



CALIFORNIA OAK MORTALITY TASK FORCE REPORT FEBRUARY 2005

NURSERIES

A previously identified *P. ramorum*-positive nursery in Los Angeles County, CA has found a new infection on a camellia. Following a series of rainstorms, the nursery's Research Director surveyed the camellias for pathogen symptoms. Identifying one symptomatic plant, leaf samples were taken and cultured on-site. Culture results appeared to be those of *P. ramorum*, prompting contact with CDFA for analysis of the culture, as well as the Los Angeles County Agricultural Department to inform them of the potential find. Following CDFA's review and confirmation of the nursery's camellia culture sample, the USDA's Confirmed Nursery Protocol (CNP) has been implemented. Additionally, as per the Emergency Federal Order, the nursery is prohibited from moving the following plants until the conditions of the CNP are met: all plants within the same genus as a host or associated plant; any plants within 10 m of host or associated plants; and any genera of other plants found infected. All other plants may move intrastate or interstate. Trace-forward information has been submitted to CDFA and USDA APHIS for follow-up investigations.

REGULATIONS

The Canadian Food Inspection Agency (CFIA) has lifted its restriction on *Phytophthora ramorum* host cut flowers (including roses) from non-quarantine California counties as a result of the new USDA Animal and Plant Health Inspection Service (APHIS) Federal Emergency Order. Based on the December 21, 2004 Emergency Order, and continued efforts to harmonize regulatory efforts between the two countries, Canada is in the process of releasing updated *P. ramorum* phytosanitary requirements. For more information, contact Rob Ormrod, CFIA, at ormrod@inspection.gc.ca; Fred Thomas, APHIS Trade Director for Canada, at Frederick.A.Thomas@aphis.usda.gov; or go to the CFIA website at <http://www.inspection.gc.ca/english/toce.shtml>.

The UK's Department of Environment, Forestry, and Rural Affairs (DEFRA) has identified six new plants associated with *P. ramorum*: *Griselinia littoralis* – Cornaceae (NZ privet), *Hamamelis mollis* – Hamamelidaceae (Chinese witch-hazel), *Magnolia stellata* – Magnoliaceae (star magnolia), *Magnolia x loebneri* – Magnoliaceae (Loebner magnolia), *Magnolia x soulangeana* – Magnoliaceae (saucer or Japanese magnolia), *Parrotia persica* – Hamamelidaceae (Persian Parrotia or iron tree). It is anticipated that APHIS will soon be adding these species to their official *P. ramorum* associated host list. Once included on the US list, these plants will fall under federal *P. ramorum* regulations.

RESEARCH

The "California Department of Food and Agriculture (CDFA) Science Advisory Panel on *Phytophthora ramorum* in the Nursery Industry" final report is complete. Key questions were addressed within the report, including: general pest risk; nursery, host plant, and natural setting disease transmission; differences between the European A1 strain and the North American A2 strain; fungicide use; and diagnostics. Following each



panel response, research needs necessary to more fully answer each question have been noted. Also included is a sampling of current research projects and papers, intended to demonstrate the scope and nature of work underway.

While able to provide some answers and direction, the panel did note that many questions can't be answered until additional research has been conducted and peer reviewed. However, the panel does feel that the evidence indicates *P. ramorum* is an introduced (exotic) pathogen and that it is known to cause disease on an expanding list of plant species. Additionally, the panel feels that *P. ramorum* may be managed in a nursery environment with fungicides that currently control other *Phytophthora* diseases, although further studies are needed to more fully understand their appropriate use and potential consequences (e.g., masking pathogen presence). The panel also acknowledged that outside the nursery environment, some hosts are only slightly affected by *P. ramorum*, while others are severely affected, and that limiting identifiable pathways of pathogen spread is a reasonable means of slowing disease spread. To access the report, go to the CDFA website at

http://www.cdfa.ca.gov/phpps/pe/sod_survey/pdfs/SODSAP_Report.pdf.

The Second Sudden Oak Death Science Symposium (Jan. 18 – 21) was attended by 350 people, and had 80 formal presentations as well as 47 posters. Of the eleven countries, 28 states, and Washington DC representatives in attendance, 32 percent of US attendees were federal officials, 54 percent were state officials, 8 percent were county representatives, and 6 percent represented private interests. While wildland issues and *P. ramorum* epidemiology continued to be areas of interest at the Symposium, increased areas of emphasis from 2002 included nursery issues, soil considerations, and pathogen and host genetics. Thanks to Pat Shea, USDA Forest Service, Pacific Southwest Research Station; Rick Standiford, UC Agriculture and Natural Resources; and Joni Rippee, UC Berkeley Center for Forestry, for organizing the Symposium.

Two *P. ramorum* Papers have been published:

Hansen, E. M., Parke, J. L., and Sutton, W. 2005. Susceptibility of Oregon forest trees and shrubs to *Phytophthora ramorum*: A comparison of artificial inoculation and natural infection. Plant Dis. 89:63-70.

Phytophthora ramorum is an invasive pathogen in some mixed-hardwood forests in California and southwest Oregon, where it causes sudden oak death (SOD) on some members of *Fagaceae*, ramorum shoot dieback on some members of *Ericaceae* and conifers, and ramorum leaf blight on diverse hosts. We compared symptoms of *P. ramorum* infection resulting from four different artificial inoculation techniques with the symptoms of natural infection on 49 western forest trees and shrubs; 80% proved susceptible to one degree or another. No single inoculation method predicted the full range of symptoms observed in the field, but whole plant dip came closest. Detached-leaf-dip inoculation provided a rapid assay and permitted a reasonable assessment of susceptibility to leaf blight. Both leaf age and inoculum dose affected detached-leaf



assays. SOD and dieback hosts often developed limited leaf symptoms, although the pattern of midrib and petiole necrosis was distinctive. Stem-wound inoculation of seedlings correlated with field symptoms for several hosts. The results suggested that additional conifer species may be damaged in the field. Log inoculation provided a realistic test of susceptibility to SOD, but was cumbersome and subject to seasonal variability. Pacific rhododendron, salmonberry, cascara, and poison oak were confirmed as hosts by completing Koch's postulates. Douglas-fir was most susceptible to shoot dieback shortly after budburst, with infection occurring at the bud.

First Report of Foliar Infection of *Maianthemum racemosum* by *Phytophthora ramorum*. D. Hüberli, K. L. Ivors, A. Smith, J. G. Tse, and M. Garbelotto. Department of ESPM-ES, 151 Hilgard Hall, University of California, Berkeley 94720. Plant Dis. 89:204, 2005; published on-line as DOI: 10.1094/PD-89-0204C. Accepted for publication 22 November 2004.

LEGISLATION

H.R. 4569 (Burns, GA), calling for a national plan for the control and management of Sudden Oak Death, was signed into law 12/23/05. Cosponsored by 19 representatives, the new law directs the Secretary of Agriculture, through USDA APHIS, to develop the plan in consultation with other federal agencies. Issues to be address include identifying *P. ramorum* hosts and surveying for the extent of Sudden Oak Death; defining risks posed by the pathogen; and control and management efforts. While there are no appropriations of funds for its implementation, cost estimates are expected to be included with the plan. For more information on H.R. 4569, go to <http://thomas.loc.gov/cgi-bin/bdquery/z?d108:HR04569:@@L&summ2=m&>.

RESOURCES

USDA APHIS has posted “*P. ramorum* APHIS Emergency Federal Order Frequently Asked Questions” to its website. Twenty-nine questions and answers are posted, addressing the regulation of non-host plants, shipping, compliance agreements, certified nurseries, handling of items other than nursery plants, and enforcement of the order. To view the FAQs, go to the USDA APHIS website at <http://www.aphis.usda.gov/ppq/ispm/sod/faqprorder011305.html>.

The “*Phytophthora ramorum*: Educate to Detect (PRED)” nationwide training session for Master Gardeners (held 10/26/04) is now available on cd and free of charge. Anyone interested in obtaining a copy should email Sandy Osterbur at saosterb@uiuc.edu. Correspondence should include the street address of the location you would like the cd mailed to, a phone number, and a notation that you are requesting the PRED CD. For more information on the PRED program, go to <http://www.ncpmc.org/sod/>.

The 2004 *P. ramorum* Summary Report, a compendium of COMTF monthly newsletters, has been posted to the COMTF website. The report includes a significant



events page, a summary of 2004 occurrences, and background information on the pathogen. To access the report, go to www.suddenoakdeath.org.

MANAGEMENT

Two cleaning devices – one for shoes and one for bikes - are currently under development to address the inadvertent spread of *P. ramorum* through shoes and tires of recreational forest users visiting infested wildlands. Both devices are designed to be very low maintenance and easy to operate.

The bike scrubber is a collaborative project with Dominican University of California, University of San Diego, and the National Park Service (NPS), with initial funding provided by the Resources Legacy Fund. A prototype was built in a few hours time and at a cost of approximately \$300; research is ongoing to quantify its cleaning ability. The shoe cleaning stations were designed and built by staff and volunteers of the NPS, with funding from the USDA Forest Service, State and Private Forestry. Portable versions of the shoe cleaning station are already in use for volunteer work days, research groups, and NPS maintenance and natural resource groups who are working in or around infested areas.

The next step for both projects is to deploy the wash stations at trailheads, along with interpretative signs and information. Locations for testing the bike cleaner have not yet been determined. The shoe cleaner will be placed at several sites throughout Golden Gate National Recreation Area to test their cleaning effectiveness as well as to see how well hikers accept and use them. Once complete, the NPS will make the shoe cleaning station plans and parts list available to interested parties.

Pictures of the cleaning stations can be seen on the COMTF website at www.suddenoakdeath.org. For further details on the bike cleaner, contact Peter Thut, Dominican College, at thut@domincan.edu. For more information on the shoe wash, contact Bruce Badzik, NPS, at Bruce_Badzik@nps.gov.

PERSONNEL

Pat Shea is retiring from his position as the Pacific Southwest Research Station Sudden Oak Death Research Program Manager, and will consequently be leaving his position as the COMTF Research Committee Co-Chairman. However, he will not be retiring from the natural resource management platform, as he has agreed to take leadership of the Wildlife Heritage Foundation, a nonprofit conservation organization that currently manages 3800 acres of wildlife habitat predominantly in the Sacramento Valley.

Rick Standiford relocated to the University of California President's Office in Oakland effective January 1, 2005. He assumed the duties as Associate Vice President of UC's Division of Agriculture and Natural Resources, the oversight group for the Agricultural Experiment Station and Cooperative Extension on the Berkeley, Davis, and Riverside Campuses, and the various County Extension offices. He will step down as the



co-chair of the COMTF research committee, but will continue with his research interests in Sudden Oak Death and changes in stand structure.

Scientists at California's Sonoma State University (SSU) are interested in hiring numerous research assistants to work on a large-scale project designed to identify the factors that influence the distribution and abundance of *Phytophthora ramorum*. As part of a large and interactive team of researchers, those hired will focus on assessing CA bay laurel trees for *P. ramorum* symptoms in eastern Sonoma County; culturing *P. ramorum* from symptomatic leaves; and conducting field experiments related to the importance of birds and small mammals as dispersal agents of *P. ramorum*. The positions will be full-time from February/early March to mid-June of 2005. For more information, contact Hall Cushman, SSU, at cushman@sonoma.edu or Ross Meentemeyer, SSU, at meenteme@sonoma.edu.

CALENDAR OF EVENTS

2005 –Spring training sessions on *P. ramorum* diagnosis and management will be offered by the COMTF. Information on the sessions will be forthcoming in next month's newsletter.

HOSTS OF THE MONTH

Six plants have recently been identified by DEFRA as susceptible to *P. ramorum*. It is anticipated that APHIS will be adding these plants to the associated host list soon.

***Griselinia littoralis* – New Zealand Privet (Cornaceae) – is an evergreen shrub native** to New Zealand. Flowering in May, the New Zealand Privet grows to 6 m high and nearly as wide. Having dioecious flowers, both male and female plants must be grown to produce seed. Tolerating maritime exposure, this plant grows well by the sea and likes full or partial sun as well as moist soil. It has an upright form and thick, leathery, lustrous green leaves. Since this shrub always looks well groomed and has a dense, compact screen, it is a good shrub for espalier use and is often used as an ornamental.

P. ramorum-infected New Zealand Privet was found on one established plant in South Wales. Symptoms included leaf blight and dieback. Culturing and TaqMan PCR are complete; Koch's postulates are pending. The identified plant has been destroyed.

Resources:

- Plants for a Future, "*Griselinia littoralis*"
http://www.ibiblio.org/pfaf/cgi-bin/arr_html?Griselinia+littoralis&CAN=LATIND
- Brenzel, Kathleen. Sunset Western Garden Book. Menlo Park, CA: Sunset Publishing Corporation, 2001. 376.

***Hamamelis mollis* – Chinese witch-hazel (Hamamelidaceae) – is a deciduous large** shrub or small tree native to central China. As a shrub, Chinese witch-hazel grows slowly to 10' - 15' tall and wide; as a small tree it may reach 30 ft. Its somewhat rounded leaves



grow 3” – 6” long and are dark green and rough on the top side, while gray and felted underneath. Turning yellow to yellow-orange in the fall, the Chinese witch-hazel has very showy autumn foliage. Its flowers have a sweet fragrance and grow 1 ½” wide. Blooming on bare winter stems, these rich golden yellow flowers with red-brown sepals are excellent for cutting.

P. ramorum-infected Chinese witch-hazel was found on one grown plant in South Wales. Symptoms included leaf blight and dieback. Culturing and TaqMan PCR are complete, but Koch’s postulates are not. The identified plant has been destroyed. *Hamamelis mollis* is the second *P. ramorum*-regulated witch hazel, following *Hamamelis virginiana*.

Resources:

- University of Connecticut, Plant Database, “*Hamamelis Mollis*”
<http://www.hort.uconn.edu/plants/h/hammol/hammol1.html>
- Brenzel, Kathleen. Sunset Western Garden Book. Menlo Park, CA: Sunset Publishing Corporation, 2001. 379.

***Magnolia stellata* – star magnolia (Magnoliaceae) – is a deciduous shrub native to East Asia/Japan.** Growing 10 feet high and having up to a 20 foot spread, this slow growing shrub or small tree has large, scented white flowers that blossom before the plant leafs out. The flowers grow to 3” and are pollinated by beetles. The star magnolia requires well-drained, moist soil and can grow in semi-shade to full sun. A very ornamental plant, it is popular in borders or garden entries.

P. ramorum-infected star magnolia was found on one established plant in South Wales. Symptoms were limited to leaf blight. Culturing and TaqMan PCR are complete; Koch’s postulates are pending. The identified plant has been destroyed.

Resources:

- Plants for a Future, “*Magnolia stellata*”
http://www.ibiblio.org/pfaf/cgi-bin/arr_html?Magnolia+stellata&CAN=LATIND
- Brenzel, Kathleen. Sunset Western Garden Book. Menlo Park, CA: Sunset Publishing Corporation, 2001. 453.

***Magnolia x loebneri* – Loebner magnolia (Magnoliaceae) – is a deciduous slow growing hybrid of *Magnolia kobus* and *Magnolia stellata*.** This shrub commonly grows 12’ – 15’ and is similar in spread. Loebner magnolia flowers are similar to that of *Magnolia stellata*, although somewhat longer and wider and fewer in number. Blooming occurs before leaf out in mid-spring, with some selections being fragrant. This shrub is commonly used in lawns as a shrub border or as a woodland edge.

Loebner magnolia was found infected with *P. ramorum* on one established plant in South Wales. Symptoms were limited to leaf blight. Culturing and TaqMan PCR are complete; Koch’s postulates are pending. The identified plant has been destroyed.



Resources:

- Brenzel, Kathleen. Sunset Western Garden Book. Menlo Park, CA: Sunset Publishing Corporation, 2001. 450.

***Magnolia x soulangeana* – saucer magnolia (Magnoliaceae) – is a deciduous hybrid of *Magnolia denudate* and *Magnolia liliiflora*.** This small tree can grow to 30' with equal spread. It may be multi-trunked or have low main branches and is round to irregular in shape. Saucer magnolia leaves are 3" – 6" long and half as wide, and are elliptical in shape with a sharply pointed tip. New foliage is reddish bronze, turning dark green with age and yellow-brown in the fall. The fragrant flowers bloom in late winter or early spring and are white to pink or purplish red, cup-like in shape, and range from 3" – 6" wide. Saucer magnolia prefers moist, fertile, deep soil and full sun. It is commonly used as a lawn plant and as an anchor plant in big container plantings.

Saucer magnolia was found infected with *P. ramorum* on three grown plants in a nursery in Northwest England. Symptoms included leaf blight and dieback. Culturing and TaqMan PCR are complete; Koch's postulates are pending. The identified plants have been destroyed.

Resources:

- University of Connecticut, Plant Database, "*Magnolia x soulangeana*" <http://www.hort.uconn.edu/plants/m/magsou/magsou1.html>
- Brenzel, Kathleen. Sunset Western Garden Book. Menlo Park, CA: Sunset Publishing Corporation, 2001. 452.

***Parrotia persica* – Persian Parrotia (Hamamelidaceae) – is a deciduous tree or shrub** native to Iran. Growing 15' – 35' tall and wide, this slow growing plant is naturally multi-stemmed with low branches and an oval crown. This colorful tree is attractive all year, with autumn foliage turning golden-yellow, then orange to rosy pink, and finally scarlet. The smooth showy gray bark peels, creating white showy patches and dense clusters of red flowers bloom in late winter or early spring before leafing out occurs. New foliage is seen as reddish purple and matures to a dark green color ranging from 2" – 5" long by 1" – 2" wide. Persian Parrotia prefers full sun or light shade and well-drained soil. It is drought tolerant and needs little pruning, but is susceptible to Japanese beetles.

Persian Parrotia was found infected with *P. ramorum* on one grown plant in South Wales. Symptoms were limited to leaf blight. Culturing, TaqMan PCR, and Koch's postulates have been completed. The identified plant has been destroyed.

Resources:

- University of Connecticut, Plant Database, "*Parrotia persica*" <http://www.hort.uconn.edu/plants/p/parper/parper1.html>
- Brenzel, Kathleen. Sunset Western Garden Book. Menlo Park, CA: Sunset Publishing Corporation, 2001. 497-497.