CALIFORNIA OAK MORTALITY TASK FORCE REPORT
OCTOBER 2008

MONITORING

As of 10/6, Oregon's 2008 summer SOD aerial survey has identified 67 new dead or dying tanoak trees between Gold Beach and the California border (the 2007 summer survey detected 154 dead tanoaks). Sixty-four of the 67 dead trees have been checked and sampled by ground crews. The 3 remaining trees will be checked in late October. The fall aerial survey is now under way. Summer survey highlights are as follow:

- There are several new positive trees near previously known sites close to the center of the generally infested area. These finds were anticipated due to the suspension of eradication treatments between January and May, 2008.

- A couple of new and expanding spots were found at the northern edge of the western side of the eradication, very close to a previously treated infestation. Treatment is in-progress on these high-priority sites.

- Two new spots were found on the south bank of the Chetco River, very close to the water and other infested sites. These discoveries add to the slow increase of new sites on the south bank of the Chetco during 2007-2008.

- The most noteworthy new site is on USFS land along Emily creek. This site is 2 miles east of the redwood trail site (the nearest known infestation) and 1.25 miles inside of the eastern quarantine boundary. The pathogen does not appear very active at this site. Treatment is underway.

- No new sites have been found north of the 2007 quarantine boundary. Landowner cooperation has been good, and state and federal funding is sufficient enough to continue the current SOD program into 2009.

NOTE - We must complete ground-checking and delimitation surveys before we can make confident statements about trends and status for the entire year.

California's northern Sierras 2008 *P. ramorum* stream-based detection survey was conducted in the counties of Butte, Yuba, Nevada, Placer, and El Dorado. A total of 31 watercourse sites in the Feather, Yuba, Bear, American, and Consumnes Rivers were surveyed during May and June using rhododendron leaves as bait for *Phytophthora* spp. This produced 118 sets of baits that were cultured for the presence of *P. ramorum*. The pathogen was not detected in any of the samples, although other *Phytophthora* spp. were recovered. For more information, contact Don Owen at Don.Owen@fire.ca.gov.

MANAGEMENT

As a result of the Oregon Emily Creek find, the USFS will implement a 28-acre three-phase eradication effort. Phase I will encompass killing all >1-inch diameter

tanoak within the 28 acres surrounding the known infected tree and within 100 ft. of Emily Creek. This will be accomplished through glyphosate herbicide injections, which will greatly inhibit re-sprouting potential. Additionally, by eliminating a large area of tanoak surrounding the infected tree, a host barrier will be created to inhibit movement of the pathogen into adjacent stands.

Phase II of the eradication effort will focus on the elimination of infected and/or exposed host material within the eradication circle. All tanoak, Pacific rhododendron, and evergreen huckleberry plants within the ~6.5 acre circle will be cut down. Additionally, Oregon myrtle (also known as California bay laurel) as well as any other plant found *P. ramorum*-positive will be cut. After felling of host plants within the core circle is complete, cut plant materials <8 inches in diameter will be stacked and burned. Burning will be conducted simultaneously with stacking if weather permits, or as soon as possible thereafter. Stem wood larger than 8 inches will be left in place. Host leaf litter and other fine plant material lying on the ground will be raked into piles and burned.

Phase III of the project will focus on conifer reforestation. It is anticipated that adequate regeneration will occur naturally; however, to ensure that the conifer reforestation level is adequate, an inventory of conifer regeneration and survival will be conducted for three growing seasons following completion of the eradication phases. If it is found that the density of young conifers averages less than 150 trees per acre, planting will be prescribed to increase conifer stocking. Douglas-fir seedlings would be planted throughout the 28-acre area to achieve these minimum stocking objectives. For a period of at least two years following project completion, the treatment site will be inspected to determine whether *P. ramorum* re-emerges. Should *P. ramorum* be confirmed, further eradication actions would take place. Burn pile sites in the core eradication circle will also be surveyed for invasive plants. Should any be found, actions would be taken to eliminate them as well. For more information, contact Ellen Goheen at Egoheen@fs.fed.us.

RESEARCH

Gallegly, Mannon E. and Hong, Chuanxue. 2008. *Phytophthora*: Identifying Species by Morphology and DNA Fingerprints; 168 pages; APS Press. ISBN 978-0-89054-364-1.

Abbreviated Summary: This new identification key, "*Phytophthora*: Identifying Species by Morphology and DNA Fingerprints," integrates the classical morphological approach and the new DNA fingerprinting technique, PCR-SSCP. The dichotomous key uses minimal morphological characters, followed by pictorial illustrations. The DNA fingerprint key uses only the rDNA-ITS region amplified with a single pair of primers; a detailed step-by-step fingerprinting protocol is provided. A total of 652 original photos are included to illustrate individual species covered as well as a partial list of other molecular characters used for description of new species and differentiation of existing species. Sixty of the important species and taxons are presented in the book.

Hüberli, D.; Lutzy, B.; Voss, B.; Calver, M.; Ormsby, M. and Garbelotto, M. 2008. Susceptibility of New Zealand flora to *Phytophthora ramorum* and pathogen sporulation potential: an approach based on the precautionary principle. Australasian Plant Pathology 37. Pages 615–625.

Abstract: *Phytophthora ramorum*, the cause of sudden oak death in the western USA and a damaging pathogen in Europe, is a biosecurity threat of unknown magnitude to New Zealand and Australasia because of its presence in traded ornamental plants. Knowledge of potential hosts acting as carriers and of symptoms caused by the pathogen on such hosts will strengthen precautionary quarantine regulations to prevent inadvertent introductions of *P. ramorum* into the region. Also, the identification of potential hosts will permit determination of areas at risk within countries that do not have *P. ramorum*. Susceptibility of New Zealand plants, including 17 endemic and three commercial species (*Eucalyptus globulus, Pinus radiata* and *Acacia melanoxylon*), as well as two known *Rhododendron* cultivar hosts, was determined by analyzing the size of lesions on inoculated excised leaves and branches, while infectivity was determined by counting sporangia produced on leaves. In order to identify extremely susceptible hosts, seven species were inoculated using three concentrations of zoospores ranging from low ($1x10^2$ zoospores/mL) to high ($5x10^3$ zoospores/mL). In branch inoculations, *P. radiata* and *Nothofagus fusca* were as susceptible as the *Rhododendron* cultivars. *Pseudopanax arboreus, Fuchsia excorticata* and one *Rhododendron* cultivar were equally susceptible in leaf inoculations. However, *F. excorticata* was the only species with 100% infected leaves, high foliar sporulation and was highly susceptible at all three zoospore concentrations. *Leptospermum scoparium* was the only asymptomatic foliar host that had high reisolations of the pathogen. *F. excorticata, P. radiata, N. fusca, P. arboreus* and *L. scoparium* should be added to the potential host list for *P. ramorum* and monitored for symptoms and sporulation in gardens and nurseries in the USA and Europe. As part of a precautionary strategy, these species are suitable candidates for targeted surveillance programs in high-risk incursion areas of New Zealand. Furthermore, the sympatry of foliar hosts with high infectivity and of highly susceptible stem hosts was identified: these areas may be at risk for the development of a forest epidemic.

McPherson, B.A.; Erbilgin, N.; Wood, D.L.; Svihra, P.; Storer, A.J.; and Standiford, R.B. 2008. Attraction of ambrosia and bark beetles to coast live oaks infected by *Phytophthora ramorum*. Agricultural and Forest Entomology. DOI: 10.1111/j.1461-9563.2008.00386.x.

Abstract: Sudden oak death is caused by the apparently introduced oomycete, *Phytophthora ramorum.* We investigated the role of bark and ambrosia beetles in disease progression in coast live oaks *Quercus agrifolia* . In two Marin County, California sites, 80 trees were inoculated in July 2002 with *P. ramorum* and 40 were wounded without inoculation. Half of the trees in each group were sprayed with the insecticide permethrin [cyclopropanecarboxylic acid, 3-(2,2-dichloroethenyl)-2,2-dimethyl-(3-phenoxyphenyl) methyl ester] to prevent ambrosia and bark beetle attacks, and then were sprayed twice per year thereafter. After each treatment, sticky traps were placed on only the permethrin

treated trees. Beetles were collected periodically in 2003. Inoculated trees accounted for 95% of all beetles trapped. The ambrosia beetles *Monarthrum scutellare* and *Xyleborinus saxeseni* and the western oak bark beetle *Pseudopityophthorus pubipennis* were the most abundant of the seven species trapped. Permethrin treatment delayed initiation of beetle attacks and significantly reduced the mean number of attacks per tree. Beetles did not attack any wounded or non-cankered inoculated trees. Trees with larger cankers trapped more beetles early in the disease. Once permethrin lost effectiveness, the number of beetle entrance tunnels was a more reliable predictor of subsequent trap catch than was canker size. Beetles were initially attracted to *P. ramorum* cankers in response to kairomones generated in the host-pathogen interaction. After beetles attacked the permethrintreated trees, aggregation pheromones most probably were the principal factor in beetle colonization behavior.

Monahan, William B.; Koenig, Walter D.; Tse, Justin; Garbelotto, Matteo. 2008. Preserved specimens suggest non-native origins of three species of *Phytophthora* in California. Mycological Research 112. Pages 757 – 758. DOI: 10.1016/j.mycres.2008.05.001.

Summary: The authors used PCR on specimens in the University and Jepson Herbaria of the University of California, Berkeley to examine whether *Phytophthora ramorum, P. nemorosa and P. pseudosyringae* were present historically in California. All 25 symptomatic and 25 asymptomatic preserved herbarium specimens were negative for *P. ramorum, P. nemorosa,* and *P. pseudosyringae.* These results corroborate findings by others which suggest non-native origins of *P. nemorosa* and *P. pseudosyringae* based on low modern AFLP diversity. These studies bolster support for the management of all three species of Phytophthora as recently introduced forest pathogens in California. The results also raise new and challenging questions concerning how best to detect and manage non-native Phytophthoras that vary so dramatically in distribution and virulence.

Moralejo, E.; Belbahri, L.; Calmin, G.; García-Muñoz, J.A.; Lefort, F.; and Descals, E. 2008. Strawberry Tree Blight in Spain, a New Disease Caused by various *Phytophthora* Species. Journal of Phytopathology Volume 156, Issue 10.
Abstract: During surveys for *Phytophthora ramorum* in garden centres in Majorca, Spain, 31 isolates of *Phytophthora* were recovered from potted strawberry trees (*Arbutus unedo*) showing leaf and twig blights. Many isolates of *Phytophthora syringae* and *Phytophthora citrophthora* as well as single isolates of *P. ramorum*, *Phytophthora tropicalis* and *Phytophthora nicotianae* were identified on morphological features and on the sequences of the internal transcribed spacer regions from ribosomal DNA genes. *Phytophthora syringae* was collected most frequently in late autumn and winter, whereas *P. citrophthora* was dominant during late summer and autumn. In vitro pathogenicity of *P. syringae* and *P. citrophthora* was compared with that of *P. ramorum* by inoculating intact detached leaves of *A. unedo* with zoospores and twigs with mycelial plugs. In addition, in vitro sporangial production was examined on inoculated excised leaves and on agar plugs at 12, 15 and 20°C. *Phytophthora citrophthora* produced the largest lesions both on leaves and on twigs at all temperatures. *Phytophthora ramorum* formed lesions

comparable in size to those of *P. syringae*, but it significantly produced more sporangia on excised leaves and agar plugs. In a log inoculation assay, *P. syringae* caused large lesions in the inner bark, whereas those of *P. ramorum* were moderate. Strawberry tree blight has not yet been observed in natural ecosystems in the western Mediterranean areas. Possible biological and environmental limitations hindering disease spread in the wild are discussed.

FUNDING

Applications are being accepted for funding to facilitate cooperative international research and management of plant diseases with an emphasis on Phytophthoras through the American Phytopathological Society, John and Ann Niederhauser Endowment (JANE). Applications are due December 15, 2008. The endowment will likely support one award up to $10,000 or two awards up to $5,000 each for projects beginning June 1, 2009. Details and submission guidelines can be found online at: http://www.apsnet.org/foundation/JANEApplication.asp.

NEW AND NOTEWORTHY – LAUREL WILT

Fraedrich, S.W. 2008. California Laurel Is Susceptible to Laurel Wilt Caused by *Raffaelea lauricola*. Plant Disease, Disease Notes. Vol. 92, No. 10. Page 1469. DOI: 10.1094/PDIS-92-10-1469A. Available online at: http://apsjournals.apsnet.org/doi/abs/10.1094/PDIS-92-10-1469A.

EDUCATION

Preventative treatment training sessions are available this fall. The field sessions are offered on the Berkeley campus once a month until December. Each two-hour session will cover basic Sudden Oak Death (SOD) information, integrated pest management approaches for SOD, how to select candidate trees for treatment, and proper preventative treatment application. CEU credits will be offered for DPR, ISA, SAF, and California Urban Forestry Council. For more information, see the "Calendar of Events" below.

The CA Oak Mortality Task Force (COMTF) will be holding several community meetings this fall to provide interested parties with basic information on SOD, preventative treatment options, and how to remove and dispose of infested material properly. Locations for the meetings include Humboldt, Sonoma, Santa Cruz, and Monterey Counties. For more information, see the "Calendar of Events" below.

JOB OPPORTUNITY

Sonoma State University is seeking a qualified, productive, and dynamic Director who will manage the University's 470 acre Fairfield Osborn Preserve (FOP) and 3,670 acre Galbreath Wildlands Preserve (GWP). Reporting directly to the Dean of the School of Science and Technology, the Director of Sonoma State University Preserves will develop, support, and facilitate environmental education, research, nature preservation and stewardship, community outreach, and fundraising at both FOP & GWP. A graduate degree in life sciences, earth sciences, environmental sciences, geography, or an appropriately related discipline is required; however, a Ph.D. is preferred. The annual

salary is not expected to exceed $70,000. Review of applications begins on October 20, 2008. For more information on the Sonoma State University Preserves, go to: www.sonoma.edu/scitech/preserves. For complete description and application procedures, go to: http://www.sonoma.edu/es/employment/jobs/3065.html. For additional information regarding the position, contact Dean Rahimi at rahimi@sonoma.edu or (707) 664-2171.

CALENDAR OF EVENTS

10/9 – Sudden Oak Death (SOD) Prevention Strategy Informational Meeting; Skypark Recreation Classroom, Scotts Valley, CA; 6:30 – 8:30 p.m.; For more information, contact Katie Palmieri at (510) 847-5482.

10/22 – SOD Prevention Strategy Informational Meeting; Sonoma Community Center; 276 East Napa St.; Sonoma; 7:00 – 9:00 p.m.; For more information, contact Lisa Bell at (707) 565-2050

10/23 – SOD Prevention Strategy Informational Meeting; Pacific Valley School; 69325 Highway One, Big Sur; 6:00 – 8:00 p.m.; For more information, contact Katie Palmieri at (510) 847-5482. **RESCHEDULED TO NOVEMBER 13, 2008, IN CARMEL VALLEY (SEE BELOW).**

11/12 - 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 SODtreatment@nature.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/sodtreatment or contact Katie Palmieri at (510) 847-5482 or palmieri@nature.berkeley.edu.

11/13 - SOD Prevention Strategy Informational Meeting; Carmel Middle School, Hilton Bialek Habitat; 4380 Carmel Valley Rd.; Carmel; 6:00 – 8:00 p.m. For more information, contact Katie Palmieri at (510) 847-5482.

12/10 - SOD Treatment Workshop; oak outside of Tolman Hall, UC Berkeley Campus; 1 – 3 p.m.; Pre-registration is required. For more information, see the 11/12 listing above.