Larix occidentalis

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FROST DAMAGE TO LARCH IN THE BLUE MOUNTAINS

An unusually warm April this year was followed by a rainy and cold May. Several killing frosts occurred during this cold period in May. This was early in the growing season when the larch needles were only half-developed and still very tender. The result was that the larch crowns throughout most of the Blue Mountain region were frost killed. During May and June the larches in this region prevailingly presented a brownish appearance which stood out strikingly in the canopy of the evergreen conifers. Most of the larches established new crowns by early summer and the trees then presented their usual green summer appearance, except for the touches of brown here and there where some individuals had suffered more severely and had only partially recovered. Although most of the trees recovered completely, a close examination of these revealed evidence of the injury in the form of shriveled brown needles which clung to the branches even until late summer.

Where the damage was especially severe, as in a few of the cases observed, not only the tender needles were killed, but this year's and last year's shoots were killed also.

Larch seedlings and saplings where they were exposed lost most of their needles and again recovered them, but where these little trees were in sheltered positions they did not suffer as much as the big trees and in many cases were not affected at all.

There are two essential questions raised by this severe frost damage to larch: (1) Is frost damage to crowns ever so great as to cause the death of the tree? (2) Does the temporary defoliated condition caused by frost have a serious effect upon volume growth? No case of a larch tree killed by frost has been observed or reported. Moreover the few dead larches in the stand as compared with the widespread and frequent occurrence of frost damage of this sort indicates that actual death caused by frost is not appreciable and probably never occurs. It is not possible at this time to answer conclusively the second question. Little is known physiologically about the formation of annual rings, but it is generally believed that the size of the annual ring is largely dependent upon the stored food material of the previous season. Thus an interruption in food manufacture would not be reflected in the annual ring of the season in which the interruption occurred, but in the following season. But that a much less wide ring and therefore a less volume growth does result through a temporary defoliated condition of larch crowns is a very safe inference. In this connection of few scattered increment borings in larch were taken at the end of the growing season near Sumpter, Oregon. Of the trees thus examined 75% showed a normal annual ring for the present year.

Regarding the occurrence of frost damage of this sort, Mr. R. M. Evans of the Whitman National Forest reports that during the cold snap in early June, 1914, when for four days there was a light fall of dry snow at Sumpter, there was noticeable frost damage to larch trees. The damage then was not so severe as this year because by early June the larch needles have more nearly reached maturity and are accordingly less susceptible to frost killing, Mr. Evans says there was

considerable browning of larch crowns at that time. But the recovery then was more complete, and the effect on the season's volume growth was not appreciable.

[signed] Robert H. Weitknecht
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