



Thuja plicata

Western Redcedar

Washington is in the heart of the western redcedar (*Thuja plicata*) range and this species is found on most types of sites where trees grow within the state. It is common along the coast, in the Olympic Mountains, along the Puget Trough, and along the west slope of the Cascades. The species also occurs in scattered populations along the east slope of the Cascades and is common in the Okanogan Highlands. Western redcedar tolerates a wide range of annual precipitation, ranging from a high of 260 inches along parts of the coast to a low of 28 inches in parts of the interior. This species is very tolerant of shade. It is found at elevations that range from sea level to 7500 feet. Western redcedar is not particularly tolerant of frost and is often damaged by late spring or early fall freezes. Where adequate water exists, its range seems to be limited by low temperatures (Minore 1990).

No field studies of adaptive variation in western redcedar have been conducted in Washington, but studies in other areas suggest genetic differences among populations are less than for most other conifers. Rehfeldt (1994) found that populations in the northern Rocky Mountains had to be separated by 2° latitude or 2000 feet in elevation before he could say they were genetically different. Frost damage was common in his test plantations and he recommended caution in breeding for increased growth in this species. John Russell (personal communication, 1998) tested a wide range of populations in southern Vancouver Island. His plantations also experienced frost damage. He found huge differences in survival between populations from northern California and Vancouver Island (about an 8° difference in latitude) and small differences between populations in the Queen Charlotte Islands and Vancouver Island (about a 4° difference in latitude). He found no differences in survival among coastal populations from the same latitude that differed in elevation by more than 2500 feet. He found distinct differences in survival between populations from coastal, intermediate, and interior sources of western redcedar.

A number of biochemical studies (Copes 1981, von Rudolff and Lapp 1979, and Yeh 1988) and a number of biometric studies that used material from a limited area (Bower and Dunsworth 1988, and Jeffers 1962) lend support to the idea that genetic differences among populations of western redcedar are relatively small.

Recommendations for seed transfer zone boundaries

TWIN HARBORS (Zone 1): A strip along the coast that includes the west side of the Olympic Mountains and extends into the Puget Trough in the southern half of the state. Consists primarily of the old 011, 012, 030, 041, 232, 241, and 242 seed zones; and western portions of the 042, 421, 422 and 430 seed zones.

PUGET SOUND (Zone 2): Portions of the Puget Trough north of Tacoma. Consists primarily of the old 201, 202, 211, 212, 221, 222, and 231 seed zones, and the western portions of the old 411 and 412 seed zones.

SKAGIT (Zone 3): West side of the Cascades north of Snoqualmie Pass at Interstate 90. Consists primarily of the old 401, 402, and 403 seed zones; the eastern part of the old 411 seed zone; and the northeastern part of the old 412 seed zone.

TOUTLE (Zone 4): West side of the Cascades south of Snoqualmie Pass at Interstate 90. Consists of the old 440 and 652 seed zones, the eastern parts of the old 421, 422, 430 and 042 seed zones; the southeastern part of the old 412 seed zone; and western parts of the old 653 seed zone where western redcedar occurs.

MID COLUMBIA (Zone 5): East slope of the Cascades where western redcedar is native. Consists of the old 600 series seed zones north of the Yakama Indian Reservation and west of the Okanogan River where western redcedar is found.

UPPER COLUMBIA (Zone 6): Northeastern corner of the state. Consists of the portions of the old 801, 802, 811, 812, 821, and 822 seed zones where western redcedar occurs.

SPOKANE (Zone 7): Isolated populations of western redcedar scattered on the east side of Spokane and Whitman counties. Consists of portions of the old 830 and 841 seed zones where western redcedar occurs. Where possible, use seed from these isolated populations. Where that is not possible, seed from nearby portions of northern Idaho may be used.

Elevation bands within geographic seed transfer zones

Within the Twin Harbors, Puget Sound, Skagit, and Toutle seed movement zones, 2000-foot elevational bands should be established. Within the Mid-Columbia, Upper Columbia, and Spokane zones, 1500-foot elevation bands should be established.