The European beech (Fagus sylvatica) or common beech is a deciduous tree. The natural range of European beech extends from southern Sweden to central Italy, west to France, southern England, northern Portugal, central Spain, and east to northwest Turkey, where it intergrades with the oriental beech (Fagus orientalis), which replaces it further east. In the Balkans, it shows some hybridization with oriental beech, producing; these hybrid trees are named Fagus × taunica. European beech is a large tree, capable of reaching heights of up to 50 m tall and 3 m trunk diameter, though it is more typically 20-35 m tall and up to 1.5 m trunk diameter at full maturity. It has a typical lifespan of 150 to 200 years, though sometimes up to 300 years. The leaves are alternate, simple, and entire or with a slightly crenate margin, 5–10 cm long and 3–7 cm broad, with 6–7 veins on each side of the leaf (7–10 veins in Fagus orientalis). The buds are long and slender, 15–30 mm long and 2–3 mm thick, but thicker (4–5 mm) where the buds include flower buds are present. F. sylvatica male flowers are borne in the small catkins. The female flowers produce beechnuts, small triangular nuts 15–20 mm long and 7–10 mm wide at the base; there are two nuts in each cupule, maturing in the autumn (http://en.wikipedia.org/wiki/Fagus_sylvatica). The health status of individual beech trees is characterized mainly on degree of defoliation, i.e. the relative foliar loss of a tree crown compared to that of a fully-foliated, healthy reference tree growing in the same stand and site conditions. Tree crown defoliation is a non-specific damage symptom, normally connected with a range of different harmful damaging factors, each of which may. All of them can act separately or together. It can be very difficult to determine the effect impact of single factors on the amount of damage and their importance is usually very difficult. That is why it is impossible usually to separate the influence of climate change from other harmful factors (insects, pathogens, air pollution and so on) affecting the beech health status in forest ecosystems.

Main pests of seed and seedlings: In the acorns of beech various larvae of insect species can develop (e.g. acorn weevil Figure 3.A,B) and destroy the entire acorn production. Powdered mildew (Figure 3.C) can cause severe injury and alter the appearance of the leaves. The most pervasive air pollutant currently and into the future forests is ozone (Figure 3.D).

![Figure 1](http://commons.wikimedia.org/wiki/File:Beech_forest_3.jpg)  
**Figure 1.** The natural range of European beech (Fagus sylvatica) (http://www.euroforest.org) and morphology of foliage, flowers and fruit: A; cross-section of female flower: B; open cupule (http://commons.wikimedia.org/).  

![Figure 2](http://commons.wikimedia.org/wiki/File:Beech_defoliation.jpg)  
**Figure 2.** Beech defoliation is defined as leaf loss in the assessable crown as compared to a reference tree. Defoliation is assessed in 5 classes and they are: 0 (0 – 10 % defoliation); 1 (11 – 25 % defoliation); 2 (26 – 59 % defoliation); 3 (60 – 89 % defoliation); 4 (100 % defoliation). (Photos: P. Fabianek).

![Figure 3](http://commons.wikimedia.org/wiki/File:Beech_defoliation.jpg)  
**Figure 3.** Major problems on beech nuts: A; acorn weevil (Curculio spp.; B; larva of acorn weevil, (Photos: S. Mitrchev); C; powdery mildew, (Photos: S. Mitrchev); D; ozone damage (Photo: M.J. Sanz & V. Calatayud).

Main pests on beech trunks: Large number of bark and wood living insects (e.g. bark and jewel beetles, Figure 5.A) attack beech trunks. Pathogenic and saprotrophic fungi can affect the twigs and branches (e.g. Necria canker, Figure 5.B) or the trunk (e.g. Tender fungus, Figure 5.D). In general beech is susceptible to the effects of climate change and also to various pests and diseases. After a closed stand has been opened and direct sunlight can reach the trunks of the trees, the bark may die on the exposed side of the tree leading to mortality (Figure 5.C). Mechanical damage (caused by game, but in most cases by humans) can lead to fungal infection and heart rot (e.g. Tender fungus, Oyster mushroom). In this case the most valuable (lower) part of the trunk will be destroyed. In general, living trees tend to decay from the inside out (heart rot) and dead trees from the outside in (sap rot). The most damaging forest pathogens from this group are root rot fungi (e.g. Artist's conk).

![Figure 4](http://commons.wikimedia.org/wiki/File:Beech_defoliation.jpg)  
**Figure 4.** Major pests on beech leaves: A; Woolly beechnaph (Phyllophaga fagi), (Photo: M. Zubiak); B; Geometrid moth (Geometridae), (Photo: G. Csoka); C; Beech flea weevil (damaged leaves) (Orchites fagi), (Photo: F. Lakatos).

Main pests of beech leaves: Beech harbors a large number of phytophagous insects (including pests) and fungi (including pathogens). Major insect pests have varied feeding habits: sucking (e.g. woolly beechnaph, Figure 4.A), leaf feeding (e.g. geometrid moths, Figure 4.B), leaf miner (e.g. beech flea weevil, Figure 4.C) species. Most of the damage causing geometrid moths (e.g. E. defoliaria, O. Jurnata) fly late autumn and on warm winter days ('winter moths').

![Figure 5](http://commons.wikimedia.org/wiki/File:Beech_defoliation.jpg)  
**Figure 5.** Major pests and other forms of damages on beech trunks: A; jewel beetle (Agrilus virdis), (Photos: F. Lakatos); B; Necria canker (Necria ditissima), (Photos: S. Mitrchev); C; Sunscald or heat canker, (Photo: S. Mitrchev); D; Tender fungus (Fomes fomentarius), (Photo: S. Mitrchev); E; Oyster mushroom (Pleurotus ostreatus), (Photo: S. Krejcl); F; Artist's conk (Ganoderma applanatum), (Photo: S. Mitrchev).

For additional information visit  
www.fao.org/forestry/pests/en/