P I N E P L A N T I N G

IN W E S T E R N A U S T R A L I A

Introductory Information

PINE PLANTING IN WESTERN AUSTRALIA.

1. THE NEED FOR PINE PLANTATIONS IN W.A.

The population of Western Australia is rising and as a result, the demand for timber and wood products is also increasing. The local indigenous forests of jarrah and karri are quite inadequate to meet any increase in demand for timber. Fast growing pine plantations provide the means of producing a large proportion of our future timber requirements. In order that Western Australia may be self sufficient in timber or even approach self sufficiency, the Forests Department has embarked on a programme of plantation establishment with a target of at least 300,000 acres by the year 2000 A.D. As at the end of 1972 approximately 82,000 acres of pines have been established by the Forests Department.

Due to limitations of available finance it is unlikely that the target can be achieved by Government planting alone. There is therefore, opportunity for private land owners to undertake pine planting with good prospects for the future. The following notes provide a very general guide to the various aspects of pine plantation establishment and maintenance.

The Forests Department will provide more detailed information to assist private planters in making their decisions. Direct advice can not be given, but individual proposals will be examined and pertinent elaborations of the information set out below particularly with respect to the suitability of the proposed land for pine planting will be provided.

Before commencing any major plantation undertaking, it is strongly recommended that you contact the Forests Department's Como office at 121 Todd Avenue, Como, for further information. (Telephone 67.6333).

2. SPECIES AND SOILS

The Forests Department has found only two species of fast growing softwood to be suitable for wide scale planting in our climate and soil conditions. These are Pinus pinaster, from the coasts of France and Portugal, and Pinus radiata from California. For plantation growth both require an annual rainfall of more than 30". Pinus radiata is recommended for private planting because of its remarkable growth rate. Pinus radiata requires deep fertile loamy soils. In the high rainfall areas of the "South-West" of W.A., these naturally suitable soils occur mainly in the valleys of the major rivers. They are recognised as being red or brown in colour and of a reasonably heavy texture. An adequate depth of soil is essential for pine plantations. This is discussed in the following section.

Fertiliser experiments and trials over many years have indicated that this pine can also be grown on the yellow sands on the coastal plain south of Perth with liberal dressings of superphosphate, some zinc, and in some areas manganese.

The successful plantation growth of Pinus radiata on other sites even with the applications of artificial fertilisers has not yet been demonstrated or proven in the south west of Western Australia.

The need for careful selection of suitable soils for P. radiata plantations can not be over emphasised.

3. SELECTION OF THE PLANTATION SITE

The Western Australian climate is characterised by a pronounced summer drought. These introduced species can only survive on soils capable of retaining moisture for the pine crop during our long dry summers. Shallow soils have inadequate volume to do this and very deep sands may allow too much moisture to pass from the root zone. Shallow soils therefore, or soils with a high proportion of gravel or rubble, (which reduces effective storage capacity) may not support a tree crop to maturity even with fertilisers. The fact that solitary trees of any species appear healthy on a particular site is not indicative that the site can support the same species under competitive plantation conditions. Somewhat similarly, the rate of development in the first five or six years of pines planted at plantation densities on poor sites, can be misleading.

Soil and rainfall play a vital part in the performance of a pine plantation. The Forests Department will inspect soils in sites which are climatically suitable. Other factors which should be considered are distance from market and risk of fire.

Distance from Market

Freight costs on logs and sawn timber are considerable and have a major effect on the nett return to the grower. The only real market for timber products in Western Australia now and in the foreseeable future is the Perth Metropolitan Area, where plywood plants, particle board factories and sawmills have already been established. A major softwood processing industry is certain to be established in the south west to utilise the production from the large plantation areas between Harvey and Nannup, but even here the major market for converted products will be Perth. The location of the proposed plantation in relation to future markets or processing centres must be carefully considered. Distance from market has its greatest effect on returns from the low value small sized logs from early thinnings.

Fire Risk

The risk of fire cannot be overlooked in the selection of a planting site and consideration should be given to the likelihood of fire from neighbouring properties. Undeveloped land is obviously the greatest hazard. It is vital that the plantation site can be kept under close observation during the summer months for the early detection and suppression of fires.

4. SITE PREPARATION AND PLANTING

The following notes set out briefly the requirements for the establishment and maintenance of pine plantations.

It is essential to eliminate all competing vegetation. The planting site should be cleared and ploughed. Where ploughing is not feasible, scrub control may be assisted by means of weedicides. External firebreaks are essential and these must be kept clean by annual maintenance. In some areas local authorities have specific requirements for plantation firebreaks. Some road building is usually necessary to provide reasonable access for fire protection and other maintenance work. The pines are planted at a relatively close spacing to prevent excessive branch development and to provide for later selection of well formed trees. Trees of inferior form and vigour are removed progressively as thinnings. The initial spacing used by the Forests Department is 9' x 7' (690 trees per acre). Planting is carried out in mid winter during the months of June and July.

5. PLANTING STOCK

For small projects, pine seedlings may be obtained from Forests Department nurseries. As it takes a year to grow the seedlings, orders should be placed 12 months in advance. Requirements in excess of 50,000 plants are beyond the scope of Departmental nurseries at this stage and for large projects arrangements must be made for raising or purchasing the plants privately. Technical information on raising pine seedlings is available from the Forests Department.

6. MAINTENANCE AND TENDING

A pine plantation requires considerable attention throughout its life to maintain it in a safe, healthy condition and to promote the production of high quality timber.

Fire Protection

Uncontrolled fires kill pine trees, and fire therefore poses a constant threat to pine plantations. It is vital that adequate measures be taken for the detection and suppression of fires in or close to the pine plantation. Firebreaks and roads must also be maintained.

Scrub Control

Regrowth of native scrub and eucalypt coppice or grass in the plantation compete with the pines for moisture and nutrients, and if unchecked can severely impair growth rates. Control of this regrowth is usually necessary in the early years.

Pruning

Unlike eucalypts, pine trees retain their limbs and this results in knots which impair the strength and appearance of the timber. To produce timber free of knots, the limbs must be removed by pruning. This is usually carried out on selected trees during the early years. The height to which the stems are pruned is the decision of the owner or manager. Excessively high pruning can inhibit the vigour of the tree or cause malformation.

7. YIELDS AND MARKETS

The yield, or volume of wood produced by the plantation depends primarily on rainfall and soil fertility. Under favourable conditions an annual yield of up to 300 cubic feet underbark per acre may be obtained with Pinus radiata, but on poorer sites it may be as low as 100 cubic feet.

Trials of various thinning regimes indicates that under Western Australian conditions, volume production remains reasonably constant over a wide range of stocking, i.e. the productivity of the site can be spread over a large number of small trees or concentrated, within limits, into a lesser number of faster growing trees. Thus the best thinning regime depends on the markets available and would be decided by assessing what is the most profitable type of produce in that market situation.

There are various outlets for plantation produce ranging from fence posts and small logs for chipping to large sawlogs and peeler logs for plywood production. Generally the larger the log the greater its value per cubic foot and the lower the costs of felling and extraction.

8. THINNING

The intensity and frequency of thinnings and the length of the rotation adopted depend on market opportunities and the type of product required. In W.A. the opportunities for selling small logs are limited and the Forests Department's thinning regime therefore aims at producing large high value logs as quickly as possible. This is achieved by heavy early thinning reducing the number of trees to the final crop stocking early in the rotation.
The anticipated rotation length for P. radiata under this system is 30 years, or possibly less depending on market opportunities.

This system produces little in the way of intermediate returns but it aims to maximise value production in the shortest period of time.

Alternative methods of management using lighter, more frequent thinnings will produce earlier returns provided markets are available for the logs from young trees. Due to their small size and high proportion of knots and coarse grain these thinnings are not attractive for sawmilling. Growth rates on the final crop trees will be correspondingly slowed by carrying a heavier crop in the intermediate years.

9. COSTS AND RETURNS

The costs of establishing a plantation depend on numerous factors including the cost of land, cost of clearing and ploughing, roading and fire protection works, vermin control and planting. The estimates of costs given in the following notes are based on Departmental experience and refer to direct field expenditure only.

The total cost of establishment can range from as low as $30 per acre, starting with cleared land under pasture to well over $100 per acre where heavy initial clearing and later scrub and coppice control is involved. Subsequent control of scrub, coppice and vermin and pruning in the first ten years could cost up to $60 per acre.

Maintenance of roads, firebreaks and other fire protection measures such as fire detection, stand-by time and maintenance of equipment costs up to $3 per acre per annum.

Prices for log timber depend principally on log size and quality but the return to the grower is also affected strongly by the cost of logging and transporting the logs to market. Returns can thus vary widely and on current prices for delivered logs range from 23 cents per cubic foot for small chipwood logs to 60 cents per cubic foot for large logs. Falling and extracting costs currently could absorb $0.10 to $0.20 per cubic foot. The proportion absorbed by freight will of course vary with distance from the market, and could range between $0.05 per cubic foot for distance up to 10 miles to $0.20 per cubic foot for distances of 200 miles by rail. Road freight can range from $0.01 to $0.03 per cubic foot per 10 miles of haulage. These costs could preclude profit on low value small size logs from distant plantations.

It is difficult to generalise, but on present day values a well managed plantation of P. radiata on a good site within 50 miles of the processing plant, should yield a nett return (i.e. total returns minus total costs excluding tax and interest considerations) of $1,200 to $1,700 per acre over a period of 30 to 40 years.

10. TAXATION

Certain State Land Tax concessions applicable to horticulture (orchards) are applicable to private forests. Details can be obtained from the State Taxation Department at No. 2 St. George's Terrace.

Forest operations are classed by the Income Tax Assessment Act (1933 - 66) as a form of primary production. For the person classified as a primary producer the same taxation considerations apply to planting and tending a forest crop as with most other crops.

Detail on Commonwealth tax deductions for primary producers engaged in forestry is collated in Leaflet 111 "Income Tax for the Forestry Industry" published by the Forestry and Timber Bureau, Banks Street, Yarralumla, A.C.T. 2600. It is available from that office or from the Forests Department. Price $0.35 post free.

Income tax information is also available from the Commonwealth Taxation office at No. 1 St. George's Terrace, Perth.

11. FURTHER INFORMATION

This is a very general outline aiming to cover briefly all the factors involved in pine plantation management in Western Australia. More detailed information is available on request and it is strongly recommended that you contact the Forests Department at Como before commencing any major plantation undertaking.

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