A CHILEAN FOREST PLANTATION

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CANADIAN foresters should know as much as possible about the forests of other countries. Most of us know the forests of the U.S.A. to some extent and of Europe probably less, but few have had the opportunity to see forests in the Southern Hemisphere. It is, therefore, a duty as well as a pleasure to have this opportunity of presenting this brief description of a Chilean plantation area.

The area in question is a part of some 2000 sq. miles of the best forest land in Chile capable of producing timber at a rate equal to any in the world. The plantations have been very well managed on a standard equal to the most intensive in Europe, and this management dates back to 1881. They now cover 50,000 acres and are being extended every year.

Plantations in Chile are considered to be a good private investment and are encouraged by a favourable taxation system, so that many people are in the business. No taxes are levied for the first 35 years and there is no yield or similar tax. Profits are taxable the same as any other income. There are no Government scalers. There is little or no inspection or regulation. The self-interest of owners effectively promotes good forestry practices.

Thinnings are made as required, so that the final stand approaches full normal stocking. The final cut consists of trees of good form, quite uniform in size and without any defects. These can be logged with only small breakage loss. The yield per acre is large.

While new afforestation is effected with 1-year seedlings, planted 1000 per acre, natural regeneration is easily obtained after the final clear-cutting.

Every individual compartment in the plantations is a pure, even-aged stand.

The chief species used successfully to date are Insignis Pine, and Blue Gum, *Eucalyptus globulus*. The latter has not been used yet to any great extent for saw-timber, pulp or veneer, but shortly will be used for these purposes. The production per acre is around 85 per cent Insignis in the final cut. Owing to its intolerance fewer but larger trees persist to the final age. One stand 43 years old had 73,000 f.b.m. per acre in 89 trees. Each tree, therefore, had 820 f.b.m. Insignis Pine usually averages 310 f.b.m. per tree and 200 trees per acre when logged.

The figures below are from measurements made in various stands:—

Insignis Pine

Total Age	No. Trees per acre	Av. d.b.h. all trees inches	Dominant & Co-dominant feet	Average Total Ht.		Site-class Ht. - metres at 20 years
				FBM per acre	FBM per acre per year	
					Int. Log scale 1/4" kerf	
38	190	15.5	125	65,600	1,725	23
38	210	16.9	120	106,300	2,800	22
38	218	14.8	120	92,500	2,430	22
11	696	5.0	34	—	—	21
35	198	14.7	131	56,300	1,610	25
35	198	14.3	131	54,600	1,560	25
42	182	18.6	135	104,200	2,480	28
32	316	11.9	105	39,700	1,240	21
10	712	6.4	52	—	—	29
35	348	12.7	125	64,750	1,850	24
38	259	14.8	111	73,480	1,935	20
36	206	15.7	113	74,440	2,065	21
Average of stands over 30 years old	232	—	—	73,190	1,970	—

These are all fairly well-stocked samples and, by leaving a fully stocked stand at the 20-23 year thinning, this stocking can be duplicated throughout the whole plantation.

A thinning at 20-23 years removes up to 600 trees per acre, 5"-9" d.b.h. These thinnings are used as mine-timbers.

The study made of these Chilean plantations provided a perspective for appraisal of other world plantations. New Zealand, Australia and South Africa are well-supplied with plantations of softwoods which will supply their local requirements for all common grades of lumber. These are the same grades which will be produced by Canada's second-growth forests. On account of rapid height growth, long inter-nodal lengths and therefore clear lumber up to six feet are quite common. In close plantations knots are not unduly large and are sound and tight.

When modern logging methods are introduced the cost of this lumber will be low. Logging chances are much easier than in any Canadian forest. Any method can be used from a silvicultural standpoint, because the final harvest is a clear-cutting.

In such plantations Canada will soon meet very severe competition in countries which have been her best markets. Perhaps the general idea that Canada's position in world lumber markets is secure forever is very wrong. It is at least unlikely that the lumber business can forever support high taxes. It is to be hoped that it can continue, however, to maintain a reasonably high standard of living for those who work in it.

Land-owners who wish to manage Canadian forests on the basis of perpetual yield will not be able to pay much for land-taxes if they pay also for the protection of their immature stands. There may not at the end of the rotation be much scope for a yield tax, but the country as a whole would still be the gainer. The Chilean plantations already employ some 600 workers all the year, and another 600 for eight months. The increment will soon reach a point where logging and milling will be greatly increased. The eventual production in perpetuity on the existing plantations will be 75 million feet minimum. Roughly, the rise will be from the present equivalent of 12 million to 75 million within 20 or 25 years. The plantations could eventually be trebled in size, producing over 200 million by one company alone.

Marketing, especially of pine, presents no problem. Eucalyptus mine-timbers are used in the mines of the company owning the plantations and in other Chilean and Peruvian mines. Any pine left over from the domestic market can be readily sold in Argentina. The cost of production will be reduced by better logging and to some extent better milling methods.

Laboratory studies in New Zealand show that, in the clear sections used for testing, Insignis pine with $2\frac{3}{4}$ rings per inch has greater crushing and breaking strength than virgin Ponderosa pine with 19 rings to the inch. It is quite obvious that plantation-grown timber, grown near its markets, can compete successfully in respects to most of the local uses of timber.