

Mini data sheet on Beech leaf disease and its potential causal agent (*Litylenchus crenatae*)

Litylenchus crenatae was added to the EPPO A1 List in 2019. A full datasheet will be prepared, in the meantime you can view here the data which was previously available from the EPPO Alert List (added to the EPPO Alert List in 2019 - deleted in 2026).

Why: A new disease of beech trees (*Fagus* spp.) called 'Beech leaf disease' (BLD) has increasingly been observed in forest areas in Eastern USA and Canada (EPPO RS 2018/178, 2020/082) and is raising serious concerns among foresters and local communities in affected areas. The disease was first reported on *Fagus grandifolia* in Ohio (Lake county) in 2012, and it rapidly spread to other counties in Ohio, as well as to Pennsylvania, New York, Ontario (Canada), Connecticut, Massachusetts, Rhode Island, New Jersey, West Virginia and Virginia. The disease has mainly been observed in forests but also in landscaped areas. A nematode species has been isolated from beech leaves and buds. At first, this nematode was identified as *Litylenchus crenatae*, a species described in Japan on *Fagus crenata*. Further studies conducted on American nematode populations concluded that they differed in morphology, host range, and ribosomal DNA marker from those in Japan. Therefore, it was proposed to consider the North American nematode associated with beech leaf disease as a new subspecies of *L. crenatae*, and to call it: *Litylenchus crenatae mccannii*. However, because the presence of *L. crenatae mccannii* has also been observed on asymptomatic bud and leaf tissue, the question as to whether nematode is the sole cause of the disease or is only a vector of unknown pathogens, remains unanswered and research is continuing in North America on the disease etiology. Considering the threat that this new disease represents to beech trees, the NPPO of the United Kingdom has added it to the UK Plant Health Risk Register and also suggested to add it to the EPPO Alert List. This proposal was subsequently supported by the Panel on Phytosanitary Measures.

Where:

EPPO region: Absent.

North America: Canada (Ontario), USA (Connecticut, Delaware, Maine, Maryland, Massachusetts, Michigan, New Jersey, New York, North Carolina, Ohio, Pennsylvania, Rhode Island, Vermont, Virginia, West Virginia).

On which plants: BLD mainly affects *F. grandifolia* (American beech). However, it was also observed in 2016 on *F. sylvatica* (European beech) and *F. orientalis* (Oriental beech) in a tree collection (Holden Forests and Gardens in Geauga county, Ohio), as well as in 2017 on *F. sylvatica* in commercial nursery stock (Lake county, Ohio). *F. engleriana* (Chinese beech) is considered to be a potential host.

Damage: Early symptoms of BLD include dark-green striped bands between lateral veins of leaves and reduced leaf size. Banded areas usually become leathery-like, and leaf curling is also observed. As symptoms progress, aborted buds, reduced leaf production, and premature leaf drop lead to an overall reduction in canopy cover, ultimately resulting in death of sapling-sized trees within 2-5 years and of large trees within 6 years. In areas where the disease is established, the proportion of symptomatic trees can reach more than 90%. However, it is noted that some variability in susceptibility has been observed among beech trees.

Pictures of symptoms observed can be viewed on the Internet:

<http://forestry.ohiodnr.gov/portals/forestry/pdfs/BLDAlert.pdf>

Dissemination: If *L. crenatae mccannii* is the main cause of BLD, plants for planting and cut foliage could be potential pathways for long distance transport. However, how the nematode spreads among forest trees is currently unknown. In particular, it is not known whether the nematode can survive in other plant parts or in the soil during winter after beech leaves have fallen.

Pathways: Plants for planting, cut branches of *Fagus* spp. from countries where the disease occurs?

Possible risks: *Fagus* spp. are widely planted in the EPPO region for forestry and amenity purposes. In particular, *F. sylvatica* is an important deciduous forest tree in Western and Central Europe (e.g. used for wood production). Many aspects remain to be clarified, in particular, it is still unclear whether *L. crenatae mccannii* is the sole causal agent of BLD or if the disease is associated with a complex of pathogens (e.g. fungi, bacteria, viruses or phytoplasmas). If *L. crenatae mccannii* is the main causal agent of BLD, its biology and epidemiology also need to be further studied to better assess its potential risk. However, considering the rapidity of spread and the severity of damage (i.e. tree decline and mortality) observed on *Fagus* species in North America, it was felt that the attention of NPPOs should be drawn to this emerging disease and the potential risks it may present to the forestry and ornamental sectors of the EPPO region.

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