Symptoms of *P. ramorum*

As Sudden Oak Death and Ramorum Blight/Dieback

USDA APHIS

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  - Rhododendron
  - Pieris
  - Viburnum
  - Kalmia (Mountain laurel)
  - Syringa (Lilac)
  - Conifers

Phytophthora ramorum Diseases

- Sudden Oak Death
  - Red oak group hosts and tanoak
  - Stem lesions beneath the bark
  - May bleed or ooze
  - Can kill adult plants
- *Phytophthora ramorum* Foliar Blight
  - Non-oak hosts
  - Spots and blotches on leaves
  - Shoot dieback
  - Can kill juvenile plants, occasionally mature plants

Sudden Oak Death

- Sudden Oak Death affects members of the oak family (Fagaceae)
  - True oaks *(Quercus* spp.*)*
  - Tanoak *(Lithocarpus densiflorus)*
  - Chestnut *(Castanea)* [Europe only]
  - Beech *(Fagus)* [Europe only]

Sudden Oak Death

P. ramorum on coast live oak

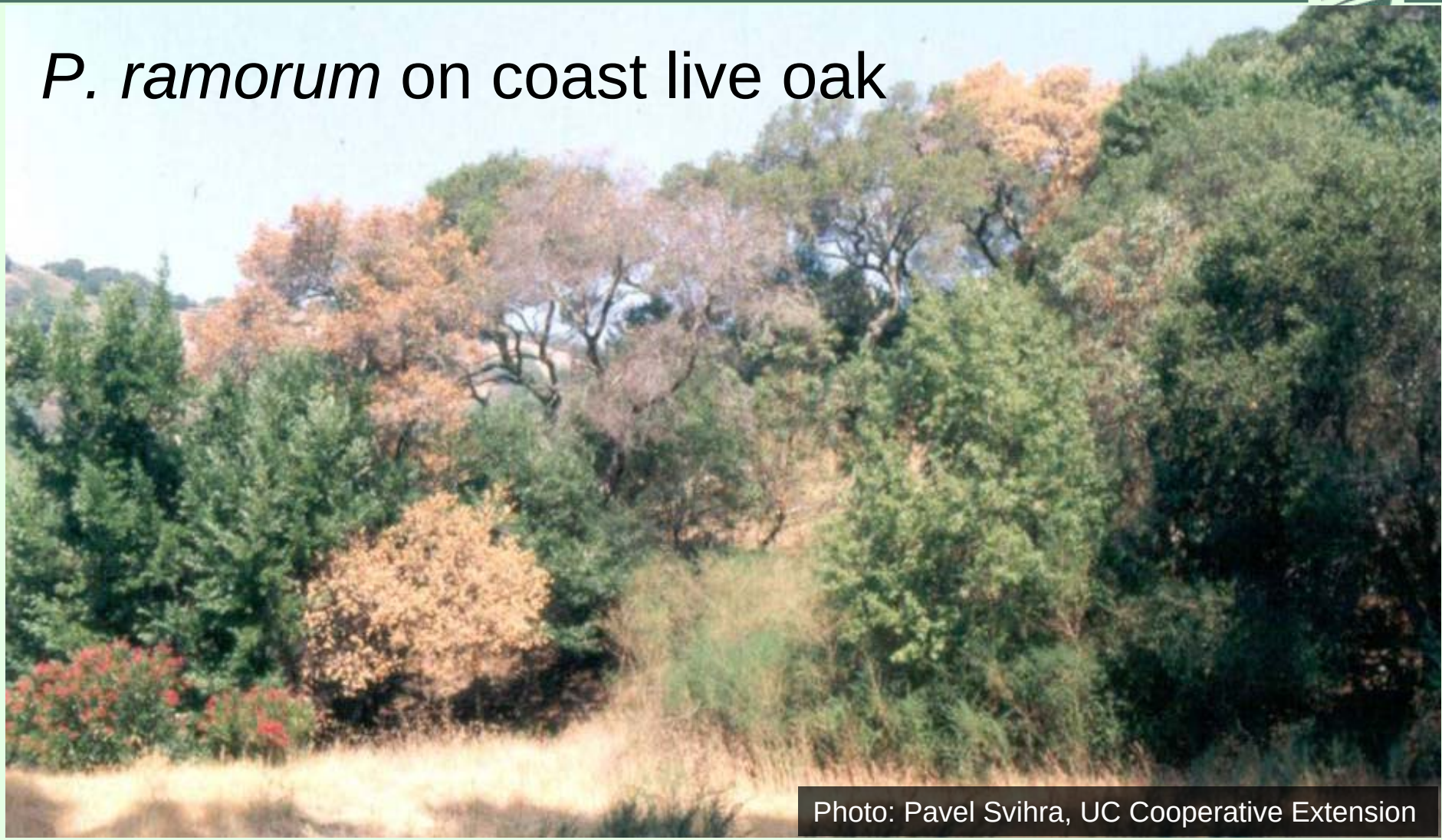


Photo: Pavel Svihra, UC Cooperative Extension

Sudden Oak Death

Tree Death From the Top Down

Sudden Oak Death

Natural Reservoir

Phytophthora ramorum infection on the leaves of California bay laurel (*Umbellularia californica*)

Photo: Joseph O'Brien, USDA-Forest Service

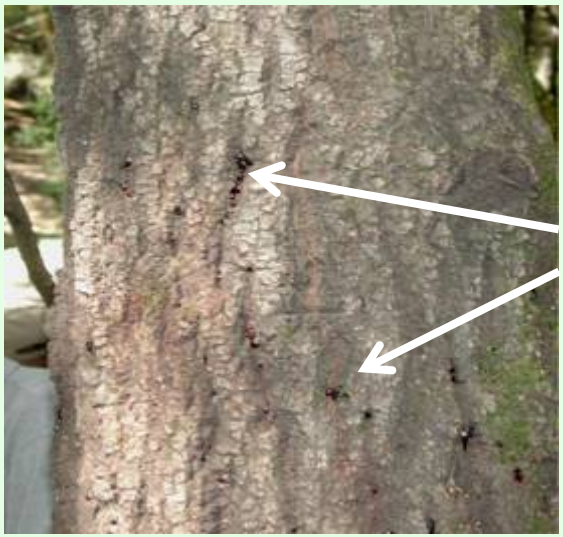
Sudden Oak Death

Photo: Garbelotto lab, UC Berkeley

'Bleeding' canker on tree trunk

- 'Bleeding' or oozing on the bark
- Not associated with cracks in bark or insect holes
- Usually on the lower 6 ft. of tree trunks

Sudden Oak Death



"bleeding"

Photos: Mike McWilliams, ODF & Bruce Moltzen, Missouri Dept. of Conservation

Sudden Oak Death

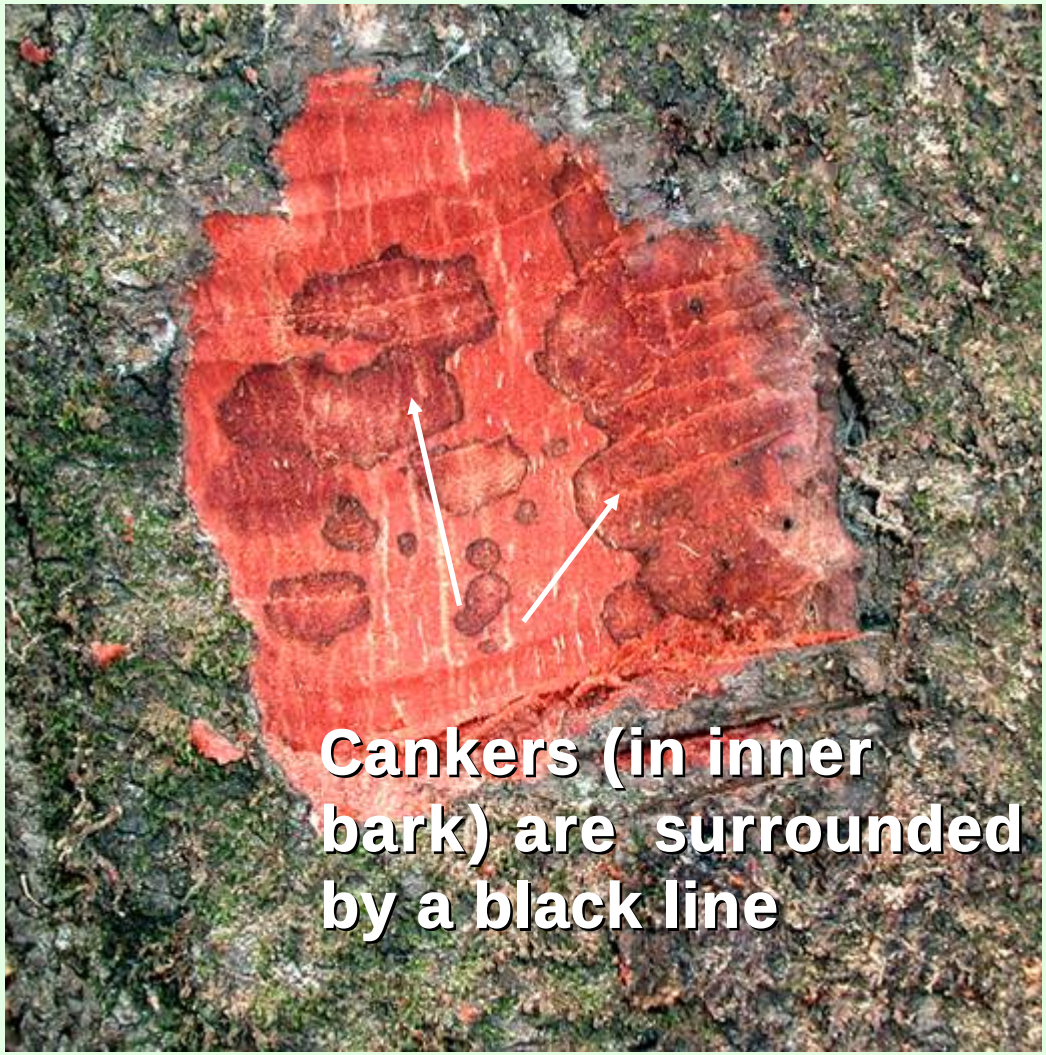


Photo: Dave Rizzo, UC Davis

Sudden Oak Death

outer bark

inner bark

Photo: Bruce Moltzen, Missouri Department of Conservation

Sudden Oak Death Look-a-Likes

- Bacterial wetwood
- Boring insects
- Mechanical injury
- Fungi

Sudden Oak Death Look-a-Likes

Similar symptoms – not *P. ramorum*

outer bark

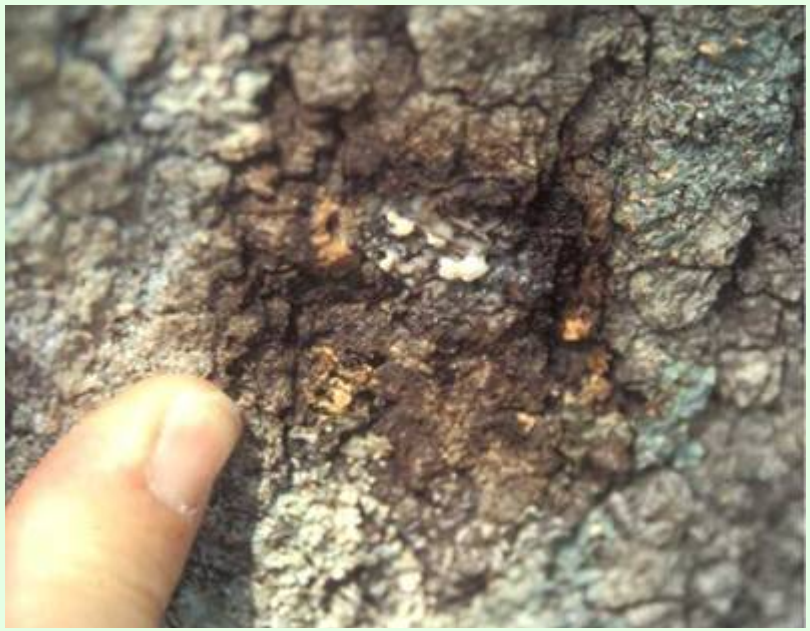
inner bark

Bleeding canker caused by *Armillaria*

Photo: Steve Oak, USDA-Forest Service

Sudden Oak Death Look-a-Likes

Similar symptoms – not *P. ramorum*



outer bark

inner bark

Bleeding canker caused by inner-bark boring insect

Photo: Steve Oak, USDA-Forest Service

Sudden Oak Death Look-a-Likes

outer bark

inner bark

Bleeding canker caused by *Inonotus hispidus*

Photo: Steve Oak, USDA-Forest Service

Blight and Dieback Hosts

Selected Hosts:

- Camellia
- Rhododendron
- Pieris
- Viburnum
- Kalmia (Mountain laurel)
- Syringa (Lilac)
- Pyracantha
- Honeysuckle
- Yew
- Douglas-fir
- Grand fir
- Coast redwood

Camellias

- Symptoms can be subtle – Pin head lesions
- Look for irregular-shaped brown lesions on the leaves
- Sometimes only the tips of leaves are brown
- Look for lower leaves that have fallen off

Photo: Cheryl Blomquist, CDFA

Camellias

Photos: Oregon Dept. of Agriculture & Cheryl Blomquist, CDFA

Camellias

Pin head lesions

Camellias

Camellias

Older Symptoms

Camellias

Tomas Pastalka, CDFA

Sunscald on Camellia

Camellias

Leaf Drop

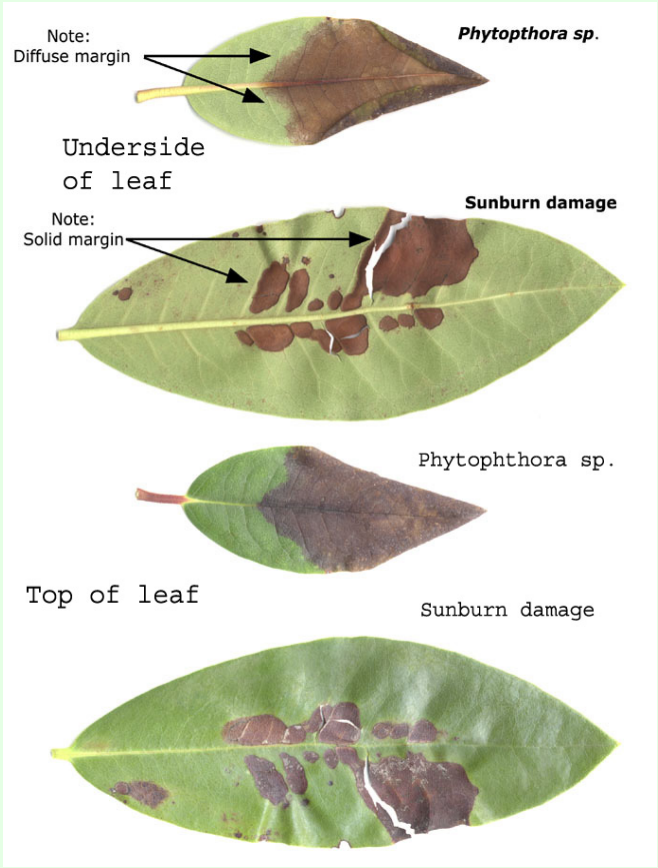
Camellias

Recent Symptoms Have More Diffuse Edges and Water Soaked Appearance

Camellias

Photo: Carrie Harmon, University of Florida

Rhododendron



Tim Tidwell, CDFA

Phytophthora ramorum-Infected Rhododendron leaves

Rhododendron

Rhododendron macrophyllum

Shoot dieback

Foliar blight

Foliar blight

Photo: Everett Hansen, Oregon State University

Rhododendron

Stem Canker and Leaf Symptoms of *P. ramorum*

Rhododendrons in Europe

Rhododendron

Photo: Everett Hansen, Oregon State University

Rhododendron macrophyllum

Rhododendron

Photo: Jennifer Parke, Oregon State University

Rhododendron ‘Unique’

Rhododendron

Foliar blight caused by *Phytophthora* species

Photo: Mike Benson, NCSU

Rhododendron

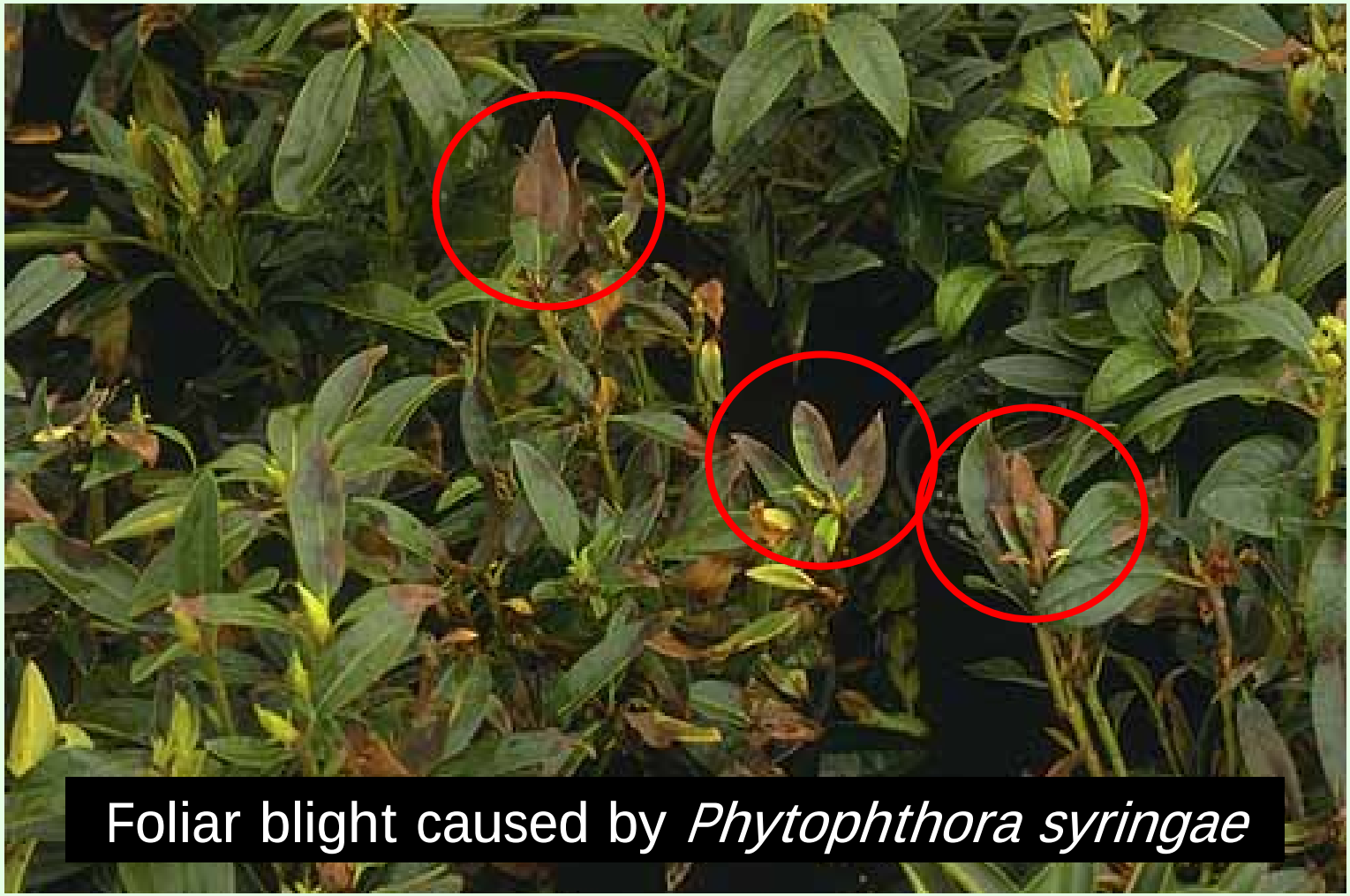


Photo: Jay Pscheidt, Oregon State University

Rhododendron

Photo: Steve Tjosvold, UCCE

Abiotic Diseases of Rhododendron

Rhododendron

Phytophthora root rot - not caused by *P. ramorum*

Photo: Jay Pscheidt, Oregon State University

Rhododendron

Sun scorch

Gray blight can develop on sun scorched rhododendron leaves

Photo: Rich Regan,
Oregon State University

Pieris

Photo: Oregon Dept. of Agriculture

Pieris

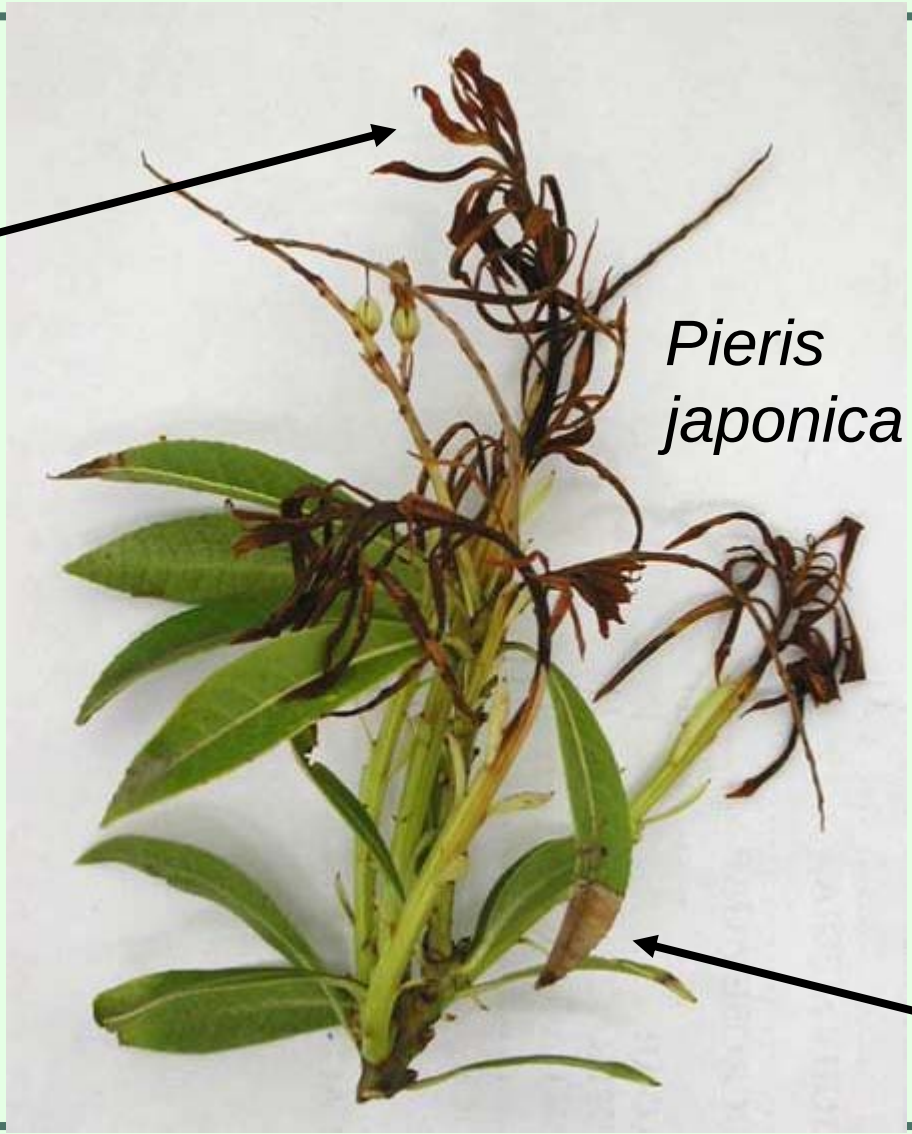


Photo: Oregon Dept. of Agriculture

Viburnum

Viburnum x bodnantense ‘’Dawn’
Photo: Oregon Dept. of Agriculture

Viburnum

Viburnum x bodnantense 'Dawn'

Photo: Oregon Dept. of Agriculture

Viburnum

Viburnum plicatum tomentosum ‘Mariesii’

Photo: Jennifer Parke, Oregon State University

Viburnum

stem
canker

Photo: Sabine Werres, Institut für Pflanzenschutz im Gartenbau, Germany

Viburnum

Kalmia (Mountain Laurel)

Photo: DEFRA

Kalmia (Mountain Laurel)

Photos: J. Fallacy, WSDA

Kalmia (Mountain Laurel)

Kalmia (Mountain Laurel)

Similar symptoms – submit sample

Kalmia latifolia (mountain laurel)

Photo: Peter Angwin, USDA-Forest Service

Syringa (Lilac)

Photo: Alexandra Schlenzig, Scottish Agricultural Science Agency

Conifers

Grand fir

Douglas-fir

Photo: Santa Clara Co. (CA) Agriculture Dept. & Dave Rizzo, UC Davis

For More Information

- APHIS: www.aphis.usda.gov/ppq/ispm/pramorum
- California Oak Mortality Task Force: www.suddenoakdeath.org
- NCIPM: www.ncipm.org/sod