CALIFORNIA OAK MORTALITY TASK FORCE REPORT
AUGUST 2007

NEW HOSTS

Oregon Grape (*Mahonia aquifolium* [Pursh] *Nutt.* - Berberidaceae Family) was found *P. ramorum*-positive for the first time at a Canadian nursery. Plants sampled on 5/25 resulted in the identification of a positive plant on 6/20/07. Symptoms found on the Oregon Grape were primarily foliar, and included leaf spots and discoloration. Various cultivars of this plant are available in the nursery trade. This host species is native to the West Coast of the US. APHIS is reviewing the findings and anticipates adding Oregon Grape to the list of *P. ramorum*-regulated hosts soon.

Silk tassel bush (*Garrya elliptica*) was found *P. ramorum*-positive for the first time in the United Kingdom. Sixteen plants were identified as infected with the pathogen in 2/07. Upon confirmation, a quarantine was imposed and the plants were destroyed. This host species is a West Coast US native. APHIS is reviewing the findings and anticipates adding silk tassel bush to the *P. ramorum*-regulated host list soon.

RESEARCH

Lilja, A.; Rytkönen, A.; Kokkola, M.; Parikka, P.; and Hantula J.. August 2007. First Report of *Phytophthora ramorum* and *P. inflata* in Ornamental Rhododendrons in Finland. Disease Notes Vol. 91, Number 8. Page 1055. DOI: 10.1094/PDIS-91-8-1055C.

Phytophthora ramorum was found for the first time in Finland during the spring of 2004 on marketed plants of *Rhododendron* spp. originating in other EU member states. During August of 2004, the pathogen was also found in one Finnish nursery on German *Rhododendron catawbiense* plants and several Finnish *Rhododendron* spp. cultivars. *P. ramorum* was detected by species-specific PCR and isolated. It was first characterized by an abundant production of chlamydospores on PARP and V8 agar, absence of oogonia and antheridia, and elongate, ellipsoid, deciduous, semipapillate sporangia produced in soil extract water (3). A partial sequence of the β-tubulin gene was identical to that of *P. ramorum* deposited in GenBank. Despite strict regulations governing the movement of plants, the pathogen has been found every year since 2004 on materials transported to Finland from other EU countries. A total of 586 samples were taken from symptomatic plants of several susceptible species from 2004 to 2006. *P. ramorum* was detected in 51 rhododendron samples and the number of the outbreak sites was 28. In domestic plant production, *P. ramorum* was found in only one nursery. The infected plants in this nursery were destroyed in 2005 according to the EU regulation 2004/426/EG. During the 2006 growing season, 84 samples from trace-forward inspections and reinspections of the nursery were tested and *P. ramorum* was not detected in any of the samples. In 2005, surveys for *P. ramorum* on Finnish *Rhododendron* spp. cultivars with necrotic lesions on leaves and blackened tips yielded, in addition to *P. ramorum*, another *Phytophthora* sp. On V8 agar, this homothallic species showed a stellate growth pattern with sparse aerial mycelium. Oogonia had both paragynous and amphigynous antheridia, and sporangia produced in soil extract water were ellipsoid in shape and semipapillate. A 763-bp segment of the β-tubulin gene was sequenced and was identical to the β-tubulin sequence

of *P. inflata* strain IMI342898 (GenBank), which was isolated in 1990 from *Syringa* sp. in the UK. It is likely that this *P. inflata* strain has been spreading in Europe with the ornamental plant trade. To fulfill Koch's postulates, rhododenrdon plants were inoculated (2) with *P. inflata* or *P. ramorum*, typical symptoms observed, and the pathogens were reisolated from inoculated plants. Both *Phytophthora* species also caused necrotic lesions on *Alnus glutinosa, A. incana*, and *Betula pendula*. *Pinus sylvestris* was resistant to both *Phytophthora* spp., whereas *Picea abies* was susceptible to *P. inflata* but not *P. ramorum*.

Werres, S.; Wagner, S.; Brand, T.; Kaminski, K.; and Seipp, D. 2007. Survival of *Phytophthora ramorum* in recirculating irrigation water and subsequent infection of *Rhododendron* and *Viburnum*. Plant Dis. 91:1034-1044.

Abstract: *Phytophthora ramorum* was studied in an open air simulation system with nine separate container stands each connected to its own water collection system. The water in these reservoirs was inoculated with *P. ramorum* and then used for overhead irrigation over the course of the season to study the spread of the pathogen and development of *P. ramorum* blight in *Rhododendron* and *Viburnum* spp. *P. ramorum* could infect plants through the use of contaminated irrigation water, with the maximum amount of infection of *Rhododendron* spp. less than 19%. In the 2 years of the study, symptom onset occurred 8 and 16 days, respectively, after water was first inoculated. The disease rate proportion of infected plants developing symptoms varied with year and season. In both years, the pathogen was detected in the water reservoirs over the course of the growing season.

The following fifteen abstracts on *Phytophthora ramorum* or related topics are from the American Phytopathological Society (APS) meeting held July 28 to Aug. 1, 2007, in San Diego, CA. Additional meeting information and abstracts can be found at: http://meeting.apsnet.org/program/welcome.cfm.

Bilodeau, Guillaume; Lévesque, C. André; DeCock, Arthur; and Hamelin, Richard. 2007. Assessment of codon volatility as an indicator of gene polymorphisms in *Phytophthora ramorum*. Phytopathology 97:S10.

Molecular genotyping could be an important tool to better understand the population biology and movements of pathogens such as *Phytophthora ramorum*. The availability of its complete genome sequences since 2004 provides a resource of 16000 predicted gene. We developed a strategy based on codon volatility to design SNP (Single Nucleotide Polymorphism) markers within candidate genes of functional importance. The codon volatility is a method to detect selection on basis of a single genome sequence, for non-synonymous substitutions. Using bioinformatics analyses and DNA sequencing, we uncovered more than 70 SNPs, including insertions and deletions in 13 genes. More polymorphic genes were found in high volatility group (50%) than in low volatility group (40%). In addition 5 of the 6 most polymorphic genes (more than 9 SNPs) were in high volatility group. In a collection of samples from Europe and the USA, we identified SNP profiles that were distinct and mostly correlated with geographic origin. Populations of *P. ramorum* in California and Oregon consisted of two SNP profiles and were most likely

clonally-derived. Non-synonymous mutations were observed; which could be used to study potential of evolution.

Fichtner, Elizabeth; Rizzo, David; Lynch, Shannon; Davidson, Jennifer; Buckles, Gerri; and Parke, Jennifer. 2007. Summer survival of *Phytophthora ramorum* in California forests. Phytopathology 97:S36.

Bay laurel supports sporulation of *Phytophthora ramorum*, but factors mediating survival are largely unknown. This study focuses on pathogen summer survival on bay in two forest types. Objectives include: i) detection of *P. ramorum* in litter and soils, ii) quantification of chlamydospores in leaves and litter, and iii) assessment of survival within the litter and canopy. Trees were sampled in redwood-tanoak and mixed-evergreen forests in May and August 2006. Soil and litter were baited to determine pathogen presence. Chlamydospore populations were determined by scrubbing individual leaves with a moistened brush and filtering the resulting suspension through nylon mesh. Survival and colonization were determined by subdividing symptomatic tissue from each leaf for detection by PCR, culture, and microscopy. *P. ramorum* was baited from soils in May but not August, and was never baited from litter. Chlamydospores were more abundant on leaves in redwood-tanoak forests than mixed-evergreen forests, and were often produced under the leaf cuticle. PCR resulted in more positives than culture. Recovery from fresh litter and attached leaves decreased between May and August, but the pathogen was never recovered from aged litter. The enhanced chlamydospore production in redwood-tanoak forests may contribute to the earlier onset of the annual disease cycle in this forest type.

Goss, Erica; Press, Caroline; and Grunwald, Niklaus. 2007. Selection on an avirulence homolog (Avh) gene family in *Phytophthora ramorum*, causal agent of Sudden Oak Death and Ramorum blight. Phytopathology 97:S41.

Pathogen effectors can serve a virulence function on behalf of the pathogen or trigger a rapid defense response in resistant hosts. Sequencing of the *Phytophthora ramorum* genome and subsequent analysis identified a diverse superfamily of approximately 350 genes that are homologous to the four known effectors in plant pathogenic oomycetes and share with them two protein motifs (RxLR and dEER). These have been termed Avh (avirulence homolog) genes. While as a whole the genes in this superfamily exhibit modest sequence similarity, small groups of closely related genes can be identified. We have investigated the molecular evolution of one such group of seven Avh genes. Microarray data suggests that four of these genes are expressed in isolate Pr-102. We sequenced the full coding region (approximately 400 bp) and flanking noncoding regions of each gene in the three clonal lineages of *P. ramorum*. The number of polymorphic sites within *P. ramorum* genes ranges from 0 to 35, suggesting different evolutionary pressures among genes. Analysis indicates that these genes contain both codons under purifying selection (e.g. in the signal peptide and RxLR and dEER motifs) and under positive selection. We have also been able to obtain the sequence of homologous Avh

genes in the sister taxa *P. hibernalis*, *P. lateralis*, and *P. foliorum*, allowing for examination of the evolution of these genes across species.

Hodges, Amanda; Momol, Tim; McGovern, Robert; McKellar, Mary; Hoenisch, Richard; Bates, Cassandra; Ruhl, Gail; and Cain, Steve. 2007. First Detector Education in the National Plant Diagnostic Network. Phytopathology 97:S47.

The NPDN Training and Education Subcommittee implemented a national training program for First Detectors (FD's) during the fall of 2003. Guidelines and polices for FD training are continually updated by the subcommittee through the First Detector Educator Training Manual. A trained NPDN FD assists in protecting U.S. agriculture from exotic pest introductions by reporting unusual pest activity to NPDN diagnostic labs. Nationally, over 12,000 FD's have received training and over 6,000 FD's are included in the national registry. A majority of high-risk special topic training sessions have been conducted on primarily plant pathogen and arthropod-related topics of interest, such as soybean rust, sudden oak death, and pink hibiscus mealybug. Registered FD's receive the national FD newsletter, pest alert information, and local AgAlerts in some cases. Increasing the availability on the WWW and quantity of information accessible to all potential FD's and extension educators has been an emphasis of the subcommittee during 2006 and 2007. As of December 2006, all core NPDN modules previously password-protected as well as several special topic modules are now available on the NPDN website, First Detector Information page. A new, searchable website interface for NPDN modules has also been released during 2007. Several improved features for educators to report and advertise upcoming training and education sessions have also recently been incorporated. Additionally, the original six modules developed for NPDN learning have also been released in an online learning format during 2007.

Martin, Frank. 2007. Mitochondrial genomics in the *Peronosporales*; implications for phylogenetics and development of molecular markers. Phytopathology 97:S71.

The mitochondrial genomes of the genera *Pythium* and *Phytophthora* encode a similar suite of genes but differ from each other by an inverted repeat (IR) in *Pythium* that can represent approximately 75% of the genome size. While an IR is not usually found in *Phytophthora* genomes, a small IR was observed in *P. ramorum* and *P. hibernalis* (less than 1.5 kb). In an effort to gain a better understanding of the evolutionary forces responsible for sequence divergence in genomes with and without an IR, as well as to clarify the phylogenetic relationships within the individual genera, the mitochondrial genomes of 15 *Pythium* and 10 *Phytophthora* species were sequenced. Comparative genomics among species within a genus indicated that certain regions of the genome were more polymorphic than others. In *Pythium*, the small unique region and adjacent IR sequences was the most polymorphic region. In *Phytophthora* genomic inversions were observed with many of the rearrangements corresponding to phylogenetic groupings. Intraspecific variation has provided tools for identification of mitochondrial haplotypes in *P. ramorum*. Gene order differences between the two genera shows promise for the development of genus and species specific molecular markers.

McDonald, Virginia and Grunwald, Niklaus. 2007. Evaluation of infection potential and sporulation of the three clonal lineages of *Phytophthora ramorum* on two *Rhododendron* cultivars. Phytopathology 97:S73.

The three known clonal lineages of *Phytophthora ramorum* consist of a European/U.S. nurseries lineage (1), a U.S. forest/nurseries lineage (2) and a U.S. nurseries lineage (3). A major cause of the spread of *P. ramorum* has been through the shipment of infected nursery stock and some *Rhododendron* species have been shown to be particularly susceptible to *P. ramorum*. The objective of this study was to evaluate three isolates from each of the three lineages of *P. ramorum* in terms of infection potential and sporulation capacity on a susceptible and resistant cultivar of *Rhododendron*. Utilizing a detached leaf assay, leaves were wounded on the upper side, inoculated with a 20 µl drop of a zoospore suspension and incubated for 8 days in a moist chamber. In two trials, measurements of percent lesion area, total sporangia/lesion and sporangia/cm^2 lesion were taken. Trial 1 showed no significant differences between the three lineages of *P. ramorum*, however, in the second trial, lesion area showed a significant difference between lineages (1) and (2), at 15% and 12%, respectively. The lesion area for lineage (3) was intermediate at 14%. Mean sporangia/lesion showed significant differences at 555, 340 and 219 for lineages (3), (2) and (1), respectively. Sporangia/cm^2 lesion showed significant differences at 188, 132 and 60 for lineages (3), (2) and (1), respectively.

McLaughlin, Inga; Jeffers, Steven; and Waldrop, Thomas. 2007. Effects of prescribed burning on survival of *Phytophthora cinnamomi* in forest soil. Phytopathology 97:S74.

Prescribed burning has become commonly used in fire-adapted forests to reduce fuels and the risk of wildfire outbreaks. Little is known about the direct effects of fire on survival of species of *Phytophthora* naturally present in the forest soils. Therefore, the effects of fire on survival of *P. cinnamomi* was assessed during two low-intensity prescribed fires that were set in mixed hardwood and pine stands in western South Carolina. Four plots were placed in areas to be burned and four plots were placed in adjacent non-burned areas. In each plot, seven 100-ml aliquots of forest soil naturally infested with *P. cinnamomi* in aluminum-mesh packets were buried at 2 cm and 10 cm below the soil surface. Thermocouple temperature sensors were placed at each packet and recorded soil temperature every 1.5 s. After the fires, soil packets were bioassayed for *P. cinnamomi.* Maximum temperatures 30 cm above the soil in each plot ranged from 47 to 111°C. Maximum soil temperatures were: 7 to 13°C, control-2 cm and 10 cm; 11 to 41.6°C, fire-2 cm; 7 to 14°C, fire-10 cm. After the first fire, *P. cinnamomi* was recovered from 98% of aliquots at 2 cm, 100% of aliquots at 10 cm, and 100% of aliquots in control plots. *P. cinnamomi* was recovered from all of the aliquots in the second fire. In this study, prescribed fire had little to no impact on survival of *P. cinnamomi* in soil.

Rooney-Latham, Suzanne; Blomquist, Cheryl; Pastalka, Tomas; and Costello, Laurence. 2007. First Report of *Phytophthora siskiyouensis* causing disease on Italian alder in Foster City California. Phytopathology 97:S101.

Phytophthora species cause cankers on the stems of many forest and landscape trees. In November of 2006, Italian alder trees, *Alnus cordat*, were reported to be dying with symptoms of bleeding cankers located at the base of the stem. The trees were located in a business development outside of a library in Foster City, California. Several of the trees had already been removed as hazardous. Successful isolations were made at the leading edge of the canker from the wood cambium interface onto PARP selective medium. A homothallic *Phytophthora* with primarily paragynous antheridia grew out in the media. The sporangia, produced easily on carrot agar plugs in soil water, were ovoid to ellipsoid in shape. Oospores were mostly globose and aplerotic. The intergenic transcribed spacer region of rDNA of the oomycete matched with 100% identity to *Phytophthora siskiyouensis*, a pathogen associated with tanoak and also found in the soil and water in coastal Oregon. Pathogenicity experiments were conducted on Italian, red, and white alder. This *Phytophthora* may be endemic to California. Foster City shares a marine-influenced climate with coastal Oregon.

Snover-Clift, Karen; Clement, Patricia; and Jensen-Tracy, Sandra. 2007. Searching for *Phytophthora ramorum*: Three years of Surveying New York State and Northeastern Nurseries for the Sudden Oak Death Pathogen. Phytopathology 97:S109.

The discovery of *Phytophthora ramorum* on Camellia in a large production nursery in California in March 2004 prompted trace forward and national survey sampling of containerized ornamental plants shipped across the country. The Plant Disease Diagnostic Clinic (PDDC) at Cornell University tested plant material from three major surveys over a three year period. From 2004 through 2006, the PDDC processed 2681 samples comprised of 284 NPDN trace forward, 2035 NYS National Survey, and 362 US Forestry nursery perimeter samples. Additionally, the Tiffany Creek Preserve has been monitored due to a questionable positive test result on a mature Red Oak (*Quercus rubra*) in June 2004. This result caused additional testing of trees, soil and water from the Preserve until the results were consistently negative twice a year for two years. Testing methods included the use of a commercial Enzyme-Linked ImmunoSorbant Assay (ELISA) test kit and double nested Polymerase Chain Reaction (PCR). Over the three year period, 327 of 2319 samples tested positive for a *Phytophthora* species with ELISA. PCR testing was conducted on these samples to determine if the *Phytophthora* species present was *P. ramorum*. All forestry samples were processed using PCR. No *P. ramorum* was found in any of our testing and the Tiffany Creek Preserve was deemed free of *P. ramorum*.

Uribe, Pedro and Martin, Frank. 2007. The usefulness of the COXI-COXII spacer region for the development of assays for specific detection of *Phytophthora* species. Phytopathology 97:S117.

Phytophthora nemorosa, and *P. kernoviae* are two forest pathogens with similar ecological niches. *P. nemorosa*, a recently described species, attacks oaks and other Pacific coast trees with foliar symptoms that are similar to those caused by *P. ramorum*, the causal agent of Sudden Oak Death (SOD). *P. kernoviae* is a quarantine pathogen in

the UK and EU that is attacking rhododendrons and trees of the Fagus family. With the purpose of improving detection systems for forest and nursery pathogens and to provide tools for diagnosis of *P. kernoviae* we designed assays for species detection using the intrinsic variability existent within the COX spacer region of the mitochondrial genome of *Phytophthora* sp. Sensitivity of the *P. nemorosa* assay was shown to be up to the fg range in Sybr green amplification, while the detection limits of *P. kernoviae* was shown to be close to 100 fg in TaqMan® and 10 fg in SYBR® green assays. In addition, progress in the development of assays for specific detection of *P. citricola*, *P. cactorum* and *P. fragariae* using the same mitochondrial region is presented.

Wamishe, Yeshi; Jeffers, Steven; and Hwang, Jaesoon. 2007. Hunting for *Phytophthora ramorum* and other species of *Phytophthora* in suburban waterways in South Carolina. Phytopathology 97:S119.

In 2004, container-grown nursery plants contaminated with *Phytophthora ramorum* were shipped from several nurseries in California and Oregon to nurseries around the USA. To determine if *P. ramorum* escaped from these plants and became established in local ecosystems, waterways are being monitored in South Carolina cities where nurseries that received contaminated plants are located. At the same time, the prevalence and diversity of other species of *Phytophthora* are being investigated. Streams that drain large suburban landscape areas were targeted. Water samples (1 to 2 liters) were collected from 20 suburban streams in five cities in spring and fall 2006; three to seven streams were sampled in each city. For each water sample, eight aliquots (50 to 250 ml, depending on water quality) were passed through membrane filters (Nuclepore with 3-µm pores or Durapore with 5-µm pores) to trap propagules of *Phytophthora* spp., and filters were inverted on PARPH-V8 selective medium. To date, *P. ramorum* has not been detected in any stream; however, *Phytophthora* spp. were recovered from all 20 suburban streams and the diversity of species appeared to be greater in fall than in spring. Identification of these species is in progress; to date, *P. gonapodyides* has been confirmed in all 20 streams. Monitoring of suburban streams will continue in 2007.

Yakabe, Lani; Blomquist, Cheryl; Thomas, Samantha; and MacDonald, James. 2007. Identification and frequency of *Phytophthora* species causing foliar diseases in California ornamental nurseries. Phytopathology 97:S126.

Attention has traditionally focused on *Phytophthora* species causing root and crown rot diseases, leaving *Phytophthora* species causing foliar infections less well-studied. As part of federally mandated nursery surveys targeting *Phytophthora ramorum*, numerous California ornamental nurseries have been extensively sampled for leaf spot and twig blight. These surveys presented the opportunity to examine the incidence of other foliar-infecting *Phytophthora* species. Diseased tissue collected during the 2005 and 2006 surveys were screened by ELISA and PCR methods to determine if *Phytophthora* species other than *P. ramorum* were present. A total of 375 samples were determined to be *Phytophthora* species other than *P. ramorum*. These isolates were initially identified by matching internal transcriber spacer I sequences with published GenBank sequences.

Subsets of these were further verified by morphological characters. Thirteen species of *Phytophthora* were found; *P. syringae* and *P. citricola* were found most frequently making up 31% and 24% of the total number of isolates, respectively. *P. Pgchlamydo* and *P. foliorum*, were also present. To verify pathogenicity, subsets of isolates are currently being inoculated onto common host plants. Knowledge of species causing foliar blights in California nurseries may aide in future management.

Zeller, Kurt; DeVries, Renee; and Levy, Laurene. 2007. Validation of Confirmatory Real-time PCR Diagnostic Assays for Detecting *Phytophthora ramorum.* Phytopathology 97:S129.

One of the limitations of validated PCR assays currently used by PPQ to complete a diagnosis of *Phytophthora ramorum* (PR) is that each assay can cross-react with DNA from PR relatives if these are present at high titer, or if the validated process is not followed exactly. We have worked to validate a recently developed Real-time PCR assay diagnostic for PR for use by PPQ. This assay targets an intron from a single-copy *Phytophthora* gene (*Ypt1*). Sequence comparisons for *Ypt1* between PR, *P. foliorum* and *P. hibernalis* indicate that the target sequences for the primers and probe used in this assay differs by ~20% between PR and *P. foliorum*, and by ~30% between PR and *P. hibernalis*. The assay does not cross-react with DNAs of *P. foliorum* or *P. hibernalis* in controlled tests, or with environmental samples of these two species identified during 2006 surveys for PR. However, the *Ypt1* assay is less sensitive for PR DNA than the validated Nested or Real-time PCR assays that target the ITS regions. Due to the lower assay sensitivity and higher probability of false negative diagnoses, we do not recommend it as a stand-alone diagnostic for PR. The *Ypt1*-based assay is straightforward to conduct, does not cross-react with DNAs from *P. foliorum* and *P. hibernalis*, and does appear to be a useful confirmatory assay for PR.

Zeller, Kurt; Twieg, Elizabeth; Picton, Deric; DeVries, Renee; and Levy, Laurene. 2007. Critical analysis of combined PCR diagnostics used in Federal Surveys for *Phytophthora ramorum.* Phytopathology 97:S129.

It has been noted that the array of PCR assays that have been utilized as the primary diagnostics methods for *Phytophthora ramorum* (PR) can cross-react with several closely related *Phytophthora* species. The potential for cross-reactivity with these related species, coupled with recent reports of at least two of these species having host ranges that overlap with PR, has raised concerns about Federal regulatory actions being taken due to false positive assay results. In this report, we directly compare and present results of the three validated PCR assays on target DNAs of known concentration from PR, *P. foliorum, P. hibernalis & P. lateralis*. We use these test data to demonstrate under what conditions a false positive might occur using the combined PCR assays. We compare these laboratory data to results accumulated during the course of 2006 for sample DNAs for which we have both conventional and Real-time PCR assay results, and for which we have obtained confirmatory DNA sequence data. These comparisons demonstrate that while there is a theoretical potential for a false positive result with a non-regulated

Phytophthora species, this result is minimal when using the prescribed set of assays and processes put in place by APHIS-PPQ.

Zeller, Kurt; Twieg, Elizabeth; Picton, Deric; Negi, Sarika; Owens, Kristina; DeVries, Renee; and Levy, Laurene. 2007. A Summary of National Survey and Compliance Testing for *Phytophthora ramorum* by NPGBL – 2005-2006. Phytopathology 97:S129.

Routine diagnoses of samples provided as part of operational testing for *Phytophthora ramorum* (PR), causal agent of Phytophthora blight and of Sudden Oak Death, during 2005 and 2006 have utilized a combination of validated conventional and Real-time PCR diagnostics. Over this period, we have used 3 PCR assays to test >3100 sample DNAs from 43 states, and from >55 plant genera. In both years the most commonly submitted samples were from *Rhododendron* (excluding Azalea), and were also the most often diagnosed as positive for PR. Other host genera frequently diagnosed as positive for PR included *Camellia, Kalmia, Pieris* and *Viburnum*. Samples from other hosts were rarely submitted for testing, or were rarely or never diagnosed as positive. PR positive samples were not evenly distributed across the USA. Greater than 90% of all PCR positives were received from sites in CA, OR or WA. Other positive diagnoses were rare, broadly distributed among states, and could be traced to known sources. Our data suggest that PPQ efforts since 2004 to restrict movement and establishment of PR have been generally effective, but that vigilance needs to be maintained in order to confirm that the quarantine strategies in place maintain effectiveness.

The USDA Forest Service Pacific Southwest Research Station (PSW) funding awards for the 2007 fiscal year (FY) have been posted to the PSW website at http://www.fs.fed.us/psw/programs/sod/funding/awards_07.shtml. Publications and presentations supported by these funds for the first half of FY2007 have been posted to http://www.fs.fed.us/psw/programs/sod/publications.shtml. For more information, contact Susan Frankel at sfrankel@fs.fed.us.

REGULATIONS

Rhododendrons planted along a residential roadway were found *P. ramorum* positive in Thurston County, WA. The Washington Department of Agriculture has implemented the landscape protocol; all rhododendrons along the roadway have been destroyed. The positive plants were provided to the landscaper from an out-of state West Coast nursery. The source nursery is undergoing CNP. For more information, contact Brad White at BWhite@agr.wa.gov.

Changes in *Phytophthora ramorum* Diagnostics Responsibilities - Final morphological identifications for foreign and domestic plant pest interceptions are the responsibility of the Animal and Plant Health Inspection Service (APHIS), Plant Protection and Quarantine (PPQ), National Identification Services (NIS). This staff coordinates final identifications carried out by specialists in NIS, the Agricultural Research Service (ARS), and cooperating laboratories. Previously, molecular and biochemical diagnostics were performed by the Center for Plant Health Science and

Technology (CPHST), National Plant Germplasm Quarantine Biotechnology Laboratory in Beltsville Maryland. However, in July 2007 the newly formed NIS Molecular Diagnostic Lab (MDL) was charged with molecular and biochemical diagnostics of quarantine pests for which there are PPQ approved tests, including *P. ramorum*, soybean rust, plum pox virus, citrus canker, and others. This freed CPHST from these responsibilities so that, among other work, they can continue to validate diagnostic methods. The MDL is staffed by Dr. Mary Palm, Lab Director; two principal scientists, Dr. Gloria Abad and Dr. Padma Sudarshana; and two support scientists, Dr. Brian Olson and Dr. Rajya Shukla. Responsibility for morphological and molecular diagnostics of *P. ramorum* and other program pests within NIS at one location will provide a centralized diagnostics and communications structure.

DNA and culture samples can be submitted to the MDL at:

Molecular Diagnostic Lab
USDA/APHIS/PPQ
Attn.: Dr. Mary E. Palm
B-580, BARC-East
Powder Mill Rd.
Beltsville MD 20705
301-504-7100

Please notify the lab via email (Mary.Palm@aphis.usda.gov) when samples are on the way and provide the tracking number if possible. All sample inquiries should be directed to Mary Palm (301-504-5700 x 329 or 301-504-7154, fax 301-504-6124, Mary.Palm@aphis.usda.gov).

NURSERIES

All interstate shipping Oregon nurseries that grow host or associated plants are currently certified as required by the USDA's interim rule. The Oregon Department of Agriculture (ODA) has completed 74% of its annual nursery certification inspections for the year. It is anticipated that all of the 493 required 2007 inspections will be complete by mid-October as well as at least one supplemental (high-risk) inspection at 201 nurseries that grow *Camellia* and *Rhododendron*. Eighty supplemental high-risk inspections have been completed so far this year. As reported in the May 2007 COMTF Newsletter, only two Oregon nurseries have been found with *P. ramorum* so far this year. No new infested nurseries have been found since May.

A wholesale nursery in Pitt Meadows, British Columbia is in the process of destroying all of its plants on site (starting with an on-site burn in July this year) in an effort to rid the property of *P. ramorum*. The nursery has been found positive for the pathogen several times since it was first identified there more than a year ago. Since the initial confirmation, the nursery has been under quarantine and unable to sell any plant species for most of that time. Following disposal of all plant material, infected soil and production areas will be disinfected. The Canadian Food Inspection Agency will sample

soil after the eradication process. If the results prove negative, follow-up samples will be taken after two months. If those samples are also negative, the nursery will be allowed to resume normal operations. To date, the disease has not been detected in the soil of surrounding properties or in local blueberry crops. The only other B.C. nursery with a persistent infection is a much smaller property on the Sunshine Coast. Disposal actions are also underway on that site, including the use of controlled burns and deep-burial of affected material. For more information, contact Shane Sela at selas@inspection.gc.ca.

In the interest of providing a higher level of assurance to trading partners, the California Department of Food and Agriculture (CDFA) and County Agricultural Commissioners are conducting two inspections in all interstate shipping nurseries with high-risk plants, in addition to the compliance agreement inspection. Originally proposed by CDFA, the "High Risk Plant Inspection" plan has been adopted by the National Plant Board (NPB) and is under development as the High Risk Proposal (HRP). The high risk plants have been identified as *Camellia, Rhododendron, Viburnum, Pieris,* and *Kalmia*. The HRP specifies a total of three inspections of high-risk genera and incorporates additional nursery management practices to the added inspections. While the NPB and USDA continue to develop the HRP, California has initiated the High Risk Plant Inspections, which resulted in the detection of the pathogen during the second inspection of a large southern California nursery in June of this year.

FUNDING

Canada has set aside more than $24 million in *P. ramorum* compensation funds for wholesale and retail nurseries as well as individuals impacted by pathogen eradication efforts. Compensation ranges from $4 for young plants to $300 for the largest trees. Affected parties can also claim costs incurred in the disposal and treatment of plants and related materials, either via incineration or deep burial. The program will run through the end of 2008, at which point the government will consider whether to extend it.

The compensation provided in these Regulations complements financial assistance through the Canadian Agriculture Income Stabilization (CAIS) Program to producers. The program has been viewed favorably as numerous requests have been made for a compensation program by provincial governments and industry stakeholders since 2003. For further information, refer to the regulations and impact statement online at: http://canadagazette.gc.ca/partII/2007/20070627/html/sor135-e.html.

The application process and program administration are being handled by CFIA. All businesses and individuals that received an order from CFIA to dispose of plant material affected by *P. ramorum* are eligible to apply under this program. For more information, contact CFIA Plant Health Division Director Greg Stubbings at (6l3) 221-4316.

RESOURCES

A ***Phytophthora ramorum* Multilocus Genotyping Database is now available at:** http://oregonstate.edu/~grunwaln/index.htm. Developed by the USDA Agricultural Research Service laboratory at Oregon State University, the searchable database is

intended to provide timely information on new isolate detections in an effort to facilitate the identification of migration pathways. Host plant species, detection location and date, lineage, mating type, and other relevant information is now available for hundreds of *P. ramorum* isolates from nurseries throughout the United States. The database is read-only. For more information, contact Niklaus J. Grünwald at (541) 738-4049 or Niklaus.Grunwald@science.oregonstate.edu.

RELATED REGULATIONS

The Republic of Korea officially added *Phytophthora nemorosa* to its list of quarantine pests on July 13, 2007. Korea is the first country to regulate for this pathogen.

NEW INVASIVE SPECIES UPDATE

Laurel wilt is a deadly disease of redbay (*Persea borbonia*) and other tree species in the Laurel family (Lauraceae). The disease is caused by a previously unknown, and still-not-named fungal pathogen (*Raffaelea* sp.) that is being introduced into host trees by the non-native redbay ambrosia beetle *(Xyleborus glabratus*). The fungus plugs the water-conducting cells of an affected tree and causes it to wilt. Laurel wilt has caused widespread and severe levels of redbay mortality in the Southeastern coastal areas of South Carolina, Georgia, and Florida. For more information, go to http://www.fs.fed.us/r8/foresthealth/laurelwilt/index.shtml.

PERSONNEL

Amy Jirka is no longer a Forestry Research Associate at Cal Poly, San Luis Obispo. In early July she started her new appointment with the University of Washington, Seattle as a Research Analyst in the College of Forest Resources. Her new duties include collecting data for the FERA (Fire & Environmental Research Applications) team, which is a division of the Pacific Northwest Research Station of the US Forest Service. Amy can be contacted via email at: ajirka@u.washington.edu or by phone at: (206) 418-8040.

Lisa Bell has joined the University of California Cooperative Extension office in Sonoma County as the County Sudden Oak Death Coordinator. Her duties include community outreach, collaborating with affected county agencies to develop a county-wide strategic plan for Sudden Oak Death (SOD), and assisting with *P. ramorum* research activities. Prior to her appointment in Sonoma, Lisa coordinated SOD ground – check surveys for the US Forest Service and she assisted with *P. ramorum* field studies conducted out of the Rizzo lab at UC Davis. Lisa can be reached at (707) 565-2050 or lkbell@ucdavis.edu.

CALENDAR OF EVENTS

8/18 – Occidental Sudden Oak Death Community Meeting; Occidental Fire Station; 3821 Bohemian Highway, Occidental; 1:00 – 4:00 p.m.; For more information, contact Caerleon Safford at (707) 565-6070 or csafford@sonoma-county.org.

10/15 – 10/18 - XVI International Plant Protection Congress 2007, Glasgow, UK; Full details on the recently announced call for papers can be found at:

http://www.bcpc.org/IPPC2007/Call%5Ffor%5FPapers/. For more information, contact Dr. Slawson, PHSI DEFRA, at: david.slawson@defra.gsi.gov.uk.