CALIFORNIA DEPARTMENT OF FOOD & AGRICULTURE

Sudden Oak Death/Ramorum blight (*Phytophthora ramorum*)

Pest Fact Sheet

Introduction: *Phytophthora ramorum* Werres, de Cock & Man in 't Veld, a plant pathogenic water mold, causes sudden oak death (SOD) and ramorum blight. *P. ramorum* was likely introduced into California forests from infected nursery plants and has caused extensive mortality and changes in species composition in coastal California forests. It is estimated that more than 50 million trees have been killed by *P. ramorum* in California and Oregon.

Distribution: Sudden oak death was first reported on tanoak (*Notholithocarpus densiflorus*) in Marin Co. California in the mid 1990's. The pathogen causes significant mortality in coast live oak (*Quercus agrifolia*), Shreve Oak (*Quercus parvula* var. *shrevei),* and California black oak (*Quercus kelloggii*). California bay (*Umbellularia californica*), though not killed by *P. ramorum*, is an important foliar host for disease inoculum in forests. To date, *P. ramorum* has been reported on over 100 plant species and is established in 16 coastal California counties and Curry Co., Oregon.

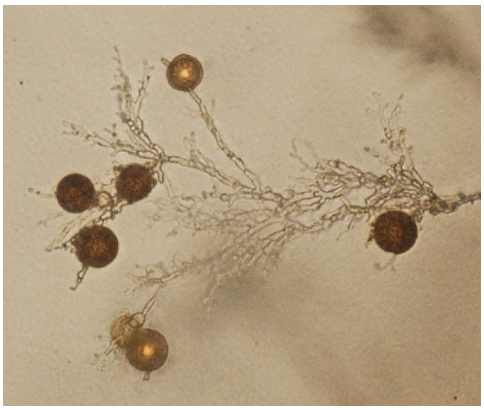
Description: *P. ramorum* is a pathogen that causes two distinct diseases – lethal trunk cankers on tanoak, oak and other Fagaceae species, and nonlethal foliar blight, leaf spots and shoot dieback on understory shrubs and herbaceous perennials, including those used extensively in ornamental horticulture.

Biology: *Phytophthora* species are oomycetes, or water molds with swimming spores (zoospores) that are favored by free water and high humidity. Zoospores of *P. ramorum* are spread in wind-blown rain to susceptible hosts, leading to either foliar or canker infections. *P. ramorum* also produces chlamydospores, thick walled overwintering structures that allow the pathogen to survive in soil or debris for prolonged periods of time. In infested nurseries, standing water, infested pots and potting mix can be an important source of pathogen spread.





Symptoms caused by *Phytophthora ramorum*
Top - Tanoak mortality in Marin Co. CA (photo Ken Peek); Bottom - Foliar symptoms on California Bay



Phytophthora ramorum hyphal growth with thick walled, resting chlamydospores

Economic importance: *P. ramorum* is a pathogen quarantined by the USDA and regulated by CDFA. To prevent spread, a regular inspection and testing program is required for nurseries in infested counties and nurseries in uninfested counties where *P. ramorum* has been previously detected. The inspection and testing program alone has cost US taxpayers more than $1M annually, since 2004. Since its introduction into California forests, *P. ramorum* has caused extensive mortality. Forest ecosystems have been negatively impacted and in some areas it has resulted in elevated wildfire risks due to increased fuel loads. These large scale forest impacts are difficult to quantify economically. Since there is no cure for *P. ramorum,* practices that prevent further pathogen spread are key for disease management.

References:

- Rizzo, D.M. and Garbelotto, M. 2003. Frontiers in Ecology and the Environment, 1: 197-204.
- https://www.aphis.usda.gov/plant-pests-diseases/pramorum

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