

The Growth and Structure of New Zealand Taxads.

These studies were continued at Canterbury University College under the direction of Dr. Chilton. Germination studies of the main taxads are being carried out under various light, exposure, and moisture conditions, and in various media, such as sand, leaf-mould and sand, and acid soil from Westland. The nature of taxad growth-rings is being further studied, and, while no definite results are yet available, certain data point to the rings being yearly ones.

Kauri and Northern Forests.

This investigation has been continued by Mr. W. R. McGregor, B.Sc., of Auckland University College. In addition to observations regarding regeneration of kauri, measurements of the rate of growth, and records of meteorological and related phenomena, analysis of that important locality factor the soil has received particular attention during the past year. The first report will be issued during the current year.

SILVICULTURAL AND UTILIZATION INVESTIGATIONS.

Westland Forest Experiment Station.

The main operations during the past year were the experimental planting of 200 acres of cut-over bush land, felling of dead trees (preparatory to planting) on 230 acres of burnt-over land and the establishment of sample plots to ensure accurate and representative growth data of all species on trial. 127,000 trees were planted, of the following species: Insignis pine (*Pinus radiata*), Ponderosa pine (*P. ponderosa*), Douglas fir (*Pseudotsuga Douglasii*), *Thuja plicata*, *Populus nigra* var., and macrocarpa (*Cupressus macrocarpa*), and, on a smaller scale, *Eucalyptus Gunnii*, *E. viminalis*, *E. regnans*, *E. Macarthuri*, and *Pinus pinaster*. Of the species planted in 1923 *Thuja plicata* has been most successful, with a mortality of only 3 per cent., and poplar next with 4 per cent. *Pinus radiata* (mortality 36 per cent.) has proven a failure in swampy ground though successful in higher, gravelly sites, and *P. ponderosa*, which through the inclusion of large numbers of the highly unsuccessful variety *scopulorum*, shows a mortality of 22 per cent., has proved eminently successful as far as the species is concerned. The soil of this station, which consists mainly of cut-over rimu forest repeatedly subject to fires in recent years, is an acid, peaty layer of semi-decomposed humus over a layer of morainic, sandy gravel, underlain often at 2 ft. to 3 ft. by a hard-pan of ferruginous conglomerate.

Rangitikei Sand-dune Experiment Station.

Extremely favourable weather conditions aided progress during the year, when there were fewer frosts, fewer strong winds, and a much lighter rainfall than the average. The frequent formation of wind-channels in the foredune which has hitherto hampered progress is now being stopped by the burning of the drift-logs on the beach, as there is no doubt that masses of these logs were the cause of this trouble. Sand-shifting, due to strong winds coming at different periods from two different points, has been effectively met by means of two parallel scrub fences, 12 ft. apart, with connecting fences at 12 ft. intervals. Scrub fences still prove the most successful type. 207 acres were planted with marram-grass at a cost of £2 10s. 6d. per acre. The marram "nurseries" for providing planting stock from marram "sets" continue eminently successful, especially in positions where fed by drifting sand. Another 10 acres of marram nursery were formed during the year. Experiments in raising marram-grass, silvery sand-grass (*Spinifex hirsutus*), and sand-sedge (*Carex pumila*) from seed met respectively with poor, fair, and good results. Sixty-nine acres were planted with trees, and of the trees planted in previous years, insignis pine still proves the most suitable. Natural reproduction of native grasses and sedges since the area was fenced against stock is even more pronounced than a year ago. The headquarters of the station have been removed to a central site at Tangimoana, where a small forest nursery has been established.

Rate-of-growth Studies of Indigenous and Exotic Trees.

Growth-measurements were obtained on six permanent sample plots previously established, and nine new plots were instituted—five for kauri, two for beech, one for taxads, and one for exotic trees. Local yield-tables were prepared for redwood in the Waikato district and for insignis pine in Canterbury and in the Waikato district. Current annual growth-rates were ascertained for kauri, totara, rimu, matai, miro, silver-pine, kaikawaka; and field-work on the mean annual growth-rate of kauri, rimu, kahikatea, silver-pine, beech, was completed. These results will, combined with stand-table data to be obtained during the current year, afford in effect yield-tables for the most important of the indigenous and exotic timbers, enabling reliable forecasts of yield to be made and control cutting to be introduced throughout the State forests.

Mill-conversion Studies.

These studies were completed for rimu, matai, miro, totara, and kahikatea. The data was obtained in co-operation with representative sawmillers throughout the Dominion. These tables, to be published during the current year, should prove of great assistance to all those concerned with the estimation and appraisal of standing timber in the Dominion.

Log-scale Table.

The Forest Service Log-scale Table showing the volume of all sizes of logs in cubic feet was issued during the year and soon met with a ready demand from sawmillers.