



CALIFORNIA OAK MORTALITY TASK FORCE REPORT FEBRUARY 2004

MONITORING

Reappearance of *Phytophthora ramorum* at a nursery in Washington State. In November 2003, *P. ramorum* was isolated from rhododendrons and camellias on hold at a nursery in Des Moines, WA. One recently detected, infected rhododendron lot had previously tested positive via PCR but had defied isolation for five months. Last spring, both the European (A1) and North American (A2) strains of *P. ramorum* were isolated from the nursery. A second nursery in WA state (retail only) was also found to contain infected *Camellia japonica* v. Kumasaka. For more details see "[Status of *Phytophthora ramorum* in Washington state nurseries](#)"

Nine trees at three sites in Cornwall, England have now been found to be infected with *Phytophthora ramorum*. The trees affected are four holm-oaks (*Quercus ilex*), a turkey oak (*Quercus cerris*), two beech trees (*Fagus sylvatica*), one sweet chestnut (*Castanea sativa*) and a horse chestnut (*Aesculus hippocastanum*). On sweet chestnut and holm-oak, symptoms are only on leaves. Recent cases, found on beech trees, a turkey oak and a horse chestnut, exhibit bleeding cankers on the bark. There are two other trees in Europe known to be infected: northern red oak (*Quercus rubra*) in the Netherlands and southern red oak (*Quercus falcata*) in Sussex, England.

At one of the sites in Cornwall, a second new species of *Phytophthora*, which has not yet been identified, is causing disease on rhododendrons and on a nearby beech tree. For more information, see <http://www.defra.gov.uk/news/2004/040202b.htm>.

FUNDING

The Gordon and Betty Moore foundation awarded \$2,484,184 for *Phytophthora ramorum* research to Matteo Garbelotto, Richard Dodd and Ellen Simms of UC-Berkeley and David Rizzo, UC-Davis. The three-year grant covers control, resistance, genetics, epidemiology and other *P. ramorum*-related topics. For more information on the Moore Foundation and their Sudden Oak Death initiative see http://www.moore.org/stories/05_02/sod_article_102802_prevent.asp.

The USDA Forest Service 2004 budget included \$2 million for Sudden Oak Death related-research and \$1.7 million for management. A portion of these funds will be used to hire a forest pathology/*Phytophthora ramorum* researcher at the Pacific Southwest Research Station. The position is currently being advertised: for more information, contact Patrick Shea at pjshea@davis.com. The USDA Forest Service, State and Private Forestry budget includes \$1.7 million for Sudden Oak Death control, monitoring and education. These funds will be used for a national wildland survey, eradication in Oregon and for California's containment program.

MANAGEMENT

Santa Cruz County plans to remove 1,465 *P. ramorum* hazard trees at risk of falling along roads and power lines in the Santa Cruz Mountains between Soquel Creek and Bonny Doon. The \$437,000 cost of removing the trees will be funded out of California State Sudden Oak Death Tree Assessment, Removal, and Restoration Plan funds. Logs and woody debris that cannot be left on site will be taken to the new SODBusters collection yard at the Ben Lomond Transfer Station. In 2003, 655 hazard trees were removed by Santa Cruz County using a \$225,000 state grant. For more information contact Karl Buermeyer, krbuermeyer@ucdavis.edu.

Ben Bradshaw, Minister for Nature Conservation and Fisheries in the United Kingdom visited Big Sur, CA and Brookings, OR on February 1-2 to observe Sudden Oak Death management programs. Bradshaw is Parliamentary Under-Secretary (Commons) and oversees the Department of Environment, Food and Rural Affairs (DEFRA). The UK is formulating policy to respond to the recent detection of *P. ramorum* killing native trees in the UK. Bradshaw was accompanied by Stephen Hunter, Head of Plant Health Division for DEFRA, from York, UK.

PUBLICATIONS

***Phytophthora ramorum* a guide for Oregon nurseries**, by J. Parke, J. Pscheidt, and R. Linderman has been published by Oregon State University Extension Service (OSUES) (Publication EM8840). A pdf version is posted at <http://eesc.oregonstate.edu/agcomwebfile/edmat/em8840.pdf>. Copies are available from OSUES, for ordering information see [Ordering Information](#).

REGULATIONS

Regulators in Canada added all species in the genera *Hamamelis* and *Fagus* to Canada's *Phytophthora ramorum* quarantine. These additions to Canada's regulated species list are in response to finds of *P. ramorum* on witch hazel (*Hamamelis virginiana*) and European beech (*Fagus sylvatica*) in the UK. For more information see <http://www.inspection.gc.ca/english/plaveg/protect/dir/sodspe.shtml> or contact Shane Sela at selas@inspection.gc.ca.

RESEARCH

Dave Rizzo, UC-Davis has hired several new staff members. Below are brief statements about their primary focus areas and their background information.

James W. Zanzot ("Djibo" pronounced JEE-bo) (see [Photo](#)) works as a technician collaborating with researchers at Sonoma State University investigating the spread of *P. ramorum* in the Sonoma Mountain area. Djibo grew up in Massachusetts, and earned a BA in Biology from Reed College in Portland, OR. He served in the Peace Corps in Niger, West Africa as an agroforestry extension agent, where he earned the nom de guerre "Djibo". After a stint in Sonoma County, he returned to Oregon, where he earned an MS in Botany and Plant Pathology from Oregon State University. His Master's work

(with Drs. Jennifer Parke and Everett Hansen) investigated the potential for *Phytophthora ramorum* to infect plant species of the Siskiyou Mountains.

Shannon Murphy (see [Photo](#)) has been hired as a post-graduate researcher primarily focusing on research, detection, and monitoring of *P. ramorum* across watersheds by sampling stream courses throughout California. Shannon is a native Californian, originally from San Diego. She completed her BA in Integrative Biology at UC Berkeley in 1998. She recently earned her MS degree in Ecology at UC Davis in Dave Rizzo's lab. Her thesis explored ecological relationships between *Phytophthora ramorum*, *P. nemorosa*, and *P. pseudosyringae* and the native forest communities they were detected within.

John Bienapfl's (see [Photo](#)) role in the Rizzo lab is largely field-based, doing both extension and research, and driving the state investigating new reports of *P. ramorum*. He is working with federal, state and county organizations, as well as homeowners and other professionals, and assists post-docs and graduate students on their projects. He will also be involved in training sessions for arborists and other professionals. John is a native Oregonian who graduated from Oregon State University in 2000 with a B.S. in Biology and a B.S. in Botany. At OSU he worked for Dr. Cynthia Ocamb, where he assisted with projects investigating *Fusarium* diseases of vegetable and row crops. For his M.S. he researched a new disease of hop cones. While conducting his M.S. research he worked in the OSU Plant Clinic for nearly 2 years, assisting with the diagnosis of a wide range of plant diseases and disorders. He completed his M.S. in the fall of 2003 shortly before joining the Rizzo lab.

Elizabeth Fichtner (see [Photo](#)) is investigating soil ecology of *Phytophthora ramorum* in forest soils with an emphasis on propagule survival and pathogenesis in the soil environment. She recently joined the Rizzo lab as a post-doc after completing her PhD in both Plant Pathology and Soil Science at North Carolina State University. Having survived too many cold winters as an undergraduate student at Cornell University, Elizabeth migrated from New York to warmer climes. Throughout her graduate studies, Elizabeth focused on the influence of soil chemical and physical properties on soil borne plant pathogens. A portion of her dissertation research addressed the mechanisms of suppression of *Phytophthora* spp. in acid mineral soils and the manipulation of soil chemistry as a disease management strategy.

DATES TO REMEMBER

2/29 to 3/14 - The Art of Saving Oaks. University of California, Santa Cruz Arboretum, Horticulture II Building, For details call (831) 427-2998. Speakers: Keyt Fisher, conservation ecologist. Wildlife Conservation Society, Sunday, February 29, 1:30pm; Glen Keator, botanist and author of *The Life of an Oak*, Sunday, March 7, 1:30pm.

3/9 to 3/10 – California Oak Mortality Task Force (COMTF) Spring Meeting and Field Trip, Sonoma State University (SSU). Tuesday, March 9 – Field Trip to Fairfield Osborn Preserve (5 miles from SSU). Wednesday, March 10 – COMTF Spring Meeting –

Research Update; Sonoma State University, Rohnert Park, CA. Details will be emailed to the COMTF list or contact Lucia Briggs, at lbriggs@nature.berkeley.edu.

3/24 - Sudden Oak Death Workshop: Current research and treatment strategies.

TCI (Tree Care Industry Association) Expo Spring 2004. 9:00 am to 3:30 pm. The Expo runs through Friday, March 26 at the Sacramento Convention Center, Sacramento, CA. For more information contact Carol Crossland, crossland@treecareindustry.org or see <http://www.treecareindustry.org/>.

4/22 - Training session for *Phytophthora ramorum* recognition, quarantine compliance, and treatment. Southern region: Santa Cruz County, exact location pending. Details will be provided in future newsletters or contact Lucia Briggs, at lbriggs@nature.berkeley.edu.

5/19 – Training session for *Phytophthora ramorum* recognition, quarantine compliance, and treatment. Northern region: Sonoma County, exact location pending. Details will be provided in future newsletters or contact Lucia Briggs, at lbriggs@nature.berkeley.edu.

YEAR-END ACTIVITY SUMMARY (CONTINUED FROM JAN 04 COMTF NEWSLETTER)

2003 Status of *Phytophthora ramorum* in Oregon

Despite several new occurrences of *P. ramorum* in 2003, distribution of the pathogen in forests remains limited to a very small area near Brookings, Oregon. New isolated infestations as far as 1.8 miles from other infestations suggest aerial or vector transmission. *P. ramorum* survived cutting and burning on approximately half of the eradication sites, and is present at low levels in stump sprouts and soils. *P. ramorum* has been detected in several streams associated with eradication sites, and rarely in streams not clearly associated with known infestations. As a result of the 2003 surveys, the Oregon Department of Agriculture will increase the area under regulation for *P. ramorum* from 9 mi² to 11 mi². Efforts to eradicate the pathogen from Oregon forests are continuing on approximately 60 acres of forest within this area.

For more details and a summary of 2003 nursery detections and regulatory action see

“**2003 Status of *Phytophthora ramorum* in Oregon**

- I. **Wildland Monitoring and Eradication**
- II. **2003 Oregon Department of Agriculture (ODA) *Phytophthora ramorum* Regulatory Activity**” (See link: [2003 OR Status](#))

California’s 2003 Sudden oak death aerial survey flew 10,000 miles in a fixed-wing aircraft, observing over 13 million acres of host habitat and ground-checking over 100 areas with mortality. The survey established a new southern boundary for CA’s *P. ramorum* infestation, near Plaskett Creek in southern Monterey County, just 15 miles north of the San Luis Obispo County line. For more information, see their year-end summary (See link: 2003 CA [aerial survey](#)).

MONITORING

***Phytophthora* Monitoring Activity in the Eastern US**

The recovery of *Phytophthora ramorum* from northern and southern red oak (*Quercus rubra* and *Quercus falcata*) in Europe raises the likelihood that *P. ramorum* might be found in US red oaks forests and increases interest in the role of *Phytophthora* species in Eastern forest ecosystems. The next few paragraphs provide an overview of monitoring and research projects aimed at detection of *Phytophthoras* in forests and nurseries and early detection of *P. ramorum* in the Eastern US.

In the Eastern US, surveys to gather information on the distribution of *Phytophthora ramorum* focused both on nurseries (coordinated by APHIS) and forests (coordinated by USDA Forest Service, State and Private Forestry). The surveys were conducted by state universities, agriculture and forestry departments. Nursery survey protocols, results and other information are posted at the NAPIS (National Agricultural Pest Information System) website at <http://www.ceris.purdue.edu/napis/pests/sod/natplan/nplan02.html>.

For a map of areas surveyed see <http://www.ceris.purdue.edu/napis/pests/sod/imap/sod2003.html>

Eastern Nursery Survey. As part of the National *P. ramorum* Survey, in spring 2003, Georgia, South Carolina, Tennessee, North Carolina and Virginia nurseries were surveyed for *P. ramorum* targeting four susceptible genera (*Kalmia*, *Rhododendron*, *Viburnum*, and *Pieris*) and production nurseries who have obtained plant material from the west coast or Europe in recent years. *P. ramorum* has NOT been recovered, but an abundance of other *Phytophthora* species have been isolated, typical ones normally associated with aerial blight in nurseries. Similar surveys are scheduled for spring 2004.

Virginia provided additional details for their survey conducted by K. L. Carlson, P. A. Richardson, P. Kong, and C. X. Hong of Virginia Tech. Twelve nurseries located throughout the state of Virginia were surveyed for *Phytophthora ramorum* throughout the late spring and summer of 2003. Two nurseries considered to have an especially high-risk were surveyed in both early and late summer. This survey focused on high-risk plant hosts: *Rhododendron*, *Azalea*, *Pieris*, *Viburnum*, and *Kalmia*. In total, over 132,000 *Rhododendron*, 61,000 *Azaleas*, 16,000 *Pieris*, 42,500 *Viburnum*, and 22,600 *Kalmia* were surveyed. From these plants, 232 samples were collected and processed using conventional isolation on PARP agar, nested PCR, and a single-strand-conformation polymorphism (SSCP) analysis. None of the samples was identified as *P. ramorum* positive. However, approximately 25 isolates of other species of *Phytophthora* were collected from these samples. These species include *P. cactorum*, *P. cryptogea*, *P. citrophthora*, *P. cinnamomi*, and *P. drechsleri* as identified with the SSCP analysis. For more information contact Chuan Hong, chhong2@vt.edu.

As part of the Cooperative Agricultural Pest Survey (CAPS) program, in 2002, six states conducted *P. ramorum* surveys: Connecticut, Michigan, Minnesota, New Hampshire, New York, and Rhode Island. In 2003, 13 states participated: Connecticut, Kentucky,

Michigan, Minnesota, New Jersey, North Carolina, Ohio, Pennsylvania, Rhode Island, Tennessee, Virginia, West Virginia and Wisconsin. They were not required to follow the *P. ramorum* National Survey protocol. *P. ramorum* has not been detected and some of the surveys are not completed.

For more information on *P. ramorum* nursery surveys in the Eastern US, contact Lloyd.E.Garcia@aphis.usda.gov. Note that the COMTF January 2004 newsletter included results from a nursery survey in Ohio. (see [Jan 04](#) Newsletter for earlier discussion).

Wildland surveys. Steve Oak, USDA Forest Service, State and Private Forestry, Asheville, NC, soak@fs.fed.us.

In summer 2003, a seven state forest survey for *P. ramorum* was completed in Pennsylvania, West Virginia, Virginia, Tennessee, North Carolina, South Carolina and Georgia. The survey called for 30 locations to be surveyed in each state with four, 100-meter transects to be installed at each location. Samples of symptomatic foliage, twigs, and bark of rhododendron, mountain laurel and oaks were taken from each transect. Composite samples consisting of ten symptomatic leaves for rhododendron and mountain laurel or symptomatic bark from a single tree for oaks were submitted for PCR diagnostics.

A total of 177 locations were sampled with 605 transects. Sixty-five locations and 168 transects were around nurseries with the remainder in the general forest area. 1102 samples were submitted for PCR diagnostics and none were positive for *P. ramorum*. A subset of samples were cultured; *P. ramorum* was not recovered.

Plans for 2004 include continuation and expansion of the survey based on the USDA Forest Service *P. ramorum* risk map (see [US risk map](#)) using similar methods as used in 2003 (30 locations per state, 4 transects per location). In the original seven states, all high risk areas not visited in 2003 will be surveyed. The survey will be expanded to the remaining states that contain high or moderate risk areas: Missouri, Arkansas, Mississippi, Alabama, Kentucky, Indiana, Ohio, Maryland, Delaware, New Jersey, New York, Connecticut, Rhode Island and Massachusetts. The survey is a cooperative effort of the states, USDA APHIS, and USDA Forest Service- State and Private Forestry.

Eastern US *Phytophthora ramorum* related-research. In the Eastern US, both the USDA Forest Service and USDA Agricultural Research Service (ARS) have funded *Phytophthora ramorum* research. The ARS funding focuses on ornamental plants and is being carried out at a quarantine facility in Fort Detrick, Maryland. Paul Tooley (tooley@ncifcrf.gov) will be publishing an ericaceous host screening study. Also working at Fort Detrick, Nina Shishkoff (nshishkoff@fdwsru.ars.usda.gov) is looking at root infection by *P. ramorum*. Larry Englander, University of Rhode Island is studying *P. ramorum* growth and sporulation. Results of these studies will be published later this year.

***Phytophthoras* in Eastern United States Forests: Sampling for presence and determining baseline *Phytophthora* species occurrence**

Kurt Gottschalk¹, William MacDonald², Jennifer Juzwik³, and Robert Long⁴

In spring 2004, northern forest ecosystems will be sampled to determine which *Phytophthora* species are present in West Virginia, Maryland, Pennsylvania, Ohio, Indiana, Illinois, Michigan, Wisconsin, and Minnesota. Soil will be sampled at about 6 sites per state and be coordinated with the S&PF pilot sampling (see Steve Oak's report above) so sampling will occur at the same location.

Dr. Yilmaz Balci has been hired as a post-doctoral researcher by West Virginia University (WVU) and the USDA Forest Service, Northeastern Research Station. Balci's PhD work is on *Phytophthoras* in oak ecosystems in Austria and Turkey, with Postdoctoral work in Austria on the alder hybrid *Phytophthora*. Dr. Balci will be carrying out studies related to *Phytophthoras* starting with *P. cinnamomi* pathogenicity testing of about 10 eastern tree species. The pathogenicity tests are a follow-up to preliminary sampling this past fall that recovered *P. cinnamomi* in four of five locations at the WVU Experimental Forest. A species similar to *P. europea* (still needs DNA confirmation) was also recovered from two sites in southern West Virginia.

Steve Jeffers, Clemson University will be hiring a researcher to investigate the distribution of *Phytophthora* spp., including *P. ramorum*, in natural forest ecosystems in the southern Appalachian Mountains region.

Research funding was provided by the USDA Forest Service, Pacific Southwest Research Station, awarded as part of the 2003 *P. ramorum* Request for Proposals.

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