REPORT BY CHIEF FORESTER.

To the Under-Secretary for Lands.

I HAVE the honour to submit the twelfth annual report on State nurseries and plantations for the year ending 31st March, 1908.

During the year 10,389,162 seedling trees have been raised in six nurseries, 6,440,785 trees have been planted permanently at nine plantations, covering an area of 2,655 acres, bringing the total planted area to 9,465 acres, on which are at present growing 20,803,083 trees from two to ten years old.

The nurseries contain 17,904,510 trees varying in age from one to three years, representing a value of £27,614 5s. 10d. The output of trees from seven nurseries for twelve months amounts to 7,630,122, valued at £15,722 14s. 6d., whilst the total output of trees from nurseries since their initiation is 34,993,625, of a value of £78,793 4s. 5d.

The expenditure on nurseries for the year amounts to £11,109 2s. 2d, thus showing a credit balance of £4,613 12s. 4d.

The total expenditure on nurseries and plantations for the year is £24,442 15s. 1d., and the expenditure to date £138,122 15s. 5d. Against this outlay improvements at the nurseries, and trees grown to date represent a sum of £113,407 1s. 3d.

Planting operations for the year have been successful in the districts of Papanui, Hanmer Springs, Rotorua, and Whangarei; but the results at Gimmerburn, in Central Otago, and Dumgree, in southern Marlborough, were practically failures owing to long-continued drought, which not only caused the loss of the greater portion of the newly planted trees, but resulted in the deaths of most of the established trees from two to five years planted. One notable exception, which appears to flourish under the most adverse conditions and in the poorest of soils, is *Pinus ponderosa*.

Planting operations have been so disappointing at the two stations named that it has now been decided to abandon further work at Dumgree, and to limit operations at Gimmerburn to the filling-up of the present enclosed area. Tree-planting will, however, be still continued in the Maniototo district, but the locality will be in the vicinity of Naseby, where the Department have fully demonstrated (as the result of some eleven years' experience) that certain classes of trees can be grown with entire success. The species found to withstand the trying climatic conditions best are *Pinus ponderosa*, *P. Benthamiana*, and *Larix europæa*, the latter species flourishing luxuriantly on slopes with a southern aspect.

Maniototo district again shows the lowest rainfall for the year, with barely 14 in. on ninety-five days, while Kurow Nursery registered 14·43 in. on ninety-four days. Even these meagre rainfalls would have been sufficient to maintain tree-growth, but, unfortunately, they occurred chiefly in the autumn and winter, practically none falling when it was most needed—viz., in the spring and early summer. The maximum rainfall was registered at Puhipuhi, with 110·12 in on 170 days, Ruatangata Nursery being a good second with 85·66 in. on 200 days.

The climatic conditions experienced throughout the Dominion have been unusually trying in extremes, the lowest readings of the thermometer being 14° at Waiotapu Plantation, and 15° at Eweburn Nursery: the highest temperatures being recorded at Kurow with no less than 101°, Hanmer Springs 98°, and Eweburn 96°. Although a wide range of temperature is looked for in the central portions of the South Island—viz., Kurow and Eweburn, both showing a variation of 81°, and Hanmer Springs 80°—it is certainly surprising that 78° difference in temperature has been recorded at Waiotapu Plantation, in the Auckland District. These extreme variations have, of course, a marked effect on plant-life, and it is thus explained why such a few species of trees (out of the thousands available) can be successfully grown at the localities mentioned.

SEEDLING TREES.

Notwithstanding the adverse climatic conditions experienced, the results obtained at the various nurseries have been successful beyond expectation, although the officers in charge had an anxious time during the prolonged drought. Not only has a much larger proportion of seedling trees been raised from a given amount of seeds, but the plants generally are much larger and better-rooted than those of any previous crop.

This success is principally due to the excellent germinative qualities of the tree-seeds obtained, and to a lesser extent to the systematic method of seed-raising adopted at the nurseries, which may be briefly referred to in detail.

(1.) The seed-bed grounds at all stations have now been brought into a high state of cultivation, and are of sufficient area to allow of either a definite rotation of crops with systematic manuring, or to lie fallow for one or two seasons—thus limiting the exhausting tree-crop to one area every third year.

(2.) The adoption of the roller system in sewing and covering the seeds to a defined depth, depending on the class of seeds dealt with.

(3.) The sowing of seeds at the proper time—not at any given date, but depending on the season. In other words, the Nurserymen in Charge have now the necessary experience to enable them to judge at what particular period this work should be undertaken to attain the best results.

(4.) The method of shading and protecting the seed-beds from drying winds and bright sunshine during the critical period of germination by properly constructed seed-frames.

(5.) The judgment of the officers in knowing the exact amount of seed required to a given area, so that the resultant crop will not be too thick to crowd one another, and thus promote conditions favourable to disease, but will allow ample space for further development of each individual