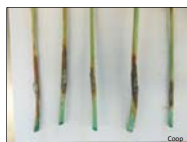


Forest Health Coop Diagnostic Laboratory Services

Dr. Lori Eckhardt and Luis Mendez



Forest Health Dynamics Laboratory
School of Forestry and Wildlife Sciences, Auburn University



Forest Health Dynamics Laboratory

Forest Health Coop Diagnostic Laboratory Services - Overview

- History
- Services Provided to Members
- Recent Updates
- Field Consulting
- Laboratory Sample Analysis
- Results

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Forest Health Dynamics Laboratory

History

- Forest Health Cooperative began in 2008
- To bring together parties interested in maintaining forest health, productivity, and sustainability
- Membership for those managing for or purchasing forest products, wildlife and endangered species
- Address important and current forest health issues with real world management as a focus

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PRODUCTS SERVICES				
FULL	ASSOCIATE	MAINTAINING	SUSTAINING	
Members Only Web Access	X	X	X	X
Newsletter	X	X	X	X
Members Only Workshops	X	X	X	X
Priority Email and Telephone Consulting	X	X	X	X
Technical Reports	X	X	X	X
Research Reports	X	X	X	X
1 Day of Field Consulting for each \$4,000 Membership Contribution (additional days at \$1,000/day)	X	X		
3 Laboratory Sample Analysis for Disease or Insect Diagnosis per year for each \$2,000 Membership Contribution (additional analysis at \$100/sample)	X	X	X	
Participation at Annual Meeting	X	X	X	X
Studies established of Members Land	X	On Request	On Request	On Request
Study Establishment Assistance	X	On Request	On Request	On Request
Vote on Research Trials	X			
Vote on Budget and Policy Issues	X			

Member Services

- One day of field consulting for each \$5000 of membership contribution
 - Additional consulting/non-member consulting for a service charge of \$1000 per consultation
- Three laboratory sample analyses for each \$2000 of membership contribution
 - Additional samples/non-member samples for \$100 per sample

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FOREST HEALTH COOPERATIVE

AUBURN UNIVERSITY

SEARCH | MEET THE GANG | EDUCATION | ABOUT US

Members Only | Job Announcements | Non-Member Meeting Information

Forest Chapter

Forest Climate
Forest Insect Pests
Invasive Plants
Extension & Capacity
Publications & Documents
Related Links
Testing Services

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http://www.auburn.edu/academic/forestry_wildlife/foresthealthcooperative/

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Tree Disease Diagnostic Form

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1. The first step in the process of the scientific method is to ask a question. This question should be based on observation and should be specific and measurable. For example, "Does the amount of sunlight affect the growth of a plant?"

2. The second step is to form a hypothesis. A hypothesis is a statement that can be tested. It should be based on the question and should be a prediction of the outcome. For example, "If a plant receives more sunlight, then it will grow taller." This hypothesis is testable because it can be measured and compared.

3. The third step is to design an experiment. The experiment should be designed to test the hypothesis. It should include a control group and an experimental group. The control group is the group that does not receive the treatment being tested. The experimental group is the group that receives the treatment. In this example, the control group would be plants that receive a normal amount of sunlight, and the experimental group would be plants that receive more sunlight.

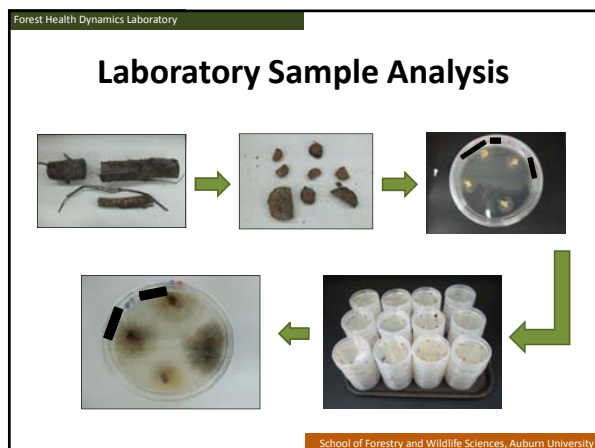
4. The fourth step is to collect data. Data is the information that is gathered during the experiment. It should be recorded in a table or graph. In this example, the data would be the height of the plants in the control group and the experimental group over a period of time.

5. The fifth step is to analyze the data. This step involves looking at the data and seeing if it supports the hypothesis. In this example, if the plants in the experimental group are taller than the plants in the control group, then the data supports the hypothesis.

6. The sixth step is to draw a conclusion. A conclusion is a statement that summarizes the results of the experiment. It should be based on the data and should answer the original question. In this example, the conclusion would be that the amount of sunlight does affect the growth of a plant.

7. The final step is to communicate the results. This step involves sharing the results of the experiment with others. It can be done through a presentation, a paper, or a report. In this example, the results would be shared with the class or the school.

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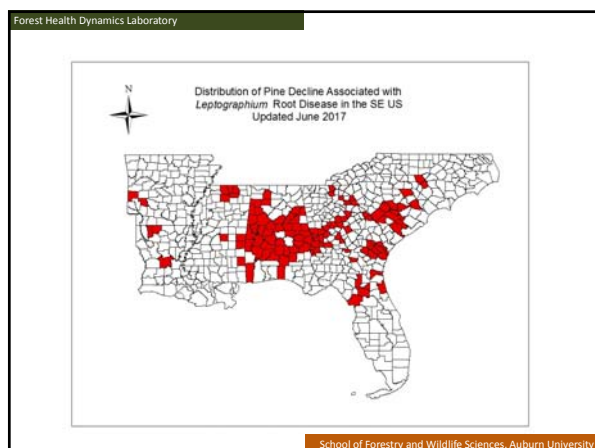


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Results

- Results available after a minimum of twenty-one days after sample is received
- Results letter sent to member with description and relevant species information

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SOD: *Phytophthora ramorum* Early Detection Program

Dr. Lori Eckhardt, Dr. Ryan Nadel, and Luis Mendez



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Phytophthora ramorum Early Detection Program - Overview

- Background of the pathogen/disease
- Scope and scale of the problem
- Purpose of the program
- Field sampling
- Laboratory process

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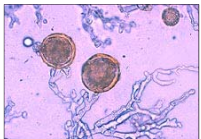
Sudden Oak Death

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


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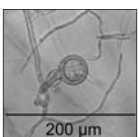
Phytophthora ramorum



Chlamydospores



Sporangia



Oospore

200 µm

Source: Steve Oak - USDA Forest Service Forest Health Protection

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Phytophthora ramorum Hosts

- Abies (fir)
- Acer (maple)
- Aesculus (buckeye)
- Arctostaphylos (kinnikinnick)
- 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

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Phytophthora ramorum symptoms





Source: Steve Oak - USDA Forest Service FHP

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Coastal/Western US



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

Source: Steve Oak - USDA Forest Service FHP

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Southeastern US



- 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

Source: Steve Oak - USDA Forest Service FHP

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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

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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 sampling periods spread across the cooler spring and fall months
- 15-22 °C (59-71.6 °F)
- Bottle of Bait method

Field Sampling



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Results

- 7 Alabama sites, 5 positive in the past. 2 confirmed in 2013; 2 confirmed positives for spring 2014 and 2015 and 1 new positive
- 6 Mississippi sites, 1 positive in the past, confirmed in 2013
- All sites negative for fall 2014 and 2015 sampling
- Spring 2016 3 positives, Fall 2016 1 positive and Spring 2017 2 positives

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Acknowledgements

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