CALIFORNIA OAK MORTALITY TASK FORCE REPORT
NOVEMBER 2004

MONITORING

Seven new *P. ramorum* infested areas were detected in Humboldt County a few miles from the Redway suppression area. The infested areas are north and northwest of the Garberville Airport, between Redway and Briceland. Eleven positive samples from tanoak, huckleberry, and California bay laurel were detected by the USDA Forest Service and California Polytechnic State University – San Luis Obispo Aerial Survey. Suppression projects are planned for these new finds. For more information, contact Jeff Mai at jmai@fs.fed.us. *P. ramorum* was also recovered from the South Fork of the Eel River, approximately 8 km downstream from areas under suppression in the town of Redway, Humboldt County. (See watershed monitoring below.)

Watershed Monitoring - Led by David Rizzo (UC Davis), Shannon Murphy and John Bienapfl of the Rizzo laboratory, along with Yana Valachovic and Chris Lee, UCCE Humboldt/Del Norte, established a network of thirty-five sampling locations in February 2004 to monitor for the presence of *Phytophthora ramorum* in rivers, streams, and creeks throughout coastal northern California watersheds. The primary areas of focus included Alameda, Contra Costa, Del Norte, Humboldt, and Mendocino Counties. These are areas where detection of *P. ramorum* has been limited, but ecological parameters and risk models predict them to be high-risk areas. Two sites in Sonoma County were also included to provide a baseline for successful recovery of the pathogen.

Disease-free Rhododendron leaves were placed in mesh bags and secured with rope to stream banks in watercourses for 1 to 3 week intervals in order to bait for Phytophthora species. The length of time that leaves were left in the streams was dependent on stream flow and water temperature. In general, perennial watercourses were selected to allow for year-round sampling. Leaves were recovered from streams and returned to the laboratory, where symptomatic leaves were plated on Phytophthora-selective media.

P. ramorum was successfully recovered at all sites previously identified as infested through forest surveys. The pathogen was recovered at three additional sites downstream of known forest infestations, but no plants were infected immediately adjacent to the stream site. The first of these sites is along Copeland Creek on the California State University (CSU) Sonoma campus, approximately 7 km downstream from heavily infested Fairfield Osborn Preserve. Another of these sites is along the South Fork of the Eel River, approximately 8km downstream of known infestation in the town of Redway, Humboldt County. The third site was approximately 3 km downstream from known infestation along Indian Creek in Mendocino County. Additionally, *P. ramorum* was recovered at three sites without prior known forest infestation. Two sites, along Bear Creek and Abrigo Creek in Briones Regional Park, Contra Costa County, have had *P. ramorum* recovery from trees at other locations approximately 2 km away within the park, but not adjacent to, or upstream from, these sites. *P. ramorum* has since been recovered in 2004 from CA bay laurel trees adjacent to Bear Creek only. Another site in

Redwood Creek, approximately 1km west of the town of Redway, has had successful pathogen recovery without known adjacent or upstream forest infestation.

Stream monitoring provides a method of early detection for *P. ramorum* infestation. Future work will include the addition of monitoring sites in Monterey and San Luis Obispo Counties at the southern extent of the known *P. ramorum* range. In addition, research questions related to spread and survival of this pathogen in watercourses will be addressed.

To date, the US Forest Service *P. ramorum* Nursery Perimeter and General Forest Survey has sampled 620 nursery perimeter locations in 32 states. Of the 2,454 samples submitted, all were negative for *P. ramorum*. Additionally, 404 general forest locations in 18 states have also been surveyed, with 1,249 samples submitted. Of those submitted, two (from one location) tested positive for *P. ramorum*. The positive confirmations were CA's Golden Gate Park finds in San Francisco County. This survey is being done in close cooperation with the USDA APHIS *P. ramorum* National Nursery Survey. Survey methods are posted at http://www.na.fs.fed.us/spfo/fhm/sod/sod_natnl.pdf. For more information, contact Borys Tkacz at Btkacz@fs.fed.us.

RESEARCH

The draft report from the USDA Animal and Plant Health Inspection Service (APHIS), Plant Protection and Quarantine (PPQ) *P. ramorum* Science Panel Workshop is available at http://www.aphis.usda.gov/ppq/ispm/sod/sciencepanel.html. The Center for Plant Health Science and Technology (CPHST) convened the science panel in Raleigh, North Carolina on 6/29 and 6/30/04. The panel of 75 North American and European scientists and regulators with *P. ramorum* expertise reviewed and discussed current scientific information on *P. ramorum* biology. The discussions were captured in 65 questions from six categories: General, Biology and Ecology, Epidemiology, Control and Eradication, Survey and Monitoring, and Diagnostics. For more information, contact Russ Bullock at Russ.Bulluck@aphis.usda.gov.

The Cooperative State Research Education and Extension Service (CSREES) Multi-state Project W-501, Management of *Phytophthora ramorum* in U.S. Nurseries, had its first meeting 10/4 – 10/5 in Corvallis, Oregon. There were 31 participants from seven states in attendance. The purpose of the initial 2-year project is to provide a multi-state forum for the exchange of information and coordination of research and extension activities on *P. ramorum* in nurseries. Jim Green, CSREES National Program Leader for Horticulture, described funding mechanisms for collaborative work. After brief introductory presentations, the group prioritized issues and needs for future research and extension, discussed possible collaborative projects, and considered the desirability of continuing as a regular 5-year multi-state research project. This requires submission of a proposal by 1/15/05. The group also drafted a resolution regarding current diagnostic protocols. Participants continued discussions during visits to the Hansen, Parke, Linderman, and Grunwald labs. W-501 intends to meet for a field trip 1/18/05 in conjunction with the Sudden Oak Death Science Symposium II in Monterey, CA. For

further information about W-501, or if you are interested in joining, please contact Jennifer.Parke@oregonstate.edu or Administrative Advisor Donald.Cooksey@ucr.edu.

Recently Published *P. ramorum* Paper - "Sudden Oak Death (*Phytophthora ramorum*) Discovered on Trees in Europe;" *Mycological Research News* 108(10): 1107-1100 (October 2004); Clive Brasier, Sandra Denman, Anna Brown, and Joan Webber; Forest Research Agency, Alice Holt Lodge, Farnham, Surrey GU10 4LH, UK. E-mail: clive.brasier@forestry.gsi.gov.uk

"Sudden Oak Death (*Phytophthora ramorum*) on trees in Europe" documents European wildland *P. ramorum* finds, providing an update to the March 2003 publication (Mycological Research 107 (3) 258-259), which described biological aspects of European nursery and North American forest detections of *P. ramorum*. Additionally, the October 2004 article introduces a second new Phytophthora, informally called *Phytophthora* taxon C, which was discovered causing bleeding cankers on beech at the two most affected Cornish sites. Like *P. ramorum*, *P.* taxon C is spreading on rhododendrons and is dispersed aerially or via splashing. The article discusses eradication efforts and hypothesizes on the origin of these new Phytophthoras. To view the article in its entirety, go to the Mycological Research News website at http://www.britmycolsoc.org.uk/news/shownews.asp?NewsID=63

The 14th Ornamental Workshop on Diseases and Insects was hosted by NC State University (NCSU) in Hendersonville, NC 9/27 – 10/1. Approximately 140 participants from universities, government entities, and private industry across the nation were in attendance. Presentations and discussions included "Sudden Oak Death: How a forest disease has put the nursery industry at risk" by Mike Benson (NCSU); the "National pilot survey for *P. ramorum*-nurseries" led by Jean Williams-Woodward (University of Georgia); and "Oak diseases that might be confused with SOD" by Ann Gould (Rutgers University) and John Hartman (University of Kentucky). "Ornamental diseases that might be confused with SOD" was led by Sue Spencer (NC Dept Ag & Consumer Services), with "Camellia" covered by Steve Jeffers (Clemson University), "Rhododendron" by Mike Benson, "Pieris" by Melodie Putman (Oregon State University), "Viburnum" by Karen Rane (Purdue University), and "Other hosts" by Colleen Warfield (NCSU). "Selecting the right tissue for analysis" was addressed by Sharon Von Broembsen (Oklahoma State University); Karen Snover-Cliff (Cornell University) presented "The National Plant Diagnostic Network and how it responded to SOD;" and Kelly Ivors (NCSU) presented "ELISA, nested PCR, and isolation of *Phytophthora ramorum*- pitfalls in detection."

Ivors presented data collected from various labs on *P. ramorum* diagnostic results using the three techniques recommended by APHIS for detection of the pathogen. A comparison of results indicated that nested PCR assays do not always agree with culture isolation results (24 - 38% of the time these tests do not agree based on data from 2 laboratories), and that no one current method is more sensitive than the other. However, if *P. ramorum* cultures were obtained, the ELISA assay always yielded a positive

reaction. This indicates that utilizing the ELISA assay for pre-screening samples can be an effective way of reducing the number of samples to be processed. Detection of *P. ramorum* is complicated and can be dependent on sample collection and storage, climactic conditions during the time of sampling, substrate and infection level of the sample, and experience of the diagnostician with using these techniques. For more information, contact Kelly Ivors at kelly_ivors@ncsu.edu.

NURSERIES

Four additional nurseries in Oregon have been identified with *P. ramorum*-positive plants. Three of the nurseries are quite small and do not routinely ship interstate, while the fourth is a small to medium size nursery that does do some out-of-state shipping. Three of the nurseries are located in the northern part to the Willamette Valley and the fourth is in southwestern Oregon. All are relatively close to the I-5 corridor. Infected plant material at the nurseries included *Pieris* spp., *Rhododendron* spp., and *Viburnum davidii*. USDA's Confirmed Nursery Protocol has been initiated at all four facilities.

To date this year, the Oregon Department of Agriculture has surveyed and tested 789 nurseries and 588 Christmas tree growers under its *Phytophthora ramorum*-Free Program. Oregon's Christmas trees were all certified as free from the pathogen following the statewide inspection and certification program conducted by the Oregon Department of Agriculture (ODA). As the leading producers of Christmas trees in the U.S., Oregon's nursery industry and Christmas tree producers had requested the mandatory certification program to assure customers that Oregon trees are free from the pathogen. For more information, contact Gary McAninch, ODA, at gmcaninc@oda.state.or.us.

The USDA APHIS PPQ *Phytophthora ramorum* National Nursery Survey activities are complete in 38 states and Puerto Rico. As of 10/14, participating states throughout the US have surveyed 3,095 sites and have collected 50,820 samples, with 15 national survey sites having been confirmed positive. For more information, see the Cooperative Agricultural Pest Survey site at www.ceris.purdue.edu/napis/maps/pstsurvey.html#sod.

Currently there are 164 USDA APHIS confirmed positive *P. ramorum* sites in 21 states from trace-forward, national, and other surveys. The breakdown per state is: AL (3), AR (1), AZ (1), CA (53), CO (1), FL (6), GA (16), LA (5), MD (2), NC (9), NJ (1), NM (1), NY (1), OK (1), OR (18), PA (1), SC (4), TN (2), TX (11), VA (2) and WA (25).

LEGISLATION

The US House of Representatives unanimously passed the "National Plan for the Control and Management of Sudden Oak Death" (H.R.4569 Burns, GA) on 10/5/04. The legislation does not appropriate funds for disease management, but it does authorize the USDA to identify all possible host plants for *P. ramorum*; determine the national scope of the pathogen; research past and current control, quarantine, and hazardous fuel reduction methods; and identify a national plan with cost estimates for disease eradication. The Bill will be heard in the Senate when they are back in session.

EDUCATION

The "*Phytophthora ramorum*: Educate to Detect (PRED)" nationwide training session for Master Gardeners was held on 10/26/04. The training session was the first step in educating Master Gardeners and other ornamental support staff on the history and biology of the pathogen, symptoms and common look-alikes, regulations, and sample submission procedures. At 115 training sites in more than 40 states across the nation, over 730 participants simultaneously viewed a PowerPoint slideshow and listened to narration through a conference call line. A panel of experts answered questions following the presentation. California hosted 12 training centers across the State, primarily at UC Cooperative Extension offices. In California, all of the plant samples taken by trained Master Gardeners will be submitted to local County Agricultural Departments before being sent to a lab for diagnosis.

To access the PRED training materials, go to the North Central Integrated Pest Management (IPM) Center website at http://ncipm.org/sod/ or the COMTF website at www.suddenoakdeath.org. For more information on the PRED program, contact Susan Ratcliffe, North Central IPM Facilitator, at sratclif@uiuc.edu; Carla Thomas, Deputy Director, Western Plant Diagnostic Network, at cthomas@ucdavis.edu; or Janice Alexander, COMTF Outreach Coordinator, at jalexander@ucdavis.edu.

"*P. ramorum* – a guide for Washington nurseries" is now available. The guide covers host and associated plant species, host symptoms, pathogen biology, disease prevention, cultural management, protection and suppression with fungicides, and detection and eradication. It also offers resources for further information and updates and has many descriptive color photos. For a copy of the guide, go to the Washington State Nursery and Landscape Association website at http://www.wsnla.org/cgi-bin/artman/exec/search.cgi?cat=39&start=6&perpage=5&template=index/news.html.

TASK FORCE BUSINESS

The COMTF Executive Committee met on 9/23 for an annual Strategic Planning Session. Agenda items included review of the Task Force Mission and Goals statement and the 2004 Work Plan, as well as development of the 2005 Work Plan. Minor changes were made to the Mission and Goals statement to reflect current areas of focus and work. The 2004 Work Plan was reviewed for accomplishments, and the 2005 Work Plan was developed, incorporating ongoing projects from 2004 as well as additional projects necessary to meet the coming year's demands. To review these documents, go to www.suddenoakdeath.org.

CALENDAR OF EVENTS

11/4 – Eureka, CA "*Phytophthora ramorum* (Sudden Oak Death) Issues in Nurseries" one-day training session for nursery managers and staff, landscape contractors, arborists, and others; Humboldt County Agricultural Center; 5630 South Broadway, Eureka; $15 registration for lunch and materials; For more information, or to register for the training, call Chris Lee, UC Cooperative Extension, at (707) 445-7351.

11/13 – Wildlife Conservation Society Presentation on Sudden Oak Death Work and Field Research in the Big Sur Area; 3:00 p.m.; Henry Miller Library along Route 1; Light refreshments will be served; For more information, call (831) 667-2574.

11/17 – Oregon State University Sudden Oak Death "Workshop for Foresters, Christmas Tree Growers, and Conifer Nursery Managers in the Northwest;" This one-day training session at the Hilton Hotel in Eugene, OR will focus on *P. ramorum* and the Pacific Northwest forestry industry. It will cover topics such as disease avoidance and direct control with fungicides. Quarantine regulations will also be highlighted, along with discussion of potential biological and regulatory impacts should the disease spread. Registration is $30. For more information, or to register, go to http://outreach.cof.orst.edu/sod/agenda.htm.

11/30 – Department for Environment, Food, and Rural Affairs (DEFRA) second annual *Phytophthora ramorum* meeting for government and industry representatives; Emmanuel Centre, London; The focus of the meeting will be to discuss progress since last year's meeting. Speakers from the USA, Europe, and industry representatives will talk about their experiences. Space is limited. To register, contact the UK Plant Health Headquarters at planthealth.info@defra.gsi.gov.uk.

12/2 – "Conservation Planning for California's Oak Woodlands" in Riverside, CA; Sponsored by UC Berkeley Integrated Hardwoods Range Management Program, Division of Ag. and Natural Resources; Intended for planners, agency personnel supervisors, consultants, and interested parties. Registration is $50 before 11/26, and $60 thereafter. For more information, contact Sherry Cooper at 530-224-4902 or via email at: slcooper@nature.berkeley.edu.

1/18 – 21/05 - Second Sudden Oak Death Science Symposium, Marriott Hotel, Monterey, CA. For Symposium program content, contact Rick Standiford, UC Berkeley Center for Forestry, at standifo@nature.berkeley.edu or Pat Shea, USDA Forest Service Pacific Southwest Research Station, at pjshea@davis.com. Updates on the meeting will be posted at http://nature.berkeley.edu/forestry/sodsymposium.

PERSONNEL

Dr. Pedro Uribe is a new post-doctoral research associate with the USDA Agricultural Research Service (ARS) working on molecular detection of *Phytophthora ramorum*. He is located in Salinas with Dr. Frank Martin, but also will be collaborating with Drs. Paul Tooley and Nina Shishkoff at the USDA-ARS lab in Fort Detrick, MD. The focus of his project will be optimizing the molecular detection methods for *P. ramorum* (primarily the mitochondrial marker system for traditional and real-time PCR) and additional field validation of the technique. He recently completed his Ph.D. in Plant Pathology at Texas A & M under the direction of Dr. Doug Cook. Dr. Uribe can be reached at (831) 755-2800.

HOST OF THE MONTH

Two plants have been added to the USDA Animal and Plant Health Inspection Service associated plant list: *Photinia fraseri* and *Viburnum x rhytidophylloides*.

***Viburnum x rhytidophylloides* - Alleghany or Willowood Viburnum (Caprifoliaceae)** – is a hybrid of *V. rhytidophyllum*, a native of central and western China, and *V. lantana*, native to Europe. Popular in the US Midwest, Alleghany Viburnum is commonly used as a screening shrub. Averaging 10 ½ ft. tall and 11 ft. wide, this dense shrub is deciduous to semi-evergreen. Easy to transplant and grow, it thrives in full sun or partial shade and prefers moist, well-drained soil. Alleghany Viburnum is distinguishable from related cultivars by its very dark green leathery leaves, bacterial leaf spot resistance, and hardiness. Its abundant cymes of small, yellowish-white fertile flowers bloom in late spring, while its brilliant red fruit are seen in September and October. When the fruit is completely ripe, it turns to a blue-black color and is enjoyed as a food source by birds.

P. ramorum-positive *Viburnum x rhytidophylloides* were identified in a Washington County, Oregon nursery that irrigates from overhead sprinklers. Initial samples were taken on 6/24/04. Infected plants were located adjacent to other non-symptomatic Viburnums. Alleghany Viburnum symptoms were limited to lower leaf discoloration. Results on subsequent samples to verify whether other plants were infected are still pending.

Resources:

- U.S. National Arboretum Plant Introduction
  Floral and Nursery Plants Research Unit
  http://www.usna.usda.gov/Newintro/allegh.html
- Personal communication, Karl Puls, Oregon Department of Agriculture

***Photinia fraseri* - Red tip or Fraser's photinia (Rosaceae)** – is a hardy evergreen shrub native to China that grows 10 – 12 ft. Used as a hedge or informal screen, Fraser's photinia is used for year-round color. Its dense, attractive toothed foliage is 5 inches long and tinged red when young, followed by a glossy dark green color. In the spring, lacy white flower clusters can be seen, while in the fall it has small red berries. It prefers sun to partial shade and moderate watering.

P. ramorum was isolated from *Photinia fraseri* in 2003 from a nursery in Poland. To date, no symptomatic Red tip has been identified in 2004. Confirmed plants were originally imported from Western Europe. Symptoms were limited to leaf blight and resembled *P. ramorum* leaf spots on rhododendron. All symptomatic plants were destroyed; the grower chose to stop growing Red tip at the nursery since it is not an important ornamental plant in Poland.

Resources:

- University of Arizona Landscape Architecture, Dr. Margaret Livingston
  http://ag.arizona.edu/classes/lar520/unit10/photxfra.htm

- Personal communication, Leszek Orlikowski, Research Institute of Pomology and Floriculture, Poland.