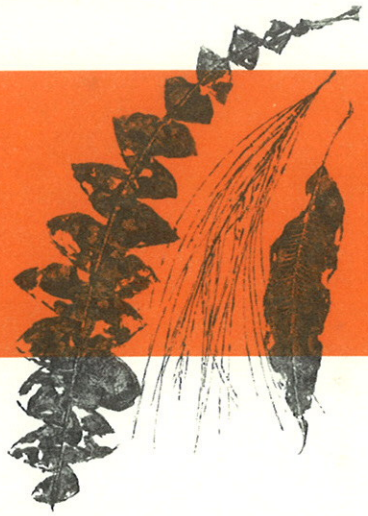

INFORMATION SHEET 3

PINE PLANTATIONS of Western Australia

E. A. JENKINS

The Need for Softwoods

Australia has few natural softwoods and no natural pine. Western Australia in particular is short of softwoods and native hardwood is used for purposes where softwoods would normally be used. Stemming from the demands of population increase future needs have been anticipated by the plantation of fast growing pine trees.

For many purposes softwoods have several advantages over hardwood. They are lighter in weight when dry, and therefore cheaper and easy to transport. They are easier and cheaper to work. They will more readily absorb preservatives and termite repellents.

It is beneficial both for the economy, in the saving of import bills, and for the preservation of our natural jarrah forests if more homegrown softwood is consumed. Jarrah, the native hardwood, is best suited to quality furniture and joinery timber, whilst its hardwearing and durability properties make it useful for steps, gates, railway sleepers and in piles for bridges and jetties.

Forests Department Pine Plantations

Our 30,000 hectares of pine plantation and the annual planting programme of 2,400 hectares have been achieved as a result of 70 years of investigation and trials. 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 coastal dunes of France and Portugal, and *Pinus radiata* from California. Both require an annual rainfall of more than 760 mm.

Pinus radiata grows more than ten times as fast as our native jarrah, but can only be grown on deep fertile loamy soils. Because such soils are rare in Western Australia, only 40 per cent of our plantation area consists of *Pinus radiata*, mainly sited in the lower south west where rainfall exceeds 1,000 mm per annum.

Pinus pinaster is able to grow on the poor grey sandy soils of the coastal plain, expanses of which are readily available. Although it grows at only one third of the rate of *Pinus radiata* it still grows much faster than our native timbers and on soils which do not naturally carry a forest. Most of the pine trees planted near Perth are *Pinus pinaster*.

By the year 2000 A.D. the Forests Department aims to have established a total of 85,000 hectares of these two species of pines, which, together with the 1,860,000 hectares of jarrah and karri forests, should fulfil the timber requirements of our anticipated population.

The Pine Seedling Stock

Our supplies of seed for the plantation programme have for many years been obtained from South Australia (*Pinus radiata*) and from Portugal (*Pinus pinaster*). An increasing proportion is now being obtained from high quality trees selected within our established plantations and seed orchards have been established by grafting techniques to provide ample high quality seed in the future.

The seed is sown in August into a nursery where it receives intensive care. It has been found necessary to introduce certain fungi known as "mycorrhiza" into the nursery soil to obtain healthy growth of the seedling. These seedlings are lifted in June and July and planted in the prepared site by a special planting machine. Frequently in the south west however, the topography is too steep or rough for machinery and planting is by hand. Normally, depending on the species and the site, between 1,200 and 2,500 plants are planted per hectare. Fertiliser is added on some sites.

Caring for the Plantation

After planting, regrowth of natural scrub is controlled by ploughing between the rows of pines, or by weedicides if ploughing is impractical.

The best 750 trees per hectare are selected at five years of age. The lower branches of each tree are pruned by axe, secateur or saw to allow the growth of a trunk free from knots. The remaining trees are then reduced in number in subsequent "thinnings", thus maintaining vigorous growth on the final crop trees.

By the age of 30 years in *Pinus radiata* the remaining 140 stems per hectare are clearfelled and a plantation re-established on the same site. These final crop trees will average over 50 cm in diameter and 30 m in height, whilst the whole hectare will have produced in thinnings and at clear felling about 600 m^3 of timber in the 30 years. The slower growing *Pinus pinaster* is thinned more heavily and grown for a "rotation" period of 40 years, in which time it will have produced about 250 m^3 of timber per hectare.

Fire Protection

Prompt fire detection is ensured by a system of lookout towers. These are the "eyes" of an efficient fire fighting organisation of 800 trained men with modern equipment that is constantly ready to deal with fires in the forest.

Plantation Management

Management of pine plantations like any other forestry project requires long term planning as well as day to day organisation. Careful records of growth rates and volumes removed are maintained, and management plans prepared for each plantation. From these are produced forecasts of future timber production, which allow the planning of timber industries.