



CALIFORNIA OAK MORTALITY TASK FORCE REPORT FEBRUARY 2007

REGULATIONS

The Tiffany Creek Preserve in Nassau County, NY has been officially confirmed *P. ramorum*-free. The one PCR *P. ramorum*-positive red oak forest find was made at the Preserve in 2005. Despite numerous follow-up official samples and laboratory analysis, officials never were able to recover the pathogen from the tree, nor the surrounding area. To assure absence of the pathogen in the Preserve, sampling and testing continued through fall 2006. With all findings remaining negative, the area is now officially considered *P. ramorum*-free and will no longer fall under regulatory scrutiny. For more information, contact Jonathan Jones, USDA Animal and Plant Health Inspection Service (APHIS), at Jonathan.M.Jones@aphis.usda.gov.

The United Kingdom has found *Schima wallichii* (Chinese guger tree) infected with *P. ramorum*. The symptomatic foliar samples were taken outdoors from a historic garden near Cornwall in 2006. The Central Science Laboratory confirmed the samples to be *P. ramorum* positive via culture and PCR. *P. ramorum* has been found on numerous hosts at the garden since 2003, including *Rhododendron* species, *Pieris*, *Kalmia latifolia*, *Magnolia*, *Camellia* and *Viburnum*. USDA APHIS is reviewing the findings and anticipates adding Chinese guger tree to either the host or associated host list soon.

[Arctostaphylos uva-ursi \(Kinnikinnik\)](#), [Prunus laurocerasus ‘Nana’ \(Dwarf English Laurel\)](#), and [Osmanthus delavayi \(Delavay Osmanthus\)](#) nursery stock have been found *P. ramorum*-positive in King County Washington. As Koch’s postulates have not been completed, all three species will be added to the “APHIS List of Regulated Hosts and Plants Associated with *Phytophthora ramorum*” as associated plants, and regulated only as nursery stock.

Symptomatic *Arctostaphylos uva-ursi* was collected in a nursery in King County on 12-11-06. Samples taken were identified as *P. ramorum*-positive by the Washington Department of Agriculture (WSDA) using Real-Time PCR, and findings were confirmed by the USDA on 1-5-07 via PCR and sequencing. This nursery, previously found positive in 2005, is approximately 85% wholesale and did ship out of state under their Federal Order Certification. The positive host was discovered in a plastic hoop-house on a ground cloth with no gravel underneath. The hoop-house was the site of recent previous positive hosts *Rhododendron* ‘Unique’ and *Viburnum tinus*. All three positive hosts were purchased from other nurseries for re-wholesale to landscapers. The soil was saturated by overhead irrigation combined with excessive rain. The site has a very high water table. Due to heavy rain in November, the house flooded leaving sediment on pots and plants. The Confirmed Nursery Protocol (CNP) is under way at the nursery.

Symptomatic *Prunus laurocerasus* ‘Nana’ nursery stock was collected on 10-23-06 in King County. WSDA found the samples to be *P. ramorum*-positive using Real-Time PCR and conventional PCR. The findings were confirmed by the USDA on 11-8-06. The nursery, also found to have *P. ramorum*-positive plants in 2005, does not ship out of



state. The positive containerized *Prunus laurocerasus* 'Nana' was on gravel with no plastic or other ground cloth underneath and was in an area with overhead irrigation. This host was onsite for at least a year prior to *P. ramorum* detection. Symptoms include tip dieback, browning on leaf margins and veins. CNP is under way at the facility.

Symptomatic *Osmanthus delavayi* was collected in a nursery on 10-23-06 in King County. Samples taken were identified as *P. ramorum*-positive by WSDA using Real-Time PCR, conventional PCR, and culture. The findings were confirmed by USDA on 11-8-06. The nursery was also found positive in 2005 and does not ship out of state. The positive *Osmanthus delavayi* was found inside a plastic hoop-house on a ground cloth with gravel underneath and in an area with overhead irrigation. Symptoms included tip dieback and V-shaped lesions at base of petioles. CNP is under way at the facility.

SUDDEN OAK DEATH SCIENCE SYMPOSIUM III

The Sudden Oak Death Science Symposium III will provide a rare opportunity to capture and clarify research needs for *Phytophthora ramorum*/Sudden Oak Death. Consequently, the USDA Forest Service, USDA Animal and Plant Health Inspection Service (APHIS), and the UK Department for Environment, Food, and Rural Affairs (DEFRA) will be holding a cooperative 2007 *P. ramorum* Research Needs Assessment (RNA) meeting on Friday, March 9, 2007, from 8:30 to noon at the Sudden Oak Death Science Symposium III in Santa Rosa. Everyone is encouraged to attend. At the RNA, researchers, regulators, land managers, industry representatives, policy-makers, and other affected parties will have the opportunity to identify and discuss nursery and forestry research gaps with the goal of directing future *P. ramorum* efforts, insuring research programs are relevant and focused on solving real-world problems. Once identified, these needs will be captured and used to update *P. ramorum* programs worldwide. For more information, see the Symposium website at <http://nature.berkeley.edu/comtf/sodsymposium/index.html> or contact Susan Frankel at sfrankel@fs.fed.us.

A Risk to Conifers Panel, sponsored by the North American Plant Protection Organization, will be held Monday, March 5, 2007 from 8:30 a.m. to 11:30 a.m. as a prelude to the Sudden Oak Death Science Symposium III. The panel discussion will focus on concerns regarding the potential impact of *P. ramorum* to conifer-dominated northern forests should the pathogen become widely established, as well as on current phytosanitary restrictions regarding the movement of conifer lumber and forest products that are already in place and impacting the industry. The panel calls on all interested and affected parties to join them in identifying research needs that would facilitate sound science-based phytosanitary decisions related to movement of conifer lumber and forest products. For more information, see the Symposium website or contact Brenda Callan, Canadian Forest Service, at BCallan@pfc.cfs.nrcan.gc.ca.

The Sudden Oak Death Science Symposium III schedule, along with all abstracts, are available at the [Symposium website](#). The Symposium registration deadline is February 14th. We encourage you to make hotel reservations at the Hyatt as soon as



possible. Conference lodging rates are only available through February 4th. To reserve a room, go to http://nature.berkeley.edu/comtf/sodsymposium/hotel_travel.htm or call (707) 284-1234.

For more information on the Symposium or for questions regarding lodging reservations, contact Katie Palmieri, CA Oak Mortality Task Force Public Information Officer, at palmieri@nature.berkeley.edu or (916) 435-3230.

MONITORING

***P. ramorum* continues to spread in Mendocino County with new detections north of Elk.** Sudden Oak Death is now present in patches along the Highway 128 corridor from Highway 101 west, to within 4 miles of the Pacific Ocean. This new find was part of the 2006 California "Early Detection of the Infectious Forest Disease Sudden Oak Death" survey overseen by Ross Meentemeyer and Walter Mark. The survey assessed 244 sites in Mendocino, Humboldt, Del Norte, and San Luis Obispo Counties. To date, results have identified one *P. ramorum*-positive site on a private parcel in southwestern Mendocino County (Piper Ranch) that is 18 km from a known infested location, as well as the site to the north near Elk in Judith Metzger Riggs Grove (Navarro River Redwoods SP) that is approximately 30 km from the nearest infested site. Additional survey results are pending laboratory processing. For more information, contact Ross Meentemeyer, University of North Carolina at Charlotte, at rkmeente@email.uncc.edu.

The USDA Forest Service (FS), Forest Health Protection, Pacific Southwest Region has published their "2006 Accomplishment Report: Aerial and Targeted Ground-Based Monitoring for Sudden Oak Death." The purpose of the Forest Service monitoring effort is to find new *P. ramorum* infestations in uninfested, high-risk counties (Del Norte, San Benito, San Luis Obispo, and Santa Barbara) and in counties with limited pathogen distribution (Humboldt and Mendocino), as well as to support site-intensive projects in the Big Sur region and Humboldt County. In 2006, the FS survey crew confirmed 10 new *P. ramorum* detections - 9 in southern Mendocino County and 1 in southern Monterey County. There were no detections in Del Norte, San Benito, San Luis Obispo, or Santa Barbara Counties, nor were there detections in the northern parts of Mendocino and Humboldt Counties. The full 19-page report is available at the FS website "Sudden Oak Death Monitoring" page: <http://www.fs.fed.us/r5/spf/fhp/fhm/sod/index.shtml>, as well as on the COMTF website under "Monitoring" at <http://nature.berkeley.edu/comtf/html/monitoring.html>.

RESEARCH

Two new *P. ramorum* A2 isolates from the EU lineage have been identified in Belgium. The finding was made as a result of a Belgian federal government research project that began in 2006 and screened all stored Belgian isolates of *P. ramorum* for their mating types.

The two isolates consistently produced oospores when mated with *P. ramorum* EU A1 isolates and not when mated with US A2 isolates or with the first EU A2 isolate. This



was confirmed by two labs participating in the project. Both new isolates originated from nurseries in northern Belgium from two separate sites and from different hosts (*Rhododendron* and *Viburnum*). One isolate was from a 2002 survey, and the other from a 2003 survey. The isolates were found during a screening of 257 isolates collected between 2002 and the end of 2005. Based on the PCR-RFLP method (Kroon et al.), all known Belgian isolates, including the A2s, belong to the EU lineage (the first EU A2 isolate originated in southern Belgium from *Viburnum* and was isolated in 2002). Belgian researchers are currently working on the genetic diversity, the pathogenicity, and functionality of the mating systems in these isolates, and hope to determine if they are clonal or not. For more information, contact Kurt Heungens, Institute for Agricultural and Fisheries Research, Belgium, at kurt.heungens@ilvo.vlaanderen.be.

Research projects aimed at management of *P. ramorum* in tanoak and oak stands are underway. While recent studies have focused on disease management strategies to minimize the impacts of *P. ramorum* in susceptible oak and tanoak stands, short- and long-term data to support the efficacy of these landscape management techniques are still needed. Consequently, a project establishing a network of long-term disease management plots is being implemented to test the efficacy of these techniques. To account for possible regional differences, plots will be distributed through much of the north to south range of *P. ramorum* in California's Coast Ranges. Results of this project will be used to improve disease management recommendations and will provide additional information on the epidemiology of the disease in treated and untreated stands.

Test sites are still needed for this collaborative project being implemented by Phytosphere Research; Matteo Garbelotto, UC Berkeley; and Yana Valachovic, University of California Cooperative Extension, Humboldt and Del Norte Counties. Funding is being provided by the USDA Forest Service, Pacific Southwest Research Station. For additional information on each of the studies, go to the Phytosphere Research website at <http://phytosphere.com/publications/SODmanagementstudy.htm>. For more information on participating in a study, contact Ted Swiecki or Elizabeth Bernhardt at Phytosphere Research: phytosphere@phytosphere.com.

Brown, A.V. and Brasier, C.M. 2007. Colonization of tree xylem by *Phytophthora ramorum*, *P. kernoviae* and other *Phytophthora* species. Plant Pathology DOI: 10.1111/j.1365-3059.2006.01511.x.

Abstract: The aetiology and frequency of *Phytophthora* spp. in discoloured xylem tissue beneath phloem lesions was investigated in a range of broadleaved trees infected with *P. ramorum*, *P. kernoviae*, *P. cambivora*, *P. citricola* and other species. Isolation was attempted from the inner surface of 81 sterilized discoloured wood panels (6 × 4 cm) from 53 trees. Discolouration mostly extended 1–5 mm into the xylem (75%), but incursions of 6–10 mm (10%) and 10–25 mm (15%) were frequent. Of the wood panels, 81% yielded *Phytophthora* spp. In 66 cases, both a wood panel and an overlying phloem panel were sampled. In 56% of these, a *Phytophthora* sp. was isolated from both the wood and the phloem panel. In 23% the *Phytophthora* sp. was isolated from the wood



panel only and in 8% from the phloem panel only. Small 'island' phloem lesions, often in linear arrays adjacent to main lesions, were a common feature of *Fagus sylvatica* and *Quercus* spp. trees infected with *P. ramorum* or *P. kernoviae*. Island lesions were often connected by underlying strips or intermittent pits of discoloured xylem in line with the wood grain. *Phytophthora ramorum*, *P. kernoviae* and other *Phytophthora* spp. were successfully isolated from these connecting xylem features with *P. ramorum* and *P. kernoviae* also recovered from discoloured tissue 5–25 mm below exposed xylem surfaces 24–27 months after the overlying phloem was removed. These results show that these pathogens commonly occupy xylem beneath phloem lesions; that they can perennate in xylem tissue; that they can spread in xylem tissue ahead of phloem lesions; and indicate that they may initiate new phloem lesions in this way. Such colonization must lead to at least local xylem dysfunction. It is recommended that, if xylem discoloration is present, isolation of the *Phytophthora* sp. should be attempted from the xylem as well as the bark; also, that removal of infected outer sapwood should be undertaken during excision of bleeding lesions for disease control and in protocols aimed at preventing national or international spread of these tree stem pathogens.

Schwingle, B.W.; Smith, J.A.; and Blanchette, R.A. 2007. *Phytophthora* species associated with diseased woody ornamentals in Minnesota nurseries. Plant Dis. 91:97-102.

Abstract: *Phytophthora* species are responsible for causing extensive losses of ornamental plants worldwide. Recent international and national surveys for the detection of *P. ramorum* have led to the finding of previously undescribed *Phytophthora* species. Since no previous *Phytophthora* surveys have been carried out in Minnesota, surveys of ornamental nurseries were performed over 4 years to isolate and identify the *Phytophthora* species causing diseases of woody plants in Minnesota. Species were identified by direct sequencing of internal transcribed spacer (ITS) rDNA, β -*tub*, and mitochondrial *coxI* genes. Species associated with diseased ornamental plants include *P. cactorum*, *P. cambivora*, *P. citricola*, *P. citrophthora*, *P. hedraiaandra*, *P. megasperma*, *P. nicotianae*, and the previously identified but undescribed taxon *P. Pgchlamydo*. The most common species encountered were *P. cactorum*, *P. citricola*, and *P. citrophthora*. Two additional isolates obtained did not match known species. One was similar to *P. alni* subsp. *alni*, and the other appeared to be a new species and is referred to as *P. sp. MN1*. In addition, species are reported for the first time from several hosts. Results indicated that several *Phytophthora* species were more widespread in the nursery industry than previously thought, and undescribed species were causing disease in Minnesota ornamental nurseries.

OTHER PHYTOPHTHORAS OF INTEREST

Shearer, B.L. and Fairman, R.G. 2007. A stem injection of phosphite protects *Banksia* species and *Eucalyptus marginata* from *Phytophthora cinnamomi* for at least four years. Australasian Plant Pathology 36:78–86. Available online at <http://www.publish.csiro.au/nid/39/issue/3714.htm>.



Abstract: Longevity of effectiveness of stem-injected phosphite against *Phytophthora cinnamomi* was determined in two ways. Injected and not injected *Banksia grandis* and *Eucalyptus marginata* were challenge inoculated with *P. cinnamomi* at different times over an 8-year period. The mortality of injected and not injected *B. attenuata* and *B. grandis* was monitored over a 16-year period on active disease fronts. Duration of phosphite effectiveness was determined from the time after stem injection to 50% inhibition of either lesion length or girdling following challenge inoculation with *P. cinnamomi* and time to 50% mortality following injection of trees in disease fronts. For both *B. grandis* and *E. marginata*, time to 50% inhibition of lesion length increased from 4–5 years for 50 g phosphite/L to at least 10 years for 200 g phosphite/L. Time to 50% inhibition of girdling was significantly less than that for lesion length. In *B. grandis*, time to 50% inhibition of girdling increased with phosphite concentration from 2.9 years for 50 g phosphite/L to 10 years for 200 g phosphite/L. Time to 50% inhibition of girdling in *E. marginata* was 4 years. Predicted response surfaces of the effect of phosphite concentration and time on inhibition of lesion length and girdling showed that there was a much more gradual decline in predicted inhibition in *E. marginata* than the more susceptible *B. grandis*. An injection of 100 g phosphite/L of *Banksia* trees on disease fronts delayed time to 50% mortality by 3 to 4.8 years (mean 4.1 ± 0.6 years). At least 4 years of effectiveness of phosphite against *P. cinnamomi* in native communities is much greater than the ≤ 2 years found in agriculture. The effects of phosphate competition and adaptation to infertile environments on longevity of effectiveness of phosphite are discussed. Demonstration that the effectiveness of an injection of phosphite against *P. cinnamomi* will last at least 4 years in native flora confirms the practical utility of using phosphite injection for the control of *P. cinnamomi* in threatened communities. A greater understanding than available at present of the differences in phosphite uptake, within-plant distribution, loss and effectiveness between targeted plant species can optimise current phosphite prescriptions.

Álvarez, L.A.; Pérez-Sierra, A.; García-Jiménez, J.; and Javier-Alva, J. 2007. Bleeding Canker on Mesquite in Peru caused by *Phytophthora syringae*. Plant Dis. 91:226. Published online as DOI: 10.1094/PDIS-91-2-0226A. Accepted for publication October 16, 2006.

PERSONNEL

Caerleon Safford and Chris Perry have been hired as Sudden Oak Death (SOD) coordinators for Sonoma County as part of a USDA Forest Service, Forest Health Protection grant to address increased SOD fire hazards as well as other SOD-related issues in Sonoma County.

Chris earned a Masters Degree in Integrated Pest Management from the University of Wisconsin, Madison. Most recently he has worked on a number of habitat restoration projects throughout Northern California. Chris can be reached at (707) 565-2050 or cperry@sonoma-county.org. Chris is stationed at the Sonoma County University of California Cooperative Extension office in Santa Rosa.



Caerleon Safford works with the Sonoma County Department of Emergency Services in Vegetation Management and Fire Prevention Education. She also is the Executive Coordinator for Fire Safe Sonoma and is currently working on a Community Wildfire Protection Plan for Sonoma County. Caerleon can be reached at (707) 206-5467 or csafford@mcn.org.

Steven Swain will be leaving his position with the Garbelotto lab at UC Berkeley in February, and is taking a position with Marin and Sonoma Counties as the Environmental Horticulture Advisor (formerly Pavel Svihra's position). Focusing on issues relevant to Marin and Sonoma Counties, Steven is likely to remain peripherally involved with Sudden Oak Death research. He can be reached at (415) 499-4204 in late February.

RESOURCES

Hardcopies of the "Proceedings of the Sudden Oak Death Second Science Symposium: The State of Our Knowledge" are now available from the USDA Forest Service, Pacific Southwest Research Station. To request ONE FREE copy, contact Richard Schneider at Rocky Mountain Research Station, Publishing Services via email: rschneider@fs.fed.us (include your full mailing address in block format), fax: (970) 498-1122, or phone: (970) 498-1392. If mailing in your request, send your name and address in block format (as if you are addressing an envelope) to: Publishing Services; Rocky Mountain Research Station; 240 West Prospect Road; Fort Collins, CO 80526-2098 USA. When ordering, ask for: Frankel, Susan J.; Shea, Patrick J.; and Haverty, Michael I., tech. coords. 2006. Proceedings of the Sudden Oak Death Second Science Symposium: The State of Our Knowledge. 2005 January 18-21; Monterey, CA. Gen. Tech. Rep. PSW-GTR-196. Albany, CA: Pacific Southwest Research Station, Forest Service, U.S. Department of Agriculture; p. 571. Copies will be available at the SOD Science Symposium III, but they are bulky and heavy. The Proceedings are also available on line at http://www.fs.fed.us/psw/publications/documents/psw_gtr196/. For more information, contact Susan Frankel at sfrankel@fs.fed.us.

CALENDAR OF EVENTS

2/15 – Deadline for 2007 USDA FS State and Private Forestry, Forest Health Protection Program Request for Pre-Proposals; For more information, contact Phil Cannon at: pcannon@fs.fed.us.

2/14 – Registration Deadline for Sudden Oak Death Science Symposium III

3/5 -3/9 - 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 – 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.

4/25 – Registration Deadline for the Third Annual Bringing Back the Natives

Garden Tour; This FREE tour will take place Sunday, May 6, 2007, from 10 a.m. – 5 p.m. The self-guided tour showcases 60 pesticide-free, water-conserving East Bay gardens that provide habitat for wildlife and contain 30% or more native plants. Sudden Oak Death presentations and materials will be available at select gardens throughout the day. For more information, go to www.BringingBackTheNatives.net or contact Janice Alexander at jalexander@ucdavis.edu.

5/1 – 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 - XVI International Plant Protection Congress 2007, Glasgow, UK;

Full details on the recently announced call for papers can be found at: <http://www.bcp.org/IPPC2007/Call%5Ffor%5FPapers/>. For more information, contact Dr. Slawson, PHSI DEFRA, at: david.slawson@defra.gsi.gov.uk.