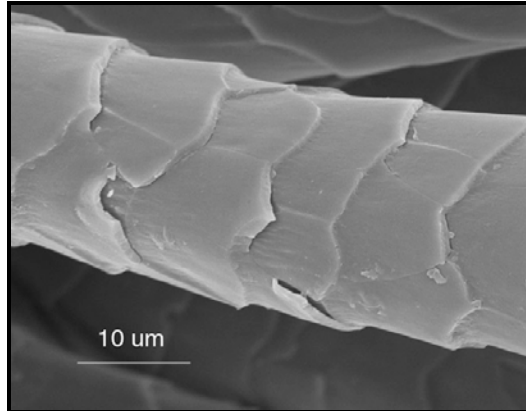


Schools to Industry Links

‘Promoting the Science that Underpins the Sheep Industry’



Project 4.3
Final Report
July 2006

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australian wool
innovation
limited



Activities for July – Dec 2005

Schools Visits

Dates: August to October 2005

Approximately 50 schools were visited in both Tasmania and WA. While these demonstrated the importance of science to the “whole of agriculture” and the career opportunities for tertiary graduates, the Sheep Industry was profiled. Approximately 3,000 Year 11/12 pre-tertiary science students (eg Chemistry, Biology) participated in the presentations on a class by class basis. As part of a GRDC/UTAS/UWA funded program, the personalised nature of this activity allows for significant interaction with small groups of students, individual teachers, careers advisors and principals.

Comment from a Yr 11 Chemistry Teacher:

These visits to the school were of particular value to the year 11 Chemistry students this year. It helps to demonstrate the “connectedness” of the classroom science to the “real world”, it provided an awareness to some of the career options available to them. Several of our students have shown considerable interest in Agricultural Science as a consequence of the visit.

These class visits are also designed to promote the industry placement scholarship (IPS) held in both Tasmania and WA during December and January. Students selected by application and interview participate in a five day primary industry “induction” camp and a subsequent industry placement with a team of research scientists for five days in January. Following the presentation of a verbal and written report, each student is presented with a \$250 cash scholarship. During the IPS program, activities promoting the Sheep Industry and subsequent placements in the Sheep Industry were incorporated.

Teachers’ Professional Development (PD), Tasmania

Dates: 6th & 7th December, 2005 on the East Coast (UTAS)

Topic: “www.Wool, Walnuts and Wine”

Promotional information about the PD was sent out to all Yr 11/12 pretertiary science teachers in Tasmania (25 schools and colleges). The program contained a specific segment relating to the science pertaining to the Sheep Industry, as well as activities relating to the Walnut and Wine industries. As part of an ongoing GRDC/UTAS/UWA funded program, strong relationships between teachers have been developed over the years, resulting in a high level of participation by schools each year.



Thirty-nine Yr 11/12 pretertiary science teachers participated in the 2 day PD on the East Coast of Tasmania, entitled “www.Wool, Walnuts and Wine”, the program of which is attached. During the following sessions that highlighted to the teachers the significant research conducted by the wool and meat industry, the Sheep CRC, AWI and MLA were acknowledged for their support. The sessions covered the DNA testing as relating to meat quality in sheep and beef, as well as R&D on increased productivity of wool production:

- A morning on a sheep farmer’s property (Julian Cotton) looking at the 8x5 program
- Another half day run by a current UTAS/Sheep CRC student, Will Bignell, making a presentation on his honours thesis as well as talking about his study path (both on the farm and during an evening meal)
- Dr Aduli (UTAS Animal Science lecturer/researcher) presented his work on meat quality, illustrating this with meat samples from the BBQ
- A young graduate Tanya Kerr from TIAR, spoke about her study path into the “Red Meat” project (MLA/TIAR) and her future career pathway in the industry

Comment from participating teacher:

"This is one of the best professional development programs on offer. Such variety! Great speakers. See places not normally accessible to the public. The recent graduates are always very impressive young people and it's great to hear their stories and passion for science".

Several State Contacts from the School Industry Links Project participated in this PD, to demonstrate first hand the style of the PD that could be delivered in their state. The two teachers from Victoria and one from WA found this a valuable activity and were able to use this experience in the planning of their activities in 2006.

Teachers' Professional Development (PD), WA

Dates: PD Session in Albany (UWA) on 1st & 2nd December, 2005

PD Session in Perth (UWA) on 6th & 7th December, 2005

Topic: "Rural Joules: Sheep Nutrition to Growing Your Own Diesel"

As part of an ongoing GRDC/UTAS/UWA funded integrated program, two programs of professional development for teachers were facilitated in Western Australia, one in Albany, the other in Perth. Current industry research and classroom teaching opportunities are linked in a range of primary industries, this year including the sheep industry. Fifty Year 11/12 pre-tertiary science teachers from Geraldton to Albany participated in these PD sessions. Teachers rated the professional development sessions at both Albany and Perth highly. The sessions were deemed relevant by the teachers, as a resource for teaching ideas, as well as enlightening and of high scientific interest.

Comment from participating teacher:

"Continues to allow me to draw on examples such as wine making in my teaching and also to encourage students to think about careers in the area."

Student Industry Science Camp in Tasmania and Western Australia

Dates: 16 – 20 December, 2005

The Industry Science Camp is designed for Yr 11/12 students who are searching for a career path in science. The students benefit in many ways including:

- By experiencing "real-life" situations, students will gain a much broader perspective of the huge range of career opportunities available, perhaps in areas they had not previously considered.
- Valuing the chance to talk with others employed in a particular area, to get their perspective on what they do, and what other opportunities exist.
- A much better appreciation of the importance of science and industry to our community is gained.

Student participant in the Industry Science Camp, WA

During camp we did not just focus only on the plant side of agriculture but we also looked at the animal side of agricultural science. For our introduction into the animal side of agricultural science, we had two guest speakers who were researchers at UWA, one scientist talked to us about red meat side research and the other talked to us about the wool and sheep milking industry. We were told about a program being run to introduce sheep milk into the buyers market and we got to taste some sheep's cheese and ice cream. In the meat research, we were told what happens to the sheep meat before they are slaughtered, how it needs to be managed and about how to scientifically determine good quality meat.

I now have a greater knowledge of the different fields within agriculture which has helped lead me towards choosing a career in the agricultural science field.

Activities for January – June 2006

Student Industry Placement Scholarship in Tasmania

Dates: 16-20 January 2006

Following the camp, the Schools to Industry Links Project sponsored two Year 11/12 students who were individually placed for 5 days with TIAR/DPIWE scientists that are engaged in the "Red Meat" Project (MLA/TIAR), Sheep Industry 8x5 Project and the extensive (sheep) section with TIAR/DPIWE in Tasmania.



Student participant in the Industry Placement, Tasmania
I also got to work with a little livestock, sheep in fact. The thing that I found most interesting about working with the sheep was learning about the electronic tags that they use to help make decisions on individual sheep. I think it is great seeing so many people and projects being able to work together as it gives me a bright outlook on what it is like working in the industry.

I have always planned on going to university and hope one day that I'll be able to do a PhD, so being placed with Fiona gave me a unique view on what it is like to do a PhD and what a PhD is all about. Overall I have found this industry placement extremely worth while and would recommend it to anyone who was thinking of an agricultural science based course at university.

Student Industry Placement Scholarship in Western Australia

Dates: 16-20 January and 23-17 January 2006



The Schools to Industry Links Project sponsored three Year 11/12 students who were individually placed for 5 days with UWA scientists engaging in the research relating to sheep meat quality, nutrition and wool quality, sheep temperament and the use of salt bush for feed.

Student participant in the Camp and Industry Placement, WA

"Overall, the whole scholarship made me realize just how varied and diverse the area of science is and how many options are available to me in the future.

The whole experience was fantastic and incredibly beneficial for me and I am glad to have been a part of this scholarship. Thank-you to everyone who made it possible, it is an experience I will never forget."

Production of an interactive CD-ROM

Audience: Years 7 – 10

Title: **The Scientific Adventures of Igor in the Sheep Industry and the Dairy Industry!**

This CD-ROM was funded from the "Skilling the Cradle Coast" program supported by the Department of Transport and Regional Services (DOTARS). This CD-ROM was designed to promote the UTAS - DOTARS Science Education Project and to support Australian science teachers by providing them with access to primary industry curriculum materials.

The CD-ROM project aims to produce a resource that will be valued by students but also contains the learning rigour required by teachers. This has been achieved by maintaining a simple framework with explanatory animation and interactivity, while including a wide variety of activities and pre-prepared resources for use in the classroom. The CD-ROM provides information within an industry-specific

context (Sheep, Wool and Dairy), allowing students to connect the science they are doing to real-life situations. This provides another opportunity to showcase industry sponsors and careers in science.

The CD-ROM content is designed to support by:

- Developing students' awareness of and skills in scientific inquiry
- Creating links with Sheep and Dairy Industries that are relevant for students
- Providing a high level of interactivity and student engagement
- Including support activities and classroom materials to enhance learning



Professional teachers have been involved in writing resources for the CD-ROM, especially the production of classroom based activities that reinforce the information and concepts presented relating to the Industry Schools Links Project. The Sheep Industry resource package is intended as a support for the use of the CD-ROM and as well as classroom activities, it will provide further ideas for

developing units and links to other useful resources.

Workshop for the State Contacts for the Industry School Links Project

Topic: "The Science that Underpins the Sheep Industry"

Date: 15 February, 2006 at the Cradle Coast Campus, Burnie

Participants: 15 teachers and educators from 6 States

The workshop brought together teachers and educators from Tasmania, Western Australia, Victoria, South Australia, New South Wales and Queensland for a day. These "State Contacts" met to connect, share ideas and resources and continue to enhance the awareness of the sheep industry and its scope for education and careers. These state coordinators compiled a business plan consisting of budgets and timelines for projects in their respective states.

Participants were required to;

- Be prepared to share current high school science programs in their state.
- Bring relevant curriculum and planning documents to enable discussion and planning around state requirements.
- Be prepared to continue the planning process in their home state and implement the program.
- Provide ongoing information to other states of progress, ideas and events.
- Work as part of a national team, operating out of the Cradle Coast Campus in Burnie.
- Attend a reporting session in June 2006, to present the materials produced and tested.



The major outcome of the Workshop was the establishment of a National Network of teachers who, over the period March – June 2006, would design, develop and deliver one or more of student camps, teachers' PD or other classroom activities, each with a strong focus on science and the sheep industry. A summary of each project follows.

PROJECT 1

State: Queensland

State Contact: Erica McLean

Activity: Curriculum Resource Material and Teachers' PD

Title: The Science Behind Wool

Objectives:

- To increase the knowledge and understanding by science teachers and student career planners of the high level science underpinning the Australian wool industry.
- To involve and excite teachers of science to the many ways science is used in the sheep and wool industry and for these teachers to develop curriculum resources based on ideas generated at a professional development workshop
- To increase the uptake by science teachers around the state of the soon to be developed sheep & wool science context curriculum resources through a train the trainer model using teachers attending the Sheep & Wool in Science PD Workshop.



Outline of the Activity:

The Queensland working group proposes a two-day professional development workshop for high school science teachers. The workshop would involve showcasing the Australian sheep and wool industry and revealing some of the exciting science behind it. The program will be designed to enthuse and educate teachers about the sheep and wool industry and its underpinning science as well as provide a variety of hands-on experimental work to expand and consolidate the teacher's learning outcomes. Following each hands-on session involving pasture management, wool fibre science and parasitology, teachers will be involved in small group workshops to brainstorm and develop a variety of curriculum context ideas to go back to their schools with and develop either independently or in small groups in the regions.



The Queensland working group has been collaborating with Spotlight on Science (an initiative of Education Queensland) and approval has been granted to make additional funding available for TRS for teachers to develop these curriculum resources in school time post-workshop for this project. The Spotlight on Science funding will provide the same or greater level of financial support as the Sheep CRC funding and can therefore be seen to be another significant advance towards ensuring this project's outcomes are realised and quality classroom resources are

produced and used by teachers within Queensland high schools. Post workshop, all attending teachers will be expected to develop a single science curriculum context resource and submit it to the working group for amalgamation and distribution.

PROJECT 2

State: Northern NSW

State Contact: Dr John Harper

Activity: Science Competition for Schools

Title: CSI - Cool Sheep Investigation

Objectives:

- To provide an interesting competition, based on the interpretation and presentation of data from research into sheep Artificial Insemination (AI), that will raise awareness in the 7 Wagga Wagga high schools of the technological advanced sheep industry.
- To extend this exercise to Northern NSW and Queensland by working with colleagues in these areas.
- To provide the 7 high schools in Wagga Wagga with a class set of Ram sperm slides for practical classes in reproduction and to raise awareness of the Genetic Technology in the sheep industry.
- To increase awareness of teachers and career advisers of the job opportunities for science students in the Wool industry.

Outline of the Activity:



Students will receive a package that will contain information about the importance of Genetic services and AI in the sheep industry. A research situation will be outlined describing the evaluation of an additive to frozen sperm that is hypothesised to increase both sperm longevity and motility. Laminated images of a statistically valid number say, between 500 and 1000 sperm per treatment time will be provided which will be labeled with a vital stain showing living and dead sperm. We will provide control images and treatment images of sperm taken at e.g. 1h, 5h, 12h, 24h and 36 h held at 37C. Students will be asked to count the living and dead sperm and evaluate the treatment. In addition motility data will be provided.

Selected year 10 students in the 7 schools will have to analyse the data and present their findings as a 5-10 minute PowerPoint presentation to myself, colleagues and industry representatives. Depending on constraints the presentation can be on CD with voiceover or on video.

PROJECT 3

State: Central NSW

State Contact: Peter Ruprecht

Activity: Science Competition for Schools

Title: SAS – Sheep And Schools

Objectives:

- To provide an interesting competition, based on the interpretation and presentation of data from research into sheep Artificial Insemination (AI) that will raise awareness in 12 Manning Valley high schools/campuses of the technological advances in the sheep industry.
- To provide 12 high schools/campuses in the Manning Valley with a class set of Ram sperm slides for practical classes in reproduction and to raise awareness of Genetic Technology in the sheep industry.
- To increase awareness of teachers and career advisers of the job opportunities for science students in the Wool industry.

Outline of the Activity:

Students will receive a package that will contain information about the importance of Genetic services and AI in the sheep industry. A research situation will be outlined describing the evaluation of an additive to frozen sperm that is hypothesised to increase both sperm longevity and motility.

Charles Sturt University will provide laminated images of a statistically valid number say, between 500 and 1000 sperm per treatment time which will be labeled with a vital stain showing living and dead sperm. We will provide control images and treatment images of sperm taken at e.g 1h, 5h, 12h, 24h, 36h held at 37C. Students will be asked to count the living and dead sperm and evaluate the treatment. In addition motility data will be provided.

Each of the 12 schools / campuses will provide a team of 4-5 students from Year 10 who will analyse the data and present their findings as a scientific report and group presentation. Activity sheets relating to scientific method and report writing will be developed and a tutorial offered to participating students.

The reports and presentations will be judged by the district veterinarian from Rural Lands Protection Board. Prizes of \$500 (First) \$200 (second) and \$100 (third) will be presented to the Science departments of the winning schools. All participating schools will receive a class set of ram semen slides, laminated images and classroom resources and activities.



PROJECT 4

State: Central Victoria

State Contact: Cate Burton

Activity: Cross Discipline Classroom Activities and Teachers' PD

Title: The Science of the Sheep and Wool Industry

Objectives:

- To develop a unit of work on the Science of sheep and wool production that reflects VELS and focuses on principles 3, 4 and 6 of PoLT.
- To use this as a model within the school for introducing the new approach to the curriculum
- To provide PD on the teaching of this unit in other schools
- To give students an insight into the science behind sheep and wool production
- To give students an understanding of the careers available in the primary industries



Outline of the Activity:

A team of teachers will develop a VELS unit on Sheep and Wool. The unit will be science based but will incorporate English, Mathematics and SOSE and will be conducted over a period of 2 -3 weeks. There will be practical activities undertaken in science classes as well as an excursion to a research centre and the Wool Museum in Geelong. On completion of the unit an evaluation will undertaken and further refinements made to the unit. The unit will be used as a VELS model and other members of staff within the school will be given PD on the teaching of the unit. It can then be trialed in other Year 9 classes and a Year 10 Science elective later in the year. With the assistance of the Science Regional Project Officer a PD program for other schools in the region will be offered.

PROJECT 5

State: Western Victoria

State Contacts: Ann Fagan and Andrew Cosby

Activity: Classroom Activities, Teachers' PD and Student Camp

Title: Science in the Sheep Industry

Objectives:

- Using a 'paddock to store' approach students will gain a greater appreciation of the wool industry through experiential learning;
- Teachers' skills will be developed in order to continue sheep and wool industry outcomes;
- The program will be written to ensure on-going relevance and application to achieve outcomes in the future.

Outline of the Activity:

This project will include the development of:

- Curriculum linked to the Victorian Essential Learning Standards (VELS);
- Relationships with farmers, industry and scientists;
- Teacher professional development; and
- School support in the form of industry and farm visits (day or camp programs) linked to the learning and teaching activities for the classroom, school lab and /or school farm.



The curriculum will be trialed with schools participating in the program, with classroom teachers participating in pre and post professional development sessions. Building on-going relationships with farmers, industry and scientists supports schools in implementing the Principles of Learning Teaching (POLT) No 6 'Learning connects strongly with communities and practice beyond the classroom'. Such connections add variety and depth to the student learning experiences and assist organisations to identify opportunities for ongoing involvement in education.

The industry and farm visits will be documented so that in future they can be run as either day fieldtrips or an overnight camp program. In this pilot phase they will be provided in a two-day program utilising a working sheep farm (Warrambeen) which also has accommodation for small groups. This project provides an opportunity to establish a closer relationship with the owners at Warrambeen that better connects their current education activities into a "paddock to back" approach and to secondary levels of Victorian Essential Learning Standards.

PROJECT 6

State: Northern Tasmania

State Contact: Tracey Taylor

Activity: Teachers' PD and Classroom Resources

Title: Science and Wool

Objectives:

- To increase the knowledge and understanding by science teachers and student career planners of the high level science underpinning the Australian wool industry.
- To increase the knowledge and understanding by teachers and career planners of the Working in Wool industry induction program.
- To pilot a program with high school students investigating the science behind wool production through a field trip and practical experiments.



Outline of the Activity:

Science & Wool is a one-and-a-half day professional development session for science teachers and pathway planners that showcases the science behind the Australian wool industry. This will include visits to laboratories, a session with wool industry scientists on their current work and an evening networking function where teachers/planners will have the opportunity to meet with science professionals with careers in the wool industry.

Science & Wool will conclude on the last day of the Working in Wool program which is held at the Campbell Town show on 2 June. This will enable the teachers and pathway planners to meet the students who participated in this program and experience their enthusiasm for the broad range of careers available in agriculture, in particular in science.

The pilot program will be done with Sheffield High Students who will visit DPIWE in Launceston to see science in the wool industry in practice and then take back with them information to implement their own practical program.



PROJECT **REPORT** JUNE 2006

PROJECT 7

State: Riverland, SA

State Contact: Peter Haines

Activity: Student Camp, Teaching Resources and Teachers' PD

Title: The Science in Sheep and Wool Production

Objectives:

- To increase the knowledge and understanding by students of the science involved in the sheep and wool industry.
- To encourage students to consider study in science and career pathways in primary industry.
- To provide resources for teachers to use in the science and Ag classroom related to the sheep and wool industry.



Outline of the Activity:

A three day camp/excursion that will show cutting edge science used in the sheep and wool industry. This will include visits to properties in the Riverland and Mallee areas, a session visiting a market/processing plant, a session with University scientists on their current work and a session with student activities at an agricultural research area.

From the activities a series of classroom activities will be prepared for use by teachers. These activities will be demonstrated to teachers at a PD session later in the year.

PROJECT 8

State: Perth, WA

State Contact: Warwick Mathews

Activity: Whole of School Program and Teachers' PD

Title: The Sheep at School

Objectives:

- To increase the knowledge and understanding by teachers of the high level of science underpinning the Australian wool industry.
- To increase the knowledge and understanding by teachers of the links between the sheep wool and meat industry, research and education.

Outline of the Activity:

A half day professional learning and curriculum development session for 8 secondary teachers will enhance their knowledge and understanding of the value of the sheep industry to a range of education subjects beyond science. This will include industry and research speakers to teachers and later to students which will promote the broad range of careers available in agriculture and the wool industry in particular.





Mid June will see the sheep come to school. Here, 500 hundred secondary students at Shenton College, Perth, Western Australia, will be greeted on arrival to school with a flock of sheep being 'worked' by a sheep dog on their school oval. Various sheep related activities will be engaged in throughout the day. These activities will promote the sheep industry as part of our scientific, economic and social culture.

Reporting Back Forum at Burnie, Tasmania

Dates: 28-29 June, 2006

Audience: All State Contacts

This two day forum had several purposes;

- An opportunity for participants to share the successes, highs and lows of their respective projects including evaluations.
- Demonstration of resources produced.
- An opportunity to further build on the network of contacts which has developed during the course of the project.
- Developing a curriculum reference document for each project which outlines the links to each state's curriculum.
- Planning and producing a template for future activities and events.



The Forum achieved many outcomes, including:

- The collation of teaching resources pertaining to the Science of the Sheep Industry.
- A clear understanding of a range of possible activities involving students and teachers which can be used to enhance science learning opportunities for students and teachers while also promoting the sheep industry.
- The development of published curriculum outcome statements for each project for each state.
- The development of a template for future Industry School Links and Teacher PD Projects.



As part of the evaluation of this Industry School Links Project, an exit survey was administered on the State Contacts, eliciting the following comments:

Question 1: Describe the Highlights of running this program in your State

- Passion of teachers/participants.
- Reference to Chemistry, Physics, Biology, Science 21, Maths & Junior Science.
- Quality of presenters – ongoing networking & resource production.



Question 2: Changes you would make?

- Excellent program – if possible annual meeting of group if funding provided and also to maintain enthusiasm of regional schools. No changes needed to current program.

Question 3: Are you going to use these resources and how?

- These resources will be written into teaching and learning activities for Semester II. Further activities (for older students) in 2007.
- Resources I have prepared will be adapted and used by teachers locally and in other states

Question 4: Major outcomes of your activity/program for the sheep industry?

- This camp had a huge impact on a number of my students. Many said the talking with the DPI staff “gelled” their thoughts as to the career they would like to go into.
- Students have a greater awareness of the complexity of the industry and the range of careers in the industry.
- Students understand the vast amount of science underpinning the industry.
- Having a range of resources to conduct PD in my state.

Question 5: Value of this Forum?

- Fantastic sharing ideas and learning. Aware of other institutions across the country.
- Meeting passionate people!
- This has been very valuable as delegates were able to showcase good teaching approaches and fantastic resources. It also inspires me to do more when I get back to school.
- Obtaining some wonderful resources that will improve teaching & learning in my school & other schools in the state.

Question 6: Anything else we could help with?

- Yes – organise/fund annual program.
- Liked the idea of applying this model to other Primary industry.
- Incredible application for the benefit of science nationwide.
- Probably the most collegiate, productive and intellectually stimulating PD ever attended.
- Empathy for the needs of the participants.

Following the completion of the Forum, the reports, images, curriculum materials and planning documents from each of the 8 State Teams, have been collated and are ready for printing. When printed, this National Resource Pack will be distributed to each State Team, WET, AWI and the Sheep CRC. These should be available in September.

The Science of the Sheep and Wool Industry Program 2005-2006 Initial Information Provided to State Participants

Project Leader: Dr David Russell, UTAS

Science Education Officer: Ms Donna Harris, UTAS

State Contacts:

State	Teacher/Contact	School/Organisation	Contact Details
Tasmania	Donna Harris Tracey Taylor	* Science Education Officer - UTAS - School of Ag Science * DPIWE	Donna.harris@utas.edu.au tracey.taylor@dpiwe.tas.gov.au
Western Australia	Warwick Mathews	* Science Teacher, Shenton College	warwickmat@gmail.com
Victoria (1)	Ann Fagan Andrew Cosby	* Coordinator Landlearn * Teacher - Science and Ag Sc	Ann.fagan@dpi.vic.gov.au ac@emc.vic.edu.au
(2)	Cate Burton	* Kyneton Secondary College	burton.catherine.a@edumail.vic.gov.au
South Australia	Peter Haines	* Science Education Officer - Growsmart	Pha24559@bigpond.com
Queensland	Erica McLean	* Chemistry Coordinator - Somerville House	mcler@somerville.qld.edu.au
New South Wales (1)	Peter Ruprecht	* TAFE NSW	Peter.ruprecht@tafensw.edu.au
(2)	Dr John Harper	* Charles Sturt University	JHarper@csu.edu.au

Expected Commitment of State Participants:

- Attend induction training and workshop in Tasmania
- Plan and deliver Sheep Industry Teacher PD
- Plan and deliver a school/industry links activity

Tasks for State Participants:

- Implement the UTAS model in the areas of Teachers' PD and Student Industry Science Camp or scientific investigations
- Customise a prepared School/Industry learning resource package for the local curriculum
- Prepare a timeline and budget document for implementation of the project.

Purpose and Focus of the Project

The education project has been established within the Sheep CRC to provide national co-ordination in the;

- development of resource materials for school students within current science curriculum for Yr 9 - 12,
- professional development for school teachers, by showing them the relevance of their science subjects to the Sheep and Wool industry,
- provision of structured science-industry induction camps that link current research and careers in the Sheep and Wool industry
- facilitate shared scientific investigations between high school students and industry

The primary focus of the program is to bring about attitudinal change in science teachers, by demonstrating the relevance of their discipline to the Sheep and Wool industry and the variety of career options in this industry for their students. This will raise the profile of the sheep industry and relevant research.

The secondary focus of the program is to encourage more high school students to undertake post-secondary training in sciences and then training in tertiary courses pertaining to sheep and wool science, leading to a career in the industry.

Project Background Information

A large number of regional and urban science school teachers are not tapped into industry research and development and many of these teachers struggle to place the sourcing of relevant material at the top of their list of priorities due to other more pressing day-to-day obligations. This gap needs to be bridged and the most effective way to achieve this is through a cooperative effort led by the combined efforts of the Sheep Cooperative Research Centre, AWI and AWET. Dr David Russell will lead the project as part of the University of Tasmania program.

Project Outcomes

This project will ensure that science teachers and students are engaged in a sequential series of activities from year to year. This project will encourage innovation by delivering structured activities and resources that are valued by teachers and students as relevant to their educational programs.

This project supports the goals of the Sheep CRC by assisting in the development of skills and technology for the future by promoting the sheep industry throughout the educational community in order to attract young people into the industry.

Activity 1: Professional Development for Science Teachers**Outcomes**

It is proposed to provide Professional Development sessions as part of an overall strategy to raise the profile of the sheep industry within each state. Key to this will be the development of a network of state coordinators for the Schools to Industry links program in Tasmania, Western Australia, Victoria, South Australia, Queensland and New South Wales.

Timeline;

- 1) State coordinators to be appointed and inducted in a national workshop
- 2) Operational plan for PD to be developed for each state for approval of expenditure
- 3) At least one professional development workshop to be run for school teachers in each state by June 2006.

Activity 2: School Industry Links Project

Outcomes

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 that details 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.

Each state will develop learning resources that relate to the science underpinning the sheep industry. Students attend industry camps or participate in industry-linked scientific investigations or competitions to further their awareness of the industry.

The project will be integrated with an existing program developed by the University of Tasmania.

Timeline:

- 1) Operational plan for student activities and learning resources to be developed for each state for approval of expenditure.
- 2) At least one student activity to be run for students in each state by June 2006.
- 3) A series of learning resources to be trialed in each state by June 2006.

Involvement and Impact of UTAS - Sheep CRC National Project (January – June 2006)

STATE	Schools	Teachers	Students	Industry Staff	University Staff	Total no. of students taught by teachers
TASMANIA	6	9	20	17	5	1,180
VICTORIA	4	8	43	18	2	900
SOUTH AUSTRALIA	10	22	473	12	2	2,750
WESTERN AUSTRALIA	1	30	500	8	9	4,000
QUEENSLAND	15	14	0	6	1	1,750
NSW	4	7	21	3	3	875
NATIONAL TOTAL	40	90	1,057	64	22	11,455