Forestry

IN

WESTERN AUSTRALIA

CHAPTER VII

UTILISATION AND FOREST PRODUCTS

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UTILISATION AND FOREST PRODUCTS

UTILISATION which concerns the harvesting and subsequent treatment of forest produce to provide marketable material, is another important branch of forestry and is the end towards which all the art and science of management, protection and silviculture are directed.

Utilisation of the State's forests to supply timber for local and export requirements is one of the oldest aspects of the State's economy. The capacity of our hardwood forests to produce the durable, reddish, mahogany-like timber, later to be known as jarrah, was an early realisation in colonial days, and its subsequent exploitation did much to aid initial development of the State.

The principle (or major) forest product in this State is sawn timber. There are, however, many minor products such as tan barks, charcoal, sawdust, piles, poles, fence posts, boronia blossom, etc., which, in themselves, are vital to our economy but whose value is considerably less than that of the major forest product—timber.

The operations concerned with the harvesting of the major forest produce, the tree crop, are conveniently considered under the headings of bush operations—including the falling, snigging and haulage of the log material to the mill, and the final milling process which converts the log into serviceable timber once it has been removed from the forest.

BUSH OPERATIONS.

Falling.

To operate a sawmill on logs obtained from State Forest or Crown Lands, it is necessary to have a sawmilling permit. The area over which the mill is permitted to cut is set out in the permit.

In most permit areas, the treemarking system applies. Only such trees as are marked by an officer of the Forests Department may be felled and those left are retained to be grown to produce the crop for the next cutting. Marking is by means of two blazes, one on the trunk to permit the faller to locate the tree and another, consisting of an axe-cut in the foot of the tree is stamped with a hammer brand to identify the tree marker and authority for marking. In addition to indicating to the faller that the tree is to be felled, the hammer brand shows the direction in which the tree is to be felled. The treemarker thus endeavours to protect, as far as possible, standing trees and regeneration from damage by the falling tree.

Until recent years, the axe and crosscut saw were exclusively the tools used by the faller to fell and prepare the tree for transport to the mill. The axe is employed to cut a scarf into the front of the tree and to trim off side limbs. The crosscut saw is used on the back of the tree, opposite the axe scarf to back the tree down and to cut the trunk into suitable log lengths.

Plate 45.

Scarfing a karri tree. Platforms are used to avoid rough or damaged butts.

Plate 46.

Falling a karri tree with a chain saw.

In recent years, the motor-powered circular saw has found widespread application for all but the very big trees, such as are found in the karri forest. This saw enables the faller to do much of the work previously done with axe and crosscut saw in much shorter time.

Although the axe and crosscut are still used to a large extent for falling in the karri forest, the power dragsaw has come into general use for cutting through the log at the crown end once the log is on the ground.

In the main, the topography of the forest area of Western Australia lends itself to the use of these saws. As both are mounted on wheels and are rather heavy, they are at their best in gently undulating and open country, suffering severe disadvantages in steep country.

Another type of power saw has been tried on a limited scale. This, the chain saw, cuts by special teeth fitted on a power driven chain. Chain saws are made in a range of sizes, the smaller one-man unit being used with success in pine plantation falling. Bigger two-man chain saws have been used in both the jarrah and karri bush. Advantages over the power circular saw include greater mobility in rough country and a better adaption to falling large girth trees.

Snigging.

Once the log has been prepared by the faller, it is ready for transport to the mill. In some cases, logs are loaded on to a motor truck at the stump, but generally they are pulled (or snigged) to a central dump (or landing) for loading on to rail or motor truck.

Crawler tractors are used almost exclusively to snig logs from the stump to the loading ramps. Prior to the advent of tractors, horse and bullock teams were the main transport means; steam haulers were also used. These latter consisted of a steam driven winch fitted with a heavy wire rope. A lighter "tail rope" was used to pull the heavy rope back into the bush to the next log.

The development of the four-wheel drive crane truck, commonly referred to as a "jib" or "quad," has revolutionised the snigging and loading of the smaller logs of the wandoo and marginal jarrah forests. The crane is powered by a winch driven by a power take-off from the engine permitting small logs to be lifted at the stump, carried to the waiting haulage truck and loaded into position. This system does away with the need for landing, and is extremely useful where the log timber is scattered.

Bush landings are built up ramps which allow the logs to be moved from the ramp on to the back of a haulage truck. Petrol winches in the jarrah forest and steam winches in the karri forest are used to move logs from the ramp on to the truck. Tractors are used as an aid in loading in only a few instances.

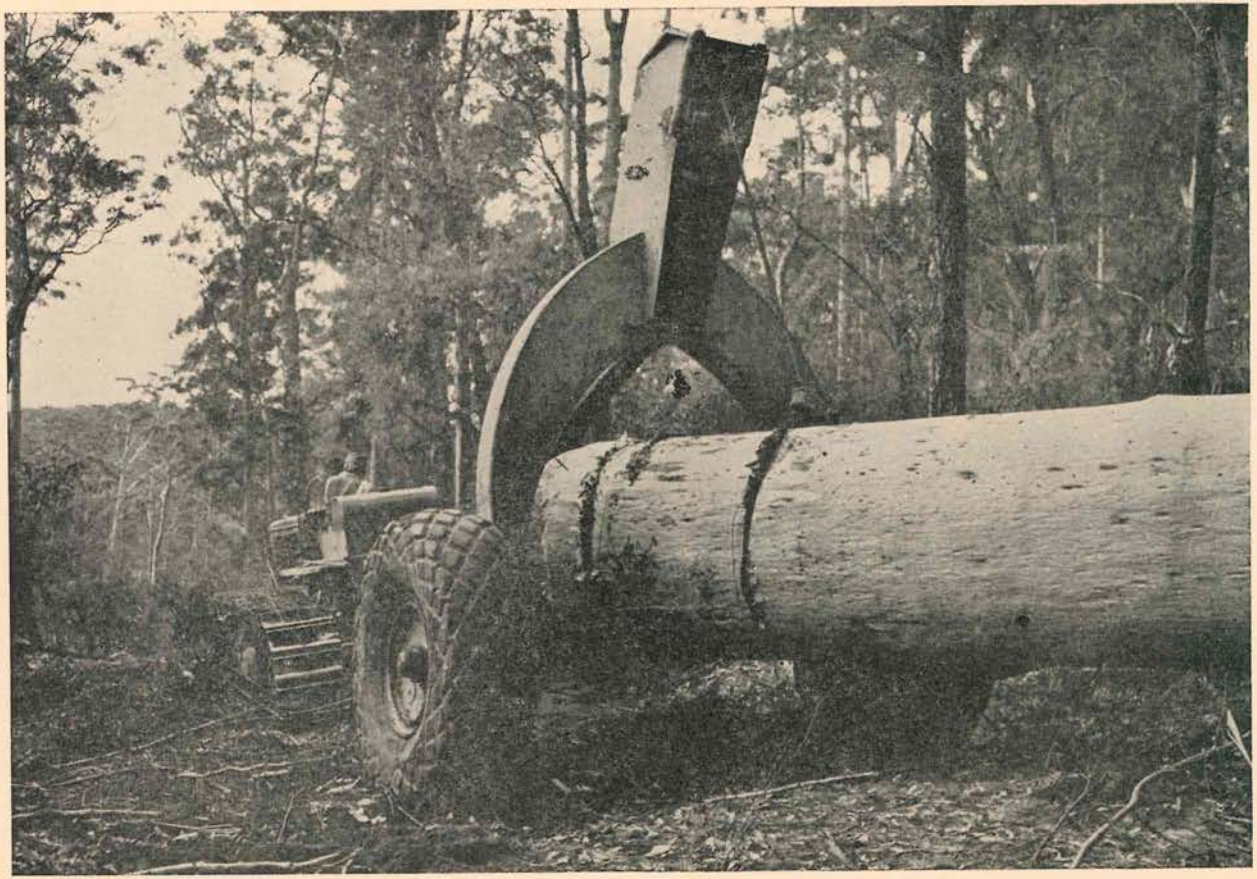

Plate 47.

Snigging with a crawler tractor and logging arch.

Haulage.

Steam locomotives still provide the means of transport from the landing to the mill for many of the bigger mills as the topography of Western Australia lends itself to this type of haulage. In the earlier days of the industry, this method was used almost entirely.

The motor truck is, however, coming into use more and more. Advantages of road transport over rail transport are:—

(1) Steeper grades can be worked.
(2) The sphere of operations can be changed quickly and with little expense.
(3) Generally, the construction of suitable haulage roads presents no problems as gravel is readily available.

Road haulage is used by the smaller mill working on areas containing limited supplies of timber where it would be uneconomical to put in expensive rail tracks.

Other systems of log transportation employed overseas, for various reasons, have not been employed in Western Australia. In the United States of America and Canada, it is common practice to float the logs down the streams to the mill. This system could not be used in this State because of the lack of suitable waterways. Other popular systems employing high lead ground lines for haulage are only suitable in rugged terrain of high volume of timber per acre. These two conditions are not met in Western Australia.

MILLING.

Timber milling, is concerned with the conversion of raw log material into sawn products suitable for marketing.

Mills, in general, fall into two classes:—

(1) The large general purpose mill cutting scantling, sleepers, flooring and joinery materials, etc.
(2) The smaller special mill. Within this class is the railway sleeper mill, the sheoak mill, the case mill and the pine mill which cuts thinnings from pine plantations.

General purpose mills vary in size. In the past, large mills employing 50 or more men under the one roof were common. Such were usually erected on sloping sites close to a good supply of water. Sloping sites permitted the use of gravity for easier movement of timber through the mill and water was necessary for the boilers, as all mills were steam powered. Wood fuel for the boilers was obtained from waste accrued in milling.

Present day mill design tends to select a flat site and mechanical means are employed to move the timber through the mill. A sloping site leads to difficulties with the handling and stacking out of the timber produced.

Sawdust fired boilers are also a recent innovation; the sawdust was previously burnt in a heap or carted away and dumped.

In smaller mills, diesel internal combustion engines have taken the place of steam. Where electricity is available, it has been used. Electricity has the advantage of ease of transmission within the mill compared with the belt drives of the steam or diesel-powered mill which do present a problem.

Plate 48.

A log landing in the karri forest.

The basic operations involved in a general purpose mill are as follows:—

For convenience the logs are brought into the mill in multiple lengths whenever possible. The first operation is to crosscut the logs into the most suitable lengths for the orders held by the sawmill or to obtain maximum recovery.

Following docking (or crosscutting) the log passes to the breaking down unit which, as the name implies, is designed to cut the log into suitable baulks or flitches for handling through the mill. The breaking down unit usually consists of two circular saws, mounted vertically one above the other to enable cutting of large girth logs. Logs are moved through and past the saws on a power driven carriage.

From the breaking down unit, the flitches pass to the saw benches. These vary in number with the size of the mill. A small mill may have a main bench (or No. 1) and one other small recovery bench subsequent to breaking down. In this case, the No. 1 bench has to do most of the cutting to size.

Large mills may have as many as three or four benches following the breakdown unit, together with the necessary docking saws. In this case, the No. 1 bench produces any material of large section, also carrying out the flitching for the next bench. The No. 2 benches do the resawing and are commonly referred to as board benches. No. 3 bench produces smaller recovery lines and some scantling.

The sleeper mill falls into the small special group. Many of these mills cut timber only for railway sleepers, though some pickets may be recovered from edgings.

Sleeper mills normally have a crude breaking down unit followed by one saw bench. Logs are cut to a neat length in the bush thus eliminating the need for a docking saw at the mill. Many early sleeper mills did not even have a breakdown unit. The log was "spotted" on the landing, that is a flat face was cut with a broad-axe, and all the cutting was then accomplished on one bench. This method of handling gave rise to the name "spot mill."

All sleepers produced in Western Australia at present are sawn. Up to 15-20 years ago, the sleeper hewer was a familiar figure in the bush, and at one stage all sleepers were hewn. Now the work is completely exclusive to the mills and not even one sleeper hewer's permit is on issue at the present time.

The Sheoak Mill cuts short length logs of sheoak into stave sizes. These staves go to the cooperage works where they are dressed and bent for final assembly into barrels. Western Australian sheoak is considered to be one of the best stave timbers obtainable.

The Case Mill operates usually on short logs or poorer quality timber, producing the small sawn boards required for the different types of boxes and cases required by the community. The greatest demand for cases in this State is for fruit packing.

Plate 49.
Loading a log onto a timber truck.

Plate 50.
Motor lorries have largely replaced steam locomotives for hauling logs from the bush landing to the mill.

SEASONING OF TIMBER.

For timber to be an efficient material in use, it is essential that its properties be stabilised as far as possible. The most important factor affecting the stability of timber in use is the fluctuation of its moisture content with initial drying from the green condition to local atmospheric conditions.

Seasoning, or controlled drying, entails the drying out of timber to requirements suited to a locality before it is put into use. Seasoning is necessary with most of our timbers due to the fact that shrinkage always accompanies the drying out process. Seasoning brings the wood to the condition at which it will remain in service, prior to shaping, finishing and installation. This is most desirable for the majority of timbers, particularly for flooring, furniture and joinery timber where deformity due to swelling, shrinking and splitting in service would impair the value of the article.

In Western Australia, the long dry summer permits air seasoning to play the major role in our seasoning practice. To enable suitable drying under natural conditions, the boards are stacked out with each layer separated by regularly placed wooden strips. This permits even drying. Under these circumstances, the rate of drying is entirely dependent on weather conditions.

The seasoning kiln for artificial drying was first introduced to the State about 1920. Since that date, with further improvement of the method, there has been a steady increase in the number of kilns operating.

The principle of the timber kiln is to induce good drying conditions by passing hot dry air through the timber stacks by means of forced circulation. To reduce kiln drying costs, timber is still given a preliminary air drying and only the final critical drying is carried out in the kiln. In the open air this final stage is usually slow and rapid artificial drying has proved an economic success over many years.

Timber handling, both in the seasoning process and milling process generally, has been simplified by the introduction of the fork lift or straddle truck.

FOREST PRODUCTS.

Our major forest product is a hardwood produced from the mature trees of jarrah, karri, wandoo, marri and blackbutt. These hardwoods have been used for practically all purposes in this State—even for uses where softwoods would be more suitable.

Western Australia, of necessity, imports softwoods and softwood products, and this position will remain until our ever increasing area of pine plantations reaches the sawmilling stage.

Building Timbers.

This is the avenue of greatest sawn timber consumption, and dwelling construction is by far the most important consumer within the group. Sawn timber is used for the numerous purposes of framing, flooring, lining, panelling, joinery, etc.

Jarrah, karri and wandoo are eminently suited for such purposes and widely used. Jarrah and wandoo are ideal flooring timbers.

Manufactured Wood Products.

Under this heading are included cases and crates, boxes, barrels and casks, furniture, matches, motor body parts, wooden pipes, boats, etc.

Jarrah, karri, marri and W.A. blackbutt fill most State demands, but certain timbers must be imported to fulfil some specific requirements. For example, furniture demands a variety of timbers of set qualities of figure, weight and colour, often characteristic of tropical timbers. Manufacturing needs are highly selective in many instances. Karri is much in demand for auto-body construction; sheoak is an excellent cooperage timber and jarrah has wide application for furniture use. Softwood timbers, however, are much more suitable for boxes and crates, clothes pegs, paper, etc.

Constructional Timbers.

Under this heading are included round, hewn, split and sawn timbers generally of large cross section.

Girders are the elite production of the hardwood forest. Demanding satisfaction in length, strength, straightness and a reasonably high degree of durability, karri is the ideal girder timber and a much ordered product from the forests.

Piles and Poles.

Piles and poles are also elite products of the forest which must satisfy certain specifications of length, straightness, girth and durability. Jarrah is an excellent pole and pile timber because of its durability in the ground and reasonably high resistance to marine borers. Wandoo is classed as the finest timber for this purpose, found in the State, but is not so readily available as jarrah.

Sleepers.

Western Australian hardwoods have established a wide reputation from the excellent railway sleepers that have been available for export. This export trade which was reduced of necessity during the war is being slowly revived. South Australia and the Commonwealth Railways remain the main markets for supplies in excess of State requirements.

Wandoo is considered to be the finest sleeper timber in Australia. Jarrah also forms an excellent sleeper, high in strength and durability. Karri sleepers are not as durable as the wandoo and jarrah yet are suitable in drier areas where susceptibility to fungal rot and termite attack is not the major factor to be considered. Preservation by pressure treatment will open up a new field for this and other species in the near future.

Fence Posts and Mining Timbers are largely obtained from the local forests adjacent to the industries concerned. Western Australia is very fortunate, in that timber requirements for the mining industry, important to State development, were very suitably met by species growing in the inland forests.

Jarrah splits well and is very durable in the ground and is widely used as a fencing timber. Wandoo is excellent for strainer posts, but is difficult to split into the smaller sizes most suited to fencing.

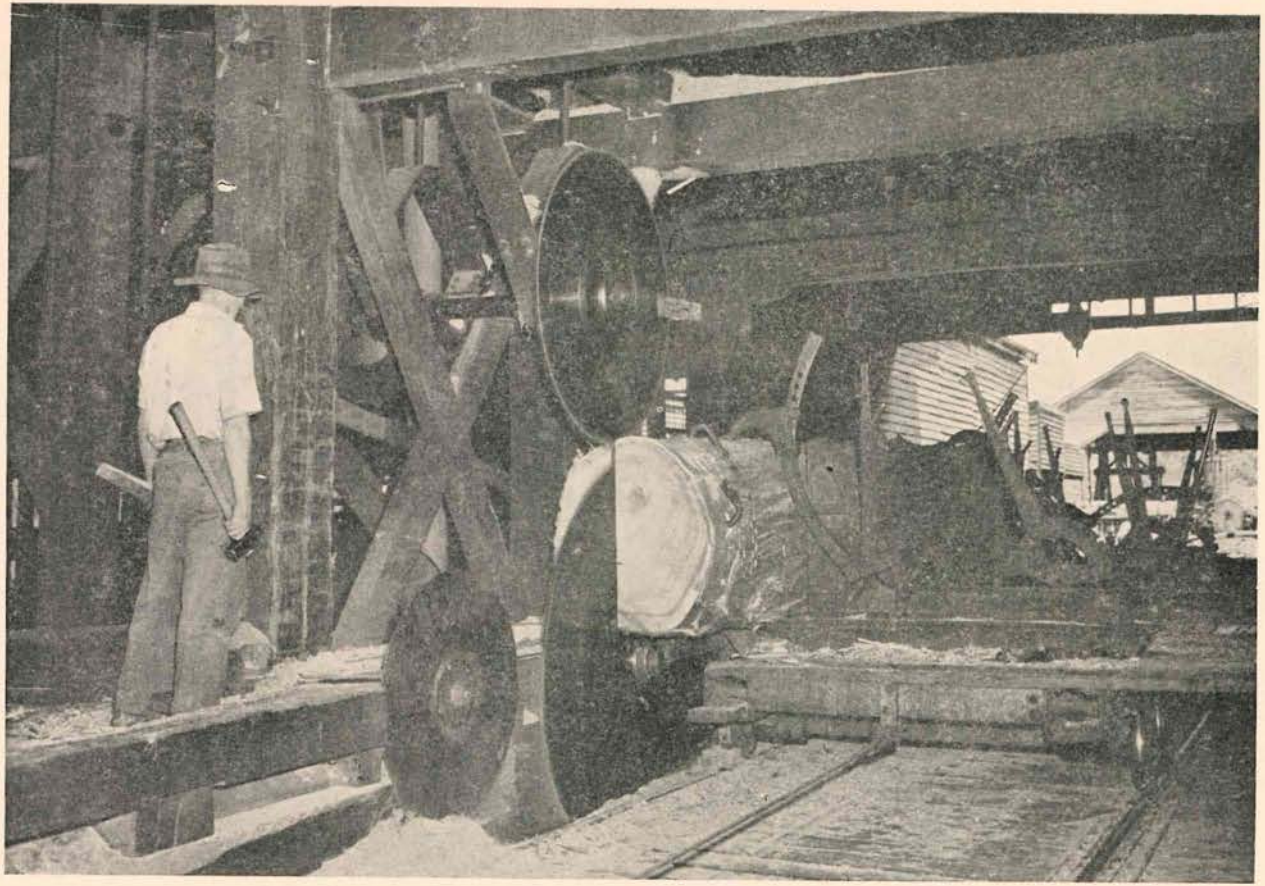

Plate 51.
Breaking down the log with a twin circular saw and power driven carriage.

Plywood Production.

The plywood industry is comparatively new to Western Australia. At present two plants are operating, one largely on karri logs which have proved suitable for this purpose. Other peeler logs are imported, mainly from Borneo.

Plywood is the wood composite produced by cross-banding two or more layers of veneer, face to face with glue or cement. The wood veneer is obtained from the log in long sheets produced by peeling on a lathe.

This product of wood is becoming increasingly popular in modern use. The desirable characteristics of ply—large surface area with no splitting or shrinking tendencies—are associated with a high recovery value from the log.

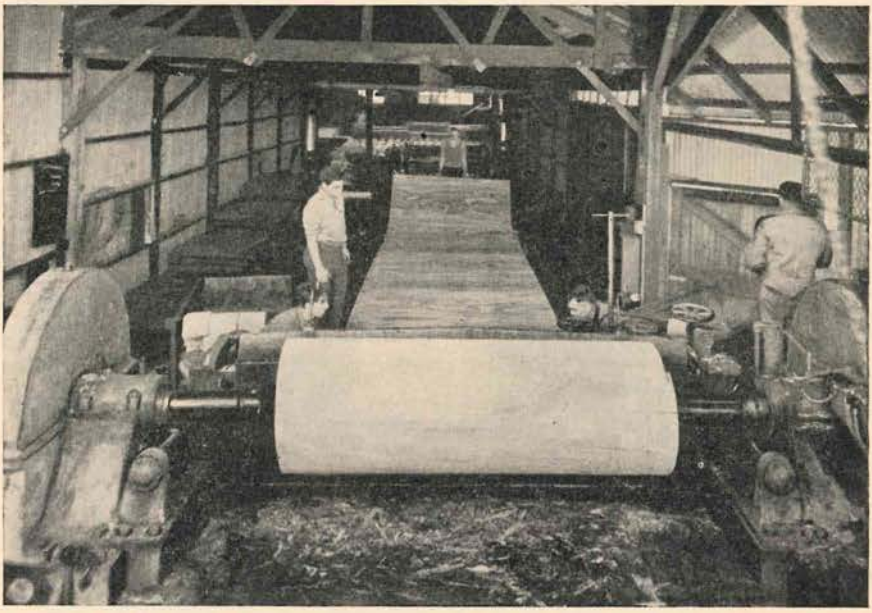

Plate 52.
Plywood peeling.

Charcoal Iron Production.

Another development in recent years is the production at Wundowie of a high grade iron using charcoal instead of coke.

The charcoal used in the smelting process is carbonised from waste wood left after all merchantable timber has been obtained from the logs by a modern sawmill. When the mill logs have been removed from an area, the remaining unmerchantable trees are also felled and converted, by a firewood cutter, into sizes suitable for charring in the retorts.

The by-products of wood carbonisation, acetic acid and methyl alcohol are also separated and marketed.

Sandalwood.

The sandalwood tree is a root parasite which once was widespread over the drier areas of the State. It has been extensively exploited, the wood fetching a high price from India and China where it is used in Joss Sticks for religious ritual. When burnt the wood emits a deep aroma. The wood is also favoured for ornamental carving.

Although all readily available supplies have been cut out, wood from more remote areas maintains a reduced but steady export trade to Asian countries.

Honey.

Honey is an important minor commodity obtained from our forests.

Karri honey is the most important. It is a high grade product, clear, light in colour, and with a delicate flavour and excellent consistency. The karri forests contribute about 25% of all the table honey produced in this State.

Jarrah is not highly regarded as a honey yielding tree. The coastal stands produce fairly large quantity of a somewhat dark-coloured and strongly flavoured honey more suitable for blending than for use in its natural state.

Tuart honey is light in colour, of a pleasing flavour and fine grained when candied.

Tannin.

A further section treats in some detail, potential tannin production from local trees. As the world supply of vegetable tanning materials decreases, this phase of forestry will become more significant.

Two plants at present are operating, at Boddington and Toodyay, to produce a tannin extract from the wood of the wandoo tree. This product, named Myrtan, is readily absorbed by the leather industry overseas, and of late has been considered for use as a constituent of drilling mud used for oil exploitation.

As far as possible, all sawmilling timber which can be utilised is removed from an area before the bush operations for the extract plants commence. Most of the remaining timber, including the larger branches, is removed to the factory where it is hogged (or chipped) into small pieces.

The hogged material is fed into vats where the water soluble tans are removed and concentrated to give a high quality tanning extract. The wood residue from the vats is used as a fuel to provide steam for the plant.

Marri is a tree with potentialities for producing tannin, but as yet, extraction from this species is considered uneconomical.

Considerable tannin exploratory work has also been carried out with karri.

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