CALIFORNIA OAK MORTALITY TASK FORCE REPORT
JUNE 2004

FUNDING

On May 18, US Department of Agriculture Secretary Ann Veneman transferred $15.5 million from the USDA Commodity Credit Corporation (CCC) to Plant Protection and Quarantine (PPQ), Animal and Plant Health Inspection Service (APHIS), to help halt the spread of *Phytophthora ramorum* to non-infested areas of the United States. When added to the $2.5 million that APHIS has already provided for the national survey and the $2 million of appropriated funds, the USDA PPQ has committed $20 million to the program in fiscal year 2004. USDA PPQ will apply the funds to quarantine actions, nursery inspections, sampling and testing, and Sudden Oak Death education and outreach. The PPQ Western Region received more than $12 million dollars; with nearly $7 million going to support activities in California. The Eastern Region got $2.5 million to support emergency actions and the national survey in states east of the Mississippi River. Additionally, nearly $500,000 has been dedicated to laboratory diagnostics through the National Plant Diagnostic Network and other laboratories.

NURSERIES

Trace-forward surveys from nursery shipments are still underway, and the national survey continues. Of the trace-forward, national, and other surveys conducted to date, 125 nurseries in 17 states have had *P. ramorum* detections. Positive findings by state are: CA(45), AL(3), AR(1), FL(6), WA(18), OR(9), TX(6), CO(1), GA(13), LA(6), MD(2), NC(9), NM(1), TN(2), PA(1), NJ(1), and VA(1). In all, 787,842 plants have been destroyed.

Fourteen states are still imposing quarantine regulations on California beyond those ordered by APHIS PPQ. Of the states imposing further regulations, some include more stringent regulations on Oregon, Washington, or British Columbia. Florida has recently changed their quarantine to allow non-*P. ramorum* host nursery stock from California to be imported. Pre-notification and official verification that no *P. ramorum* host or associated host plants are grown at the shipping nursery are required. West Virginia has also revised their quarantine to allow for incoming shipments of nursery stock from certified nurseries. Additionally, pre-notification of all nursery stock must be made and non-host nursery stock must be certified. North Carolina and Oregon have implemented regulations that parallel the federal emergency order.

REGULATIONS

On 4/30/04, the USDA Animal and Plant Health Inspection Service (APHIS) amended the Federal Confirmed Nursery Protocol of 4/7/04 pertaining to the holding and stopping sale of nurseries that only ship intrastate. Under the new amendment, nurseries found to be positive, that only ship intrastate, are only required to place on hold host nursery stock and associated articles until delimitation within and outside of the nursery are complete. Nurseries with *P. ramorum* positive plants that ship interstate, must hold

all genera of all host plants and associated plants until delimitation within and outside of the nursery are completeFor more information, contact James Writer, USDA PPQ in Riverdale, James.V.Writer@aphis.usda.gov**.**

The California Department of Food and Agriculture revised required actions at *Phytophthora ramorum*-positive retail nurseries and garden centers on May 7, 2004. CDFA adopted the 4/30/04 USDA APHIS changes described above but added new rules that apply only in retail nurseries or garden centers in uninfested counties. Under the new guidelines, *P. ramorum*-positive retail nurseries and garden centers in uninfested counties will not be required to hold plants of the same genera as *P. ramorum* hosts and associated hosts. The new requirements call for all host species and associated host species to be inspected and sampled for *P. ramorum*, and for symptomatic host and associated host plants to be placed under a nursery stock non-compliance hold. For all host and associated host plants that test positive the lot will be destroyed. For more information, contact Courtney Albrecht at (916) 653-1440 or via email at calbrecht@cdfa.ca.gov.

A summary pest risk assessment for a new *Phytophthora* species affecting European beech (*Fagus sylvatica*) and rhododendron (*Rhododendron* spp.) has been posted to the DEFRA website at http://www.defra.gov.uk/planth/pra/forest.pdf. The new species was identified by researchers at the UK Forestry Commission, Forest Research Agency in mid-November 2003, while looking for *P. ramorum* in natural settings. The positive isolates were from a large bleeding canker of a mature European beech tree in southwest England.

The USDA APHIS April 22, 2004 Emergency Rule included significant changes in the regulatory diagnostic protocols for *P. ramorum*. The enzyme-linked immunosorbent assay (ELISA) test is to be used as a prescreen for *P. ramorum* samples. Phytophthora ELISA tests indicate whether any Phytophthora species is present; they are simple, quick, and inexpensive to perform. While ELISA negative samples need no further analysis, positive samples must be tested further by culturing or nested PCR. Samples that are culture-negative (meaning no *P. ramorum* is isolated) must be tested via nested PCR. Nested PCR is required for negative culture samples because the failure to isolate *P. ramorum* from symptomatic tissue does not mean that the organism is absent. Many factors may inhibit pathogen growth in culture, including fungicides, sampling at a time of year when environmental conditions or pathogen physiology are not conducive to isolation, and/or poor lab techniques. For these reasons, a sample will be declared positive based on nested PCR even though the organism may not have been isolated in culture. (Should this occur, however, it is strongly encouraged that further attempts be made to isolate the organism.) Diagnostic protocols and Frequently Asked Questions on *Phytophthora ramorum* Diagnostics, including definitions and explanations of various diagnostic techniques, are posted on the USDA APHIS website at http://www.aphis.usda.gov/ppq/ispm/sod/diagnostics.html. New sampling protocols for water and soil are also available. For more information contact Philip Berger, APHIS

National Science Program Leader for Molecular Diagnostics and Biotechnology at philip.h.berger@aphis.usda.gov.

MONITORING

The UK "Report on the Forestry Commission Woodland Surveys 2004 to Assess the Level of Incidence of *Phytophthora ramorum* in British Woodlands" is now available on the UK Forestry Commission website at http://www.forestry.gov.uk/pdf/survey2004final.pdf/$FILE/survey2004final.pdf. The survey was carried out at 1,217 high-risk sites across England, Scotland, and Wales, as well as at 131 sites in lower-risk areas of England and Scotland. Of the 335 symptomatic plant samples taken, all were negative for *P. ramorum*.

California Polytechnic State University, San Luis Obispo and the USDA Forest Service, Remote Sensing Lab in Sacramento will start to fly the 4th consecutive yearly Sudden Oak Death aerial survey of California on June 14, 2004 in an effort to identify and locate tree mortality in areas at risk for *Phytophthora ramorum*. Ten crew members have been hired to work with Amy Jirka and Wally Mark, Cal Poly San Luis Obispo and Jeff Mai, USDA Forest Service.

Flights will focus on counties adjacent to the 13-county infested area, in addition to areas not known to be infested in Monterey and Mendocino counties. Cal Poly will fly the southern CA counties to be surveyed, including San Luis Obispo, Santa Barbara, San Benito, and Southern Monterey, over 6 days. The US Forest Service will cover the northern CA counties to be surveyed, including Del Norte, Humboldt, N. Mendocino and W. Lake, over 7 days of flying. Helicopter follow-up flights to further refine mortality locations are planned.

The survey will use a digital mapping system (Sketchmapper). A GPS system will also be used to capture the coordinates of mapped polygons (areas of interest), in addition to taking 35mm photos of each area to aid in the ground-truthing efforts. Samples taken from the ground-check crews will be processed by CDFA for infested counties and Dave Rizzo's lab, UC Davis, for all non-infested counties.

Survey results from the 2003 aerial survey resulted in two significant finds.
1) *Phytophthora ramorum* was isolated from the Plaskett Creek area in southern Monterey County, extending the southern range of the infested area. 2) *Phytophthora ramorum* was isolated in Lake County near the Sonoma County border, adding Lake County to the list of infested counties.

Results from the 2003 Statewide Aerial Survey can be found at http://kellylab.berkeley.edu/OakMapper/viewer.htm. This webpage was developed and updated by Maggi Kelly of UC Berkeley. For more information, contact Amy Jirka at ajirka@calpoly.edu, Wally Mark at wmark@calpoly.edu, or Jeff Mai at jmai@fs.fed.us.

RESEARCH

The second Sudden Oak Death Science Symposium will be held January 18 – 21, 2005 at the Marriott Hotel in Monterey. A call for papers has been announced**.** Submissions should focus on pathology, organisms associated with *P. ramorum*, ecological impacts, evolutionary biology, restoration, management and control strategies, monitoring, silviculture, arboriculture and urban forestry, nursery management, economics and policy, public risk and fire relations, solid waste disposal and wood utilization, or other topics relating to Sudden Oak Death. Abstracts of proposed papers or posters must be submitted by October 1, 2004. Authors of accepted papers and posters will be notified by October 22, 2004. For more information on the abstract submission or conference logistics and facilities, contact Joni Rippee, UC Berkeley Center for Forestry at (510) 642-0095 or via email at rippee@nature.berkeley.edu. For Symposium program content, contact Rick Standiford, UC Berkeley Center for Forestry, at standifo@nature.berkeley.edu or Pat Shea, USDA Forest Service Pacific Southwest Research Station, at pjshea@davis.com. Updates on the meeting will be posted at http://nature.berkeley.edu/forestry/sodsymposium. The link to the pdf of the announcement is SOD Symposium II Call for Papers

Several *P. ramorum*-related papers have recently been published. The following is a list of those papers or citation information. Abstracts of the papers are available on the website where noted.

Hayden, K. J.; Rizzo, D. M.; Tse, J.; and Garbelotto, M. Detection and quantification of *Phytophthora ramorum* from California forests using a real-time PCR assay. Phytopathology. In press. (Abstract)

Kroon, L. P. N. M., Verstappen, E. C. P., Kox, L. F. F., Flier, W. G., and Bonants, P. J. M. 2004. A Rapid Diagnostic Test to Distinguish Between American and European Populations of *Phytophthora ramorum*. Phytopathology 94:613-620. (Abstract)

Martin, F. N., Tooley, P. W., and Blomquist, C. 2004. Molecular detection of *Phytophthora ramorum*, the causal agent of sudden oak death in California, and two additional species commonly recovered from diseased plant material. Phytopathology 94:621-631. (Abstract)

Frank N. Martin and Paul W. Tooley. Phylogenetic relationships of *Phytophthora* *ramorum*, *P. nemorosa*, and *P. pseudosyringae*, three species recovered from areas in California with sudden oak death. Mycol. Res. 107 (12): 1379-1391 (December 2003). The British Mycological Society. (Abstract)

Tooley, P. W.; Kyde, K. L.; and Englander, L. 2004. Susceptibility of Selected Ericaceous Ornamental Host Species to *Phytophthora ramorum.* Plant Disease. In press. (Abstract)

Rapid identification of *Phytophthora ramorum* using PCR-SSCP analysis of ribosomal DNA ITS-1. P. Kong, C. X. Hong, P. W. Tooley, K. Ivors, M. Garbelotto, and P. A. Richardson. 2004. Letters in Applied Microbiology 2004, 38, 433-439.

The British Society for Plant Pathology has posted the First report of ramorum bleeding canker on *Quercus falcata*, caused by *Phytophthora ramorum* C.M. Brasier, S. Denman[a], J. Rosea, S.A. Kirka, K.J.D. Hughes, R.L. Griffin, C.R. Lane, A.J. Inman and J.F. Webber at www.bspp.org.uk/ndr/july2004/2004-31.asp.

Surveying For and Eradicating *Phytophthora ramorum* in Agricultural Commodities. N. K. Osterbauer, J. A. Griesbach, and J. Hedberg. 9 March 2004. Plant Health Progress, http://www.plantmanagementnetwork.org/php/2004.asp.

Sudden Oak Death: A Tale of Two Continents. Matteo Garbelotto, Extension Specialist and Adjunct Professor, Department of Environmental Science, Policy and Management, University of California, Berkeley, CA, USA describes this new disease of oaks and related trees and compares the infection potential in the U.S. and Europe.

WWW.SUDDENOAKDEATH.ORG

Pictures of *P. ramorum* symptoms on *Pyracantha* have been posted to the COMTF website at www.suddenoakdeath.org. For details on the photos, contact Stephan Briere, Canadian Food Inspection Agency, Ottawa, at brieresc@inspection.gc.ca.

CALENDAR OF EVENTS

Early July - San Joaquin Valley training session on "*Phytophthora ramorum* in Nurseries: Diagnosis and Control." This free one-day class will be dedicated to pathogen recognition, regulations, and other *P. ramorum* nursery topics. For more information, contact Karl Buermeyer, southern COMTF outreach coordinator, at (831) 763-8012 or krbuermeyer@ucdavis.edu. Further details will be forthcoming and posted to the COMTF website at www.suddenoakdeath.org.

FEATURE STATE

Washington State has been continually surveying nurseries for *P. ramorum* since May 2003. During this period, over 250 nurseries have been surveyed and more than 36,000 samples processed. As a result, 20 nurseries have been confirmed as *P. ramorum*-positive; eradication efforts per United States Department of Agriculture (USDA) guidelines are complete or underway at all sites. Of the samples taken, Monrovia-Azusa trace-forward nurseries represented only 28 percent of the total survey, yet produced 78 percent of the infected variety blocks. To date, wildland and nursery perimeter surveys have not identified *P. ramorum* outside of nursery boundaries.

2004 Findings:

	Samples Collected/Processed	Nurseries Visited	Nurseries *P. ramorum* +	Variety-blocks *P. ramorum* +
Monrovia-Azusa Trace Forward Nurseries	5,670	47	12	47
National Survey	13,645	102	7	13
Other	1,170	-	-	0
Total	**20,485**	**149**	**19**	**60**

Since May, 2004, Washington State has collected and processed more than 5,000 samples. In 2003, a single nursery was determined to have the European strain of the pathogen; however, this year no European isolates have been identified.

Based on the results of extensive surveying and no positive natural setting *P. ramorum*-confirmations, Washington believes most of the state's nursery infestations are external in origin, as they are a net importer of nursery stock, with approximately 80 percent of *P. ramorum* host material sold in Washington grown out-of-state. Similarly, 85 percent of Washington's *P. ramorum* confirmed nurseries are retail establishments that do not produce their own stock. These statistics, coupled with survey findings and Washington's moderate climate, has state officials concerned about the vulnerability of their retail/wholesale ornamental nursery industry.

Interested in assuring the quality of nursery stock produced in Washington, as well as safeguarding the state's environment, natural resources, and economic well being, Washington has developed a long-term strategy for addressing *P. ramorum.* Their multi-pronged approach is outlined as follows:

- Conduct a production nursery survey prior to shipping season.
- Develop a *P. ramorum* clean-stock certification program for host material produced in the State of Washington.
- Conduct a retail/wholesale nursery survey during shipping season to curtail any flow of infected material into Washington's nurseries and landscapes.
- Continue to survey Washington's landscapes and wildlands for *P. ramorum* infestations.
- Continue to monitor incoming stock for the presence of *P. ramorum*.

For more information on Washington's *P. ramorum* program, contact Art Wagner, WA State Department of Agriculture, at awagner@agr.wa.gov. or Brad White at bwhite@agr.wa.gov.