



## REPORT TO THE CALIFORNIA OAK MORTALITY TASK FORCE JULY 2002

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### **MONITORING**

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***Phytophthora ramorum* has been confirmed in Contra Costa and Humboldt Counties.** There are now 12 counties known-to-be-infested. Contra Costa County's isolates came from bleeding cankers on *Quercus agrifolia* and the leaves of *Umbellularia californica* in Wildcat Canyon. Humboldt County's isolates came from *Umbellularia californica* in Redway. All isolate identification was confirmed by DNA analysis through the cooperative effort of the Rizzo and Garbelotto labs.

***Phytophthora ramorum* has been found on USDA-Forest Service lands.** The pathogen was confirmed from leaf spots on bay and bleeding coast live oak near Timber Top on the Los Padres National Forest, Monterey Ranger District near Big Sur. The infestation is part of a larger infestation on state and private lands that extends from Highway 1 (400 ft. elevation) east into the coastal mountains (3,000 ft. elevation). The area is behind locked gates, but is used to access private properties. Adjacent to the Ventana Wilderness, there are no harvests or other activities on-going or planned for the area. The Forest Service is educating its employees in disease recognition, sanitation, and quarantine compliance to prevent artificial pathogen spread. Garey Slaughter and David Rizzo's laboratory at UC Davis collected the samples and identified the pathogen.

**Post-treatment monitoring of Oregon's SOD-eradication sites is underway.** Monitoring efforts include the initial sites and the static plots of healthy-appearing host plants adjacent to the sites. Since January 1, 2002, seven new infection centers have been detected. All of the new sites are located within the quarantine area, with most sites being 0.5 acres or smaller in size (although one site may be as large as 1 acre). As with the 2001 sites, all of the new sites have been targeted for eradication. Treatments are underway or have already been completed on some of the sites.

**The survey of Oregon nurseries and other high risk sites for *Phytophthora ramorum* is nearly complete.** The nurseries and other high risk sites were chosen using the criteria outlined in the USDA Sudden Oak Death Pilot National Survey protocol for nurseries. As of 6/27/02, 3,016 samples have been collected from 76 nurseries and other high-risk sites. To date, *P. ramorum* has not been detected in any of the samples.

**National surveys for ornamental nurseries and forests are being designed and implemented under a cooperative effort of the USDA Animal Plant Health Inspection Service (APHIS), USDA-Forest Service Forest Health Monitoring, USDA Agricultural Research Service, and several State Departments of Natural Resources and Agriculture.** In 2002, a pilot survey will focus on the eastern United States to determine if *Phytophthora ramorum* is present in eastern forests. Washington State has also chosen to participate in this survey.



The forest survey protocol uses a risk-based polygon sample system. A risk/hazard map was developed using the following factors to assign risk and develop the sampling polygons: a) presence of known *Phytophthora ramorum* host species, genera, or closely related genera, currently includes both overstory tree and understory evergreen hosts; b) locations of private ornamental nurseries receiving host stock, currently uses only rhododendron stock; c) length of yearly mesic/moist weather period; and d) areas of limiting temperature extremes currently associated with *Phytophthora ramorum*.

This approach to surveying United States forests for the presence of *Phytophthora ramorum* will allow the participating agencies to focus the initial detection surveys in high-risk areas in order to maximize the efficiency of the limited resources available. For more information on the U.S. forest survey, contact Ellen Goheen at [egoheen@fs.fed.us](mailto:egoheen@fs.fed.us).

### MANAGEMENT

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Monterey County's "Sudden Oak Death Hazard Tree Assessment, Removal, and Restoration Plan" proposal will be ready for submission to the Board of Forestry for approval in August. To date, Marin and Sonoma Counties have plans approved by the Board of Forestry. For specific information on a county plan, please contact the appropriate agricultural commissioner for the specific county.

### EDUCATION

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**The COMTF is planning another training session for arborists on SOD recognition, sampling, and regulation compliance September 12th in Marin County.** This class will have a morning lecture and an afternoon hands-on field session at China Camp State Park. After completion of the course, arborists will be considered "certified" by CDFA and allowed to take *Phytophthora ramorum* samples for diagnostic purposes.

**The COMTF is developing a training session tentatively scheduled for August 20<sup>th</sup> on SOD quarantine enforcement issues for California Department of Forestry and Fire Protection Forest Practice staff, USDA Forest Service employees, Agricultural Commissioners, and other cooperating with State and Federal regulatory agencies.** The class will be held in Marin County so SOD symptoms can be viewed. Details on this free course will be issued in the next few weeks. For more information, contact Katie Facino at [Katharine.Facino@fire.ca.gov](mailto:Katharine.Facino@fire.ca.gov).

**UC IPM Education has issued a new Pest Note, "Sudden Oak Death in California."** The five-page publication for property owners and landscape professionals on SOD is available at <http://www.ipm.ucdavis.edu/PMG/PESTNOTES/pn7498.html>. It can also be obtained from most UCCE county offices for free (ask for UC DANR Publication 7498).

**"The Art of Saving Oaks," an art auction and SOD public outreach event will be held from October 26 to November 18, 2002 at the Bay Model in Sausalito.** The intention of this function is to educate the public on oak tree care, how to recognize SOD symptoms, how to deal with SOD-infested material, hazards associated with SOD, the role of oak ecosystems in environments, and best management practices in SOD-infested



areas. It will also be a recruiting forum for help with mitigation, replanting, and safety programs surrounding Sudden Oak Death. The California Oak Foundation, Marin Community Foundation, California Oak Mortality Task Force, Marin Releaf, Marin County Open Space District, and others support the event.

### **FUNDING**

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**Senator Barbara Boxer's Sudden Oak Death bill authorizing \$70 million for Sudden Oak Death passed in the Senate.** The funding would be used over the next five years by local, state, and federal authorities for research and outreach related to Sudden Oak Death, as well as monitoring, management, and treatment of the disease. The House of Representatives will now consider the bill.

### **Senate and House Appropriations Committee actions**

Senator Barbara Boxer was key in the Senate Interior Appropriations Committee's approval of \$5 million for Sudden Oak Death. Congressman Mike Thompson and Congresswoman Lynn Woolsey announced that the House of Representatives Agriculture Appropriations Bill includes \$2.8 million to control the spread of Sudden Oak Death. The House Appropriations Committee approved the funding during consideration of the U.S. Department of Agriculture budget for Fiscal Year 2003. The bill now moves to the floor of the House of Representatives for consideration.

**The Senate Natural Resources and Wildlife Committee passed AB2251.** The hearing date has been set in the Senate Appropriations Committee for August 5, 2002.

### **PRESS COVERAGE**

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The San Francisco Chronicle editorial "Advance of a tree killer" ran July 13, 2002. The article calls for additional state and federal funding in response to Contra Costa and Humboldt Counties being added to the list of infested counties, calling for "a more serious research and prevention effort than has been mounted so far." The complete text may be found at <http://www.sfgate.com/cgi-bin/article.cgi?file=/chronicle/archive/2002/07/13/ED187957.DTL>.

### **DATES TO REMEMBER**

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- 8/20/02 – Regulator/Enforcement Agency Training in Marin County (Tentative)
- 9/12/02 – COMTF Arborist Training in Marin
- 9/27/02 – "Space for Trees" SOD/Pitch Canker fundraising golf tournament at Del Monte Golf Course in Monterey
- 10/26 - 11/18/02 – "The Art of Saving Oaks" art auction and exhibit in Bay Model, Sausalito
- 12/16–18/02 - COMTF meeting and SOD Research Symposium in Monterey

### **THE LEARNING CURVE, QUESTIONS AND ANSWERS**

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**Is it possible to identify a *Phytophthora ramorum* leaf spot from any other leaf spot?** *Phytophthora ramorum* causes leaf spots on ornamental plants, such as rhododendron, that look similar to spots caused by other *Phytophthora* species. Are there any features of



*P. ramorum* leaf spots that distinguish them from leaf spots caused by other *Phytophthora* species? Is *P. ramorum* more virulent than the other species known to infect rhododendrons or other nursery plants? To answer these questions, Robert Linderman, USDA-ARS Horticultural Crops Research Laboratory in Corvallis, Oregon, inoculated a wide range of nursery crop plots with several *Phytophthora* species. He found that spots caused by many different *Phytophthora* species all look alike and are not visually distinguishable. His preliminary results are summarized below.

Detached leaves of a wide taxonomic range of nursery crops were inoculated in moist chambers with mycelial plugs of *P. cactorum*, *P. citricola*, *P. citrophthora*, *P. syringae*, *P. heveae*, *P. parasitica*, or *P. cinnamomi*, incubated at 20°C for 14 days, and rated visually for severity of lesion symptoms caused. The results indicated that on any host plant, spotting symptoms caused by all the *Phytophthora* species were essentially the same, although some *Phytophthora* species were clearly more virulent than others were. Lesions were dark and necrotic and spread to varying extents from the inoculum plug. Species of *Rhododendron*, *Pieris*, *Vaccinium*, *Syringa*, and *Prunus* (Portugal Laurel and English Laurel) were the most susceptible to the most *Phytophthora* species. Some plant species were susceptible to *P. ramorum* but not other species (*Viburnum*), while others were susceptible to other *Phytophthora* species but not *P. ramorum*. The more severe symptoms caused by the most virulent *Phytophthora* species were larger than 2 cm in diameter, and often spread across the midvein. *P. ramorum*, *P. citrophthora*, and *P. citricola* were the most aggressive/virulent pathogens, often spreading throughout the entire leaf, suggesting that they pose the greatest risk to nursery and landscape plants should they become more widespread. These results also indicate that a wider range of nursery and landscape plants should be surveyed for early detection of *P. ramorum* and other aggressive species in the nurseries and landscapes.

For more information, contact Robert Linderman at [lindermr@bcc.orst.edu](mailto:lindermr@bcc.orst.edu).

### **Are azaleas susceptible to *Phytophthora ramorum*?**

Preliminary studies by Steve Tjosvold indicate azaleas are susceptible. Five successive experiments were implemented to determine the susceptibility of commercially available azaleas to *Phytophthora ramorum*. The 17 tested species and cultivars represented a wide range of genetic diversity of evergreen azaleas. One deciduous azalea was tested. *Rhododendron* 'Cunningham's White' was tested in all experiments to represent a susceptible "standard" rhododendron. In the first experiment, various inoculum strains were tested, and it was found that the rhododendron strain was most virulent and was used in subsequent experiments. Various methods were tested to infect leaves of potted plants in a greenhouse and on detached leaves in an incubator held at high humidity and 20 °C. Methods included 1) mycelial agar plugs *with* pin wounding, 2) mycelial agar plugs *without* pin wounding, and 3) zoospores. For pin wounding infection, cultivar susceptibility was measured by the mean difference of lesion size produced by pinning with inoculum and the lesion size produced by pinning without inoculum. Zoospore inoculations for 24 hours, 1 week, and 2 weeks were tested. For zoospore treatments, the



resulting lesion was very small and could not be measured. Therefore, cultivar susceptibility was measured by the number of treated leaves that had symptoms and the percent success rate of isolation from those lesions.

Zoospore infection and symptom development was best with the 24-hour inoculation period. Zoospore inoculation of detached leaves resulted in all cultivars showing small lesions. Except one cultivar, *P. ramorum* was successfully isolated from 17 to 100 percent of these leaves, depending on the cultivar. Most cultivars showed a larger lesion diameter resulting from pin wounding with inoculum versus pin wounding without inoculum. These differences were relatively small, however, only a mean maximum of 3.5 mm, depending on the cultivar, in a 4 week period. Plug inoculations without pin wounding on greenhouse-grown plants and on detached leaves resulted in a low infection rate. The deciduous azalea 'Northern Hilights' is consistently susceptible with all infection techniques. In conclusion, the evergreen azaleas tested are susceptible to *P. ramorum* using these inoculation techniques but generally symptoms are weakly expressed.

A new experiment is underway with several new deciduous azaleas along with the previously tested evergreen azaleas. Pin inoculation on greenhouse plants and detached leaf inoculation with and without pinning will be used. This research was supported, in part, by the USDA Forest Service, Pacific Southwest Research Station and State and Private Forestry.

For more information, contact Steve Tjosvold, UC Cooperative Extension, Santa Cruz and Monterey Counties at [satjosvold@ucdavis.edu](mailto:satjosvold@ucdavis.edu).