CALIFORNIA OAK MORTALITY TASK FORCE REPORT
MAY 2010

REGULATIONS

On 4/20/10, South Carolina (SC) rescinded its *P. ramorum* rule that required California and Oregon growers importing plants to the state to comply with additional guidelines which were more restrictive than the federal regulations. The repeal effectively ends the lawsuit filed on 3/8/10 by the California Association of Nurseries and Garden Centers (CANGC) and the Oregon Association of Nurseries (OAN) and restores the right of all nurseries in California, Oregon, and Washington to ship *P. ramorum* host and associated host plants to SC, provided they follow the federal rule.

The USDA Forest Service, Forest Health Protection hosted a Sudden Oak Death wildland framework technical working group meeting in Denver, CO, April 19-21, 2010. Consisting of state and federal agencies, the group worked to develop a management protocol for state foresters and agricultural officials should *P. ramorum* become established in a forest outside of the current West Coast quarantine area. The team analyzed response scenarios for water, vegetation, and bole canker confirmations to determine agency roles and responsibilities, and discussed how best to facilitate communication among multiple affected agencies. *P. ramorum* management recommendations were also reviewed and updated using the best available science to more accurately reflect current treatment options. The final document will be forthcoming. For more information, contact Bruce Moltzan at bmoltzan@fs.fed.us.

The USDA Animal and Plant Health Inspection Service (APHIS) Water Sampling Protocol (Appendix to Nursery Survey Manual) was revised March 2010 and has been posted online at http://www.aphis.usda.gov/plant_health/plant_pest_info/pram/survey.shtml. The updated protocol is for use in waterways or ponds located within and around nurseries.

Australia has adopted emergency measures prohibiting the importation of *P. ramorum* host species (other than tissue cultures) from Canada in an effort to minimize the risk of pathogen introduction into the country. This measure, announced through a "Notification of Emergency Measures" from the World Trade Organization on 4/12/10, is consistent with actions taken for other countries where *P. ramorum* is established.

Korea updated its list of *P. ramorum*-regulated hosts to include: *Choisya ternate*, *Cornus kousa*, *Daphniphyllum glaucescens*, *Lithocarpus glaber*, *Magnolia cavalieri*, *Magnolia foveolata*, *Ribes laurifolium*, *Vaccinium myrtillus*, and *Vaccinium vitis-idaea*. As of 4/6/10, phytosanitary certificates must accompany imported shipments of these newly listed species if the plants are from regulated areas.

NURSERIES

The Oregon Department of Agriculture has completed testing for the 2010 *P. ramorum* Federal Order Survey on 6,190 samples collected from 153 nursery grower locations. This year, Oregon has three nurseries operating under a Federal EAN or the

State equivalent because of positive *P. ramorum* detections. In late March, *P. ramorum* was discovered infecting *Camellia* plants in a nursery that has been operating under a State Administrative Directive since 2009 because of recurrent *P. ramorum* detections. Directive requirements include prohibition against the movement of *Rhododendron, Camellia, Pieris, Kalmia,* and *Viburnum* off site. Delimitation surveys have been completed at this nursery and the Confirmed Nursery Protocol (CNP) has been implemented. On 4/21/10, *P. ramorum* was confirmed on two *Rhododendron* plants at a Clackamas County, OR wholesale nursery that does some interstate shipping. The plants were discovered during a regulatory compliance survey. This nursery was also found positive for the pathogen in 2005 and 2008. CNP has been enacted.

The Washington State Department of Agriculture (WSDA) has surveyed 30 host and non-host nurseries to date this year for *P. ramorum*, all of which have been negative for the pathogen. Some shippers in the state have greatly reduced the amount of high-risk genera (*Camellia, Rhododendron, Pieris, Viburnum*, and *Kalmia*) inventory for sale in an effort to reduce the risk of a *P. ramorum* find. However, two nurseries continue to yield positive water samples - one in Pierce County and one in King County. These sites continue to be monitored as no infected plants have been found in association with the positive water and the inoculum source is unknown. February and April surveys of plants downstream from the Pierce County positive nursery perimeter salal find in 2009 found no positive plants, and the Rosedale Stream has been continuously baited since January 2010, with no positive water finds. WSDA also followed up on trace-forward investigations from a Pennsylvania positive nursery, of which all 160 *Laurus nobilis* imported plants were free of *P. ramorum*.

RESEARCH

2010 Research Needs Assessment (RNA) Participation Request - The first phase of the 2010 *P. ramorum* in Nursery and Forest Environments RNA was completed in April. The responses were used to compile a list of general research categories. The second phase of the survey is now underway, and involves prioritization of the categories developed in phase one. We ask that all interested parties participate in phase two of the survey, regardless of participation in phase one. To have your feedback included in the results presented at the COMTF June meeting, please respond by May 17, 2010. The forestry survey link is https://ucce.ucdavis.edu/survey/survey.cfm?surveynumber=4798 and the nursery survey link is https://ucce.ucdavis.edu/survey/survey.cfm?surveynumber=4771. The links can also be found on the COMTF website under "Research" at 2010 RNA http://nature.berkeley.edu/comtf/html/2010_rna.html. For more information, or if you have questions, contact Janice Alexander at jalexander@ucdavis.edu or (415) 499-3041.

Alexander, H.M. 2010. Disease in Natural Plant Populations, Communities, and Ecosystems: Insights into Ecological and Evolutionary Processes. Plant Disease Vol. 94, No. 5. DOI: 10.1094/PDIS-94-5-0492.

Davis, F.W.; Borchert, M.I.; Meentemeyer, R.K.; Flint, A.; and Rizzo, D.M. 2010. Pre-impact forest composition and ongoing tree mortality associated with sudden oak death in the Big Sur region; California. Forest Ecology and Management 259:2342–2354.

Abstract: Mixed-evergreen forests of central coastal California are being severely impacted by the recently introduced plant pathogen, *Phytophthora ramorum*. We collected forest plot data using a multi-scale sampling design to characterize pre-infestation forest composition and ongoing tree mortality along environmental and time-since-fire gradients. Vegetation pattern was described using trend surface analysis, spatial autocorrelation analysis, and redundancy analysis. Species-environment associations were modeled using non-parametric multiplicative regression (NPMR). Tanoak (*Lithocarpus densiflorus*) mortality was analyzed with respect to environmental and biotic factors using trend surface analysis and multivariate regression. Mixed-evergreen forest occurs throughout the Big Sur region but is most widespread in the north, on north facing slopes, at mid-elevations near the coast. Relative basal area of the dominant tree species changes fairly predictably from north to south and from coast to interior in relation to mapped patterns of precipitation, temperature factors and soil characteristics. Most dominant tree species sprout vigorously after fire. The forests experience a mixed-fire regime in this region ranging from low severity understory burns to high severity crown fires, with the latter increasing above the marine inversion layer and at more interior locations. *Ceanothus* spp. can dominate mixed-evergreen sites for several decades after severe fires. All of the dominant broadleaf evergreen tree species are hosts of *P. ramorum*, although not all will die from infection. Tanoak mortality decreases from northwest to southeast and is significantly correlated with climate, especially growing degree days and mean annual precipitation, and with basal area of the foliar host bay laurel (*Umbellularia californica*) in a 0.5–1 ha neighborhood. Adaptive management of mixed-evergreen forest to mitigate *P. ramorum* impacts in the region will need to consider large local and regional variation in forest composition and the potentially strong interactions between climate, fire, forest composition and disease severity.

Kuljian, H. and Varner, J.M. 2010. The effects of sudden oak death on foliar moisture content and crown fire potential in tanoak. Forest Ecology and Management 259:2103–2110.

Abstract: The introduction of non-native pathogens can have profound effects on forest ecosystems resulting in loss of species, changes in species composition, and altered fuel structure. The introduction of *Phytophthora ramorum*, the pathogen recognized as causing Sudden Oak Death (SOD), leads to rapid decline and mortality of tanoak (*Lithocarpus densiflorus*) in forests of coastal California, USA. We tracked foliar moisture content (FMC) of uninfected tanoaks, SOD-infected tanoaks, SOD-killed (dead) tanoaks, and surface litter for 12 months. We found that FMC values differed significantly among the three categories of infection. FMC of uninfected tanoaks averaged 82.3% for the year whereas FMC of infected tanoaks had a lower average of 77.8% (ANOVA, P = 0.04). Dead trees had a significantly lower FMC, averaging 12.3%

(ANOVA, P < 0.01) for the year. During fire season (June–September), dead tanoak FMC reached a low of 5.8%, with no significant difference between dead canopy fuels and surface litter (ANOVA, P = 0.44). Application of low FMC values to a crown ignition model results in extremely high canopy base height values to escape crown ignition. Remote estimation of dead FMC using 10-h timelag fuel moisture shows a strong correlation between remote automated weather station (RAWS) 10-h timelag fuel moisture data and the FMC of dead leaves (R2 = 0.78, P < 0.01). Results from this study will help refine the decision support tools for fire managers in SOD-affected areas as well as conditions in other forests where diseases and insect epidemics have altered forest canopy fuels.

EDUCATION AND OUTREACH

Two "Sudden Oak Death Update for Foresters and Landowners" workshops will be offered by the California Oak Mortality Task Force, UC Cooperative Extension, and the USDA Forest Service in Ukiah and Eureka in May. The free training sessions will cover the latest *P. ramorum* regulatory requirements as well as up-to-date pathogen information to assist in limiting disease impacts. The status of SOD-affected wildlands in California will also be discussed, including new infested areas, predicted spread, wildfire risks, and continued SOD impacts on affected forest-product industries. While the workshops are intended for people working in the woods, anyone interested is invited to attend. For more information, see the Calendar of Events below.

Four Sudden Oak Death (SOD) Blitzes will be held in May. **Open to the public,** participants will be given a two-hour training on identifying symptoms, correctly sampling symptomatic plants, and documenting sample locations. Blitz dates and locations can be found below in the "Calendar of Events." For additional Blitz information, go to http://nature.berkeley.edu/garbelotto/english/sodblitz.php.

The California Oak Mortality Task Force annual meeting will be held 6/8 – 6/11 at the Embassy Suites and Dominican University in San Rafael. The meeting includes a welcome reception, a National Ornamental Research Site (NORS-DUC) field trip and a Sudden Oak Death (SOD) field trip to China Camp State Park. Indoor sessions include nurseries, policy and research updates, a panel discussion on impacts and management of SOD, and a Research Needs Assessment for Forestry and Nursery issues. There will also be a COMTF Nursery Committee meeting as well as the first meeting of the Continental Dialogue's *Phytophthora ramorum* Initiative working group. The agenda, registration, and hotel accommodations for the meeting are available online at http://www.suddenoakdeath.org/html/comtf_annual_meeting_2010.html. Hotel rooms at the discounted rate are limited, so be sure to make a reservation soon. For more information, contact Katie Palmieri at (510) 847-5482 or kpalmieri@berkeley.edu.

You are encouraged to stay the morning of Friday, June 11 for a meeting to discuss and shape the Continental Dialogue's Address *Phytophthora ramorum* Initiative. The Continental Dialogue on Non-Native Forest Insects and Diseases is a multi-stakeholder, interdisciplinary, problem-solving group aimed at encouraging collaborative, integrated

efforts to prevent adverse impacts from non-native forest insects and diseases on North American forests and trees (http://www.continentalforestdialogue.org/). The Continental Dialogue's Address *P. ramorum* Initiative will work with private industry and public sector partners to encourage a collaborative, integrated effort to prevent the spread of *P. ramorum* to uninfested areas, and particularly to prevent its establishment in the wild in areas remote from current wildland/suburban/urban infestations. Toward this end, the Initiative will 1) support and encourage APHIS and USFS actions to develop and implement a strategic plan at the national level to prevent *P. ramorum* movement into new wild areas (this may well begin as an expanded version of the planned APHIS-USFS framework); 2) support and encourage private sector, academic, and APHIS efforts to develop and implement effective and cost-effective systems approaches to prevent *P. ramorum* spread via nursery production; and 3) implement communications efforts to improve public and professional understanding of *P. ramorum* and to encourage actions to minimize the likelihood of pathogen spread via multiple pathways. The Initiative is unique in its focus on the intersection of science, management, and public policy encompassing all aspects of *P. ramorum* for the U.S. The June 11th meeting will help to determine specific actions moving forward. For more information, contact any of the Initiative co-leads: Susan Frankel, sfrankel@fs.fed.us; Jerry Lee, jlee@monrovia.com; or Ken Rausher, rauscherk@michigan.gov.

The Washington State University, Puyallup (WSU-P) SOD community-based stream monitoring program was piloted in March 2010 in Washington's Puget Sound region. In addition to increasing the number of streams monitored for *P. ramorum* throughout the state by the Washington State Department of Agriculture (WSDA) and Washington Department of Natural Resources (WADNR), the new program also has potential to increase community awareness about the spread of *P. ramorum* and other *Phytophthoras* in streams. WSU-P received two years worth of funding from the USDA Forest Service to manage this program, which involves Master Gardeners, high school and college students, and other volunteers. Baiting sites were chosen based on discussions with WSDA and WADNR, and also volunteer availability. In 2010 four sites are being monitored for six two-week intervals and three sites for one two-week interval. The two-week interval sites are part of class projects for UW-Tacoma and Pierce College. Some students are also doing projects in the lab related to disinfectant use and survival in saline conditions. The program will be expanded in 2011. No *P. ramorum* has been detected at any of the sites so far. For more information, go to http://www.puyallup.wsu.edu/ppo/sod/monitoring/stream%20monitoring.htm or contact Marianne Elliott at melliott2@wsu.edu.

RELATED RESEARCH

Nelson, S.C. and Abad, Z.G. 2010. *Phytophthora morindae*, a new species causing black flag disease on noni (*Morinda citrifolia* L) in Hawaii. *Mycologia*, 102(1), 2010, pp. 122-134. DOI: 10.3852/08-209.

Pérez-Sierra, A.; León, M.; Álvarez, L.A.; Alaniz, S.; Berbegal, M.; García-Jiménez, J.; and Abad-Campos, P. 2010. Outbreak of a new *Phytophthora* sp. associated with severe decline of almond trees in eastern Spain. Plant Disease 94:534-541.

COMTF REPORTING

The 2009 Year End Summary Report is now posted to the COMTF website at http://nature.berkeley.edu/comtf/pdf/2009YearEndSummary.pdf. The report is a compendium of monthly newsletters, and highlights those events that are most significant for 2009.

CALENDAR OF EVENTS

5/1 **Marin County SOD Blitz Initial Meeting and Training; Creekside Room,** Dominican University, San Rafael; 10 a.m; For more information, contact Sarah Gardner at sarah.gardner@dominican.edu.

5/8 **Atherton Area SOD Blitz Initial Meeting and Training; The Carriage House,** Holbrook-Palmer Park; 150 Watkins Ave., Atherton; 10:00 a.m.; For more information, contact Susan Finocchio at susanfin@earthlink.net.

5/12 - **SOD Treatment Workshop; meet at oak outside of Tolman Hall, UC** Berkeley Campus; 1 – 3 p.m.; Pre-registration is required. This class is free and will be held rain or shine. To register, email kpalmieri@berkeley.edu, and provide your name, phone number, affiliation (if applicable), and the date for which you are registering. For more information, go to http://nature.berkeley.edu/garbelotto/english/sodtreatmenttraining.php or contact Katie Palmieri at (510) 847-5482 or kpalmieri@berkeley.edu.

5/12 **Free "Sudden Oak Death Update for Foresters and Landowners;"** UCCE/County Agriculture Department; 890 N. Bush Street, Ukiah; 1-5 pm; For more information, or to register, contact Chris Lee at (707) 445-7351.

5/13 **Free "Sudden Oak Death Update for Foresters and Landowners;" Humboldt** County Agriculture Center; 5630 S. Broadway, Eureka; 8:30 am - 12:30 pm; For more information, or to register, contact Chris Lee at (707) 445-7351.

5/15 **Los Altos Area SOD Blitz Initial Meeting and Training; Town Hall; 26379** Fremont Road, Los Altos; 10:30 a.m.; For more information, contact Sue Welch at sodblitz09@earthlink.net.

5/22 **Woodside Area SOD Blitz Initial Meeting and Training; For more** information, contact Debbie Mendelson at naturemend@sbcglobal.net.

6/8 – 6/11 – COMTF-wide meeting; Dominican University; 50 Acacia Avenue; San Rafael, CA 94901-2298; This meeting is intended for all interested parties. The agenda, registration, and hotel accommodations are available online at http://www.suddenoakdeath.org/html/comtf_annual_meeting_2010.html. For questions, contact Katie Palmieri at (510) 847-5482 or kpalmieri@berkeley.edu.