

# ECOLOGY AND SILVICULTURE OF BLACK ALDER (*Alnus glutinosa* (L.) Gaertn.)

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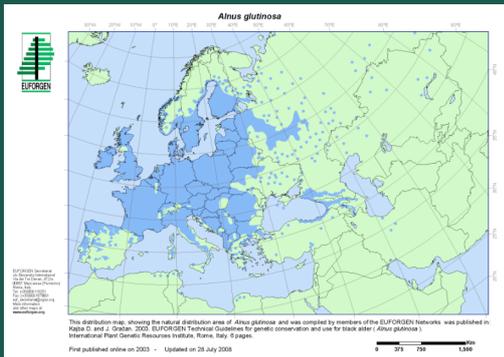
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## Introduction

Black alder (*Alnus glutinosa* (L.) Gaertn.) is widespread across Europe, both in forest and on open land along the watercourses. It plays a major role in nature conservation, thanks to its relation with the river ecosystems and its network distribution on open land.



Natural distribution  
(after Rusanen et al., 2003, EUFORGEN)

## Crown architecture

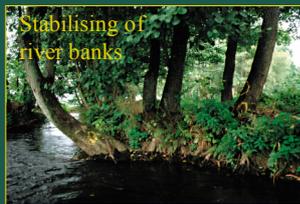
The stem of black alder is generally straight and without forks. Branches are small since, because the tree does not produce shade leaves, natural pruning begins very early and progresses fast.



## Stand dynamics

In open areas, black alder competes well and will regenerate profusely. It also grows fast for the first 7-10 years. Later growth slows down considerably as light requirements remain high but light becomes less available as trees and branches begin to compete for it. As a forest tree, alder does best in mixtures of light-demanding species such as ash, maple and oak.

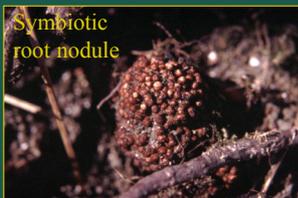
Normally, black alder can be grown over a rotation of 50-70 years to produce high quality boles of 50 to 70 cm DBH and approximately 6 m long. This can be achieved by planting 800 to 1600 stems/ha. At plantation densities of more than 1000 stems/ha, no artificial high pruning is necessary.



Stabilising of river banks

## Site requirements

Since its leaves have no mechanism for controlling transpiration, black alder needs abundant soil water. The root system is adapted to very wet, including anaerobic soils. Its root system helps to stabilise river banks.

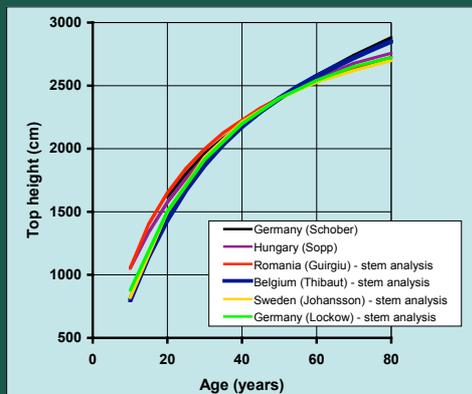


Symbiotic root nodule

It will grow on a wide range of soils, both acid and basic, and of varying nutrient status. A special characteristic of the tree is its ability to fix atmospheric nitrogen in symbiotic root nodules with bacteria.

## Growth pattern

Growth rates up to ages 7 to 10 are very fast but then slow rapidly. 60-70 years is the maximum practicable rotation for growing timber if heart rot is to be avoided. Maximum mean annual increments range from 4 to 14 m<sup>3</sup>/ha/year.



Shape of the growth curve following different authors

Thinning has to start early, when the trees are around 10 m tall, and must be heavy and frequent around selected final crop trees to achieve marketable sized timber before heart rot sets in.



Growing Valuable Broadleaved Tree Species

This poster was prepared under the COST action E42 "Growing Valuable Broadleaved species (ValBro)".

This poster is a summary of: Claessens, H., A. Oosterbaan and P. Savill 2008 A review of the characteristics of black alder (*Alnus glutinosa* (L.) Gaertn.) and their implications for silvicultural practices (see also [www.valbro.uni-freiburg.de](http://www.valbro.uni-freiburg.de))