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FOREST FOCUS

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\$30 MILLION FOREST PRODUCTS COMPLEX—FOREST RECREATION

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IVE MANAGEMENT



Merchantable thinnings (above) in Milward plantation, Nannup, commenced several years ago. The pines being thinned are 14-year-old radiata.

Logging in 30-year-old radiata plantation at Grimwade (below).





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Focus on \$30 Million Integrated Forest Products Complex

A range of new, decentralised industries eventually worth \$25 to \$30 million annually and bringing greater employment opportunities, more productive use of some rural land, and a reduced imports bill for forest products will result from expansion and co-ordination of forest resources in the south-west of Western Australia.

Continuation of the Forests Department's long-range softwood reforestation programme will provide the required basis for a fully integrated forest products complex.

Integrated use of softwoods and hardwoods will result in more efficient and more economic use of the State's hardwood forest resources.

By the year 2000, the estimated consumption of forest products in Western Australia will exceed the equivalent of 100 million cubic feet of log timber a year—*more than double the present State log intake.*

Australia's imports of forest products (including all forms of wood manufacture such as plywood, chip board, wood fibre and paper products) are now the highest in value of any single import item, even exceeding petroleum products.

Softwood plantations, with a productive potential from 10 to 30 times that of jarrah forest, offer a means of supplementing timber supplies quickly. The alternative is to import requirements at prices which will continue to rise in a world where rapidly increasing population makes increasing demands on its forest resources.

To provide the additional annual requirement of 55 million cubic feet, a continued, energetic planting programme is essential.

The great demand by Japan for pine logs and timber from U.S.A. and New Zealand indicates the possibility of producing much more pine than Western Australia needs if plantings are further increased, with

a view to an eventual export trade in softwood. (Even softwood sawdust is now being imported by Japan from British Columbia for pulp manufacture. One vessel, the M.S. *Shima*, has been specially built for the cargo, and carries 27,500 tons of sawdust.)

Species, soils, location

Radiata pine (*Pinus radiata*), with three times the growth rate of pinaster pine (*P. pinaster*), and highly valued both for timber and pulpwood, is the favoured species. However, it is extremely demanding as to site, and has only been grown successfully in Western Australia on soils of good texture and relatively high nutrient value within the over 30 in. rainfall zone of the South-West.

Soils naturally suitable for growing radiata pine occur almost entirely in the valleys of the various water courses, which have cut down into igneous parent rocks along the Darling Range from Mundaring southwards.

Where these soils occur in State forest they have either been planted with radiata, will be planted—or will be inundated in water reservoirs. Well known examples of existing plantations on such sites are at Mundaring Weir, Murray River, Stirling Dam, Bussell Brook and Grimwade.

These are relatively small, scattered areas. Although small plantations of about 5,000 to 10,000 acres are economically sound, a much more viable and profitable industry with all utilisation channels completely

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Front Cover

The last glow of the setting sun on a winter afternoon lends a touch of warmth to these nine-year-old radiata pines, two miles east of Nannup. Radiata (Pinus radiata), or Monterey pine, from California, is one of two major species planted in W.A. softwood forests. The other species is pinaster (P. pinaster), or maritime pine, from Portugal.

Back Cover

Gleneagle picnic grounds, see Forest Recreation story.

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Contractors pruning four-year-old radiata pines in Nannup Hills plantation (above).

Good quality 38-year-old radiata pine, Grimwade (below).



Early morning view from Wally's Nob (above).



Freshly thinned radiata pines (above) and earlier thinned pines (below), Milward Plantation, Nannup.



Four-year-old pines before pruning (below).



integrated, can be founded when areas of 50,000 acres or more can be established over a comparatively compact area.

The valley of the Blackwood River and its tributaries north and east of Nannup offers the possibility of such a desirable area. It already forms an integral and important part of the whole planting programme with 13,800 acres of pine established and a further 18,200 acres held and programmed for future plantings.

A desirable plantation target for the valley is considered to be 75,000 acres. To achieve this the acquisition of a further 43,000 acres of plantable country in this area during the next 20 years is essential.

Over the past two years increasing numbers of properties have been offered to the Department by private owners anxious to leave the valley and acquire land elsewhere.

Because of the brackish nature of the water coming from the farmlands drained by the headwaters of the Blackwood River, it is most unlikely to be dammed for water supply and so "drowning" of the plantable area is highly improbable.

Since an acre of radiata pine produces as much wood as three acres of pinaster, the importance of acquiring the maximum area of soils suitable for this species cannot be over-emphasised.

A total of 63,000 acres of additional radiata land is necessary throughout the South-West to increase the radiata pine ratio—which means that a further 20,000 acres will be sought elsewhere in addition to the 43,000 acres mentioned above.

Areas of plantation required

A modified target of 310,000 acres of plantation (basically 120,000 radiata, 190,000 pinaster) by the year 2000 has now been set as the State's minimum requirement. This could



Preparing contour road in steep country (above).

Photograph (below) shows steep nature of country planted to pines so far. The gentler slopes were also planted. The pipe, left, runs from a water supply tank.



Young pines before lifting from the nursery (below).





Sorting and bundling pine seedlings at a Nannup nursery (above).



*Pine-planted slopes (two-year-old in foreground), Nannup Hills plantation (above).
Trimming branches off freshly felled pine, Milward thinning operations (below).*



be achieved with an 8,000-acre planting programme:

	<i>Acres</i>
Areas planted to 1970 . . .	71,500
8,000 acres a year between 1971 and 2000 . . .	240,000
	311,000

As much as possible of this programme is to be planted to radiata.

Financial limitations restrict the Department planting for the present to 6,000 acres a year.

The shortfall may be made up in part by private enterprise, but it is difficult to foresee this being maintained at a consistently high or regular rate. It must be remembered also that pine planting, more than most enterprises, depends for success on a firm and regular planting and tending schedule and an efficient protection service.

While this is normal practice with "industrial plantings" like those of A. P. M. forests in the Eastern States, it is doubtful if it can be guaranteed with "investment planting" projects.

The present level of Forests Department planting (6,000 acres a year) is made possible by the use of money from General Loan Fund, The Softwood Forestry Agreement Loans and Forests Department Re-forestation Fund. Without additional finance, it will not be possible to either raise the planting rate, or undertake additional large purchases of land.

The current annual establishment and maintenance costs of Forests Department softwood plantations now exceeds \$1 million. The total annual production volume in various log categories now approaches three million cubic feet (i.e. about 8 per cent of the hardwood log intake), giving a net revenue of just over \$250,000 (most of this is derived from the very small areas of older plantations established before 1941).

Employment

Employment levels will rise steadily with increases in area planted, with

tending and maintenance of planted areas, and more rapidly with utilisation of produce commencing 11 years after planting.

The following broad indications of employment are given for a hypothetical 2,500 acres a year planting programme, giving 75,000 acres in 30 years.

Planting will provide full employment for 25 men. Five to 10 years later with pruning, maintenance and fire control, this will rise to 65 men. Once utilisation commences with the thinning operation at 11 years of age, an additional 65 men will be required full time in the forest. As the project comes to maturity and clear felling commences, a further 150 will be involved in logging and hauling operations.

This means some 280 men will eventually be employed in the forest itself. Many times this number will be needed in the processing and manufacturing industries based on the forest.

If radiata pine is planted at 2,500 acres a year in the Blackwood Valley, giving a mean annual increment of 300 cubic feet per acre, increasing quantities of merchantable timber will become available. After 11 years from the start of the project, thinnings will yield some 3,750,000 cubic feet a year. Thirty years after the start, when clear felling commences, a yield of approximately 20 million cubic feet of timber will be produced annually. Clear-felled areas will be replanted, and the cycle continued.

The output value of processed products could well be in the order of \$25 million to \$30 million annually.

From a recent study in South Australia in a paper presented to the 39th A.N.Z.A.A.S. Conference, it was stated that "*The present level of employment in reforestation in the lower S.E. of South Australia is about one man (or family) per 30 acres of plantation. By the time the forests are reaching their full productivity level later this century, this will be about one man employed per 25 acres of*



Contractor's employees working at log dump, Milward thinning operations (above).



Selective logging in the Grimwade pine forest (above). Logs are snigged to a central point for cutting to length and loading on to log trucks.

plantation compared with one man per 500 acres or so under agriculture."

On these figures, 75,000 acres of plantation would eventually provide employment for 3,000 men.

Likely industrial development

The following industries are likely to develop in utilising plantation-grown pine as a raw material:

Particle board industry. This is likely to be one of the first in the field, and in Perth has proved its ability to utilise pine from 2½ in. to 5 in. diameter. It is believed the smallest economic unit would require about 850,000 cubic feet of pine logs a year, and could treble its intake on a three-shift basis as available timber increased.

This industry is likely to promote

decentralisation by its establishment in the lower South-West, where it could draw supplies of low cost raw material from several plantation areas, and so obtain sufficient intake to warrant the costly sophisticated plant.

An alternative could be a local industry utilising both small round logs and quantities of sawmill waste when sawmills are established at a later stage.

Wood pulp industry. The most likely site for a wood pulp industry is in the karri region, in the Manjimup-Pemberton locality, where three basic requirements already exist:

1. Adequate raw material from native hardwood forests and sawmill residue plus the required long fibred softwoods to lift quality and strength of papermaking pulps.

2. Adequate supplies of water of acceptable quality.
3. Suitable facilities for satisfactory disposal of effluent after treatment.

A fourth requirement is an adequate supply of long fibred softwood to yield pulps with satisfactory strength characteristics.

When the time is appropriate for the establishment of a wood pulp industry, softwood supplies could be drawn from the Blackwood Valley until subsidiary supplies are available from consequent plantings in the karri region.

Wood preservation industry. Recently established on a small scale in Western Australia, this industry has treated some 200,000 pine posts a year in addition to hardwood poles for the P.M.G. and S.E.C. The pine fence posts, because of their durability and attractions of uniform size and appearance, were being sought in increasing quantities prior to the recent agricultural recession, and were being delivered up to 600 miles from the production site.

An expanding future is forecast for this industry, which certainly will also cater for the treatment of sawn pine for use wherever durability is required.

Softwood sawmilling industry. The availability of some eight million cubic feet of pine logs a year would provide saw logs equivalent to the combined intake of six of the State's largest hardwood mills, with a sawn pine output of some 50 million super feet a year. Sawmill residue (other than sawdust) would be readily disposable as chips for particle board.

Veneer and plywood industry. In Western Australia this industry is dependent on imported logs for about two-thirds of its raw material. An estimated three million cubic feet of pine peeler logs a year could replace all but specialty imports,

supply the needs of the future population and support a plywood plant larger than any in Australia.

Plywood logs are premium logs of high quality and eagerly sought by sawmillers and plywood manufacturers.

Western Australia has a very high per capita consumption of plywood.

Transport industries. Transport will be required to move some 500,000 tons of produce a year from forest to processing plants, and then processed goods from plants to markets.

In addition there is the transport of consumer goods for the increased population of towns concerned.

Engineering services. Service industries of some magnitude would be required for the maintenance of transport, plant and heavy equipment such as tractors, loaders, trucks, mill equipment and other items for industries associated with the plantations.

Concomitant district benefits. The employment of about 3,000 people

in the establishment, tending, protection, harvesting and processing of forest products would imply some 2,500 families with the necessary facilities such as shops, housing, domestic services, schools, power, water supplies and so on. This would involve considerable expansion of the towns concerned, with a great increase in housing and the essential services normally associated with a population of 6,000 to 8,000 people.

A local market for farm produce and a source of employment for the families of farmers established in the district would also be provided.

It is a common misconception that plantation establishment merely involves clearing, planting pine seedlings and waiting for their growth to maturity.

The truth is that the steps for successful plantations are many, varied and costly, and the period between land acquisition and actual planting may be from three to five years.



A stand of 38-year-old radiata at Grimwade. These trees are managed as a seed orchard.