



REPORT TO THE CALIFORNIA OAK MORTALITY TASK FORCE SEPTEMBER 2002

RESEARCH

UC researchers confirm Coast redwood and Douglas-fir susceptibility to

Phytophthora ramorum, bringing the total number of known species affected worldwide to 17. Isolations of living *P. ramorum* cultures came from the branches and needles of Coast redwood at Jack London State Park in Sonoma County and Henry Cowell State Park in Santa Cruz County. The infected Douglas-fir were found at another site in Sonoma County. DNA tests have also been conducted on diseased sprouts growing from the base of mature redwood trees in Marin, Alameda, and Monterey counties. The presence of the pathogen in the sampled trees has been strongly suggested by repeated positive DNA identification. The new test results will be published online in October in the journal *Plant Disease*.

A new species of *Phytophthora* has been reported on Beech (*Betula spp.*) trees in New York and Connecticut. To date, 50 trees are known to have died from the disease. Symptoms include bleeding cankers, pinkish wood, dieback of the limbs, and apparent sudden death of the tree. It is believed that it is not the same pathogen that causes Sudden Oak Death in California, but a close relative. For more information, visit Science News at <http://www.sciencenews.org/20020803/fob8ref.asp> (Vol. 162:No5)

Another canker-causing *Phytophthora* from California and Oregon forest trees has been found. A second, apparently undescribed *Phytophthora* species is occasionally isolated from lethal cankers on tanoak and coast live oak, and from foliar lesions on tanoak and California bay laurel (aka myrtlewood), in areas where *P. ramorum* is active. Its DNA sequence indicates a close relationship to *P. ilicis* (a foliar pathogen of holly) and *P. psychrophila* (newly described from European oak forest soils). It grows more slowly and with a lower temperature optimum, than *P. ramorum*. In log inoculation tests, it is nearly as pathogenic to tanoak as *P. ramorum*. It does not infect holly leaves in leaf inoculation tests. In the forest setting it is usually associated with single tree deaths, in contrast to the expanding patches of mortality caused by *P. ramorum*. This information was presented by Jennifer Davidson, USDA-Forest Service researcher at the annual meeting of the American Phytopathological Society (APS) in July 2002. Garbelotto, UC Berkeley; Hanson and Reeser of Oregon State University; and Rizzo, UC Davis, collaborated on this research.

Also presented at the APS meeting - Infectivity of *Phytophthora ramorum* on selected Ericaceous host species. Paul Tooley, USDA-Agricultural Research Service, Fort Detrick, and Larry Englander, University of Rhode Island.

Phytophthora ramorum was evaluated in laboratory tests for its ability to infect ornamental plant species in the family Ericaceae. Leaves on whole plants were inoculated by cutting off the tips (2-3 mm) and dipping them in *P. ramorum* mycelial



suspension, followed by incubation for 7 days in a dew chamber at 20°C in darkness. Mean lesion areas, as percentage of leaf areas were 10.2% for kinnikinnick (*Arctostaphylos uva-ursi*), 5.9% for *Rhododendron maximum*, 15.9% for Girard's rose azalea, 4.4% for florist azalea Inga, 31.8% for mountain laurel (*Kalmia latifolia* Madeline), 27.8% for mountain andromeda (*Pieris floribunda*), 32.6% for *Zenobia pulverulenta*, and 17.4% for Cunningham's white rhododendron. Two isolates of *P. ramorum* were used in the tests and one appeared less virulent than the other. Further surveys and evaluations are needed to determine if these plants are susceptible to *P. ramorum* under natural conditions.

REGULATIONS

Both the California Department of Food and Agriculture (CDFA) and USDA-Animal and Plant Health Inspection Service (APHIS) added only the affected plant parts of Coast redwood and Douglas-fir to state and federal quarantines. Regulated parts include needles, twigs, and branches less than 1" in diameter, while Coast redwood and Douglas-fir bark, logs, and sawdust are not regulated.

For more details on the quarantines, check: <http://pi.cdfa.ca.gov/pqm/manual/455.htm> for the California regulations and <http://www.aphis.usda.gov/ppq/ispm/sod/> for the federal regulations.

PRESS COVERAGE

Media coverage of the researchers' announcement of Coast redwood and Douglas-fir as susceptible to *Phytophthora ramorum* includes the Associated Press, the New York Times, the LA Times, the Oakland Tribune, the San Francisco Chronicle, the Contra Costa Times, the Daily Californian, KTVU, KPIX, KRON, KCBS, KQED, and others.

The Journal of Forestry published in their September issue an article entitled "Focus on...Field Foresters: Sudden Oak Death: Where and How to Detect it." A summary of the article is available at www.safnet.org/pubs/periodicals.html.

FUNDING

\$2 million in new funding for Sudden Oak Death has been included in the 2002/03 state budget expected to be signed into law on 9/5/02.

With the announcement that Coast redwood and Douglas-fir are susceptible to *P. ramorum*, Governor Gray Davis sent a letter to President Bush requesting \$10 million in federal funding to fight Sudden Oak Death. Senator Barbara Boxer also sent a letter to President Bush requesting \$10 million in funding.

Amended by the Senate, AB2251 passed unopposed in the Assembly 8/30/02. The Bill is now on Governor Davis' desk for approval.

**MONITORING**

Maggi Kelly, UC Berkeley Environmental Sciences, Policy, and Management Department, and Ross Meentemeyer, Sonoma State University, will have their paper "Landscape dynamics of the spread of Sudden Oak Death" published next month in the journal Photogrammetric Engineering and Remote Sensing. In the paper they present a landscape-scale study on the distribution of oak mortality and underlying landscape factors in California. They found that during 2000 and 2001, dying oaks in China Camp State Park were clustered at scales between 100 and 300 meters. A statistical model of the mortality was developed to predict spatial patterns of disease risk based on several landscape variables. Proximity to the forest edge was found to be the most important explanatory factor, followed by topographic moisture index, abundance of bay trees, and potential summer solar radiation. This research demonstrates the utility of integrating remotely sensed imagery analysis with geographic information systems and spatial modeling for understanding the dynamics of exotic species invasions. The paper is available in .pdf form (Kelly.Meentemeyer.pdf) for ftp download at: <ftp://nature.berkeley.edu/pub/oaksftp/>

EDUCATION

The Regional SOD Education Coordinators have been hired. Welcome aboard to our Northern Regional SOD Coordinator Janice Alexander stationed with UC Cooperative Extension, Marin County and Southern Regional SOD Coordinator Karl Buermeier, at the UC Cooperative Extension Santa Cruz office in Watsonville.

The September 12, 2002 Task Force and CDFA training session in Marin County on recognition, sampling, and diagnosis of *Phytophthora ramorum* (Sudden Oak Death) still has some space available. There will be a lecture session in the morning at the Marin Center followed by a field trip in the afternoon to Miwok Meadows, China Camp State Park for hands-on field session. Registration materials and more information can be found on the California Oak Mortality Task Force web site at <http://www.suddenoakdeath.org> or contact Bettie Trotter at bettie.trotter@fire.ca.gov.

Sudden Oak Death: issues and implications for management, policy and society is the topic for this year's SJ Hall lecture. Susan Frankel, plant pathologist for the USDA-Forest Service will speak on Friday, October 18, 2002 at 4:00 PM, Booth Auditorium, School of Law, Boalt Hall, University of California, Berkeley. The lecture is free and open to the public. The S.J. Hall Lectureship in Industrial Forestry was initiated in Berkeley in 1969 by Mrs. Dessie Hall and the Board of the Forest Economics Foundation. Since 1969, the Lectureship has been presented annually on the Berkeley Campus. For more information contact Al Stangenberger at 510-642-4424 or forags@nature.berkeley.edu.

DATES TO REMEMBER

9/12/02 – COMTF SOD Training in Marin; contact Bettie Trotter at bettie.trotter@fire.ca.gov



- 9/21 – 22/02 – Marin Releaf acorn harvesting of Coast Live Oak trees in China Camp State Park for planting in December; contact Sandra Sellinger at (415) 721-4374
- 9/27/02 – “Space for Trees” SOD/Pitch Canker fundraising golf tournament at Del Monte Golf Course in Monterey; contact Rick Hawley at rick@greenspacecambria.org.
- 10/26 - 11/18/02 – “The Art of Saving Oaks” art auction and exhibit in Bay Model, Sausalito; contact Carol Haggerty at chaggert@pacbell.net
- 12/16–18/02 - COMTF meeting and SOD Research Symposium in Monterey; contact Pat Shea at pjshea@davis.com

SPOTLIGHT

(We will be highlighting COMTF organizations doing outstanding work on Sudden Oak Death. Send suggestions to Katie Facino, Katharine.Facino@fire.ca.gov)

**Wildlife Conservation Society, North America Program
Keyt Fischer, PhD; Conservation Ecologist**

Recognizing the potential consequences elevated levels of oak and tanoak mortality could have on wildlife, the Wildlife Conservation Society (WCS) performed statewide surveys to assess the incidence and extent of dieback. The surveys, completed in October 2000, documented symptomatic and dying trees in the coastal ranges from Humboldt County to Monterey County. Using these and other data, the USDA Forest Service and the plant pathology teams from UC Davis and UC Berkeley sampled symptomatic trees around California. The previously unknown pathogen, *Phytophthora ramorum*, proved to be associated with much of the dieback.

Since those surveys, WCS has developed a long-term applied research program on the ecological impact of *Phytophthora ramorum* on native plants and animals. In collaboration with UC researchers Rizzo, Garbelotto, and others, WCS scientists are setting up plots at selected sites to monitor trends of disease development and measure the impact of *P. ramorum* on food availability for selected vertebrate species. In addition, WCS has begun research to describe the relationship between inoculum load in ‘natural’ habitats and fire history to determine the relationship (if any) of fire management practices to naturally-occurring inoculum load; correlate recency, frequency, and severity of fires with levels of inoculum load as a first approximation of potential fire or fire-surrogates for pathogen management; assess whether fire acts as a surrogate variable for forest composition and cover by using fire-surrogate management sites as controls; and examine the relationship between fire history and inoculum load at selected sites.

This spring WCS will begin research on wildlife likely to be affected by *P. ramorum*. Species of concern include jays, woodpeckers, squirrels, deer, bears, and mountain lions.



These long-term studies will be coupled with monitoring work and survey work, in collaboration with the UC Rizzo and Garbelotto labs.

In addition to its research on *P. ramorum*, WCS has also developed an educational video and CD that will be distributed free of charge to parks and other educational institutions. WCS has also enlisted scientists in its North America Program, working throughout the USA and Canada as a network to monitor and report symptomatic plants in areas outside of California. This will significantly increase the number of experienced field scientists monitoring the spread of *Phytophthora ramorum* throughout North America.