

To CRC or not to CRC

Every two years (under current arrangements) the Australian Government advertises for proposals for new Cooperative Research Centres (CRCs). Typically, a CRC is a partnership, between industry, research providers and government bodies, seeking to pursue a focused research program to achieve specified outcomes over a seven-year term. Applications for Round 11 CRCs are expected to be called in late 2007 for initial submissions in March 2008.

The forest and wood products industry has benefited from the activities of several CRCs, including CRC for Forestry (now in its third term), CRC Wood Innovations (closing in July 2008) and CRC for Functional Communication Services (a CRC focusing on paper products, as the name suggests, which will also close in July 2008).

In recognition of the upcoming application opportunity, the FWPRDC invited a cross-section of the wood products and allied industries to a meeting in Melbourne on 27 February to discuss ideas potentially supporting the formation of a new CRC, which could attract wide industry support both intellectually and financially. Given the very competitive nature of the selection process, CRCs require significant

industry cash contributions (minimally \$1.5 to \$2 million a year) to leverage annual Commonwealth funding of between \$5 and \$7 million.

The meeting was attended by 24 industry representatives. A concept proposal around the theme 'Building in Wood' served as a basis for discussion and many worthwhile ideas were raised during the day.

The FWPRDC invited a cross-section of the wood products and allied industries to discuss ideas potentially underpinning the development of a new CRC that could attract wide industry support, intellectually and financially.

The FWPRDC will develop an initial proposal or prospectus as a basis for further consultation with potential industry participants before determining whether there is likely to be sufficient support to justify directing resources towards the development of a full bid.

PhD STUDENTS TACKLE VITAL FORESTRY R&D

The FWPRDC has awarded two scholarships to PhD students undertaking collaborative forestry genetics research by the University of New England (UNE), Ensis (a joint venture between CSIRO and Scion), and the Southern Tree Breeding Association (STBA).

Adrian Hathorn, from Canberra, and Meimei Ding, from China, are both studying forestry quantitative genetics and genomics – an emerging and increasingly vital area of research and development.

Mr Hathorn completed his Bachelor of Forest Science with first class honours at the Australian National University and has moved directly into postgraduate research.

As an important component of the juvenile wood initiative project – led by Ensis principal scientist Dr Harry Wu – Mr Hathorn is integrating genomic data from Ensis and genetic data from STBA to examine the use of genetic markers in breeding for important forestry traits in juvenile wood, especially *Pinus radiata*.

Mr Hathorn's UNE supervisor Dr Bruce Tier says the study aims to reduce the incidence of low-value juvenile wood in the inner tree by breeding for early maturity in the *Pinus* species.

"The objective is to produce solid internal and outer rings to provide a more useful structure timber," Dr Tier says.

Based at UNE's Animal Genetics and Breeding Unit (AGBU), Mr Hathorn is tapping into cutting-edge genetics used in sheep and cattle research, with a view to modifying technologies for his research. He proposes to meld molecular data with quantitative breeding techniques specific to the forestry industry.

Ms Ding completed postgraduate studies



(Top) Meimei Ding and (above) Adrian Hathorn: winners of two FWPRDC-funded PhD scholarships for forestry genetics research.

in forestry science at Beijing Forestry University in China and is undertaking her scholarship through UNE.

She is exploring existing and new methods

to analyse data collected in genetics trials of trees grown under different environments and production systems throughout Australia.

Using TREEPLAN® - a FWPRDC-backed genetic evaluation software system for forest tree improvement developed by STBA and AGBU – Ms Ding aims to determine how important genotype by environment interaction (GxE) is by using data for common genotypes grown in different regions. The focus is on repeatable GxE differences due to environmental influences, such as rainfall, water availability, soil type and nutrient status, which can be described on a regional basis.

STBA General Manager Dr Tony McRae says many factors cause GxE and it is repeatable patterns which can be categorised and targeted through genetics as part of the national breeding and deployment programs.

"We need to know and understand genotype by environment interactions so we can breed trees that are suited to specific regions and production systems," Dr McRae says. "Meimei's research will help us to select and deploy *Pinus radiata* genotypes more strategically "

FWPRDC Executive Director

Dr Glen Kile says the scholarships are indicative of the FWPRDC's commitment to developing Australian research expertise to tackle important issues for the forest industry.

FWPRDC updates

IMPROVING TIMBER CLADDING FOR BUILDERS, DESIGNERS, CONSUMERS

PROJECT: PN06.1027

RESEARCH PROVIDER: Timber Development Association (NSW)

PRINCIPAL RESEARCHER: Andrew Dunn, 02 9279 2366

EXPECTED COMPLETION DATE: May 2007

The TDA cladding project is being undertaken in conjunction with the New Zealand timber industry and aims to revitalise the use of timber in Australian building.

Research is progressing well. Prototyping on a building in Gosford will begin in late March and will feature a new system of exposed metal Colorbond® and stainless steel flashings.

Apart from a hidden nail fixing system, there will also be a metal cavity batten system tested. It will be used to fit boards against raked tabs so that no nails are visible on the exterior; this creates a ventilated cavity suitable for hot humid climates. The batten design will also provide greater fixity for cyclonic areas.

In overall terms, the new approach aims to offer ease of use and a modern appearance that will suit architectural trends.

AN ADVANCED GENETIC EVALUATION SYSTEM FOR FOREST TREE IMPROVEMENT (TREEPLAN®)

PROJECT: PN03.1915

RESEARCH PROVIDER: Southern Tree Breeding Association Inc

PRINCIPAL RESEARCHER: Tony McRae, 08 8723 0688

EXPECTED COMPLETION DATE: December 2007

The project aims to further develop the TREEPLAN® software system for the analysis of data from genetic trials in national tree breeding programs. TREEPLAN® provides rapid genetic gain, with a focus on commercial output and cost efficiencies in breeding programs.

Recent developments include the capacity to integrate information at the DNA level (genetic markers and candidate genes) with usual performance data for volume growth, tree form (straightness and branching characteristics), disease resistances and wood quality traits (basic density and timber stiffness).

The system can now account for unknown male parentage on a probabilistic basis, that is, where the father is likely to be one of several in a pollen mix.

The project will also provide a better understanding of Genotype x Environment interaction for *Pinus radiata* across Australia, allowing genetic material to be more strategically matched to target production regions.

The project is on schedule, with advanced functionality being rolled into the operational versions of TREEPLAN® as development occurs.

The system is routinely being used for national analyses in *P. radiata*, *Eucalyptus globulus* and *E. nitens*. Retrospective analyses of data in these and other tree-breeding programs have shown that selection efficiency and genetic gain has more than trebled with the application of TREEPLAN®.

QUANTIFYING PLANTATION WATER USE IN THE GREEN TRIANGLE

PROJECT: PN06.4014

RESEARCH PROVIDER: Ensis

PRINCIPAL RESEARCHER: Richard Benyon, 08 8721 8100

EXPECTED COMPLETION DATE: August 2008

The purpose of this project is to collect real measurements of water use by tree plantations in south-west Victoria over a two- to three-year period, and to test the effectiveness of three models used to predict plantation water use.

The project is more than half way through. Over the past 18 months to two years, water use data has been collected from monitoring sites established in four bluegum plantations and two radiata pine plantations.

Two of the three models tested are undergoing improvements as a result of early research and will be retested after modification.

The third model provided accurate predictions of annual water use at most sites, but did not quantify seasonal variations.

PULL-OUT CAPACITY OF STEEL AND FIBRE COMPOSITE RODS GROUTED INTO TIMBER

PROJECT: PN04.2014

RESEARCH PROVIDER: Monash University

PRINCIPAL RESEARCHER: Bob Milner, 03 9905 4987

EXPECTED COMPLETION DATE: July 2007

Researchers set out to develop design methods that support the way rods are used in Australian designs – typically to form the knee and ridge in glulam timber portal frames.

The existing Euro standards contain provisions that limit edge distances to no less than 2.5 bar diameters, which limits the technique's usefulness.

Design methods have been developed, based in part on rules published in Eurocode 5. Once edge distances drop below the aforementioned level, this method of joining timber is no longer valid.

The research has demonstrated how to increase pull-out strengths by reinforcing the grouting layer with glass fibre. The glass fibre is effective in constraining the bursting stresses that appear as the rod is removed.

A set of design rules is being developed and Standards Australia has been requested to consider inserting the rules in Australian Standard AS1720.1.