Forest Health Dynamics Laboratory Update

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Forest Health Coop Diagnostic Laboratory Services - Overview

History

Laboratory Sample Analysis

Results

History

Forest Health Cooperative began in 2008

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

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


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Member Reports
Meetings
Publications & Documents
Diagnostics Clinic
Quantifying Pine Decline
Weather Data
Decline Distribution Map
Loblolly Pine Decline Hazard Map Files
Pupal Chamber
Galleries
Forest Health Cooperative | 3301 Forestry and Wildlife Sciences Building
Auburn University, Alabama 36849-5418 | Phone: (334) 844-1012 | E-mail: bowerep@auburn.edu
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Diagnostics Clinic

Members only page – Diagnostics Clinic

Sample collection and submission guide

- Provide an instruction set for collecting “good” samples for laboratory analysis

Tree Diagnostics Form

- Provide a detailed sample/site history to aid in diagnosis accuracy

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FOREST HEALTH COOPERATIVE

Members Only Home

Homepage > Pine Needle Submission

Pine Needle Sample Collection and Submission Guide

Samples are recorded and processed routinely by the date and time in which they are received. All samples will be initially processed within five days of receipt with results available twenty-one days after processing. Some laboratory diagnostic techniques take longer than others, which may affect result punctuality.

Sample Collection

Tree disease diagnosis is largely dependent on the quality of the sample and on the relevant information provided by the submitter. Samples must be of sufficient quality and quantity to allow for proper laboratory testing and pertinent information, such as sample tree identification, is essential.

1. Samples should be collected from symptomatic trees showing thinning/transparent crowns, and foliage discoloration.

2. Samples should NOT be collected from dead trees; determining the casual agent from such trees is highly unlikey.

3. Submit a generous amount of sample material to allow for all required laboratory processes. Remove needles from the branch. Sterilize all tools between trees

4. Keep all samples seperated and cool until ready to be shipped, do not expose collected needles to high temperatures. Place samples in an envelope or paper bag

5. Include the following information: Tree species and age, Recent Silviculture, Location (GPS coordinates), Date of Collection, Stand Prevalence and Severity.

6. Samples may be delivered in person or mailed to the Forest Health Dynamics Laboratory, 602 Duncan Drive, Ste 3301, Auburn University, AL 36849.

7. When submitting samples by mail, either mail them early in the week to avoid weekend layovers or use an overnight service. Send us an email letting us know that you have sent us some samples, include pictures of the damage in the email. Dr. Lori Eckhardt (eckhalg@auburn.edu) and/or Luis Mendez (lmm0081@auburn.edu)

8. Samples should be mailed in an appropriate sized box, with padding, or in a padded envelop. Please write on the outside "Refrigerate Upon Arrival".

9. Complete a "Tree Disease Diagnostic Form" for each sample.

Contact us if you would to like to become part of a study where we would come to your property to collect monthly samples over the course of a year. This will help us in our studies to solve this problem!

Contact: Tina Ciaramitaro, Research Assistant
Phone: (334) 844-1538 Email: tmc0073@auburn.edu

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Tina Ciaramitaro (tmc0073@auburn.edu)
334-844-1538
https://fp.auburn.edu/ForestHealthCooperative/default.htm

Diagnostic 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 Collected: _____ Date Sample Shipped: _____ No. of Samples: _____

Sample Location - County, State: _____ Sample ID: _____

Submitter Information	Results Recipient (If different than submitter)
Name:	
Company:	
Address:	
City/Zip:	
Phone No:	
Fax No:	
Email:	

Tree and Site Information

Select ALL that apply

Tree Species:	___ Loblolly	___ Longleaf	___ Shortleaf	___ Slash	___ Other:	_____
Site Location:	___ Forest	___ Nursery	___ Greenhouse			
Aspect:	___ N ___ NE	___ E ___ SE	___ S ___ SW	___ W ___ NW		
Slope %:	___ 0 - 5%	___ 5 - 10%	___ 10 - 15%	___ > 15%		
Soil Type:	___ Sand	___ Silt	___ Clay	___ Loam		
Age of Planting:	___ 0 - 10	___ 11 - 20	___ 21 - 30	___ 31 - 40	___ > 40	
Foliage Symptoms:	___ Flagging	___ Thin	___ Wilted	___ Yellowed	___ Other:	_____
Root Symptoms:	___ Insect Signs	___ Resinous	___ Rotted	___ Stained	___ Other:	_____
Insect Attack:	___ BTB	___ Hylastes	___ Ips	___ SPB	___ Termites	___ Weevils
Insect Damage:	___ Boles	___ Branches	___ Foliage	___ Roots		
Stand Prevalence:	___ Entire	___ Localized	___ Scattered	___ % Affected		
Severity of Damage:	___ Low	___ Medium	___ High	___ Severe		
Recent Silviculture:	___ Fertilizer	___ Fire	___ Herbicide	___ Insecticide	___ Thin/Harvest	
Problem Description:	_____					

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

Field Consulting

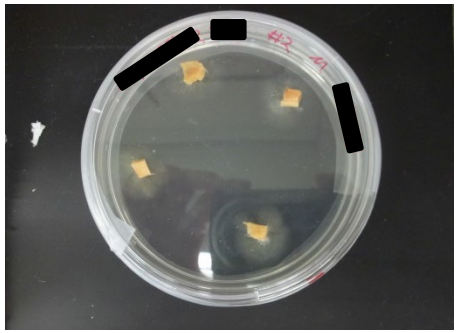
Travel to member's location

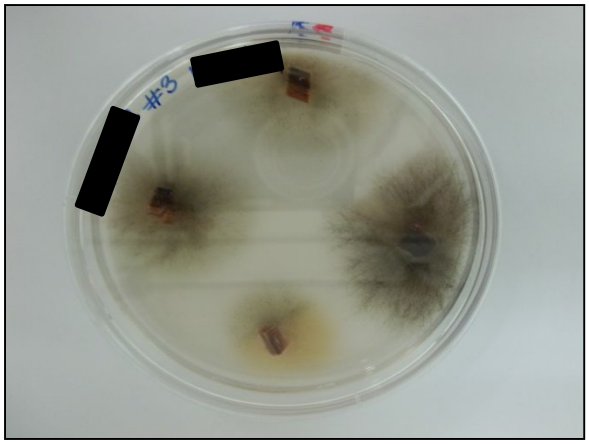
Provide onsite diagnostic information

Collect samples for laboratory analysis

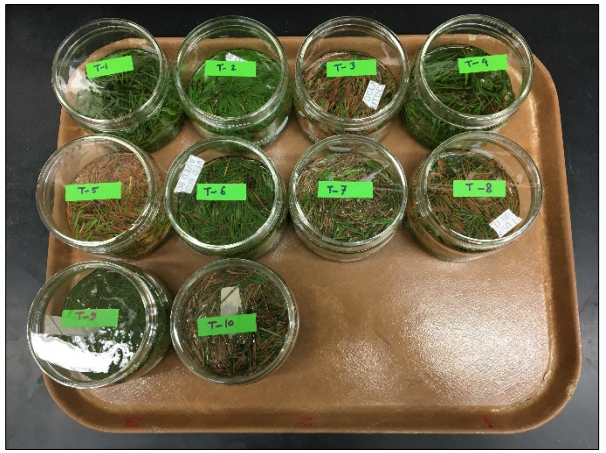
Photos: FHDL

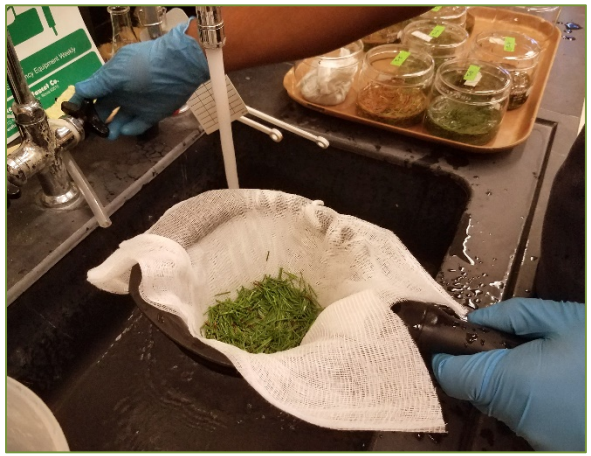
Laboratory Sample Analysis

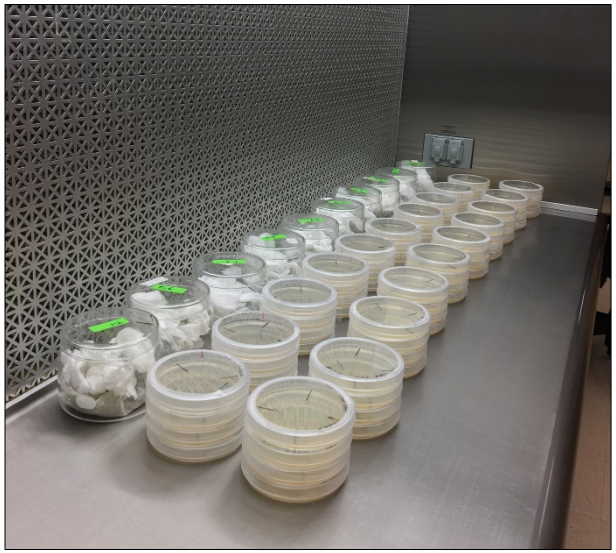




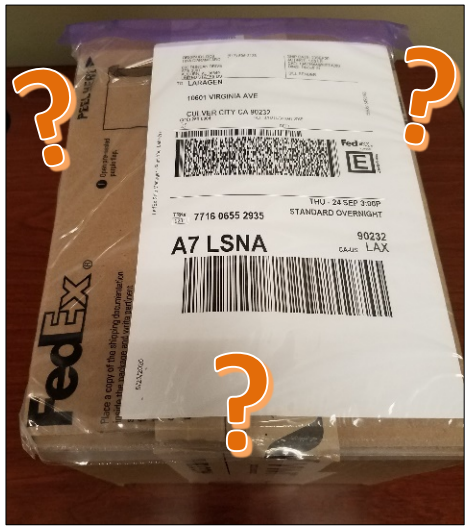
Laboratory Sample Analysis

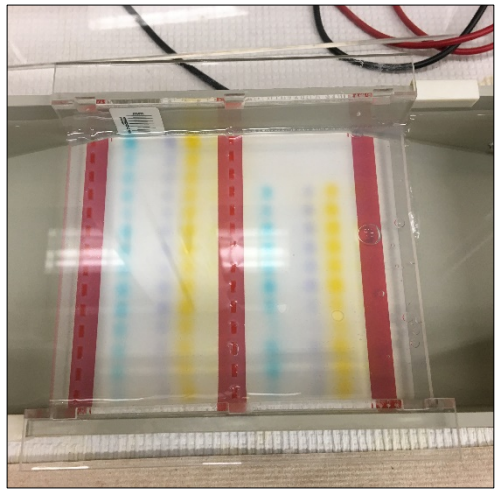


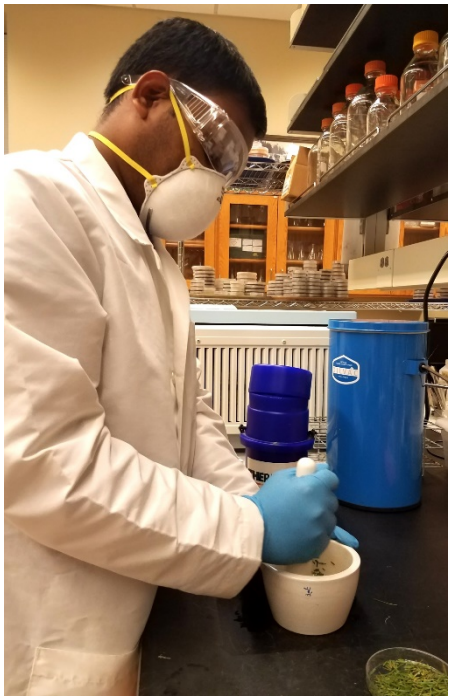


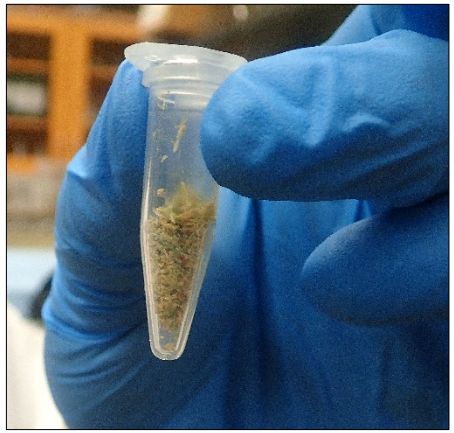


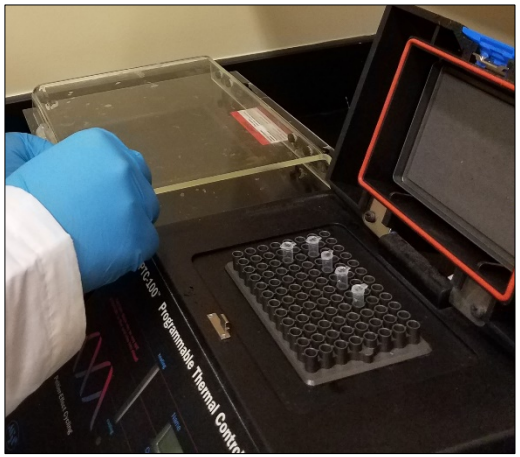
Molecular Analysis











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

Emerging Forest Pests and Sudden Oak Death Review

Tina Ciaramitaro and Dr. Lori Eckhardt

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

2019-2020 pest issues in Alabama

Hemlock woolly adelgid

Pine Tip moth

Pine sawfly

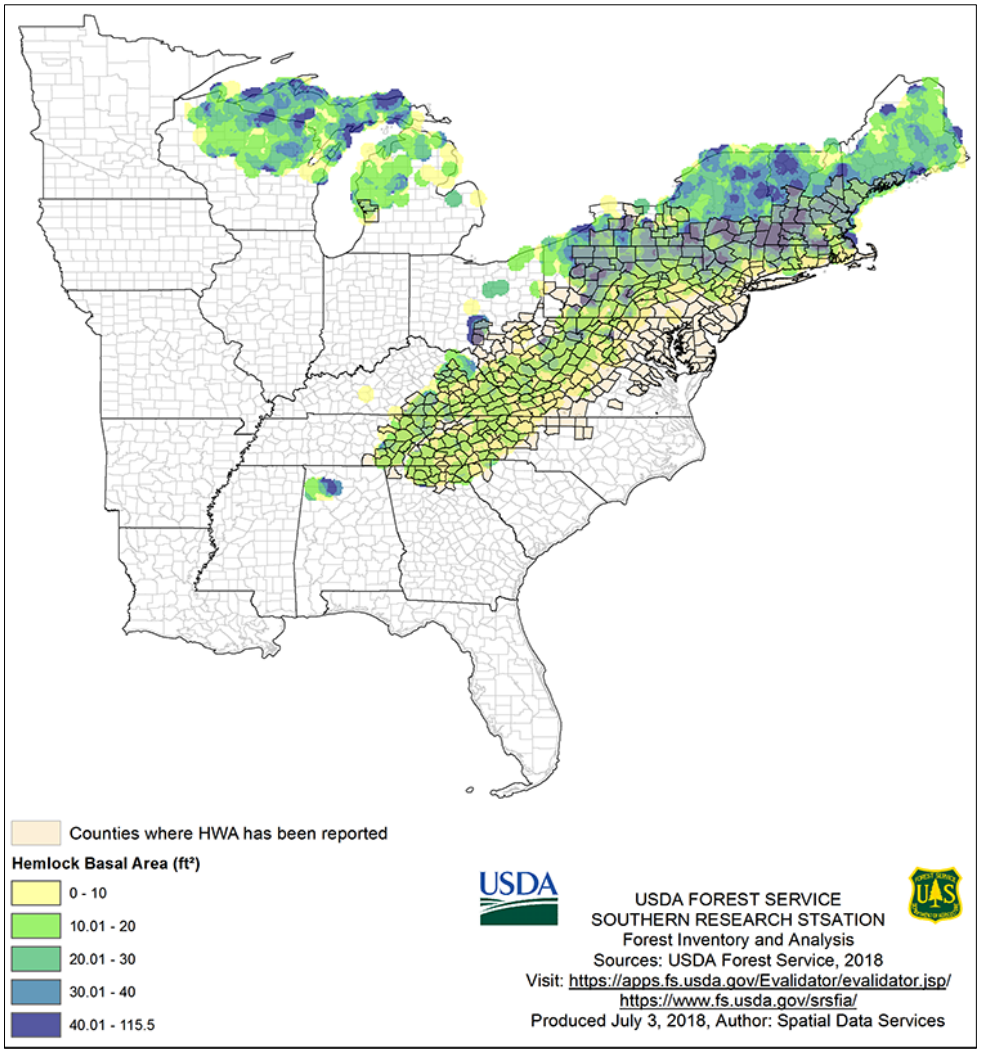
Spotted lanternfly

Pine decline

Needle mortality

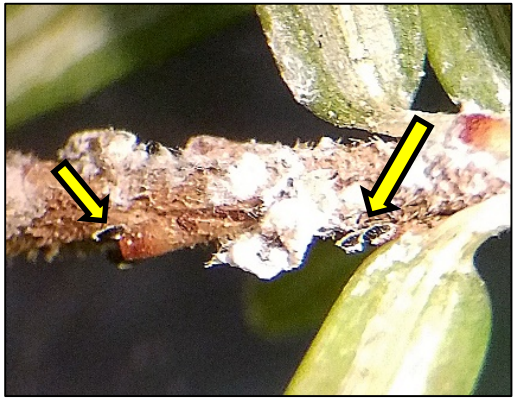
Hemlock Woolly Adelgid

- *Adelges tsugae*
- Native to East Asia
- Found in eastern US in 1951 in Virginia
- Threat to AL: Bankhead National Forest



Hemlock Woolly Adelgid

- Site visit in July 2020 to Mentone, AL – landscape trees
- HWA is related to aphids
- Distinct waxy coating develops for protection
- Young instar nymphs were collected at the site



Photos: FHDL

Pine Tip Moth

Photo: James A. Richmond, USDA Forest Service, Bugwood.org

- *Rhyacionia frustrana*
- Larvae feed on new growth and then bore into shoot
- Washington County, AL
- 100+ acres affected, 2 year old stand

Photo: Darrell Ross, Oregon State University, Bugwood.org

Photo: A. Steven Munson, USDA Forest Service, Bugwood.org

Photo: Eric R. Day, Virginia Polytechnic Institute and State University, Bugwood.org

Pine Sawfly

Photo: Brian Bradley, NRCS Forester

- Redheaded pine sawfly, *Neodiprion lecontei*
- Large outbreak in Lauderdale County, AL in October 2020
- Over 90% of saplings defoliated over 130 acres

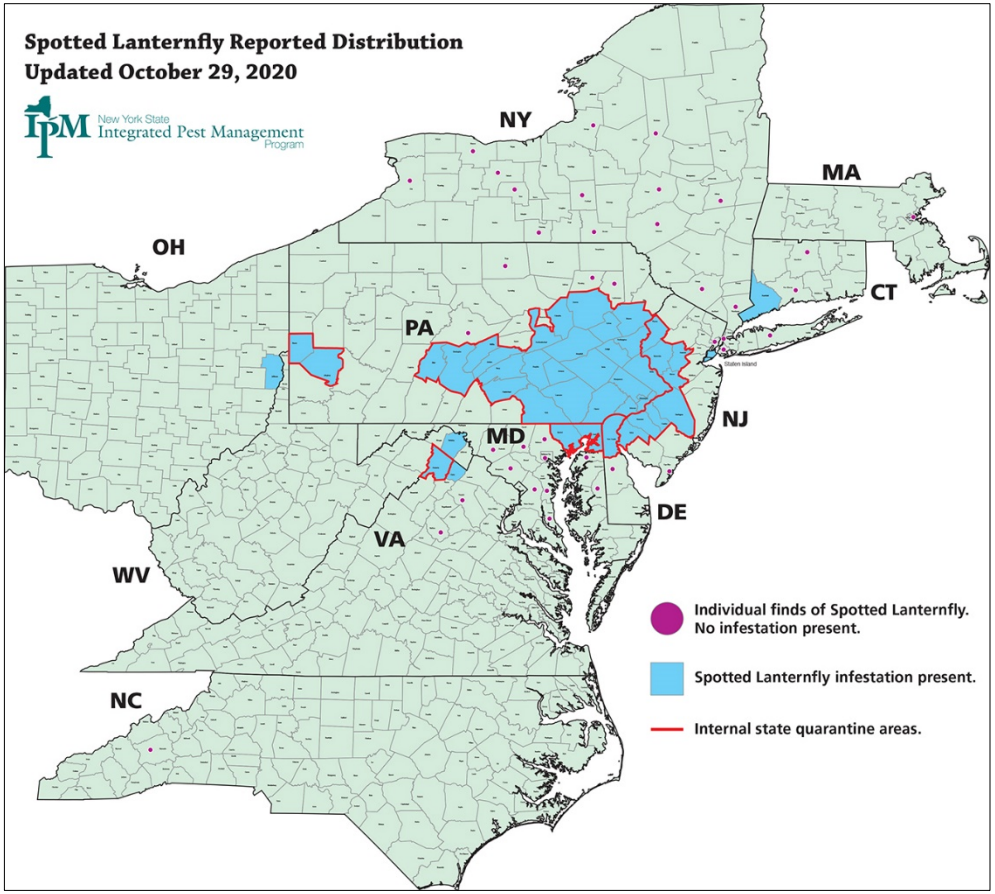
Photo: Brian Bradley, NRCS Forester

Photo: James McGraw, North Carolina State University

Spotted Lanternfly

- *Lycorma delicatula*
- Native to China, India, Vietnam
- Found in Pennsylvania in 2014, has been seen down to North Carolina
- Fruit trees, grapes, hops, black walnut, maples, tulip poplar, and black cherry

Photos: PA Department of Agriculture

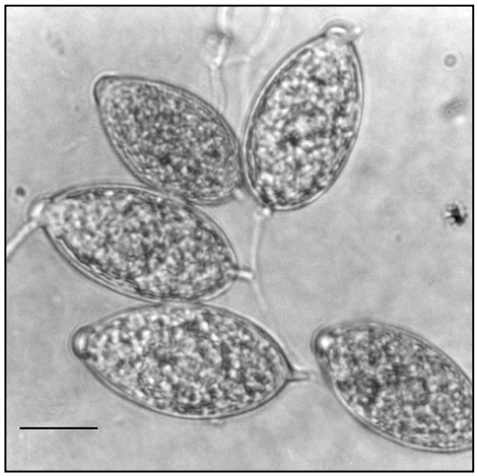


Sudden Oak Death

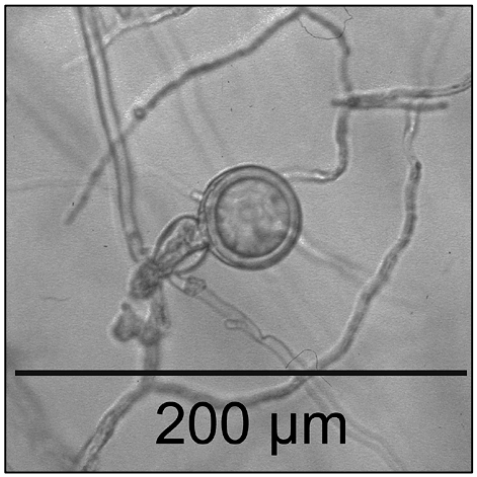
- First reported 1995 coastal region of central California with *Phytophthora ramorum* positively linked to the disease in 2001
- Fungus-like water mold (Oomycete)
- Spreads aerially and aquatically
- Pathogen has a wide host range
- Three expressions of the disease

Phytophthora ramorum

Chlamydospores



Sporangia



Oospore

- *P. ramorum* thrives in wet conditions
- Chlamydospores can persist in soil and leaf litter
- Sporangia contain flagellated zoospores
- Oospores are resistant to damage

Source: Steve Oak - USDA Forest Service Forest Health Protection

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

SOD Risk Map

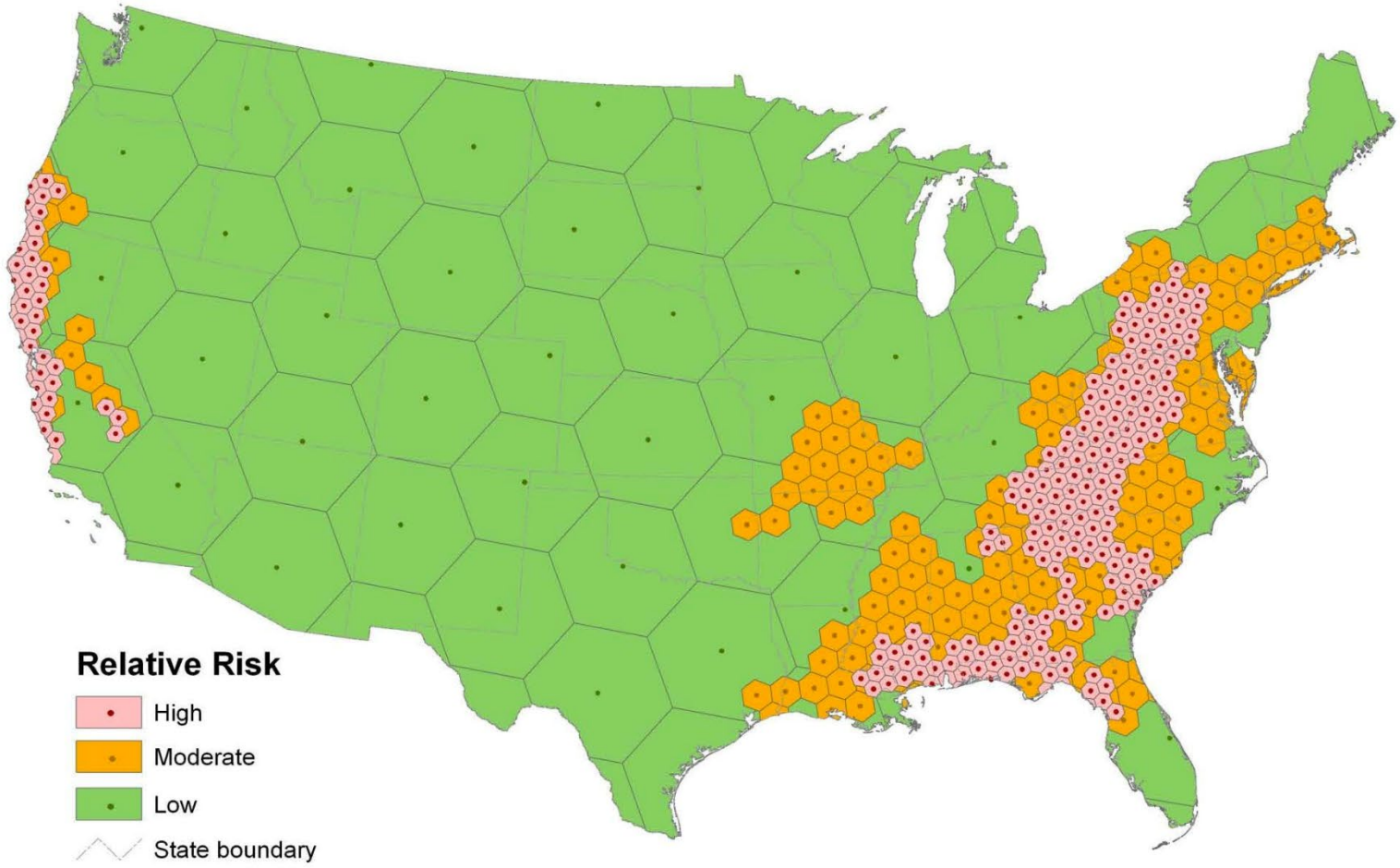
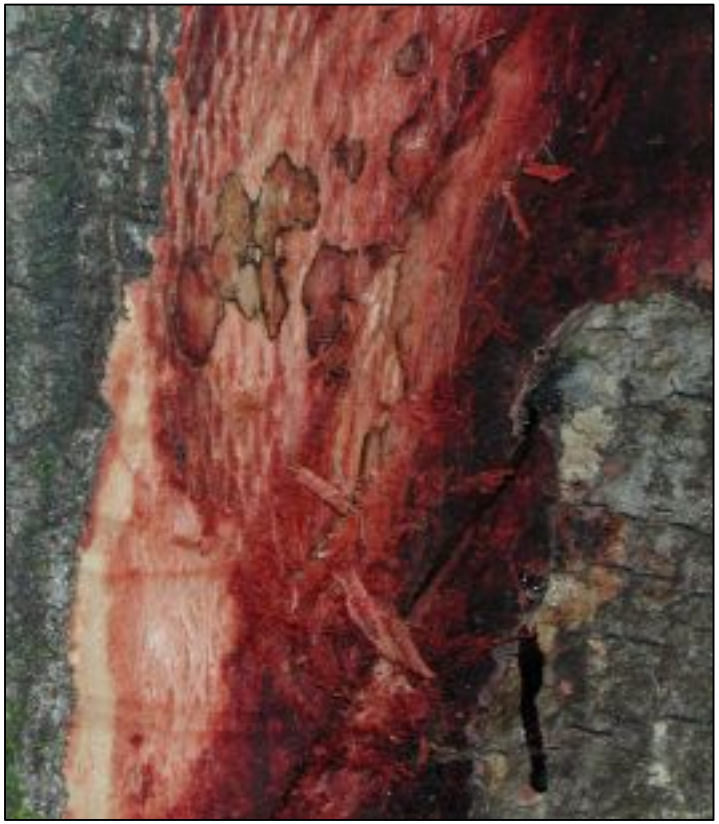


Figure 7.7 – New national risk map for sudden oak death (*Phytophthora ramorum*). State boundaries are included for reference.

Phytophthora ramorum symptoms



Source: Steve Oak - USDA Forest Service FHP

Field Sampling

- Six sampling periods per year
- Optimum water temperature is 10-22°C
- Bottle of Bait method: rhododendron leaves and pieces are incubated in bottles of nursery runoff water

Photos: FHDL

Field Sampling

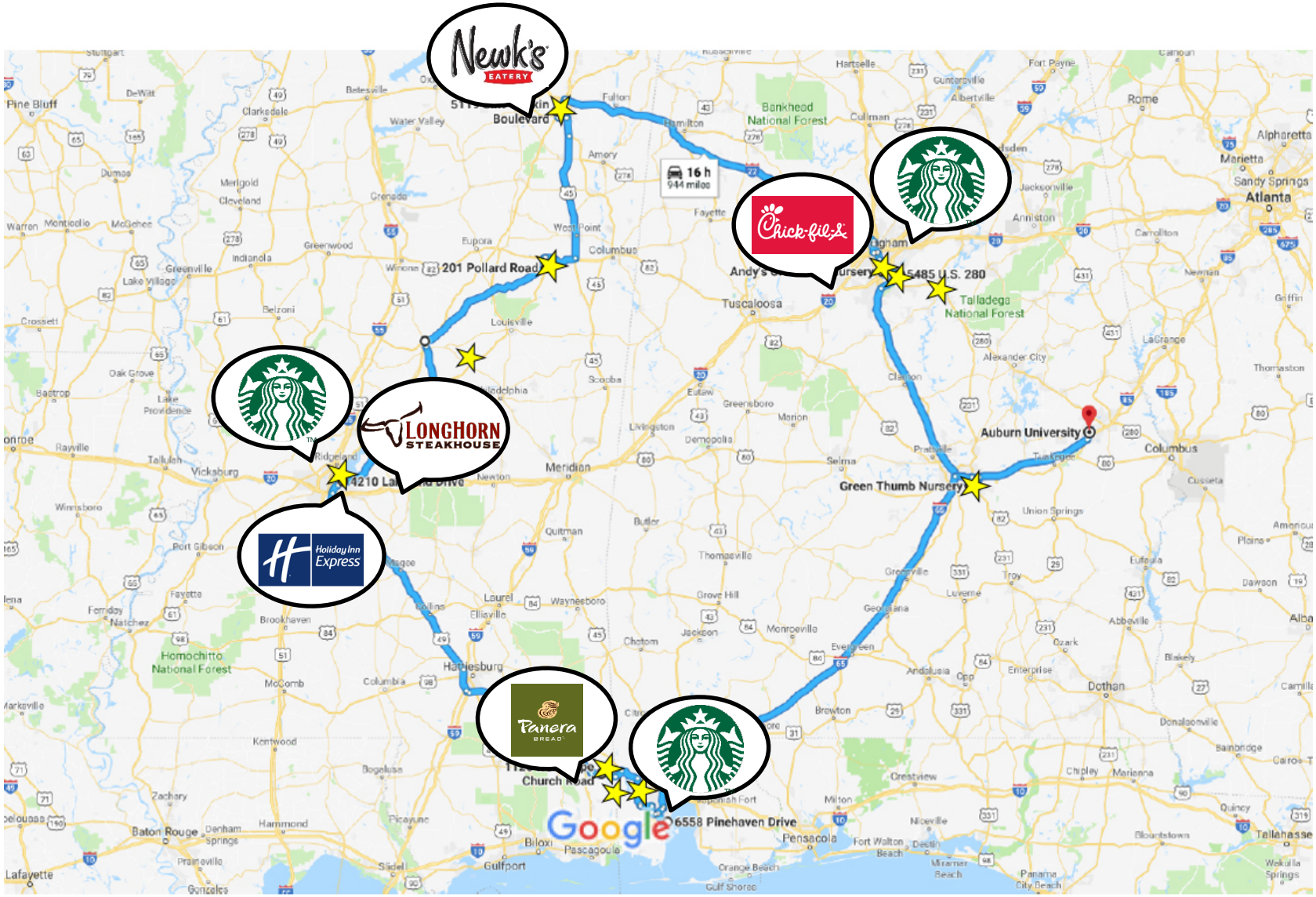
Photos: FHDL

Field Sampling

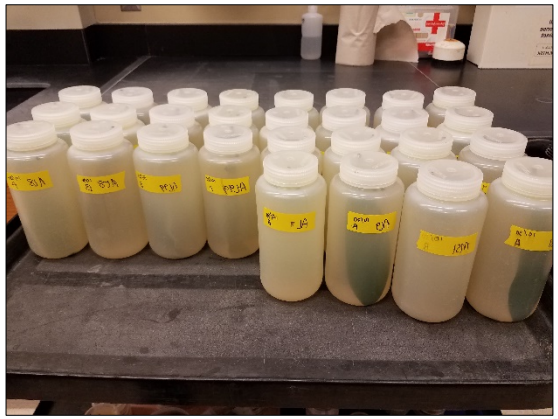
Photos: FHDL

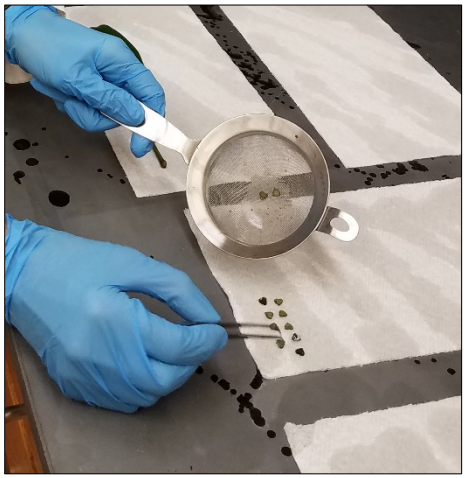
April 23, 2020

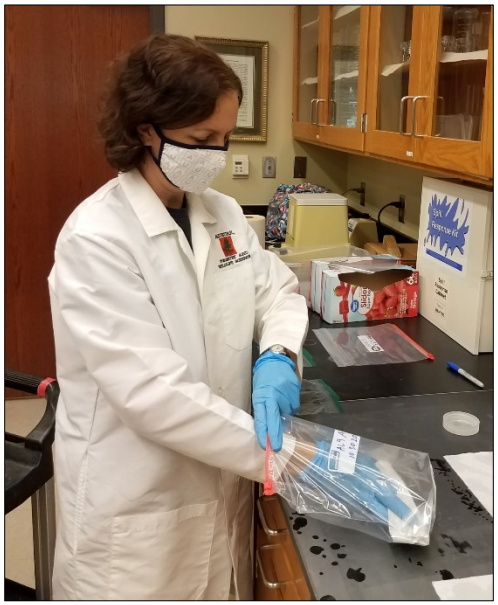
May 7, 2020


Newk's EATERY
Boulevard
16 h
944 miles
Chick-fil-A
201 Pollard Road
485 U.S. 280
Talladega National Forest
Auburn University
Green Thumb Nursery
LONGHORN STEAKHOUSE
4210 La
Holiday Inn Express
Panera BREAD
Church Road
6558 Pinehaven Drive
Google
Map data ©2018 Google, INEGI
20 mi

Lab processing



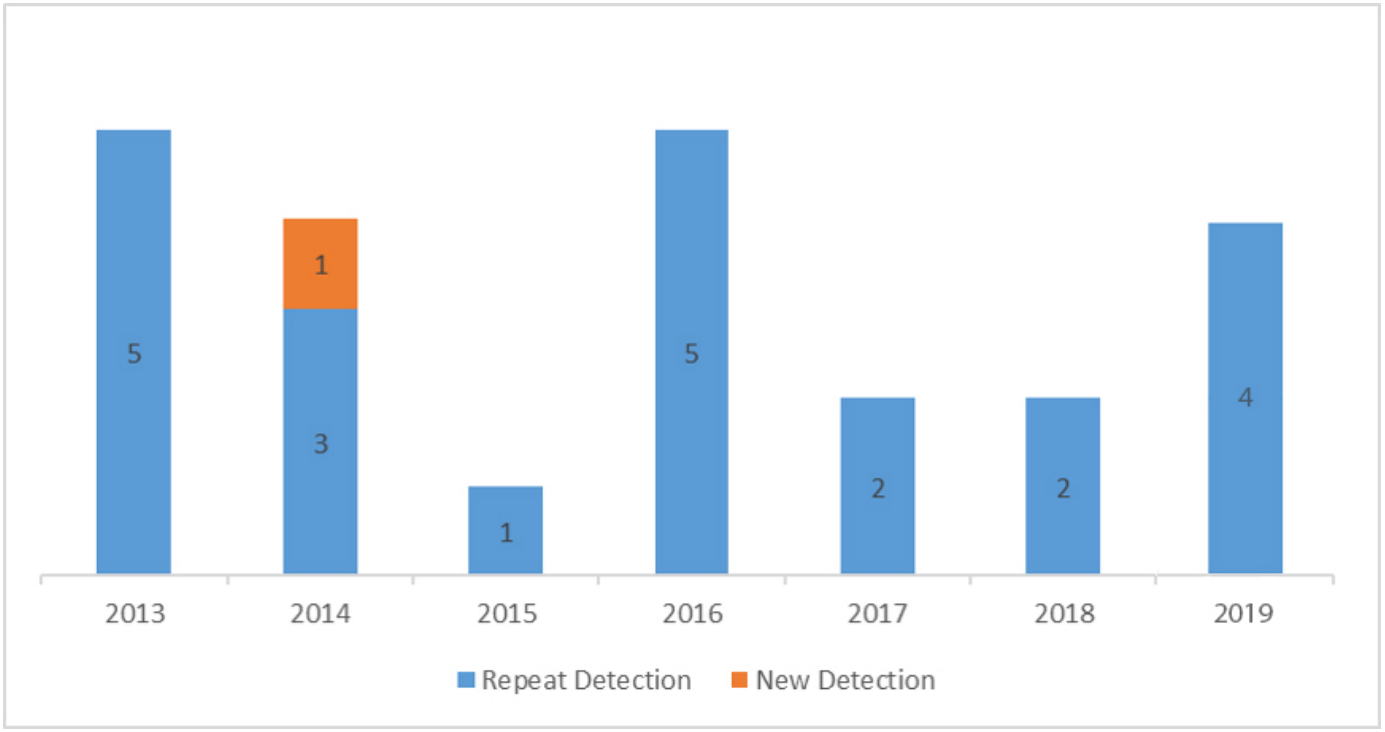




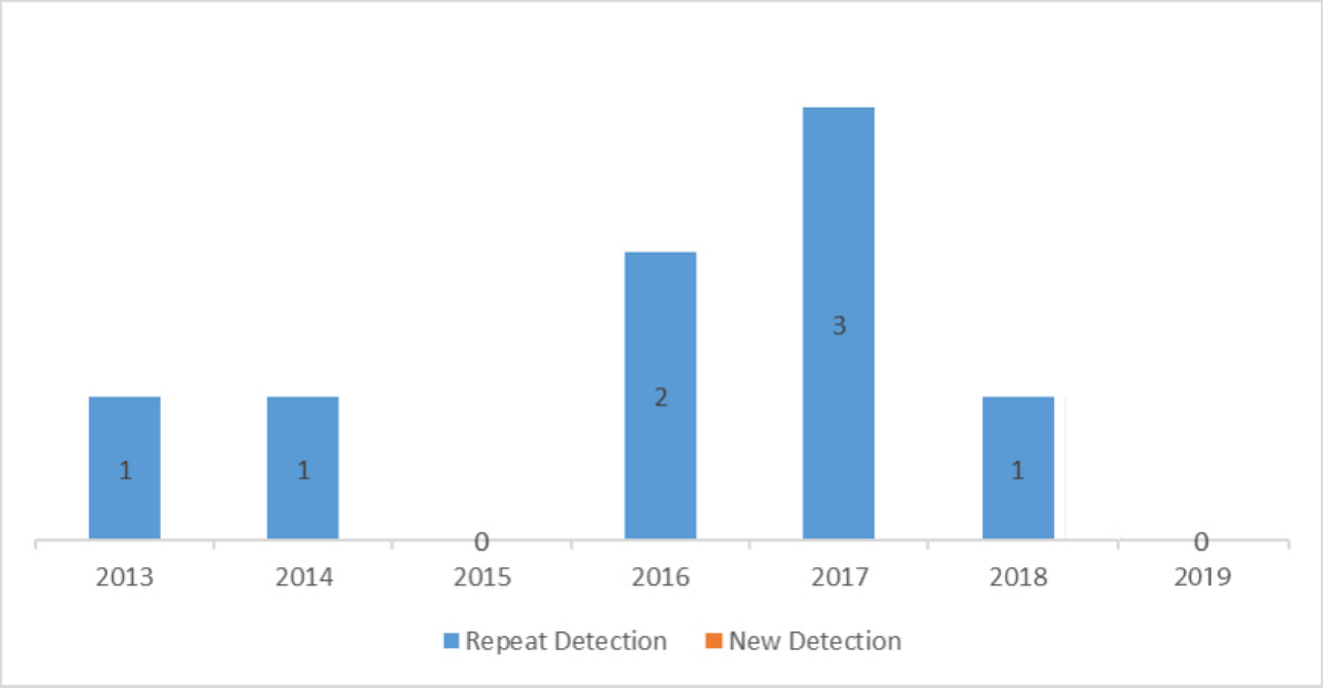
PennState

Photos: FHDL

Bottle of Bait Survey
P. ramorum Detection by Year in Alabama



Bottle of Bait Survey
P. ramorum Detection by Year in Mississippi



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