

In the hauling of logs within the forest the horse still ranks as an essential unit, while, external to the forest itself, investigations point to the adoption of trailer units equipped with low-pressure tires. Such vehicles are capable of haulage either behind show-moving tractors over forest roads or behind fast-moving vehicles over public roads.

3. SAWING TECHNIQUE.

Continued experience in the grading of timber for export indicates that considerable room for improvement still exists in the accuracy of sawing in the native timbers. Further experience also with various types of small mills operating on exotic thinnings confirms the previous judgment of the Service that the introduction of North European sawing-equipment is essential to the efficient utilization of the small logs of the State exotic forests, and the sales policy thereof will be shaped in accordance with this conclusion.

4. DRYING OF TIMBER.

More than ever before in the history of the industry the proper drying of timber stands out as the most important practical problem of the trade, and considerable attention has therefore been directed to its solution. While undoubted opportunities exist for the improvement of air-seasoning practices, the ever-increasing adoption of central heating for both public and private buildings indicates that the only ultimate solution lies in the wider adoption of kiln-drying, and for this reason the investigation and improvement of current kiln-drying practices has constituted a major activity of the department.

The kiln-drying of rimu was studied in considerable detail. The work has demonstrated clearly that, in the internal-fan reversible-circulation type of kiln, 1 in. rimu, other than heart, can be kiln-dried green off the saw to 12-per-cent. moisture-content in five days, the heart timber requiring approximately twice this time. The two classes of timber cannot be dried together either efficiently or satisfactorily, and to obtain the best results it is essential that they be dried in separate charges. The kiln-drying of silver-beech was also studied and highly satisfactory results secured only from timber which had been air-dried previously to a moisture-content of 35 per cent., demonstrating, as on previous occasions, that the kiln-drying of silver-beech green off the saw is both uneconomical and unsatisfactory. Satisfactory drying of other timbers, including white-pine and insignis pine, was also recorded, both being regularly conditioned green off the saw down to 12-per-cent. moisture-content in four days.

In co-operation with the New Zealand Railways the State Forest Service serviced a pilot kiln at the Hutt Railway Workshops. This is an adaptation of the conventional design of internal-fan reversible-circulation compartment kiln recommended to the industry and in which a number of fans are installed on a longitudinal shaft running the complete length of the kiln either below or above the stacked timber.

The general practice in kiln-installations is for operators to erect the building and contract for the supply, erection, and servicing of all necessary equipment, the cost of this latter item, for a 32 ft. kiln of the internal-fan type automatically controlled, being within £1,000.

As regards the claims of individual manufacturers to any inherent superiority, either in speed or quality of drying, it should be realized that in any forced-draught kiln of approved design the speed of drying is determined solely by the rate of moisture-transfusion through the wood, which obviously is quite independent of the kiln. In the hands of a poor operator the best of kilns will produce the worst of kiln-dried timber, while even with poor kilns a good operator can produce relatively high-quality drying. It is for this reason that where wood-users submit their proposals for the erection and operation of kilns to the State Forest Service it is prepared to consider, under appropriate terms, the training of a suitable operator for the owner. It is unfortunate that considerable prejudice against kiln-drying continues to be created by the failure of new kiln-owners to take advantage of this service. It is also advisable for all intending owners of kilns to carefully check up, by reference to the State Forest Service, any statements attributed to it by word of mouth, or letter, or in any other than official publications.

5. MOISTURE-CONTENT OF TIMBER.

The development of rapid methods for the determination of moisture-content of timber is fundamental to both the science and practice of wood-utilization. The usual method of oven-drying employed in kiln-drying work is not only slow but also dependent upon awkward sampling, and in an endeavour to test the efficiency of a recently developed electrical method of measurement an electric moisture-meter of the "Blinker" type was purchased during the year. Through the courtesy of the Division of Forest Products of the Commonwealth Department of Scientific and Industrial Research this instrument was calibrated for use with the principal commercial timbers of the Dominion, and practical experience in connection therewith indicates that it should have a wide range of usefulness amongst the wood-consuming industries. By means of this instrument it is possible to measure almost instantaneously the moisture-content of any individual piece of timber either without cutting off any section or otherwise damaging the wood. It should be noted, however, that it is not suitable for current-control work in kiln-drying on account of the surface moisture induced by sudden temperature changes during handling of the samples.