

## UC Marin Master Gardener: Fight against sudden death syndrome needs citizen scientists



A California bay laurel with symptoms of *Phytophthora ramorum* infection. PHOTO BY DOUGLAS SCHMIDT — UC BERKELEY

By Barbara Robertson, Marin Master Gardener

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Steven Swain, right, environmental horticulture advisor for UCCE in Marin and Sonoma counties explains how to recognize sudden oak death symptoms. PHOTO BY BARBARA ROBERTSON

Our native plants face many dangers but few are as insidious as a deadly water mold known as *Phytophthora ramorum*. The disease created by the pathogen carries the ominous sobriquet “sudden oak death,” abbreviated as SOD.

The name is accurate: The crown of oaks infected with the *P. ramorum* pathogen might look healthy for two years, and then in two to four weeks turn brown and die. SOD affects adult oaks, not saplings.

SOD has killed more than 3 million trees in coastal California since its discovery in the mid-1990s. It remains a major threat to coast live oak, California black oak, Shreve’s oak, canyon live oak and tanoak

trees from Monterey to Humboldt counties, and on into southern Oregon.

The drought has tempered the water-loving pathogen's spread, but rain this year will activate it in spring. To stop the spread, volunteers participating as citizen scientists will be crucial.

*P. ramorum* thrives in cool, wet climates with tanoak and redwood forests a primary habitat. The greatest predictor of *P. ramorum* is the presence of California bay laurel trees (*Umbellularia californica*), which are hosts for the pathogen. More closely related to brown algae than a fungus, *P. ramorum* nevertheless spreads like a fungus, with spores moving in raindrops from plant to plant. The spores land on an oak's trunk, work their way up into the xylem and phloem, colonize and cause vascular wilt. The trees starve. Once infected, tree trunks can also develop cankers that ooze, attract beetles, girdle the trunk and strangle the tree.

"Marin County was one of the first places where SOD was seen," says Janice Alexander, who is in charge of sudden oak death outreach for the UC Agriculture and Natural Resources Cooperative extension in Marin County. "So you'd think we'd have a good idea about where exactly it is. But, people assumed it was everywhere. We didn't know where it was really present."

Knowing exactly where SOD exists turns out to be critical. Researchers have determined the pathogen infects oaks only within 1 kilometer (.6 miles) of known infected host trees.

"Prevention is the best weapon we have against SOD," states Matteo Garbelotto, who runs the forest pathology lab at UC Berkeley and spearheads efforts to combat the disease. "Early detection is essential for containment and possibly even detection of new outbreaks."

Unfortunately, many diseases have symptoms similar to SOD. The only way to positively identify the pathogen is by collecting samples and running lab tests.

"There aren't enough professionals working in agencies or universities to collect the samples we need," Alexander says. "And, all the large-scale monitoring depends on seeing trees that have already died. We need people on the ground."

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That's why citizen scientists are crucial.

"Really, citizen scientists are the cornerstone to maintaining a large-scale ongoing urban monitoring program," Garbelotto says. "We simply couldn't generate the necessary people power without them."

The solution has been the annual SOD Blitz, during which locals help detect the disease. Thus far, approximately 2,300 SOD Blitz citizen scientists have collected samples during seven years.

SOD Blitz volunteers learn how to identify and collect symptomatic bay leaves in a one-hour training session during which they receive necessary supplies. The result is the SODMAP, a free app for mobile

devices that shows the laboratory-confirmed positive and negative results.

The SODMAP can help homeowners determine the risk of infection for their oaks and tanoaks. Workshops provided by the UC Berkeley forest pathology lab provide homeowners with treatment and prevention options.

The next SOD Blitz training session will be in early spring.

To join the next blitz, go to [www.sodblitz.org](http://www.sodblitz.org). For more information, go to [www.nature.berkeley.edu](http://www.nature.berkeley.edu), [www.suddenoakdeath.org](http://www.suddenoakdeath.org).

*The University of California Marin Master Gardeners are sponsored by UC Cooperative Extension. For questions about gardening, plant pests or diseases, call 415-473-4204 from 9 a.m. to noon, and 1 to 4 p.m. weekdays, or bring in samples or pictures to 1682 Novato Blvd., Suite 150B, Novato.*