

to plant such land with a slow-growing tree. Many good specimens of the prickly acacia (*Robinia pseudo-acacia*) can be seen in favoured spots in the Rotorua district, but for extensive cultivation it has been found unsuitable on our plantations. Large areas of the land which is being planted is covered with a heavy growth of bracken. This is noticeable mostly in the gullies, where the black soil is not infrequently 18 in. deep and the fern sometimes as high as 9 ft. The shelter afforded by the fern is favourable to the growth of most of the hardwoods; but then we are faced with a heavy annual expenditure—perhaps for eight years—in clearing the fern-growth around each tree. Under such circumstances the growing of these hardwoods is altogether too costly, and has been discontinued for the present. When a plantation of trees reaches a state in which the whole of the land is covered by an overhead canopy of leaves, we find that the frost has no ill effect upon them; and so, if a hardwood plantation could be protected until the crowns of the trees meet, this class of tree could be as successfully grown here as in any other part of the Dominion.

A system of underplanting as adopted on the Continent of Europe would probably give the desired result. This system consists in either sowing or planting a wood that has been regularly thinned until there remains, perhaps, a hundred trees to the acre. The species that it is desired to introduce is sown or planted under these shelter-trees, and when the young crop gives sufficient protection to the soil, the shelter-trees are removed. So far none of our plantations are sufficiently advanced to try this system, but it has been mentioned in order to show that, although these species are not now being planted, future planting will become possible when some of the present areas have matured. Much better results have been got with the conifers, although, amongst this class, the number of successful species is comparatively small. Of the twenty-two millions of trees that are now growing successfully in this district, the principal species are larch, Austrian pine, Corsican pine, western yellow-pine, clear or white pine, remarkable pine (*Pinus insignis radiata*), Oregon pine, birch, and several species of eucalypti. As these kinds generally do well throughout the Dominion, the following information regarding them will perhaps be useful to intending planters:—

*Larix Europæa* (European larch) has occupied first place in the operations in the Rotorua District. This species is a native of the Alps and the Moravian and Carpathian Mountains. It is easily raised from seed, which can be procured in almost any quantity in Europe. The average number of seedlings produced per pound of seed over a period of five years at Rotorua Nursery was 3,500, and the cost per thousand, reckoned only on the cost of seed, was 8d. It has been found that on elevated situations or else sloping ground this species does best. If planted in hollows or valleys where the warm air-currents during the day are succeeded by very cold night air, the trees are very liable to be frosted during the spring when the young growth appears.

With the exception of *Pinus radiata*, larch is the most rapid-growing tree that has been tried here. A plantation of these at Whakarewarewa, planted in 1901, average 25 ft. in height. The trees, when planted, were seedlings from the two-year-old beds, and averaged 15 in. in height. At the third year from the time of planting they averaged 5 ft. in height. From then on very rapid progress was made, 3 ft. of vertical growth in a year being a common thing, while individual specimens have been measured showing a growth of 52 in. for the year. It will be readily understood that the larch very soon protects the ground, and that the dense growth of bracken usual to this part is soon suppressed. Other species of trees that have been mixed with it when planting have ceased to exist after the fourth year, and there seems to be no alternative but to plant this species pure.

In regard to light-requirements, larch is one of the most exacting of our timber trees, and, judging from the growth made by it in this district, the plantations will probably require a severe thinning about the twelfth year from the time of planting. A second thinning will perhaps be necessary about the eighteenth year; and, as this will expose the land very considerably, it may probably be found expedient to protect the soil by underplanting the larch with a shade-enduring species of timber tree. Either the redwood (*Sequoia sempervirens*) or Oregon pine (*Pseudo-tsuga taxifolia*) will probably be found suitable for this purpose.

The timber of larch is reputed to be the best grown in Britain for construction above and below ground. It is used for fencing, railway-sleepers, and for mining purposes. The Germans make casks of it, and it can also be used for house-building and furniture.

In Great Britain the larch is seriously affected by a fungoid disease (*Peziza Dasyscypha Wilkominii*), and for this reason planting with this species is much less general than formerly. The disease, however, has not made its appearance in New Zealand, and as yet the larch plantations are quite as healthy as plantations of other species. Larch presents a miserable appearance wherever planted near the sea-coast, and, generally, will not thrive at an altitude of less than 500 ft.

*Larix leptolepis* (Japanese larch) has at the present time a somewhat restricted range on the central mountains of Japan, where it is not uncommon at 5,000–6,000 ft. elevation. The wood is hard, heavy, and strong, but not much used on account of the inaccessibility of the trees. This species has been tried at Rotorua, but not to any great extent. In appearance it is somewhat similar to the European larch, but of somewhat slower growth than that species. At the present time it is receiving great attention in Great Britain, as a probable substitute for the European species, on account of its immunity—at least up to the present—from the larch moth and larch disease.

*Larix occidentalis* (Western larch, or tamarack).—This species is indigenous to the State of Oregon, Washington, Northern Montana, Idaho, and British Columbia. With the exception of a small trial lot raised from seed at Rotorua this year, this species has not been tried by the Department. The information gained is, therefore, somewhat meagre, and at the present time all that can be said of it is that the seed germinated well, but the growth is less vigorous than that of the European species. The following description is taken from Veitch's "Manual of Conifers": "The wood surpasses that of all other American conifers in hardness and strength;