



## Fagus sylvatica

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*Fagus sylvatica*, the European beech or common beech, is a deciduous tree belonging to the beech family *Fagaceae*.

*Fagus sylvatica* is a large tree, capable of reaching heights of up to 50 m (160 ft) tall and 3 m (9.8 ft) trunk diameter, though more typically 25–35 m (82–115 ft) tall and up to 1.5 m (4.9 ft) trunk diameter. A 10-year-old sapling will stand about 4 m (13 ft) tall. It has a typical lifespan of 150–200 years, though sometimes up to 300 years. In cultivated forest stands trees are normally harvested at 80–120 years of age. 30 years are needed to attain full maturity (as compared to 40 for American beech). Like most trees, its form depends on the location: in forest areas, *F. sylvatica* grows to over 30 m (100 ft), with branches being high up on the trunk. In open locations, it will become much shorter (typically 15–24 m (50–80 ft)) and more massive.

The leaves are alternate, simple, and entire or with a slightly crenate margin. When crenate, there is one point at each vein tip, never any points between the veins. The buds are long and slender, but thicker (to 4–5 mm (0.16–0.20 in)) where the buds include flower buds.

The leaves of beech are often not abscised in the autumn and instead remain on the tree until the spring. This process is called marcescence. This particularly occurs when trees are saplings or when plants are clipped as a hedge (making beech hedges attractive screens, even in winter), but it also often continues to occur on the lower branches when the tree is mature.

Small quantities of seeds may be produced around 10 years of age, but not a heavy crop until the tree is at least 30 years old. *F. sylvatica* male flowers are borne in the small catkins which are a hallmark of the Fagales order (beeches, chestnuts, oaks, walnuts, hickories, birches, and hornbeams). The female flowers produce beechnuts, small triangular nuts 15–20 millimetres (0.59–0.79 in) long and 7–10 mm (0.28–0.39 in) wide at the base; there are two nuts in each cupule, maturing in the autumn 5–6 months after pollination. Flower and seed production is particularly abundant in years following a hot, sunny and dry summer, though rarely for two years in a row.

## Distribution and habitat

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The natural range extends from southern Sweden to northern Sicily, 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 southern part of its range around the Mediterranean, it grows only in mountain forests, at 600–1,800 m (1,969–5,906 ft) altitude.

Although often regarded as native in southern England, recent evidence suggests that *F. sylvatica* did not arrive in England until about 4000 BC, or 2,000 years after the English Channel formed after the ice ages; it could have been an early introduction by Stone age humans, who used the nuts for food. The beech is classified as a native in the south of England and as a non-native in the north where it is often removed from 'native' woods. It is often planted in Britain. Similarly, the nature of Norwegian beech populations is subject to debate. If native, they would represent the northern range of the species. However, molecular genetic analyses support the hypothesis that these populations represent intentional introduction from Denmark before and during the Viking Age.

Though not demanding of its soil type, the European beech has several significant requirements: a humid atmosphere (precipitation well distributed throughout the year and frequent fogs) and well-drained soil (it cannot handle excessive stagnant water). It prefers moderately fertile ground, calcified or lightly acidic, therefore it is found more often on the side of a hill than at the bottom of a clayey basin. It tolerates rigorous winter cold, but is sensitive to spring frost. In Norway's oceanic climate planted trees grow well as far north as Trondheim. In Sweden, beech trees do not grow as far north as in Norway.

A beech forest is very dark and few species of plant are able to survive there, where the sun barely reaches the ground. Young beeches prefer some shade and may grow poorly in full sunlight. In a clear-cut forest a European beech will germinate and then die of excessive dryness. Under oaks with sparse leaf cover it will quickly surpass them in height and, due to the beech's dense foliage, the oaks will die from lack of sunlight.

## Ecology

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The root system is shallow, even superficial, with large roots spreading out in all directions. European beech forms ectomycorrhizas with a range of fungi including members of the genera *Amanita*, *Boletus*, *Cantharellus*, *Hebeloma* and *Lactarius*; these fungi are important in enhancing uptake of water and nutrients from the soil.

In the woodlands of southern Britain, beech is dominant over oak and elm south of a line from about north Suffolk across to Cardigan. Oak are the dominant forest trees north of this line. One of the most beautiful European beech forests called Sonian Forest (Forêt de Soignes/Zoniënwoud) is found in the southeast of Brussels, Belgium. Beech is a dominant tree species in France and constitutes about 10% of French forests. The largest virgin forests made of beech trees are

Uholka-Shyrokyi Luh (8,800 ha (22,000 acres)) in Ukraine[10] and Izvoarele Nerei (5,012 ha (12,380 acres) in one forest body) in Semenic-Cheile Caraşului National Park, Romania. These habitats are home of Europe's largest predators (the brown bear, the grey wolf and the lynx). Many trees are older than 350 years in Izvoarele Nerei and even 500 years in Uholka-Shyrokyi Luh.

The European beech invests significantly in summer and autumn for the following spring. Conditions in summer, particularly good rainfall, determine the number of leaves included in the buds. In autumn, the tree builds the reserves that will sustain it into spring. Given good conditions, a bud can produce a shoot with up to ten or more leaves. The terminal bud emits a hormonal substance in the spring that halts the development of additional buds. This tendency, though very strong at the beginning of their existence, becomes weaker in older trees.

## Cultivation

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European beech is a very popular ornamental tree in parks and large gardens in temperate regions of the world. In North America, they are preferred for this purpose over the native *F. grandifolia*, which despite its tolerance of warmer climates, is slower growing, taking an average of 10 years longer to attain maturity. The town of Brookline, Massachusetts has one of the largest, if not the largest, grove of European Beech Trees in the United States. The 2.5 acre public park, called 'The Longwood Mall', was planted sometime before 1850 qualifying it as the oldest stand of European beeches in the United States. It is frequently kept clipped to make attractive hedges. Since the early 19th century there have been numerous cultivars of European beech made by horticultural selection, often repeatedly; they include several different cultivars with attractive foliage variegation are currently being sold in the U.S. under the common name of tricolor beech, including 'Purpurea Tricolor', 'Roseo-marginata' and 'Tricolor'. Differences between these cultivars are somewhat confusing. 'Tricolor' reportedly originated in France in 1873. As originally described, it featured nearly white leaves spotted green with a pink margin. 'Tricolor' is now considered to be quite rare and may no longer be circulating in commerce. Plants sold as 'Tricolor' may in some cases be 'Purpurea Tricolor'. Royal Horticultural Society Plant Finder lists 'Tricolor' misapplied, see *F. sylvatica* 'Purpurea Tricolor' in addition to 'Tricolor'. Moreover, RHS currently takes the position that 'Roseo-marginata' (often described as the purple form of 'Tricolor') is in fact a synonym of 'Purpurea Tricolor'. The bottom line is that tricolor beeches in general, regardless of assigned cultivar name, provide often stunning variegated foliage (purple/pink, green and white), particularly in spring. They are understory trees that typically grows to 30' tall and from a distance usually project a rose foliage color in spring although the actual variegation is a bit more complicated.