Observatree
monitoring tree health

www.observatree.org.uk

‘**Host of the month**’ is a series of information sheets and blogs that highlight a tree host and their associated priority pests and diseases that are best seen and recorded in that month. For June we’re looking at Beech (*Fagus sylvatica*) and beech leaf disease.

Common Beech is an extremely efficient light interceptor when in full leaf, the woodland floor beneath the canopy can be quite dark and almost devoid of ground flora in summer. However, these conditions suit bluebell very well and give rise to spectacular carpets of them in beech woodland where little else can flourish.

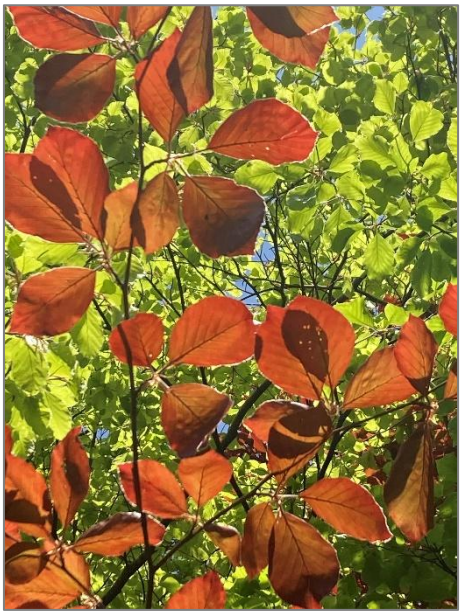

Figure 1: Copper beech with the more typical green leaved form in the background (Matt Parratt).

Beech (*Fagus*) are part of the Fagaceae family which along with oaks (*Quercus*) and sweet chestnuts (*Castanea*), characterised by catkin-like male flowers and nuts held in a cup-like structure. There are between 10 and 13 species globally, just one being native to the UK – *Fagus sylvatica*. The species is classed as native to southern England and is frequent in places such as the Chilterns but has been planted and is naturalised across much of the UK. The timber is of a good quality and finds uses from musical instruments and furniture to the sticks in ice lollies.

It’s a popular choice as an amenity tree with several common cultivars; copper beech (fig. 1), the fastigiate beech ‘Dawyck’, and fern-leaved Beech with finely cut leaves which sometimes reverts to the normal foliage, particularly where branches are damaged. Beech hedges are very common, probably in part due to the phenomenon of marcescence where dead leaves are retained on the twigs over winter. The tallest hedge in the world at Meikleour in Scotland is composed of Beech and is currently 30m tall!

Beeches are deciduous trees with leaves arranged alternately on the shoots. Leaves are more or less oval with a fine fringe of silky hairs around the margin which gradually disappear as summer progresses. The catkin-like male flowers (fig. 2) are more obvious than the more subtle female flowers which are followed by the tough spiky cupule which opens to release a pair of three-sided beechnuts.

Southern beeches (*Nothofagus* species) are in their own family (*Nothofagaceae)* and are not known to be affected by Beech leaf disease.

Observatree is a citizen science project led by Forest Research, in collaboration with key organisations

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Previously 50% funded by the EU’s LIFE+ Programme (2013-2017)

Figure 2: Common beech leaves (left). and flowers (right) - catkin-like male flowers bottom left of the picture with female flowers at the shoot tip above. Note the fringe of fine hairs along the leaf margin. Images by Robert Vidéki, Doronicum Kft., Bugwood.org.

Priority disease - Beech leaf disease (BLD)

BLD was first observed in American beech (*F. grandifolia*) in Ohio in 2012 and soon spread to other parts of the Eastern USA including Pennsylvania, New York, New Jersey and West Virginia and Ontario in Canada. In Ohio the disease spread at around 5km per year and in areas where BLD is established almost 100% of American beech show symptoms. Research suggests a strong association between the presence of the nematode (*Litylenchus crenatae* ssp. *mccannii*) and the symptoms of BLD, but it has also been found in symptom-free buds and leaves. Further research is required to determine if the nematode is the sole cause of BLD, or if it is a vector for as yet unidentified pathogens. The mechanism for local transmission between trees is unknown but if the nematode is the principal cause young plants from the nursery trade, cut foliage, plant fragments or soil could all play a role in long distance transmission.

American beech is the main species affected, but symptoms have also been reported on Common beech and Oriental beech (*F. orientalis*) planted in the USA. However, as a relatively new disease the full risk to other beech species in not yet known. BLD has not yet been observed in the UK or the rest of Europe but the importance of beech trees and the potential threat to them led to it being added to the UK Plant Health Risk Register.

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Identification

The first sign of BLD and a key diagnostic feature is the appearance of dark bands between the lateral veins on the leaves in early summer, best observed from below. Note that the individual dark bands do not cross the lateral veins. The banded areas gradually take on a leathery texture, frequently accompanied by chlorosis giving a yellow appearance. Over the ensuing few years the canopy begins to thin due to buds being aborted, a reduction in leaf size and premature leaf drop (fig. 3). Saplings displaying symptoms are usually killed within five years, and large trees within ten.

Figure 3: Dark bands between lateral veins of beech leaves (left, Yonghao Li, The Connecticut Agricultural Experiment Station, Bugwood.org), bands turning yellow as symptoms progress (middle) and reduced leaf size of affected trees (right), Matthew Boden, Bartlett Tree Experts, Bugwood.org)

Lookalikes

Leaf miners such as the larvae of the *Phyllonorycter* moths produce feeding traces known as blotch mines. Unlike the distinct banding associated with BLD these become translucent, brown, and papery due to the feeding action of the larvae (fig. 4). Phyllonorycter larvae produce a hormone which prevents chlorophyll breakdown in the autumn, leaving a series of 'green islands' in the yellowing leaf. In all cases, if the larvae are still present they can be seen by looking at the leaf with a light source behind it

Aceria nervisequa is a mite which causes white felt galls on the lower surface of beech leaves which can distort and discolour the upper surface (fig. 5). On copper beech these are a dramatic shocking pink colour. For more images and information see the Plant Parasites of Europe website.

Petrakia liobae is a non-native fungal pathogen that discovered in Switzerland in 2008 and causes brown, irregular necrotic spots on the leaves of beech trees. Older spots may also have the fluffy white fungal propagules

associated with them (fig. 6). This isn't a priority disease and hasn't yet been seen in the UK, but you should report via TreeAlert if you think you have found it. For more information see the DEFRA pest alert.

Figure 4: leaf mines of *Orchestes fagi* weevil larvae (left - Matt Parratt), blotch mines caused by P*hyllonorycter* moth larvae (middle - Richard Churchman), and green islands in autumnal leaf caused by *Phyllonorycter* larvae (right - Matt Parratt).

Figure 5: Felt galls on the upper surface of typical Common beech (left - Richard Churchman), and on the underside of Copper beech (right - Matt Parratt), most likely caused by the mite *Aceria nervisequa*.

Figure 6: Typical symptoms caused by *Petrakia liobae* on common beech (©Ludwig Beenken, Swiss Federal Research Institute WSL.)

Reporting

Beech leaf disease is a priority pathogen in the UK so please report possible sightings via TreeAlert.

For more information and resources on Beech leaf disease check the Observatree website.

Matt Parratt, Forest Research, July 2025