



Eastern Filbert Blight: *Anisogramma anomala*

Introduction

Eastern Filbert Blight is caused by the fungus *Anisogramma anomala* and is indigenous to the Northeast United States. It is an unimportant parasite causing a small canker on the native American Hazelnut, *Corylus americana*. However, on the introduced and commercially important European Hazelnut, *Corylus avellana*, it causes a lethal disease. Early attempts to establish hazelnut orchards in the Northeast U.S. failed because the disease could not be controlled. Hazelnut production in the Pacific Northwest, which was free of the disease, flourished, but in 1973, the fungus was discovered there as well.



Figure 1: Elliptical black stromata on the twigs (provided by Dr. George Hudler, Cornell University)

Symptoms and Signs

The first symptoms to appear on infected trees are elliptical black stromata. They are formed in longitudinal rows on infected branches, and appear only after extended cold periods, usually between

May and August. The first stromata to appear erupt from branches 12-18 months after the initial infection. The infected area is known as a canker, and these cankers are perennial, adding both additional rows and more stromata to existing rows each year. On European Hazelnut, these cankers can expand from a few centimeters up to 1 meter annually; on American Hazelnut they increase by only 1-10 centimeters in the same amount of time. Infected



Figure 2: Note the football shape of the stromata (provided by Dr. George Hudler, Cornell University)

branches become girdled. Leaves on these branches die, remain attached, and flag the presence of the disease during the summer months. The tree declines, with many leafless, dead, and dying branches visible in the canopy. If no action is taken, in 5-12 years time the tree will be dead.

Disease Cycle

New infections are initiated in the spring, when spores land on the new tissue immediately adjacent to the apical meristems of growing shoots. European Hazelnuts are most susceptible during the period that new shoots are actively elongating and sending out young leaves. Once spores have adhered to the stem surface, they penetrate epidermal cells directly. Wounding and natural openings are not thought to be important to the establishment of the fungus. Infection is facilitated by extended periods of high humidity, but occurs over a wide range of temperatures.

After entering the tree, the fungus invades the phloem and outermost layers of xylem and grows extensively. Twelve to eighteen months later, stromata erupt from the surface of the branch. Within are perithecia, or flask shaped reproductive structures. Ascospores are formed in sacs within the perithecia. The following spring, the spores are shot out from the perithecia, sometimes collecting in a milky ooze on their surface. Wind, wind-driven rain, and splashing raindrops spread the disease to other branches and to nearby trees.

Management Strategies

Eastern Filbert Blight can be managed but only with diligence. The following measures are required in order to achieve best results.

Scouting

Scout trees in the winter for cankers, and in the summer between July and August for flagging branches. Check these for cankers as well.

Pruning

Infected branches should be pruned .6 to .9 meters below the edge of a canker, as the fungus grows ahead of the area in which it produces reproductive structures. The cut branches should be burned or chipped, because the fungus can continue to sporulate in the branch as long as it has moisture.

References

Johnson, K.B., Pinkerton, J.N., Mehlenbacher, S.A., Stone, J.K., and Pscheidt, J.W. Eastern filbert blight of European Hazelnut: It's becoming a manageable disease. *Plant Disease* 80:1308-1316. 1996

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Created, JTF, 5/02; Updated. SLJ, 1/15

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