



Extension

UNIVERSITY OF WISCONSIN-MADISON

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Sudden Oak Death

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What is sudden oak death? Sudden oak death (SOD), 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 can affect or has been reported in association with a wide range of woody and herbaceous plants including, but not limited to 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*), 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*), 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*



Rapid wilting and die back of branch tips can be a symptom of ramorum dieback. Photo courtesy of David Rizzo, University of California-Davis

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-ideae*), 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 carcephalum X Viburnum utile*, Victorian box (*Pittosporum undulatum*), wayfaringtree viburnum (*Viburnum lantana*), and wood rose (*Rosa gymnocarpa*).

SOD was first reported in the US in California and has subsequently been found in other US states, including in Wisconsin in 2019. SOD has also been reported in Europe.

What does sudden oak death look like? Symptoms of SOD 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 large 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 SOD 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? SOD is caused by the fungus-like water mold *Phytophthora ramorum*, which was first recognized as a pathogen in 1995. *Phytophthora ramorum* can be



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spread over long distances through movement of infected plants or infested plant parts. The organism can also be moved with contaminated soil (e.g., on vehicle tires, tools, or shoes), or in contaminated water. Once established on plants in a given location, the organism produces reproductive structures (called sporangia) that

can be moved from plant to plant by rain splash, or wind. *Phytophthora ramorum* was introduced into Wisconsin in 2019 on nursery stock grown in the state of Washington.



Ramorum leaf blight symptoms can mimic those of other leaf spots and blights. Photo courtesy of David Rizzo, University of California-Davis

How do I save a plant with sudden oak death?

If you believe you have seen a plant that has SOD, please IMMEDIATELY submit a sample to the UW-Madison Plant Disease Diagnostics Clinic (PDDC). See below for address details. Double bag suspect plant tissue in sealable plastic bags and place the bagged specimen in a box or envelope for shipping. Include contact information (complete address, phone number, email address) in a separate sealable plastic bag with the sample. Tape over all of the edges of boxes and envelopes used for shipping to keep everything sealed inside. Write on the box or envelope that the box or envelope contains a suspect SOD sample. If you have questions about collecting or submitting a sample, contact PDDC staff at (608) 262-2863 or at pddc@wisc.edu.

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, other than to collect a specimen for submission for a diagnosis. Be sure to decontaminate

any tools or other items that come into contact with the plant (including those used to collect a diagnostic sample) by treating them for at least 30 seconds in 10% bleach. Thoroughly rinse and oil tools after decontamination to prevent rusting. If a 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 SOD. 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 on sudden oak death: Contact the University of Wisconsin Plant Disease Diagnostics Clinic (PDDC) at (608) 262-2863 or pddc@wisc.edu.