A *seasoned* PERFORMANCE

Western Australia's native hardwoods are among the most diverse and beautiful in the world. They also have the capacity to be the most highly valued because of recent breakthroughs in timber processing and value-adding technology. **By Terry Jones**
Photographs by Ross Swanborough

In 1987, the Department of Conservation and Land Management (CALM) released a document called *Timber Production in Western Australia, A Strategy to take WA's South West Forests into the 21st Century*. It promised a management strategy that would meet the needs of all forest users, balancing the demands of conservation, tourism, recreation and water catchment protection with those of timber production, bee-keeping and other forest-based industries.

One of the major direction changes this document heralded was towards value-adding. It was hailed as a way to buffer the effects of fluctuations in the housing market and a way to make best use of our native timbers. It was also suggested that value-added WA timber products would be the ones most likely to succeed in the export market.

CHALLENGE AND COMMITMENT

Ever since 1987, CALM has put a great deal of effort into encouraging sawmillers to jump on the value-adding bandwagon. In 1994, the case was further strengthened with the release of the *Forest Management Plan 1994–2003*. It recognised that the hardwood processing industry was facing critical market-based challenges, and that the 'green sawn' structural market, which had traditionally been the major market for hardwoods in WA, was being progressively replaced by plantation-grown softwood.

The management plan pledged to promote the use of jarrah and karri in dried, appearance-grade products, rather than just for unseasoned and relatively low value structural purposes. It also encouraged the use of high quality marri for dried, appearance-grade products, and poorer quality marri for pulpwood or board manufacture.

The 1987 plan supported 10-year Contracts of Sale, rather than the usual one-year deal, believing that these long-term contracts would provide security of tenure to sawmillers, and encourage them to invest in the new plant and technology required to turn their mills into value-adding showcases.

To earn a 10-year contract, sawmillers were required to demonstrate their ability to respond to the value-adding philosophy. Their business plan submissions had to give details of intended capital development and equipment upgrades or improvements, and a commitment to downstream processing.

This commitment would eventually see the industry move away from its reliance on green sawn structural timber, to concentrate more on seasoned timber, suitable for higher value products that capitalise on the unique appearance and properties of WA's native hardwoods.

To ensure that value-adding targets continue to be met, CALM has set conditions on the purchase of high grade logs. Buyers of first or second grade jarrah log have to give an undertaking to convert at least 50 percent of their green sawn output into value-added timber products. Those buying top grade karri sawlogs are required to develop appropriate technology and markets to maximise value-added timber products.

Previous page
A 'charge' of green sawn jarrah dries in one of the CALM solar-assisted kilns at Hamilton Sawmills.

Left: The solar-assisted kiln has gained national recognition, including an Australian Design Award.

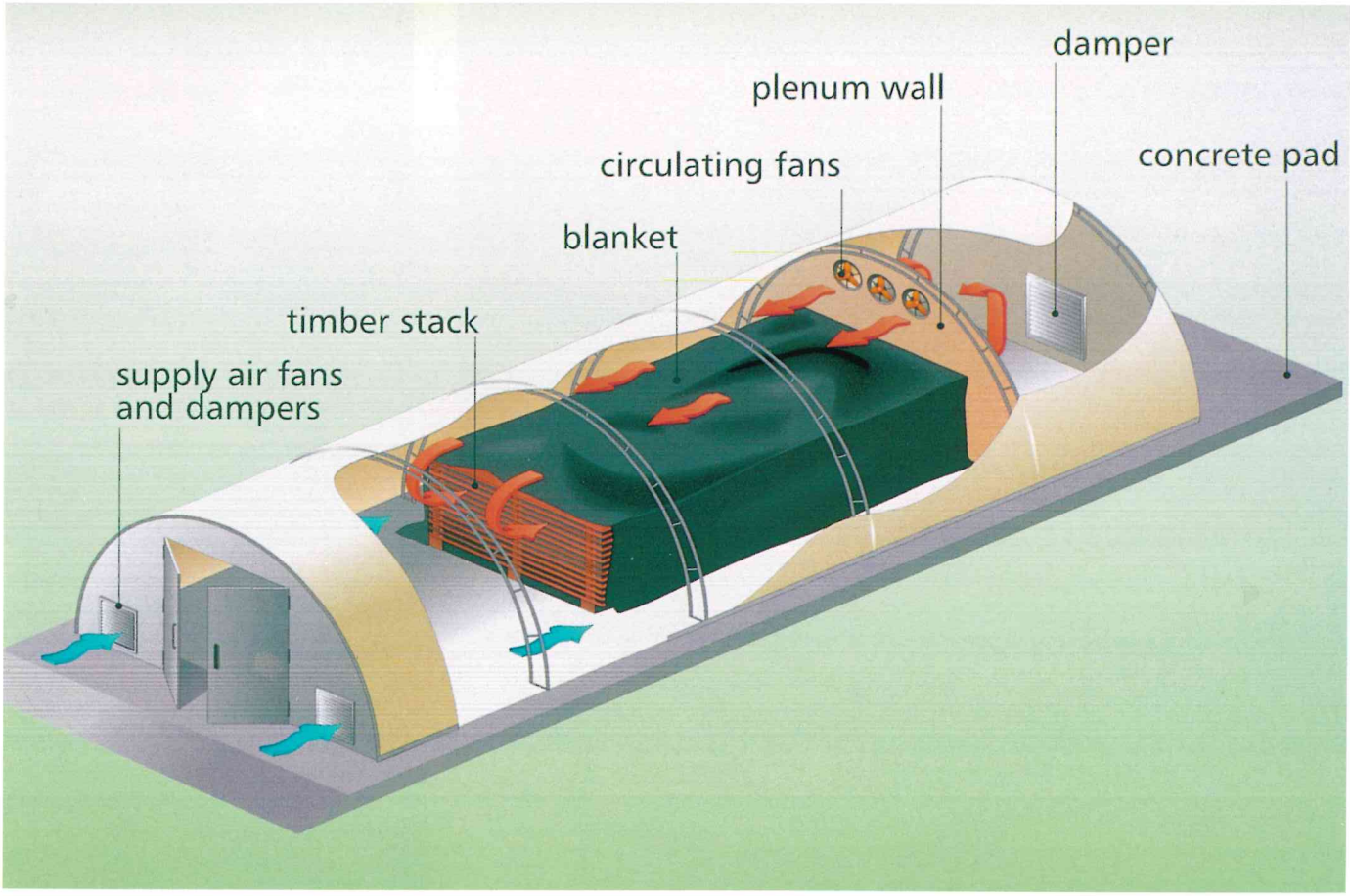
Below: The kiln uses a simple, steel structure, covered with two layers of UV-resistant plastic.

RECOGNITION AND AWARDS

In 1995, the value-adding push received a further boost, with CALM gaining national recognition for two projects aimed at developing more effective ways to use plantation and regrowth timber.

The department's Timber Utilisation Centre at Harvey was responsible for the development of a Solar Assisted Timber Drying Kiln that earned an Australian Design Award (one of only eight given in 1995). Two Australian DesignMarks (a prerequisite for Australian Design Award consideration) were also accepted—one for the kiln and the other for VALWOOD®.

Both projects were developed during a four-year Commonwealth Public Interest Project between 1986 and 1990. This project was set up to look at ways of establishing a market for the thinnings of overcrowded, regrowth eucalypt forests and plantations, as well as researching and developing technologies for downstream processing of these resources.



The inner workings of the CALM solar-assisted kiln.

VALWOOD®

VALWOOD® is the name given to a timber panel manufactured from thin, random width boards of small regrowth and plantation-grown hardwoods. The boards are edge and face glued to produce an attractive, ready-to-use, solid timber panel.

The logs used in the process would not normally be considered economical because of their small diameters and short lengths. They would generally be used for residue purposes or thinned to waste, to encourage growth on crop trees.

CALM conducted market research into the furniture manufacturing industry to see what sized boards were used, and found that a panel product would supplement the solid timber supplied by the local timber industry.

The Timber Utilisation Centre is currently producing VALWOOD® panels from jarrah and locally grown Tasmanian blue gum in its pilot plant. The products are marketed around Australia, and local manufacturers have supplied coffee tables with VALWOOD® tops to Singapore. Displays have also generated considerable interest in Italy and Japan.

The range of goods produced include bench tops, table tops, commercial fit-outs for the hospitality industry, furniture components, and material for wood-turning and wood-carving. For example, carved sections on the 'Endeavour' replica were crafted from VALWOOD®.

An intensive research and development program has been carried out to confirm that the principles used in the VALWOOD® process are also applicable to a range of timber species in other States.

THE SOLAR KILN

The CALM solar-assisted kiln was specifically developed to provide a low capital, low technology dryer with low running costs for small hardwood sawmills. Its research and development were jointly funded by the State and Commonwealth governments, and the Western Australian timber industry.

After assessing its design and the research, manufacturing, marketing and distribution stages of its production, the Australian Design Award judges said CALM's solar-assisted kiln was an excellent concept. Its timber seasoning performance was proven, and it was found to reduce the use of conventional heat sources, such as gas and electricity, and to reduce operating costs.

The kiln uses a simple, steel structure, covered with two layers of UV-resistant plastic that are kept apart by a fan. This system provides good insulation at night, while maintaining the integrity of the structure. Fans are mounted on an inner chamber wall to provide continuous airflow through the timber stacks. This inner chamber allows mixing of the air within the kiln. Foggers spray water mist to lower temperatures and increase humidity in the early, critical stages of drying.

A blanket, suspended over the timber, controls the movement of air through the stacks. This greatly reduces the risk of timber degradation during the drying process (if it dries too fast, the ends may split and the face of the wood may become checked). The blanket can be lowered or raised, as required.

While the kiln can dry timber using solar radiation alone, auxiliary heating systems using gas or wood residues improve the drying performance and allow uniform drying rates throughout the year. Computerised control systems are generally used to regulate temperature and humidity inside the kiln.

So far, more than twenty CALM kilns are being used to dry local hardwoods, softwoods and imported timbers throughout Australia.

Above: Forest furniture, produced using the latest technology in sawmilling, kiln drying and processing.

Above right: Selectively cut and prepared jarrah is readied for kiln drying and the value-added market.

CALM has also successfully used the basic structure as a storage facility for both green and dried timber. For the green timber, low temperature and high humidity is achieved by using banks of fogging sprays on a time switch. In practice, this would allow a small sawmill to select high quality boards suitable for market requirements from general production, and then store them until there is sufficient volume for a kiln charge. The same structure, without the fogging sprays, provides a low cost storage facility for dried timber.

FAITH IN THE VISION

Despite the support and technological breakthroughs CALM has provided throughout the value-adding transition, it has still not been an easy process for the timber industry. A measure of faith has been required.

The latest Western Australian sawmiller to bite the bullet and sign up for a solar-assisted kiln was Hamilton Sawmills Pty Ltd. It is a small operation that used to be based in Osborne Park, but is now establishing a new mill complex in Landsdale, north of Perth. Including the cost of land, new sawmill, downstream processing equipment and two kilns (each able to hold 85 m^3 of sawn timber), the company's investment has been about $2 million.

Apart from the financial commitment, value-adding has required a change in traditional practices, like only cutting green sawn timber for structural roofing material or sleepers. Millers have had to adopt the latest drying, machining and grading practices, and issues such as packaging and distribution have taken on greater significance. New markets have also had to be found for the value-added product.

The response from local, interstate and overseas timber buyers has been promising. They have recognised the change in attitude to downstream processing and value-adding, and there are now many products being produced from kiln-dried hardwood.

Companies like Hamilton Sawmills are ideally placed to supply these new markets. In fact, a third solar-assisted kiln is already necessary at its Landsdale premises to keep up with demand.

FUTURE DEVELOPMENTS

The next project for CALM is to look at value-adding and downstream processing of other native hardwoods, such as karri and marri. A special network, with timber and furniture industry representatives, has been set-up to explore market opportunities for these two species.

Two new solar-assisted kilns are being developed at the Timber Utilisation Centre to overcome the problems associated with drying karri and marri, while other research is looking at machining characteristics, gluing properties, and sanding and finishing results. There will also be prototype manufacturing, product assessment and marketing to increase acceptance in the industry.

Two local manufacturers–BVR Furniture of O'Connor and Jensen Jarrah of Busselton–have been supplied with dried marri and karri to craft into fine furniture. The resulting pieces were unveiled at a furniture trade fair last year and received excellent reviews.

The results of CALM's value-adding strategy are impressive. Before 1987, less than 10 per cent of sawn jarrah timber was seasoned. In 1995, more than 50 per cent of jarrah sawn timber is kiln-dried, with some of the bigger mills kiln-drying 75 per cent of their output.

As well as giving a huge boost to Western Australia's fine wood and furniture industry, the value-adding push means imported timbers such as cherry wood and oak can be replaced by WA's native hardwoods, and more jobs can be created in the local timber processing industries.

As research and development activities continue, value-adding in Western Australia is set to contribute further to the efficient and sustainable use of our forest and plantation timber.

Terry Jones is CALM's Forest Resources Marketing Manager.

He can be contacted on (09) 334 0417.