Pacific Silver Fir, Abies amabilis



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Range
Pacific silver fir has a range in SE Alaska, coastal British Columbia, and along the western slopes in the Cascade Range in Washington and Oregon. (2)

Climate, elevation
Pacific silver fir grows in maritime climates with annual temperatures generally between 16° F and 61° F. Precipitation can vary between 6650 mm on the west coast of Vancouver Island to an extreme low of 965 mm on the eastern side of Vancouver Island. In the Cascade Range the average annual precipitation is more than 1500 mm.(2)
Elevation varies from 1000+m in the southern part of its range to 300+m in the central part of its range and sea level in its northern range. (7)

Local occurrence (where, how common)
Pacific silver fir occurs most often on in areas with high precipitation and moist soils like the mid-slope of the western cascades. It can remain in the understory for centuries. (6)

Habitat preferences
Pacific silver fir is dependent on adequate soil moisture during the growing season. It is most abundant on sites where summer drought is minimal, such as areas of heavy rainfall, seepage, or prolonged snowmelt. (2)

Plant strategy type/successional stage (stress-tolerator, competitor, weedy/colonizer, seral, late successional)
Pacific silver fir is an obligate climax species. It is one of the most shade-tolerant trees in the Northwest. Small trees are often abundant in the forest understory. On many sites Pacific silver fir can eventually outgrow and become taller than western hemlock or Doug-fir after 100 years. (2)

Associated species

Pacific silver fir is associated with Western hemlock *(Tsuga heterophylla)* throughout most of its range. West of the Cascade Range it is associated with Noble fir *(Abies procera)*, Douglas-fir, Western red-cedar *(Thuja plicata)*, and grand fir *(Abies grandis)*. And it is associated with Mountain hemlock *(Tsuga mertensiana)*, Alaska-cedar *(Chamaecyparis nootkatensis)*, and subalpine fir *(Abies lasiocarpa)* at subalpine elevations. (2)

May be collected as: (seed, layered, divisions, etc.)
Seed. (4)

Collection restrictions or guidelines
The timing of cone collection (mid to late August) is important because
cones disintegrate as they mature. Felling and topping are not successful collection methods. The cones are susceptible to molding and heat build-up if sacked when wet. (4) Good seed crops generally only occur every 3 years. (2)

Seed germination (needs dormancy breaking?)
Sow 4 weeks @ 39°F, move to 70°F for germination. (3)

Seed life (can be stored, short shelf-life, long shelf-life)
Up to 5 years. (8)

Recommended seed storage conditions
Store in drums, cans, or plastic bags near 5° F. Leave containers unsealed to minimize moisture buildup and prevent mold growth. (8)

Propagation recommendations (plant seeds, vegetative parts, cuttings, etc.)
Plant seeds. Cool, moist habitats are best for germination, but full sunlight produces maximum subsequent growth. (2)

Soil or medium requirements (inoculum necessary?)
Germination can occur on a variety of media: on litter humps and in moist depressions in the subalpine zone; on edges of melting snowpack in subalpine meadows; and in litter, rotten wood, moss, organic soils, mineral soils, and fresh volcanic tephra. Survival is better on mineral seedbeds than on organic seedbeds. (2)

Installation form (form, potential for successful outcomes, cost)
Stock is usually outplanted as 2-3 year old seedlings or 3-4 year old transplants. (8)

Recommended planting density
Seeds should be sown in spring at a density of 62.5 to 125 per acre (25-50 per ha) and approximately 0.25 inch (0.64 cm) deep, depending on the site. (4)

Care requirements after installed (water weekly, water once etc.)
Mulches of sawdust or straw are sometimes used to protect seedlings during the first winter. (8)

Normal rate of growth or spread; lifespan
Pacific silver fir takes about 9 years to reach breast height on average sites. Planted seedlings may only grow 1 to 6 inches per year for the first few years after planting with most of the plant's energy being devoted to root development. After reaching breast height, it may grow up to 35 inches per year. (2) It can eventually grow to heights of 100 to 230 feet and diameters of 36 to 44 inches depending on the site. Pacific silver fir can live up to 400-500 years on good sites, and 250-350 years on more adverse sites. (4)

Sources cited
(1) Bisbee, Jeff. Jeff Bisbee Gallery. Arboretum de Villardebelle. April 18, 2005.
http://www.pinetum.org/PhotoJEFFamabilis.htm

(2) Burns, R. and B. Honkala. 1990. *Silvics of North America. Volume 1, Conifers. Agricultural Handbook 654*. U.S. Department of Agriculture, Forest Service, Washington, D.C. Available online: http://www.na.fs.fed.us/Spfo/Pubs/silvics_manual/Volume_1/abies/amabilis.htm

(3) The Conifer Garden. Seed Sowing Guidelines. April 19, 2005. http://www.conifergarden.com/seed_sowing.htm

(4) Cope, Amy B. 1992. Abies amabilis. In: Fire Effects Information System, [Online]. U.S. Department of Agriculture, Forest Service, Rocky Mountain Research Station, Fire Sciences Laboratory (Producer). April 20, 2005.
http://www.fs.fed.us/database/feis/plants/tree/abiama/all.html

(5) Dendrology at Virginia Tech. April 18, 2005. http://www.cnr.vt.edu/dendro/dendrology/syllabus/aamabilis.htm

(6) Earle, Christopher (editor). Abies Amabilis. Gymnosperm Database. April 19, 2005.
http://www.botanik.uni-bonn.de/conifers/pi/ab/amabilis.htm

(7) Pojar, Jim and Markinnon, Andy. 1994. Plants of The Pacific Northwest Coast Washington, Oregon, British Columbia & Alaska. B.C Forest Service, Research Program.

(8) Young, James and Young, Cheryl. 1992. Seeds of Woody Plants in the United States. Dioscorides Press, Portland, Or.

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