SUDDEN OAK DEATH AND *PHYTOPHTHORA RAMORUM*

2010 - 2011 SUMMARY REPORT

A COMPENDIUM OF 2011 MONTHLY NEWSLETTERS

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TABLE OF CONTENTS

2011 Significant Events……. 1

Monitoring……. 2

Management……...5

Nurseries…….7

Regulations…….9

Research…….…...10

2010 Wildland Summaries……19

Funding…….23

COMTF 2011 Meeting..……23

Education and Outreach……23

Resources……...24

Related Research.……..26

Related Issues……31

Personnel…….. 34

Kudos……34

Calendar of Events……35

2010-2011 *Phytophthora ramorum* and Sudden Oak Death Significant Events

- *Phytophthora. ramorum*-infected Japanese larch trees are found in Scotland for the first time in December 2010.

- The first field detections of *P. ramorum*-positive Sitka spruce (*Picea sitchensis*) and Noble fir (*Abies procera*) are found in the Republic of Ireland.

- The first detection of *P. ramorum*-positive European larch (*Larix decidua*) is found in southwest England.

- The NA2 *P. ramorum* lineage is found for the first time outside a repeat positive retail nursery in soil in December 2010 in Gig Harbor, Pierce County, Washington.

- The USDA Forest Service California Aerial Survey has mapped almost 4,000 acres of SOD mortality in 2011, up from 800 acres in the same area in 2010. The number of trees killed by *P. ramorum* is currently on the rise due to the previous two years of increased precipitation.

- A new *P. ramorum* find six miles north of the quarantine boundary in Curry County, OR is detected near Cape Sebastian State Park. It is over 12 miles from the nearest known infected tree.

- *Molinadendron sinaloense*, a relative of witchhazel, is found *P. ramorum* positive for the first time at a research garden in Alameda County. This host is not on the 2011 Animal and Plant Health Inspection Service list of regulated hosts.

- To date, more than 3 million Japanese larch (*Larix kaempferi*) trees have been felled or are under notice to be felled in the UK in response to the *P. ramorum* outbreak.

- In 2010, the US had 33 *P. ramorum*-positive nurseries and 1 greenhouse in 13 states: CA (7); OR (9); WA (6); IA (1); IL (1); AL (1); NC (1); SC (1); VA (1); NY (1), MS (3); GA (1); PA (1). There were two positive residential landscape detections and one water-pond positive. Eighteen of the infested nurseries were interstate shippers and 13 were retail facilities.

MONITORING

***P. ramorum*-infected Japanese larch (*Larix kaempferi*) trees were confirmed in** Scotland for the first time in December 2010. The find was made in a forestry plantation on the west coast. Approximately three acres of larch are being felled in hopes of preventing further pathogen spread. Although *P. ramorum* has been detected in Scotland before in plant and shrub species, including rhododendron, it had not been previously found in trees. (2/11)

Northern Ireland's Glenariff Forest Park was found to be *P. ramorum* positive in December via aerial survey, bringing the total number of infested sites in Northern Ireland woodlands to eight. This is the first find in a forest park for Northern Ireland, and requires the felling of 10.6 acres of larch to limit pathogen spread. Approximately 667 acres of public forest land and 15 acres of private woodlands are directly affected. (2/11)

Fifteen *P. ramorum*-positive water samples were confirmed in Washington in January 2011. The only new location was a Clark County nursery. All other locations have had prior water positives. Little Bear Creek (King, Snohomish County) has been positive since 2010. All genotypes have been NA2. The perimeter of the former retail nursery site near Gig Harbor, Pierce County continues to be positive. All genotypes have been NA2 with the exception of one NA1 sample in 2010. The Rosedale Stream, Pierce County has had numerous positives since 2006. The genotype of the current sample was not determined, but previous samples typed as NA1. The King County nursery perimeter ditch, which empties into the Sammamish River, has been positive since 2010. All samples have been the NA1 genotype. (3/11)

A Sitka spruce (*Picea sitchensis*) tree has been found *P. ramorum* positive in the Republic of Ireland. The infected tree is growing under the canopy of a large infected rhododendron. This is the first field record worldwide of *P. ramorum* infection in Sitka spruce; however, it had previously been found susceptible in laboratory tests. Annual forest surveys for *P. ramorum* have been ongoing in the Republic of Ireland since 2003. Until July 2010, *P. ramorum* had only been detected in forest areas on wild invasive rhododendron shrubs. Since 2010, extensive national aerial and ground surveys have confirmed infected Japanese larch at 11 forest locations totaling approximately 308 acres in five counties. Noble fir (*Abies procera*), beech, and Spanish chestnut (*Castanea sativa*) growing in close proximity to infected Japanese larch have also been found positive at a number of the sites. This is also the first report of *P. ramorum* infection on Noble fir. (4/11)

European larch (*Larix decidua*) has been found *P. ramorum* positive in a woodland in southwest England in an area with infected Japanese larch trees. This is the first time European larch has been found naturally infected with the pathogen. It has not yet been determined if European larch is a sporulating host. To date, approximately 2 million Japanese larch (*Larix kaempferi*) trees have been felled in the UK in response to the *P. ramorum* outbreak. Since first identified as a host in August 2009, larch has been found

infested in southwest England, Wales, Scotland, the Isle of Man, and Northern Ireland. (4/11)

***P. ramorum* has been confirmed in a Lawson's cypress (*Chamaecyparis lawsoniana*)** (also known as Port Orford cedar) and on rhododendron at Balloch Castle Country Park in Scotland where *P. lateralis* was confirmed in Lawson's cypress late in 2010 (the first time *P. lateralis* had been identified in Britain). The park is only the second site in Scotland where *P. ramorum* has been found in trees. Researchers believe that the cause of the cypress and yew (*Taxus brevifolia*) decline at the park is *P. cinnamomi*. (4/11)

The Washington *P. ramorum*-positive soil confirmation in December 2010 in a Gig Harbor, Pierce County landscape (adjacent to a previously positive repeat nursery) has been identified as the NA2 lineage. This is the first time this strain has been found outside of a nursery in soil. The confirmed site is along a drainage that had been found positive with infected salal plants in the summer of 2009. (5/11)

Washington had two repeat *P. ramorum*-positive waterway detections in May. One of the sites has been positive since 2009 and the other since 2010. Each positive stream feeds into the Sammamish River. Both sites have had positive samples recovered upstream from the confluence of the water course and the Sammamish; the inoculum source for each is unknown. (6/11)

Survey work for 2011 National *P. ramorum* Early Detection Survey of Forests is underway in 17 participating states. To date, no new positive sites have been reported; however, all eight previously positive southeast sites (MS, GA, FL, NC, and AL-4 sites) have been found positive again, with most sites having had multiple pathogen detections from waterways. (6/11)

The British Forestry Commission has completed seven *P. ramorum*-infected larch woodland survey flights so far this year. To date, the flyovers have detected fewer suspected infected larch than the previous two years. All areas most strongly suspected to be positive appear to be contiguous with, or in close proximity to, previously infected woodlands. (6/11)

To date in 2011, the US Forest Service Aerial Detection Survey for CA has flown over a million acres in six counties: Yolo, Solano, Napa, Marin, Sonoma, and Mendocino. The primary damage agent this year has been SOD, with almost 4,000 acres mapped, up from 800 acres mapped in the same area in 2010. The number of trees killed by *P. ramorum* has also increased significantly. The majority of mortality was mapped in Sonoma County, with little mapped in Mendocino County. (7/11)

Washington had two new and one repeat *P. ramorum*-positive waterway detections in June. One of the new positives was detected upstream from a 2010 positive site. The positive stream feeds into the Sammamish River. The other new positive was detected in a watershed sub-basin adjoining the Sammamish River. The repeat detection site has

been positive since 2010 and is in a stream that feeds into the Sammamish. While the exact source of the inoculum remains unknown, genetic evidence points toward previously positive nurseries in the associated watershed. (7/11)

The UK has confirmed a new *P. ramorum*-infected Japanese larch site in the previously uninfested region of Derbyshire County, central England. The site is a 10-acre woodland within the Peak District National Park, approximately 80 miles from the nearest confirmation (which is also considered an isolated outbreak in northern Wales). Infected rhododendron had previously been confirmed on a nearby property. The Forestry Commission's 2011 UK *P. ramorum* aerial surveys for infected larch trees have identified fewer and smaller suspect locations than in 2009 and 2010. Almost all of the new sites in question are close to, or contiguous with, existing known areas of infection. (7/11)

Great Britain had three new *P. ramorum*-infested Japanese larch tree outbreaks confirmed in July: a cluster of four sites in Lancashire County, one site in Cumbria County, and one on Mull Island (western Scotland). Lancashire and Cumbria are in England's far northwest, and the outbreaks there are the second and third confirmed findings on larch in England outside of the southwest region. Although all three outbreaks are remote from the nearest confirmed larch outbreaks, in each case there have been findings or suspected findings on other plants (i.e., rhododendron) nearby. The Mull outbreak is only the second confirmed larch site in Scotland. (8/11)

A new *P. ramorum*-positive site six miles north of the quarantine boundary has been found in Curry County, OR infecting two tanoak trees. The infestation near Cape Sebastian State Park is over 12 miles from the nearest known infected tree. Other tanoak trees in the immediate vicinity also show signs of lower tree crown browning. As required by the state, the Cape Sebastian State Park infection site and a three mile buffer zone are now included in the SOD quarantine area. (10/11)

From 2001 to 2009, OR eradication treatments were completed on approximately 2,900 forested acres at an estimated cost of $5 million. From 2007 to 2009, approximately 60 new infested sites were found each of the two years, and in 2010, 83 new sites were found. Through September 2011, more than 100 new SOD sites have been found. It is believed that disease spread is occurring at such a rate due to consecutive years of wet weather, slow development of recognizable symptoms, and detection and resource constraints resulting in treatment delays. (10/11)

SOD has increased dramatically in areas surveyed during the spring 2011 fourth annual SOD Blitz, with infection levels up to three-fold greater than 2010 data. Approximately 500 participants gathered nearly 10,000 samples from 2,000 trees covering at least 50,000 acres of California woodlands and parks. While not a scientific sample, it indicates that a higher than expected infection level is present in the San Francisco Peninsula as well as in the western hill slopes of the San Francisco East Bay. It also confirmed for the first time that the pathogen is now present in Carmel Valley

Village and the valley floor of Napa Valley. Sixteen 2011 spring SOD Blitzes were organized in Humboldt, Sonoma, Napa, Alameda, Contra Costa, San Francisco, San Mateo, Santa Clara, and Monterey Counties. (10/11)

An outbreak of *P. ramorum*-infected larch trees was confirmed in October in private woodlands north of Newton Stewart, Galloway following an aerial survey of western Scotland. Approximately 43 acres are affected. It is unclear how the disease arrived there; site investigations are underway. The outbreak is the third on Japanese larch in Scotland, the first was a small area of Craignish Peninsula larch trees in late 2010, and the second was on the Island of Mull in summer, 2011. (11/11)

MANAGEMENT

In 2009, DEFRA implemented a five-year *Phytophthora* Program to reduce the rate of spread of *P. ramorum* and *P. kernoviae* as well as address the impacts of these pathogens on the nursery trade, heritage gardens, forests, and other industries. The initial goal of reducing the incidence of disease was to achieve a level at which less than 1% of inspections resulted in a positive finding of either pathogen. The first year (April 2009 to March 2010), less than 0.5% of inspections yielded positive confirmations. The biosecurity measures adopted by the UK Plant Trade resulted in a further fall in the number of confirmations found following inspections during the first half of the 2010/11 year to 0.2%. As part of the program, officers working throughout England and Wales have been asked to double the number of host plant inspections to ensure that any infection is identified early. (3/11)

Slow Sand Filtration Project for South Carolina *P. ramorum*-Positive Nursery - One nursery in SC has had positive detections of *P. ramorum* for three consecutive years (2009, 2010, and 2011). While surveys indicate that eradication efforts have eliminated *P. ramorum* from nursery stock, the pathogen continues to be found in the nursery's water and soil. Perimeter forest surveys and stream baiting of the river associated with this nursery have been negative to date. In an effort to maintain pathogen-free status in the natural area outside of the nursery, Clemson University researchers and the nursery owner are installing a slow sand filtration system in which all runoff will be directed into a vegetated ditch that will lead to a small retention pond. The water from the pond will be pumped into a slow sand filtration system and then drain to another vegetated area for diffusion before entering the river. The nursery and river will continue to be tested for *P. ramorum*. (6/11)

The UK is offering grants in 2011-12 to help woodland owners in England and Wales comply with requirements to fell *P. ramorum*-infected trees. Enhanced Forestry Commission replanting grants have also been announced and will be made available to help owners in England replant cleared sites. (6/11)

A Gig Harbor, Pierce County, WA site that was previously a *P. ramorum*-positive retail nursery with positive salal outside of the nursery perimeter, was sold to the Peninsula Metropolitan Park District in April. Discussions are underway about how the

site will be developed. In June, propane torches were used to burn and blacken all the vegetation in the county roadside ditches adjacent to the former nursery site (where the infested salal had been identified) in an effort to prevent pathogen spread by eliminating any remaining nearby *P. ramorum* host plants. (8/11)

The Midpeninsula Regional Open Space District, in cooperation with the California Conservation Corps, removed approximately 250 bay laurel trees in July in an effort to protect 49 large, healthy oak trees from SOD. Funded by Proposition 84, all bays growing within 15 feet of the protected oaks in Los Trancos, Long Ridge, Saratoga Gap, Skyline Ridge, and Monte Bello Open Space Preserves were removed. During the removals, sanitation protocols were implemented in all areas associated with SOD. The goal of the project is to help prevent the buildup of dead trees and protect recreational benefits. (8/11)

The UK Forestry Commission has revised the Japanese larch risk zone map for *P. ramorum* in Great Britain, dividing the county into high-risk areas where infection has been found on larch, high-risk areas where no infection has been found on larch, and low-risk areas. These zones are intended to guide licensing for larch removal and restocking. (9/11)

Preventing the spread of *P. ramorum* via water was the focus of a 2 ½ day workshop in Puyallup, WA, June 28-30, 2011. Attended by over 50 regulators, researchers, and industry representatives from the western and southeastern US, as well as Washington, DC, the workshop's mission was to coalesce research, management, and regulations for effective, economical, and environmentally acceptable ways of limiting *P. ramorum* spread via contaminated nursery water runoff. (9/11)

The British Forestry Commission has stopped issuing new felling licenses for larch in high-risk areas over the winter to avoid inadvertent spread via infected material. After winter needle drop, it is impossible to identify disease symptoms and confirm if trees are infected. Once the trees flush with new needles next spring, any infected larch can be identified, and biosecurity measures implemented, to avoid pathogen spread. This is the second year a seasonal embargo has been put in place. (11/11)

Fire Safe Sonoma received a $120,000 grant for Sonoma County Roadside Hazard Fuels Survey and Removal to survey, prioritize, and treat roadside fuels build up and hazard trees, particularly on roadways impacted by SOD or other diseases. Approximately 150 miles of SOD and/or beetle impacted roads throughout Sonoma County will be surveyed to prioritize treatment areas. (12/11)

NURSERIES

California had 874 establishments under compliance for *P. ramorum* in 2010, including 634 host nurseries. A total of 18,418 samples were taken in California nurseries, with 2,090 nursery sites found to be negative for the pathogen and eight sites found positive. Five of the confirmed locations were production facilities, two were

retail sites (both in quarantined counties), and one was a residential location (regulated county). (2/11)

Nurseries identified as *P. ramorum* positive throughout the US in 2010 totaled 33 nurseries and 1 greenhouse in 13 states: CA (7); OR (9); WA (6); IA (1); IL (1); AL (1); NC (1); SC (1); VA (1); NY (1), MS (3); GA (1); PA (1). Confirmations by plant genera included: *Rhododendron*/Azalea (41); *Camellia* (18); *Viburnum* (7); *Pieris* (6); *Kalmia* (2); *Laurus noblis* (3); *Loropetalum chinensis* (1); *Magnolia* (2); *Tracheolospermum jasminoides* (2); *Osmanthus fragrans* (1); *Mahonia nervosa* (1); *Sequoia sempevirens* (1); and *Veronica spicata* (1). There were two positive residential landscape detections and one water-pond positive. Eighteen of the infested nurseries were interstate shippers and 13 were retail facilities. (2/11)

The NA2 *P. ramorum* genotype has been detected in retail nurseries in five California counties: Sacramento, San Mateo, Contra Costa, Placer, and Sonoma. The Sacramento County nursery has made efforts to eliminate the pathogen from the premises; it was not detected in the March 2010 survey. The Sonoma and Contra Costa County nurseries have had repeat confirmations in previous years; however, it is unknown if the positives have always been the NA2 genotype. The San Mateo County nursery has had all three genotypes (NA1, NA2, and EU1) and only sells within the infested area. The NA2 genotype is also showing up with greater frequency in Washington state nurseries. (3/11)

A nursery in Clark County, Washington that has had *P. ramorum*-positive water onsite since 2008 has been found to have a new positive water location on the southeast corner of the nursery along a county road right of way. The new location drains into two separate small streams. The genotype detected in all of the water positives to date has been NA1. (3/11)

California had four *P. ramorum*-positive nurseries in April. A production nursery in Santa Clara County was found to have *P. ramorum*-positive *Camellia*. This nursery was previously positive in 2010 and ships interstate; however, the only interstate shipments in the past six months have been to Nevada. The second confirmation was made at a production facility in Stanislaus County on *Rhododendron* and *Camellia*. The nursery was also positive in 2010. No interstate shipments have been made in the past six months. The third positive production nursery was in Orange County in the retail section of the nursery. Positive samples were collected from *Pieris* and *Camellia*. The nursery has not previously been found positive for the pathogen, nor has it made any interstate shipments within the past six months. The fourth confirmation was made on *Cinnamonum camphora* at a Sacramento County retail nursery. No interstate shipments have been made in the past six months. (5/11)

Oregon had two *P. ramorum*-positive nurseries in April. *P. ramorum* was confirmed on a *Rhododendron* in a Washington County retail nursery and six *Viburnum* plants were

confirmed at a Polk County retail nursery. Neither nursery ships interstate. The Washington County nursery was also positive in 2010. (5/11)

California had four *P. ramorum*-positive nurseries confirmed in May. *Pieris forrestii* was found positive at a production nursery in San Joaquin County. A second production nursery was identified in Santa Cruz County with *P. ramorum*-positive *Rhododendron*. The nursery was also positive in 2003, 2004, 2005, and 2006. A Sacramento County retail nursery was found to have positive *Camellia*, and a Sacramento County production facility was found to have positive *Camellia* and *Magnolia*. The nursery does ship interstate and was also found positive in 2009 and 2010. (6/11)

A Snohomish County, WA wholesale/production nursery was confirmed *P. ramorum* positive in May. The nursery was previously positive in 2008 and 2010. The nursery has not made an interstate shipment in the past 12 months. Positive species include *Mahonia aquifolium*, *Gaultheria shallon*, and *Arctostaphylos uva-ursi*. (6/11)

Four Oregon nurseries were found *P. ramorum* positive in May. Two wholesale nurseries were identified in Clackamas County. One of the nurseries was previously positive in 2010 and had infected *Rhododendron*, *Camellia*, and *Viburnum*. At the second nursery, also positive in 2005, 2008, and 2010, *Rhododendron* was found infected. Both nurseries are interstate shippers. *P. ramorum* was also found infecting plants at a Lincoln County retail nursery (*Rhododendron*) and a Lane County wholesale nursery (*Camellia*). The Lane County nursery was also positive in 2006 and 2009, and does ship interstate. (6/11)

California had two *P. ramorum*-positive nurseries identified in June. The first was a production facility in Fort Bragg, Mendocino County. The positive sample originated from a *Camellia*. The nursery was also found positive in 2008 and 2010. The second confirmation was at a production facility in Lodi, San Joaquin County. The positive sample was taken from a 5-gallon, *Camellia* during a trace-back inspection from a Santa Clara County site. The nursery was also positive in 2010. The nursery does ship interstate. (7/11)

To date this year, *P. ramorum* has been confirmed in 21 US nursery (plant and/or soil) locations: CA (11), OR (6); WA (3), and SC (1) as well as one residential location in CT identified during a trace-forward investigation from an online supplier in OR. Of the 21 positive nurseries, 12 are certified interstate shippers and nine are retailers. Detections have been on *Camellia* (32 %), *Rhododendron* (32%), *Pieris* (5%), *Viburnum* (5%), *Magnolia* (5%), and eight other species (21%). (8/11)

A Sacramento County, CA production nursery was confirmed to have *P. ramorum*- positive *Cinnamomum camphora* in July. The nursery was previously positive in 2005, 2006, and 2007, and does ship interstate. (8/11)

The Oregon Department of Agriculture's survey of commercial Christmas tree plantations for *P. ramorum* is nearly complete. Christmas tree plantations in Benton, Clackamas, Curry, Deschutes, Douglas, Lane, Linn, Marion, Polk, Washington, and Yamhill Counties have been surveyed. To date, testing has been completed on 5,510 samples from 139 fields, with no detection of *P. ramorum*. (8/11)

***Molinadendron sinaloense* was found *P. ramorum* positive for the first time in June** during a routine light brown apple moth inspection at a research garden in Alameda County. *Molinadendron sinaloense* is not currently on the federal host or associated host list for *P. ramorum*. The symptomatic plant had leaf symptoms similar to those seen on infected California bay laurel leaves. The sample was confirmed positive by USDA APHIS in August. (9/11)

The National Plant Board (NPB) sponsored a workshop in November on best management practices (BMPs) for nurseries and soil remediation for *P. ramorum*. NPB members from seven states and representatives from the USDA Plant Protection Quarantine National *P. ramorum* program attended. Presentations covered the CDFA BMP Program, repeat positive nursery issues from a grower's perspective, the OR Department of Agriculture Grower Assisted Inspection Program, and the CA Association of Nurseries and Garden Centers Multiple Pest Management Program. The field component of the meeting included visiting a repeat positive nursery, a study that incorporates *Trichoderma* into contaminated soil, and another study analyzing steam disinfection of contaminated soil. (12/11)

REGULATIONS

USDA APHIS will implement a Federal Order on 3/1/11 requiring interstate shipping nurseries in *P. ramorum* quarantine areas or regulated counties that have previously tested positive for the pathogen to provide advance notification to destination states in non-regulated areas when shipping *Camellia, Kalmia, Pieris, Rhododendron* (including Azalea), and *Viburnum*. Advanced notification is intended to enhance the traceability of potentially infected nursery stock. In addition, nurseries shipping any of these species interstate to non-regulated areas must provide advance notification if they are located in regulated counties with one or more interstate shippers that have tested positive for *P. ramorum* since 2003. (2/11)

CAL FIRE passed an interim emergency regulation for SOD at their January 2011 meeting. The rule defines an Emergency Condition and specifies the location, treatments, and environmental protection measures related to the removal of live and dead hardwood trees or vegetation infected by or susceptible to SOD. The action will enable private landowners in isolated areas outside of California's generally infested area to more rapidly remove host hardwoods and take treatment actions on newly discovered infested sites. The regulation has a 180-day life, during which time the Board will be working on implementing a permanent rule. (2/11)

An amendment has been made to the 1/28/11 Federal Order requiring advance notification for certain *P. ramorum*- host nursery stock shipments. The counties of Santa Barbara (CA), Ventura (CA), Lincoln (OR), and Kitsap (WA) have been removed from the list of affected counties. This action was taken because Santa Barbara and Ventura Counties only detected *P. ramorum* on trace-forward plants and not on host plants grown within the interstate shipping nursery premises; Lincoln County has no *P. ramorum*-positive interstate shippers; and Kitsap County does not have an interstate shipping nursery that has previously tested positive for the pathogen. (3/11)

A "Workshop on APHIS/National Plant Board *P. ramorum* Regulatory Program Review and USFS Framework for SOD in Wildland Forests" was held 2/16-17/11 in Washington DC. Convened by the Continental Dialogue for Non-Native Forest Insects and Diseases, Address *P. ramorum* Initiative, the meeting brought together about 50 state and federal regulators, researchers, nurserymen, forest industry representatives, environmentalists and forest health specialists to look at ways of working together to limit pathogen spread. (3/11)

Effective 6/27, USDA APHIS updated regulations governing international trade in plants used in gardening and landscape design. The new rules implement systems that allow imported material to be judged by invasive potential rather than just non-native status in an effort to prevent invasive pest issues rather than respond to them once established in the US. The rule change creates a new category, “Not Authorized for Importation Pending Pest Risk Assessment,” which allows APHIS to restrict the importation of plants suspected of being invasive or carrying pests until possible risks are understood and protective measures are put in place. (7/11)

Canada/US bilateral talks on *P. ramorum* policy - The USDA APHIS *P. ramorum* program manager and trade director for Canada attended a meeting hosted by CFIA in Vancouver, BC in November to discuss certification processes for shipments of *P. ramorum* host plants from Canada as well as other international commerce concerns. To date, *P. ramorum* detections in BC have only been in retail establishments, not in propagation nurseries which are the major shippers of host plants to the US. (12/11)

RESEARCH

In 2008, the San Francisco Public Utilities Commission (SFPUC) and US Forest Service Pacific Southwest Research Station implemented a *P. ramorum* research and management partnership to better understand and predict oak mortality as well as test management strategies for effectiveness in minimizing ecological impacts of the pathogen. Two long-term projects are currently underway. One study with the UC Berkeley Garbelotto lab includes a large-scale analysis of 16 plots in vulnerable forest habitats. On these plots, water, soil, California bay-laurel, coast live oak, and tanoak are being tested regularly. Data is being used to infer phylogeography of *P. ramorum*, seasonal timing of pathogen activity, and other epidemiological characteristics. The second research project with Phytosphere Research and Midpeninsula Regional Open Space District focuses on the efficacy of management activities. On SFPUC land, five

acres of coast live oak forest are receiving bay removal treatments and three acres of a tanoak/redwood forest are being treated with Agri-Fos®. During the course of program activities, other *Phytophthora* species, including *P. cinnamomi* and *P. cambivora*, were also found on SFPUC lands. These findings are in patches of vegetative mortality that appear to be expanding. (8/11)

The following seven projects are underway at the National Ornamentals Research Site at Dominican University of California. Funding for 2011-2012 fiscal year projects will be provided by the Farm Bill, pending California Department of Pesticide Regulation approval.

Use of *Trichoderma* to Remediate *P. ramorum*-Infested Soil; Timothy Widmer and Nina Shishkoff, USDA Agricultural Research Service, Ft. Detrick, MD

The Risk of Asymptomatic *P. ramorum* Infection on Fungicide-Treated *Rhododendron*; Gary Chastagner and Marianne Elliott, Washington, State University, Puyullap

Potential Efficacy of a Copper Fungicide for Preventing Establishment and Dissemination of *P. ramorum* in Ornamental Plant Nurseries; Steven Jeffers, Clemson University

Effect of Fungicides and Biocontrol Agents on Sporulation and Persistence of *P. ramorum* on Nursery Hosts; Steve Tjosvold, UC Cooperative Extension, Santa Cruz and Monterey Counties, Gary Chastagner, and Marianne Elliott

Solarization to Eliminate *P. ramorum* from Nursery Beds; Jennifer L. Parke, Oregon State University

Episodic Abiotic Stress and Ramorum Blight in Nursery Ornamentals: Impacts on Symptom Expression and Chemical Management of *P. ramorum* in *Rhododendron*; Richard M. Bostock, UC Davis

Risk of Root-to-Root Spread of *P. ramorum* in Ornamental Production Nurseries; Gary Chastagner, Marianne Elliott, Steve Tjosvold, and Nina Shishkoff (9/11)

The USDA Forest Service, Pacific Southwest Research Station Sudden Oak Death/*P. ramorum* research program list of 2011 funded projects is now available at http://www.fs.fed.us/psw/programs/sod/funding/FY2011PSWSODFunding.pdf. Eleven continuing projects were funded, for a total of $407,154. (10/11)

Sudden Larch Death? – Larch Susceptibility to *P. ramorum* in Oregon Forests. (summary of a Western International Forest Disease Work Conference 2011 poster) By Everett Hansen, et al., Oregon State University

To test the susceptibility of Japanese larch as well as native North American Western larch (*Larix occidentalis)* to the strains of *P. ramorum* found in Oregon forests, potted seedlings were exposed to natural inoculation under infected tanoak trees in Curry County, Oregon. Douglas-fir *(Pseudotsuga menziesii*) was included for comparison.

Study findings:

- Exposure of potted seedlings beneath infected tanoak during periods of sporulation provides an effective and realistic susceptibility test.
- Symptoms and intensity of infection on Douglas-fir seedlings were comparable to artificial inoculation and natural infection observed in the forest.
- Western larch is susceptible to the Oregon forest lineage (NA1) of *P. ramorum* under environmental conditions prevalent in the epidemic area of SW Oregon. This confirms previous stem wound inoculation results.
- Japanese larch is also susceptible, although the degree of susceptibility cannot be determined from this experiment.

In western North America, Japanese larch and some hybrids have been planted in the Coast Ranges on a trial basis. These plantations must be considered at great risk if exposed to *P. ramorum*. The susceptibility of western larch seedlings in this experiment was comparable to Douglas-fir. Western larch is not native to the Coast Ranges, and has not been planted widely there. It remains an open question whether the environment in the western larch native range will support *P. ramorum*. Western larch is native to the interior northwest, and according to the Kelly et al. 2007 risk of *P. ramorum* spread map, much of western larch's native range falls in a medium-low or medium risk zone. Such risk rating systems are weighted heavily by the presence of host plants, however, and larch was not a known host when this risk rating was done. (11/11)

Bottle O' Bait Update - In situ baiting of water for *P. ramorum* with host foliage has been used in the field for at least 9 years in the western US and for more than 5 years by the USDA Forest Service for the National *P. ramorum* Early Detection Survey. During this time, the pathogen has been recovered from water in eight states. Leaving baits exposed in water for extended periods allows sampling of large volumes of water over time. However, it also leaves baits vulnerable to loss from vandalism and storm surges, requires sustained water flow during the exposure period, and requires two site visits for each sample period—once to deploy and once to retrieve baits. To address some of these limitations, an in vitro baiting assay using both intact leaves and leaf pieces of rhododendron was examined to recover *P. ramorum* from waterways draining known infested nurseries and forests. A water filtration assay also was used to provide a quantitative estimate of the density of propagules of *P. ramorum* in a water sample. Over a 3-year period, samples were collected from 18 waterways in five states where *P. ramorum* was known to be present based on results from in situ baiting. The pathogen was detected at 16 of 18 sites by in situ baiting; in vitro (bottle method) baiting detected the pathogen at 14 of the 16 positive sites plus one site where in situ baiting was negative. Ten of the positive water samples detected by the in vitro assay had very low propagule densities. The in vitro assay was nearly as effective as in situ baiting for recovering *P.*

ramorum from water even though a very small volume of water was collected at one point in time. However, the lack of sampling over time may challenge pathogen recovery at some sites because only propagules present at the time of sampling can be collected and short-lived extremes in water conditions such as high water temperature and storm flows may reduce inoculum density below detectable levels. The in vitro assay, dubbed bottle o' bait (BOB), is being tested in a comparative pilot survey under field conditions to determine if it is as reliable as the current in situ baiting assay as a survey protocol. (11/11)

The Proceedings of the 5th meeting of IUFRO unit 7.02.09 *Phytophthora* Diseases on Forest Trees, held in Rotorua, New Zealand from March 7-12, 2010, are being released by the New Zealand Journal of Forestry Science as individual papers at http://www.scionresearch.com/general/science-publications/science-publications/nzjfs/iufro-working-party-S07-02-09,-phytophthora-diseases-in-forests-and-natural-ecosystems-supplement-to-volume-41. (11/11)

Bowcutt, F. 2011. Tanoak target: the rise and fall of herbicide use on a common native tree. Environmental History 16(2): 197-225. DOI: 10.1093/envhis/emr032. (8/11)

Chadfield, V. and Pautasso, M. 2011. *Phytophthora ramorum* in England and Wales: which environmental variables predict county disease incidence? Forest Pathology 42(2): 150-159. DOI: 10.1111/j.1439-0329.2011.00735.x. (9/11)

Chimento, A.; Cacciola, S.O.; Garbelotto, M. 2012. Detection of mRNA by reverse-transcription PCR as an indicator of viability in *Phytophthora ramorum*. Forest Pathology 41(1): 14-21. DOI: 10.1111/j.1439-0329.2011.00717.x.

Cormier, R.; Seavy, N.; Jennings, S.; and Gardali, T. 2011. Abundance Patterns of Landbirds in the Marin Municipal Water District over Fifteen Years: 1996 to 2010. PRBO Conservation Science. 36 pages. Available online at http://marinwater.org/documents/PRBO_Report_MMWD_Landbirds_2010.pdf. (3/11)

Davidson, J.M.; Patterson, H.A.; Wickland, A.C.; Fichtner, E.J.; and Rizzo, D.M. 2011. Forest Type Influences Transmission of *Phytophthora ramorum* in California Oak Woodlands. Phytopathology 101(4): 492-501. DOI: 10.1094/PHYTO-03-10-0064. (5/11)

Demon, I.; Cunniffe, N.J.; Marchant, B.P.; Gilligan, C.A.; and van den Bosch, F. 2011. Spatial sampling to detect an invasive pathogen outside of an eradication zone. Phytopathology 101: 725-731. (6/11)

Elliott, M.; Sumampong, G.; Varga, A.; Shamoun, S.F.; James, D.; Masri, S.; and Grunwald, N.J. 2011. Phenotypic differences among three clonal lineages of *Phytophthora ramorum*. Forest Pathology 41(1): 7–14. DOI: 10.1111/j.1439-0329.2009.00627.x. (3/11)

European Food Safety Authority (EFSA) Panel on Plant Health (PLH). 2011. Scientific Opinion on the Pest Risk Analysis on *Phytophthora ramorum* prepared by the FP6 project RAPRA. European Food Safety Authority Journal 9(6): 2186. 107 pp. DOI: 10.2903/j.efsa.2011.2186. Available online at www.efsa.europa.eu/efsajournal. (7/11)

Fichtner, E.J.; Rizzo, D.M.; Kirk, S.A.; and Webber, J.F. 2011. Root Infections May Challenge Management of Invasive *Phytophthora* spp. in U.K. Woodlands. Plant Disease 95(1): 13-18. DOI: 10.1094/PDIS-03-10-0236. (2/11)

Goss, E.M.; Larsen, M.; Vercauteren, A.; Werres, S.; Heungens, K.; Grünwald, N.J. 2011. *Phytophthora ramorum* in Canada: Evidence for Migration Within North America and from Europe. Phytopathology 101(1): 166-171. DOI: 10.1094/PHYTO-05-10-0133. (2/11)

Grünwald, N.J. and Goss, E.M. 2011. Evolution and Population Genetics of Exotic and Re-Emerging Pathogens: Novel Tools and Approaches. Annual Review of Phytopathology 49: 5.1–5.19. DOI: 10.1146/annurev-phyto-072910-095246. (6/11)

Haas, S.E.; Hooten, M.B.; Rizzo, D.M.; and Meentemeyer, R.K. 2011. Forest species diversity reduces disease risk in a generalist plant pathogen invasion. Ecology Letters 14(11): 1108-16. DOI: 10.1111/j.1461-0248.2011.01679.x. (9/11)

Hayden, K.J.; Nettel, A.; Dodd, R.S.; Garbelotto, M. 2011. Will all the trees fall? Variable resistance to an introduced forest disease in a highly susceptible host. Forest Ecology and Management 261(11): 781-1791. DOI: 10.1016/j.foreco.2011.01.042. (5/11)

Herrero, M.L.; Toppe, B.; and Brurberg, M.B. 2011. First report of *Phytophthora* *ramorum* on bilberry (*Vaccinium myrtillus*) in Norway. Plant Disease 95(3): 355. DOI: 10.1094/PDIS-10-10-0709. Available online at http://apsjournals.apsnet.org/doi/abs/10.1094/PDIS-10-10-0709. (2/11)

Huberli, D.; Garbelotto, M. 2012. *Phytophthora ramorum* is a generalist plant pathogen with differences in virulence between isolates from infectious and dead-end hosts. Forest Pathology 42(1): 8-13. DOI: 10.1111/j.1439-0329.2011.00715.x.

Hüberli, D.; Hayden, K.J.; Calver, M.; and Garbelotto, M. 2011. Intraspecific variation in host susceptibility and climatic factors mediate epidemics of sudden oak death in western US forests. Plant Pathology 61(3): 579 - 592. DOI: 10.1111/j.1365-3059.2011.02535.x. (11/11)

Hulbert, J. and Navarro, S. 2011. Effective Collaboration Slows the Spread of Sudden Oak Death in Oregon. PNW SAF Western Forester 56 (3)12 – 13. To access the article, go to: http://www.forestry.org/media/docs/westernforester/2011/june11.pdf. (8/11)

Ireland, K.B.; Hüberli, D.; Dell, B.; Smith, I.W.; Rizzo, D.M.; and St. J. Hardy, G.E. 2012. Potential susceptibility of Australian native plant species to branch dieback and bole canker diseases caused by *Phytophthora ramorum*. Plant Pathology 61(2): 234–246. DOI: 10.1111/j.1365-3059.2011.02513.x. (9/11)

Jinek, A.; Simard, M.; Brière, S.C.; Watson, A.K.; Tweddell, R.J.; and Rioux, D. 2011. Foliage susceptibility of six eastern Canadian forest tree species to *Phytophthora ramorum*. Canadian Journal of Plant Pathology 33: 26-37. DOI: 10.1080/07060661.2010.534892.
Online at http://dx.doi.org/10.1080/07060661.2010.534892. (2/11)

Julich, S.; Riedel, M.; Kielpinski, M.; Urban, M.; Kretschmer, R.; Wagner, S.; Fritzsche, W.; Henkel, T.; Moller, R.; and Werres, S. 2011. Development of a lab-on-a-chip device for diagnosis of plant pathogens. Biosensors and Bioelectronics 26: 4070–4075. (7/11)

Kasuga, T.; Kozanitas, M.; Bui, M.; Hüberli, D.; Rizzo, D.; and Garbelotto, M. 2011. Host induced epigenetic alteration in *Phytophthora ramorum*. Fungal Genetics Reports 58(Suppl): P.97. (Presented at the 26th Fungal Genetics Conference, Monterey, CA, March 15-20, 2011.) (4/11)

Kay, J.; Meijer, H. J.G.; ten Have, A.; and van Kan, J.A.L. 2011. The Aspartic Proteinase family of three *Phytophthora* species. *BMC Genomics* 2011 12: 254. DOI: 10.1186/1471-2164-12-254. (6/11)

Kliejunas, J.T. 2010. Sudden oak death and *Phytophthora ramorum*: a summary of the literature. Gen. Tech. Rep. PSW-GTR-234. Albany, CA: U.S. Department of Agriculture, Forest Service, Pacific Southwest Research Station. 181 p. Available as a CD, book, or downloadable file at
http://www.fs.fed.us/psw/publications/documents/psw_gtr234/. (2/11)

Kovacs, K.; Holmes, T.P.; Englin, J.E.; and Alexander, J. 2011. The Dynamic response of housing values to a forest invasive disease: Evidence from a Sudden Oak Death Infestation. Environmental and Resource Economics 49(3): 445-471. DOI: 10.1007/s10640-010-9441-y. (8/11)

Kovacs, K.; Václavík, T.; Haight, R.G.; Pang, A.; Cunniff, N.J.; Gilligan, C.A.; and Meentemeyer, R.K. 2011. Predicting the economic costs and property value losses attributed to sudden oak death damage in California (2010-2020). Journal of Environmental Management 92: 1292-1302. (3/11)

Lamsal, S.; Cobb, R.C.; Cushman, J.H.; Meng, Q.; Rizzo, D.M.; and Meentemeyer, R.K. 2011. Spatial estimation of the density and carbon content of host populations for *Phytophthora ramorum* in California and Oregon. Forest Ecology and Management 262(6): 989–998. (7/11)

Matari, N. and Blair, J.E. 2011. Comparative Genomics Suggests the Presence of RNA Interference in Oomycetes. Fungal Genetics Reports 58(Suppl): #8. (Presented at the 26th Fungal Genetics Conference, Monterey, CA, March 15-20.) (4/11)

Meentemeyer, R.K.; Cunniffe, N.J.; Cook, A.R.; Filipe, J.A.N.; Hunter, R.D.; Rizzo, D.M.; and Gilligan, C.A. 2011. Epidemiological modeling of invasion in heterogeneous landscapes: spread of sudden oak death in California (1990–2030). Ecosphere, Volume 2(2), Article 17. (9/11)

Meijer, H.J.G.; Kay, J.; ten Have, A.; Govers, F.; and van Kan, J.A.L. 2011. The Aspartic Proteinase Family of Three *Phytophthora* Species. Fungal Genetics Reports 58(Suppl): #64. (Presented at the 26th Fungal Genetics Conference, Monterey, CA, March 15-20, 2011.) (4/11)

Metz, M.R.; Frangioso, K.M.; Meentemeyer, R.K.; and Rizzo, D.M. 2011. Interacting disturbances: wildfire severity affected by stage of forest disease invasion. Ecological Applications 21(2): 313–320. (5/11)

Moralejo, E. and Descals, E. 2011 Diplanetism and microcyclic sporulation in *Phytophthora ramorum*. Forest Pathology. 41(5): 349–354. http://dx.doi.org/10.1111/j.1439-0329.2010.00674.x. (2/11)

Nagle, A.M.; Mcpherson, B.A.; Wood, D.L.; Garbelotto, M.; Bonello, P. 2011. Relationship between field resistance to *Phytophthora ramorum* and constitutive phenolic chemistry of coast live oak. Forest Pathology 41(6): 464–469. DOI: 10.1111/j.1439-0329.2010.00703.x. (2/11)

Noblea, R.; Blackburnb, J.; Thorpb, G.; Dobrovin-Penningtona, A.; Pietravalleb, S.; Kerinsb, G.; Allnuttb, T.R.; and Henry, C.M. 2011. Potential for eradication of the exotic plant pathogens *Phytophthora kernoviae* and *Phytophthora ramorum* during composting. Plant Pathology 60(6): 1077–1085. DOI: 10.1111/j.1365-3059.2011.02476.x. (6/11)

Pérez-Sierra, A.; Álvarez, L.A.; Vercauteren, A.; Heungens, K.; and Abad-Campos, P. 2011. Genetic diversity, sensitivity to phenylamide fungicides and aggressiveness of *Phytophthora ramorum* on *Camellia*, *Rhododendron*, and *Viburnum* plants in Spain. Plant Pathology 60: 1069–1076. DOI: 10.1111/j.1365-3059.2011.02485.x. (11/11)

Ramage, B.S.; Forrestel, A.B.; Moritz, M.A.; and O'Hara, K.L. 2012. Sudden oak death disease progression across two forest types and spatial scales. Journal of Vegetation Science 23(1): 151–163. DOI: 10.1111/j.1654-1103.2011.01340.x. (10/11)

Ramage, B.S.; O'Hara, K.L; and Forrestel, A.B. 2011 Forest transformation resulting from an exotic pathogen: regeneration and tanoak mortality in coast redwood

stands affected by sudden oak death. Canadian Journal of Forest Research 41: 763-772. (5/11)

Riley, K.L.; Chastagner, G.A.; and Blomquist, C. 2011. First report of *Phytophthora ramorum* infecting grand fir in California. Online. Plant Health Progress. DOI: 10.1094/PHP-2011-0401-01-BR. (5/11)

Shishkoff, N. 2011. A test system to quantify inoculum in runoff from *Phytophthora ramorum*-infected plant roots. Phytopathology 101: 1457-1464. (12/11)

Spaulding, H.L. and Rieske, L.K. 2011. A glimpse at future forests: predicting the effects of *Phytophthora ramorum* on oak forests of southern Appalachia. Biological Invasions 13: 1367–1375. DOI: 10.1007/s10530-010-9895-4. (4/11)

Swei, A.; Ostfeld, R.S.; Lane, R.S.; and Briggs, C.J. 2011. Effects of an invasive forest pathogen on abundance of ticks and their vertebrate hosts in a California Lyme disease focus. Oecologia 166(1): 91-100. DOI: 10.1007/s00442-010-1796-9. (3/11)

Tooley, P.W.; Browning, M.; and Leighty, R.M. 2011. Infectivity and Sporulation of *Phytophthora ramorum* on Northern Red Oak and Chestnut Oak. Journal of Phytopathology 159(7-8): 516–521. DOI: 10.1111/j.1439-0434.2011.01797.x. (4/11)

Tooley, P.W. and Carras, M.M. 2011. Enhanced Recovery of *Phytophthora ramorum* from Soil Following 30 Days of Storage at 4°C. Phytopathology 159(9): 641–643. DOI: 10.1111/j.1439-0434.2011.01810.x. (6/11)

Tsopelas, P.; Paplomatas, E.; Tjamos, S.; Soulioti, N.; and Kalomoira, E. 2011. First report of *Phytophthora ramorum* on *Rhododendron* in Greece. Plant Disease 95(2): 223. Available online at http://dx.doi.org/10.1094/PDIS-08-10-0607. (2/11)

Valachovic, Y.S.; Lee, C.A.; Scanlon, H.; Varner, J.M.; Glebocki, R.; Graham, B.D.; and Rizzo, D.M. 2011. Sudden oak death-caused changes to surface fuel loading and potential fire behavior in Douglas-fir-tanoak forests. Forest Ecology and Management, 261(11): 1973-1986. DOI: 10.1016/j.foreco.2011.02.024. (5/11)

Vercauteren, A.; Boutet, X.; D'hondt, L.; Van Bockstaele, E.; Maes, M.; Leus, L.; Chandelier, A.; and Heungens, K. 2011. Aberrant genome size and instability of *Phytophthora ramorum* oospore progenies. Fungal Genetics and Biology 48(5): 537-43. DOI:10.1016/j.fgb.2011.01.008. (3/11)

Vercauteren, A.; De Dobbelaere, I.; Van Bockstaele, E.; Maes, M.; and Heungens, K. 2011. Genotypic and phenotypic characterization of the European A2 isolates of *Phytophthora ramorum*. European Journal of Plant Pathology 129(4): 621-635. Available online at http://dx.doi.org/10.1007/s10658-010-9727-5. (2/11)

Vercauteren, A.; Larsen, M.; Goss, E.; Grunwald, N.; Maes, M.; and Heungens, K. 2011. Identification of new polymorphic microsatellite markers in the NA1 and NA2 lineages of *Phytophthora ramorum*. Mycologia 103(6): 1245-9. DOI: 10.3852/10-420. (6/11)

The following 21 abstracts on *P. ramorum* are being presented at the 2011 APS Annual Meeting in Honolulu, HI, August 6 – 10, 2011.

Aram, K. and Rizzo, D.M. 2011. *Phytophthora ramorum*'s trophic nature suggests that it cannot utilize dead leaf litter in aquatic systems. Phytopathology 101:S8.

Aram, K.; Swiecki, T.; Bernhardt, E.; and Rizzo, D.M. 2011. Canyon live oak (*Quercus chrysolepis*) is susceptible to bole infection by *Phytophthora ramorum*. Phytopathology 101:S8.

Bonants, P.J.; Gaszczyk, K.; Mendes, O.; Verstappen, E.; and Schoen, C.D. 2011. Multiplex detection of *Phytophthora*: Padlock probe based Universal detection Multiplex Array (PUMA). Phytopathology 101:S18.

Brasier, C.M. 2011. Flaws in international protocols for preventing entry and spread of plant pathogens via "plants for planting." Phytopathology 101:S218.

Campbell, F.T. 2011. Progress and pitfalls in developing policies for reducing risks of introductions of exotic forest insects and pathogens. Phytopathology 101:S218.

Chastagner, G.; **Coats, K.; and Elliott, M.** 2011. Spread of *Phytophthora ramorum* to water, soil, and vegetation outside a nursery in Pierce County, Washington. Phytopathology 101:S32.

Chastagner, G.; Coats, K.; Omdal, D.; Ramsey-Kroll, A.; and Elliott, M. 2011. Mystery on the Sammamish: What are the sources of *Phytophthora ramorum* infesting this Washington State waterway? Phytopathology 101:S32.

Colburn, G. and Jeffers, S. 2011. Use of real-time and nested PCR to detect *Phytophthora ramorum* in infested nursery container mixes and soils. Phytopathology 101:S38.

Elliott, M.; Chastagner, G.; Coats, K.P.; DeBauw, A.; and Riley, K. 2011. Volunteer stream monitoring for invasive *Phytophthora* species in western Washington. Phytopathology 101:S48.

Espindola, A.S.; Stobbe, A.H.; Daniels, J.; Fletcher, J.; Garzon, C.D.; and Schneider, W.L. 2011. Design and validation of queries for the detection of *Phytophthora ramorum* in simulated metagenomes. Phytopathology 101:S50.

Hong, C.; Richardson, P.; Kong, P.; Edgerton, T.; Asaro, C.; and Oak, S. 2011. *Phytophthora* species identified from streams in Virginia. Phytopathology 101:S74.

Johnson-Brousseau, S.; Henkes, M.; Kosta, K.L.; Suslow, K.; Posadas, A.; Bulluck, R.; and Ghosh, S. 2011. *Phytophthora ramorum* research at the National Ornamentals Research Site at Dominican University of California. Phytopathology 101:S85.

Kong, P.; Lea-Cox, J.D.; Moorman, G.W.; and Hong, C. 2011. Survival of three quarantine pathogens in a simulated aquatic system at different levels of pH. Phytopathology 101:S93.

Oak, S.; Hwang, J.; and Jeffers, S. 2011. An in vitro baiting assay for recovery of *Phytophthora ramorum* from waterways. Phytopathology 101:S131.

Osterbauer, N.; Trippe, A.; Lane, S.; and S. Lewis, S. 2011. First report of *Phytophthora ramorum* infecting *Trachelospermum jasminoides* in Oregon. Phytopathology 101:S134.

Parke, J.L.; Britton, K.O.; and Frankel, S.J. 2011. Historical pathways of introduction for non-indigenous forest pathogens. Phytopathology 101:S137.

Preuett, J.A.; Collins, D.J.; Luster, D.G.; and Widmer, T.L. 2011. The effects of salinity on *Phytophthora ramorum* viability and infectivity. Phytopathology 101:S146.

Shishkoff, N. 2011. Risk analysis of native and ornamental plants for root infection and inoculum production from roots by *Phytophthora ramorum*. Phytopathology 101:S166.

Tjosvold, S.; Chambers, D.; and Mori, S. 2011. Effect of environmental conditions and lesion age on sporulation of *Phytophthora ramorum* on California bay, rhododendron, and camellia. Phytopathology 101:S177.

Vannini, A. 2011. Did *Phytophthora ramorum* already invade Italian forests? A possible answer by mass sequence approach. Phytopathology 101:S182.

Widmer, T.L.; Johnson-Brousseau, S.A.; and Ghosh, S. 2011. Management of *Phytophthora ramorum*-infested nursery soil with *Trichoderma asperellum*. Phytopathology 101:S191. (7/11)

2010 WILDLAND SUMMARIES

2010 California *P. ramorum* Stream Survey Highlights - In Humboldt County, the recovery of *P. ramorum* from Redwood Creek marked a considerable shift north in the pathogen's known distribution. Additionally, pathogen detection in Blue Slide Creek of the Mattole River watershed was confirmed for a second year, and two tributary infestations were discovered. In Mendocino County, the pathogen was found in the

South Fork of the Eel River at Piercy. The spore source has yet to be identified. Another positive site was confirmed in the Big River near Mendocino Woodlands, just south of Jackson State Demonstration Forest. The closest known infestation is near Orr Springs. The Little River continued to have regular culture positive samples (since 2008), though the spore source has not been identified. There were no signs of new infestations in the Central Coast. As in the past, the pathogen was not detected in Sierra Nevada Foothills or Del Norte County. (2/11)

SOD in Oregon Forests – Ten years ago in 2001, SOD was discovered in Curry County, OR, five miles north of the California border near the town of Brookings. At that time, five infested sites were known, encompassing a total of 36 acres. ODA responded by declaring a state quarantine, and implemented an eradication program that involved cutting and burning infected and nearby host plants. The initial quarantine area was 9 mi^2 in size. It has been expanded four times since then, with the most recent expansion to 162 mi^2 occurring in 2008.

The initial objective of the eradication program was to eliminate disease and the pathogen from the infested sites, thereby stopping spread. Post-treatment monitoring in 2009 and 2010 showed clearly that the disease and the pathogen are absent from most, but not all, of the treated sites. Despite the effectiveness of eradication treatments on many sites, disease has continued to spread slowly (predominantly northward), following the prevailing wind direction during storms and wet weather. From the initial infestations the disease has spread southward only 1.2 miles, and northward and eastward 5.3 and 4.7 miles, respectively. This spread is largely the result of limitations to early detection and delays in completing eradication treatments. Although eradication *per se* has not been achieved on all sites, the treatments have prevented disease intensification in most areas and slowed disease spread overall.

The number of infested sites discovered annually had stabilized at approximately 60 new sites per year from 2007 to 2009; however, in 2010, 83 new sites were detected (Figure 1). These sites represent approximately 27 infested acres and involve more than 120 infected trees (Figure 2). Seventy-five of these sites occurred on private land and eight occurred on lands administered by the US Department of Interior Bureau of Land Management. All of the 2010 infested sites were well within the quarantine area and most contained few infected trees, suggesting reasonably early detection. The geographic distribution of new infested sites was uneven, with most located in the Taylor and Duley Creek drainages two miles north of Brookings. The disease is intensifying in this area and treatments are challenging and expensive because of landownership, dwellings, and difficult terrain. We also observed continued but less intense expansion of disease in the Bravo Creek area to the northwest (Figure 3).

Eradication projects have been delayed or interrupted many times due to uneven funding for activities on non-federal lands. Many of the sites discovered in 2009 on private land remained untreated from 2009 through the very wet spring of 2010. This undoubtedly contributed to disease spread and intensification. Federal stimulus funds became

available in April 2010, allowing work to resume on the backlog of 2009 treatment areas and new sites identified in 2010. All high-priority sites (outliers or those closest to the periphery of the quarantine area) were treated promptly in 2010. All of the infested sites on federal land have been fully or partially treated. Funding for treatment of the remaining infested sites and anticipated new ones looms as a challenge for 2011. (2/11)

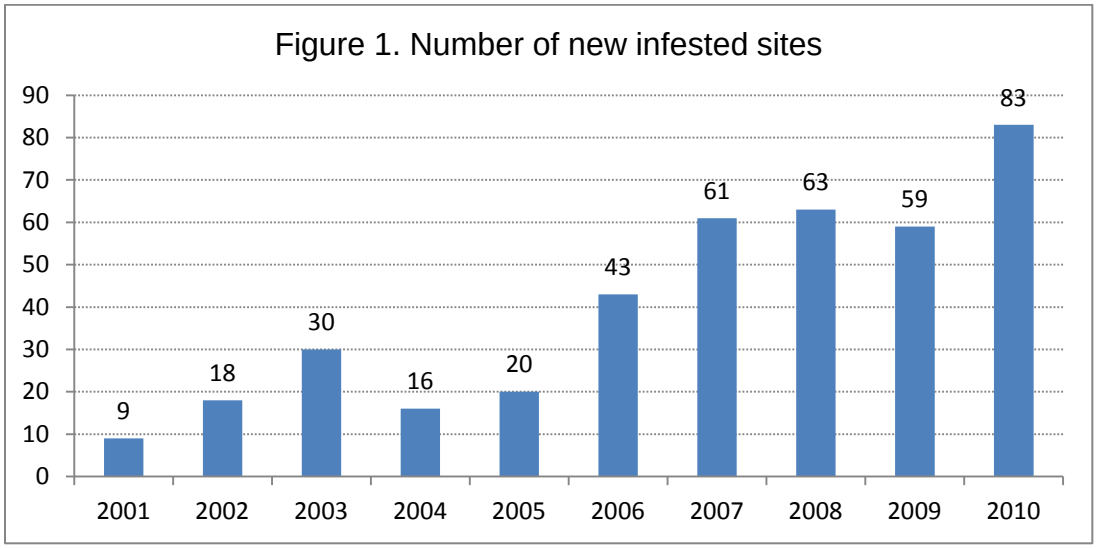

Figure 1. Number of new SOD sites discovered in Curry County forests, 2001-2010. (2/11)

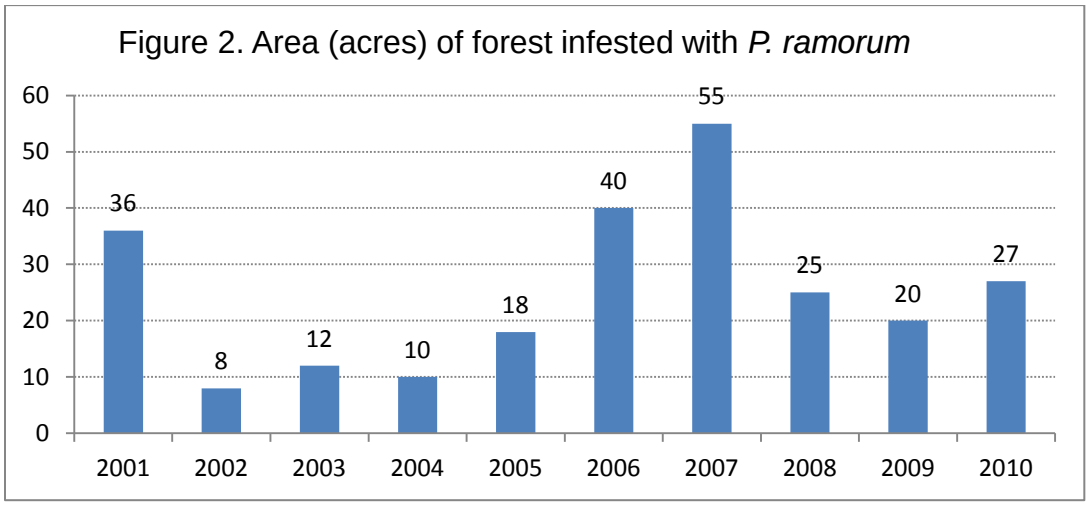

Figure 2. Acres infested with *P. ramorum* in Curry County forests, 2001-2010. (2/11)

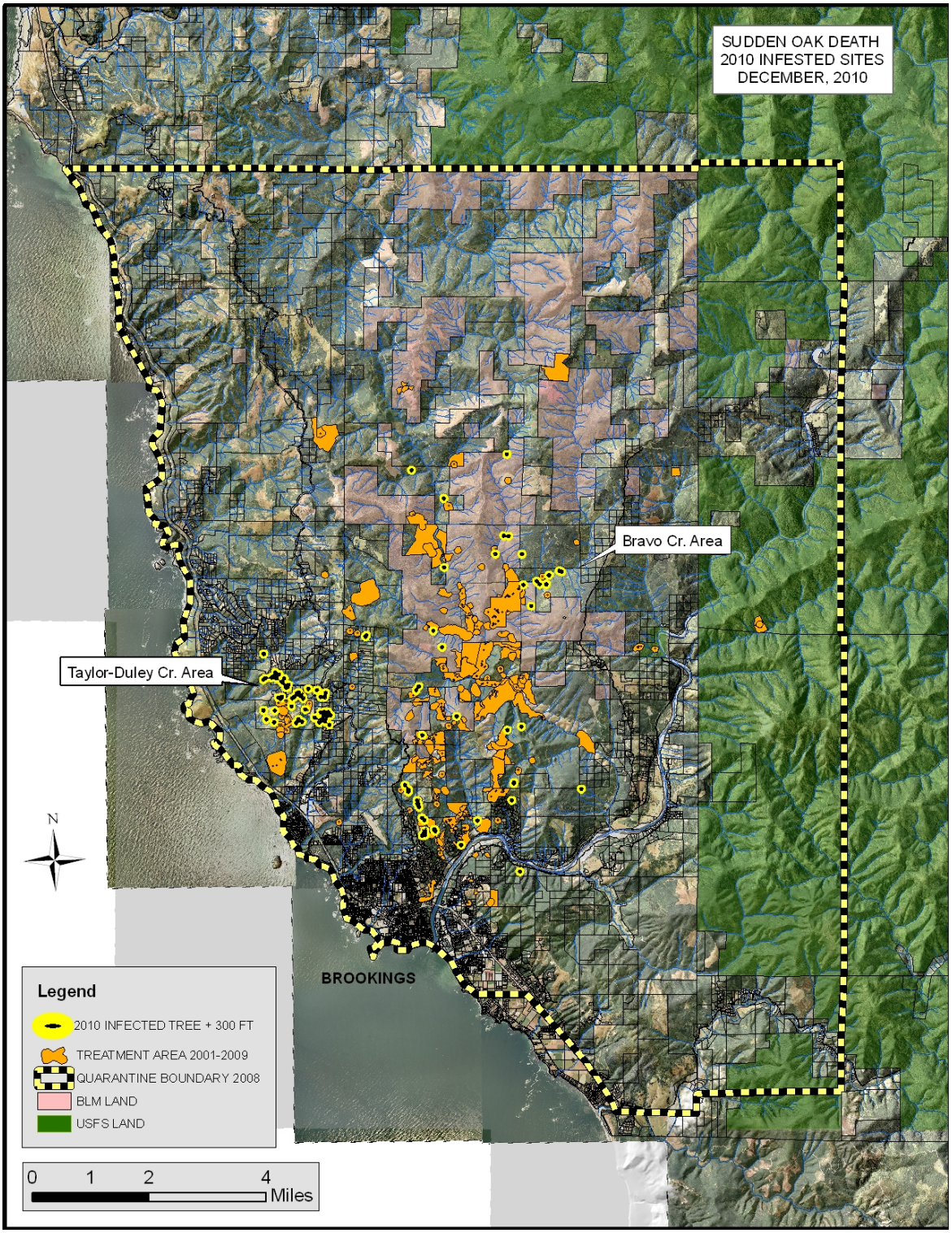

Figure 3. Location of areas infested with *P. ramorum* in 2010, Curry County, OR, December 2010. Sites enlarged by yellow halo for visibility. (2/11)

FUNDING

The USDA is allocating $50 million in fiscal year 2011 Farm Bill funding for projects that prevent the introduction or spread of plant pests and diseases that threaten US agriculture and the environment. Of those funds, nearly $2 million will be provided to *P. ramorum* efforts, including survey and analysis of nurseries in 17 participating states, safeguarding nursery systems, and enhanced mitigation through monitoring the efficacy of treatments in wildland areas. (7/11)

The USDA APHIS, Center for Plant Health Science and Technology fiscal year 2012/2013 NORS-DUC request for proposals (RFP) opens September 9, 2011. Short-term applied research projects are being sought that support of the broad goal of safeguarding nursery production and the forest industry. Research priorities include, but are not limited to: methods development to inhibit *P. ramorum* spread, mitigations to manage *P. ramorum*, epidemiological studies on inoculum sources, pathways, soil sampling focal points, and disease distribution in nurseries. The deadline for submission is 12/9/11. (9/11)

The UK has launched a Tree Health and Plant Biosecurity Action Plan that dedicates more than $11 million in funding over the next three years to combat exotic pests and diseases in an effort to protect the country's plants, trees, and habitats. Four key areas of activity addressed in the Plan include: import controls; practical actions; research; and communications and public engagement. (11/11)

The USDA Forest Service, Pacific Southwest Region, State and Private Forestry, Forest Health Protection program has issued its 2012 *P. ramorum* RFP for management projects. Approximately $500,000 in grants is expected to be available in federal fiscal year 2012. Proposals should focus on: detection and evaluation of pathogen presence, management activities that could limit the impact of SOD in CA or southwest OR, pathology activities that will provide new *P. ramorum* spread information, and activities that promote relevant information exchange. The submission deadline is 1/27/12. (12/11)

COMTF 2011 MEETING

The California Oak Mortality Task Force 2011 meeting took place May 25, 2011 and June 1, 2011 online, with each one-hour session focusing on challenging *P. ramorum*-related topics. On May 25, attendees participated in a virtual "field trip," as speakers discussed *P. ramorum* management-related issues in the field, and on June 1, presenters focused on issues dealing with *P. ramorum*-related pathways. Forest health specialists, land managers, regulators, nursery industry representatives, tribal members, arborists, researchers, Master Gardeners, and other interested parties were encouraged to attend. To access either session, go to at http://www.suddenoakdeath.org/news-and-events/past-events/comtf-2011-meeting/. (4/11)

EDUCATION AND OUTREACH

The "Arborist and Applicators" page of the COMTF website has been revised. Due to a change in policy, only those professionals who have attended a COMTF-sponsored

workshop within the last three years will be listed. Additionally, information will no longer be provided on a county by county basis, but rather as one comprehensive list. (2/11)

The OakMapper project now has a downloadable iphone® application that enables users to report trees suspected of having *P. ramorum*. Using the application, people can note symptoms such as bleeding cankers, bark and crown discoloration, dead leaves, shoot die-back, and beetle activity. The iphone's® built-in GPS identifies the participant's location when the data is submitted. On your phone you can view a map of confirmed and suspected locations of SOD in your vicinity and around the state. (2/11)

The UC publication: C. Lee, Y. Valachovic, M. Garbelotto. 2011. Protecting Trees from Sudden Oak Death before Infection. UC Agriculture and Natural Resources, Publication #8426 is now available online at http://anrcatalog.ucdavis.edu/Items/8426.aspx. (3/11)

The COMTF website has a new and improved Sudden Oak Death/*P. ramorum* bibliography page. Now you can browse and search an online database of over 600 references. The original PDF is also available for easy download and printing. (7/11)

"Super Rangers and the Legion of Bugs" is a new Don't Move Firewood animated outreach video now available online at http://www.dontmovefirewood.org/super-rangers.html. Nearly five minutes in length, the cartoon features Asian Longhorned Beetle, Sirex Woodwasp, Emerald Ash Borer, Goldspotted Oak Borer, Ambrosia Beetle, and SOD as these pests and pathogens can be transported on infested firewood. (9/11)

The COMTF website's Education and Training Resources page has been updated. Reorganized into sections on Youth Activities, Activities for Educators, Handouts & Posters, and Training Resources, the page aims at educating diverse audiences about *P. ramorum* through a variety of avenues. Youth Activities contains a new interactive Flash animation developed from the "Can My Tree Catch the Flu" educational series as well as a SOD-related word search, crossword, and jigsaw puzzle. Activities for Educators offers interactive and engaging projects for teachers to use, along with background information on *P. ramorum*. Handouts & Posters lists downloadable *P. ramorum*/SOD fact sheets, brochures, and posters in both English and Spanish, and a short course on the introduction, symptom recognition, diagnosis, sampling, regulations, and management of *P. ramorum* as well as the *P. ramorum* Educate to Detect presentation, are available for download under Training Resources. (10/11)

RESOURCES

Hilburn, D. 2011. A Tale of Three Nurseries. Digger March 2011: 4 pp. The article provides *P. ramorum*-related best management practices to help growers avoid problems. Available online at http://www.oan.org/associations/4440/files/digger/Digger_MAR_2011_p33-36.pdf. (4/11)

"Sudden Oak Death Impacts on Oregon South Coast Forests 2001-2009" is presented as part of Oregon's Forest Atlas 2010 online edition (http://www.oregon.gov/ODF/RESOURCE_PLANNING/forestatlas.shtml). A map and description of *P. ramorum* spread in the state are available. (4/11)

The UK Forestry Commission has published a comprehensive update on the *P.* *ramorum* Japanese larch outbreak. To access current knowledge, symptoms, diagnosis, treatment, actions, regulations, owners' responsibilities, financial assistance, and other information, go to: http://www.forestry.gov.uk/forestry/INFD-8EJKP4. (4/11)

The 2010 California Forest Pest Conditions Report is now available at http://www.fs.usda.gov/detail/r5/forest-grasslandhealth/?cid=fsbdev3_046704. It provides an update on insects, diseases, and abiotic conditions impacting California's forests. (5/11)

The Forest Pathology and Mycology Laboratory at UC Berkeley has launched a new tool to assist scientists, land managers, and property owners in furthering the understanding of SOD epidemiology and selecting the most appropriate disease management options for a given area. SOD-MAP will complement and interface with OAKMAPPER, only have *P. ramorum* reports confirmed by an official laboratory, including negative findings, with the intention of sharing known distribution information gathered by public agencies and research groups. Nursery data will not be included, but SOD records both from wildland and urban settings throughout the country will be. The maps are accessible at http://nature.berkeley.edu/garbelotto/english/sodmap.php. (6/11)

The Oregon Association of Nurseries has published the "Safe Procurement and Production Manual," a free 100-page guide to producing healthy nursery stock by using a systems approach. The book is available online at http://www.oan.org/displaycommon.cfm?an=1&subarticlenbr=861 as a PDF for download. (8/11)

Parke, J. 2011. Managing *Phytophthora*. Oregon Department of Agriculture. 4 pp. This document discusses strategies designed to help prevent disease in a nursery. Available online at http://cropandsoil.oregonstate.edu/sites/default/files/faculty-staff/ManagingPhytophthora.pdf. (8/11)

Parke, J. 2010. Reducing *Phytophthora*: these top 10 tips will help prevent this group of pathogens from taking hold. Digger 54(9):41-44,46. (8/11)

Parke, J.L. and Lewis, C. 2011. Protecting container-grown plants. Digger 55:41-45. This five-page article provides practical information to growers interested in reducing pest and pathogen threats by considering the type of containers and growing media used, where they are sourced, how they are handled, and how they are stored. (8/11)

A website devoted kauri dieback is now online at http://www.kauridieback.co.nz/. The site provides information about *Phytophthora taxon* Agathis (PAT), the fungus-like pathogen first identified in 2008 that causes the disease in New Zealand's kauri trees as well as information on disease prevention, the kauri tree, and related publications. (12/11)

RELATED RESEARCH

Browne, G.T.; Prichard, T.L.; Schmidt, L.S.; and Krueger, W.H. 2011. Evaluation of phosphonate treatments for control of *Phytophthora* crown rot of walnut. Plant Health Progress. June. (7/11)

Campbell, F. 2011. The hidden cost of trade: Invasive species as a trade "externality." Bridges Trade BioRes Review 5(3). (12/11)

Coleman, T.W.; Grulke, N.E.; Daly, M.; Godinez, C.; Schilling, S.L., Riggan, P.J.; and Seybold, S.J. 2011. Coast live oak, *Quercus agrifolia*, susceptibility and response to goldspotted oak borer, *Agrilus auroguttatus*, injury in southern California. Forest Ecology and Management 261(11): 1852-1865. (5/11)

Collins, S.; McComb, J.A.; Howard, K.; Shearer, B.L.; Colquhoun, I.J.; and St. J. Hardy, G.E. 2012. The long-term survival of *Phytophthora cinnamomi* in mature *Banksia grandis* killed by the pathogen. Forest Pathology 42(1): 28-36. DOI: 10.1111/j.1439-0329.2011.00718.x. (6/11)

Dehnen-Schmutz, K.; Holdenrieder, O.; Jeger, M.J.; and Pautasso, M. 2010. Structural change in the international horticultural industry: some implications for plant health. Scientia Horticulturae 125: 1-15. http://dx.doi.org/10.1016/j.scienta.2010.02.017. (2/11)

Döring, T.F.; Pautasso, M.; Finckh, M. R.; and Wolfe, M.S. 2012. Concepts of plant health – reviewing and challenging the foundations of plant protection. Plant Pathology 61(1): 1–15. DOI: 10.1111/j.1365-3059.2011.02501.x. (8/11)

Érsek, T. and Ribeiro, O.K. 2010. An annotated list of new *Phytophthora* species described post 1996. Acta Phytopathologica et Entomologica Hungarica 45(2): 251-266. http://dx.doi.org/10.1556/APhyt.45.2010.2.2. (2/11)

Fairweather, M.L. and Geils, B.W. 2011. First Report of the White Pine Blister Rust Pathogen, *Cronartium ribicola*, in Arizona. Plant Disease 95(4): 494. DOI: 10.1094/PDIS-10-10-0699. (4/11)

Fichtner, E.J.; Rizzo, D. M.; Kirk, S.A.; and Webber, J.F. 2012. Infectivity and sporulation potential of *Phytophthora kernoviae* to select North American native plants. Plant Pathology 61(2): 224–233. DOI: 10.1111/j.1365-3059.2011.02506.x. (9/11)

Grünwald, N.J.; Martin, F.N.; Larsen, M.M.; Sullivan, C.M.; Press, C.M.; Coffey, M.D.; Hansen, E.M.; and Parke, J.L. 2011. Phytophthora-ID.org: A Sequence-Based *Phytophthora* Identification Tool. Plant Disease 95(3): 337-342. DOI: 10.1094/PDIS-08-10-0609. (3/11)

Grünwald, N.J.; Werres, S.; Goss, E.M.; Taylor, C.R.; and Fieland, V.J. 2012. *Phytophthora obscura* sp. nov., a new species of the novel *Phytophthora* subclade 8d. Plant Pathology 61(3): 610–622. DOI: 10.1111/j.1365-3059.2011.02538.x. (11/11)

Harrington, T.C.; McNew, D.; and Young Yun, H. 2012. Bur oak blight, a new disease on *Quercus macrocarpa* caused by *Tubakia iowensis* sp. nov. Mycologia 104(1): 79-92. DOI: 10.3852/11-112. (12/11)

Hong, C.; Gallegly, M.E.; Richardson, P.A.; and Kong, P. 2011. *Phytophthora pini* Leonian resurrected to distinct species status. Mycologia, 103(2): 51–360. DOI: 10.3852/10-058. (4/11)

Jacobi, W.R.; Crump, A.; and Lundquist, J.E. 2011. Dissemination of Forest Health Research Information in the Rocky Mountains. Journal of Forestry, January/February, Pages 43–49. (3/11)

Jung, T.; Stukely, M.J.C.; St. J. Hardy, G.E.; White, D.; Paap, T.; Dunstan, W.A.; and Burgess, T.I. 2011. Multiple new *Phytophthora* species from ITS Clade 6 associated with natural ecosystems in Australia: evolutionary and ecological implications. Persoonia 26: 13–39. DOI: 10.3767/003158511X557577. (3/11)

Juzwik, J.; Appel, D.N.; DacDonald, W.L.; and Burks, S. 2011. Challenges and Successes in Managing Oak Wilt in the United States. Plant Disease 95(8): 888-900. DOI: 10.1094/PDIS-12-10-0944. (8/11)

Kale, S.D. 2012. Oomycete and fungal effector entry, a microbial Trojan horse. New Phytologist 193(4): 874-81. DOI: 10.1111/j.1469-8137.2011.03968.x. (12/11)

MacLeod, A.; Pautasso, M.; Jeger, M.J.; and Haines-Young, R. 2010. Evolution of the international regulation of plant pests and challenges for future plant health. Food Security 2: 49-70. http://dx.doi.org/10.1007/s12571-010-0054-7. (2/11)

Magarey, R.D.; Borchert, D.M.; Engle, J.S.; Colunga-Garcia, M.; Koch, F.H.; and Yemshanov, D. 2011. Risk maps for targeting exotic plant pest detection programs in the United States. OEPP/EPPO Bulletin 41: 46-56. (5/11)

Marcais, B.; Cael, O.; and Delatour, C. 2011. Interaction between root rot basidiomycetes and *Phytophthora* species on pedunculate oak. Plant Pathology 60: 296–303. DOI: 10.1111/j.1365-3059.2010.02378.x. (5/11)

Meadows, I.M.; Zwart, D.C.; Jeffers, S.N.; Waldrop, T.A.; and Bridges Jr, W.C. 2011. Effects of fuel reduction treatments on incidence of *Phytophthora* species in soil of a southern Appalachian Mountain forest. Plant Disease 95(7): 811-820. DOI: 10.1094/PDIS-07-10-0505. (7/11)

Mills, P.; Dehnen-Schmutz, K.; Ilbery, B.; Jeger, M.; Jones, G.; Little, R.; MacLeod, A.; Parker, S.; Pautasso, M.; Pietravalle, S.; and Maye, D. 2011. Integrating natural and social science perspectives on plant disease risk, management and policy formulation. Philosophical Transactions of the Royal Society, Biological Sciences 366: 2035–2044. DOI: 10.1098/rstb.2010.0411. (7/11)

Nechwatal, J.; Hahn, J.; Schönborn, A.; and Schmitz, G. 2011. A twig blight of understorey European beech (*Fagus sylvatica*) caused by soilborne *Phytophthora* spp. Forest Pathology, 41(6): 493–500. DOI: 10.1111/j.1439-0329.2011.00711.x. (12/11)

Orlikowski, L.B. 2010 Occurrence and harmfulness of *Phytophthora* spp. in Polish hardy ornamental nursery stock. Acta Horticulturae 885: 243-248. http://www.actahort.org/books/885/885_32.htm. (2/11)

Ostry, M.E.; Venette, R.C.; and Juzwik, J.. 2011. Decline As a Disease Category: Is It Helpful? Phytopathology 101(4): 404-409. DOI: 10.1094/PHYTO-06-10-0153. (4/11)

Pautasso, M.; Dehnen-Schmutz, K.; Holdenrieder, O.; Pietravalle, S.; Salama, N.; Jeger, M.J.; Lange, E.; and Hehl-Lange, S. 2010. Plant health and global change – some implications for landscape management. Biological Reviews 85: 729-755. http://dx.doi.org/10.1111/j.1469-185X.2010.00123.x. (2/11)

Pautasso, M.; Moslonka-Lefebvre, M.; and Jeger, M.J. 2010. The number of links to and from the starting node as a predictor of epidemic size in small-size directed networks. Ecological Complexity 7: 424-432. http://dx.doi.org/10.1016/j.ecocom.2009.10.003. (2/11)

Pautasso, M.; Xu, X.M.; Jeger, M.J.; Harwood, T.; Moslonka-Lefebvre, M.; and Pellis, L. 2010. Disease spread in small-size directed trade networks: the role of hierarchical categories. Journal of Applied Ecology 47: 1300-1309. http://dx.doi.org/10.1111/j.1365-2664.2010.01884.x. (2/11)

Pilbeam, R.A.; Howard, K.; Shearer, B.L.; and St J. Hardy, G.E. 2011. Phosphite does not stimulate a wounding response in *Eucalyptus marginata* seedlings. Australian Journal of Botany 59: 393–398. (7/11)

Potter, C.; Harwood, T.; Knight, J.; and Tomlinson, I. 2011. Learning from history, predicting the future: the UK Dutch elm disease outbreak in relation to contemporary tree disease threats. Philosophical Transactions of the Royal Society, Biological Sciences 366: 1966-1974. DOI: 10.1098/rstb.2010.0395. (7/11)

Ramage, B.S.; O'Hara, K.L.; and Caldwell, B.T. 2010. The role of fire in the competitive dynamics of coast redwood forests. Ecosphere 1:art20. DOI: 10.1890/ES10-00134.1. (2/11)

Rea, J.; Burgess, T.I.; St J. Hardy, G.E.; Stukely, M.J.C.; and T. Jung, T. 2011. Two novel and potentially endemic species of *Phytophthora* associated with episodic dieback of Kwongan vegetation in the south-west of Western Australia. Plant Pathology 60(6): 1055–1068. DOI: 10.1111/j.1365-3059.2011.02463.x. (5/11)

Richter, B.S.; Benson, D.M.; and Ivors, K.L. 2011. Microbial profiling of cultural systems for suppression of *Phytophthora* root rot in Fraser fir. Plant Disease 95(5): 537-546. (5/11)

Sturrock, R.N.; Frankel, S.J.; Brown, A.V.; Hennon, P.E.; Kliejunas, J.T.; Lewis, K.J.; Worrall, J.J.; and Woods, A.J. 2011. Climate change and forest diseases. Plant Pathology 60: 133–149. DOI: 10.1111/j.1365-3059.2010.02406.x. (4/11)

Tsopelas, P.; Paplomatas, E.J.; Tjamos, S. E.; and Elena, K. 2011. First Record of *Phytophthora nicotianae* Causing Leaf Blight on *Rhododendron* in Greece. Plant Disease 95(6): 777. DOI: 10.1094/PDIS-02-11-0096. (6/11)

Vettraino, A.M.; Brasier, C.M.; Brown, A.V.; and Vannini, A. 2011. *Phytophthora himalsil*va sp. nov. an unusually phenotypically variable species from a remote forest in Nepal. Fungal Biology 115(3): 275–287. http://dx.doi.org/10.1016/j.funbio.2010.12.013. (2/11)

Webber, J.F.; Vettraino, A.M.; Chang, T.T.; Bellgard, S.; Brasier, C.M.; and Vannini, A. 2012. Isolation of *Phytophthora lateralis* from *Chamaecyparis* foliage in Taiwan. Forest Pathology 42(2): 136–143. DOI: 10.1111/j.1439-0329.2011.00729.x. (8/11)

Wilkinson, K.; Grant, W.P.; Green, L.E.; Hunter, S.; Jeger, M.J.; Lowe, P.; Medley, G.F.; Mills, P.; Phillipson, J.; Poppy, G.M.; and Waage, J. 2011. Infectious diseases of animals and plants: an interdisciplinary approach. Philosophical Transactions of the Royal Society, Biological Sciences 366: 1933–1942. DOI: 10.1098/rstb.2010.0415. (7/11)

The following 16 abstracts on related research topics are being presented at the 2010 APS Annual Meeting in Charlotte, NC August 7-11th.

Dalio, R.; Fleischmann, F.; and Osswald, W. 2011. Localization of *Phytophthora plurivora* effector protein citricolin in *Fagus sylvatica* roots by light and fluorescence laser scanning microscopy. Phytopathology 101:S40.

Dalio, R.; Fleischmann, F.; and Osswald, W. 2011. Potassium phosphite protects European beech (*Fagus sylvatica*) seedlings against *Phytophthora plurivora*. Phytopathology 101:S40.

Grunwald, N.J.; Werres, S.; Goss, E.M.; Taylor, C.R.; and Fieland, V.J. 2011. *Phytophthora obscura* sp. nov. defines a novel *Phytophthora* subclade 8d. Phytopathology 101:S65.

Hadwiger, L.A.; Druffel, K.; Humann, J.; and Holloway, C. 2011. Non-host plant defense against multiple genera of fungal pathogens - initiated with DNase signals released by the pathogen. Phytopathology 101:S68.

Hao, W.; Vinatzer, B.; and Hong, C. 2011. Effect of temperature on survival of *Phytophthora* and bacterial species in irrigation water. Phytopathology 101:S69.

Hong, C.; Richardson, P.; Ghimire, S.; Kong, P.; Hu, J.; Moorman, G.; Lea-Cox, J.; and Ross, D. 2011. Diversity of *Phytophthora* species identified in a nursery irrigation runoff water containment basin of eastern Virginia. Phytopathology 101:S74.

Kilbourne, K.; Mmbaga, M.T.; and Harrison, R. 2011. Severity risk spatial model for *Phytophthora* diseases in woody ornamental nurseries in southern middle Tennessee. Phytopathology 101:S90.

Levesque, C. 2011. Deployment of DNA arrays in plant pathogen detection. Phytopathology 101:S214.

Liu, Z.; Rappaport, K.; Bowman, H.; Twieg, E.; Mavrodieva, V.; and Levy, L. 2011. Evaluation and adaptation of CANARY technology for rapid detection of plant pathogens. Phytopathology 101:S106.

Loyd, A.; Benson, D.M.; and Ivors, K. 2011. Identifying *Phytophthora* species isolated from nursery irrigation water throughout North Carolina. Phytopathology 101:S110.

Mathews, D.M.; Gu, D.; Johnston, B.S.; and Coffey, M.D. 2011. Screening of the world *Phytophthora* collection for viruses. Phytopathology 101:S116.

Meadows, I.M. and Jeffers, S.N. 2011. Evaluation of commercial algaecides to mitigate *Phytophthora* spp. in naturally-infested water. Phytopathology 101:S119.

Parke, J.L.; Eberhart, J.E.; Hansen, E.M.; and Frankel, S.J. 2011. Forest *Phytophthoras* of the world website. Phytopathology 101:S137.

Ristaino, J.B. 2011. A lucid key to the common *Phytophthora* species. Phytopathology 101:S153.

Widmer, T.L. 2011. Sporulation potential of *Phytophthora kernoviae* compared to *P. syringae* and *P. cactorum* on selected hosts. Phytopathology 101:S191. (7/11)

RELATED ISSUES

The initial meeting for a new California Firewood Task Force was held in Davis on 2/16/11 at the request of the CA Forest Pest Council. At the Council's 2010 annual meeting, a firewood resolution was brought forth by the USDA FS, State and Private Forestry, Forest Health Protection calling for the formation of a statewide task force to address issues related to the spread of invasive pests and pathogens via the movement of firewood. The resolution directs the task force to: engage concerned stakeholders; synthesize, evaluate, and publicize relevant information; develop best management practices and appropriate outreach materials; and identify and support appropriate research, management, and educational programs. (3/11)

***Phytophthora lateralis* was confirmed in April on Lawson cypress (*Chamaecyparis lawsoniana*)** (also known as Port Orford cedar) trees at two more Scottish sites in Greenock Cemetery, west of Glasgow. The finding follows the first confirmation of *P. lateralis* in Britain in November 2010 when Lawson cypress trees at Balloch Castle were found positive for the pathogen. Greenock Cemetery has more than 100 Lawson cypress, of which 23 are showing clear signs of infection, and several more are showing early signs. The symptomatic trees at the cemetery are being felled and burned on site. Biosecurity measures are being put in place to minimize the risk of the pathogen being spread from the site. (5/11)

Western Australia's Environmental Protection Agency (EPA) rejected a bid by the Department of Environment and Conservation to build a walking trail through Fitzgerald River National Park for fear of exposing the park to *P. cinnamomi*. However, the EPA has said it would support a proposal that does not include traversing the Park's wilderness management zone between Point Charles and Quoin Head. (6/11)

***Phytophthora lateralis* has been found in Devon (southwest England) killing Lawson Cypress** (*Chamaecyparis lawsoniana*) trees for the first time. The several infected trees identified were in a shelter hedge on an industrial estate. The trees will be felled and disposed of safely. The site is subject to biosecurity measures to prevent spreading the disease. Previous cases in the UK have only been identified in Scotland and Northern Ireland. *P. lateralis* was mostly known in the western states of the US and Canada, but outbreaks have recently been recorded in Scotland, Northern Ireland, France, and The Netherlands as well as in Taiwan on Taiwanese yellow cedar (*Chamaecyparis obtuse* var. *formosana*). (11/11)

Patterns of Firewood and Forest Pests Brought to California in 2011, By Matthew Bokach, USDA Forest Service, Pacific Southwest Region Forest Health Protection

In the last year (October 2010-September 2011), over 18 million pounds of firewood were recorded entering the State by the California Department of Food and Agriculture

(CDFA). The Hornbrook, Redwood Highway, and Alturas border stations were the top three entry points. Firewood came from 47 other states, Canada, and Mexico, with 87% of the wood by mass coming from Oregon, California, Arizona, and British Columbia. Most (86%) of the firewood was being taken to a destination in California, and almost half of the remaining wood was being carried to Reno, NV. Firewood in commercial vehicles was expected to travel over twice as far on average than wood in private vehicles: 185 miles versus 87.

Over the same time period, CDFA border stations intercepted 317 potential forest pests. The majority of these (93%) were beetles (longhorned, bark beetles, and wood borers). Almost half of the potential forest pests (44%) were intercepted at the Needles station, followed by the Meyers (15%) and Redwood Highway (10%) stations. Over 90% of the intercepted forest pests were intercepted in private vehicles.

Pests were intercepted in firewood that originated in 36 other states, California, and Canada, with the top origins being Arizona, Oregon, Colorado, and Texas. However, over a quarter of the pests were intercepted in vehicles bearing California license plates. Californians brought firewood containing forest pests back to the state from at least 17 other states. Most of these were in the West but pests were brought back to California from as far away as Georgia and Alabama. Vehicles with license plates from Colorado (9%) and Texas (5%) were the next most frequent.

Nearly all (97%) of the intercepted forest pests were going to a destination in California and there were 122 destinations total. Top destinations were: the Los Angles urban area (31 pests), the San Francisco-Oakland urban area (20), the Sacramento urban area (19), Yosemite National Park and the Riverside-San Bernardino urban area (15 each), Barstow (12), the Victorville urban area (11), and Placerville (10).

An analysis of the factors that best predicted destinations for firewood coming from outside California was conducted. Using logistic regression and Akaike's information criterion, it was determined that out-of-state firewood in private vehicles was more likely to go to areas with higher populations, larger numbers of homes that heated with wood, larger numbers of visitors to public campgrounds, and lower median incomes. Commercial loads of firewood were more likely to go to areas with higher populations, larger numbers of homes that heated with wood, and greater overall truck traffic. (12/11)

***Alder Phytophthora*: Native or Exotic? --Surprising New Findings - Throughout** Europe, alder species have been devastated by Alder *Phytophthora*. Consequently, there has been significant concern that epidemic levels of alder mortality could also occur in the US if these *Phytophthora* were introduced here. To address these concerns, the USDA FS Forest Health Technology Enterprise Team developed risk models, analyzing the likelihood of introduction, establishment, and spread of *P. alni* on susceptible alder in the lower 48 states. Then, in 2007, a subspecies of *P. alni* was discovered in Alaska under alder stands exhibiting considerable sudden mortality. It was later determined that the subspecies was widespread and capable of infecting Alaskan alder species.

Phytophthora alni is recognized as a species that resulted from hybridization of other *Phytophthora* species. The Alder *Phytophthora* are a subspecies group of *P. alni*: *P. alni* ssp. *alni* (PAA), *P. alni* ssp. *multiformis* (PAM), and *P. alni* ssp. *uniformis* (PAU). The parent species could not infect alder and the hybrids exclusively infect alders, so these hybrids are of special interest to scientists as one of only a small sample of plant pathogens shifting hosts following hybridization. How likely is it that hybrids will form in nature? How likely is it they will jump hosts? We do not yet know.

European forest pathologists have considered their Alder *Phytophthora* to be exotic invasive pathogens that entered Europe prior to 1993 and began causing widespread damage. But, proving a pathogen is exotic requires detailed population genetic analysis, as does determining if it is native. To this end, this year cooperative research between European and American pathologists has uncovered some cogent information on the subspecies PAU that occurs in Alaska and Europe. Population genetic studies of many isolates of PAU support the opinion that PAU is native to Alaska. Analysis has also found that the European population appears to be very limited in genetic diversity, and therefore presumably clonal in nature. Conversely, the Alaskan population is sexually reproducing, showing much higher levels of diversity and heterozygosity. Additionally, the differentiation between the two populations is high, with many unique alleles in both European and Alaskan isolates. While the alleles in the European population were not found in the Alaskan population of PAU, suggesting that Alaska is not the origin of the European introduction, the sample size of Alaskan isolates to date has been small, suggesting that there is a chance that the unique alleles present in Europe could be rare Alaskan alleles that were missed in current collections. These findings support the hypotheses that the Alaskan PAU population is likely endemic while the European PAU population is likely invasive, and the present data do not point toward an Alaskan origin of the European population. These results are presented in a poster at a COST FP0801 meeting on "Established and Emerging *Phytophthora*: Increasing Threats to Woodland and Forest Ecosystems in Europe," held last month in Budapest, and authored by J. Aguayo, B. Marcais, P. Frey and others from Nancy-Université, France and G. Adams from Michigan State University.

The results on the Alaskan PAU study agree with the ecological scenario of widespread occurrence of PAU beneath alders but low propagule numbers and scarce symptoms of root rot. Despite five years of intensive sampling for *Phytophthora* species under diseased and healthy alder, the subspecies PAM, PAA, and the suspected parent species *P. cambivora* have not been discovered in Alaska. Today the pathologists working on alder mortality in Alaska believe the damage is not the result of the Alder *Phytophthora*, but rather the result of climate induced susceptibility to alder canker pathogens and a later antagonist defoliator that has worsened the damage. However, concern is yet warranted because PAU hybridizing with PAM is believed to result in formation of PAA, the most highly virulent of the Alder *Phytophthora* subspecies and introduction of either PAM or PAA into the Alaskan riparian forests is predicted to result in long-term alder devastation. (12/11)

***Phytophthora lateralis* has been confirmed in Lawson cypress trees at** Blubberhouses, near Otley in North Yorkshire, England. This is the second confirmed outbreak in the country. The Forestry Commission has served Plant Health Notices on the owners requiring them to fell and destroy the trees in an effort to contain the disease and prevent it spreading. All owners are cooperating. (12/11)

PERSONNEL

Roddie Burgess, who lead the Forestry Commission's Plant Health Service for 14 years, has retired. Effective April 4, 2011, John Morgan will assume Burgess' position. Prior to his new appointment Morgan had been head of the Commission's Plant & Seed Supply Business Unit, overseeing the production and supply of more than 300 million forestry plants from the Commission's tree nurseries. (4/11)

John McDonald retired from the Canadian Food Inspection Agency. **As of March** 28, 2011, Dominique Pelletier is handling Canada's *P. ramorum* regulatory program. Pelletier can be reached at (613) 773-7180 or Dominique.Pelletier@inspection.gc.ca. (4/11)

Franny Healey will be retiring on June 29th after nearly seven years as the COMTF webmaster and administrative assistant. Franny first started managing the COMTF website in 2004. Her technical knowledge and pleasant demeanor made her an asset at the office and onsite at meetings. (6/11)

Bonnie Nielsen has been hired as the new COMTF webmaster, replacing Franny Healey who retired last month. She will work with Janice Alexander at the UC Cooperative Extension, Marin County office in Novato. Bonnie can be reached at banielsen@ucdavis.edu or (415) 499-3261. (7/11)

Chris Lee, the Northern Outreach Coordinator for COMTF and a staff research associate for UC Cooperative Extension in Humboldt County, is leaving the world of SOD after seven years of education, monitoring, and management activities in northwestern California. (8/11)

KUDOS

Gary Chastagner, Washington State University Puyallup Research and Extension Center, received an award of Excellence in Extension from the American Phytopathological Society (APS) in August at the 2011 annual meeting in Honolulu, HI. Gary was recognized for his "success in addressing stakeholders' needs through translational research" with diseases of ornamental bulbs and Christmas trees. (9/11)

Congratulations to Susan Frankel and Ellen Goheen for receivinge the 2011 Outstanding Achievement Award from the Western International Forest Disease Work Conference "for leadership in the science and practice of Forest Pathology and for critical contributions to the management of Sudden Oak Death." Only one award is granted each year. This is the first time women have been granted the award. (11/11)

2011 CALENDAR OF EVENTS

2/9 – SOD Treatment Workshop; UC Berkeley
3/9 – SOD Treatment Workshop; UC Berkeley
3/15 – Guidelines for Managing Oak Rangelands four-part webinar series; UC DANR
4/16 – Guidelines for Managing Oak Rangelands; webinar series field trip to Sierra Foothill Research and Extension Center
4/20 – SOD Treatment Workshop; UC Berkeley
4/30 – Guidelines for Managing Oak Rangelands; webinar series field trip to Hopland Research and Extension Center
5/11 – SOD Treatment Workshop; UC Berkeley
5/23 – 28 - Fourth International Workshop on Oomycetes: *Phytophthora*, *Pythium* and *Phytopythium*; College Park, Maryland
5/25 – COMTF 2011 Meeting: SOD/*P. ramorum*: A Global Perspective on Management and Movement Webinar, Part 1, "Virtual 'Field Trip' of *P. ramorum* Wildland Management
6/1 – COMTF 2011 Meeting: SOD/*P. ramorum*: A Global Perspective on Management and Movement Webinar, Part 2, "Focus on *P. ramorum* Pathways"
6/21 – 6/23 - Coast Redwood Forests in a Changing California: A Symposium for Scientists and Managers; UC Santa Cruz
6/24 – "Using genomics to manage healthy oak populations," UC Davis
6/30 – SOD in Humboldt County; Free Workshop for landowners, the general public, and all other interested parties; Garberville
6/30 – Guidelines for Managing Oak Rangelands; webinar series field trip to Avenales Ranch; San Luis Obispo County
7/13 – 7/14 - CFPC Summer Weed Tour; Calaveras County
7/26 – CFPC Summer Insect, Disease, and Animal Damage Tour; Mendocino County
7/31 – 8/5 – Disease and Insect Resistance in Forest Trees: Fourth International Workshop on the Genetics of Host-Parasite Interactions in Forestry; Eugene, OR
9/15 – 9/17 - California Urban and Community Forests Conference, Palo Alto
10/5 – SOD Treatment Workshop; UC Berkeley
10/5 – 10/6 – The Seventh Meeting of the Continental Dialogue on Non-Native Forest Insects and Diseases; Boulder, Colorado
10/10 – 10/14 - The 59th Western International Forest Disease Work Conference; Leavenworth, WA
10/15 – Sonoma/Marin SOD Blitz Community Meeting
10/15 – Sonoma County SOD Field Meeting; Glen Ellen
10/17 – Sonoma County SOD Field Meeting; Santa Rosa
10/21 – Woodside/Portola Valley/South Skyline/Saratoga SOD Blitz Community Meeting
10/26 – SOD Treatment Workshop; UC Berkeley
10/28 – Napa SOD Blitz Community Meeting
11/4 – Carmel Valley SOD Blitz Community Meeting
11/8 – 11/11- 2011 IUFRO Forest Protection Joint Meeting, Research Groups 7.02 – 7.03; Colonia del Sacramento, Uruguay
11/9 – SOD Treatment Workshop; UC Berkeley

11/13 – SOD Workshop for Marin County Area Residents
11/16 – Oakland SOD Blitz Community Meeting