Agriculture WESTERN AUSTRALIA

Farm Forestry Advisory Service

DEPARTMENT OF CONSERVATION AND LAND MANAGEMENT

THE GOVERNMENT OF WESTERN AUSTRALIA

TreeNote

No. 18
May 1999

Growing pines for wood products

A 12 year old maritime pine (Pinus pinaster) *windbreak at Jurien, WA. These trees have been thinned for fence posts and the remainder pruned to 6 m to be retained for sawlogs.*

Pines have an important place in farm forestry in many districts of Western Australia. Besides producing saleable products they can provide shelter for crops and livestock, and carefully sited belts and blocks can help combat land degradation such as wind erosion, salinisation and waterlogging.

To produce such benefits the pines need to be integrated with farming and planted in ways that complement agriculture rather than competing with it. This often means planting belts of trees in appropriate places rather than as plantations.

Pines are often a good choice for farm forestry because:

- there is a pine timber industry in place in the south-west of Western Australia to use the timber grown on farms; and
- there are many sites on farms, especially on sandy areas, where pines are more productive than other trees and agricultural crops.

This *TreeNote* outlines the potential for pines to be fitted into farming operations to improve farm productivity and sustainability as well as to produce a cash return from timber.

Pines as a crop

There are two main species of pines for south-western Australia: radiata pine (*Pinus radiata*) and maritime pine (*P. pinaster*). Radiata pine requires reasonably fertile soils and a medium to high rainfall (about 600 mm or more per year). Maritime pine tolerates low fertility soils (for example, grey sands) and lower rainfall (450 to 600 mm annual rainfall) although production is higher on better quality sites. Saline or waterlogged sites are unsuitable for both species.

Pines are grown for many types of logs – including industrial wood which is used for reconstituted board products, treated fence posts, and sawlogs for sawn timber. Industrial wood uses the poorer quality trees at each thinning - at 10 to 15 years of age and sawlogs from about 18 years onwards. The final harvest is at 25 to 35 years.

Concerns about pines

Some farmers believe that pines may have serious disadvantages when grown on farms. Major concerns are:

Soil acidification. Contrary to popular belief, pines do not turn soil 'sour'. Pasture grows under widely spaced pines and after clearfelling. The main effect of pines on pasture growth is competition for light (shading) and competition for nutrients.

Fire. Pines are vulnerable to fire and a protection strategy should be developed for each farm. However, when pines are integrated with farming, this makes them much easier to protect, especially when the land is grazed. Belts of trees also reduce wind speed and thereby fire speed.

Pruning. It is not essential to prune pines to produce saleable wood, providing they are grown close together. If the pines are planted at densities of more than 1500 trees per hectare, branch size is controlled and the trees produce logs of structural grade timber. However, trees of densities less than about 1500 per hectare need to be

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pruned, especially on fertile farmland. Trees in outside rows of the belts will also develop large branches. The recommended approach is to at least low prune all the 'edge trees'. These 'edge trees' can be either harvested as industrial wood at about 10 years or pruned higher as sawlog trees. Widely spaced trees do need to be pruned if saleable wood is to be produced. Although there is presently no premium price for clearwood logs (knot-free from pruning), growers have the option of producing clearwood for the future.

Fencing. Livestock must be excluded until trees are three to four years old. Simple electric fencing is effective and can be re-used in an ongoing planting program.

Should I grow pines?

Points to consider before deciding to plant pines include:

- Will pines grow in the area? Check with neighbours and farm forestry advisers. A soil survey will be necessary to determine soil type and suitable species to plant.
- Proximity of a mill or processing plant. If the farm is within 200 km of a processing plant it should pay to use a contractor to thin and transport sawlogs. Otherwise more expensive or time consuming alternatives must be considered.
- Size of planting. The minimum area of pine for a commercial sawlog operation is about a hectare. Growers with 1 to 5 ha need to realise that commercial thinning may be uneconomic and that they should concentrate on producing sawlogs only. Plantings greater than 10 ha should be large enough to enable logging contractors to thin profitably.

Planting design

The layout of pines is flexible and can be tailored to suit the individual farm plan.

Planting pines in belts is a practical system. If belts contain at least five rows, they can produce sawlogs as well as chiplogs for reconstituted boards.

Rows should be 3 to 4 m apart with 1.5 to 3 m between trees along the row, giving a density of between 833 and 2200 trees per ha. The choice of density depends on soil type, rainfall and product to be produced. Remember that pines planted at densities of less than 1500 trees per hectare will need pruning to produce sawlogs. Spacing between belts is also flexible and depends on farming objectives. Consider 100 to 200 m as a guide.

Blocks, or woodlots of pines are worthwhile for most farms, planted on areas of soils not suitable for other uses or in odd-shaped or under-used parts of the farm. They can shelter adjacent paddocks and can provide shade and shelter for livestock. In some cases they may be designed to lower watertables.

Establishment

Seedlings for farm plantings are available from CALM or some commercial nurseries. CALM nurseries can supply *P. Pinaster* seedlings that have been bred for good form and growth rate.

Ripping to about 50 cm is necessary on many sites to improve moisture infiltration and to encourage rapid, deep root growth by breaking hardpans. Mounding improves establishment on all but very dry sands. On wet sites large mounds are imperative. Drainage may be necessary. Scalping, with no ripping is preferred on sandy sites.

Weed control is essential for establishment and rapid early growth. Herbicide should be used to create a 1.5 m wide weed-free strip along the planting line or a 1.5 m diameter area around each tree. Choice of herbicide will depend on the weed species present and site type.

Rabbits will damage young trees and should be controlled. Stock must be excluded from the time of planting and should be kept out during the establishment years, from as little as two to as long as five years, depending on how fast the trees grow. Cattle should not be allowed among trees less than five years old.

Grazing among young trees should be monitored, as it is difficult to predict the likelihood of tree damage. Cutting the pasture growth among the trees for hay or silage for the first few years is an alternative to livestock. Pastures will decline if not managed.

Fertiliser is not necessary for establishment on farm sites with a good fertiliser history.

Soil testing gives an indication of nutrient status.

Costs

Direct costs of establishing and managing pines can range from $350 to $1840 per hectare. Establishment costs depend on many factors, such as site conditions and equipment used.

Tending costs also depend on the site and the style of planting adopted. For example, trees on poor sands will need more fertiliser than those on fertile soils and narrow belts of pines (five rows or less) may require no fertiliser in addition to that supplied to adjacent pastures. The proportion of the stand requiring pruning increases as belts get narrower, consequently increasing the costs.

A breakdown of costs, in 1999 dollars, is given in Table 1.

Markets for softwood

A softwood processing industry is established in south-west Western Australia. Five sawmills, two reconstituted board plants and three treatments plants for posts and rails are located between Perth and Pemberton.

The demand for softwoods is increasing. Local consumption is growing as softwoods take over from hardwoods for many uses. Exports are also increasing. This is leading to an expansion of the industry and

Table 1. Direct costs of establishing and tending pines

Year	Item	Cost ($/ha)
0	Seedlings; 23¢ each	$190 - $500
0	Site preparation	$50 - $100
0	Rabbit and insect control	$0 - $40
0	Planting	$60 - $160
0	Fertilising	$0 - $110
1	Weed control	$50 - $100
7	Fertilising	$0 - $110
10	Pruning	$0 - $500
13	Fertilising	$0 - $110
20	Fertilising	$0 - $110
	Total	**$350 - $1840**

consequently an increased demand for wood. Farmers have an opportunity to reap the financial rewards of providing this wood.

Logging and hauling contractors operate within 200 km of processing centres. Farmers have the option of transporting logs themselves and may be able to employ back-loading to reduce costs. Mills will accept private deliveries provided logs meet industry standards or specifications.

Returns from timber

Total gross returns from pine logs, over a 30 year rotation, can range from $6200/ha for *P. pinaster* in northern districts (e.g. Moora) to $26,800/ha for *P. radiata* in southern districts (e.g. Bridgetown). Returns depend on factors such as growth rate, tending regime

Table 2. Likely timber yields and returns from pine growing at low rate (e.g. maritime pine producing 8 m³/ha/yr on poor site in Moora district)

Year	Operation and product	Timber yield (m³/ha)	*Gross stumpage ($/m³)	Returns ($/ha)
12-15	Thin for industrial wood. (Posts and rails could be an option - if density is more than 1500/ha)	70	$14.23	$996
20-22	Thin for:			
	- industrial wood	35	$14.23	$498
	- small sawlogs	20	$23.30	$466
	- grade 2 sawlogs	25	$43.36	$1084
30-35	Clearfell for:			
	- industrial wood	15	$14.23	$213
	- small sawlogs	15	$23.30	$350
	- grade 2 sawlogs	60	$43.36	$2602
	Totals	**240**		**$6209**

Note: 8 m³ is equivalent to about 8 tonnes of wood.

* Gross stumpage includes base stumpage, roading charge, in-forest charge and administration.

Table 3. Likely timber yields and returns from pine growing at a high rate (e.g. radiata pine producing 30 m³/ha/yr on fertile site in Bridgetown district)

Year	Operation and product	Timber yield (m³/ha)	*Gross stumpage ($/m³)	Returns ($/ha)
10-12	Thin for industrial wood (posts and rails could be an option - if) - density is more than 1500/ha	100	$12.04	$1204
18-20	Thin for:			
	- industrial wood	50	$12.04	$602
	- small sawlogs	200	$23.30	$4660
25-30	Clearfell for:			
	- industrial wood	50	$12.04	$602
	- small sawlogs	200	$23.30	$4660
	- grade 2 sawlogs	200	$43.36	$8672
	- grade 1 sawlogs	100	$64.13	$6413
	Totals	**900**		**$26,813**

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and grade of log sold. For example, returns at first thinning would be higher if sold as posts and rails rather than as chipwood or particle board logs.

Likely timber yields and returns (based on CALM's 1999 prices for standing trees – stumpage) are presented in Tables 2 and 3 on page 3.

Typical silvicultural regime for *P. pinaster* in Moora district	
Year	Operation
0	Plant 1600 trees/ha
12-15	Thin to 450 trees/ha
22-25	Thin to 150 trees/ha
35	Clearfell

Typical silvicultural regime for *P. radiata* in Bridgetown district	
Year	Operation
0	Plant 1600 trees/ha
10-12	Thin to 400 trees/ha
18-22	Thin to 100 trees/ha
30	Clearfell

Financing and assistance

Farmers can either establish pines on their own or in partnership with CALM. CALM has developed a Pine Sharefarming Scheme involving an agreement which legally secures the interests of both parties and shares returns from wood products. Presently the Scheme applies to the Maritime Pine Project which is operating in areas within 200 km of Kewdale, Collie, Albany and Esperance. In the Albany cell the project is targeting areas in the 450 to 600 mm rainfall zones.

Those going it alone may need technical advice from CALM advisers or private forestry consultants.

Loading pine chiplogs at Waroona.

Further information

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TreeNote Editor: Peter Watt on (08) 9368 3390

ISSN 1329–3273 Print Post Approved 606811/00013

5/99TN18DT-2500

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