



CALIFORNIA OAK MORTALITY TASK FORCE REPORT TO THE BOARD OF FORESTRY MAY 2014

MONITORING

A Kitsap County, Washington waterway was found *Phytophthora ramorum* positive in April for the first time. The positive site is downstream from a previously positive nursery. Delimitation and detection surveys will be conducted.

FUNDING

The USDA Animal and Plant Health Inspection Service 2014 Farm Bill awarded \$2,056,578 for *P. ramorum*-related work. Funded projects include *P. ramorum* surveys in 15 non-regulated states; support for the National Ornamental Research Site at Dominican University of California; research on *P. ramorum* mitigation using physical, chemical, and biological control methods; host-range studies; improved detection methods; epidemiology of the pathogen; supply chain evaluation; and outreach activities. For a comprehensive list of projects, go to http://www.aphis.usda.gov/newsroom/2014/04/pdf/fy14_farm_bill_spending_plan.pdf.

NURSERIES

Fourteen Oregon interstate shipping nurseries that have been positive for *P. ramorum* since March 31, 2011 have opted to participate in the *P. ramorum* federal program with the new Federal Order in place. Nurseries that have been positive since then that are not shipping interstate are also being surveyed for *P. ramorum* under state authority. As of April 29th, plant, water, and soil media samples have been collected and processed from seven nurseries. So far, *P. ramorum* has been detected in one Clackamas County nursery that does not ship interstate. The USDA Confirmed Nursery Protocol was enacted at that nursery and the delimitation survey and required mitigation activities have been completed. The nursery is now undergoing the 90-day quarantine period.

As required by the new Federal Order that was implemented April 1st, the California Department of Food and Agriculture increased sampling protocol inspections at nurseries shipping host plants interstate that were found positive in the last 3 years. Five inspections were completed in April, with the remaining two scheduled for May. Quarantine county nurseries that ship out of the quarantined area continue to be inspected and sampled. To date, there have been no positive detections.

The National Plant Board (NPB) Systems Approach to Nursery Certification (SANC) initiative is being developed cooperatively by the nursery industry, National Plant Board, and USDA with funding from the Farm Bill. Once fully implemented, it will provide growers with the tools necessary to help reduce pest risk, facilitate movement of plant material, and produce higher quality nursery stock while minimizing movement of plant pests.



A SANC pilot program being initiated this summer will include eight nursery and greenhouse facilities of various sizes across the four Plant Board regions. The pilot will test the feasibility and effectiveness of an audit-based certification system prior to implementation of the program nationally. Included in the pilot will be training for regulatory staff from the participating states and initial visits to the selected nurseries and greenhouses, followed by risk assessments at the pilot facilities, review of best management practices, and development of facility SANC manuals. It is anticipated that the program will be phased in over several months to accommodate seasonal demands and resources and will likely continue for 2 to 3 years to provide the SANC steering committee with adequate information on program successes and needs for adjustment. For more information on the SANC program as well as resource materials, go to www.SANC.nationalplantboard.org.

RESEARCH

Hayden, K.J.; Garbelotto, M.; Knaus, B.J.; Cronn, R.C.; Rai, H.; and Wright, J.W. 2014. Dual RNA-Seq of the Plant Pathogen *Phytophthora ramorum* and Its Tanoak Host. *Tree Genetics & Genomes*, 1-14.

Abstract: Emergent diseases are an ever-increasing threat to forests and forest ecosystems and necessitate the development of research tools for species that often may have few preexisting resources. We sequenced the mRNA expressed by the sudden oak death pathogen *Phytophthora ramorum* and its most susceptible forest host, tanoak, within the same tissue at two time points after inoculation, and in uninfected tanoak controls. Using the *P. ramorum* genome to differentiate host and pathogen transcripts, we detected more than 850 *P. ramorum* transcripts at 5 days post-inoculation and a concurrent upregulation of host genes usually associated with pathogenicity. At 1 day, in contrast, we did not detect pathogen expression or significant enrichment of functional categories of host transcripts relative to controls, highlighting the importance of sequencing depth for *in planta* studies of host–pathogen interactions. This study highlights processes in molecular host–pathogen interactions in forest trees and provides a first reference transcriptome for tanoak, allowing the preliminary identification of disease-related genes in this study and facilitating future work for this and other members of the family Fagaceae.

Zappia, R.E.; Hüberli, D.; St. J. Hardy, G.E.; and Bayliss, K.L. 2014. **Fungi and Oomycetes in Open Irrigation Systems: Knowledge Gaps and Biosecurity Implications.** *Plant Pathology*. 12 pages. (Early View) DOI: 10.1111/ppa.12223.

Abstract: Water used for the irrigation of plants has the potential to harbour and spread plant pathogens yet little research is conducted within this field. This review was undertaken to critically review current understanding of waterborne fungal and oomycete plant pathogens in open irrigation systems, particularly in the context of plant biosecurity. It was determined that very limited data exists on these plant pathogens, with the majority of previous studies only recording pathogen presence. There are significant gaps in current knowledge of pathogen survival and spread, and very limited information on their



ability to cause disease when contaminated irrigation water is applied to crops. This review highlights the need for new research on the epidemiology and pathogenicity of putative plant pathogens isolated from water, in order to determine their risk to crops. The importance of regular monitoring of irrigation systems for the early detection of plant pathogens is also discussed.

RELATED ISSUES

Surveys of juniper (*Juniperus communis*) stands in northern Britain have revealed that the recently emerged pathogen *Phytophthora austrocedrae* is more widespread than was previously thought. Over thirty juniper woodlands throughout Scotland, Cumbria, County Durham and North Yorkshire are now confirmed to be infected, with juniper showing symptoms of foliage discoloration and dieback, mainly as a result of basal lesions. In 2011, *P. austrocedrae* was isolated from a single specimen each of *Chamaecyparis lawsoniana* and *Chamaecyparis nootkatensis* in Scotland. So far all isolates of the pathogen in Britain conform to a single genotype, which is distinct from the genotype occurring in Argentina. Currently the geographical origin of *P. austrocedrae* is unknown. The current reported distribution of *P. austrocedrae* is limited to Argentina, Chile and the findings in the UK. It is not known how the pathogen entered the UK.



Phytophthora austrocedrae infected juniper, Durham County, Northern England, July 2011.
Photo by: Forest Research, Crown Copyright.

Outbreaks of *Phytophthora lateralis* on Lawson cypress (*Chamaecyparis lawsoniana*, or Port Orford cedar) have been occurring sporadically in the UK since the pathogen was first reported there in 2010. To date, 14 infected sites have been confirmed in Scotland, five in England, one in Wales, and several in Northern Ireland. Most sites are plantings in public or private non-commercial settings, several of which are adjacent to commercial nurseries. *P. lateralis* has also been found infecting *Chamaecyparis pisifera* and *Thuja occidentalis* (arbor-vitae or northern white cedar), and most recently was confirmed



causing foliage infections on *Thuja plicata* (western redcedar) near Stirling, Scotland; a new host record for this pathogen.



Phytophthora lateralis infected Lawson cypress, Dumbartonshire, Scotland, January 2014
Photo by: Forest Research, Crown Copyright.

RESOURCES

USDA APHIS has updated their *P. ramorum* website

(http://www.aphis.usda.gov/wps/portal/aphis/ourfocus/planthealth?1dmy&urile=wcm%3apath%3a%2FAPHIS_Content_Library%2FSA_Our_Focus%2FSA_Plant_Health%2FSA_A_Domestic_Pests_And_Diseases%2FSA_Pests_And_Diseases%2FSA_Plant_Disease%2FSA_PRAM). Included on the new site are updates to regulatory requirements (see Federal Order DA-2014-02), a new inspection and sampling protocol, a revised water sampling protocol for nurseries, and a new confirmed nursery protocol.

MEETINGS

The IUFRO 2014 World Congress “Sustaining Forests, Sustaining People, The Role of Research;” meeting, to be held in Salt Lake City, Utah this year, will focus on seven themes: [Forests for People](#); [Forest Biodiversity and Ecosystem Services](#); [Forests and Climate Change](#); [Forest and Water Interactions](#); [Forest Biomass and Bioenergy](#); [Forests and Forest Products for a Greener Future](#); and [Forest Health in a Changing World](#), which includes a discussion on the ever-increasing vital role of citizen scientists. For more details on the meeting, see the ‘Calendar of Events’ below.

**CALENDAR OF EVENTS**

- 5/10 - Contra Costa SOD Blitz Training; Orinda Public Library; 26 Orinda Way, Orinda; 10:00 – 10:45 a.m.;** For more information, contact William Hudson at wllhh@gmail.com.
- 5/10 – Alameda SOD Blitz Training; UC Berkeley Campus; 159 Mulford Hall, Berkeley; 1:00 -1:45 p.m.;** For more information, contact Toni Mohr at toni.mohr@gmail.com.
- 5/16 - San Luis Obispo SOD Blitz Training; SLO County Department of Agriculture; 2156 Sierra Way, San Luis Obispo; 7:00 – 7:45 p.m.;** For more information, contact Lauren Brown at lbrown805@charter.net.
- 5/17 - San Mateo-Santa Clara, Woodside-Portola Valley/Emerald Hills/San Carlos/Atherton SOD Blitz Training; Woodside Town Hall; 2955 Woodside Road, Woodside; 10:00 – 10:45 a.m.;** For more information, contact Debbie Mendelson at sodblitz@gmail.com.
- 5/18 - Santa Clara SOD Blitz Training; Montalvo-Saratoga-Los Gatos; Montalvo Arts Center; 15400 Montalvo Road, Saratoga; 10:00 – 10:45 a.m.;** For more information, contact Kelly Sicat at KSicat@montalvoarts.org or president@cnps-sev.org.
- 5/22 - San Francisco SOD Blitz Training; Golden Gate Park Presidio and Golden Gate Park Rec. Room; San Francisco County Fair Building; Golden Gate Park near 9th Ave. & Lincoln Way, San Francisco; 10:00 – 10:45 a.m.;** For more information, contact Eric Anderson at eric.anderson@sfgov.org.
- 5/24 - Santa Clara, Los Altos Hills SOD Blitz Training; Los Altos Hills Town Hall; 26379 Fremont Road, Los Altos Hills; 10:00 – 10:45 a.m.;** For more information, contact Sue Welch at sodblitz09@earthlink.net.
- 5/31 – Napa SOD Blitz Training; UCCE Meeting Room; 1710 Soscol Avenue, Napa; 10:00 – 10:45 a.m.;** For more information, contact Bill Pramuk at info@billpramuk.com.
- 10/5 – 10/10 – IUFRO 2014 World Congress “Sustaining Forests, Sustaining People, The Role of Research;” Salt Lake City, Utah;** For more information or to register, go to <http://iufro2014.com/scientific-program/overview/> or contact John A. Parrotta at (703) 605-4178.
- 11/3 – 11/6 - 7th California Oak Symposium; Visalia Convention Center, Visalia;** For more information, go to http://ucanr.edu/sites/oaksymposium/?utm_source=Oak+Symposium+2014+Save+the+Date&utm_campaign=oak+symposium&utm_medium=email.
- 11/10 – 11/14 - Seventh meeting of the IUFRO Working Party 7.02.09 “Phytophthora in Forests and Natural Ecosystems;” Esquel, Argentina.** For more information, registration, or abstract submission details, go to <http://www.iufrophytophthora2012.org/>.
- 11/12 – 11/13 - 2014 Annual Meeting of the California Forest Pest Council; USDA Forest Service, Wildland Fire Training & Conference Center; 3237 Peacekeeper**



Way; McClellan; More information will be forthcoming. For more information, contact Katie Palmieri at kpalmieri@berkeley.edu.