


Larix occidentalis Western Larch

The natural distribution of western larch (*Larix occidentalis*) is centered over the northern Rocky Mountains, where it is one of the fastest growing, most shade intolerant, and most fire tolerant of trees. It is common in the nearby Okanogan Highlands of Washington and is also found in the Blue Mountains and on the east slope of the Cascades of Washington and Oregon. This species grows in a cool, moist zone at elevations from 2000 to 6500 feet. Its upper elevation limit is apparently determined by low temperatures and its lower elevation limit by lack of water. Western larch always grows in mixed stands. Its most common associate is Douglas-fir, but others include ponderosa pine, grand fir, western hemlock, western redcedar, and western white pine (Schmidt and Shearer, 1990).

Little work has been done to determine the seed transfer rules for western larch in Washington. However, some excellent work has been done in the northern Rocky Mountains that is relevant to this state, and in some cases these studies included seed sources from Washington. Rehfeldt (1995) found there were significant differences among populations of western larch in a number of adaptive traits. However, the large genetic differences that also existed within populations tended to mask genetic changes that occurred across the landscape. Thus, western larch showed less genetic differentiation across the same environmental change than other conifers. Elevation was responsible for the largest genetic difference; Rehfeldt recommended limiting movement of this species to 1500 feet in elevation within a locality. A number of traits tended to vary latitudinally, especially tolerance of foliar disease and survival. While differences in these traits between the Blue Mountains and the Okanogan Highlands were large enough to suggest that seed should not be transferred between these areas, they were not large enough to suggest restricting seed movement within each area.

The westernmost of the seed sources in Rehfeldt's (1995) study, which included the eastern Cascades, differed from those in the northern Rocky Mountains, suggesting that it would be prudent to restrict seed movement between the east slope of the Cascade Mountains and the Rocky Mountains as well. Rehfeldt (1982 and 1995) has also suggested that while western larch cannot be moved as far as western redcedar, it can be moved slightly further than ponderosa pine. Because risk of seed movement can vary from place to place within the range of a species, and because we have very little information for the state of Washington for this species, it would be prudent to be somewhat more conservative than Rehfeldt recommends.

Based on adaptive characteristics, Rehfeldt (1982 and 1995) recommended moving seed between northeastern Washington and northern Idaho. However, Fins and Seeb (1986) found there were genetic differences in allozymes between western larch in eastern Washington and northern Idaho and that the Washington populations had several unique and rare alleles. Allozymes are different forms of enzymes that can be used to evaluate the relatedness of groups of plants, but are widely considered not to be related to adaptive characteristics.

They suggested it might be wise to restrict movement of larch seed between the Okanogan Highlands and the northern Rocky Mountains.

There is very little western larch west of the Cascade crest; it occurs only as scattered individuals in a small area in central Skamania County. Local reforestation experience suggests seed transfers between the east and west sides of the Cascades in this area may be risky (Dave Doede, personal communication, August 2000).

New recommendations for seed transfer zone boundaries

YAKIMA (Zone 1): East side of the Cascades where western larch occurs. Consists primarily of the those portions of the old 440, 622, 631, 632, 641, 651, and 652 seed zones where western larch is native.

TWISP (Zone 2): The area where western larch occurs west of the Okanogan River. Consisting of portions of the old 600 and 611 seed zones.

KETTLE (Zone 3): The area where western larch occurs between the Okanogan River and the Columbia River. Consists primarily of portions of the old 612, 613, 614, 801, 802, 803, and 804 seed zones.

PEND OREILLE (Zone 4): The northeast corner of the state east of the Columbia River. Consisting of the old 811, 812, 813, 821, and 822 seed zones, and the northern part of the old 830 seed zone.

SPOKANE (Zone 5): An isolated population on the east side of Whitman County. Consists of portions of the old seed zone 841 where western larch grows. Use seed from the local area where possible. If this is not practical, seed from nearby parts of Idaho may be used.

GRANDE RONDE (Zone 6): The southeast corner of the state and nearby areas of Oregon. Consists primarily of the old seed zones 851, 852, and 861 and nearby areas of Oregon.

Elevation bands within geographic seed transfer zones

Within each seed movement zone, 1200-foot elevation bands should be established.