

At the instigation of the Service, Mr. F. E. Hutchinson, B.Sc.F., of the Canterbury School of Forestry, carried out an investigation into certain phases of forest utilization, under the following headings: "Utilization in Bush," "Logging Process," "Mill and Manufacture." A one-acre plot was demarcated in a typical West Coast logging-area, and carefully measured before the bushmen commenced felling. The purpose of the investigation was, first, to secure a complete inventory of all woody material; and, second, to obtain data regarding the total quantity of merchantable timber removed from the area, the quantity, form, and species of material regarded as useful, and all other points bearing on the complete utilization of the stand prior to the area being logged. Losses in snagging, loading, and conversion were analysed and recorded, and the summarized results will be most valuable for future comparative purposes. After the milling-timber had all been removed from the plot a careful cruise was made of the remaining secondary timbers with a view to arriving at the probable percentage of waste from this source. Owing to the small area of the plot investigated, and the fact that one forest-type only was studied, the accuracy of the figures obtained as applicable to other parts of New Zealand should perhaps be accepted with certain reservations; but, nevertheless, a conservative view of the summary of the resulting data demonstrates that there is abundant room for improvement in all stages of our present system of forest-utilization.

4. FOREST BOTANY.

Towards the end of the year the New Zealand Government, at the suggestion of the Department of Scientific and Industrial Research, took advantage of the presence in Australia of Dr. A. W. Hill, C.M.G., F.R.S., F.L.S., Director of the Royal Botanic Gardens, Kew, to invite this distinguished botanist to the Dominion. Dr. Hill, who came from England at the invitation of the Commonwealth Government to advise on matters of economic plant-development and to confer with the various Directors of the botanic gardens in the Australian States, fortunately found it possible to so arrange his itinerary as to enable him to spend a few weeks in this country. The Forest Service was pleased to render all the assistance in its power to make Dr. Hill's visit both profitable and instructive, and arranged for the Secretary of Forestry (Mr. E. Phillips Turner, F.R.G.S.) and the Honorary Botanist, Dr. L. Cockayne, F.R.S., to accompany him through the Dominion. Dr. Hill subsequently embodied his views and observations in a report to the Government.

Rangitikei Sand-dune Experimental Station.

The ideal weather conditions which prevailed during the planting season, combined with the experience acquired from several years of experimental work at this station, enabled a record to be established, and 426 acres were planted with marram-grass, as compared with 372 for the previous year, making a total to date of 1,471 acres. Moreover, planting-costs were again substantially reduced, and have now reached practically bed-rock figures. Planting-stock for 1928-29 will be available from a nursery situated closer to the area to be treated than has been the case hitherto, and this will materially reduce transport costs and tend to speed up next year's operations.

The planting of exotic conifers on fixed marram-covered dunes was continued, and 150,590 trees were established on an area of 219 acres. The total area now under trees is 534 acres. Certain damage by deer has been noticed, and as the trees increase in growth and afford more protection worse damage must occur unless measures are taken to deal with the pest.

The experimental planting of flax (*Phormium tenax*) mentioned in last year's report was continued over an increased area with separate plots of young and old plants to ascertain which will prove the more suitable for commercial purposes. From the results obtained there appears to be a fair prospect of flax-planting being successful as a commercial undertaking, provided the areas to be planted are judiciously chosen. The trial planting of flax in the rear of the fore-dune as a wind-break for the young trees, which was commenced in 1926-27, has been only partially successful.

The planting of lupin (*Lupinus arboreus*) for the purpose of reinforcing the fore-dune was continued, and the results obtained from the previous year's operations are distinctly promising.

The seedlings raised at Tangimoana Nursery for the year are estimated to total 650,000, being mainly *Pinus radiata*, with lesser quantities of *P. muricata* and *P. pinaster*.

5. SILVICULTURAL INVESTIGATIONS.

Westland Forest Experiment Station.

The area planted at this station for the year just closed has exceeded all previous efforts, and an area of 400 acres was afforested with 257,500 trees, which comprised mainly *Pinus radiata*, *P. muricata*, *Cupressus Lawsoniana*, *C. macrocarpa*, and *Eucalyptus Gunnii*, with smaller lots of five other species. The area thus planted to date is 1,250 acres.

Of the species mentioned, *C. Lawsoniana* was planted in cut lines through heavy undergrowth, and made highly satisfactory growth. *E. Gunnii* was also successful, *C. macrocarpa* partially so, while *P. radiata* and *P. muricata* were almost complete failures, which seems to prove conclusively that these two species are not suited to the moist soil conditions of the plantation. Taking a line through the various species tried out since the plantation was established, it can safely be said that *Thuja plicata* has given most promising results, closely followed by *C. Lawsoniana*, *Cryptomeria japonica* and *P. ponderosa*. (A further reference to this area will be found in Appendix II.)