

**Tree factsheet**

images at pages 3 and 4

***Abies grandis* (Douglas ex D. Don) Lindley**

<b>taxonomy</b>	
author, year	Lindley, 1833
synonym	<i>A. amabilis</i> Murr. not Forbes
Family	Pinaceae
Eng. Name	Grand fir, Giant fir, Lowland fir
Dutch name	Reuzen zilverspar (Heukels' Flora, 2005 en Boom, 2000)
subspecies	
varieties	
hybrids	<i>A. concolor</i> x <i>grandis</i>
cultivars, frequently planted	
<b>references</b>	Earle, C.J. Gymnosperm database <a href="http://www.conifers.org">www.conifers.org</a>
	USDA Forest Service <a href="http://www.fs.fed.us/database/feis/plants/tree/index.html">www.fs.fed.us/database/feis/plants/tree/index.html</a>
	USDA Forest Service <a href="http://www.pfaf.org/database/index.php">www.pfaf.org/database/index.php</a>
	USDA Natural Resource Conservation Service <a href="http://plants.usda.gov/java/factSheet">plants.usda.gov/java/factSheet</a>
	Schmidt, P. 1989. <i>Abies alba</i> en <i>Abies grandis</i> (in Dutch). in: Schmidt, P. 1989. Nederlandse boomsoorten II, Syllabus Vakgroep Bosbouw Landbouwniversiteit Wageningen.
<b>morphology</b>	
crown habit	conical to pyramidal
max. height (m)	USA: 75 The Netherlands: 40
max. dbh (cm)	150 or more
actual sizes North America	year ....., d(130) 185, h 77 (1988), Duckabush River Trail, Olympic National Park, WA year ....., d(130) 220, h 75 (19..), Chilliwack River BC year ....., d(130) 158, h 81,4 (1993), Glacier Peak Wilderness, WA
actual sizes Great Britain	year 1875, d(...) 198, h 61, Ardinglas woodland garden, Loch Fyne, Cairndow, Scotland year ....., h 44, Westonbirt Arboretum, England
actual sizes The Netherlands	year 1840-1850, d(130) 99, h 32 year 1910-1920, d(130) 116, h 27
leaf length (cm)	4-7 single
leaf petiole (cm)	0
leaf colour upper surface	green
leaf colour under surface	grey with stomatal bands
leaves arrangement	alternate
flowering	April-May
flowering plant	monoecious
flower	monosexual
flower diameter pollen cones (cm)	1-3 ( <i>Abies alba</i> )
pollination	wind
fruit; length	cone; 6-12 cm
fruit petiole (cm)	0,2
seed; length	samara (=winged nut); 9-12 cm
seed-wing length (cm)	
weight 1000 seeds (g)	17-20
seeds ripen	September-October same year
seed dispersal	wind

<b>habitat</b>	
natural distribution	West U.S.A.
in N.W. Europe since	1831 England
natural areas The Netherlands	not indigenous
geological landscape types The Netherlands (Hoek 1997)	coversand area, ice-pushed ridges
forested areas The Netherlands	sandy soils; former heath fields
area Netherlands	<1700 ha (2002, Probos)
% of forest trees in the Netherlands	<0,7 (2002, Probos)
pH-KCl	4,5-5 (4-7) ( <i>A. alba</i> )
soil type	sand, ...
soil fertility	medium to nutrient rich
light	highly shade tolerant
① shade tolerance (0=no tolerance to 5=max. tolerance)	4.0
① drought tolerance (0=no tolerance to 5=max. tolerance)	2.3
① waterlogging tolerance (0=no tolerance to 5=max. tolerance)	1.6
plant communities in the Netherlands	Vaccinio-Piceetea (klasse der naaldbossen)
<b>management</b>	
status USA, natural range	frequent species in forests
status Europe	infrequent exotic species in forests
status The Netherlands	frequent exotic species in forests
application	timber tree, ornamental
propagation	seed
regeneration	planting
optimal gap size for regeneration	< 1x tree length
first plantation Netherlands	
resprouting after cutting	no
growth rate (M.A.I. in m <sup>3</sup> ha <sup>-1</sup> j <sup>-1</sup> )	
diseases	<i>Rhizina undulata</i> , fungus on roots <i>Heterobasidion annosum</i> , fungus on roots (Wortelzwam)
insects	aphids (Dutch: luis)
<b>wood</b>	
wood	Fir, Silver Fir (Dutch: Dennen)
wood structures key characteristics of pores	tracheids; resin canals absent or marginal
density heartwood (kg/m <sup>3</sup> )	(350-)450(-550)
elastic modulus (N/mm <sup>2</sup> )	<i>A. alba</i> : 10.800
durability heartwood	fungus 4
heartwood colour	yellowish to grey-white
sapwood colour	yellowish to grey-white
contents	resin in the wood, bark has resin pockets
products	pulpwood for paper, packing wood
<b>non-timber products</b>	
seeds	raw edible

① Ülo Niinemets and Fernando Valladares. 2006. Tolerance to shade, drought, and waterlogging of temperate Northern Hemisphere trees and shrubs. Ecological Monographs 76:521–547



young fir in Edesche Bos



young fir in Wageningen-Hoog



adult tree in Wageningen-Hoog



branch showing upper and underside of leaves



leaves details



bark characteristics of a young tree with resin blisters(left) and an old stem with cracked bark (right)



freshly cut round-wood of Grand Fir

photography: 8x ©Leo Goudzwaard, Wageningen University