

Bleeding canker impacting health of European beech

by GEORGE W. HUDLER and
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The prominence of European beech (*Fagus sylvatica*) is unmistakable where it has been planted as a centerpiece in landscapes throughout the Northeast. Few trees can match European beech's massive size and spread that alone can dominate an entire site. Beyond its size, the species' smooth, chalky gray bark and fine exterior branches with large buds offer winter appeal that is nearly equal to the desirability of its foliage, especially with various cut-leaf and colored cultivars.

Unfortunately, the potential of European beech to sustain its prominence is being seriously challenged by a recently identified, deadly disease called bleeding canker. In fact, a survey of European beeches by pathologists at Cornell University, Ithaca, NY, showed an infection rate of 40 percent for trees in northeastern landscapes.

The pathogens. Cornell pathologists have found — after much work — that



The bleeding and dark staining of European beech from bleeding canker disease is caused by several soil-borne *Phytophthora* species.

The real damage from bleeding canker occurs beneath the bark where the pathogen is killing the cambium and inner bark and causing damage to the outer xylem or wood.

bleeding canker can be caused by at least three closely related species of water molds in the genus *Phytophthora*. The three species — *P. plurivora*, *P. pini* and *P. citricola* — all cause bleeding canker symptoms that cannot be distinguished in the field. These organisms appear to be common in soils in landscapes throughout the range of European beech in the US.

They also are known to cause root disease in tree nurseries, but there is no evidence that there is any tree nursery link to the current bleeding canker problem.

Disease and symptoms. Bleeding cankers can be recognized, as the name suggests, by dark-colored “bleeding” areas that usually appear first near the root collar (photo, left). The bleeding from infection sites leaves a persistent dark stain on the bark that allows for easy detection of the disease as it spreads within and between trees. Occasionally, the bleeding may start higher on the trunk, but in all cases, areas of symptomatic bark become larger and more numerous as the disease spreads around and up the lower trunk of the tree (photo, above right).

The real damage from bleeding canker occurs beneath the bark where the pathogen is killing the cambium and inner bark and causing damage to the outer xylem or wood. Destruction of these tissues slowly girdles the tree, and as the disease progresses, the bark falls off, exposing large areas of sapwood to potential invasion by wood decay fungi and insect borers (photo, opposite).

Beeches weakened by disease become attractive to a host of secondary insects and pathogens, and their presence may mask bleeding canker as the primary cause of the problem, particularly as a tree starts to significantly decline in health.



Bleeding canker symptoms have progressed up the trunk of a large European beech. The disease seems to affect mostly large, mature beeches.

Brief biology. Interestingly, even though the *Phytophthora* species that cause bleeding canker are soil-borne, there is usually not a clear and obvious association of root collar cankers with diseased roots. Apparently, spread of these pathogens is via splashing water, although insect transmission has not been ruled out. American beech (*F. grandifolia*), which has been devastated in the woods by the well-known beech bark disease, has not seriously been damaged by bleeding canker.

Management. Regular scouting of European beeches for bleeding canker symptoms is important in early detection and subsequent management efforts. Testing of trees with initial bleeding symptoms to confirm *Phytophthora* as the cause is a good idea because similar bleeding symptoms can be due to agents other than *Phytophthora*.

University extension laboratories offer reliable diagnostic services for this purpose, and several commercially available field test kits are offered for *Phytophthora* confirmation from diseased trees. No matter what test is being used, it is important to sample from bark at the advancing edge of canker and then test scrapings from the inner bark to have the greatest chance of an accurate result.



This European beech shows advancing symptoms of bleeding canker disease, which can kill large areas of bark and cambium that eventually fall off infected trees.

Bleeding canker seems to be manageable with fungicides if symptoms are identified early or before large areas of the trunk are infected. Several fungicides with phosphoric acid as the active ingredient have shown the greatest promise in slowing further disease spread, particularly if they are applied together with a bark-penetrating product. The phosphoric acid appears to have two modes of action — one is helping increase the tree's natural defenses, and the second is acting as a fungicide against the *Phytophthora* pathogen.

The future. The widespread occurrence and serious impact of bleeding canker might indicate European beech is doomed as a choice for planting in the landscape. However, the disease seems to be affecting mainly large, mature trees, and early success with fungicide management suggests that continued planting and survival of the species as a dominant feature in landscapes is possible.

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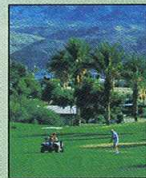
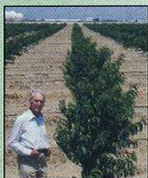
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