

***Phytophthora ramorum* Detection Surveys for Forests in the United States**

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Diseases caused by *Phytophthora ramorum* in forest landscapes of North America are presently confined to areas of the Pacific coast in the states of CA and OR. However, the vulnerability of other ecosystems is suggested by the discovery in Europe of disease in hosts which are abundant in oak-dominated forests of eastern North America; successful greenhouse inoculation trials of these and other potential eastern tree and shrub hosts; and brisk domestic and international trade in woody ornamental hosts. A risk map was developed for the US using overlay analysis. The three factors used in the analysis included hosts (red and live oak overstory and evergreen understory); climate (limiting temperature extremes and length of annual mesic/moist period); and potential pathways of introduction (importers of *rhododendron* nursery stock from the Pacific coast or Europe). The results showed an area of potentially elevated risk in the East centered in the Southern Appalachian Mountains.

Federal and state forest management agencies in 7 eastern states encompassing most of this area joined in pilot tests of early detection survey methods in 2003. Objectives were to field test survey methodology, develop diagnostic capacity, and determine *P. ramorum* status. The risk map guided sampling intensity. *Rhododendron* spp. and *Kalmia latifolia* were examined for foliar symptoms and *Quercus* spp. bark for bleeding symptoms on 4-100 meter transects per survey location. Diagnosis for the presence of *P. ramorum* was by nested PCR conducted at laboratories located in 6 of 7 cooperating states. Quality assurance of diagnostic results was accomplished on replicate samples from half of all transects at a separate laboratory. Over 1,100 bark and foliage samples (foliage samples consisting of a 10 leaf composite) were collected from the forested perimeter of 54 woody ornamental nurseries and from 118 general forest areas during the growing season of 2003. *P. ramorum* was not detected in any sample. These survey methods were implemented in a greatly expanded survey in 2004 in response to the discovery that *P. ramorum*-infected ornamental nursery stock had been shipped throughout the US during the previous year. The target host list was expanded to 8 foliar and 3 bark host genera. Top survey priority was assigned to the perimeters of trace forward woody ornamental nurseries. The cumulative total of locations surveyed in 2003 and 2004 now exceeds 1000, and the number of submitted samples exceeds 4000. *P. ramorum* was detected by these methods during 2004 only in Golden Gate Park, San Francisco County, CA in symptomatic bark of coast live oak (*Quercus agrifolia*). This area is in the heart of the CA quarantine area surrounded by the infested counties of Marin, Contra Costa, Alameda, and San Mateo. These survey results demonstrate that *P. ramorum* is not yet widely established in forest landscapes outside of currently regulated areas on the Pacific coast, even in close proximity to woody ornamental nurseries receiving infected stock in high risk areas. Surveys aimed at early detection of *P. ramorum* diseases will continue.