Phytophthora ramorum Early Detection Program

Forest Health Coop Diagnostic Laboratory Services

Phytophthora ramorum Early Detection Program

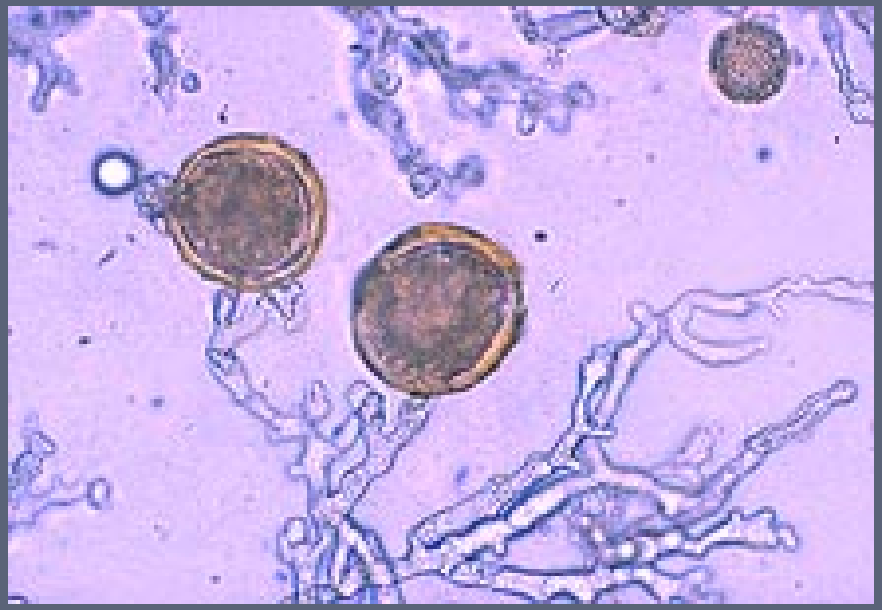
Phytophthora ramorum Early Detection Program

- Background of the pathogen/disease
- Scope and scale of the problem
- How and where in the Southeastern US
- Purpose of the program
- Field sampling
- Laboratory process

Sudden Oak Death

- First reported 1995 coastal region of central California with *Phytophthora ramorum* positively linked to the disease in 2001
- Fungus like water mold (Oomycete)
- Spreads aerially and aquatically
- Pathogen has a wide host range
- Three expressions of the disease

Phytophthora ramorum



Source: Steve Oak - USDA Forest Service Forest Health Protection

Phytophthora ramorum Hosts

- Abies (fir)
- Acer (maple)
- Aesculus (buckeye)
- Arctostaphylos (kinnikinick)
- Calycanthus (sweet bush)
- Castanea (chestnut)
- Corylus (hazelnut)
- Euonymus
- Fagus (beech)
- Fraxinus (ash)
- Gaultheria (teaberry)
- Kalmia (mountain laurel)
- Hamamelis (witch hazel)
- Leucothoe (doghobble)
- Lonicera (honeysuckle)
- Magnolia
- Maianthemum (false Solomon's seal)
- Pieris (fetterbush)
- Prunus (cherry)
- Quercus (oak)
- Rhamnus (buckthorn)
- Rhododendron
- Rubus (salmonberry, blackberry)
- Salix (willow)
- Toxicodendron (poison oak, ivy)
- Vaccinium (huckleberry, blueberry)
- Viburnum (arrowwood)

Source: Steve Oak - USDA Forest Service FHP

Phytophthora ramorum symptoms

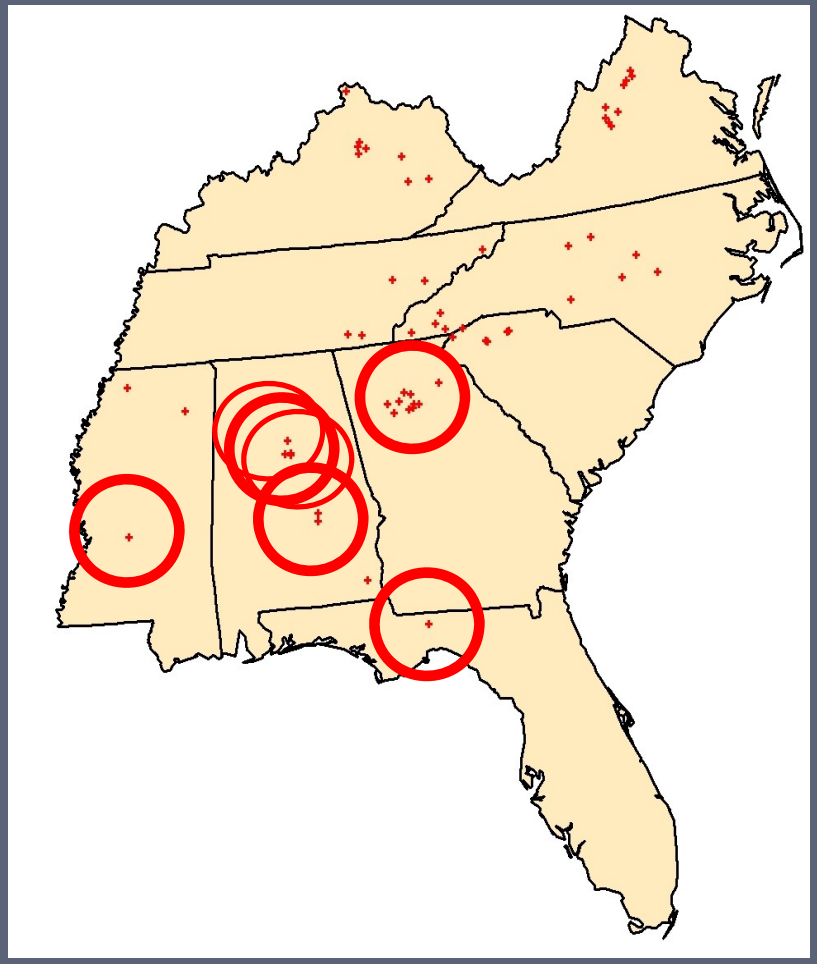
Source: Steve Oak - USDA Forest Service FHP

Coastal/Western US

Source: Steve Oak - USDA Forest Service FHP

- Fourteen coastal counties in CA
- Curry County in OR
- Hundreds of thousands of tanoaks, coast live oak, and California black oaks killed

Southeastern US



Source: Steve Oak - USDA Forest Service FHP

- March 2004 infected Camellias shipped from southern California wholesale nursery throughout the US and Canada
- Additional shipments of infected material have occurred
- *Phytophthora ramorum* detected outside nurseries in four states

Risk To Our Forests

- *Phytophthora ramorum* persists in infected nurseries even after eradication measures.
- Inoculum is leaving infected nurseries via waste water
- A pathway from the water into terrestrial ecosystems is plausible
- Southeastern US climate is at least seasonally suitable for infection
- Eastern woody plants are susceptible

Program Purpose

- The purpose of the survey program is the early detection of *Phytophthora ramorum* in forest vegetation before infection centers become fully established and more difficult to eradicate
- Detection and monitoring of *Phytophthora ramorum* outside of nurseries which have tested positive for infected nursery stock

Field Sampling

- Six baiting periods spread across the cooler spring and fall months
  - Begin baiting when water temperatures approach 10 °C and suspend baiting when water temperatures exceed 22 °C
- Bait bags deployed with susceptible bait material and exposed for one week
- Bottle of Bait

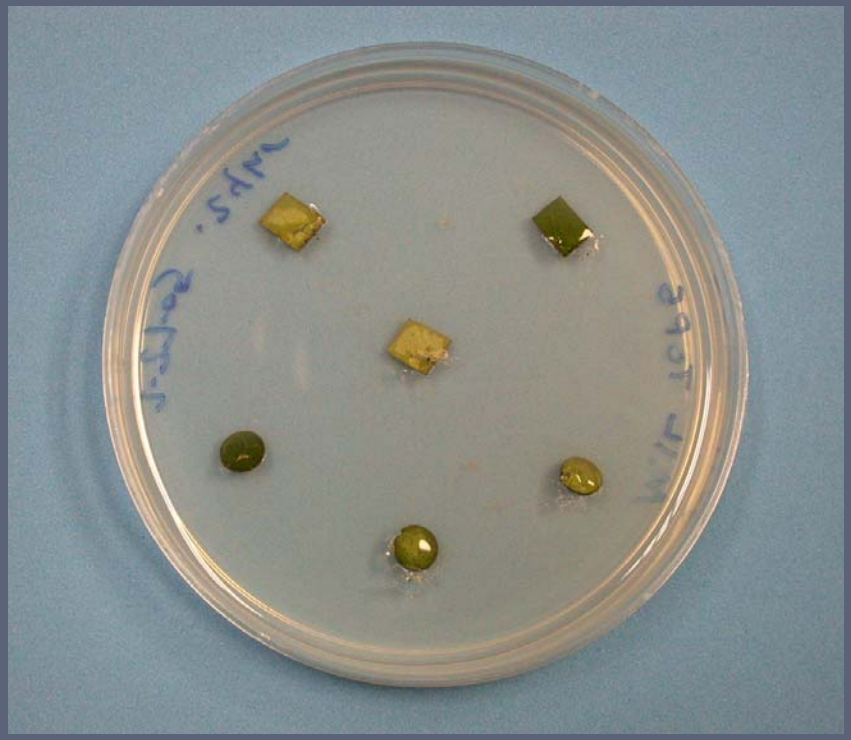
Field Sampling

Source: Steve Oak - USDA Forest Service FHP

Laboratory Process

- Pieces of the bait leaves are placed into selective growth media
- Samples are monitored over a one month period for any growth of *Phytophthora ramorum*
- All positive and negative results are reported to study partners

Laboratory Process



Source: Steve Oak - USDA Forest Service FHP

Forest Health Coop Diagnostic Laboratory Services

Forest Health Coop Diagnostic Laboratory Services

- History of the Coop
- As a service to members
- Recent updates
- Field consulting
- Laboratory sample analysis
- Results

History

- Forest Health Cooperative was started in 2008
- To bring together parties interested in maintaining forest health, productivity, and sustainability
- Membership to those managing forest products
- Address forest health issues with real world management as a focus

Member Service

- One day of field consulting for each $4000 of membership contribution
  - Additional consulting/non-member consulting for a service charge of $1000 per consultation
- Five laboratory sample analyses for each $4000 of membership contribution
  - Additional samples/non-member samples for $100 per sample

Diagnostics Clinic Updates

- Sample collection and submission guide
  - Provide a instruction set for collecting “good” samples for laboratory analysis
- Tree Diagnostics Form
  - Provide a detailed sample/site history to aid in diagnosis accuracy
- Members only page – Diagnostics Clinic

Forest Health Cooperative
Forest Health Dynamics Laboratory
3301 Forestry and Wildlife Sciences Building
Auburn University, Auburn, AL 36849-5418
Daniel Anderson (dda0003@auburn.edu)
334-844-8037
https://fp.auburn.edu/ForestHealthCooperative/default.htm

Diagnostics Laboratory Use Only:

Date Received: _____

Received by: _____

Tree Disease Diagnostic Form

Please include ALL relevant data; maintain an office copy; submit original copy with specimen.

Date Sample Taken: _____ Date Sample Shipped: _____ Sample No. (___) of (___)

Sample ID: _____

	Submitter Information:	**Client Information:** (If different from Submitter)
Name:	_____	_____
Company:	_____	_____
Address:	_____	_____
City/Zip:	_____	_____
Phone No:	_____	_____
Fax No:	_____	_____
Email:	_____	_____

Preferred contact method for results:

Mail: ___ Submitter ___ Client
Fax: ___ Submitter ___ Client
Email: ___ Submitter ___ Client

Tree and Site Information

Select ALL that apply.

Tree (Pine or Hardwood spp.): _____

Planting Type: ___ Forest ___ Nursery ___ Greenhouse ___ Other: _____

Exposure: ___ Full sun ___ Partial shade ___ Full shade ___ Windy ___ Protected ___ Irrigated
Aspect:_____ % Slope: _____

Soil Type: ___ Sand ___ Silt ___ Clay ___ Loam ___ Other: _____

Age of Planting: ___ 0 – 10 ___ 11 – 20 ___ 21 – 30 ___ 31 – 40 ___ 41 – 50 ___ 51+

Foliage Symptoms: ___ Wilted ___ Spotted ___ Yellowed ___ Mosaic ___ Other: _____

Root Symptoms: ___ Rotted ___ Resinous ___ Stained ___ Insect Signs ___ Other: _____

Insect Attack: ___ BTB ___ SPB ___ Ips ___ Weevils ___ Termites ___ Hylastes

Insect Damage: ___ Foliage ___ Branches ___ Bole ___ Roots

Prevalence: ___ Entire Planting ___ Localized ___ Scattered % Planting Affected: _____

Degree of Damage: ___ High ___ Medium ___ Low

Recent Chemicals: ___ Pesticide ___ Fertilizer What/when applied: _____

Recent Silviculture: ___ Thin ___ Prescribed fire ___ Other: _____

Problem Description: _____

_____

_____

_____

_____

_____

Field Consulting

- Travel to member's location
- Provide onsite diagnostic information
- Collect samples for laboratory analysis

Laboratory Sample Analysis

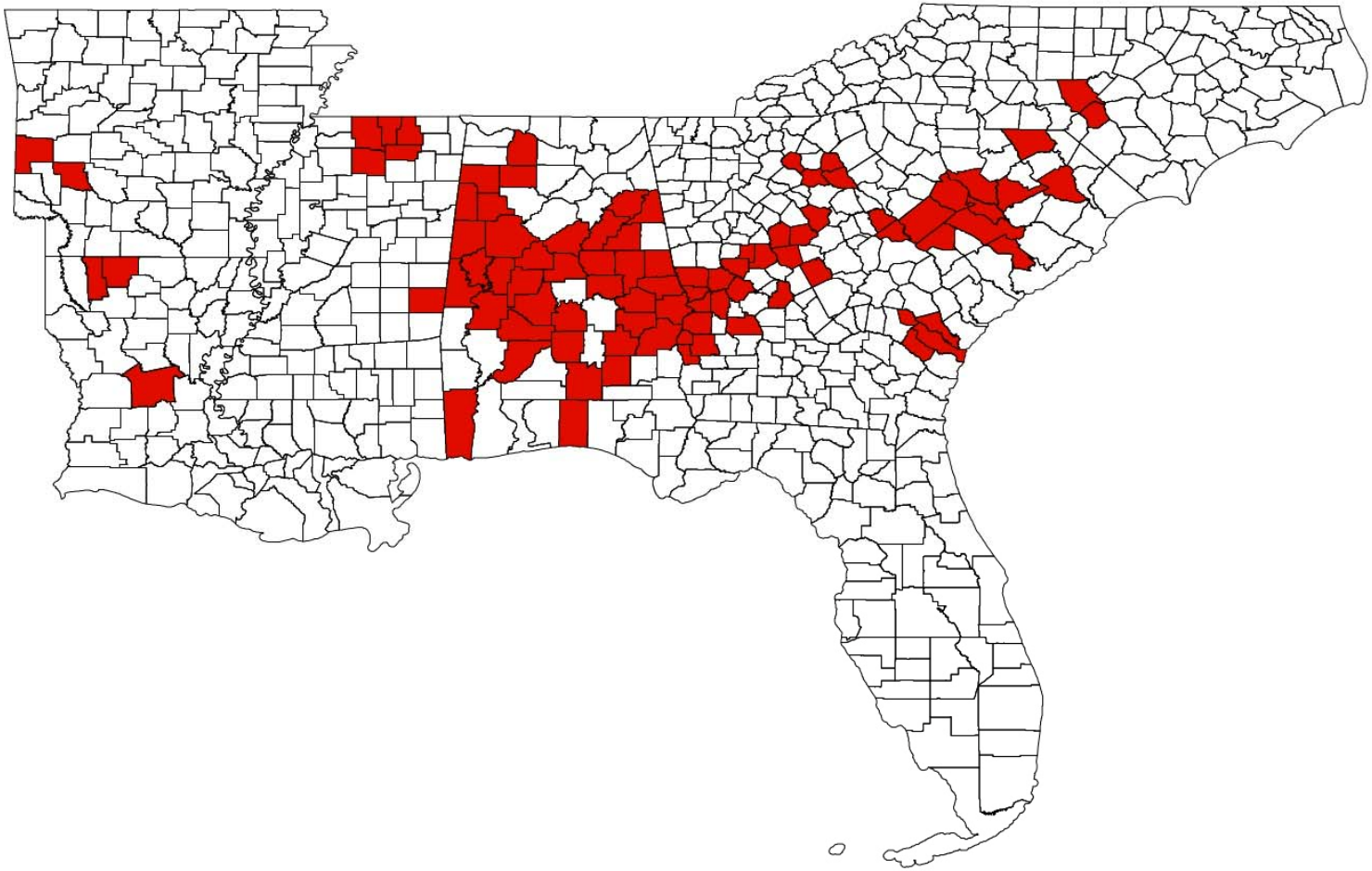
Source: http://www.123rf.com/photo_6554753

- Signs/symptoms of sample
- Plating of samples
- Culturing
- Pathogen identification

Results

- Results available after a minimum of twenty-one days after sample is plated
  - Certain diagnostic processes may take longer
  - Addition time may be needed for positive identification
- Results letter sent to member with description, relevant species information, and recommendation for management/treatment

Distribution of Pine Decline Associated with
Leptographium Root Disease in the SE US
Updated: 06/2011



Questions