



CALIFORNIA OAK MORTALITY TASK FORCE REPORT DECEMBER 2010

Note: The COMTF report is produced 11 times a year. There will be no report in January 2011. The next report will be issued the first week of February 2011.

MONITORING

A Gig Harbor, Pierce County, WA landscape site adjacent to a previously positive repeat nursery has been found to have *P. ramorum*-positive soil. The confirmed site is along a drainage that had been found positive with infected salal plants in the summer of 2009. Soil sampling has been ongoing since the initial confirmation; however, this is the first time a positive sample has been recovered. The nursery associated with the site closed in August 2010, yet the retention ponds and outlet for the ponds continue to be positive for the pathogen. The nursery site is currently up for sale. The county has volunteered to remove the remaining host plants and material on the drainage banks where the previous salal find was confirmed in an effort to eliminate the pathogen's ability to become established. Survey work will also continue in the area. For more information, contact Michael Schell at michael.r.schell@aphis.usda.gov.

MANAGEMENT

As of 11/12/10, Northern Ireland has confirmed seven *P. ramorum*-infected Japanese larch sites in woodlands on the southern half of the Antrim plateau and one in Mid Down. Approximately 268 hectares of public land and six hectares of private land are affected. Aerial and ground surveys (completed this fall) have confirmed that the infected larch is confined to a cluster of sites in south Antrim and an isolated site in County Down. To date, 79 hectares of Japanese larch woodland have been felled. The remaining felling is planned to be completed by spring 2011.

All *P. ramorum*-related larch felling in Wales is now on hold until late May 2011. With needles from the trees dropping, it is difficult to identify which trees are actually infected. If such trees were felled unknowingly, infected material could circumvent biosecurity measures, risking the unintentional spread of a disease which threatens large swathes of Welsh forests.

FUNDING

The fiscal year 2011-2012 National Ornamentals Research Site at Dominican University of California (NORS-DUC) Request for Proposals (RFP) application deadline has been extended to Friday, 12/24/10. Proposals reflecting short-term applied research are requested for validation of established Best Management Practices (BMPs), the development of new BMPs, and research that leads to science-based mitigations to manage *P. ramorum*. Research priorities include, but are not limited to, methods development to inhibit *P. ramorum* spread and epidemiological studies on inoculum sources, pathways, soil sampling focal points, and disease distribution in nurseries. All



proposals should be submitted to RFP.norsduc@dominican.edu. For more information, go to www.dominican.edu/norsduc. For questions, contact Sibdas Ghosh at sibdas.ghosh@dominican.edu.

RESEARCH

Koenig, W.D.; Knops, J.M.H.; and Carmen, W.J. 2010. Testing the environmental prediction hypothesis for mast-seeding in California oaks. Canadian Journal of Forest Research 40:2115-2122. DOI: 10.1139/X10-152.

Abstract: We analyzed 29 years of acorn production by five species of California oaks (genus *Quercus*) to test the hypothesis that trees produce large seed crops prior to wet years, conditions facilitating seedling germination and survival. The mean crop of three of the species correlated positively and nontrivially with the following year's rainfall, but none was statistically significant. Including the acorn crop 1 and 2 years earlier yielded several significant relationships between the acorn crop and the future rainfall, but none held up when applied to a second, independent site. Across individuals, acorn production by 7% of trees correlated significantly with subsequent rainfall. Although these trees differed from other trees in several characters, differences were not sufficient to discriminate between trees that correlated significantly with subsequent rainfall from those that did not. We conclude that acorn production California oaks does not forecast wet years and does not support the environmental prediction hypothesis.

RELATED TOPICS

***Phytophthora lateralis* has been confirmed for the first time in Britain. At least one** Lawson's cypress tree at Balloch Castle Country Park in Scotland has been killed by the pathogen. Many of the other 80 Lawson's cypress in the park also have *P. lateralis* symptoms; laboratory confirmations are pending.

Twenty-seven dead and dying yew trees in the park are also being tested. English yew (*Taxus baccata*) is a British native species whose timber is prized for uses such as furniture veneer. The Forestry Commission is not aware of any records of *P. lateralis* infection of English yew, so it is anxious to also identify the cause of the declining yews in Balloch Castle Country Park.

Biosecurity measures will be put in place at the park, including the installation of disinfectant mats at park exit points to reduce the risk of spreading the disease on contaminated footwear. Notices are being erected to inform visitors of the infection, asking them to take other simple biosecurity measures such as keeping on established trails, keeping dogs on leashes, and refraining from taking cuttings or other plant material from the park.

FEATURED RESEARCH

Characterizing Douglas-fir Tissue Colonization by the 'Sudden Oak Death' Pathogen, *Phytophthora ramorum*. By Kathleen McKeever, M.S. and Dr. Gary



Chastagner; Department of Plant Pathology, Washington State University Puyallup Research and Extension Center

In 2001, Koch's Postulates confirmed Douglas-fir as a host for *P. ramorum*. Naturally-infected saplings have been observed in California forests, and studies on artificially inoculated Douglas-fir stems and shoots have established susceptibility parameters. Although naturally occurring stem infections in the U.S. have been limited to smaller diameter seedlings and saplings, *P. ramorum* stem cankers were recently observed on 8-year-old plantation grown Douglas-fir in Great Britain in 2009. All previous research has served to substantiate the importance of performing studies to characterize the behavior of *P. ramorum* in Douglas-fir and assess the potential risk that this pathogen poses to Douglas-fir ecosystems.

Artificial inoculation experiments were carried out to provide a thorough analysis of the colonization of Douglas-fir by *P. ramorum*. Goals of this research included determining which tissues are colonized by the pathogen, whether woody tissues are able to support sporulation, the likelihood of stem infections occurring on Douglas-fir with intact bark, and the viability of the pathogen in foliage. Methods employed included isolation, ELISA, and histological examination of stem tissues; qPCR and isolation to determine colonization efficacy and viability of the pathogen in needle tissues; and baiting studies to determine the ability of Douglas-fir bark to inhibit colonization of *Rhododendron* leaves by the pathogen.

ELISA results showed that proteins of the pathogen were detectable in the phloem, cambium, and superficial xylem, with infrequent detection in asymptomatic tissues. The pathogen was able to be isolated from all symptomatic woody tissues tested, but not from non-discolored tissues. ELISA and isolation techniques produced results that were highly positively correlated ($r^2=0.62$, $p=0.78$), and histological observations paralleled information derived from these techniques. Douglas-fir bark reduced infection on *Rhododendron* leaf baits by up to 83 percent in the presence of inoculum. Results from foliage inoculations indicated that pathogen DNA is detectable using qPCR methods, but there was an inability to isolate the pathogen from needle tissue. Evidence of spore formation in woody stem tissues has not been observed.

It was concluded that the pathogen may be able to infect into the shallow xylem tissues of Douglas-fir in the presence of wounding, but there was no evidence of sporulation in tissues. The inability to isolate the pathogen from non-discolored tissues suggests that the proteins detected by ELISA outside of the lesion may be elicitors that are secreted in advance of hyphal colonization. The inability to isolate the pathogen from colonized needles may indicate the presence of chemical inhibitors that render the pathogen non-viable subsequent to initial infection. Finally, the ability of Douglas-fir bark to suppress infection of *Rhododendron* leaf baits suggests that the bark is inhibitory to *P. ramorum* and that infection of woody stem tissues through intact bark may be limited. Further research is required to identify the nature of this inhibition.



Characterization of *P. ramorum* colonization of Douglas-fir tissues is relevant to our current understanding of the behavior of the pathogen in different hosts and may enhance our ability to assess risk and create adequate regulations to thwart the spread of this exotic pathogen.

REGULATIONS

The USDA Animal and Plant Health Inspection Service (APHIS) *P. ramorum* Regulatory Working Group met on October 25-28, 2010 in Salem, OR. The three-day facilitated meeting was attended by representatives from APHIS, the National Plant Board, and State Plant Regulatory Officials and included regulatory discussions and visits to local nurseries implementing the US Nursery Certification and Grower Assisted Inspection Programs as well as meeting with nursery industry representatives. For more information on the meeting, contact Prakash Hebbar at prakash.hebbar@aphis.usda.gov.

RELATED RESEARCH

Lynch, S.C.; Eskalen, A.; Zambino, P.; and Scott, T. 2010. First Report of Bot Canker Caused by *Diplodia corticola* on Coast Live Oak (*Quercus agrifolia*) in California. Plant Disease, Disease Notes Volume 94, Number 12: 1510. DOI: 10.1094/PDIS-04-10-0266.

Robin, C.; Piou, D.; Feau, N.; Douzon, G.; Schenck, N.; and Hansen, E.M. 2010. Root and aerial infections of *Chamaecyparis lawsoniana* by *Phytophthora lateralis*: a new threat for European countries. Forest Pathology, Short Communication. DOI: 10.1111/j.1439-0329.2010.00688.x.

WWW.SUDDENOAKDEATH.ORG

The COMTF now has a presence on Facebook through a “Sudden Oak Death” group and a “*Phytophthora ramorum*” account. Go to the [Task Force homepage](#) to “like” us, and spread the word to friends and colleagues.

CALENDAR OF EVENTS

- 12/24/10 - National Ornamentals Research Site at Dominican University of California** Request for Proposals (RFP) application deadline. For more information, see “Funding” above.
- 6/21 – 6/23/2011 - Coast Redwood Forests in a Changing California: A Symposium** for Scientists and Managers; University of California, Santa Cruz; For more information on the conference, go to <http://ucanr.org/sites/redwood>.
- 7/31 – 8/5/2011 – Disease and Insect Resistance in Forest Trees: Fourth** International Workshop on the Genetics of Host-Parasite Interactions in Forestry; Valley River Inn; 1000 Valley River Way; Eugene, OR 97401; Details will be forthcoming. For questions, contact Richard Sniezko at rsniezko@fs.fed.us; Katie Palmieri at (510) 847-5482 or kpalmieri@berkeley.edu; or Janice Alexander at (415) 499-3041 or jalexander@ucdavis.edu.