



## CALIFORNIA OAK MORTALITY TASK FORCE REPORT

### JUNE 2023

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**Editors' note:** This month we feature our revised comprehensive sudden oak death and *Phytophthora ramorum* [bibliography](#). This provides a moment to express thanks to the scientists, funders, administrators, legislators, and others who made this work possible.

Over the next few issues, we will be providing status updates for *P. ramorum* in Europe, starting this month with France.

#### RESEARCH

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A complete [bibliography](#) for sudden oak death and *P. ramorum* has been revised and is now available on [www.suddenoakdeath.org](http://www.suddenoakdeath.org). Over the past twenty-five years, over 600 scientific papers by more than a thousand authors have been published about sudden oak death or *P. ramorum*. The first paper to mention the disease came out in 1997, “Triebsterben an rhododendron: Unbekannte Phytophthora” in *Deutscher Gartenbau* (“Dieback of rhododendrons: Unknown *Phytophthora*” in German Horticulture) by Werres and Marwitz. The year with the most publications is 2006 with over 150, but that is partly due to the publication of the Second Sudden Oak Death Science Symposium Proceedings with over 90 papers, 571 pages. From 1997 to 2023, papers have been published by lead authors in 22 countries: U.S. (485), U.K (67), Germany (23), Canada (20), Spain (12), Belgium (11), Italy (11), The Netherlands (10) and 12 other countries each with less than 10 *P. ramorum*-related publications.

If you notice that we overlooked a paper on sudden oak death or *P. ramorum* that needs to be added, please contact Janice Alexander, [jalexander@ucanr.edu](mailto:jalexander@ucanr.edu).

#### UPDATE ON *P. RAMORUM* IN FRANCE

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*P. ramorum* was first detected in nurseries in France in 2002 with the first forest outbreaks identified in 2017 in *Larix kaempferi* (Japanese larch) plantations in two forests in Brittany (Saint-Cadou and Hanvec). The stands, infested with the EU1 lineage, and a buffer of neighboring healthy-appearing stands, were clearcut to destroy the infestation. Over the past few years intensive surveys including rain traps and litter sampling were conducted in larch stands within a 15 km (9 mile) radius of the outbreaks to check for pathogen spread in western Brittany. In and near the treated area, native woody hosts were surveyed along with areas adjacent to six ornamental nurseries that had been previously infected by *P. ramorum*. In 2018-21, a very limited presence of *P. ramorum* was detected. Two new stands of infected *L. kaempferi* were found close to the initial outbreak, in Saint-Cadou and Saint-Rivoal. In the Saint-Cadou state forest, *P. ramorum* was detected, in 2019-21, on chestnut trees (*Castanea sativa*) in an area where all the mature larch trees had been removed. *P. ramorum* was also detected on chestnut and rhododendron in the vicinity of two of the ornamental nurseries that were previously positive. While larch and rhododendron are infrequent in Brittany forests, chestnuts are present in 21-25% of forest lands and thus represent the major risk for survival of *P. ramorum* in the area.

At a national scale, France's Forest Health Department (Département de la santé des forêts, DSF) conducts annual surveillance on 50 to 60 mature larch stands and 150 larch plantations. To date,



no *P. ramorum* has been detected. For more information contact Claude Husson, Département de la Santé des Forêts, [claud.husson@agriculture.gouv.fr](mailto:claud.husson@agriculture.gouv.fr) or Benoit Marcais, [benoit.marcais@inrae.fr](mailto:benoit.marcais@inrae.fr).

**Figure 1. *P. ramorum* symptoms on chestnut showing necrotic lesions on shoots. Photos courtesy of the French National Research Institute for Agriculture, Food and Environment (INRAE).**



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#### ***P. RAMORUM* IN OREGON - OUTREACH**

Join experts from Oregon Department of Agriculture for an **informational community meeting on the status of Ramorum blight in Lincoln City** (Lincoln County, Oregon). The meeting will be held on Monday, June 26<sup>th</sup>, 4:00 – 5:00 p.m. at the North Lincoln Fire & Rescue Station, in Lincoln City and online via Zoom. Registration is free and required. To register and for more information, visit <https://beav.es/Sv7> or email OSU Extension Forester Dan Stark, [Dan.Stark@oregonstate.edu](mailto:Dan.Stark@oregonstate.edu).

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#### **CITIZEN SCIENCE – 2023 CALIFORNIA SOD BLITZ**

The 2023 [Sudden Oak Death \(SOD\) Blitz](#) continues with Bay Area and North Coast surveys in June. For 2023, over twenty citizen science surveys for *P. ramorum* are being conducted from Big Sur to Del Norte County to track disease incidence and pathogen spread. The program is a cooperative effort led by Matteo Garbelotto and Doug Schmidt, UC Berkeley Forest Pathology and Mycology Laboratory, and local partners in each county. Training materials and instructions are online and may be a helpful refresher for anyone interested in recognizing symptoms of sudden oak death/*P. ramorum*. The results from the 2022 surveys are also [available](#). For a complete list of scheduled blitzes and info on how to join one (or more) see [sodblitz.org](http://sodblitz.org) or contact Doug Schmidt, [dschmidt@berkeley.edu](mailto:dschmidt@berkeley.edu).

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#### **NURSERIES AND MANAGED LANDSCAPES**

**California Department of Food and Agriculture (CDFA) *P. ramorum* nursery program update: Spring compliance inspections complete.** Earlier this year, regulated nurseries in counties quarantined for *P. ramorum* and five California nurseries that were previously positive for *P. ramorum* were inspected and sampled in compliance with 7 CFR 301.92. Four nurseries, all in *P. ramorum* quarantine counties, were confirmed positive for *P. ramorum*. Two additional nurseries were also confirmed positive after trace-forward investigations found positive plants at those nurseries. This brings the total to six positive nurseries in California for 2023. All positive



nurseries are undergoing, or have completed, the USDA's Interstate Confirmed Nursery Protocol for Interstate Nurseries Containing *Phytophthora ramorum* or the Confirmed Retail Nursery and Retail Nursery Dealer Protocol. Trace investigations searching for potentially positive plants shipped from the positive nurseries are still underway. For more information contact Carolyn Lambert, Carolyn.Lambert@cdfa.ca.gov.

**Oregon Department of Agriculture (ODA) *P. ramorum* nursery program update.**

Currently, there are seven nurseries participating in the ODA *Phytophthora ramorum* Nursery Program. Five of the nurseries are interstate shippers under federal compliance agreements (7 CFR 301.92). They are in Washington (2), Columbia (1), and Marion (2) Counties. One of the two nurseries in Washington County was newly added to the program in May 2023. Two nurseries are intrastate shippers operating under state compliance agreements (both 7 CFR 301.92 and OAR 603-052-1230) in Clackamas and Linn Counties.

Compliance inspections for the 2023 spring season began on March 14<sup>th</sup>. There were six nurseries which required a compliance inspection entering the sampling season. One nursery tested positive for *P. ramorum* with ten positive rhododendron plants detected (Figure 2). One delimitation has been completed and results are pending from the lab. All other nurseries tested negative for *P. ramorum* during the spring compliance inspection.



**Figure 2. Images of three rhododendron plants found to be positive for *P. ramorum* during the spring 2023 compliance inspection. Photos courtesy of ODA.**

One interstate shipping nursery was added to the program in April. An ODA inspector observed host plants in poor health during an annual nursery inspection. *Prunus laurocerasus* (cherry laurel) plants were sampled and one was confirmed positive for *P. ramorum*. The first delimitation was completed in early April and ten additional positives were detected: *Viburnum* spp. (2), *Pieris* spp. (4), *Arbutus unedo* (1), *Rhododendron* (1), *Gaultheria shallon* (1), and *Prunus laurocerasus* (1). A second delimitation inspection has been completed and results are pending from the lab.





**Figure 3. From left to right: images of *Gaultheria shallon*, *Pieris* spp., and *Prunus laurocerasus* plants found to be positive for *P. ramorum* during the first delimitation at a Washington County nursery. Photos courtesy of ODA.**

To be released from the program, nurseries must achieve six consecutive negative results from compliance inspections over three years. No nurseries were eligible to be released from the program this spring. For more information, please contact Chris Benemann (chris.benemann@oda.oregon.gov) or Kaitlin Gerber (kaitlin.gerber@oda.oregon.gov).

**Washington State Department of Agriculture (WSDA) *P. ramorum* program update.** In May, WSDA received trace-forward information on plants that shipped to ten homeowners from a positive out-of-state nursery. Inspectors are following up at each location and all samples collected so far have been negative. For more information contact Scott Brooks, SBrooks@agr.wa.gov.

#### RELATED RESEARCH

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**Avila-Quezada, G.D.; Rai, M. 2023.** Novel nanotechnological approaches for managing *Phytophthora* diseases of plants. Trends in Plant Science. <https://doi.org/10.1016/j.tplants.2023.03.022>.

**Coomber, A.; Saville, A.; Carbone, I.; Ristaino, J. 2023.** An open T base phylogeny for emerging *Phytophthora* species. Plos One. <https://doi.org/10.1371/journal.pone.0283540>.

**De Zoysa, G.H.; Schwendenmann, L.; Waipara, N.; Sarojini, V. 2023.** Evaluating the potential of environmentally friendly compounds to deactivate different life stages of *Phytophthora* species. Plant Pathology. <https://doi.org/10.1111/ppa.13717>.

**Guégan, J.F.; de Thoisy, B.; Gomez-Gallego, M.; Jactel, H. 2023.** World forests, global change, and emerging pests and pathogens. Current Opinion in Environmental Sustainability. 61: 101266. <https://doi.org/10.1016/j.cosust.2023.101266>.



Liew, E.C.; Phelan, M.; McDougall, K.L. 2023. The efficacy of a range of hygiene measures for boot cleaning to protect natural vegetation from *Phytophthora cinnamomi*. Scientific Reports. 13(1): 5825. <https://www.nature.com/articles/s41598-023-32681-7>.

Sarker, S.R., Burgess, T.I., Hardy, G.E.S.J. 2023. Closing the gap between the number of *Phytophthora* species isolated through baiting a soil sample and the number revealed through metabarcoding. Mycological Progress. 22: 39. <https://doi.org/10.1007/s11557-023-01892-7>.

Summerell, B.A. 2023. The impact of plant diseases on wildlife in Australia. Australian Zoologist. <https://doi.org/10.7882/AZ.2023.016>.

#### DIAGNOSTICS AND TAXONOMY

Abad, Z.G.; Burgess, T.I.; Redford, A.J.; Bienapfl, J.C.; Srivastava, S.; Mathew, R.; Jennings, K. 2023. IDphy: An international online resource for molecular and morphological identification of *Phytophthora*. Plant Disease. 107(4): 987-998. <https://doi.org/10.1094/PDIS-02-22-0448-FE>.

The screenshot shows the IDphy website interface. At the top, the title "IDphy: molecular and morphological identification of *Phytophthora* based on the types" is displayed. Below the title is a navigation bar with links: ABOUT, FACT SHEETS, KEY, MOLECULAR, MORPHOLOGY, GLOSSARY, and GALLERY. A search bar is located on the right side of the navigation bar. The main content area is titled "PHYTOPHTHORA RAMORUM". Below this title, there is a section for "NAME AND PUBLICATION" which includes the species name "Phytophthora ramorum" and its publication details: "Werres S., Marwitz R., Man in 't Veld WA, de Cock AWAM, Bonants PJM, de Weerd M., Themann K., Ilieva E., and Baayen RP. 2001. *Phytophthora ramorum* sp. nov., a new pathogen on *Rhododendron* and *Viburnum*. Mycol. Res. 105: 1155-1165. Corresponding author: s.werres@bba.de". To the left of this text is a small image showing a phylogenetic tree. Below the "NAME AND PUBLICATION" section is a section for "NOMENCLATURE" which states "from Werres et al. (2001)".