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Department of Agriculture, Conservation and Forestry

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Oak Wilt Disease (*Bretziella fagacearum*)

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Hosts: Oak (*Quercus* spp.). Symptoms are more severe on species in the red oak group (oaks with pointed leaf tips). The disease can persist on white oak group oaks (rounded leaf tips) causing less-severe symptoms for several years.

General Information: Oak wilt has not been detected in Maine but is a pathogen of significant concern and therefore a focus of early detection efforts. The causal agent of oak wilt, *Bretziella fagacearum* (formerly *Ceratocystis fagacearum*), has been confirmed in several locations New York State. This disease has caused mortality of oaks in the Midwestern United States for decades and is a threat to oaks in forest and residential settings.

Symptoms and Signs: The oak wilt fungus infects water-conducting tissues, first leading to discoloration and early defoliation of leaves followed by wilting and killing of branches (flagging). As the disease progresses in the tree, wilting and branch mortality expands with trees dying in the same year or the following year (disease progression is situation-specific). Oak trees have a habit of connecting their roots with neighboring oak trees (root grafting). This can allow the oak wilt fungus to spread from tree to tree rapidly, causing pockets of oak mortality in a stand. Trees infected with the oak wilt fungus can die rapidly, often the same year they are infected. The disease can persist for longer periods in white oak-group oak trees causing noticeable, but less-severe symptoms and overall slower decline.

Figure 1: (top) Early leaf symptoms of oak wilt disease on red oak in MN. (middle) An oak branch showing wilting symptoms associated with the oak wilt disease.

Photo: R.F. Billings, Bugwood. (bottom) Bark removal reveals streaked sapwood in a branch showing advanced oak wilt symptoms.



Management: From May until the end of the growing season, wounding of oak trees via pruning or otherwise should be strictly avoided in areas where the oak wilt pathogen is present. This is because the beetles that spread the disease are attracted to both the oak wilt fungus's spore-producing structures that exude a sweet smell and spore-filled liquid (fungal pads, Figure 2) as well as tree wounds. If the beetle visits a fungal structure and becomes coated with spores and then visits a wound on an oak tree, the fungus can be successfully transmitted. If wounds occur during the growing season, they should be immediately sealed with pruning paint to prevent attracting beetle vectors to the wound. There are a few management strategies that involve creating buffers around infection centers that including breaking underground root grafting junctions around infected trees via trenching with a vibratory plow or girdling and using herbicide to avoid spread to neighboring oaks. These methods are evolving and are followed by tree, stump and root removal. Trees that die in the summer must be removed from the site and dried by debarking, splitting, chipping or burning the wood. This prevents the formation of the fungal pads that produce spores and attract the beetle vectors of oak wilt. Since symptomology can be highly variable, any oak trees that prematurely drop a substantial amount of discolored leaves, oak trees that show wilt symptoms, or pockets of oak tree mortality should be further investigated by a forest health professional.



Figure 2: (left) An oak tree in late stages of decline, with wilt symptoms involving most of the crown. (right, top) A fissure in the bark caused by an oak wilt fungus pressure pad. (right, bottom) A fungal pressure pad that produces the sticky, spore-filled liquid involved in attracting beetles that will vector spores of the oak wilt fungus to other oak trees. All of these symptoms are not always seen in trees infected by oak wilt.