

Tapping of Kauri for Resin.

Periodical examinations have been made of the kauri-trees which were experimentally tapped for resin (*vide* report for 1927), and a further collection of gum will be made this winter. The interim results to date go to show that taps cut to the depth of the tough pithy tissue just outside the wood give best results; that taps at the top of the trunk give better yields than those at the base; that freshing or rewounding after the first and subsequent collections are essential; that better-quality gum and less waste and cost in collection are obtained during winter tapping; and that larger-sized trees give increased yields of gum. Other interesting phenomena have been observed and recorded, but further trials and observations will be necessary to prove the truth of these.

The Westland Podocarp Rain Forest.

References have been made in previous reports to the ecological survey of the podocarp forests of Westland initiated by Mr. C. E. Foweraker, of the staff of Canterbury College School of Forestry, in 1920, and continued during the succeeding four summers. This work was recommenced by Mr. Foweraker, in association with Mr. F. E. Hutchison, during the summer of 1927-28, and investigations made from the silvical viewpoint.

A working plan was drawn up, the basis of the investigation being to discover and formulate the means whereby these forest areas, both virgin and logged, may be placed under an efficient and economically satisfactory system of forest-management, and investigations were concentrated on the regenerative powers of the podocarp forests, the field-work being carried out principally on the Westland Forest Experiment Station near Rimu, an area of 7,000 acres, which provides a most suitable series of forest types for investigation, being represented by mature virgin forest, pole and sapling virgin stands, and second-growth vegetation. Eleven sample plots, varying in size from one-tenth acre to one acre were established amongst these various types, and all available data collected therefrom.

Investigations into the seed production and germination of the podocarps show that the dioecious habit of this class—as the rimu, for example (in which individual trees are either wholly “male” or wholly “female”)—is chiefly responsible for such a small proportion as 3 to 6 per cent. of ripe seed per tree. Laboratory tests are being made of seed collected during the late summer and autumn to ascertain what is the most suitable collecting-period for germination purposes, and further research is necessary to determine what constitutes a “good” or a “poor” seed year.

One of the chief factors governing the successful natural regeneration of the podocarps is the question of light-requirements, and indications show that the rimu requires shelter and not shade, an interesting fact being that although little regeneration can be found under mature stands it is frequently prolific on cut-over areas adjacent to living seed-bearing trees.

From the scanty evidence at present available, the best reproduction seems to occur on areas where the mineral soil has been exposed by logging, burning, and cattle-grazing, whilst cut-over areas densely covered with broad-leaf scrub are notably deficient in rimu seedlings. Further work will, however, be necessary to substantiate this theory.

To attempt, however, to advance any hypothesis in regard to the growth and increment rate of the native bush on the basis of the few existing sample plots would be absurd, and until the next five years affords a series of measurements on stands of all ages and in all conditions nothing further may safely be said than that the only two cases of authentic data available prove conclusively that in the pole stage the rimu stands make quite appreciable increment, with an annual increase, under certain conditions of $\frac{1}{10}$ in. diameter at breast-height.

The present stage of the investigation opens up many interesting theories in regard to the habits of rimu, replacement by natural means within a reasonable time, &c., but these cannot be tested without further study and research, which will be undertaken in future seasons.

6. FORESTATION STUDIES.

Further silvicultural experiments were carried out during the year, and the co-ordination of these operations was ensured by the following of prescribed standard schemes.

Trials of Planting Stock.

Trials were carried out in regional plantations to determine the best type of tree-stock (age and size), and the best season for planting, as applied to the local conditions. By such studies the percentage of losses in planting should be greatly reduced.

Underplanting of Native Bush.

A systematic measurement and observation was carried out on an underplanted area of State forest, near Mamaku, exotic conifers having been underplanted in this tawa forest in 1920.

Valuable information is being collected with reference to the shade-bearing capacities of the various conifers planted.

Experimental Nursery Technique—Rotorua.

Experiments for the improvement of nursery technique were continued, the following projects being given special attention:—

- (1) Quality and germination trials with experimental seed lots.
- (2) Pre-treatment of seed with various chemicals, to determine a satisfactory fumigant against the introduction of seed-disease.