The many shades of W.A.'s forests — salmon of new generation jarrah, dark grain of the old forest, pale honey of turned marri.

# NEW TIMBER FROM A NEW FOREST

*by Andrew Cribb*

By 2020 AD timber from mature jarrah and karri will be unobtainable for most uses.

This is the message coming loud and clear from W.A.'s forest managers.

This situation is not confined to W.A.: timber supplies throughout the world are running down. Eleven million hectares of tropical rainforest are being cleared every year in third world countries, with little or no attempt being made at regeneration.

In developed countries, such as Canada, U.S.A. and Australia, the cheap, easily extractable timber from large indigenous forests is nearly at an end. The only timber available by the middle of next century will be that produced on a sustainable basis from managed forests. By 2020 the production of mature hardwood in W.A. will have dropped to about 26 per cent of the current level.

The implications for the timber industry, and for W.A.'s economy are far-reaching. Unless alternatives to mature jarrah and karri are found, mills will close, jobs will be lost, and millions of dollars in Government revenue will disappear as the import bill for timber soars.

## A new kind of timber

To meet the shortfall in supply, and the increasing demand, new timbers, new products, new seasoning methods, and new manufacturing styles need to be pioneered.

A proportion of the shortfall will be met with softwood timbers from the *radiata* and *pinaster* pine plantations of the Blackwood Valley, and the Swan Coastal Plain. Other softwood supplies are expected from private plantation growers and farmers practicing agroforestry.

But the limited supply of mature hardwood will also need to be supplemented if W.A. is to become self-sufficient in timber supplies.

The answer to the problem is to obtain timber products from wood that has, in the past, been regarded as either inferior, or waste.

This wood exists in quantity in overcrowded stands of young jarrah, marri and karri that have regrown on the areas of forest originally felled around the turn of the century.

Previously discarded, this wood is the new generation jarrah, poised to enter the world market as a first-class furniture timber.

At the Department of Conservation and Land Management (CALM) in Harvey a research centre, established in an old softwood mill, is developing methods of handling both regrowth and mature timber, which are set to revolutionize the industry in W.A..

## Traditional milling techniques

The utilization of young jarrah, marri and karri timber has never been explored commercially in W.A., for a variety of reasons.

Since first settlement in 1829 sawmillers, builders, furniture manufacturers — the entire timber industry — have had access to a steady supply of large, high-quality logs taken from a mature native hardwood forest.

When W.A. timbers were first marketed in the latter years of the nineteenth century the type of timber sold was taken exclusively from the 200-400 year old mature forest.

The larger logs were more economical to handle. A greater proportion of the wood could be milled to a finished product after the bark and outer sapwood were stripped off, and the size of the log made it easier to put through the sawmill.

Sawmills became geared to processing the large logs that were freely available, and even in the 1980s the situation remains the same.

Regrowth jarrah logs are generally less than 300 mm in diameter, and cannot be handled efficiently on existing equipment.

Sawmills are reluctant to re-equip for smaller sizes before it becomes imperative to do so, particularly if they are not guaranteed access to the resource.

The risks of failure attached to the development of new techniques, and uncertainty about access to the log resource have acted effectively to deter investment in the research and development of new processing techniques.

## Timber use in W.A.

The building industry has traditionally been one of the largest consumers of locally produced wood. Other uses, such as furniture manufacture, have occupied only a small percentage of the market.

The properties of mature hardwoods, particularly the size of the logs, make them ideal for cutting long beams for roofing. The strength and resistance to decay of mature jarrah makes it suitable for a wide range of outdoor uses with little or no preservative treatment. These have ranged, in the past, from railway sleepers, to jetty piles, decking, and even blocks to pave the streets of London.

By contrast, the use of hardwoods in the structure of buildings has long been unusual elsewhere in the world. Generally, what hardwood resource does exist is reserved almost exclusively for high-grade uses such as cabinet making. In roofing the norm is softwood timbers, which are easy to work, relatively cheap, quick to grow, and more than sufficiently strong for the task.

## Beams or bookshelves

The second major factor influencing the local use of native hardwoods has been, and still is, the length of time that sawmillers need to store the cut product before they can sell it.

At current prices one cubic metre of green-sawn structural timber fetches about $400, whereas one cubic metre of furniture-grade jarrah fetches around $800. Both products can be obtained from the same log, so much of the timber sold for building could, theoretically, be seasoned for furniture.

However, structural timber can be sold green, and seasoning left to occur once the beams have been pinned into place in a building. This means that the sawmill has a saleable product straight off the saw. No money is tied up in wood stored for seasoning.

High-quality furniture grade timber, by comparison, has to be carefully seasoned before it meets the standards acceptable to its users. In the case of jarrah the traditional seasoning method consists of storing the sawn boards to air-dry in stacks. This process can take 12 months or more, and much of the timber develops cracks in the surface ('surface checks') which degrade the timber to a standard unacceptable to the furniture manufacturers.

## Processing new generation jarrah

New seasoning processes are currently being developed in

New generation timbers range from 150-300 mm in diameter.

The results of dry stockpiling . . . (left)

Stockpiling under sprinklers prevents 'surface checking'. (Below left)

The twin-bladed breaking down saw. (Top)

. . and square cut balk of new generation jarrah.

The revolutionary tunnel kiln. (Top)

The salmon-pink grain of new generation jarrah. (Below)

CALM's experimental mill at Harvey, with assistance from the timber industry.

If proven, these methods will virtually eliminate the disincentives of storage time and timber deterioration which presently affect furniture-grade timber production.

After arriving at the Harvey mill yard the logs are stored under sprinklers. This helps prevent splitting at the ends and on the surface of the log. It also reduces the tension in the green timber, making sawing easier.

The logs are then cut on equipment designed to handle small diameters.

The Harvey mill has a twin-saw unit for 'breaking down' the logs into square balks, by taking a thin slice of timber off four sides.

When the balks are cut into planks a band-saw with a 3 mm thick kerf blade is used, instead of the 7.5 mm thick circular saws installed in more conventional mills.

When dealing with small logs this makes a significant difference to the amount of cut timber recovered from the log.

Sawdust and chips are collected during the cutting process, and will be partly recycled as fuel for the burner used to fire the high temperature seasoning kiln.

## Seasoning

After cutting, the planks are seasoned in two stages. For the first part of the seasoning a tunnel kiln is used. Timber is fed in at one end of the 'tunnel', stacked on trolleys in a manner which allows the air to circulate freely through the stacks.

At this stage it is vital that the timber dries evenly all the way through. If the surface dries too quickly, cracks ('surface checks') will develop which degrade the final product from the standard needed by furniture makers.

The stacks of green timber are fed progressively through the tunnel kiln for a period of about five weeks, and a fan blows air from the 'dry' end of the kiln to the 'wet' end. The green timber entering the kiln loses more moisture initially than the more seasoned timber. This moisture is recycled via an overhead ducting system and helps to maintain a high humidity throughout the initial seasoning.

When using conventional seasoning methods mills have been constrained by hot, dry weather if cutting furniture-grade timber. Traditionally this grade of timber has only been cut and initially seasoned during the winter months, when the atmosphere is cool and moist enough to prevent surface checks developing, either on logs lying in the bush for a few days, or in cut timber.

Use of the tunnel kiln for seasoning means that furniture-grade timber can be cut and seasoned all year round, even in the hottest and driest months of summer.

The timber enters the tunnel kiln with a moisture content between 70 and 100 per cent, and should lose two per cent moisture a day. At the end of the process the moisture content is approximately 25 per cent.

The final seasoning to 10 per cent moisture content is carried out in the high-temperature kiln over about 18 hours at between 120 and 130°C.

The end result is seasoned furniture-quality jarrah, worth $800 a cubic metre in five weeks, with little or no loss during processing.

## New generation jarrah

Physical differences between the new jarrah and karri, and the old, may well initially affect market acceptance of the end product. They will also demand radical change in the methods currently used to process sawlogs into timber.

— The logs are smaller: mills will have to be re-equip or modify existing equipment to handle the new sizes.

— The reaction of the young timber to seasoning is different: new techniques need to be developed to evolve a satisfactory end product.

— Resistance to decay and insect attack may be lower in the new timber: methods of treating the timber may need to be modified.

— Mechanical strength and durability may be different from that of more mature timber: new products using the qualities of the new timber need to be evolved.

— A greater proportion of sapwood in the smaller sawlogs means a lower yield of heartwood timber from each log: mills will have to be prepared to process both heartwood and sapwood into marketable products. In mature trees the proportion of sapwood is very small, and traditionally it has either been discarded or regarded as an inferior product. Using modern seasoning and treatment techniques acceptable products can be produced from what was previously regarded as waste.

— The colour and grain of the sawn product will be different from that of the mature timber. New generation jarrah has a warmer salmon-pink colour than the older woods. One advantage for furniture manufacture is the evenness in colour of the young wood, which makes matching and staining pieces an easier task.

The new generation timbers from the 50-100 year old regrowth forests outclass many timbers available on the world market, and have the potential to supersede mature hardwood for many purposes.

Cover
Pink and Grey Galahs do well to peer cautiously from their perch. Although a familiar species, the picture of the fledgling (right) emphasises the value and vulnerability of even our common wildlife.
*Cover Photo: Jiri Lochman*


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# Selling

## by Liana Christensen

Thousands of kilometres of isolated coastline, numerous deserted airstrips, lack of radar surveillance: the same factors which make W.A.'s Northwest a drug importer's haven also facilitate the less sensationalised crimes of poaching and smuggling wildlife.

Trafficking in native fauna is an extremely attractive criminal proposition. It is as lucrative as drugs — some estimate an annual turnover in excess of $40 million — and it is far less risky. Large operations, including the Mafia, are believed to be involved in both activities. Having established a safe route, they set up a 'conveyor belt' moving drugs into the country and sending wildlife out. In a telephone interview reported in *The Bulletin*, ex-Mafia boss Vincent Teresa claimed that bird smuggling was 'a racket that is just getting bigger and bigger'.

Smuggling is one of the major problems facing our State's 32 wildlife officers. In the Northwest, some wildlife officers are responsible for districts covering hundreds of thousands of square kilometres. They work in close connection with the local police, as well as federal police and customs officers. Typically, a wildlife officer will make ten-day patrols — which often stretch into two weeks because of problems with terrain or weather — checking known or likely trouble spots.

### A Dangerous Job

A wildlife officer's work is often difficult, and sometimes