

GO THE GOOD OIL

WESTERN AUSTRALIAN SANDALWOOD



The West's THE WEST'S "WOODEN GOLD" *Wooden Gold*

The spiritual, therapeutic and healing properties of sandalwood have been recognised for thousands of years, particularly in Asia.

Sandalwood's fragrant timber has long been used to burn as incense in religious ceremonies in India and most other countries throughout Asia. In recent times Western Australian Sandalwood oil has been accepted as an important ingredient in the world's fine fragrance and aromatherapy industries. Smaller amounts of sandalwood are also used for decorative carving, craft and smaller furniture pieces.

Markets worldwide are currently facing a serious shortage of increasingly expensive, high quality Indian sandalwood (*Santalum album*) – largely as a result of unsustainable harvesting of this species over a long period of time in its native environments of India and other parts of Asia.

Over the past ten years, as sandalwood supplies from the rest of the world have decreased, Western Australian sandalwood (*Santalum spicatum*) has increased its global share to around 40 per cent.

The value of the State's sandalwood resource has also increased significantly in the past four years, with the market price increasing on average by 12 per cent per annum.

About 2,000 tonnes of *S. spicatum* is harvested each year, with all of the material coming from natural stands, mainly in the pastoral regions of the State.

This quantity consists of about 65 per cent of green wood, half of which is currently processed locally, and 35 per cent of dead wood.

The total area over which wild stands of *S. spicatum* are distributed in Western Australia covers some 160 million hectares, of which about half is unavailable for harvesting.

WA SANDALWOOD REQUIRES HOST
TREES TO SURVIVE

WESTERN AUSTRALIAN SANDALWOOD OIL IS ACCEPTED
AS AN IMPORTANT INGREDIENT IN THE WORLD'S FINEST
FRAGRANCE AND AROMATHERAPY INDUSTRIES

The West's THE WEST'S "WOODEN GOLD" *Wooden Gold*



CHINESE TEMPLE



SANDALWOOD JOSS STICKS DRYING IN THE SUN

The Western Australian sandalwood industry is managed by the State Government's Forest Products Commission (FPC), which ensures its long-term viability and sustainability.

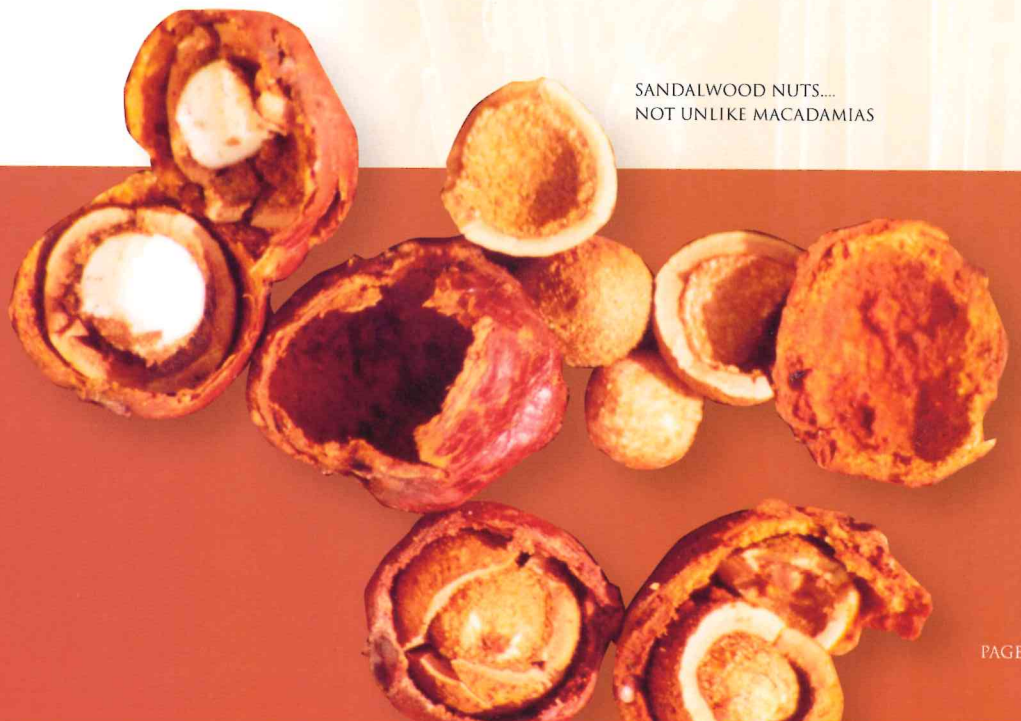
The FPC is responsible for commercial harvesting, regeneration, marketing and developing the sandalwood industry – both in plantations and in natural resource areas.

Over the past 20 years, the FPC and its predecessors have undertaken intensive research to establish plantations of Western Australian and Indian sandalwood.

The FPC believes that both species of sandalwood have the potential to become an important plantation tree crop in medium (400-600 mm) rainfall and, under irrigation, in low (200-300 mm) rainfall regions in Western Australia's Wheatbelt, Midwest and Rangelands.

The FPC shares much of its research into plantation establishment with commercial organisations and farmers within the State, to encourage plantation establishment.

Meanwhile, harvesting and regeneration rotations from wild stands will continue to meet current market demand into the foreseeable future.



SANDALWOOD NUTS....
NOT UNLIKE MACADAMIAS

Western Australia's AN EARLY EXPORT COMMODITY *Sandalwood*

Native Western Australian sandalwood was first exported to China in 1844 as a powder to produce incense.

The aromatic quality of the product was deemed to be "excellent" by the joss stick industry, and the export trade became firmly established with sandalwood being the State's first significant export commodity.

WA sandalwood's export value – at £30 per tonne – was considerably higher than that of wool, another WA export staple, at £19 per tonne.

In addition, sandalwood was far easier and cheaper to harvest and prepare than other export commodities such as heavy timber and whale products.

The industry continued to develop, as sandalwood in the Western Australian Wheatbelt Region was salvaged ahead of clearing for agricultural purposes.

By 1870, annual exports averaging around 6,000 tonnes of sandalwood were to become the norm for the next 60 years. The peak came in 1920 when 14,355 tonnes were exported at a value of £240,580.



WA SANDALWOOD EXPORTS WERE BIG BUSINESS AS EARLY AS 1870 (COURTESY BATTYE LIBRARY)



CLEANED SANDALWOOD

Native WESTERN AUSTRALIAN *Sandalwood*

Western Australian sandalwood (*Santalum spicatum*) is a native, hemiparasitic tree that grows up to four metres tall and occurs south from the Hamersley Ranges, east to the South Australian border and to the south coast.

S. spicatum is dependent on nutrients and water from host trees to survive and grow, the best hosts being nitrogen-fixing trees such as wattles (*Acacia genus*). Trials have demonstrated that jam (*Acacia acuminata*) is an excellent long-term host for sandalwood.

Wild sandalwood trees should produce fragrant heartwood when they are around five to 10 years old. However, in the Rangelands it is between 50 and 100 years before a harvestable base diameter of 127 mm is reached.

Western Australia's AN EARLY EXPORT COMMODITY *Sandalwood*

Sandalwood

MARKETS

The traditional markets of Taiwan, Hong Kong and China are the largest consumers of Western Australian sandalwood, importing more than 60 per cent of annual production, largely for the manufacture of incense and joss sticks.

Demand from these markets is expected to grow in the future with the strength of the growing economy in the Peoples' Republic of China.

Other significant Asian markets include Malaysia, Singapore, India and Thailand.

Mount Romance Australia, based in Albany on the South Coast of WA, is the major buyer in Australia of Western Australian sandalwood. The company is the largest domestic producer of sandalwood oil, the majority of which is purchased by European fine perfume and fragrance manufacturers.



MOUNT ROMANCE HAS A RANGE OF SANDALWOOD BASED FRAGRANCES

New Mountain Sandalwood, based in Bibra Lake, manufactures the only natural, chemical free, mosquito repellent using Western Australian sandalwood. Sandalwood mosquito sticks offer an alternative repellent that is safe for children and the environment. These are sold nationally and worldwide.

Domestic interest in sandalwood oil continues to grow with new companies coming into the market.

The processing and marketing of all sandalwood from Crown land is conducted under a contractual arrangement with the FPC. Wescorp International, a private Western Australian company was awarded this contract through a public tendering process.

Wescorp International processes the harvested sandalwood to specification and arranges for its shipment to overseas and domestic buyers on behalf of the FPC.

Sandalwood

PRODUCTIVITY INCREASES

Over the past five years, the FPC has fine-tuned a new approach to harvesting aiming to utilise the entire sandalwood tree.

Recent developments in tree extraction techniques have replaced traditional "pulling" with hydraulic lifting. Vertical extraction effectively frees the valuable aromatic roots from the soil improving recovery rates by around 16 per cent.

Small branches have now become an important ingredient in several export powder mixes, and the FPC is also experimenting with using sandalwood bark and leaves.



"PULLING" A SANDALWOOD TREE



Regenerating NATIVE SANDALWOOD

WA sandalwood has not been regenerating naturally at a sufficient level to sustain the species in the Rangelands.

FPC and Murdoch University researchers explored the possibility that the extinction of native marsupials, such as the woylie, had greatly influenced sandalwood's ability to regenerate. The extinction of woylies and other marsupials has been due to predation by introduced foxes and cats.

The study observed the behaviour of a remnant population of Woylies in the presence of sandalwood.

Woylies were found to incorporate sandalwood seeds in their natural diet and individually collect and hoard the seeds in shallow diggings, similar to the way that squirrels store acorns. Not all of the woylie's buried seeds are revisited and therefore germinate with winter rain.

It is now known that this process of scatter-hoarding has been responsible for the natural regeneration of sandalwood, with woylies burying sandalwood seeds as far as 80 metres away from the tree where they collected them.

This understanding has resulted in refined strategies to create regeneration in the Rangelands. Mimicking the actions of the woylie, FPC harvesting contractors plant a minimum of 12 fresh seeds beneath two nearby host trees for each sandalwood tree they harvest.

As a result, the areas harvested by sandalwood contractors show a marked increase in regeneration compared to protected areas where no harvesting is allowed.

To support germinating sandalwood seedlings, the FPC actively works with land managers such as pastoralists toward removing feral herbivores (goats) from the landscape. Goats have a voracious appetite and stress native vegetation including sandalwood.



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SANDALWOOD *Plantations*

The FPC is exploring the potential of growing sandalwood in plantations to compliment wild harvest rotations, thereby increasing the resource base of what is already a valuable industry.

The FPC is progressing the establishment of sandalwood plantations in the State's Wheatbelt and Midwest regions.

Aside from the commercial value of sandalwood trees, the plantations offer environmental benefits such as combating salinity, and providing soil stabilisation, native vegetation re-establishment, native fauna habitat and carbon sinks.

Trials conducted by the FPC in the Wheatbelt and Midwest regions have determined the most appropriate host species, effective stocking rates and fertiliser treatments, as well as helping to establish the best provenances for optimum sandalwood performance. Harvesting in these conditions takes place when the plantation sandalwood trees are about 20 years of age.

The FPC is also working with pastoralists in the Rangelands, where *S. spicatum* grows naturally, in a mutually beneficial programme to use valuable dead sandalwood while establishing sandalwood regeneration on pastoral leases.



SANDALWOOD TREES PRODUCE HIGHLY EDIBLE NUTS



FPC

FOREST PRODUCTS COMMISSION



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