ARBOR CARE
TREE & LANDSCAPING, LLC
Howard County: 765-860-9470
Hamilton County: 317-582-1824
Tippecanoe County: 765-742-0306

Ash Yellows Disease

Ash yellows is a recently discovered disease that causes slow growth and decline of ash (Fraxinus) species. Ash yellows went undetected until the 1980's because its symptoms were not differentiated from those of decline caused by adverse environmental factors such as drought, shallow soils, flooding, or parasitism by opportunistic fungi. Current knowledge supports the theory that ash decline can result from various causes, and ash yellows can be, but is not always, a causal factor.

Ash yellows is caused by wall-less microbes called mycoplasma-like organisms (MLOs) which invade the tree systemically (phloem sieve tubes) and are presumed to be transmitted by leafhoppers or related insects. White ash (F. americana) and green ash (F. pennsylvanica) are the most frequently affected species.

The impact of ash yellows on ash populations is not well documented. Individual trees in which the disease is discovered are likely to show declining growth and, often, dieback. The disease occurs in woodlots and forests, home landscapes, and urban plantings.

Distribution and Host Range

Ash yellows has been reported only in North America. The main range of the disease includes parts of 16 northeastern and midwestern states and the southernmost portions of the Canadian provinces of Ontario and Quebec (Figure 2). Ash yellows has also been found in two southwestern locations. In addition to white ash (F. americana) and green ash (F. pennsylvanica), ten other ash species including blue ash (F. quadrangulata), black ash (F. nigra), and velvet ash (F. velutina) are also reported hosts.

Ash yellows MLOs also cause lilac witches'-broom, a decline-type disease that has been diagnosed in at least 35 lilac taxa. Ash yellows MLOs have not been detected in naturally infected plants other than ash and lilac.

Symptoms

Symptoms of ash yellows vary with ash species. White ash sustains permanent and often rapid decline in tree growth. Slow twig growth and short internodes can cause foliage to appear tufted at tips of twigs and the crown to appear more transparent than normal.

Subnormal leaf size and light green leaf color, upturned leaf margins, and premature fall coloration are common. Deliquescent branching (loss of apically dominant growth habit) on slowly growing lateral branches may also occur.

Eventually a progressive dieback of branches begins and witches'-brooms may develop at the trunk base. Witches'-brooms are clusters of upright spindly shoots. Vertical cracks and cankers are common on the trunk near the ground.

Witches'-brooms usually develop near the soil line but occasionally are found several feet up the trunk. Brooms may produce simple leaves or dwarfed compound leaves with fewer than the normal 5 to 9 leaflets. Interveinal chlorosis (yellowing) is common on foliage of brooms. On white ash, brooms occur most often on trees with severe dieback, on suppressed saplings, and on stumps of diseased trees. Green ash exhibit symptoms similar to white ash but appear to sustain less dieback and sometimes produce witches'-brooms without other distinctive symptoms. Radial growth loss associated with MLO infection has been detected in green ash.

The larvae feed through the summer and early autumn, growing as they do so. In mid-to-late autumn, they bore about an inch deep into the sapwood and create their over-wintering chamber.

Diagnosis

Field diagnosis of ash yellows is sometimes difficult. Reduced growth, deliquescent branching and progressive decline are typical symptoms of ash yellows but can also result from other factors such as poor site conditions, drought stress, freezing and flooding damage, mechanical or chemical injuries, insect attack, and parasitism by opportunistic fungi.

Witches'-brooms are diagnostic, but only a small percentage of infected trees display this symptom at a given time. To assess a stand for the presence of ash yellows, inspect suppressed saplings and stumps, particularly along the edges of the stand, for the witches'-brooms. If ash yellows is present, careful inspection will usually reveal at least one tree or stump with a broom. If brooms are found, then trees showing deliquescent branching may be assumed to have ash yellows.

If numerous ash in a stand have ash yellows, the disease typically interferes with stand productivity. It is not critical to learn which individual trees are infected, however, because ash yellows commonly occurs in conjunction with slow growth and decline caused by adverse environments.

Management

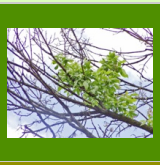
There is no known way to prevent or cure ash yellows. White ash that become infected when young do not grow to merchantable size. Most merchantable sized diseased ash trees live for at least 5-10 years. Management prescriptions which promote species diversity or stand conversion to species other than ash and reduce plant stresses from water shortage and competition should minimize growth losses associated with ash yellows.

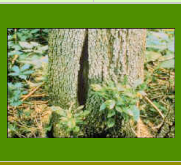
Home Landscapes

Managers of shade and ornamental trees should consider management strategies which:

- Remove trees with severe dieback, because they can not be rehabilitated.
- Promote species diversity in tree planting programs, and avoid monocultures of ash along city streets.
- Select tree species suitable to planting sites, and avoid planting ash in drought-prone sites.
- Encourage tree care practices that reduce plant stresses. Watering during drought and periodic fertilization to promote general tree health may be useful.
- In the future, ash cultivars or rootstocks resistant to or tolerant of ash yellows may become available.

If you have any additional questions or concerns, please do not hesitate to contact Arbor Care Tree & Landscaping at the number listed on this website closest to your location, or e-mail us at the website mail links.





(left to right)
Dieback caused by Ash Yellows.
Witches'-broom and vertical crack on trunk near the ground.