

Historical and Economic Aspects

PINWORMS IN LUMBER

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THE condition in lumber known as "pinworm" damage, caused by small wood-boring insects called ambrosia beetles, in felled-and-bucked timber, is a defect which has troubled the industry on the Pacific Coast for many years. Although this defect has been long recognized, provisions in the governmental Log Rules allowing for scaling deductions to cover the expected loss, have led to a certain degree of acceptance of the damage. Concern was expressed from time to time by millmen, but generally the loss was accepted and written off against the available resources. The full extent of the losses is, however, not generally recognized.

Serious economic difficulties arose in 1928, when parts of some shipments of hemlock lumber sent from British Columbia to Australia were, on arrival, ordered destroyed because of live beetles. This action was taken in accordance with quarantine regulations enacted to guard against the importation of foreign pests. The law requires that on every vessel which arrives, the importers obtain a clearance certificate from the quarantine authorities that the timber is in good order and free from all traces of borers. At the ports of entry, inspectors of the Federal Quarantine Department and Department of Agriculture were constantly at the ship's side during discharge of cargo, where they designated which logs were to be destroyed or otherwise treated to kill the insects. Other countries maintain similar quarantine inspections.

Difficulties were again reported in 1930, when a shipment of box shooks containing a small percentage badly infested was released only after great difficulty. The Quarantine Department in Australia made it clear that in the future, delivery of this class of timber could not be permitted under any conditions. The same year, part of another shipment of British Columbia hemlock arriving in Sydney, found to contain live borers, was ordered destroyed.

In the interests of the B. C. lumber trade, a firm of shipping and commission merchants requested identification of the insect to determine whether it was truly a native of Canada or whether it had entered the timber after arrival in Australia. The insect was identified by the Canadian entomological service as being indeed a native of B. C. and distinct from Australian species.

The trouble continued in 1931, and B. C. timber arriving at the ports of destination was subjected to inspection at a cost of 60 cents per M, later reduced to 18 cents per M for the entire shipment, even though the proportion of lumber actually infested amounted to only 1 or 2 per cent. These costs, it will be remembered, were at depression period level. In addition to the inspection costs, fumigation of the infested material to kill the insects, imposed an additional \$5 per M for the material fumigated. The effec-

tiveness of this fumigation might, incidentally, be open to doubt and the treatment may not always be acceptable to an importing country.

In 1931 the problem of ensuring that export lumber was free of living insects, prompted researches into determining effective kiln-drying and air-seasoning schedules to ensure freedom of the lumber from living beetles. These investigations were conducted by the Federal Government Forest Products Laboratory in Vancouver in cooperation with the Federal Forest Insect service, with the assistance of the B. C. Lumber and Shingle Manufacturers' Association and the P.L.I.B.

In 1933, owing to the delays in clearing and discharging exported cargoes of hemlock, because of the beetles, the shipping and commission merchants in Vancouver insisted that their suppliers give them guarantees that any timber furnished by them was free from this borer, and indeed that the timber was not infested in any way.

That the problem still affected the export trade in 1936 is shown in statements by the British Columbia Trade Commissioner to Australia, who observed that a large proportion of B. C. Douglas fir logs, on arrival, showed ambrosia beetle damage. He pointed out that a 4-inch reduction in diameter, which is the approximate amount of sapwood on the average log, reduces the total footage approximately 20 per cent—in this instance in the most valuable part of the logs namely, the clears. He stated that "This is part of the reason why buyers are complaining of the small amount of clears they are now recovering from British Columbia logs."

The broad implication of the damage as it affects the export trade is easily appreciated, but the full significance of the insects as they affect lumber manufacture is more difficult to assess.

The effect of the borer damage is felt first by log suppliers selling logs to the mill, where log volume is docked according to the extent of pinworm damage in the sapwood, since they will not yield the class of material paid for in the better grades of logs. On a log of 25-inch diameter loss of the outer inch of radius involves 8.2 per cent of its contents. The outer 2 inches of radius involves 16.2 per cent of its contents.

The losses are difficult to assess in monetary values because the damage caused by the beetles is essentially a technical defect rather than a structural one, and does not result in complete loss of the material in the outer layer of the log where it occurs. If the injured wood is not removed by heavier slabbing, a large amount of the defect finds its way into the manufactured product, particularly in the clears and sappy clears. The presence of the holes may reduce the market value by as much as 50 per cent in the

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better classes of lumber. In thus trying to salvage as much as possible of the defective timber, the mill floods its inventory with it, greater than the domestic market can absorb in normal times. This class of material is a poor advertisement for a mill operating in a competitive market.

If the injured wood is slabbled away more heavily, it involves the loss of that portion of the log normally yielding sappy clears, and even then some defect still enters into the better classes of lumber. The loss of wood by this procedure, moreover, reduces the amount of "overrun" normally expected as an excess over the log scale. It signifies furthermore, that the mill handles and manufactures more volume than its output credits it with. With a fixed overhead this implies an increase in manufacturing costs.

Another alternative to accepting the degrade as it comes, on the one hand, or to losing volume by slabbing, on the other, is the conversion of the log into a different class of lumber in which the holes are less important. It is difficult to determine what net loss is sustained under such alteration of cut. In some instances the presence of the beetle damage in a log may prevent its manufacture into large dimension timbers and require it to be worked down to smaller size. In pinwormy timber it is often necessary for the head sawyer to cut extra lines to establish a clear face free of holes. This increased manufacturing on the head-rig thus increases costs by slowing output.

The pinworm problem is thus more complex to appraise from the economic point of view than is at first apparent. **The loss in value of lumber through degrade is undoubtedly**

the most important loss, but it is not the only one. In addition, there is to be considered the effect of increased slabbing and edging waste on overrun and mill output per unit of log volume manufactured. Thirdly, there is the effect of increased manufacturing time on the head-rig when the sawyer attempts to establish a clean face on a log before passing it on to the edger. At present the extent of these losses is not known with any degree of precision, and indeed is rarely appreciated except by millmen looking critically at the situation perpetually in front of them.

Even though the defect in the lumber frequently arouses superficial concern, the thought of additional expense to protect the logs after they are felled is a deterrent to further action. Expenditure for control cannot be justified if it is not shown to be rewarded by a saving greater than the outlay in materials and labor. The problem thus resolves itself into that of determining how much value loss is sustained in degrade, and in manufacturing costs. Then it will be possible to state how much per thousand feet of logs can be expended for control.

With the objective of evaluating the losses from ambrosia beetles (pinworms) in lumber, the foregoing considerations were used as a guide in planning an investigation of this problem under normal mill conditions.

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