

1 in. stock may be dried green from the saw down to 12 per cent. moisture content within seven days, but that yellow-heart requires a much longer treatment. No new air-seasoning studies were inaugurated during the year, but a valuable series of observations has been made over a period of twelve months to establish the equilibrium moisture content of timber used in centrally heated buildings, the results indicating that stock for such use should be kiln-dried down to 10 per cent. moisture content based on oven-dry weight.

The Service test lines of creosoted fencing-posts and telegraph-poles continue to yield valuable data as to the efficiency of the various treatments. All those posts and poles which were properly conditioned and treated, some as early as 1925, are still sound after seven years and likely to remain so for many years more, whereas had they been used untreated all would have been replaced long since.

The first laboratory study undertaken by the State Forest Service—an investigation into the fundamental physical and chemical properties of the indigenous timbers—has been completed after ten year's work, the only minor species excluded from the experiments being puriri (*Vitex lucens*), kowhai (*Edwardsia microphylla*), rewarewa (*Knightia excelsa*), and mountain-beech (*Nothofagus cliffortioides*), all of which are either in restricted supply or of only minor importance. The results will be published during the next year, and structural grades, together with working-stresses, developed for the principal species.

Requests for identification of timber specimens were not as numerous as in past years. The major activity in timber-identification work was the development of a macroscopic key for the indigenous softwoods, and further testing of the microscopic key developed for the *Nothofagus* species last year.

The Dominion Federated Sawmillers' Association has also contributed a substantial sum towards the purchase of equipment for testing the fire-resistance of indigenous timbers and the efficacy of fire-resisting treatments. Some of the equipment has already been received, and immediately the apparatus is complete a comprehensive series of tests will be inaugurated, the major objective being the determination of suitable species and treatments which will enable the locally-grown woods to better compete with the imported woods at present used for their fire-resisting properties.

Exotic Forests.

Contrary to public opinion, the development of markets for the yield from exotic plantations does not present as difficult a problem as in the case of many of the indigenous timbers. The species commonly established are so easily sawn, conditioned, preserved, or otherwise used, and suitable for such a wide variety of purposes in which large volumes of wood are absorbed, that once regular log-supplies become available, they will dominate the principal softwood markets, with the exception, naturally, of that for joinery and finishing timbers, &c. So rapidly, indeed, have the exotic pines advanced in public favour during the last two years that the supply of mature logs from private plantations and windbelts promises to be exhausted long before similar supplies are available from the State plantations—a position which will simplify the problem of disposing of the intermediate products or thinnings.

The development of a market for thinnings has been a major project for several years. Practically every major avenue of utilization has been explored, from wood distillation and preservation to pulpwood and sawing, and it is clear that the only one showing any distinct possibility of economic success is the sawing of the material for boxes and crates with European machines especially developed for this purpose. Evidence of the wide field for such products is found in the fact that during the year over a million apple-cases were manufactured from insignis pine (*Pinus radiata*), several hundred thousand fruit-boxes for the Pacific Islands fruit trade, over one hundred thousand benzine-cases, and several hundred thousand cheese-crates, besides numerous other containers, which have assisted to increase the production of the pine timbers (*Pinus* spp.) from only 4,000,000 ft. b.m. in 1918–19, equal to less than 1 per cent. of the total production of all species, to an estimated figure of 15,000,000 ft. b.m., equal to 12 per cent. of the production in 1931–32.

Of the practical field utilization experiments with exotic timbers, the more important include the kiln-drying of insignis pine (*Pinus radiata*), and service tests of larch (*Larix decidua*) butter-boxes and of creosoted fencing-posts. Schedules have been developed for the kiln-drying of insignis pine, which may be conditioned rapidly at temperatures up to 200° F. without excessive degrade, 1 in. stock having been dried regularly green from the saw down to a moisture content of 12 per cent., based on the oven-dry weight, in about four days. Following upon the successful storage of butter in boxes constructed from locally-grown European larch during 1930–31, a shipment of these boxes was despatched to London in January, 1932, and is now under observation in London by New Zealand dairying officials, who are also watching the Australian experiments designed to allow the use of insignis pine for butter-boxes. The pine, larch, and eucalyptus fencing-posts, some of them treated as long ago as 1921, show that when creosote is properly applied a long life is assured, all those so treated being still sound after ten years use and likely to remain so for many years more.

As with indigenous species, studies have been continued into the fundamental physical and mechanical properties of the principal exotic woods. In the case of insignis pine, a series of structural tests has enabled this work to be translated into commercial use by the publication of structural grading rules with recommended working-stresses.