

Sudden Oak Death

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What is sudden oak death? Sudden oak death (also called ramorum leaf blight or ramorum dieback) is an oftentimes lethal disease that has caused widespread death of tanoak (*Lithocarpus densiflorus*), coast live oak (*Quercus agrifolia*), California black oak (*Quercus kelloggii*), and Shreve oak (*Quercus parvula* var. *shrevei*) in California. The disease has also been reported in Oregon, as well as in Europe. Currently 60 species of plants have been reported to be susceptible to the disease. Twenty-eight of these plants are confirmed hosts. In addition to the trees listed above, bigleaf maple (*Acer macrophyllum*), Bodnant viburnum (*Viburnum X bodnantense*), 'Brouwer's Beauty' pieris (*Pieris floribunda X japonica*), California bay laurel (*Umbellularia californica*), California buckeye (*Aesculus californica*),



Rapid wilting and die back of branch tips can be a symptom of ramorum dieback.

California coffeeberry (*Rhamnus californica*), California honeysuckle (*Lonicera hispidula*), canyon live oak (*Quercus chrysolepis*), coast redwood (*Sequoia sempervirens*), doublefile viburnum (*Viburnum plicatum* var. *tomentosum*), douglas-fir (*Pseudotsuga menziesii* var. *menziesii*), evergreen huckleberry (*Vaccinium ovatum*), Formosa firethorn (*Pyracantha koidsumii*), 'Forest Flame' pieris (*Pieris formosa X japonica*), Himalaya pieris (*Pieris formosa*), Japanese camellia (*Camellia japonica*), Japanese pieris (*Pieris japonica*), laurustinus (*Viburnum tinus*), madrone (*Arbutus menziesii*), manzanita (*Arctostaphylos manzanita*), rhododendron (*Rhododendron* spp.), Sasanqua camellia (*Camellia sasanqua*), toyon (*Heteromeles arbutifolia*), western starflower (*Trientalis latifolia*), and witch hazel (*Hamamelis virginiana*) fall into this group. An additional 31 species including Burkwood viburnum (*Viburnum X burkwoodii*), California hazelnut (*Corylus cornuta*), *Camellia X williamsii*, cascara (*Rhamnus purshiana*), Chinese pieris (*Pieris formosa* var. *forrestii*), common lilac (*Syringa vulgaris*), David viburnum (*Viburnum davidii*), drooping leucothoe (*Leucothoe fontanesiana*), European beech (*Fagus sylvatica*),

European cranberrybush viburnum (*Viburnum opulus*), European turkey oak (*Quercus cerris*), European yew (*Taxus baccata*), fragrant viburnum (*Viburnum farreri*), grand fir (*Abies grandis*), Holm oak (*Quercus ilex*), horse-chestnut (*Aesculus hippocastanum*), lingonberry (*Vaccinium vitis-idaea*), mountain laurel (*Kalmia latifolia*), Northern red oak (*Quercus rubra*), *Pieris formosa* var. *forrestii* X *Pieris japonica*, poison oak (*Toxicodendron diversiloba*), Prague viburnum (*Viburnum X pragense*), reticulate camellia (*Camellia reticulata*), salmonberry (*Rubus spectabilis*), Southern red oak (*Quercus falcata*), strawberry tree (*Arbutus unedo*), sweet chestnut (*Castanea sativa*), *Viburnum X carlcephalum X Viburnum utile*, Victorian box (*Pittosporum undulatum*), wayfaringtree viburnum (*Viburnum lantana*), and wood rose (*Rosa gymnocarpa*) are suspected hosts, although tests to verify their susceptibility have not yet been completed.

At this time, sudden oak death has not been reported in Wisconsin. However, the disease was recently found at a large nursery near Los Angeles, CA that ships plants throughout much of the United States, including Wisconsin. Thus, the disease may be present in Wisconsin, but not yet detected.

What does sudden oak death look like? Symptoms of sudden oak death vary depending upon the plant species infected. On some hosts, infections occur primarily on leaves leading to light brown leaf spots and blotches. These leaf symptoms may be indistinguishable from other, more common, leaf spots and blights, or may mimic sunburn or leaf scorch symptoms. Twigs and branches that become infected often wilt, forming a "shepherd's-crook", and subsequently die back. Infection of tree trunks leads to cankers (i.e., sore-like areas) that produce copious amounts of an amber to black colored ooze. This ooze can dry to form a stained area on the bark. Removing the bark over the affected area will reveal discolored

wood beneath that sometimes (but not always) has a black border. Cankers can eventually expand to girdle trunks, thus resulting in the death of the tree or shrub. Trunk infections appear not to extend into the root system of the plant. Once sudden oak death cankers develop, other pathogens may invade the infected areas, accelerating tree or shrub death and complicating the diagnosis of the disease.

Where does sudden oak death come from? Sudden oak death is caused by the fungus *Phytophthora ramorum*, which was first recognized as a pathogen in 1995. *Phytophthora ramorum* can be spread over long distances through movement of infected plants or infested plant parts. The fungus can also be moved with contaminated soil (e.g., on vehicle tires, tools, or shoes), or in contaminated water.



Ramorum leaf blight symptoms can mimic those of other leaf spots and blights.

Once established on plants in a given location, the fungus produces reproductive structures (called sporangia) that can be moved from plant to plant by rain splash, or wind. *Phytophthora ramorum* has currently been documented as occurring in California, Oregon and Europe, but the recent discovery of the pathogen in a large nursery in California that ships plants throughout the United States raises the possibility that this pathogen may have been spread to other areas.

How do I save a plant with sudden oak death? If you believe you have seen a plant that has sudden oak death, IMMEDIATELY call the Plant Disease Diagnostics Clinic (PDDC) at (608) 262-2863 to make arrangements for an appropriate diagnosis. Because *Phytophthora ramorum* is a regulated, quarantined pathogen, DO NOT remove the affected plant (or parts thereof) or take the plant from the site where it is located. PDDC staff will make arrangements for sample collection and testing. If your plant tests positive for *Phytophthora ramorum*, it will be removed and destroyed to help prevent further spread of the pathogen.

How do I avoid problems with sudden oak death in the future? Carefully inspect any new nursery stock upon delivery (or prior to purchase, if possible) for symptoms of sudden oak death. Keep new stock isolated from older stock as long as possible, to minimize possible movement of the pathogen should the disease develop after plants have arrived. If you see any suspect symptoms, alert the PDDC so that arrangements can be made for proper testing for *Phytophthora ramorum*.

For more information or help in diagnosing sudden oak death: Contact Brian Hudelson, Plant Disease Diagnostic Clinic, Department of Plant Pathology, University of Wisconsin-Madison, 1630 Linden Drive, Madison, WI 53706-1598, phone: (608) 262-2863, fax: (608) 263-2626, email: bdh@plantpath.wisc.edu, see the USDA APHIS sudden oak death website <http://www.aphis.usda.gov/ppq/ispm/sod>, or contact your County Extension agent.