

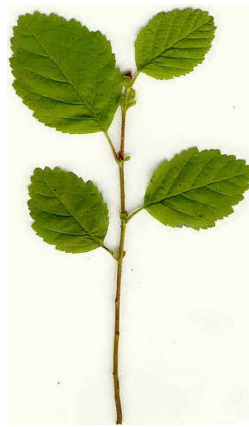


<b>habitat</b>	
natural distribution	Europe, West Asia, N. Africa
in N.W. Europe since	7.000 B.C.
natural areas The Netherlands	brook forests
geological landscape types The Netherlands (Hoek 1997)	coversand area, river valleys
forested areas The Netherlands	loamy, clay and peat soils
area Netherlands	<i>Alnus</i> spp. 967 (2002, Probos)
% of forest trees in the Netherlands	0,4 (2002, Probos)
soil type	indifferent
pH-KCl	neutral to alkaline
soil fertility	nutrient poor to rich
light	half shade tolerant
① shade tolerance (0=no tolerance to 5=max. tolerance)	2.7
① drought tolerance (0=no tolerance to 5=max. tolerance)	2.2
① waterlogging tolerance (0=no tolerance to 5=max. tolerance)	3.9
plant communities in the Netherlands	<i>Alnetea glutinosae</i> (klasse der Elzenbroekbossen): - <i>Thelipterido-Alnetum</i> (Moerasvaren-Elzenbroek) - <i>Carici elongatae-Alnetum</i> (Elzenzegge-Elzenbroek) <i>Querco-Fagetea</i> (klasse der Eiken-Beukenbossen op voedselrijke grond): - <i>Carici remotae-Fraxinetum</i> (Goudveil-Essenbos) - <i>Pruno-Fraxinetum</i> (Vogelkers-Essenbos) - <i>Violo odoratae-Ulmetum</i> (Abelen-Iepenbos)
<b>management</b>	
status Europe	frequent species in forests, landscape
status The Netherlands	frequent indigenous species in forests, landscape; infrequent in urban environment
application	nature tree, timber tree, coppice tree
propagation	seed; named cultivars by grafting or cuttings
regeneration	planting; natural regeneration from seed; new stems
optimal gap size for regeneration	2-3x tree length
first plantation Netherlands	
resprouting after cutting	good
growth rate (M.A.I. in m <sup>3</sup> ha <sup>-1</sup> j <sup>-1</sup> )	4-8
diseases	<i>Phytophthora cambivora</i> , fungus
insects	aphids (bladluizen) <i>Eriophyes laevis</i> , gallmite (galmijt) <i>Agelastica alni</i> , alder leaf beetle (elzenhaantje)
<b>wood</b>	
wood	Alder, Black alder (Europees elzen)
wood structures key characteristics of pores	diffuse porous; radial pore groups
vol. mass heartwood (kg/m <sup>3</sup> )	(490-)530(-640) (12% moisture content)
elastic modulus (N/mm <sup>2</sup> )	9400
durability heartwood	fungus 5
heartwood color	red-brown
sapwood color	red-brown
contents	
products	tools, cutlery, turnery, triplex, boxes; construction wood (old)
<b>non-timber products</b>	
bark	medicinal purposes

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



Black alder leaves and buds in summer



seedling, one year old



winter buds



Young tree, Wageningen



Mature tree, multi-stemmed, Wageningen

photography 5x © Leo Goudzwaard, Wageningen University



Black alder female flowers in detail, photography ©Plantengids KU Leuven



flower buds in winter  
photos 2x © Leo Goudzwaard



unripe fruits



ripe fruits © Plantengids KU Leuven



cone



bract



seed (here without wings)



Mature alder bark



Alder wood, photo © Chris Sonnemans



Alder woodland, Valle van de Zwarte Beek, Vlaanderen  
Photo © Koen Jellema



Alder woodland, Beaulieu River, New Forest  
Photo © Leo Goudzwaard, Wageningen University



Thomé, 1885