

silver-pine is densest seems to suggest that silver-pine is a succession forest following on rimu. Further observations were made in the totara and kahikatea areas, the data concerning these stands being now practically complete. Kahikatea dies out when silted up, but totara responds by the putting forth of fresh tiers of roots. Further, totara has great powers of vegetative growth when uprooted and silted up, being the only taxad so far observed to do this. Special observations were made in logged areas where second growth of tree-ferns was abundant. This valuable research will be completed during the current year.

The Growth and Structure of New Zealand Taxads.

Under the direction of Professor Charles Chilton, M.A., D.Sc., of Canterbury University College, two subsidized studies have been undertaken at Canterbury College. One study has to do with the conditions necessary for the germination of rimu, totara, silver-pine, white-pine, matai, and miro seeds, and for the development of the resulting seedlings. Rate-of-growth studies of the native trees have been handicapped owing to the lack of information regarding the number of growth-rings formed per annum. The second study embraces a microscopical examination of wood structure of trees of known age. A number of growing trees have also been placed under observation. This research will be continued.

Kauri and Northern Forests.

This study was continued during the year by Mr. W. R. McGregor, M.Sc., of Auckland University College. Definitive recommendations as to the silvical needs and minimum silvicultural requirements of these forest types will be finalized during this year.

SILVICULTURAL RESEARCHES.

Westland Forest Experiment Station.

Good progress was made during the year on this station. An experimental planting on 140 acres of cut-over-slash-burn country was made with 85,250 trees, consisting of Douglas fir, *Pinus ponderosa*, *P. radiata*, *P. muricata*, *Thuja plicata*, *Cupressus lusitanica*, *Populus deltoides*, and Norway spruce. An area of 200 acres was rough-cleared for the current year's planting.

A splendid nursery of 73.5 acres was established, a tree-propagating officer installed, 5 acres of ground broken, and active propagation operations begun with a view to raising all the tree stock required in the experimental work. As soon as a silviculturist can be retained, sample thinnings, demonstration plots, felling areas, experiments in selective cutting, tests in natural and artificial reseeding, slash-disposal, and many other studies will be undertaken at this station. Surveys have been made with reference to a similar station in the North Island.

Rangitikei Sand-dune Experiment Station.

A regrettable break in the continuity of the work occurred during the year owing to the death of the supervising officer, but new arrangements were made to carry on the work. Substantial advances were made during the year. Several types of sand-arresting fences were erected and are now being tested, and two miles of fore-dune have been consolidated with marram-grass. An area of 142 acres of marram-grass was planted at a cost of £3 per acre; and a careful study was made of the various methods of planting and espacement with relation to the effect of wind and drift. Spot seed-sowings of *Pinus radiata*, *P. muricata*, *P. pinaster*, *P. Banksiana*, *Alnus glutinosa*, *Cupressus Lawsoniana*, *C. macrocarpa*, and black-wattle were made in suitable localities. The *Pinus radiata* has again demonstrated its versatility. The fencing of the area and the removal of grazing-animals have resulted in a most remarkable development of the native grasses and shrubs.

It is proposed to plant 100 acres in trees during the current year, to establish a 500,000-tree-capacity nursery, and to locate a permanent camp headquarters at Tangimoana.

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

Periodic studies of the growth conditions were made during the year of the forty-eight sample plots established in the Auckland, Rotorua, Wellington, Nelson-Marlborough, Westland, and Canterbury-Otago regions. These studies will enable the formation of the felling budgets, a reliable forecast of yield, and ensure the formation of authoritative forest working plans. These investigations will be continued for several years. A start was made on the preparation of yield tables of the more important indigenous timbers, such as kauri, totara, matai, rimu, miro, tawa, and beech. This work is in progress.

Volume Tables for Rimu.

The central North Island table for rimu was completed, and this table, together with the rimu volume table for Southland and Westland, is now available for public distribution. The use of these tables will be most valuable to those dealing with standing timber.

Mill Conversion Tables for all Milling-timbers.

The collection and compilation of data for these tables was continued during the year in co-operation with the sawmillers of the Dominion.

Underplanting of Exotic Trees in the Indigenous Forest.

The plot established at Mamaku in 1916 was under observation during the year. Preliminary results will be published in the next annual report.