



CALIFORNIA OAK MORTALITY TASK FORCE REPORT DECEMBER 2014

Note: The COMTF report will be produced 10 times in 2015 as reporting is aligned with the CA Board of Forestry and Fire Protection meeting schedule. The first report of the year will be issued January 28, 2015.

FUNDING

The USDA Forest Service, Pacific Southwest Region, State and Private Forestry, Forest Health Protection program has issued its 2015 *Phytophthora ramorum* Request for Pre-Proposals ([RFP](#)). Approximately \$350,000 in grants is expected to be available in 2015. Proposals should focus on management activities that could help limit the impact of sudden oak death (SOD) in California and/or southwest Oregon, improve understanding of pathogen spread, and promote the exchange of relevant information. Tribal groups are especially encouraged to apply. In general, proposals should be for grants of between \$10,000 and \$90,000 per year. Collaborative projects are encouraged. The submission deadline is 4:00 pm on Jan. 23, 2015. For questions, contact Phil Cannon at: pcannon@fs.fed.us or 707-562-8913.

MANAGEMENT

CAL FIRE Jackson Demonstration State Forest (JDSF) closed the Trestle Trail to mushroom gathering and other recreational activities on 10/22/14. Moving forward the trail will be closed annually during the wet season (Oct – May) as a precautionary measure in an attempt to slow the spread of *P. ramorum*. The infected area along the North Fork of the South Fork Noyo was found in 2013 and remains the only confirmed site in JDSF. The Trestle Trail is a 4.3-mile native surface foot trail and comprises about 10 percent of the Forest trail system. For more information, contact Lynn Webb at (707) 964-5674.

ATTENTION

Trestle Trail Closed Temporarily

Help slow the spread of Sudden Oak Death on JDSF!



Phytophthora ramorum, the pathogen that causes Sudden Oak Death, has been identified in the North Fork of the South Fork Noyo River Watershed. The Trestle Trail will be closed during the 2014-2015 wet season as part of an effort to reduce the spread of Sudden Oak Death.

Contact Jackson Demonstration State Forest @ 707-964-5674.
Or visit www.suddenoakdeath.org for more information.



NURSERIES

From January 1 to December 3, 2014, *P. ramorum* was reported in 19 nurseries in 3 regulated states (CA, OR and WA) and 4 non-regulated states (ME, NY, TX, and VA). Of the 19 positive nurseries, 8 were interstate shippers (CA-1; OR-4; WA-1; TX-1; VA-1) and 11 were non-interstate shippers. The Confirmed Nursery Protocol was conducted



in the positive nurseries. The TX interstate shipping nursery was positive due to plants received from a positive CA nursery. Six of the interstate shippers had shipped in the previous 6 months. Trace investigations are complete. *P. ramorum* was detected in *Camellia* (20), *Pieris* (8), *Rhododendron* (27), *Viburnum* (32), *Gaultheria* (14), *Prunus* (1), *Syringa* (2), and *Vaccinium* (1) as well as potting media (2), soil bait(6), and water bait(15).

Following the January 2014 Federal Order (DA-2014-02), which revised *P. ramorum* domestic quarantine requirements, 23 nurseries in CA, OR, and WA (all found positive since March 31, 2011) underwent the enhanced USDA APHIS compliance program to continue shipping host nursery stock interstate. As of December 3, 2014, four of the 23 facilities no longer ship interstate; however, two nurseries (OR-1, VA-1) were added to the compliance program in 2014 due to *P. ramorum* confirmations, bringing the total number of participating nurseries to 21.

In 2014, *P. ramorum* was detected in six of the original 23 nurseries as well as the 2 newly confirmed nurseries. Three of the eight nurseries decided to discontinue interstate shipping, and therefore must undergo state regulatory authority, inspections, and requirements. The remaining five interstate shippers underwent Critical Control Point Assessments and are required to employ specific mitigations. The mandatory mitigations are incorporated into a federal compliance agreement signed by the nursery owner, the State Department of Agriculture Regulatory Official, and APHIS PPQ (Plant Protection and Quarantine) State Plant Health Director.

In 2014, California had one *P. ramorum*-positive nursery identified in Sacramento County. Plants found infected included camellias, viburnum, and lilac; the nursery was disinfested according to the USDA's protocol. A total of 13,839 samples were taken from nurseries statewide in 2014; however, many of those were prior to the USDA Animal and Plant Health Inspection Service (APHIS) March 2014 rule change that only previously positive nurseries and interstate shipping nurseries within the quarantined area need to be inspected. Since the March rule, 3,360 samples have been taken from the seven previously positive nurseries. Nurseries within the quarantined area that ship out of California are still inspected and tested regularly, but yielded negative results.

RESEARCH

Conrad, A.O.; Rodriguez-Saona, L.E.; McPherson, B.A.; Wood, D.L.; and Bonello, P. 2014. Identification of *Quercus agrifolia* (Coast Live Oak) Resistant to the Invasive Pathogen *Phytophthora ramorum* in Native Stands Using Fourier-Transform Infrared (FT-IR) Spectroscopy. *Frontiers in Plant Science*. 5:521. DOI: 10.3389/fpls.2014.00521.

Abstract: Over the last two decades coast live oak (CLO) dominance in many California coastal ecosystems has been threatened by the alien invasive pathogen *Phytophthora ramorum*, the causal agent of sudden oak death. In spite of high infection and mortality rates in some areas, the presence of apparently resistant trees has been observed, including trees that become infected but recover over time. However, identifying resistant trees based on recovery alone can take many years. The objective of this study was to



determine if Fourier-transform infrared (FT-IR) spectroscopy, a chemical fingerprinting technique, can be used to identify CLO resistant to *P. ramorum* prior to infection. Soft independent modeling of class analogy identified spectral regions that differed between resistant and susceptible trees. Regions most useful for discrimination were associated with carbonyl group vibrations. Additionally, concentrations of two putative phenolic biomarkers of resistance were predicted using partial least squares regression; >99% of the variation was explained by this analysis. This study demonstrates that chemical fingerprinting can be used to identify resistance in a natural population of forest trees prior to infection with a pathogen. FT-IR spectroscopy may be a useful approach for managing forests impacted by sudden oak death, as well as in other situations where emerging or existing forest pests and diseases are of concern.

Elliott, M.; Shamoun, S.F.; and Sumampong, G. 2015. Effects of Systemic and Contact Fungicides on Life Stages and Symptom Expression of *Phytophthora ramorum* In Vitro and In Planta. Crop Protection 67: 136-144.

Abstract: Nine isolates of *Phytophthora ramorum* Werres, de Cock & Man in't Veld were screened using a variety of systemic and contact fungicides *in vitro* for mycelial growth inhibition and zoospore germination inhibition, and *in planta* for suppression of lesion expansion on rhododendron foliage. Three isolates from each of the major clonal lineages, NA1, NA2, and EU1 were used. Systemic fungicides were the most effective at preventing mycelial growth and zoospore germination of *P. ramorum*, and the results from testing on host plants at the labeled rate supported the *in vitro* results. Development of resistance to some chemicals used for routine control of *P. ramorum* in the nursery should be monitored, especially in the EU1 and NA2 populations. Metalaxyl-M had the lowest EC50 for both mycelial growth inhibition and zoospore germination inhibition for all isolates. EC50 was higher for zoospore germination inhibition of the EU1 isolates by two strobilurin fungicides, indicating possible cross-resistance in this group.

Eyre, C.A.; Hayden, K.J.; Kozanitas, M.; Grünwald, N.J.; and Garbelotto, M. 2014. Lineage, Temperature, and Host Species have Interacting Effects on Lesion Development in *Phytophthora ramorum*. Plant Disease. 98(12): 1717-1727.

Abstract: There are four recognized clonal lineages of the pathogen *Phytophthora ramorum*. The two major lineages present in North America are NA1 and NA2. With a few exceptions, NA1 is found in natural forest ecosystems and nurseries, and NA2 is generally restricted to nurseries. Isolates from the NA1 and NA2 lineages were used to infect rhododendron, camellia, and California bay laurel in detached leaf assays to study the effects of lineage, temperature, and host on pathogenicity and host susceptibility. Isolates within both lineages were highly variable in their ability to form lesions on each host. There was also a tendency toward reduced lesion size in successive trials, suggesting degeneration of isolates over time. Temperature had a significant effect on lesion size, with a response that varied depending on the host and isolate. Phenotypic differences between lineages appear to be heavily influenced by the representation of isolates used, host, and temperature. The importance of temperature, host, and lineage are



discussed with respect to disease management, as well as future range expansions and migrations of the pathogen.

MEETINGS

Minimizing the risk of *Phytophthora* introduction and spread during native plant establishment was the focus of “Responding to an Expanding Threat: Exotic *Phytophthora* species in Native Plant Nurseries, Restoration Plantings, and Wildlands” held December 2, 2014 at the Presidio in San Francisco. Over 140 professionals attended the workshop organized by the California Native Nursery Network and sponsored by the Presidio Trust, Golden Gate National Parks Conservancy and National Park Service. The meeting brought the restoration community up to date on recent detections of *Phytophthora tentaculata* and many other exotic *Phytophthora* species in native plant nurseries and restoration sites. Ted Swiecki, of Phytosphere Research, presented on extensive *Phytophthora* damage to rare native plants such as Ione manzanita (*Arctostaphylos myrtifolia*) and coyote ceanothus (*Ceanothus ferrisiae*) in restoration areas and open space lands. Reviews of best management practices for native plant nurseries were followed by a case study of the Watershed Nursery showing improved sanitation practices and a tour of the Presidio Native Plant Nursery. For more information, contact: Alisa Shor, Director of Nurseries, Golden Gate National Parks Conservancy at ashor@parkconservancy.org.

EDUCATION

The new Green Teacher magazine “Teaching About Invasive Species” includes a “Can Trees Catch the Flu” article by Janice Alexander, which highlights hands-on activities developed by the COMTF and CA Firewood Task Force for young adults. Lessons such as a firewood passport activity and a SOD tree flu activity teach children about how invasive species damage forests and what can be done to help prevent their spread. To access the article, go to <http://cemarin.ucanr.edu/files/202259.pdf>.

PERSONNEL

Ron Rhatigan has been hired to be the new SOD forester for the Rogue River—Siskiyou National Forest in Oregon beginning January 11, 2015. Stationed at Gold Beach, he will work for the USDA Forest Service Forest Health Protection Southwest Oregon Forest Insect and Disease Service Center and the Coast Zone Timber/Vegetation Program. Ron currently works as the SOD forester for the Oregon Department of Forestry. Once on the job, Ron can be reached at Gold Beach Ranger Station (541) 247-3600.

CALENDAR OF EVENTS

1/13/15-1/17/15 – California Native Plant Society Conservation Conference; “Celebrating 50 Years of Progress and Promise;” Hilton DoubleTree; San Jose; For more information, go to <http://www.cnps.org/cnps/conservation/conference/2015>.