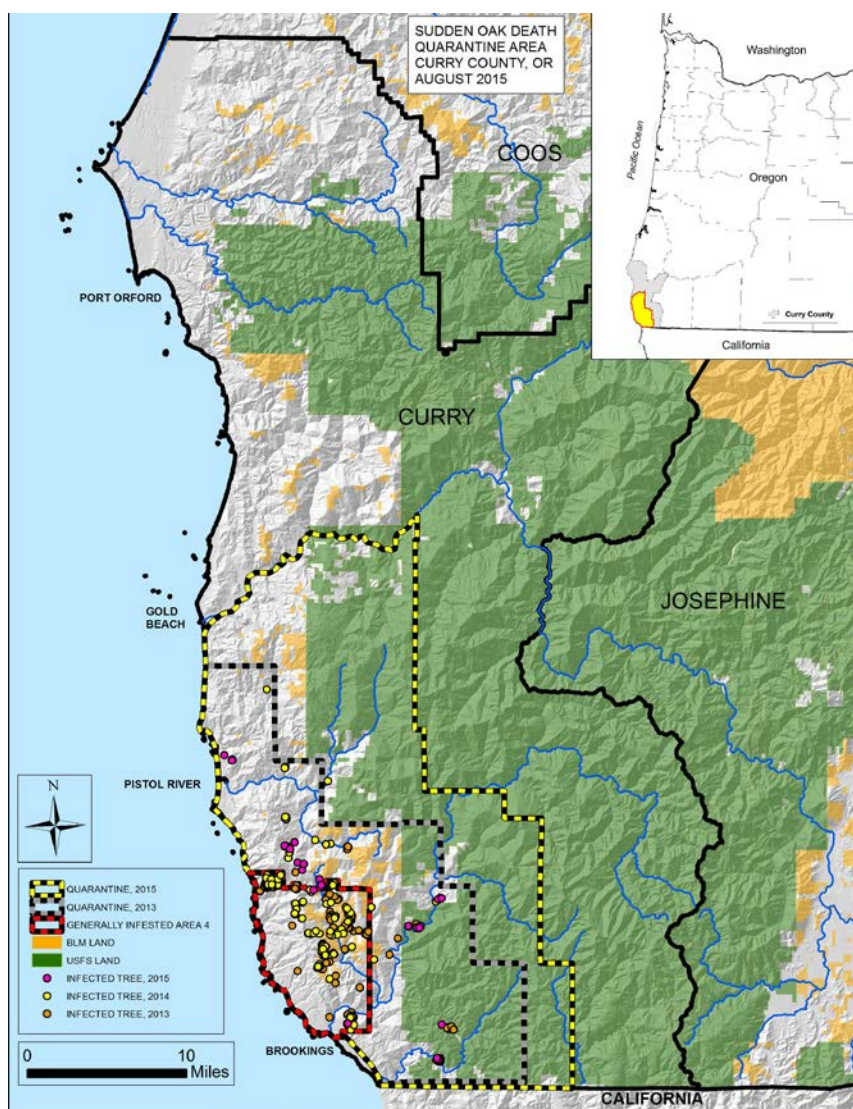




CALIFORNIA OAK MORTALITY TASK FORCE REPORT SEPTEMBER 2015

MANAGEMENT

The Oregon Department of Agriculture expanded the Curry County *Phytophthora ramorum* quarantine area in July. The expansion increases the regulated area from 264 sq. mi. to 519 sq. mi., providing an 8-mile buffer from infested to non-infested sites to the north/northeast and 6-mile buffer to the east. The new quarantine area also extends south to the California border. This additional quarantine area will help facilitate a greater rapid detection and response area, helping to minimize spread into uninfested forested regions. For more information on the quarantine expansion, contact Nancy Osterbauer at nosterbauer@oda.state.or.us.





WILDLAND MONITORING

Nine states are participating in the 2015 USDA FS National *P. ramorum* Early Detection Survey of Forests: AL, GA, MS, NC, PA, SC, CA, OR, and WA. Of the 275 samples collected from eastern states so far this year, two *P. ramorum*-positive samples were recovered from a previously positive AL watershed (first positive in 2009) and two samples from one MS site (previously positive) were inconclusive.

NURSERIES

Oregon's fall *P. ramorum*-regulated nursery survey is underway (spring and fall surveys are required annually). Over the summer, the Oregon Department of Agriculture focused on mitigation activities in nurseries found to have *P. ramorum*-positive soil during the spring survey. Steam treatments were completed at three nurseries. The soil in two of the three nurseries tested free of *P. ramorum* following the treatments. Post-treatment soil samples from the remaining nursery are still being processed.

A review of the new USDA APHIS nursery inspection protocols for previously positive, interstate shipping nurseries was held in July in Clemson, SC. Representatives from USDA APHIS, the National Plant Board, CA, WA, OR, NY, PA, and a number of other state departments of agriculture were in attendance. In addition to assessing the successes and failures of the protocols, the group visited a previously positive nursery that utilizes sand filtration to decontaminate water prior to release from nursery grounds.

One outcome of the meeting was the formation of a technical working group, which will review, and possibly modify, the current USDA APHIS *P. ramorum* host and associated host list. Determining which hosts will remain on the list will depend upon many factors and may include a review of the scientific data supporting the designation of a host plant. The group has had an initial meeting and will be conducting work via conference calls.

Nursery and Greenhouse Industries Examine the Benefits of a Systems Approach to Certification of Plant Material - During the past 10 months, six nurseries and greenhouses of various sizes throughout the US have participated in a pilot project to assess the benefits of an audit-based Systems Approach to Nursery Certification (SANC). The National Plant Board (NPB) SANC initiative is designed to minimize the inherent risk of pest introduction and distribution as nursery stock is produced and moved. To date, all participating producers have found it beneficial to proactively analyze their production and distribution operations for areas of risk, mitigating for threats that might otherwise have led to pest proliferation and/or economic loss. An evaluation subcommittee is assessing the progress of the program and the pilot project to improve upon procedures prior to the second pilot project phase (which will include greater diversity of facility size and product) and SANC implementation. Additionally, the SANC steering committee is actively seeking opportunities to educate nurseries about the program and its potential benefits through tradeshow exhibits and other outreach efforts.



Positive SANC milestones are the result of continued support from the nursery and greenhouse industries, USDA, the NPB, and other leadership organizations, such as the California Oak Mortality Task Force.



Karen Suslow (NORSUDUC), providing SANC information, American Horticulture–Cultivate 15 Conference, Columbus, OH.

RESEARCH

Lamarche, J.; Potvin, A.; Pelletier, G.; Stewart, D.; Feau, N.; Alayon, D.I.O.; Dale, A.L.; Coelho, A.; Uzunovic, A.; Bilodeau, G.J.; Brière, S.C.; Hamelin, R.C.; and Tanguay, P. 2015. Molecular Detection of 10 of the Most Unwanted Alien Forest Pathogens in Canada Using Real-Time PCR. PLoS ONE 10(8): e0134265. DOI: 10.1371/journal.pone.0134265.

Abstract: Invasive alien tree pathogens can cause significant economic losses as well as large-scale damage to natural ecosystems. Early detection to prevent their establishment and spread is an important approach used by several national plant protection organizations (NPPOs). Molecular detection tools targeting 10 of the most unwanted alien forest pathogens in Canada were developed as part of the TAIGA project (<http://taigaforesthealth.com/>). Forest pathogens were selected following an independent prioritization. Specific TaqMan real-time PCR detection assays were designed to function under homogeneous conditions so that they may be used in 96- or 384-well plate format arrays for high-throughput testing of large numbers of samples against multiple targets. Assays were validated for 1) specificity, 2) sensitivity, 3) precision, and 4) robustness on environmental samples. All assays were highly specific when evaluated against a panel of pure cultures of target and phylogenetically closely-related species. Sensitivity, evaluated by assessing the limit of detection (with a threshold of 95% of positive samples), was found to be between one and ten target gene region copies. Precision or repeatability of each assay revealed a mean coefficient of variation of 3.4%. All assays successfully allowed detection of target pathogen on positive environmental samples, without any non-specific amplification. These molecular detection tools will allow for rapid and reliable detection of 10 of the most unwanted alien forest pathogens in Canada.



Funahashi, F. and Parke, J.L. 2015. Effects of Soil Solarization and *Trichoderma Asperellum* on Soilborne Inoculum of *Phytophthora ramorum* and *Phytophthora pini* in Container Nurseries. Plant Disease. Accepted for publication.
<http://dx.doi.org/10.1094/PDIS-04-15-0453-RE>.

Abstract: Infested container nursery beds are an important source of soilborne *Phytophthora* spp. for initiating disease through movement with surface water or splashing onto foliage. We investigated the effects of soil solarization, alone or with subsequent amendment with a *Trichoderma asperellum* biocontrol agent, on the survival of *Phytophthora* spp. inoculum. In field trials conducted with *P. ramorum* in San Rafael, California (CA) and with *P. pini* in Corvallis, Oregon (OR), infested rhododendron leaf inoculum was buried at 5, 15, and 30 cm below the soil surface. Solarization for 2 or 4 weeks during the summer of 2012 eliminated recovery of *Phytophthora* spp. buried at all depths in CA trial 1, at 5 and 15 cm in CA trial 2, but only at 5 cm in OR. There was no significant reduction of *Phytophthora* spp. recovery after *T. asperellum* application. Although the population densities of the introduced *T. asperellum* at the 5 cm depth were often 2- to 4-fold higher in solarized as compared to non-solarized plots, they were not significantly different ($P = 0.052$). Soil solarization appears to be a promising technique for disinfesting the upper layer of soil in container nurseries under certain conditions.

Yüksel, S.; Schwenkbier, L.; Pollok, S.; Weber, K.; Cialla-May, D.; and Popp, J. 2015. Label-Free Detection of *Phytophthora ramorum* Using Surface-Enhanced Raman Spectroscopy. Analyst. DOI: 10.1039/C5AN01156F.

Abstract: Within this study, we report on a novel approach for the label-free and species-specific detection of the plant pathogen *Phytophthora ramorum* from real samples using surface enhanced Raman scattering (SERS). In this context, we consider the entire analysis chain including sample preparation, DNA isolation, amplification and hybridization on SERS substrate-immobilized adenine-free capture probes. Thus, the SERS-based detection of target DNA is verified by the strong spectral feature of adenine which indicates the presence of hybridized target DNA. This property was realized by replacing adenine moieties in the species-specific capture probes with 2-aminopurine. In case of matching capture and target sequence, the characteristic adenine peak serves as indicator for specific DNA hybridization. Taken together, this is the first assay demonstrating the detection of a plant pathogen from infected plant material by label-free SERS employing DNA hybridization on planar SERS substrates consisting of silver nanoparticles.

RESOURCES

The Scottish Government has published a [Strategy for *Phytophthora ramorum*, 2015-2017](#), that aims to manage and control the rate of *P. ramorum* spread in Scotland to protect the health of trees, shrubs, and heathland. The previous goal of *P. ramorum* eradication in Scotland is no longer possible; therefore, new measures have been put in place to try and contain the pathogen in the wider environment, slow down spread in larch, and minimize economic impacts to forestry, nurseries, and ornamental gardens.



A [status report on *Phytophthora ramorum* and *Phytophthora kernoviae*](#) has also been published in conjunction with the strategy. It describes the history of the diseases, the current situation for each, and the actions being taken to control them. It is an update to the [Summer 2010 Status Report](#) on the organisms.

RELATED RESEARCH

Horner, I.J.; Hough, E.G.; and Horner, M.B. 2015. Forest Efficacy Trials on Phosphite for Control of Kauri Dieback. *Agrichemicals for plant protection.* New Zealand Plant Protection 68: 7-12.

Nelson, M.F. and Bone, C.E. 2015. Effectiveness of Dynamic Quarantines against Pathogen Spread in Models of the Horticultural Trade Network. *Ecological Complexity.* 24: 14-28. DOI: [10.1016/j.ecocom.2015.07.002](https://doi.org/10.1016/j.ecocom.2015.07.002)

Schwenkbier, L.; Pollok, S.; Rudloff, A.; Sailer, S.; Cialla-May, D.; Weber, K.; and Popp, J. 2015. Non-Instrumented DNA Isolation, Amplification and Microarray-Based Hybridization for a Rapid On-Site Detection of Devastating *Phytophthora kernoviae*. *Analyst.* 140: 6610-6618. DOI: [10.1039/C5AN00855G](https://doi.org/10.1039/C5AN00855G).

PERSONNEL

The USDA Forest Service (FS) Southern Region is pleased to announce Dr. Jaesoon Hwang as the principal forest pathologist for the Forest Health Protection Unit in the Alexandria Field Office, Pineville, LA. Jaesoon will help coordinate the National *P. ramorum* Early Detection Survey of Forests. His technical expertise will focus on survey data management for NC, SC, GA, FL, AL, MS, and TX to ensure sampling is completed properly and in a timely manner. Jaesoon will work with Dr. Seong Hwan Kim (Eastern Lab, Pennsylvania Department of Agriculture) to compile PCR diagnostic results and formulate summary reports for USDA APHIS, USDA FS, and other stakeholders. His extensive field expertise will benefit sampling personnel as well as provide leadership for streamside vegetation surveys associated with new *P. ramorum* nursery confirmations. Jaesoon can be reached at jaesoonhwang@fs.fed.us.

CALENDAR

10/21 - SOD Treatment Workshop; meet at oak outside of Tolman Hall, UC

Berkeley Campus; 1:00 – 3:00 p.m.; Pre-registration is required. This class is free and will be held rain or shine. To register, or for questions, email kpalmieri@berkeley.edu, and provide your name, phone number, affiliation and license number (if applicable), and the name and date of the class.

10/27 - Urban Forest Insect and Disease Workshop for Santa Cruz and Monterey

Area Arborists: What's wrong with that tree?; Felton Community Hall, 6191 Highway 9, Felton; 10:00 a.m. - 3:30 p.m.; To register, or for more information, go to <http://caforestpestcouncil.org/2015/09/urban-forest-insect-and-disease-workshop-for-santa-cruz-and-monterey-area-arborists-whats-wrong-with-that-tree-october-27th-from-10am-330pm/> or contact Katie Harrell (previously Palmieri) at kpalmieri@berkeley.edu.



- 11/4 – 11/5 - 2015 Annual Meeting of the California Forest Pest Council; USDA**
Forest Service, Wildland Fire Training & Conference Center, Hamm and Loop rooms; 3237 Peacekeeper Way; McClellan; To register, or for more information, go to <http://caforestpestcouncil.org/2015/08/save-the-date-california-forest-pest-council-annual-meeting-november-4-5th-2015/> or contact Katie Harrell (previously Palmieri) at kpalmieri@berkeley.edu.
- 11/3 - Sudden Oak Death and Oak Drought Management Workshop; Sebastopol**
Center for the Arts (Veterans' Hall); 282 S. High St.; Sebastopol; 6:00 – 8:00 p.m.; This workshop is free. Registration is not required. For more information, go to <http://nature.berkeley.edu/garbelottowp/> or contact Katie Harrell at kpalmieri@berkeley.edu.
- 11/4 - Sudden Oak Death and Oak Drought Management Workshop; UC Berkeley;**
159 Mulford Hall; Berkeley; 6:00 – 8:00 p.m.; This workshop is free. Registration is not required. For more information, go to <http://nature.berkeley.edu/garbelottowp/> or contact Katie Harrell at kpalmieri@berkeley.edu.
- 11/13 - Sudden Oak Death and Oak Drought Management Workshop; Dominican**
University of California; Science Center Room #102; 155 Palm Avenue; San Rafael; 6:30 – 8:30 p.m.; This workshop is free. Registration is not required. For more information, go to <http://nature.berkeley.edu/garbelottowp/> or contact Katie Harrell at kpalmieri@berkeley.edu.
- 2/23 - 24/16 - Observatree/IPSN Conference on Tree and Plant Health Early**
Warning Systems in Europe; Royal Botanic Gardens, Kew, UK; Registration is free, but space is limited. To submit an abstract, or to register, go to <http://www.observatree.org.uk/events/>. For more information, contact EPPOThewsConf@fera.co.uk.
- 6/21 – 23/16 Sudden Oak Death Science Symposium 6; Fort Mason, San Francisco;**
Save the Date! More information will be available soon at <http://www.suddenoakdeath.org/>. For questions, contact Katie Harrell at kpalmieri@berkeley.edu or (510) 847-5482