Sandalwood
Information Sheet
Issue 3

Estimating Returns on Plantation Grown Sandalwood *(Santalum spicatum)*

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WESTERN AUSTRALIA

Introduction

During the last decade the Department of Conservation and Land Management has carried out research into the establishment of sandalwood (*Santalum spicatum*) as a tree crop in Western Australia.

Results indicate there is considerable potential to grow sandalwood on farmland, particularly in the Wheatbelt, and increase the resource base of this valuable industry.

The demand for basic information about the sale of sandalwood from plantations has increased dramatically in the last two years. This information sheet aims to provide background information that will assist growers and potential growers in the future management of their plantations.

The data used in this information sheet has been derived from trials at a number of locations throughout Western Australia including Narrogin, Katanning, Dandaragan and Northampton. Information has also been derived from past sales of sandalwood from Crown land to overseas markets.

Included are yield estimates based on harvesting from natural stands, including specifications for sandalwood products. It should be noted that product specifications are subject to change but that the specifications in this information sheet are correct at the time of printing.

For information on establishing a plantation, refer to Information Sheet No. 1 'Growing Sandalwood (Santalum spicatum) on farmland in Western Australia.'

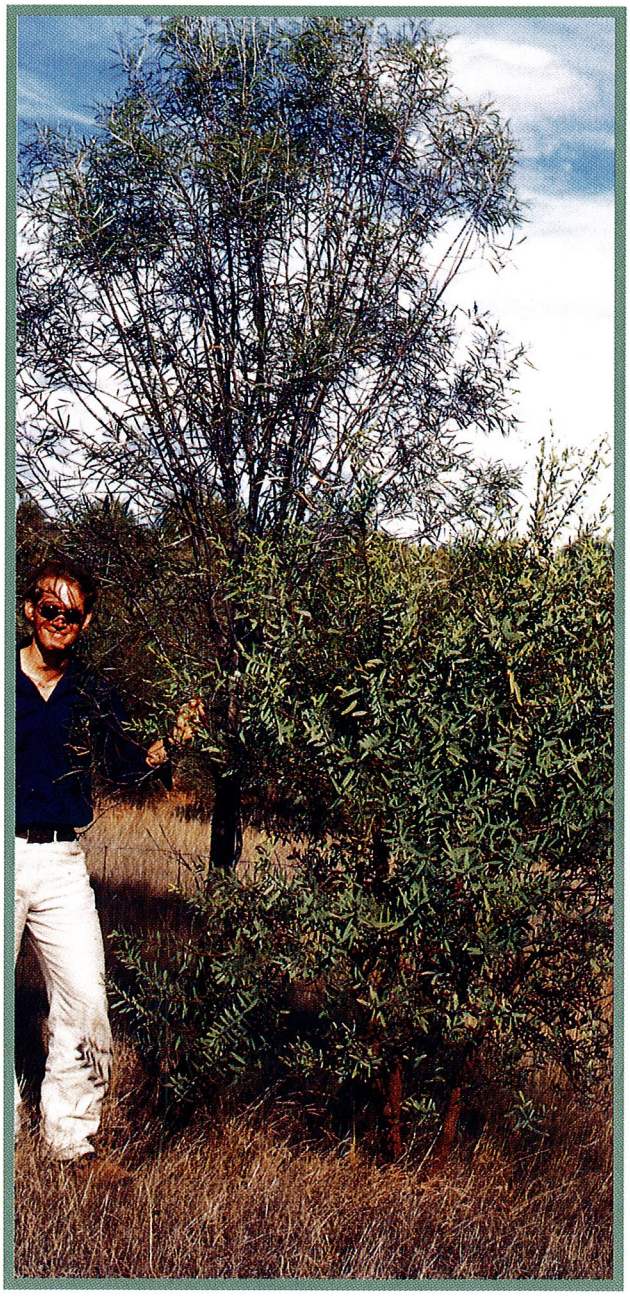

Figure 1. Five-year-old sandalwood (right) growing near a seven-year-old Acacia acuminata. Photo by W. Edgecombe.

Plantation growth rates

In Western Australia's Wheatbelt there is not enough long-term data to accurately predict growth rates after 11 years. The Wheatbelt is likely to be the area in which sandalwood plantations will be established because of its medium rainfall.

Data from the Department of Conservation and Land Management's Northampton trials indicates an average stem diameter of 72mm at 12 years but it must be noted this trial was established on a one-to-one sandalwood to host ratio, which is no longer the recommended establishment ratio. Growth rates may also vary with other site and host factors.

During the life of the trial, the average stem growth rate was between six and seven millimetres a year.

Age, diameter and yield of sandalwood

Age (years)	Diameter (millimetres)	Yield (kilograms)
5	30-35	0.2-0.4
10	60-70	1.8-2.8
15	90-105	5.6-8.6
20	120-140	12.5-19.3

This table is based on the average annual growth rate of six to seven millimetres being maintained throughout the 20-year period. No trials have been held to verify this assumption.

Figure 2. Commercial logs harvested from 11-year-old sandalwood in a plantation at Northampton, Western Australia. Photo by J. Brand.

Yields per tree

The relationship between stem diameter (over the bark) 150 millimetres above the ground and the weight of sandalwood meeting product specifications—where x is the stem diameter and y is the weight of the sandalwood product - is:

$$\log y = 2.8045 \log x - 4.7331$$

Yield against stem diameter

Diameter (@ 150mm agl)	Yield per stem (kilograms)
50	1.07
100	7.51
150	23.41
200	52.48

Yield per hectare

A stocking rate of between 200 and 300 stems per hectare should yield between two and three tonnes of commercial grade sandalwood at 20 years.

Yields will vary depending on individual site conditions.

Sandalwood grading

There are no official industry standards for grading sandalwood products. However the FPC has developed the following grades for green sandalwood from Crown land sold overseas. These are:

Unclean logs

These are solid green logs and branches between 300mm and 1.2 metres long with more than 50mm of heartwood.

Small green logs

These are small logs and branches trimmed to lengths between 300mm and 1.2 metres. The heartwood content must be between 25mm and 50mm.

Green butts

Green butts are separated from green wood stems.

Offcuts

Small offcuts of pieces with good heartwood.

Pricing

The prices listed below are based on prices for sandalwood from natural stands.

The price of sandalwood from plantations will be less because it contains less heartwood for a stem diameter.

Eleven-year-old sandalwood harvested from the Northampton trial plantation (see figure 2) contained about a third of the heartwood of sandalwood harvested from natural stands with the same stem diameter. This was attributed to the faster growth rates under plantation conditions.

Sandalwood harvested from the Northampton trial was graded as small green logs for sale into existing markets.

The prices (Australian dollars, based on average market prices for the 1999-2000 financial year) are:

Unclean logs: $6500 per tonne

Small green logs: $4000 per tonne

Green butts: $8500 per tonne

Offcuts: $7000 per tonne

Export earnings for sandalwood from Crown land

The table below gives approximate export earnings from the sale of sandalwood from Crown land during the last four financial years. The information is from the Department of Conservation and Land Management's annual reports.

Financial year	Tonnes exported	Revenue ($million)
96/97	1073	7.5
97/98	1336	8.3
98/99	1150	6.6
99/00	1820	11.0

Figure 3: Sandalwood plantation trial near Beverley, Western Australia. Photo by W. Edgecombe.

Further reading

Brand, J.E., Ryan P.C. and Williams M.R. (1999). Establishment of sandalwood (*Santalum spicatum*) in south-western Australia: the Northampton pilot trial. Australian Forestry 62 (1): 33-37

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Brand, J. and Jones, P. (1999). Growing sandalwood (Santalum spicatum) on farmland in Western Australia. Sandalwood Information Sheet 1. Department of Conservation, Western Australia, 4pp.

Brand, J.E., Crombie, D.S. and Mitchell, M.D. (2000). Establishment and growth of sandalwood (*Santalum spicatum*) in south-western Australia; the influence of host species. Australian Forestry 63 (1): 60-65 (March 2000).

Sandalwood contacts

The information contained here is up to date at the time of printing. For the latest developments or for information on other sandalwood matters please contact the following FPC branches:

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