



051134

BULLETIN No. 28
(SECOND EDITION).

23

Western



Australia.

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FORESTS DEPARTMENT



Tuart.

TUART AND WANDOO.

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TUART

(*Eucalyptus gomphocephala*).

TUART and Wandoo come next in importance to Jarrah and Karri among the hardwoods of Western Australia, and, with Jarrah, Karri, and Tingle Tingle, are the only eucalypts found in pure forest formation. Tuart is a handsome tree, and with its silvery-grey bole and bright green foliage has a wonderfully attractive appearance in the forest. It is confined in its natural habitat to the limestone belt lying along the coast between Lake Pinjar, on the North, and the Sabina River, on the South, some 12 miles North of Busselton. Curiously enough, it is not to be found anywhere else in the State, although limestone occurs all round the coast-line. The best Tuart is to be found between the Sabina River and the Capel. The tree attains a height up to 100 feet, with a bole 35 to 45 feet, and a diameter 7 to 8 feet. Its chief physical and mechanical properties are as follows:—

Density :

Green, 78lbs. per cubic foot.

Dry (at 12% moisture), 68lbs. per cubic foot.

Transverse Strength (Beams of 20sq. in. cross section at 12% moisture) :

Modulus of Rupture, 17,900lbs. per square inch.

Modulus of Elasticity, 2,560,000lbs. per square inch.

Tuart is in some respects unique. It is one of the toughest and densest timbers in the world, and for that reason has found acceptance wherever these qualities are prime essentials. The timber is yellow in colour, and is very hard, possessing an interlocked grain which gives it the advantage of extreme toughness. A tribute to its remarkable qualities in this respect lies in the fact that, in the early days of the Colony's history, the cogs in the wheels of the flour-milling machinery were often of Tuart.

For a great many years Tuart was used mainly for wheelwright and waggon construction, and in these industries it still plays a very important part. Amongst its uses in this connection may be mentioned the navies required for the 9ft. and 10ft. whim wheels used for hauling logs in the Jarrah and Karri forests. With the development of fast moving self-propelled traffic new uses have been found for Tuart. It enters largely into the construction of the framing for motor lorry and char-a-banc bodies, and here it gives every satisfaction. The principal use of Tuart is, however, in railway rolling stock construction, where it is employed extensively for underframing. It is claimed that, as a result of using Tuart and Wandoo instead of steel in truck construction on the Western Australian Government Railways, maintenance costs have been reduced from £3 7s. 6d. to 10s. per annum per truck. Tuart wagon-bogie bolsters, after 14 years' service, were perfectly sound, although conditions were such that the average life of teak bolsters was eight years and that of American oak bolsters five years. The cutting of Tuart and Wandoo, except for departmental purposes, is forbidden on Crown Lands.

A Working Plan has been laid down by the Forests Department in the Tuart Forest, and a mill established for the working of the timber. All the larger sizes are used for railway rolling stock construction, while the scantlings are used for building and wheelwright work. Tuart lends itself well to turnery work, and on this account the small waste ends have a commercial value, and have been used very

successfully for the manufacture of tool handles, telephone insulator spindles, clothes pegs and other small articles. In the case of insulator pins, it is interesting to note the experience of the Deputy Postmaster General's Engineer in Adelaide. It appears that, under test, the pins are required to stand a strain of 200lbs. sideways when in position. The samples sent from Western Australia actually stood a strain of 400lbs., and gave no indication of breaking. The precise breaking-point of the pins was not discovered, owing to a part of the testing machine collapsing under the strain imposed. The Engineer stated that he was highly pleased with the samples, and that they were altogether superior to those then being supplied to his Department.

With a view to determining the value of Tuart for spools and bobbins, samples of the timber were forwarded to Messrs. Baguley Bobbins Ltd., of Blackburn, England. Of 21 pieces experimented with, 18 successfully made pins, and the remaining three broke in manufacture. Commenting on the test, the firm state that Tuart is at least as easy to manufacture on their machine as the woods commonly used, and that the 18 pieces stood up to the machining processes in a satisfactory manner. The service required of pins imposes severe conditions and, before passing judgment on the value of Tuart for this purpose, the firm in question are forwarding samples to customers as a final test.

Tuart has been kiln dried in the departmental experimental kiln, and a provisional drying schedule which indicates the desirable conditions for kiln-drying is available.

WANDOO

(*Eucalyptus redunca*, var. *elata*).

WANDOO does not grow in close forests, but in open savannah form, and it is found, either by itself, or more frequently mixed with Jarrah and Marri, scattered in patches over nearly the whole of the South-West. It prefers a clayey soil, and though occasionally met with on the sand-plains; even here it usually indicates a clay subsoil. The tree was at one time known as "White Gum," but, in order to differentiate it from species bearing the same vernacular name in some of the Eastern States, the aboriginal term of "Wandoo" has been adopted for the Western Australian variety. Its chief physical and mechanical properties are as follows:—

Density :

Green, 79lbs. per cubic foot.

Dry (at 12% moisture), 71lbs. per cubic foot.

Transverse Strength (Beams 20 sq. in. cross section at 12% moisture) :

Modulus of Rupture, 16,100lbs. per square inch.

Modulus of Elasticity, 2,190,000lbs. per square inch.

The colour is light brown, although trees with a yellowish tint are not uncommon. The durability of Wandoo is remarkable, as the following instances will show:—

A pile from the old Serpentine Bridge on the Bunbury Road, driven in 1854, when drawn in 1899, 45 years after driving, was in a remarkable state of preservation.

Cogs of this timber which had been in use in Ellen's Brook Flour Mill since 1837, showed, in 1899, very little wear, and were in a thorough state of seasoning and preservation.

Many sleepers of Wandoo were tested in cross-bending after 18 years' service, and gave results only 6% below those of unused seasoned timber.

Wandoo is used for all purposes to which Tuart is applied. It may be noted that the top planks of truck-siding on the Western Australian Railways were at one time made of softwood, finished with a thick steel strap. By replacing the top plank in Tuart and Wandoo, it was found that not only was the construction cheaper and more effective, but also the danger attendant upon loose metal straps was avoided. A remarkable quality which this timber possesses is that, when used in conjunction with steel, no chemical action is set up between the wood and the metal. Bolts have been taken from underframes of trucks after 20 years' use, and have been found to be quite as clean as when put there, while the auger marks were still visible in the holes.