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Ash Yellows and Decline


 Ash yellows or decline on ash (*Fraxinus*)

Ash yellows is a disease caused by *Candidatus fraxinii*, which affects the tree's vascular system or its' phloem sieve tubes. It is presently only found in North America. Ash yellows disease cycle is still a mystery. Experts think it is transmitted by insect vectors such as leaf hoppers which also transmit viruses. Symptoms seem to appear most widely on white ash (*Fraxinus americana*) than green ash (*F. pennsylvanica*.) It can also affect at least ten other ashes including black ash (*F. nigra*) and blue ash (*F. quadrangulata*.) The ash yellows phytoplasma can also cause symptoms of witches broom in lilacs often called lilac witches broom.

Ash decline is the rapid decline of ash trees including sparse crown growth and dieback. It may be caused by many factors including environmental factors like weather stresses or poor soil conditions and other pathogens like ash yellows.

Symptoms and Diagnosis

Symptoms of ash yellows and decline can vary depending upon ash species and environment conditions.

White ash shows the most prominent of symptoms for ash yellows and can result in substantial dieback which leads to premature death of the trees. Trees may show slow twig growth and short internodes among the twigs causing a tufted appearance of foliage and thinning of the overall crown. The symptomatic leaves can be stunted, chlorotic (yellow coloring,) have upturned margins, and premature autumn color. When the branches are slow growing laterally, another symptom is deliquescent branches which lose their apical dominance. Additionally, the branches can have severe dieback. The tree may develop witches broom at the trunk collar and occasionally in major branches as well.

Green ash can have similar symptoms as white ash but usually less severe. Green ashes can develop witches broom at the base of the tree without the other symptoms. Green ash appears to tolerate ash yellows better than white ash.

Observation of the trees' conditions is very important since adverse environmental conditions can cause similar decline in ash trees as ash yellows. Some environmental factors to look out for are mechanical damage, drought stresses, insect infestations, and parasitic fungi. The witches broom can be diagnostic of the ash yellows but this symptom is not always present with infected ash trees.

Ash decline can be caused by both ash yellows and other environmental factors, mentioned above. Ash decline is typified by growth reduction and crown dieback. Both ash yellows and environmental factors can work together to cause the premature death of the ash tree in as little as 2 years or as many as 10 years once symptoms occur.

Molecular method tests such as polymerase chain reaction (PCR) are available in diagnostic labs for the ash yellows phytoplasma. At this point, the presence of witches broom is the most reliable diagnostic symptom in the field but not all infected trees have them.

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Integrated Pest Management Strategies

- 1. Remove the tree.** There is no cure for ash yellows. Remove any trees that have severe dieback over 30 to 50% of the crown and decline since the tree will not recover.
- 2. Improve the vigor of the tree.** Although there is no known cure for ash yellows or decline, improving the growing conditions of your tree by watering during drought or fertilizing the tree in the fall can help the tree to live longer and look better.
- 3. Choose trees suited to the growing conditions.** Do not plant ash trees in drought prone areas and reduce competitive plants. Plant a diverse group of trees including other types of trees besides ash trees.
- 4. Plant more resistant trees.** Plant other ash trees besides white and green ash. Some cultivars that have shown to be more resistant to ash yellows are *Fraxinus pennsylvanica* 'Bergeson,' 'Dakota Centennial®,' 'Patmore,' and *Fraxinus americana* 'Autumn Applause.'

Organic Strategies

Strategies 1, 3, and 4 are strictly organic approaches. Organic tree fertilizers are available and could be a viable organic approach to Strategy 2.

More images:



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