

# Balsam poplar (Acb) - *Populus balsamifera*

Tree Species > Balsam poplar



## Page Index

[Distribution](#)

[Range and Amplitudes](#)

[Tolerances and Damaging](#)

[Agents](#)

[Silvical Characteristics](#)

[Genetics and Notes](#)

## BC Distribution of Balsam poplar (Acb)

Range of Balsam poplar



An old-growth stand of balsam poplar on an alluvial terrace west of St. John. Poplars are characteristic of early primary succession on alluvial floodplains. They inhabit low and medium bench sites along major streams, which are typically fresh to moist and nutrient-rich to very rich.

## Geographic Range and Ecological Amplitudes

### Description

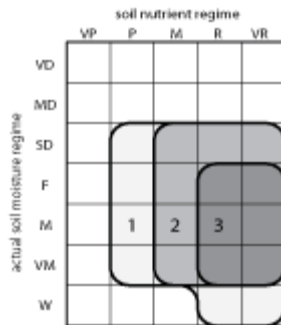
Balsam poplar is a medium-sized (exceptionally over 30 m tall), deciduous broad-leaved tree, at maturity with a narrow, open crown of thick ascending branches and gray and deeply furrowed bark. Many kinds of wildlife use the twigs for food. The light, soft wood is used for pulp and construction.

### Geographic Range

Geographic element:  
North American transcontinental-incomplete

Distribution in Western North America:  
north in the Pacific region; **north** and central in the Cordilleran region

### Ecological Amplitudes



generalized edaphic amplitude of balsam poplar according to actual soil moisture and nutrient regimes

#### Climatic amplitude:

subarctic - subalpine boreal - **montane boreal** - cool temperate

#### Orographic amplitude:

submontane - **montane** - subalpine

Occurrence in biogeoclimatic zones:  
(lower SWB), BWBS, (SBS), (IDF), (ICH)

#### Edaphic Amplitude

Range of soil moisture regimes:  
slightly dry - **fresh - moist - very moist** - (wet)

Range of soil nutrient regimes:  
(poor) - medium - **rich - very rich**

Balsam poplar does not tolerate acid Mor humus forms because it requires a good supply of nitrate nitrogen, calcium, and magnesium. Therefore, it benefits from soils in which these nutrients are replenished by flooding in spring or before summer. As with black cottonwood, balsam poplar does not tolerate brackish water.



## Tolerance and Damaging Agents

### Root System Characteristics

On floodplains, the root system of balsam poplar is multi-layered, owing to the deposition of new soil by periodic flooding. Although early root development is downward, subsequent development progresses upward as root growth occurs on the buried stem. Lateral root spread can be >14 m. Roots are associated with ecto- and endo-mycorrhizae.

### Tolerances

tolerance to	tolerance class	comments
low light	L	a very intolerant, exposure-requiring species
frost	H	it may grow in permafrost soils
heat	M	not a concern in boreal climates
water deficit	L	absent on water deficient sites
water surplus	H	tolerates flooding and strongly fluctuating water table well; intolerant of brackish water
nutrient (mainly N) deficiency	L	absent on very poor sites, infrequent on poor sites

### Damaging Agents

damaging agent	resistance class	comments
snow	M	
wind	H	high winds will break the boles rather than uproot trees
risk class		
fire	L	not a concern in pure balsam poplar stands
insect	L	not a major concern; wood borers (e.g. poplar borer)
fungi	L	not a major concern; heart rots (e.g., aspen trunk rot)
other agents	L	not a major concern; browsing by large ungulates

**Associated tree species and successional role**

In British Columbia, balsam poplar grows predominantly in even-aged, pure stands, and, in the later stages of primary succession on floodplains, with shade-tolerant conifers. The most commonly associated tree species are subalpine fir and white spruce (& its hybrids). Balsam poplar is a pioneer species (primary succession) on floodplains, and is present in early and intermediate stages of secondary succession on floodplains and upland sites.

**Silvical Characteristics**

characteristic	interpretive comments class	
reproduction capacity	H	the flowering stage is reached in 8 to 10 years; the most versatile member of the Willow family for reproduction from root and stump sprouts
seed dissemination capacity	H	dispersed by wind and water
potential for natural regeneration in low light	L	practically nil; a shade-intolerant and exposure-requiring species
potential for natural regeneration in the open	H	especially on mineral soil; segments of stems and buried branches greatly contribute to regeneration
potential initial growth rate (<5 years)	H	>1 m in one growing season in stump sprouts
response of advance regeneration to release	na	advance regeneration does not develop in the absence of adequate light and seedbeds
self-pruning capacity in dense stands	H	if initial stand density is high
crown spatial requirements	H	short but wide crown is necessary to support rapid growth
light conditions beneath closed-canopy, mature stands	H	associated with well-developed understory vegetation

potential productivity	H	site index functions are not available
longevity	L	rarely >200 years

## Genetics and Notes

### Genetics

Two varieties have been identified: var. *balsamifera* and var. *subcordata*. Balsam poplar and black cottonwood hybridize and produce mixed populations fairly frequently where both taxa are sympatric, or even when they are separated by rather large distances, because it is wind-pollinated and its pollen grains may be easily transported a long distance. Interbreeding may be seen as intraspecific, providing we consider, as it is often done, that both taxa belong to the same species; the scientific name in this case is *Populus balsamifera* L. s.l.

### Notes

Balsam poplar produces in a short time high yields of wood suitable for mechanical pulping. Considering its productivity, vegetative reproduction, and low risk of being affected by damaging agents, it is a suitable species for intensive management on flooded sites. More detailed silvics information is given by:

Peterson, E.B. and N.M. Peterson. 1992. Ecology, management, and use of aspen and balsam poplar in the prairie provinces. Special Report 1, For. Can., Northern Forestry Centre, Edmonton, Alberta. 252 pp.

Zasada, J.S. and H.N. Phipps. 1990. *Populus balsamifera*. Pp. 518-529 in R.M. Burns and B.H. Honkala (technical coordinators) *Silvics of North America*, Vol. 2. Agri. Handbook 654, USDA For. Serv., Washington, D.C.