community-based partnerships.

Ongoing student involvement in practical projects provides a real-life grounding to issues that are studied in the classroom and are linked to the curriculum as core learning. Student learning is taken to the next dimension by working through the complexities of the social, environmental and economic issues that are associated with practical involvement in environmental projects. This involvement provides an important foundation to students becoming future guardians of the environment.

Evaluation of the Cluster Schools Program for Regional Onground Projects shows that every experience is different and that the process-based approach provides a useful tool kit to plan for the array of issues experienced. It has also shown that all schools involved saw the importance of planning and involvement in partnerships with community, even though first experiences were not always successful.

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## 10.2 The Landcare Rural Urban Schools' Awareness Competition

The SA Cluster Schools Program successfully helped city and urban schools to link with each other through the Landcare Rural Urban Schools' Awareness Competition. Involvement in the competition enabled students to learn more about the other school's natural resource management projects and communities. They did this through a variety of methods. Most schools had participated in hands on work in the other school's projects as well as sharing information through email, internet, environmental games, visits from local environmental people and through presentations. The competition worked as a catalyst for schools to link with each other and share knowledge, information and experience about projects and communities. Most expect to continue their relationships in the future.

The Cluster Schools Program for Regional Onground Projects were funded through the Natural Heritage Trust with support from the Department of Education and Children's Services and the Australian Association for Environmental Education.

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## 10.3 Facilitating Schools Natural Resource Management Environmental Education Programs

While natural resource management agencies have been successful in delivering contemporary natural resource management based environmental education programs to schools, the number of schools involved in a comprehensive range of programs is often limited.

Many schools tend to introduce a narrow selection of environmental topics or projects, rather than address the broad range of environmental issues that require attention. The effective uptake of environmental education often tends to involve individual teachers in a school rather than the whole school. Likewise topics and projects often tend to be programmed as an addition rather than being integrated throughout the curriculum. Information currently used by teachers receives no quality control and may not be up to date.

A coordinated approach between agencies and the schools system would increase the uptake of environmental education programs and contemporary natural resource management information to ensure students will have access to current information and practices across all school sectors.

South Australia initiated a project to explore this issue. Called 'Facilitating Schools Natural Resource Management Environmental Education Programs' the project was coordinated by the Department of Water, Land and Biodiversity Conservation (DWLBC), Primary Industries and Resources SA (PIRSA) and the Department of Environment and Heritage (DEH).

The cooperative project was managed by DWLBC, DEH and Department of Education and Children's Services (DECS) with a steering committee with representatives of PIRSA, DECS, Catholic Education, Association for Independent Schools SA, DWLBC and DEH. The project demonstrated an integrated approach involving natural resource management agencies and the schools' systems in recognition of the growing awareness of the need to respond to environmental concerns through integrated decision making.

The project contributed to activities involving teachers, students and communities learning and working together towards sustainable futures. Such an on-going project would improve the uptake of natural resource management-based environmental education programs delivered by natural resource management agencies by:

- researching current practices of school-focussed natural resource management environmental education programs within the schools' systems and environment and natural resource management agencies;
- identifying restrictions to the uptake of natural resource management based environmental education programs and projects;
- identifying issues critical to successful natural resource management environmental education practice;
- developing recommendations for strategies to support schools and teachers to become more effectively involved in natural resource management environmental education and establish evaluation criteria to measure the processes and outcomes.

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#### 10.4 Regional Capacity Building Through Youth

Learning from the Cluster Schools' Program for Regional Onground Projects, South Australia had plans to extend on the processes used in the Cluster Schools' Program by working with schools and communities on projects, but with another important layer added that would focus on building capacity and youth leadership within regions across South Australia. This would be done by involving youth and community people in training, mentoring, and management and implementation of school and community cooperative landcare projects.

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## 10.5 Better Forests Education Program

The Better Forests Education website is an interesting website produced by Timber Queensland, formally known as the Queensland Timber Board, with the support of Queensland Department of State Development. The *Better Forests* education resource pack comprises a number of different educational approaches. These include:

- Easy-to-access forest facts
- Downloadable versions of the *Better Forests* student brochure, teacher guide and project material
- Profiles of Buzz Saw, Theresa Green and Splinter
- A fun, interactive wordsearch.

Website: [www.betterforests.com.au](http://www.betterforests.com.au)

### 10.5.1 National Forest Education Program Network

A National Forest Education Program Network is working on both a strategic approach to forest education at a national level and a national web portal.

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## 10.6 Options for a national strategic approach to education about agriculture

A number of people consulted during this study made reference to the pro-active educational work done by the mining industry, and in particular the Minerals Council of Australia. The question was asked "where are the virtual farm tours and on-line resources that the Mining Industry has produced?"

### 10.6.1 Minerals Council of Australia model

The Minerals Council of Australia (MCA) model is industry driven, but it does liaise closely with the education sector. MCA has developed resources for the primary, secondary and tertiary education sectors as well as information on careers. A national coordinator in Canberra, supported by education team members in all States and Territories, assist with professional development and even classroom activities. Each State cooperates with MCA but also operates independently. At the primary level 'Minerals Down Under' resource materials provide information on mineral formation, exploration, mining and the uses of metals obtained from minerals. A teacher's guide and student activities support the resource materials to promote scientific literacy.

At the secondary level, 'EnviroSmart' provides easy to follow action templates for teachers and students to develop, implement and report on a School Environmental Management Plan. 'Oresome Froth' enables students to experience the challenges that metallurgists face in applying their skills and scientific knowledge to operate a 'virtual minerals processing plant'. 'Down to Earth' is a series of six interactive, science-based multimedia learning objects for use by secondary students. Fact sheets and companion websites are also available. Professional development is also run for teachers and trainee teachers interested in seeing the resources being showcased.

Website: [www.minerals.org.au](http://www.minerals.org.au)

The NSW Minerals Council has established an online Minerals Campus. This virtual campus is designed to support teaching and learning in various curriculum areas with an initial focus on



secondary science. The Mineral's Classroom has a wide range of resources for students and staff. Photos may be copied from the Photo library, students can do an Energy audit of their school or teachers can download lessons on minerals related education. A wide variety of links helps visitors find additional information.

To complement teaching about minerals and mining, the NSW Minerals Council Ltd has produced a variety of lesson plans and ideas for teachers. Some of these are linked to 'virtual tours' of the Cadia Hill gold mine and the Bengalla coal mine and can be used in conjunction with these "visits" to NSW mine sites or as stand-alone lessons. Most are directly linked to the NSW Stage 3 Science & Technology, Stage 3 H.S.I.E and Stages 4/5 Science syllabus.

#### **10.6.2 CRC for Catchment Hydrology model**

Based on the author's experience of working as a communication consultant to the CRC for Catchment Hydrology, the *modus operandi* of this CRC provides a useful model that should be considered when developing a national networking approach to education about agriculture. Partners in the CRC include industry, all three levels of government and Universities. The individual members of the CRC carry out research and project work at the 'local' level but they also collaborate cooperatively with colleagues at a national level. The seven program leaders get together as required to report on their progress against agreed milestones. A 'small' national secretariat helps coordinate the seven programs and supports a Board comprising experts who review the program and help steer the ship.

The CRC for Catchment Hydrology has a strong focus on developing models that can predict or model catchment behaviour - these models form part of the practitioners 'Catchment Modelling Toolkit'. Practitioners can download the latest version of the models from the dedicated Toolkit website, where they can also access the newsletter 'Catchwords', or find out about the next summer school where training will take place on how to use the models for practical outcomes. The summer school provides an important parallel with 'Food and Agriculture in the Classroom', a program from Alberta, Canada. In Alberta the summer school is implemented by partners including the Department of Agriculture, agricultural industries, teacher training institutions, the education sector and farmers.

The CRC model clearly demonstrates that success breeds success. Whilst some modellers were involved in complex long-term modelling, they would share in the celebration of models that had been published and were making a difference in the real world eg MUSIC - a model for designing an urban stormwater reclamation systems being used by Melbourne Water and Brisbane Water. Collectively all the members of the 'national CRC family' shared in the success of the toolkit, the toolkit website and the positive independent review conducted by international scientists.

A key challenge for the CRC has been to integrate the various multi-disciplinary threads of its research programs, and to realise the holistic view of catchments desired by users. To help achieve this the CRC researchers targeted five focus catchments to build upon existing catchment management initiatives at those sites, to link to research networks outside the bounds of the CRC and to satisfy the specific interests of each of the participating industry Parties. Such 'focus catchments' (or school networks) could provide an important reality check for initiatives of the national promoting agriculture to schools network.

## 10.7 Learning from Leaders project (New Zealand Farm Environment Awards Trust)

Encouraged by the success of the New Zealand Farm Environment Awards (NZFEA) Trust's sustainable farming publications, several organisations have teamed up with NZFEA Trust to lead sustainable farming learning events across New Zealand. Supported by the Ministry of Agriculture and Forestry's (MAF) Sustainable Farming Fund (SFF), the project is called 'Learning from Leaders'.

Partners in the project are the Ballance Farm Environment Awards (BFEA) Trust, Federated Farmers of New Zealand, New Zealand Contractors' Federation, Queen Elizabeth II National Trust and the Rural & Associated Contractors Federation of New Zealand. The Learning from Leaders project will provide opportunities to learn about practical and applied sustainable farm business management options, primarily from farmers who are developing and using them.

In its first MAF SFF funded project 'Tools for Farmers', the NZFEA Trust produced publications on nutrient management, sustainable pastures, low impact tracks and races, natural features on farms and waterway management. These topics are key components of sustainable farm management. The publications use real life stories of BFEA achievers to show how a sustainable farm management approach can deliver financial as well as environmental benefits. The Learning from Leaders project will make learning events available on these topics, again involving local BFEA farmer entrants to give the training a very practical, real focus.

Two types of learning events are offered - both focused on learning from farmer leaders:

**1) Whole farm sustainability events:** These will be useful for farmers who are interested in learning about the detail and practical application of whole farm sustainability concepts and their cost/benefit aspects. They will also be designed for rural professionals who may know about one aspect of whole farm sustainability in detail but need 'broad-brush' information on others.

**2) Topic events:** These will look at the five Tools for Farmers publication topics individually and in more detail. They will be both direct-to-farmer events and sessions for people who help farmers make decisions about farm activities (e.g. contractors).

The Program's June 2005 newsletter is available at <http://www.maf.govt.nz/sff/about-projects/decision-management-and-learning/04037newsletter.htm#come>

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## 10.8 New Zealand Human Capability in Agriculture/Horticulture Draft Strategy

### 10.8.1 Summary

A Draft Strategy initiated by the AgHort Human Capability (HC) Governance Working Group in New Zealand sets the overall strategy, justifications, actions and activities being proposed to industry sector leaders and government to ensure New Zealand's AgHort industries attract, retain and have access to the people needed to succeed in the future. The Draft Strategy points out that both government and private organisations need to understand and incorporate industry priorities in their planning.

It is expected that each organisation and sector will provide resources and funding, and will share in the outcomes ensuing from the implementation of the strategy. The strategy includes a long-term strategic approach to communication, education, training and provision of careers advice.

The HC Group, including Meat and Wool New Zealand, has just about finalised a strategy related to provision of resources for schools that fit with the new (2002) curriculum. The Group's current discussions (October 2005) are focused on finding the funds to respond to the recommendations. The various organisations participating in the HC Group are already supplying some resources but in an ad hoc manner so a coordinated approach should have much greater impact. The New Zealanders are keen to share their approaches in this area and liaise with Australians developing new resource material. The Virtual Field Trips provided by LEARNZ cost \$75,000 per year over a three-year period. This provides for four field trips per year (different farms, orchards etc) for senior secondary school. These trips would be repeated for the following years, with some different content/subject focus such as geography, science, etc. (see [www.learnz.org.nz](http://www.learnz.org.nz))

### 10.8.2 Introduction

The Schools Curriculum Strategy is one component of a much larger initiative being undertaken by the Agriculture and Horticulture industries - the 'Human Capability in Agriculture and Horticulture (HC Ag/Hort)' program. It's primary objective is to identify the most effective means of contributing valued resources to support the secondary schools curriculum.

The Strategy supports the wider goals of the HC Ag/Hort program by identifying the most effective means of:

- Significantly increasing the profile of the sector;
- Changing school's perception of the sector;
- Increasing the number of people seeking careers in the sector; and
- Introducing resources across the wider curriculum.

A number of activities have been undertaken to date as part of the first phase of the Strategy. These activities include:

- Focus Groups with Ag/Hort teachers
- A survey completed by Ag/Hort teachers
- A stocktake of current resources
- One-on-one interviews with teachers, principals, senior school staff and key influencers
- An investigation into the NCEA Achievement Standards framework

### 10.8.3 General Perception

Two polarised views of the agriculture and horticulture industries were evident throughout the focus group and interview processes:

- Not a credible career path
- Not an academic subject
- Social stigma attached
- Gumboots and mud
- A legitimate career pathway
- An academic subject
- Part of the school's heritage
- A science

Those school communities holding the non academic viewpoint, tended to be either:

- in residential zones, relatively removed from farming/growing regions and with little ag/hort 'culture' evident; or
- in farming regions where the community focus is on practical skills for the children of local farm owner/operators.

Those holding the academic viewpoint tended to be:

- higher decile schools with ag/hort as part of the heritage of the school; and/or
- schools where the principal, Head of Department and/or ag/hort teacher holds a strong belief that ag/hort is an academic subject.

### 10.8.4 Current Environment

The current climate within schools is not a positive one for the sector. Teachers are reporting a continuing drop in student numbers with many teachers struggling with the subject being treated as a 'dumping ground' for non-academic students. As a result of low class numbers, it is viewed by many schools as a minor part of their curriculum. A comparison of the average number of students in 2004 assessed for Achievement Standards in Ag/Hort, Geography and Economics highlights this situation:

Average Number of Students Being Assessed for Achievement Standards

	<i>Level 1</i>	<i>Level 2</i>	<i>Level 3</i>
<b>Ag/Hort</b>	<b>1,305</b>	<b>760</b>	<b>470</b>
Geography	10,831	5,636	5,797
Economics	7,658	5,046	4,448

In 2004, the number of students not achieving Ag/Hort Achievement Standards ranged from 36.7% for a Level 3 standard to 85.8% for a Level 2 standard. In terms of average "non-Achievement" percentages, continuing comparisons with Geography and Economics are set out below:

Average Percentage of Students Not Achieving Achievement Standards

	<i>Level 1</i>	<i>Level 2</i>	<i>Level 3</i>
<b>Ag/Hort</b>	<b>56%</b>	<b>72.9%</b>	<b>61.9%</b>
Geography	33%	47.9%	44.1%
Economics	31%	46.3%	56.2%

This high level of non-achievement is considered to be due to a number of factors relating to the introduction of NCEA:

- the removal of "scaling" of examination results has seen the reporting of true results;
- students are now required to provide more explicit responses to questions – 1-2 word or long-winded responses are no longer acceptable; and
- internally set examinations at Level 2 (old 6<sup>th</sup> Form certificate) have been replaced by externally set and marked examinations, resulting in many schools being confused over the depth and breadth of teaching required at this level.

While the non-achievement rate for Level 1 has fluctuated since its inception in 2002, non-achievement rates for Level 2 have increased between 2003 and 2004.

Low student numbers, along with low achievement rates, has prompted the Ministry of Education to withdraw the subject from scholarships exams in 2004 and 2005. However this decision may be reviewed for 2006, subject to substantial increases in achievement rates and enrolments.

#### **10.8.5 Agriculture/Horticulture Teacher Findings**

Focus Groups and one-on-one interviews held with Ag/Hort teachers indicate that over 50% of schools teaching the subject, are teaching a combination of unit standards and achievement standards.

Teachers report that available resources are dated, do not fit with NCEA, are too technical, not New Zealand based, cost prohibitive and/or copyrighted. As a result, individual teachers are developing their own resources, by translating information from websites, magazines or textbooks into a language appropriate for their students. This activity is time consuming, produces a varied result and is carried out during teachers' non-contact hours, evenings, weekends or school holidays.

The technical capability of each school is dependant on its strategic plan, inherent wealth, size, fees and charity. This can impact on a sole teacher scenario, where the teacher is operating alone, without a national ag/hort teacher structure and support mechanism in place. Many teachers feel that the subject is viewed as a 'gumboot' profession rather than a 'science'.

The teachers identified a list of resources that they felt were important to support their teaching. Each item was ranked in order of priority. The most important\* being:

- A dedicated 'one stop shop' website
- Training resource packs
- Practical resources
- Posters
- Resources for Years 9-10
- Games
- Glossary
- Guide for 1<sup>st</sup> Year teachers

\* The full list is available

### 10.8.6 Wider Curriculum Findings

Principals and senior teachers approached were extremely supportive of the concept of bringing the sector into the wider curriculum through teacher resources. Three key messages were given:

- Heads of Department are the decision makers for content in a teaching program
- Any resources developed must align with achievement standards
- Resources should be developed by expert subject writers with industry input

Opportunities exist in subjects such as: Economics; Geography; Accounting; Business Studies; Biology; Mathematics; and Science.

Preliminary discussions with the relevant Teacher Associations have been positive with all keen to support the development of resources and to endorse the end product for use by their members.

### 10.8.7 Other Stakeholders

There are a number of key stakeholders who have been consulted during the course of this project and are keen to be further involved in the next phases. In particular:

**Animals in Schools Education Trust** – is keen to be involved in the development of resources.

**The Royal Society of New Zealand** – is keen to be involved where possible, particularly in the areas of: free access to foundation information; sourcing of writing expertise and publishing companies; and critiquing of resources.

**Beef and Sheep Councils** – are very committed to establishing a link between industry and schools at a local level and to provide mentoring, technical and general support to students.

**LEARNZ** – have submitted a proposal to the agriculture and horticulture industry for the development and delivery of four field trips in 2006.

LEARNZ are considered world leaders in virtual field trip delivery. Their field trips have a science focus, are 3 days in duration and are accessed live from the LEARNZ website. Supporting information includes: 1 weeks worth of preparatory work for students (video clips and 12-20 pages of specific information); a web board and teleconferencing facility for questions and answers; and access to the tutor's daily diary.

LEARNZ estimates that each field trip generates 3-4 week's worth of study time for students. Should teachers not be able to access the field trip live, each is stored in the archive section of the website and can be accessed (along with supporting material) at any time. 400 schools are currently registered and field trip subjects include coal mining, geothermal power and the Karori Wildlife Sanctuary. LEARNZ is funded primarily by the Ministry of Education and the development and delivery of specific field trips are sponsored by relevant organisations.

### 10.8.8 Recommendations

It is recommended that:

- a) further investigation into the highest priority items on the ag/hort teachers resource list be undertaken in the following staged manner:
  - i) **2005: Website:** a section of the pan sector website currently in development be established for teachers and a framework for the sourcing, uploading and maintaining of information be developed (including investigation of costing, ownership and IT implications) - delivery of website by the end of 2005.
  - ii) **2005: Practical Resources:** 10 key resources that could be provided to schools through company sponsorships be identified - delivery of resources by the end of 2005.
  - iii) **2006: Training Resource Packs:** the most frequently used Achievement Standards and Unit Standards be identified and the development, delivery and maintenance of resources for these Standards be investigated (including costing, resource development, timelines) -delivery of resource packs from mid 2006 in a staged manner.
  - iv) **2006: Games:** the reproduction of the "Crossroads" game be investigated - delivery of games early 2006.
  - v) **2006: Posters:** 10 key subjects for posters be identified and the design and delivery be investigated (including costing and timelines) - delivery of posters mid 2006.
  - vi) **2006: Glossary:** the development of a glossary of terms be investigated (including costing, resource development and timeline) - delivery of glossary end of 2006
  - vii) **2006: Guide for 1<sup>st</sup> Year Teachers:** discussions with the Ministry of Education be held at a high level to promote development of this resource.
- b) The HC in Ag/Hort Group urgently consider the proposal from LEARNZ to develop 4 virtual field trips for agriculture and horticulture in 2006
- c) The HC in Ag/Hort Group consider providing support to the Horticulture Agriculture Teachers Association (HATA) to enable them to provide a high level of support and service to their members
- d) Discussions with the wider curriculum Teachers Associations be advanced to identify potential Achievement Standards and resource writers for the development of ag/hort based resource packs for wider curriculum subject teachers in 2006.

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- Anna Dollard, Stephanie Alexander Kitchen Garden Foundation
- Belinda Barr, Australian Centre for Plant Functional Genomics
- Brian Trench, Camden Park Environmental Education Centre
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- Linden Masters, Rural Solutions SA and Cleve Area School
- \*Liz Yuncken, CSIRO Education
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- Mairi Barton, National Farmers Federation
- Michael Williams, NSW Department of Education and Training, Sheep CRC
- Nel Smit, Woodbridge School, Tasmania
- Niel Jacobsen, Dane Consulting
- NSW Farmers Association
- \*Paul Comyn, Australian Wool Innovation
- \*Rhonda Scoullar, Agaware, Queensland
- \*Rob Wallace, Department of Water, Land and Biodiversity Conservation, SA
- Ross Cardile, Rural Skills Australia
- Samantha McConnell-Green, Royal Agricultural Society, Queensland

\* Denotes member of the Promotion of Agriculture to Schools Network Steering Committee.

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A National Scoping Study of the Promotion of Agriculture to Schools, convened by the Promotion of Agriculture to Schools Network and undertaken by Scarlet Consulting and funded by the Australian Wool Education Trust with in-kind contributions from national stakeholders.'



## Appendix 2 List of Acronyms found in this publication

ACPGF	Australian Centre for Plant Functional Genomics
Ag/Hort	Agriculture/Horticulture
Ag-Ed	Agricultural Education
ANICA	Australian Network of Industry Careers Advisers
AWET	Australian Wool Education Trust
AWI	Australian Wool Innovation
BFEA	Ballance Farm Environment Awards (New Zealand)
BSSSS	Board of Senior Secondary School Subjects
CBD	Central Business District
CEP	Country Education Project
CRC	Cooperative Research Centre
CSIRO	Commonwealth Scientific and Industrial Research Organisation
DEST	Department of Education Science and Training
DOTRS	Department of Transport and Regional Services
DPI&F (Qld)	Department of Primary Industries and Fisheries, Queensland
DPIF&M (NT)	Department of Primary Industry, Fisheries and Mines, Northern Territory
EKKA	Royal Queensland Show
Farmarm	Farm Animal Resource Management
G2L	Grow to Learn
GRDC	Grains Research and Development Corporation
HC Ag/Hort	Human Capability in Agriculture and Horticulture (New Zealand)
HSIE	Human Society and its Environment
LLENs	Local Learning and Employment Networks
MLA	Meat and Livestock Australia
MPB CRC	Molecular Plant Breeding CRC
NFF	National Farmers Federation
NFIS	National Food Industry Strategy
NRMSEQ	Natural Resource Management, South East Queensland
NT DEET	Northern Territory Department of Employment, Education and Training
NTCF	Northern Territory Curriculum Framework
NZFEA	New Zealand Environment Awards Trust
PSV	Primary Skills Victoria
QAST	Queensland Association of School Tuckshops
RAS	Royal Agricultural Society
RSA	Rural Skills Australia
RYAG Sheep	Rotary Youth Agriculture – Sheep
SARDI	South Australian Research and Development Institute
SHS	Senior High School
SOSE	Studies of Society and Environment
VET	Vocational Education and Training
WFC	Wilsonton Agricultural Field Studies Centre
YG	Young Gourmet

### Appendix 3: Australian Schools Innovation in Science, Technology and Mathematics (ASISTM) Project

The Federal Department of Education, Science and Training (DEST) has a \$33.7 million funding program called ASISTM. The Program aims to improve science, maths and technology education in schools.

A group of schools plus non-school organisation(s) apply as a group for funding (\$20K - \$80K) to run a program that will provide an innovative, transferable, sustainable improvement in science, maths and/or technology education. The focus can be primary, secondary or both and the group of schools does not need to be geographically close together.

First round funding was announced on 21 July 2005. In the first round of the *Australian Schools Innovation in Science, Technology and Mathematics (ASISTM) Project*, the Australian Government will provide \$9 million to directly target the teaching of science, technology and mathematics and promote innovation in our schools.

Initially, 103 school clusters, comprising 623 schools and partner organisations (from the scientific community, universities, industry, education authorities, and the wider community), will receive grants of between \$20,000 and \$120,000 to develop new approaches to science, technology and mathematics education.

The initiative will ultimately employ around 1,300 teacher associates (university students, researchers and other specialists in these fields), who will provide project support, excite student interest and act as role models. This first phase of the Project will employ around 320 teacher associates.

The ASISTM Project is a key element of the Government's response to the independent 2003 *Review of Teaching and Teacher Education*. The Government will fund an estimated 500 ASISTM projects over the seven years to 2010-2011.

Curriculum Corporation has been appointed as the National Administrator for the ASISTM Project and will enter into direct agreements with the successful schools and other organisations. The ASISTM project is part of the Australian Government's Boosting Innovation, Science, Technology and Mathematics Teaching (BISTMT) Program. For a complete list of successful Round One projects and further information about ASISTM visit [www.asistm.edu.au](http://www.asistm.edu.au)

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Major Ag Industries GVP	Agriculture \$39 billion	Meat & Livestock \$3.8 billion	Cotton \$1.2 billion	Dairy \$2.8 billion	Grains \$5 billion	Horticulture \$6.5 billion	Sugar \$1.4 billion	Wine \$2.4 billion	Wool \$3.5 billion	Eggs \$330 million	Other (Food industry, Fisheries and aquaculture, Pigs, Goats, Tobacco, Apiculture, Horses, Farm forestry)
Industry Resources	See Austrade Student Centre www.austrade.com.au	Meat and Livestock Australia www.mla.com.au	Cotton Australia www.cottonaustralia.com.au	Dairy Australia www.dairyaustralia.com.au	Grain Research and Development Corporation www.grdc.com.au	Horticulture Australia Limited www.horticulture.com.au	Sugar Industry www.sugar.org.au	Wine Australia wineaustralia.com Wine Industry National Education and Training Council winebiz.com.au	Australian Wool Innovation Limited www.wool.com.au Australian Wool Education Trust woolwise.com	Australian Egg Corporation www.aecl.org	e.g. Australian Pork Limited www.apl.au.com

Agricultural Education focus	NSW	Victoria	Queensland	South Australia	Tasmania	Western Australia	Northern Territory	ACT	National
<b>Arousing curiosity about Agriculture in young children</b>	<b>Farmarm Milking Barn</b> - Sydney Easter Show plus 200 School visits per year. Contact: Jane Southwell <b>Royal Sydney Easter Show Education Program</b> 20,000 students Contact: Jacqueline McCarthy <b>Farm visits</b> , Dairy Australia Contact: Janet Werkmeister	<b>Jamieson's run Mobile Farm</b> Royal Melbourne Show Contact: David & Marie Jamieson  Place-based "edu-tainment" Golden Cow, Tongala Collingwood Children's Farm	<b>Food and Fibre Trail</b> Royal National Agricultural and Industrial Association of Queensland <b>Ag-Ed Program</b> RNA Queensland Samantha McConnell-Green <b>Primary Industries Week</b> <b>Rural Discovery Day</b> QFF & The AgAware Group <b>Barnyard Babies</b>	<b>Farmarm Milking Barn</b> 2005 Royal Adelaide Show Contact: Jane Southwell  <b>Ag Learning Centre</b> (Ag students and Teachers)	<b>Royal Hobart Show</b> 'All about animals' Royal Agricultural Society of Tasmania	<b>Perth Royal Show</b> Royal Agricultural Society of WA  <b>Kondinin Workboot Series</b>  <b>Kondinin - Taking Agriculture the Classroom Week</b>	<b>Royal Darwin Show</b> Royal Agricultural Society of Northern Territory  <b>Grow to Learn</b> Department of Primary Industry, Fisheries & Mines Contact: Alison Jacks	<b>Royal Canberra Show</b> The Royal National Capital Agricultural Society (February each year)  <b>Farmarm</b> school visits. Contact: Jane Southwell	<b>Kondinin Workboot Series</b>  <b>Kondinin 'Taking Agriculture the Classroom' Week</b>  <b>NFF Campaign for Australian Agriculture</b> Contact: Mairi Barton, NFF  <b>Sheep CRC</b> Sheep Industry Schools Package School Industry Links Project Professional Development RYAG Support Package Contact: Michael Williams DET, NSW
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<b>Promoting Agriculture through Studies of Society and Environment</b>	<b>Royal Sydney Easter Show Education Program</b> Contact: Jacqueline McCarthy	<b>Victorian Landcare Centre, Creswick</b> SOSE curriculum focus now on 'sustainable farming' <b>Warrambien Landcare Education Centre &amp; Demonstration Farm</b> Rokewood <b>Landlearn</b> Collaborative work with environment education sector to promote a balanced approach to the conservation/production perspective. <b>Urban Rural Links Program</b>	<b>Agaware</b> DPIF/The AgAware Group Contact: Rhonda Scoullar  <b>Learning through Landcare, Queensland</b> Annette Gray Landcare Discovery Centre Toowoomba	<b>Landcare Education</b> (Good models not currently funded) Contact: Rob Wallace	<b>Landcare Education</b> Education Tasmania <b>'Adopt a Patch'</b> <b>'Whole Farm Planning'</b>	<b>Tammin Alcoa Landcare Education Centre</b> <b>Landcare education and 'Landcare in Your Hands'</b> Department of Education and Training, WA  <b>Growing Knowledge</b> Department of Agriculture WA Contact: Katrina Bonser  <b>Kondinin Group</b>	<b>Grow to Learn</b> Department of Primary Industry, Fisheries & Mines Contact: Alison Jacks	<b>CSIRO Education</b> Contact: Liz Yuncken	<b>CRC for Australian Weed Management</b> Lord of the Weeds Competition Ghastly Guests Weed Warriors Weed Wipeout VET Sector Resources Contact: Susanna Greig, Education Officer  <b>CRC for Sugar Industry Innovation through Biotechnology</b> Contact: Dr Mary-Rose Hoja, Education Officer
<b>Promoting Agriculture through Agricultural and Horticultural Studies</b>	<b>NSW Association of Agricultural Teachers</b>  Canobolas Rural Technology HS Bankstown Grammar Hurlstone Ag HS James Ruse Ag HS Yanco Ag HS	<b>Vic Assoc'n of Agriculture and Horticulture Educators</b>  Elisabeth Murdoch College - Langwarrin Ballarat Grammar School Avila College - Mt Waverley Antonio Park PS Mitcham Brunswick NW PS  <b>Landlearn</b> Ann Fagan	<b>Old Agricultural Teachers' Assoc'n</b> Dakabin SHS Ferry Grove SHS Hendra SC Southport SHS Stanthorpe SHS and Wine College Tully SHS <b>Wilsonton Field Studies Centre</b> John Martin <b>Agaware</b> DPIF/The AgAware Group	<b>ATSA</b> (Ag Teachers Association)  <b>Urrbrae Agricultural HS</b> Dean Cresswell <b>Cleve Area School</b> Linden Masters <b>Lucindale Area School</b> Kym Grant, Principal <b>Nuriootpa HS</b> <b>St Marks, Port Pirie</b> <b>Faith Lutheran School, Tanunda</b>	<b>Tasmanian Association of Agricultural Educators</b> <b>Bridgewater High School</b> Contact: Jackie Brown  <b>Sheffield District School</b> Contact: Alistair Primrose <b>Woodbridge School Sustainability Program</b> Woodbridge School Contact: Nel Smit	<b>Ag Educators Assoc'n WA</b>  <b>Growing Knowledge</b> Department of Agriculture WA Contact: Katrina Bonser  <b>Kondinin Group</b> Landsdale Farm School (also has Professional Development Program for Teachers).	<b>Taminmin High School</b>	<b>National Association of Agricultural Educators</b> Contact: Andrew Crosby  <b>CSIRO Education</b> Contact: Liz Yuncken  <b>Kaleen Village Farm</b> Kaleen High School	<b>Dairy CRC</b> Resources for Science and Biology, Biotechnology - Food and Technology, Enterprise studies, animal production, sustainability, ethics and values. Contact: Dr Susan Cumming Project Coordinator and Education
<b>Promoting Agriculture through Careers Education</b>	<b>Rural Skills Australia</b> Alicia Wilson Garry Tong VET in Schools School-based Apprenticeships  <b>TOCAL Agricultural College</b> Cameron Archer  <b>Murrumbidgee College of Agriculture</b>	<b>Landlearn</b> Ann Fagan <b>Rural Skills Australia</b> Gordon Griffin, Ross Cardile Rural Skills Passport, VET in Schools School-based Apprenticeships <b>Primary Skills Victoria</b> Land & Food Resources (Uni Melb) Dookie & Longerenong Colleges  <b>Bendigo Sheep and Wool Show</b> Andrew Ternouth	<b>Agaware</b> DPIF/The AgAware Group Contact: Rhonda Scoullar  <b>Rural Skills Australia</b> Beth Russell VET in Schools School-based Apprenticeships  <b>Ferry Grove SHS</b> (TAFE accredited VET Course)	<b>Rural Skills Australia</b> Jane Bartlett Wool Industry Induction Program Australian Schools Wine Show VET in Schools School-based Apprenticeships	<b>DPIWE and Rural Skills Australia</b> Lesley Richardson Wool Industry Induction Program Cropping a Career Vocational Education & Learning VET in Schools School-based Apprenticeships	<b>Rural Skills Australia</b> Fred Chambers VET in Schools, School-based Apprenticeships  <b>Woolpro in Schools</b> AgWA, Educ'n Dept, Primary Industries Training Council  <b>Cunderdin Agricultural College</b> <b>Curtin University's Muresk Institute of Agriculture</b> <b>Kondinin Group</b>	VET in Schools School-based Apprenticeships	VET in Schools School-based Apprenticeships	<b>Biotechnology Online</b> Biotechnology Australia Website with targeted curriculum resources on 'What is biotechnology?' Human Uses, Environment, Food and Agriculture, Careers. Contact: Janine Young  <b>Dairy Australia</b> <b>Just a Little Bit</b> Practical Nutrition Educational Resource produced by Dairy Australia available at www.justalittlebit.com.au  <b>Young Gourmet Gastronomy Challenge</b>
<b>Promoting Agriculture through Health and Physical education</b>	<b>Royal Sydney Easter Show Education Program</b> Jacqueline McCarthy	<b>Kitchen Garden at Collingwood College</b> Stephanie Alexander and Melanie Ruchel  <b>Landlearn</b> Ann Fagan Livestock Industries (Pork & Dairy) Education Programs (LIEP)  Health & PE Curriculum about to be launched based on findings of Animal Welfare Centre research.	<b>Agaware</b> DPIF/The AgAware Group Contact: Rhonda Scoullar  <b>Active-Ate</b> Queensland Health Teacher and student resources for Years 1-7. Queensland Association of School Tuckshops			<b>Growing Knowledge</b> Department of Agriculture WA Contact: Katrina Bonser  <b>Kondinin Group</b>	<b>Grow to Learn</b> Department of Primary Industry, Fisheries & Mines Contact: Alison Jacks	<b>CSIRO Education</b> Contact: Liz Yuncken	