

*Wider use of our Indigenous Forests.*

The maximum utilization of our indigenous forests can be attained only after intensive forest-products research. The main objects of the latter have been popularly quoted as the means whereby forest waste can be satisfactorily utilized. Waste-utilization is certainly of great importance, but research directed more to enhance the quality of the forest products, thus also increasing their value and indirectly reducing waste, is of still greater value. This latter problem can be accomplished in a number of ways, among which may be mentioned controlling the properties of the material grown through manipulation of the growth process, sorting the material to segregate the properties required in each use, and modifying the properties where sorting is not sufficient.

The State Forest Service has been engaged on these problems for the past seven years, and definite achievements have been made in forest-products researches and their application in industry and use. Results for the year are recorded under the following headings:—

*Timber Mechanics.*—Determination of the mechanical and physical properties of four species of timber. Green tests conducted on redwood (*Sequoia sempervirens*), taraire (*Belschmiedia taraire*), pukatea (*Laurelia novae-zealandiae*), and hinau (*Elaeocarpus dentatus*), and air-dry tests on taraire and pukatea. Green tests on rimu structural timbers, and air-dry tests on insignis pine and rimu structural timbers. Nail-holding study on New Zealand timbers commenced. Routine examination of box-bindings in connection with standard specifications.

*Timber Physics.*—Microscopic study of insignis pine. Study of fibres of New Zealand native and exotic woods suitable for paper-manufacture. Shrinkage and specific-gravity studies on locally-grown pondosa pine.

*Wood-preservation.*—Preservative treatment of locally-grown exotic species suitable for telegraph-poles commenced. Investigations made into the possibility of preserving local timbers with water-soluble preservatives.

*Derived Products.*—Laboratory and semi-commercial pulping tests on New Zealand timbers suitable for paper-making. Commercial tests on some species commenced. Utilization of bled kauri-gum continued.

*Industrial Investigations.*—Detailed report on timber-production in New Zealand. Revision of New Zealand's grading rules for building-timbers into one uniform classification commended. Floatation methods developed for tawa.

*Pathology.*—Commercial treatment developed for sap-stain in white-pine. Survey of insects introduced on imported forest-produce completed and clauses drawn up for an Order in Council to inspect and quarantine insect-infested forest-produce.

*Silvicultural Research.*

The two main silvicultural problems in the Dominion, presenting entirely different conditions, are the native-forest types and the exotic plantations. Of the first mentioned, the podocarp type, which is the most extensive and likewise the most important economically, presents the greatest difficulty, and much research work in this connection is proceeding, but much still remains to be accomplished. The two remaining types—viz., the kauri type and the *Nothofagus* type—regenerate freely by natural means, and their silvicultural treatment is therefore not such a difficult matter. The inventory giving detailed information in regard to growth, yield, &c., of our exotic plantations was completed towards the close of the year and will prove of very great value in formulating future working plans for these forests.

Cultural treatment here, except in a small way, has been delayed owing to the lack of a market for the sale of thinnings, and the cost of carrying out the work. When it is remembered that the State plantations cover 134,000 acres, the financial burden herein involved can be readily appreciated. It is hoped, however, that with the establishment of a wood-pulp and paper industry our plantations will be more extensively utilized.

At present the main silvicultural operations are concentrated on selecting the best planting species, securing seed from specially selected acclimatized parent trees in the locality where the seedlings are to be planted, and experimental thinning of small plantation-plots.

*Improved Planting and Nursery Technique.*

The use of machinery, improved planting methods, and large-scale operations, more particularly in Rotorua region, have enabled nursery and plantation costs to be reduced to bed-rock, and it is unlikely that any further reduction of any consequence of field costs under these two main headings will be possible for at least some time to come. These splendid results have only been achieved by the continued zeal, enthusiasm, and co-operation of all Forest officers.