



CALIFORNIA OAK MORTALITY TASK FORCE REPORT MARCH 2007

REGULATIONS

The new USDA Animal and Plant Health Inspection Service (APHIS) *Phytophthora ramorum* regulation “*Phytophthora Ramorum*; Quarantine and Regulations” was published February 27, 2007 in the Federal Register. This rule primarily codifies the Federal Order issued in December 2004 that established restrictions on the interstate movement of nursery stock from nurseries in nonquarantined areas in California, Oregon, and Washington. The rule also incorporates all updates (SPROs) issued since the original APHIS regulation was published in 2002, most of which are updates to the host list. The rule is effective immediately and can be found online at <http://www.regulations.gov/fdmspublic/component/main>. The comment period is 60 days, ending April 30, 2007. Comments may be submitted online, and are welcomed and encouraged. For more information, contact Jonathan Jones at Jonathan.M.Jones@aphis.usda.gov.

MONITORING

The USDA Forest Service “2006 National *P. ramorum* Early Detection Survey for Forests” was conducted in 36 states. Of the 1,044 locations surveyed nationwide; 607 were nursery perimeter locations and 437 were general forest locations. All of the 4,016 samples processed were negative for *P. ramorum*.

Patterned after successful *P. ramorum* water monitoring efforts in CA and OR, national water monitoring survey protocols were pilot tested during 2006 in 93 watersheds in 11 states. WA became the first state using national survey protocols to detect *P. ramorum* in a stream not known to be infested. The intermittent stream flowed through a woody ornamental nursery that had previously been confirmed *P. ramorum*-positive. Follow-up terrestrial surveys up- and downstream found no infection of forest vegetation.

The 2007 National *P. ramorum* Early Detection Survey for Forests will employ stream baiting exclusively and discontinue vegetation transects. For more information, contact Steve Oak at soak@fs.fed.us.

OTHER TOPICS OF INTEREST

A new fungal species that is being transmitted by a newly discovered non-native beetle is killing alarming numbers of redbay trees (*Persea borbonia*) along the coast of South Carolina, Georgia, and Florida. Redbay mortality rates exceeding 80 percent have been found on some of the coastal islands in the area. The beetle (*Xyleborus glabratus*) was first found in North America in 2002 through the USDA Forest Service Forest Health Protection’s Early Detection and Rapid Response project and the Forest Health Monitoring program has supported follow-up detection surveys in the area. Recently, dying sassafras and a rare spicebush have also been found infected with the fungus. USDA Forest Service representatives met with personnel from APHIS and representatives from numerous local groups at Jekyll Island, Georgia in January to address the problem. For more information go to



<http://www.doacs.state.fl.us/pi/enpp/ento/x.glabratus.html> or contact Don Duerr, dduerr@fs.fed.us.

FUNDING

The USDA Forest Service Pacific Southwest Research Station (PSW) will not issue a Sudden Oak Death Request for Proposals (RFP) in 2007. With more than 20 active research projects still underway as a result of the 2004, 2005, and 2006 RFP process, most available research funds are committed through the 2007 federal fiscal year. The PSW SOD Research and Development Program remains very actively engaged in all aspects of the Sudden Oak Death/*P. ramorum*. Among other things, the program will hold the Sudden Oak Death Science Symposium III March 5 – 9 in Santa Rosa, and will revise the [Sudden Oak Death 5-year Research Strategy](#) aimed at providing the most relevant science support and in anticipation of a continued RFP process in 2008. To view a list of PSW-funded Sudden Oak Death/*P. ramorum* research to date, go to the CA Oak Mortality Task Force website at www.suddenoakdeath.org under “Research.” For more information, contact Susan Frankel at sfrankel@fs.fed.us

An RFP for research on biological invasions of non-native species in Northeastern and Midwestern forests has been issued by the USDA Forest Service Northern Research Station, Disturbance Ecology and Management of Oak-Dominated Forests Research Work Unit. Non-native pest insects, pathogens, and plants that result in serious or potentially serious economic or ecological effects, including *Phytophthora* spp. (Sudden Oak Death-related) are in the scope of the RFP. A total of \$150,000 is available for the 2007 fiscal year pending final Congressional budgetary action. For more information on the RFP, go to the Northern Research Station website at <http://nrs.fs.fed.us/4557/>. Proposals are due March 30, 2007. For additional questions, contact Kurt Gottschalk at kgottschalk@fs.fed.us or (304) 285-1598.

RESEARCH

Donahoo, Ryan; Blomquist, Cheryl L.; Thomas, Samantha L.; Moulton, John K.; Cooke, David E.L.; and Lamour, Kurt Haas. 2006. *Phytophthora foliorum* sp. nov., a new species causing leaf blight of azalea. *Mycological Research* 110:1309 – 1322. Available online at www.sciencedirect.com.

Abstract: A previously unknown *Phytophthora* was recovered more than 60 times from evergreen hybrid azalea leaves collected during surveys for the sudden oak death pathogen *Phytophthora ramorum* in California and Tennessee. The novel *Phytophthora* was discovered when genomic DNA from this species cross-reacted with the ITS-based diagnostic PCR primers used to screen plants for the presence of *P. ramorum*. This species had caducous, semi-papillate sporangia, was homothallic with both paragynous and amphigynous antheridia, and was pathogenic on both wounded and intact azalea leaves. Nuclear and mitochondrial sequence data indicate that this species is related to, but distinct from, *P. ramorum*. AFLP analysis indicates that the isolates of this species have limited genotypic diversity and share no markers with *P. ramorum*. This paper



presents the formal description of *P. foliorum* as a new species and underscores the need for caution when relying solely on DNA-based diagnostic tools.

Kelly, Maggi; Guo, Qinghua; Liu, Desheng; and Shaari, David. 2007. Modeling the risk for a new invasive forest disease in the United States: An evaluation of five environmental niche models. Computers, Environment, and Urban Systems. Available online at www.sciencedirect.com. In press.

Abstract: Efforts to model the potential habitat and risk for spread of invasive diseases such as Sudden Oak Death (SOD) are important for disease regulation and management. However, spatially referenced risk models using identical data can have differing results, making decision-making based on the mapped results problematic. We examined the results from five spatial risk models generated from common input parameters, and investigated model agreement for mapping risk for the causal pathogen for SOD, *Phytophthora ramorum* across the conterminous United States. We examined five models: Expert-driven Rule-based, Logistic Regression, Classification and Regression Trees, Genetic Algorithms, and Support Vector Machines (SVM). All models were consistent in their prediction of some SOD risk in coastal California, Oregon and Washington states, and in the northern foothills of the Sierra Nevada Mountains in California, and in an east–west oriented band including eastern Oklahoma, central Arkansas, Tennessee, Kentucky, northern Mississippi, Alabama, Georgia and South Carolina, parts of central North Carolina, and eastern Virginia, Delaware and Maryland states. The SVM model was the most accurate model, and had several advantages over the other models. Although theoretical in nature, this paper presents results that have practical, applied value for managers and regulators of this disease, and discusses common challenges in modeling invasive species niches over large scales.

Moralejo, Eduardo; Puig, Miquel; García, José A.; and Descals, Enrique. 2006. Stromata, sporangiomata and chlamydosori of *Phytophthora ramorum* on inoculated Mediterranean woody plants. Mycological Research 110:1323 – 1332. Available online at www.sciencedirect.com.

Abstract: Three types of multihyphal structures, stromata, sporangiomata and chlamydosori, are described for the plant pathogen *Phytophthora ramorum*. Their morphology, morphogenesis and position on the host organ were observed by dissecting, compound and scanning electron microscopy. Stromata were consistently formed one to two weeks after zoospore inoculation of detached leaves and fruits of an assortment of Mediterranean sclerophyll shrubs. Stroma initials appeared subcuticularly or subepidermally and developed as small hyphal aggregates by repeated branching, budding, swelling and interweaving, eventually forming a prosenchyma. They always emerged through the adaxial side of the leaf by rupture of the overlying host tissue. Occasionally sporangia and chlamydosori (packed clusters of chlamydospores) were formed on the stromata. Sporangiomata bore short sporangiophores and clusters of 20–100 sporangia and resembled sporodochia of the mitosporic fungi. The biological significance of these multihyphal structures is discussed. Some epidemiological aspects



were also studied: several understory species of the holm oak (*Quercus ilex*) woodland were susceptible to in vitro infection with three isolates of *P. ramorum* originally collected from different ornamental hosts. The risk of spread to this ecosystem is evaluated.

OTHER RESEARCH OF INTEREST

Greslebin, A.G.; Hansen, E.M.; Sutton, W.; and Hawksworth, D.L. 2007.

Phytophthora austrocedrae sp. nov., a new species associated with *Austrocedrus chilensis* mortality in Patagonia (Argentina). *Mycological Research*
DOI:10.1016/j.mycres.2007.01.008. In press.

Göker, Markus; Voglmayr, Hermann; Riethmüller, Alexandra; and Franz

Oberwinkler. 2007. How do obligate parasites evolve? A multi-gene phylogenetic analysis of downy mildews. *Fungal Genetics and Biology* 44:105–122. Available online at www.sciencedirect.com.

RESOURCES

Kliejunas, John T. 2007. Sudden Oak Death and *Phytophthora ramorum*: A

Summary of the Literature. Chapter 5. Management and Control. Draft, February 22, 2007, Albany, California. Pacific Southwest Research Station, Forest Service, U.S. Department of Agriculture, 42 pages.

The first available chapter of this comprehensive document on research findings and management activities of Sudden Oak Death and *P. ramorum* has been posted to the COMTF website at http://nature.berkeley.edu/comtf/pdf/management_and_control.pdf. Topics covered will include background; identification and distribution; the disease cycle; epidemiology and modeling; management and control; and environmental and socio-economic impacts. If you have any suggestions or comments, please email Susan Frankel at sfrankel@fs.fed.us.

The California Tree Failure Report Program (CTFRP) is seeking reports of tree failures related to Sudden Oak Death and other causes. The CTFRP

(<http://groups.ucanr.org/treefail/>) was established in 1987 to collect quantitative information on the mechanical failure of trees (trunk breaks, branch breaks, and uprootings). This information is used to develop "failure profiles" for genera and species to more accurately assess failure probability in standing trees and thereby help to recognize hazardous trees before they fail. Failures of *Quercus* species account for 21% of all the submitted reports in the California database.

Over 200 tree care professionals in California are cooperating in this effort by systematically inspecting fallen trees and reporting failure details for entry into the CTFRP database. As of January 16, 2007, 4292 failure reports have been filed.

California Tree Failure Report Program data has been migrated into the newer Internet-based International Tree Failure Database (ITFD) which began in 2004. If you are



interested in becoming a member of the CTFRP, contact Katherine Jones, with the University of California Cooperative Extension, at kajones@ucdavis.edu.

For more information about the international effort, please visit the ITFD website for instructions (<http://ftcweb.fs.fed.us/natfdb>).

The Nature Conservancy has posted “An Ounce of Prevention: How to Stop Invasive Insects and Diseases from Devastating U.S. Forests” to their website at <http://www.nature.org/initiatives/forests/files/ounceofpreventionsingle1.pdf>. In this report, the Nature Conservancy highlights the role of imported nursery stock in the accidental introduction of invasive species to the US. To respond to trade issues and invasive species challenges, the Conservancy suggests the use of a 5-point implementation plan for a temporary holding category, called “Not Approved Pending Pest Risk Assessment” (NAPPRA).

The concept paper “Recommendation of a Pathway Approach for Regulation of Plants for Planting,” has been issued by the new International Union of Forest Research Organizations (IUFRO) ‘Alien Invasive Species and International Trade’ Unit. The paper endorses a pathway approach to provide the scientific background and advice for regulators concerned with preventing movement of pests with live plants. The authors suggest that the current pest-based regulatory approach does little to hinder the introduction of pests not yet known to science, and suggests that a pathway approach to regulating nursery stock, in conjunction with best management practices that are effective at preventing known pests, will significantly reduce the risk of introducing unknown pests. The paper is expected to be available online soon at <http://www.forestresearch.gov.uk/iufroinvasives>.

CALENDAR OF EVENTS

3/5 -3/9/2007 - Sudden Oak Death Science Symposium III; Hyatt Vineyard Creek Hotel and Spa; 170 Railroad Street; Santa Rosa, CA 95401; For questions, contact Katie Palmieri, CA Oak Mortality Task Force Public Information Officer, at: palmieri@nature.berkeley.edu or (510) 847-5482.

4/24/07 – Free one-day Sudden Oak Death/*P. ramorum* Wildland Training Session; Pt. Reyes National Seashore, Red Barn Classroom; 1 Bear Valley Road, Pt. Reyes Station, CA 94956; More information, including session times, will be forthcoming. For questions, contact Janice Alexander at: jalexander@ucdavis.edu or (415) 499-3041.

5/1/07 – Free one-day Sudden Oak Death/*P. ramorum* Wildland Training Session; Presentation Center; 19480 Bear Creek Road, Los Gatos, CA 95033; More information, including session times, will be forthcoming. For questions, contact Katie Palmieri at: Palmieri@nature.berkeley.edu or (916) 435-3230.



10/15 – 10/18/2007 - XVI International Plant Protection Congress 2007, Glasgow, UK; Full details on the recently announced call for papers can be found at: <http://www.bcpc.org/IPPC2007/Call%5Ffor%5FPapers/>. For more information, contact Dr. Slawson, PHSI DEFRA, at: david.slawson@defra.gsi.gov.uk.