GNANGARA NURSERY

by

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Due to the current expansion of plantation establishment in the Wanneroo Division the nursery at Gnangara has been extended to 35 acres to meet with increased demand for plants. About 11 acres is used annually for pines.

In planning for efficient management the following has been considered with the aim to reduce hand work to a minimum and the nursery is sown with the idea of doing all subsequent work with the use of a M/F Tractor and various implements and to this end the beds are sown in groups of 4 rows at 12" intervals which can be straddled with the tractor. Four Mintern seeders attached to the 3 point linkage are used at present, but it is hoped to use more modern seeders as the Forests Department have purchased some which can sow six rows.

Soils

The soils are white sands low in fertility and moisture holding capacity. Organic matter is the main if not the only means of holding nutrients against leaching. Tests have shown that in order to double the nutrient level, the organic matter content would need to be trebled.

Green Cropping

In the past, as general practice, crops of N.Z. Lupins and oats have been sown immediately after lifting pines. In late summer these are "rotary hoed" in for self sowing in the following season. After this another crop of pines is sown. This has been the only means of lifting the level of organic matter.

Above a level of 4% organic matter, seedlings do not experience any prolonged water stress. Below 2% these are repeated crises from November 30 onwards.

Use of Peat

Experiments with quantities of 1, 2 and 3 inches of moist peat accompanied by about 2 cwt. per acre of nitrogen fertiliser have produced a marked increase in pine growth and health. The use of lime in these experiments did not produce significant results.

Recently 1,000 cubic yards of peat has been excavated by dragline from local deposits. It is proposed to spread this where required with the objective of lifting the organic matter content above 2% throughout the nursery.

In beds where organic matter is 3% or more it has already been shown that repeated crops of pine can be raised. It is, therefore, hoped to reduce or eliminate the need for green cropping.

Irrigation

Experiments have shown that watering produces good development of superficial laterals in the top 6" of soil. Without watering a strong tap root develops with fewer superficial laterals.

For best growth in the field, superficial laterals are necessary as there is an obvious limit to planting depth using planting machines. Hence, watering is reduced to the minimum to sustain life and satisfactory growth. The use of peat should reduce the need for watering in the poorer sections. Root wrenching is not done.

Size of Beds and Plant Production

The aim is to have long beds to facilitate the use of machinery. The aim is to produce between 9 and 12 seedlings per foot. Higher rates result in plants smaller than the optimum 7 - 14" height.

Topography

Topography is ideal as the area is flat.

Drainage

A deep drain runs through the nursery. This is necessary, as the water table is only 5 feet below the level of the nursery in summer.

Location

Proximity to Headquarters (30 chain) is ideal for management purposes.

Fertilizers

Nutrifert is applied at 2 cwt. per acre at time of sowing.

Weedicide

Recent successful trials include application of Dacthal at 12 lbs. per acre applied immediately after sowing. This gives approximately 6 weeks free of weeds till the seedlings are strong enough to be treated with B.P. Pine Spray. B.P. Pine Spray is obtained from B.P. Australia, and is a mixture of Power Kero and lighting kero to an aromatic content of 28%.

Dowpon has been used repeatedly to reduce the amount of perennial grasses in the drains and verges.

Diseases

Formaldehyde has been used on limited areas at the rate of 140 gallons per acre mixed at 1 part Formaldehyde to 9 parts water.

Formaldehyde is applied by a dribble bar from 100 gallon tank mounted on tractor about three weeks before sowing takes place, but this is difficult to apply as it gives of strong pugnent fumes; it is hoped that some other mixture can be used in the near future. Application is used for low lying beds where "damping off" occurs. Results are good in the 1st year with survival increased and weeds greatly reduced. However, it is very expensive and resedual effect is weak.

Insects

Insects are not a major problem, but some damage occurred in the past from black beetle and grasshoppers. Dieldren is used to kill these.

Lifting

A Fergie 65 tractor pulls a cutter approximately 10" below the ground level of each bed. Above the horizontal cutter there is a vertical separator between each row. This loosens the plants sufficiently to be lifted and bagged.

The tractor is fitted with an outrigger on which bags are attached to receive the plants as it moves slowly along the bed. The outrigger is shaped so that the bag for a particular row is in a convenient position for the lifter.

No counting of individual plants is done and is not necessary for daywork planting.

Production and Costs

Current production is about 3,500,000 P. pinaster plants per annum. Normally no other species are sown. Latest costs are:

Cost per 1,000 plants to raise	$1.55
Cost per 1,000 to lift and bag	$0.69