We are well into the final two years’ activities of the CRC. In this newsletter I have outlined some ideas for the future.

The CRC has activities in Queensland, Tasmania, Western Australia and Victoria. The first three editions of this newsletter have reported mainly on our Victorian activities. This month there is an account of what we do in Western Australia and I hope to report on activities in the other two States in the future.

The health and safety of all people working on CRC projects is a priority of the Governing Board and of the Board of IWM Centre Management Ltd. Since IWM Centre Management Ltd owns the ACAWP site on behalf of the CRC it is responsible for OH&S on that site. Its Board receives reports on all ACAWP OH&S incidents.

Tom Spurling
Chief Executive Officer

Western Australian involvement in the CRC

The Forest Products Commission was one of the foundation partners in the CRC Wood Innovations, and Dr Graeme Siemon has been the FPC researcher most actively involved.

With the microwave equipment at Creswick now installed and commissioned, there was an opportunity to have Western Australian-grown timbers tested in both the improved drying and preservation projects. Drying trials of jarrah from native forests and Sydney blue gum from plantations are being done at Creswick, to assess the advantages of microwave pre-treatment before conventional drying. Pole sections of Tasmanian blue gum are similarly being tested for improved retention of preservative after microwaving, because there are shortages of class 1 hardwood power poles, but a big plantation resource of regrowth forests.
In the enhanced adhesion project the CSIRO group have had excellent results from gluing WA timbers, particularly karri, which has a reputation of being difficult to glue. A rack designed for exposure trials of products from this research is being installed at the FPC Sharefarms Office near the Gnangara maritime pine plantations in Perth’s northern suburbs, where exposure conditions are comparatively severe.

Extensive wood bending research using microwaves is being done at the University of Melbourne, with the FPC doing steam bending research as a control to allow comparisons. The steam bending has been done by Graeme and Mario Reis. Mario was the exchange student from Rosenheim University who worked for the FPC from September 2005 to January 2006. Comparisons between Mario’s moisture content data and that compiled by Beat Studhalter are being made.

Graeme regularly provides information on wood properties and timber utilisation to CRC staff and students, and edits scientific papers, reports and theses. He is a contributor to the termites and pyrolysis projects.

Other FPC research

The FPC operated a Timber Technology Centre at Harvey, a country town about 140 km south of Perth. However, there was an increasing need to cooperate more closely with tertiary institutions, the WA forest products industry, and furniture manufacturers. A Joint Venture Agreement was signed recently with the University of Western Australia, with regrowth and plantation timber research and furniture marketing projects being a high priority. Researchers will be based at the UWA. The acting Director of the Joint Venture is Patrick Beale of the UWA, who has extensive experience in architecture and furniture design. There is great potential for doing research which complements that being done by the CRCWI.

Other FPC research involvement is with Ensis (Ensis is a 50:50 unincorporated joint venture between CSIRO Forestry and Forest Products and a New Zealand forest research group called Scion), where the FPC is participating in sawmilling trials of native regrowth karri, and plantation-grown Sydney blue gum, Tasmanian blue gum and manna gum.

Energy Networks Association (ENA) Power Poles and Crossarms Committee

25 members from the ENA Power Poles & Crossarms Committee visited ACAWP in Creswick to view the facility and discuss opportunities for the application of CRC technology in the electricity industry.

The Energy Networks Association is the peak national body representing gas and electricity distribution businesses throughout Australia. Energy networks are the lower pressure gas pipes and lower voltage electricity lines that distribute gas and electricity from energy transmission systems directly to the doorsteps of energy customers.

The Power Poles and Crossarms Committee are investigating products to replace the poles and crossarms that are now at the end of their service life and products for new distribution lines. Many opportunities emerged from the visit.
Enhanced Adhesion project in ‘Solve’

CSIRO has a quarterly publication ‘Solve’ which is inserted in the Australian Financial Review. The August 2006 edition had an article about our enhanced adhesion project. It is reprinted here with the permission of the author...

Hardwood Primed to Stick

by Rebecca Thyer

Australia is blessed with commercially important hardwoods, like the Spotted Gum, Blackbutt, and Messmate. Yet their use in furniture and building materials is limited, particularly in out-door applications because they are notoriously difficult to bond and paint. The answer could be a simple new water-based primer. The primer, a single-step treatment process, might help boost native hardwood use in timber furniture and building materials.

Developed by materials science researchers at CSIRO Manufacturing and Infrastructure Technology (CMIT) and the Cooperative Research Centre (CRC) Wood Innovations, the primer improves hardwood timbers’ adhesive strength by up to 400 per cent.

Professor Tom Spurling, CEO of the CRC Wood Innovations says the industry had been looking to improve hardwood’s adhesion for some time. “Generally speaking softwoods are better at forming bonds than hardwoods,” he says. “If you compare the tensile strengths of bonded timbers, softwoods like radiata pine are at least twice as easy to bond as some of the Australian hardwoods.”

Poor adhesion strength, large variability in the adhesive strength of bonded timber and the need to bond or paint machined components as soon as possible after machining or sanding has meant manufacturers often favour softwoods over the troublesome hardwoods.

CMIT’s new single-step process addresses these issues, substantially improving adhesion strength, overcoming hardwood’s variable and unpredictable surface chemistry, and creating high strength and durability for hardwood products bonded or painted within a large timeframe after surface machining.

Essentially a simple spray-on or brush-on application, the primer uses compact equipment compatible with existing manufacturing facilities, or DIY or in-field surface priming.

Professor Spurling says the breakthrough was made possible because of CMIT’s long-term investment in the surface science of important industrial materials. “The timber industry has benefited from CSIRO’s long-term investment into the surface and interface science, which has allowed it to solve a key problem - poor adhesion.”

CMIT project leader Dr Voytek Gutowski’s key research area is adhesion and functional surfaces. His team has had commercial success in developing improved adhesion solutions for plastic components used by GM Holden and other manufacturers.

Dr Gutowski says hardwoods are natural polymers and their adhesion problems may be solved using approaches similar to those used in enhancing adhesion of synthetic polymers. "Until now we were not dealing with timber at all, but we felt that we’d be reasonably comfortable looking into timber adhesion problems," he says. “We’ve proved we can significantly improve bonding of all hardwoods. It should lead to an increase in hardwood use by timber product manufacturers.”

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He says the initial product range of primers could be broadened and used whenever improved adhesion and durability of adhesives, coatings and other materials is needed. “For example, the principle could be used in furniture, cladding materials or laminated products comprising wood veneer with other types of wood, metal or polymers.”

Science

The enhanced adhesion technology package is backed by excellent science. Some of this has been published and some will be published at a time which suits our commercial purposes.

In the past year two papers have been published in reputable international journals by the CSIRO scientists involved in the project. The papers address the following issues: (1) Detailed analysis of principal factors controlling adhesion enhancement through the use of chemically grafted connector molecules, and (2) detailed investigation of the influence of surface and bulk chemical properties of principal Australian hardwoods on the adhesion of bonded joints prepared with the use of structural grade polyurethane adhesive.


What will happen on 30th June 2008?

As announced earlier, the Governing Board of the CRC did not proceed with a ‘new from old’ application in the 10th CRC selection round. This means that the current CRC will be wound up on 30th June 2008.

The Governing Board has approved a budget that will ensure that the research programs of the CRC will be adequately funded through to that date and, in particular, that all PhD students on CRC Scholarships will be funded for their full three years.

The main tasks for us all in the next two years are to complete the CRC’s research program and to ensure that we achieve the best commercial outcomes for the technology packages that we are developing.

Some of the technology packages will be commercialised in spin-off companies in which the CRC has an equity position. When this is the case there will be opportunities for the scientists working on the project to work for the company. Luke Juniper working for Wood Shapes is an example of this.

Other packages will be commercialised by licensing the technology to an established company. If successful this could lead to employment opportunities for CRC scientists with the licensee.

Some of our packages will require further development work beyond the life of the CRC. It will be the responsibility of the Governing Board to ensure that the IP associated with those packages is returned to the research provider committed to completing the task.

I have enquired to the CRC Secretariat about the possibility of extending the current CRC for an eighth year to enable us to apply for a ‘new from old’ CRC in Round 11. I have been informed that this is only possible if the CRC itself can fund the eighth year. There are no Commonwealth funds available for this purpose. Our cash model has us spending all of our funds by June 2008 so this is an unlikely option for us.

It is my opinion that it is highly desirable that the Forest Products industry does research through the CRC program. Unfortunately this view was not shared widely enough by the industry to enable us to have a bid in Round 10.

The following is a suggested timetable for a proposal for Round 11.

This timetable assumes that the guidelines for Round 11 will be similar to those for Round 10. It also assumes that the 2007 election will not affect the timetable for Round 11.

September 2006
Form initial steering group.
The purpose of this group is to recruit an industry bid committee to lead the bid. This committee would need some funds and a person appointed to prepare the bid documents.

October 2006
Bid committee commences scoping the new bid. Plan a series of industry visits, visits to NAFI, A3P and Government Departments.
The output of these activities will be a document that outlines the problems facing the industry and how research in science and engineering can contribute to their solution.
This should be available in October 2006.

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Finally

It is almost a year since I joined the CRC and I will be taking my annual leave from September 21st. I believe that the technology packages that have been developed by the CRC all have great commercial potential. I look forward to working with you all in achieving that potential.

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November 2006
Call a meeting of representatives of research providers to gauge interest in new proposal.

February 2007
Hold a workshop or a series of workshops to develop program/project ideas. At the same time commence work on developing the economic case for the new CRC.

April 2007
Establish a joint industry/research provider steering committee to finalise preparation of bid document.

December 2007
Minister announces Round 11 timetable.

March 30th 2008
Preliminary bid document submitted to DEST.

May 2008
Minister invites full bid proposals from selected bids.

June 30th 2008
CRC Wood Innovations closes.

August 2008
Final bid document submitted to DEST.

December 2008
Minister announces successful bids.

July 1st 2009
New CRC commences.