



Photo: M. Elliott

PLANT PRODUCTION & DISPLAY AREAS

- Reduce potential spread of *P. ramorum* by alternating blocks of host plant material with blocks of non-host plants.
- *P. ramorum* can spread contact with infected foliage, so keeping space between plants is a good practice.
- When plants are sold, clean up leaf debris that may contain inoculum so that new stock does not get infected.

USE CLEAN POTS. Soil and potting mix can adhere to pots and be a source of *Phytophthora*

inoculum that will infect the next plant. Other hitchhikers include insect pests, fungal pathogens, and weed seeds. Use new pots or clean old ones in bleach or steam sterilize.



Photo: R. Johnson



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Sudden Oak Death Research Program

Protecting our natural resources and helping industry respond through research, education, and monitoring.

If you suspect that *P. ramorum* is in your nursery, contact your local department of agriculture.

This brochure is not a comprehensive guide for monitoring and managing *P. ramorum*, but is a brief primer on some of the main issues that should be considered when developing a management program for your nursery and the basics of recognizing *P. ramorum*-like symptoms.

Visit our website

www.puyallup.wsu.edu/ppo/sod.html

if you have questions or would like more information on managing this plant disease.

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How to keep *Phytophthora ramorum* Out Of Your Nursery



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WHAT IS PHYTOPHTHORA? *Phytophthora* is a fungus-like organism that is closely related to brown algae. Like algae, some stages of its life cycle depend on water. Unlike algae, *Phytophthora* is microscopic and is recognized by the damage it does to plants. *Phytophthora* species cause some of the most destructive diseases of forest, nursery, and food crops worldwide. *Phytophthora ramorum* is an introduced organism that causes sudden oak death and blight on nursery crops. This organism is regulated, and detection of *P. ramorum* in a nursery can trigger quarantines and have serious economic impact.

THE "FILTHY FIVE". Five genera have accounted for most of the *P. ramorum* detections in nurseries. These plants should be monitored closely for symptoms:

- Rhododendron
- Camellia
- Pieris
- Kalmia
- Viburnum

For a complete host list, visit the USDA APHIS website: http://www.aphis.usda.gov/plant_health/plant_pest_info/pram/downloads/pdf_files/usdaprlst.pdf



Photo: M. Elliott

Most of the positive detections of *P. ramorum* in Washington nurseries have been on Rhododendron.

BUY FROM A TRUSTED SUPPLIER. Keep diseases out of your nursery by purchasing certified clean nursery stock from a trusted supplier.



Photo: M. Elliott

LOOK FOR SYMPTOMS. Always monitor incoming plant material. This is especially important in Washington since most is grown out of state. Isolate any plants with suspicious symptoms.



Photo: G. Chastagner

Photo: M. Elliott

Typical symptoms of *P. ramorum* on Rhododendron and Viburnum foliage. Look for brown lesions on areas where water collects, such as leaf tips. Lesions tend to spread along the midvein.

WATER MANAGEMENT. Since *Phytophthora* diseases are waterborne, good water management practices are key in preventing plant losses.



Photo: G. Chastagner

Do not allow plants to sit in water. Plants that tip over into puddles containing inoculum (zoospores) can become infected within ten seconds.

KEEP PHYTOPHTHORA FROM SPREADING

- Provide good drainage in plant display areas, can yards, roads, etc.
- Avoid overhead irrigation. If you use overhead irrigation, ensure that leaf wetness of 12-hr or more is minimized. Irrigate in the morning to allow leaves to dry as soon as possible.
- Do not use water from ponds or streams for irrigation unless it is treated with chemicals—such as sodium hypochlorite (bleach)—to eliminate disease organisms.



Photo: M. Elliott

Ensure that runoff from cull piles is directed away from areas such as roads, growing beds, soil components and mixing areas, and especially from areas containing high-risk host plants.