

Western redcedar (Cw)- *Thuja plicata*

Tree Species > Western redcedar



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BC Distribution of Western redcedar (Cw)

Range of Western redcedar



Western redcedar is one of the most valuable tree species of B.C., considering its ecological, silvical, timber, and cultural values. This picture shows an extraordinary western redcedar tree in the coastal rain forest.

Geographic Range and Ecological Amplitudes

Description

Western redcedar is a medium- to large-sized (rarely >60 m tall), evergreen, scale-leaved conifer, at maturity often with a forked (candelabra-like) top, a tapered fluted base, drooping branches, and thin, fibrous, brown bark. It is one of the most valuable conifers owing to the unique colour, texture, and durability of its wood; it is also the provincial tree of B.C.

Geographic Range

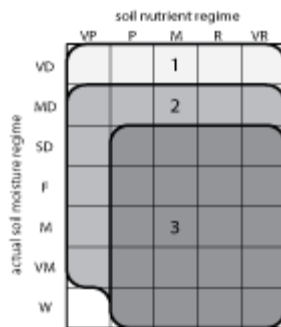
Geographic element:

Western North American/mainly Pacific and less Cordilleran

Distribution in Western North America:

(north), **central**, and (south) in the Pacific region; central in the Cordilleran region

Ecological Amplitudes



generalized edaphic amplitude of western redcedar according to actual soil moisture and nutrient regimes

Climatic amplitude:

(subalpine boreal) - cool temperate - **cool mesothermal**

Orographic amplitude:

submontane - montane - (subalpine)

Occurrence in biogeoclimatic zones:

(lower MH), (lower ESSF), (SBS), (MS), (PP), IDF, **ICH**, CDF, **CWH**

Edaphic Amplitude

Range of soil moisture regimes:

(very dry) - moderately dry - **slightly dry - fresh - moist - very moist - wet**

Range of soil nutrient regimes:

very poor - **poor - medium - rich - very rich**

On the basis of sand culture experiments and field observations, Krajina (1969) and Krajina et al. (1973) concluded that western redcedar requires nitrate-N for its growth and cannot tolerate the complete replacement of nitrates by ammonium compounds. In this respect redcedar differs greatly from western

hemlock, which tolerates the ammonium source of nitrogen.

Western redcedar was killed by ammonium, with the exception of one seedling (out of ten) which survived but showed evident N-deficiency. In contrast, all western hemlock seedlings treated with ammonium for two years were growing well, however those treated with complete Hoagland solution were growing better. In sand cultures, with a solution of only nitrates, all redcedars grew only slightly slower than those treated with complete Hoagland solution.

Western redcedar is able to survive and grow, though less vigorously, in soils with a low moisture and nutrient content. In fact, this species occurs on such soils over much of its natural range. However, common douglas tolerates poor soils somewhat better than redcedar.

Tolerance and Damaging Agents

Root System Characteristics

In freely drained soils western redcedar develops a dense, profuse root system, with non-existent or poorly defined taproots. Fine roots form a very dense mat in the surface organic layer. Roots are mycorrhizal of the vesicular-arbuscular type.

Tolerances

tolerance to	tolerance class	comments
low light	H	comparable to Pacific silver fir
frost	L - M	low in coastal populations, medium in interior populations
heat	M	protection-requiring on warm and dry sites
water deficit	M	protection-requiring on dry and warm sites
water surplus	H	tolerates flooding, high water table, and strongly fluctuating water table well
nutrient (mainly N) deficiency	H	frequent on very poor sites; intolerant of salt spray and saline soils (e.g., tidal flats)

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Damaging Agents

damaging agent	resistance class	comments
snow	L - M	low in coastal populations, medium in interior populations
wind	M	
risk class		
fire	L - H	wildfires are rare in wet cool mesothermal climates but very frequent in dry cool temperate climates
insect	L	not a major concern; western hemlock looper, phantom hemlock looper

fungi	H	major concern in trees that regenerated vegetatively or were damaged
other agents	H	browsing by deer and elk at the seedling and sapling stage

Associated tree species and successional role

In British Columbia, western redcedar grows in uneven-aged, mixed-species stands, less frequently in pure, even-aged stands. It is present in early, mid-, and late stages of secondary succession; a major component in old-growth stands in the IDF, ICH, CDF, and CWH zones.

associated tree species	occurrence class	major area of occurrence
common douglas	H	one of the major associates in cool temperate and mesothermal climates
western hemlock	H	one of the major associates in ICH and CWH
red alder	M	mainly on floodplains
western larch	M	southern ICH and IDF
sitka spruce	M	mainly in hypermaritime CWH
black cottonwood	M	floodplains
pacific silver fir	L	wetter CWH
grand fir	L	southern ICH and CWH
subalpine fir	L	mainly in ICH
paper birch	L	mainly in ICH
alaska yellow-cedar	L	upper and hypermaritime CWH
lodgepole pine	L	mainly in hypermaritime CWH

characteristic	interpretive comments class
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Silvical

Characteristics

reproduction capacity	H	seed-producing at an age of 10 years, heavy seed crops are frequent
seed dissemination capacity	M	adequate dissemination within 100 m from source
potential for natural regeneration in low light	M	high, if considering vegetative reproduction
potential for natural regeneration in the open	H	providing the presence of mineral soil or burnt forest floor
potential initial growth rate (<5 years)	H	may be as high as for common douglas, western hemlock, or Sitka spruce
response of advance regeneration to release	H	
self-pruning capacity in dense stands	H	providing that initial stand density is high
crown spatial requirements	M	
light conditions beneath closed-canopy, mature stands	L	associated with poorly developed understory vegetation
potential productivity	H	site index (50 yr @ bh) close to 35 m on the most productive sites
longevity	H	frequently >1,000 years, possibly >2,000 years

Genetics and Notes

Genetics

Western redcedar seems to vary less than many other tree species; however, some differences in the chemical properties were recently detected between coastal and interior populations.

Notes

Minore, D. 1990. *Thuja plicata*. Pp. 590-600 in R.M. Burns and B.H. Honkala (technical coordinators) *Silvics of North America*, Vol. 1. Agri. Handbook 654, USDA For. Serv., Washington, D.C.

Minore, D. 1983. Western redcedar: a literature review. GTR-PNW-150, USDA For. Serv., Pacific Northwest Forest and Range Exp. Station, Portland, Oregon. 70 pp.

Smith, N.J. (editor) 1988. Western red cedar — does it have a future? Faculty of Forestry, University of British Columbia, Vancouver, B.C. 177 pp.

Similar to Alaska yellow-cedar, western redcedar is one of the most valuable tree species of British Columbia when considering its ecological, silvical, and timber values. It could be also considered a nurse species as its foliage improves decomposition of forest floor materials. More detailed silvics information is given by: