Forest Health Cooperative

Auburn University

Spring Newsletter 2026

Director's Report

It has been a few months since our last meeting, and I hope everyone had a good holiday season and are ready for a productive new year!

The FY26 Annual Meeting was held November 4-5, 2025 in conjunction with the Brown Spot Needle Blight Assessment Workshop at the Forestry & Wildlife Building. It was attended by all members as well as State and Federal Forest Health Specialist from Alabama, Mississippi, Louisiana, and Arkansas. It was a very comprehensive meeting with presentations on all aspects of the Mitigating Brown Spot Needle Blight project which was funded at just over 2 million and includes multiple PIs, graduate and undergraduate students.

I was very excited to be recently informed that the federal appropriations process that was considered a lost cause for FY26 has moved forward. Congress managed to reach a final agreement on the three of the FY26 funding bills and the legislation included $1 million for our needle blight mitigation research initiative through the USFS. The U.S. House and Senate passed the appropriations package, and it was signed into law by the President.

We would like to welcome our new member PRT. Pat and I will continue to work toward increasing membership throughout the year

Graduate and Undergraduate Students

Students continue to be hard at work in the Forest Health Dynamics Lab as our projects continue to progress, with focus on Brown Spot Needle Blight, Sudden Oak Death, and the Sentinel Garden. We welcomed five new undergraduate student workers and said goodbye to three graduating students – congratulations Gracey, Alexandra, and Emmanuel! As the lab continues to grow and change, we stay dedicated to the foundations of research and data collection. We hope to see more students grow and learn with us as we make our way through the new year. Listed below are the new undergraduate workers with the FHDL:

Mary Grace Hunt – Conservation and Management

Ella Struck – Conservation and Management

Lexi Bozarth – Wildlife Ecology and Management

Aspen Mayhew – Wildlife Sciences, Pre-Vet

Jacob Podemski – Forestry

The next Brown Spot Needle Blight workshop and FY27 Forest Health Cooperative meeting is set to be held July 14-15th, and information on the location and times will be sent out in advance.

Please reach out if you have any questions about upcoming meetings or diagnostics!

What's Inside?

Student Research Reports

Susceptibility of *Pinus taeda* families to *L. acicola* —

Emmanuel Nyarko- M.S. Student

My work on the Brown Spot needle Blight project began in January 2023. Brown spot needle blight is a foliar disease that affects loblolly pines. It is characterized by small, necrotic spots on the needles that expand into brown lesions surrounded by a yellowish halo, often culminating in defoliation when conditions are favorable. Loblolly pine (*Pinus taeda* L.) is the most abundant pine found in the southeast U.S. It is of a high economic value, however in recent years, it has been threatened by brown spot needle blight disease, thereby impacting the region's forest economy. In this study morphological and molecular techniques were used to identify co-occurring foliar pathogens with *Lecanosticta acicola*, the causative pathogen of the disease. Twenty-one different fungi genera were recovered from these methods of which *Pestalotiopsis*, *Cladosporium*, *Hendersonia*, and *Trichoderma* were found to be the predominant fungi associated with *L. acicola*.

The study further tested the susceptibility of seventeen different loblolly pine families to *L. acicola.* We ranked all the families based on growth parameters such as mean height, disease rating root collar diameter and relative water content, after exposure to the inoculum source. Families F13, F14, F8 were the top three best performing families.

We also assessed seedling susceptibility using open-top chambers as a more controlled environment. The treatments used were: (1) chambers with infected pine needles as inoculum source, (2) chambers with healthy pine needles and (3) bare ground chambers.

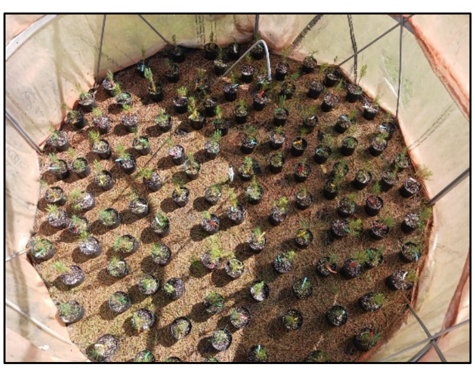

Figure 1. Seedlings in an open top chamber.

We found that the seedlings in the infected chambers showed higher disease expression than the ones in the control chambers. There was no significant difference in disease rating within the two control treatment groups. No difference in relative water content regardless of the treatment chamber used.

Finally, we investigated how spore traps could be used to assess L. acicola spore loads in BSNB-infected plots. We found that climatic variables such as rainfall, relative humidity and temperature affected spore release throughout the sampling period, with rainfall having the best association with spore release.

Figure 2. Image of a spore trap in the field (Osko Forest).

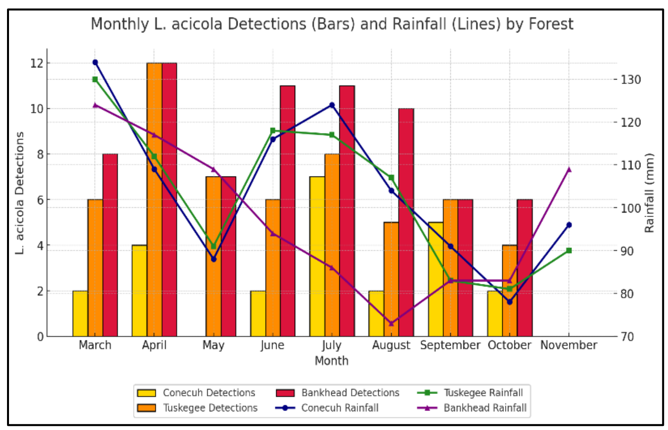

Figure 3. Chart showing L. acicola spore detection by plots.

I would like to express my profound gratitude to Dr. Lori Eckhardt (my advisor), my committee members: Dr. Rabiu Olatinwo, Dr. Brian Via and Dr. Annakay Abraham, The Forest Health Cooperative, U.S. Forest Service Regions Bank, Auburn University, FHDL Members, Kris Bradley, Dr. Glenn Glover & Family (Osko Forest), The Williams Family, Stallworth Land Company, Longleaf Land & Timber Company.

Monitoring Brown Spot Needle Blight impact on Loblolly Pine Across Alabama —

Jaden King- Ph.D. Candidate

2025 was the last year of monitoring brown spot needle blight plots across Alabama, with monitoring starting in January 2023 and ending in December 2025. Disease over the three years stayed relatively consistent among trees. Most trees maintained the same disease rating, but some did get more disease. We did not see any trees getting healthier over the years. Defoliation was higher in highly diseased trees with some severely diseased trees dropping current year needles leaving only a few needles at the tips of the branches.

Height and diameter at breast height (DBH) were measured annually to understand growth changes over time. From the growth data, we saw that most trees grew in height, whereas DBH growth was minimal for most. From our data, we did see growth differences between less and more diseased trees. Disease affected height growth, with less diseased trees growing taller each year compared to more diseased trees. Less diseased trees grew an average of 2.5 feet each year, and more diseased trees grew an average of 1.5 feet each year. For DBH, severely diseased trees grew less than all other trees. Severely diseased trees grew about 0.05 inches per year, and all other trees grew between 0.1 and 0.17 inches per year.

Physiology data collection was just completed in December 2025. Analysis still needs to be completed, but preliminary data from the resin collection, which was done at DBH on the bole of the tree each year in June, suggest that disease may have little impact on how much resin came out of the trees during sampling and was more influenced by tree size. Smaller trees released less resin than larger trees. Future research could investigate the chemical composition of the tree resin and the resin ducts within the needles. Water stress preliminary results are showing more seasonal differences than from disease. Needle anatomy is continuing to be looked into, with samples coming from the brown spot monitoring plots and additional trees outside of those plots. Measurements include surface and cuticle traits using a scanning electron microscope and stomata traits with a chemical wash to view just the epidermal layer of the needle for microscopy measurements.

For the pine straw monitoring, analysis is complete, and the important question answered by this study was that *Lecanosticta acicola* sporulated 52 weeks after needles were removed from the tree. Needles were removed from 3 trees in November 2023 and an additional 3 trees in March 2024. Once removed, needles were transported back to an outdoor chamber in Auburn for weekly monitoring for 52 weeks after removal from the tree. Each week of monitoring, 5 needles from each tree were set in sporulation chambers, and *L. acicola* was assessed by morphological identification. This study helped us understand the inoculum load of the diseased pine needles that fall from the tree to the forest floor. Over the 52 weeks, the likelihood of sporulation decreased as time since removal increased, but needles were still sporulating at the end of the year.

There was a rise in sporulation in late May, which was around week 30 for needles sampled in November and week 15 for needles sampled in March. Needles that were collected in the fall and needles collected in the spring followed the same general trend of sporulation probability declining across the 52 weeks, with spring collected needles being more variable across the weeks (Fig. 1). Future research could expand this idea to look at how high from the pine straw on the floor do needles get infected or how weather or management effect sporulation such as a long drought period or prescribed burns.

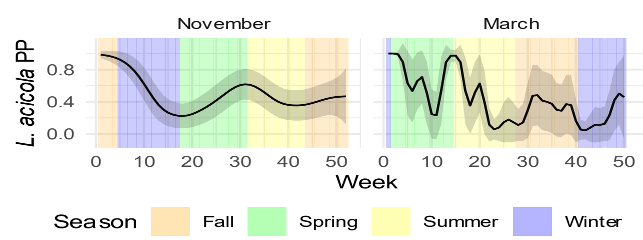

Figure 4. *Lecanosticta acicola* (*L. acicola*) predicted probability (PP) of sporulation each week for a total of 52 weeks after removal from the tree. The November graph is for needles removed in November 2023 and the March the needles were removed in March 2024. The color represents the season during the monitoring.

Evaluating a portable NIR-based model to detect susceptibility in loblolly pine trees affected by BSNB —

Laura Nieto- Research Assistant

I am Laura Nieto, a Research Assistant in the Forest Health Dynamics Laboratory, working with Dr. Lori Eckhardt and collaborators Dr. Brian Via and Dr. Iris Vega. My research focuses on the use of near-infrared (NIR) spectroscopy model to detect the response of pine needles infected with BSNB.

In 2025, a previously calibrated portable NIR model has been used to collect and scan pine needles from 120 trees in Sylacauga, and 30 trees across 6 plots located in Pineville and surrounding areas, bringing the total to 630 trees scanned. The model was run to predict the lignin content using NIR scans collected and lignin (Figure 5) was determined in the lab from a subset of selected pine needles samples for comparison with the predicted lignin content. with predicted lignin content. Preliminary results demonstrated reasonable level of agreement between NIR predictions and lab measurements, suggesting the model is progressing in the right direction and providing a solid basis for further refinement.

The next step consists of connecting the indirect chemical response (NIR predictions) to disease progression. Ongoing experiments are being conducted to obtain the required additional data. The approach involves detecting and quantifying a toxin produced by *Lecanosticta acicola*. Based on previous studies by other authors, infected pine needles should present this toxin. Preliminary high-performance liquid chromatography (HPLC) results from one extracted and analyzed pine needle sample (Figure 5) showed a similar chromatographic profile to that of the pure toxin reference (Figure 6).

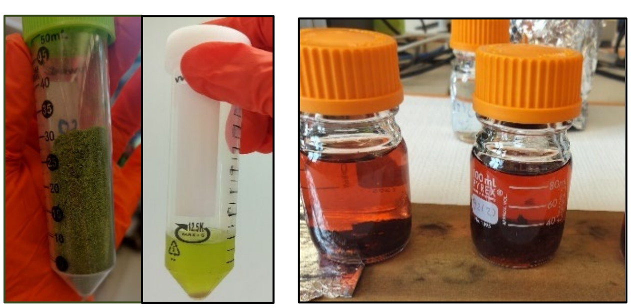

Figure 5. Extracted pine needle sample (left) and lignin (right) from pine needles

In the coming year, the HPLC method for extracting fungal toxin is expected to be optimized mainly by working in two techniques: column chromatography and thin layer chromatography (TLC) (Figure 6). Results obtained are expected to contribute to understanding how the chemical response predicted by the model directly relates to the disease.

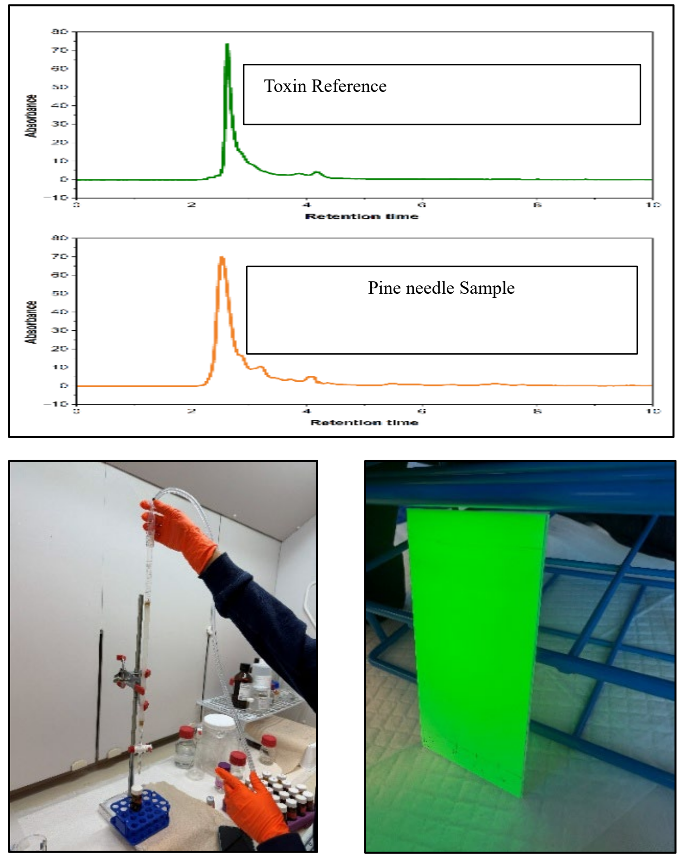

Figure 6. HPLC results (top), column chromatography (bottom left), and TLC (bottom right)

Remote Sensing–Based Detection of Brown Spot Needle Blight: Research Overview —

Swati Swingh- Ph.D. Candidate

Brown Spot Needle Blight (BSNB), caused by *Lecanosticta acicola*, is an increasing threat to loblolly pine (Pinus taeda) forests in the southeastern United States. Although remote sensing has been widely applied to detect and monitor other foliar pine needle diseases, including *Dothistroma* Needle Blight (DNB) and vascular Pine Wilt Disease (PWD), a review of the literature indicates that remote sensing applications for BSNB remain limited. Existing BSNB studies primarily emphasize disease biology and epidemiology, with limited investigation of spatially explicit detection and severity mapping approaches (Singh et al., 2025a). High-resolution unmanned aerial vehicle (UAV)-based multispectral approaches for BSNB detection at tree and stand scales have received limited investigation (Singh et al., 2025b).

To address this gap, a UAV-based multispectral study was conducted in managed loblolly pine stands in Cullman and Washington counties, Alabama. Multispectral imagery was acquired using a DJI Mavic 3M UAV (green, red, red-edge, and near-infrared bands). Vegetation indices that are sensitive to canopy conditions, including the Normalized Difference Vegetation Index (NDVI), Soil-Adjusted Vegetation Index (SAVI), Normalized Difference Red-Edge Index (NDRE), and Green Normalized Difference Vegetation Index (GNDVI), were derived following soil and background masking. Machine-learning classification using Support Vector Machine (SVM) and Artificial Neural Network (ANN) algorithms were applied to map BSNB severity. The UAV-based multispectral sensor enabled acquisition of high-spatial-resolution spectral data sufficient to resolve crown-level variation in visible, red-edge, and near-infrared reflectance associated with BSNB severity.

The Support Vector Machine (SVM) model produced the highest classification performance, with an overall accuracy of approximately 92.5% and a Kappa coefficient of 0.89. Structure-from-Motion (SfM) point clouds supported individual-tree detection and enabled characterization of tree-level BSNB spatial patterns within the study plots. Figure 1 presents true-color (RGB) UAV imagery alongside the SVM-classified BSNB severity map, demonstrating the conversion of multispectral imagery into spatially explicit disease information.

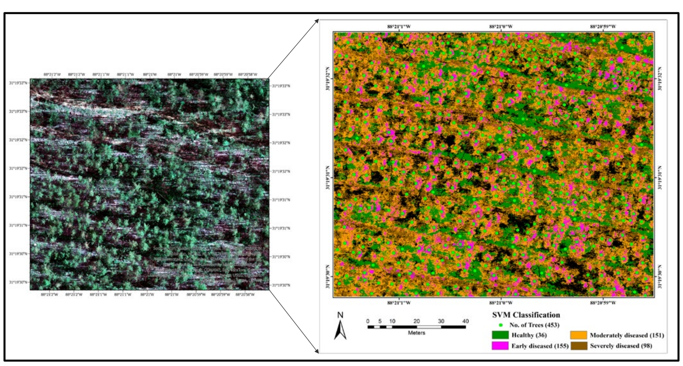

Figure 7. UAV imagery (left) and Support Vector Machine–classified Brown Spot Needle Blight (BSNB) severity map (right), derived from multispectral UAV data and showing the spatial distribution of healthy, early, moderate, and severe infection classes.

Unraveling the brown spot needle blight disease: genomic evidence for multiple-pathogen involvement and diversity across scales —

Temitope Ruth Folorunso – Ph.D. candidate; Gabriel Silva – Ph.D. candidate

We recently published a comprehensive review synthesizing current knowledge on brown spot needle blight, with particular emphasis on emerging outbreaks in North America. Although brown spot needle blight has long been recognized as a global pine disease, recent large-scale impacts on native loblolly and eastern white pine underscore new challenges for forest management within the pathogen's presumed native range. The review integrates what is known about pathogen biology, detection and monitoring tools, environmental drivers, and management options, while identifying critical gaps that limit our ability to predict spread and implement durable control strategies (Silva et al., 2026). We highlighted the need to move beyond single-pathogen perspectives toward approaches that capture the broader biological complexity of the disease.

One important feature of brown spot needle blight disease is that it is best understood as a disease complex, rather than a problem caused by a single pathogen. Addressing brown spot needle blight therefore requires characterizing the full fungal community associated with symptomatic needles. This includes the primary pathogen, *Lecanosticta acicola*, as well as co-occurring taxa such as *Sydowia polyspora* and *Diplodia sapinea*, various *Rhizosphaera* and *Dothistroma* species, endophytes, and opportunistic pathogens. To reliably characterize these fungal communities, we developed and validated a standardized workflow that integrates needle plating, fungal culturing, and DNA extraction. Symptomatic pine needles were surface sterilized, plated on multiple culture media, and monitored for fungal growth and morphology, allowing consistent recovery of Lecanosticta acicola alongside co-occurring pathogens and endophytes. We then quantitatively evaluated how culture conditions influenced fungal biomass production and downstream DNA quality, identifying Sabouraud dextrose media as the most reliable for generating sufficient mycelial growth. Building on this, we compared multiple DNA extraction approaches and demonstrated that a modified

CTAB-PVP (cetyltrimethylammonium bromide protocol incorporating polyvinylpyrrolidone) consistently produced high-molecular-weight DNA with minimal contamination, suitable for molecular and genomic analyses. This workflow, and additional Sanger sequencing, consistently recovered both common endophytes (e.g., *Cladosporium* spp.) and important opportunistic or pathogenic taxa including *Sydowia polyspora*, *Rhizosphaera* spp., *Dothistroma* spp., and *Diplodia sapinea* from infected loblolly needle samples (Folorunso et al., 2025). By enabling reliable recovery of diverse brown spot needle blight-associated fungi and high-quality DNA across isolates, this improves comparisons across sites and hosts and supports additional downstream molecular analyses.

Expanding on these culture-based identifications and incorporating whole genome sequencing data, we examined how brown spot needle blight-associated fungal community composition varied across loblolly disease severity classes. As part of this work, we also conducted targeted benchmarking analyses to evaluate how sequencing effort and genome characteristics influence fungal genome assembly and downstream inference, helping ensure that observed patterns reflect biological differences rather than data-processing artifacts. Ultimately, we found that at low disease severity, communities were dominated by plant pathogens and saprotrophs, whereas at higher severity levels plant pathogens remained dominant and endophytes increased in relative importance as saprotrophs declined (Figure 8). In addition, species richness increased with disease severity, with the highest richness observed in southern Alabama sites compared to northern Alabama sites. Functional trait analyses indicated that plant pathogens consistently represented the largest functional group across all severity classes, followed by endophytes and a moderate contribution from saprotrophs. Yeasts and zygomycetes occurred at lower relative abundances, and despite changes in richness and relative proportions, overall functional composition remained broadly similar across disease categories (Figure 8). These results suggest that brown spot needle blight disease severity captures more than symptom intensity, reflecting underlying differences in fungal community complexity that may influence disease progression and recovery potential.

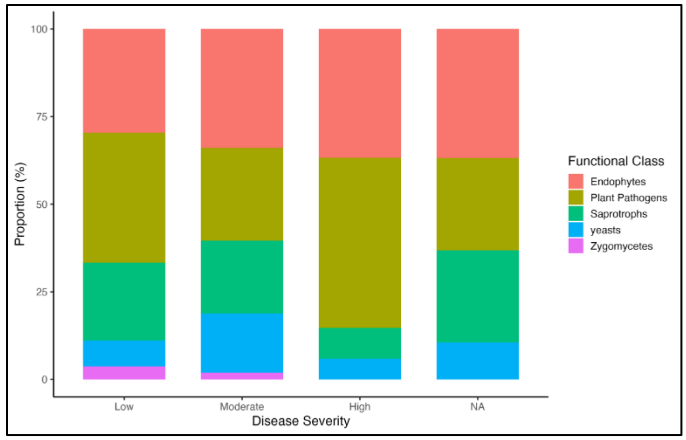

Figure 8. Functional composition of BSNB-associated fungal communities across disease severity classes.

Stacked bar plots show the proportional representation of functional groups across disease severity categories. Plant pathogens dominate all severity classes, with endophytes increasing in relative abundance and saprotrophs declining at higher disease severity. Yeasts and zygomycetes occur at consistently low proportions. Although relative abundances shift with disease severity, overall functional composition remains broadly similar across categories.

Detecting Biological Invasions with Sentinel Plantings in Alabama —

William Heaster – Undergraduate Student; Jacob Podemski – Undergraduate Student

In a world where products and consumer goods are constantly being transported from other countries into America it is extremely important that we remain aware of what else could be coming on those ships. The shipping industry is capable of introducing various pests and disease that could affect our forests. Based on a study conducted in

Figure 9. FHDL student applying herbicide to the Sentinel Garden planting area

Tacoma, Washington, the Sentinel Garden project aims to provide detection and monitoring for invasive species arriving via different shipping modalities. Secondarily, the project seeks to incorporate outdoor education and community learning through the monitoring of the garden, for the purpose of determining the immediate and long-term impact of early detection. Our project builds on the success of the Port of Tacoma garden, which boasts active volunteers and Citizen Scientists, by allowing Sentinel Gardens to be more accessible to the public and present an experience similar to that of a botanical garden to visitors.

The Sentinel Garden project consists of three planting sites: the decommissioned Brookley Airforce Base, which will be the site of the new Brookley by the Bay park in Mobile, directly outside the Port of Mobile, and the Jules Collins Smith Museum of Fine Arts in Auburn. The gardens will be used for outdoor education purposes, such as 4H, Scouts, and field trips, as well as training grounds for volunteers who are interested in participating in the project.

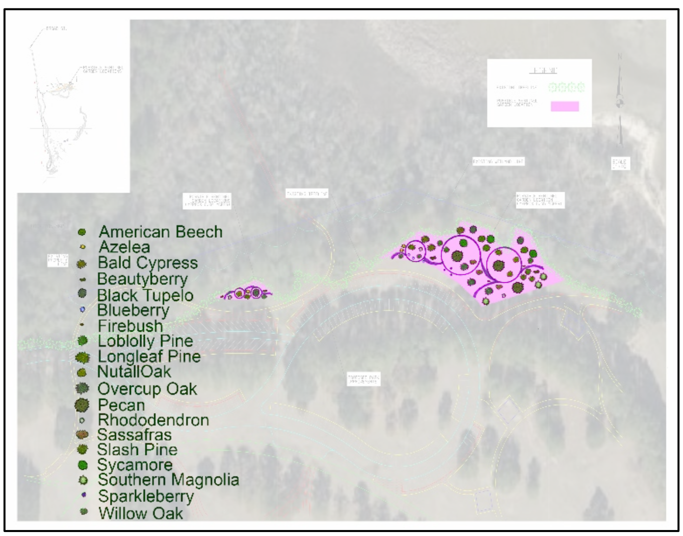

Figure 10. The planting and pathway markup for the Brookley Sentinel Garden

To achieve community interaction, we are creating one-page fact sheets for each tree and shrub species. These sheets will provide information about the plants and will be accessible through QR codes displayed on signs in front of each planting. Through this effort, we hope to help visitors learn more about the plants they encounter while visiting the Sentinel Gardens or walking through their neighborhoods. To support our objective of consistent monitoring and reporting, we reached out to local groups in the Mobile area to provide volunteer hours. Volunteers, or Citizen Scientists, will be trained and given resources to detect pests and pathogens that may attack the sentinel plants. After reporting, samples will be sent to the Forest Health Dynamics Lab for further testing and diagnostics.

Progress has been made at two of the three sites those being the Brookley Air Force site and the Jules Collins Smith Museum site. At the Brookley Air Force site, we have marked out the entire area that we will be working with and laid out the paths for the plants to go around. We have also sprayed herbicide to clear the grass for the planting, and we have drilled all the holes for each of the plants. The Jules Collins Smith Museum site is not far behind, we have marked the area and the paths, sprayed herbicide, and marked where the holes will be. We will be drilling the holes soon and then in mid-January we can start the planting. We have not been able to do any work at the site outside of the Port of Mobile because they are currently doing construction in that area and we must wait until they are finished to begin work. It is estimated that we will be able to break ground around January of 2026.

Figure 11. FHDL students studying a Sentinel Garden pathway map.

Using Spore Traps to Measure *Lecanosticta acicola* Dispersal —

Joseph Anglin- Undergraduate Student

My study is about how weather, time of the year, and control burns affect *Lecanosticta acicola* spore loads through the use of spore traps. The study is conducted in Osko Forest, Cullman, Alabama, focusing on Loblolly Pine (*Pinus taeda*) plantations. Twenty spore traps were initially set up in late February and reinstalled after some prescribed fire management in April. Five traps are placed in unburned areas and fifteen traps are placed in burned areas to study spore dispersal in managed versus unmanaged forests. The traps (pictured above) use a motor that spins two microscope slides that uses a small amount of petroleum jelly as a medium to catch spores. Preliminary observation of the data show peaks in late May to early June which line up with other methods of brown spot detection conducted by the lab.

Figure 12. An example of spore traps used by the FHDL

Diagnostics Lab Updates

***Phytophthora ramorum* and the Forest Health Cooperative – Sudden Oak Death (SOD) State Laboratory**

Phytophthora ramorum is an oomycete plant pathogen, often referred to as a water mold, that causes Sudden Oak Death. The disease kills oaks and tanoak, expressed as a bleeding canker, and causes leaf blight and dieback on many other species of tree and woody plants. First reported in California in 1995, *Phytophthora ramorum* has devastated the coastal California black oak, tanoak, and coast live oak populations and has spread to fourteen coastal counties in California and one in Oregon. Through the selling and shipping of infected nursery stock from the West Coast, *Phytophthora ramorum* has been detected in nurseries throughout the Southeastern United States. Streams outside of nurseries in Alabama, Mississippi, Florida, Georgia, and North Carolina have tested positive for *Phytophthora ramorum*. Spread of the disease has been somewhat slowed through the use of quarantine actions and the eradication of infected nursery stock.

However, the pathogen persists in infected nurseries and is leaving these nurseries in discharge water. As many of the Eastern United States woody plants can act as sources of inoculum, there is a plausible pathway for *Phytophthora ramorum* to enter the local ecosystems and remain a long-term threat. Symptoms of infection by *Phytophthora ramorum* can look very similar to other Eastern United States diseases, such as Oak wilt, Oak decline, Red oak borer and other *Phytophthora* species. Laboratory testing is required to provide confirmation of the pathogen's identity.

Figure 13. Student preparing SOD samples for incubation

The Forest Health Cooperative, in association with the U.S. Forest Service, has conducted routine baiting and testing of select nurseries in Alabama and Mississippi for several years, and has found Positive identifications every year except for that of Spring 2024 – Spring 2025, all of which came back Negative. However, the results for the sampling conducted in May 2025 are still pending and could produce a Positive result.

Diagnostics Clinic- The Forest Health Cooperative has seen a variety of issues this year as several opportunities for diagnosis arose from field consultations and sample submissions. The Cooperative saw mostly Brown Spot Needle Blight, but there has been a rise in Laurel Wilt submissions this past year.

For any questions regarding the Diagnostics Clinic or any specific forest health concerns, please contact us.

In the year 2025, the Forest Health Dynamics Lab diagnosed:

- Pine Decline
- Ips Beetle Damage
- Pitch Canker
- Laurel Wilt on Sassafras
- Red Bay Ambrosia Beetle Damage
- Brown Spot Needle Blight
- Leaf Spot on Hickory
- Hypoxylon Canker
- Herbicide Damage of Longleaf Pine

Featured Pests

Redbay Ambrosia Beetle, *Xyleborus glabratus* – Drew Metzler

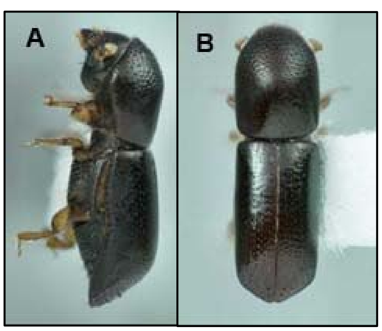

Figure 14. Redbay Ambrosia Beetle, side and top-down view

Alabama has been home to some key forest health issues in recent years, most notably pathogens and insects affecting pine production such as brown spot needle blight and southern pine beetles. While these pine pests certainly receive the limelight, numerous other native and non-native pathogens and insects play roles in the decline of other tree types. A particular insect and its associated disease that has quietly spread through the southeast and within Alabama has been the Redbay ambrosia beetle and its fungal associate *Raffaelea lauricola*, better known as Laurel wilt disease. Laurel wilt disease is a fast-moving, lethal vascular disease boosted by the natural immune response of trees within the Laurel family that rapidly occludes xylem tissues, leading to the wilt symptoms that we recognize.

This insect was first discovered in Port Wentworth, Georgia in 2002. As both the names of the beetle and pathogen imply, members of the Laurel family or *Lauraceae* are targeted by the beetle. Laurel wilt started out with a bang in the United States since the Redbay tree was once a dominant species along the Gulf and Atlantic coasts. The damage along these localities was obvious and severe, with the disease spreading to nearly all the redbay tree range within a decade or less.

Figure 15. Staining present under the bark of sassafras due to a Laurel wilt infection

While redbays were the first and most prominent member of the *Lauraceae* family to be affected by the Redbay ambrosia beetle and Laurel Wilt, there are other members of the family that are threatened by the continued spread of Laurel wilt. One of these species happens to be an endangered member of the Laurel family, *Lindera melissifolia*, commonly known as pondberry or southern spicebush and only occurs within a couple of known localities in southeast Alabama. However, the most widespread member of the family are Sassafras trees, occupying nearly all of North America east of the Great Plains as far north as Maine. The propensity of the redbay ambrosia beetle to readily attack healthy sassafras trees has become the reason for the continued spread of laurel wilt disease far inland from its initial detections along the coast.

Since the first confirmation of laurel wilt in Alabama in Mobile and Marengo counties in 2011, the disease spread through multiple southwest Alabama counties over a decade and then reports began to slow down and become quiet. This downturn in activity may largely be due in part to the cessation of formal surveys for both the insect and the disease in 2020.

In 2025, a flurry of laurel wilt detections in central Alabama brought the disease back to attention.

During the summer of 2025 during a routine technical assistance regarding longleaf pine management on a property in Pike County, a severe case of laurel wilt disease was recognized in a larger stand of sassafras. Stem samples from these affected trees were sent to the Forest Health Dynamics Laboratory at Auburn University to isolate the fungi responsible for the disease. As expected, these samples successfully returned a positive identification of *Raffaelea lauricola*, marking the first new discovery of the disease in two years. Unbeknownst at the time, this Pike County discovery would just be the beginning of new discoveries of the disease in other central and southeast Alabama counties during the year.

2025 ultimately yielded the most confirmations of the disease in a single year (5) since the initial discovery in 2011. These counties were Pike, Bullock, Autauga, Talladega, and Tallapoosa County. All but one of the new laurel wilt confirmations were observed by Alabama Forestry Commission staff coincidently while conducting other activities. The newest confirmation was actually observed by staff while responding to a wildfire in Tallapoosa County. In all five cases, stem samples were taken and submitted to the forest health dynamics lab for confirmation. All five newly confirmed counties are largely fragmented from most of the previously known laurel wilt range, meaning the likelihood for presence of laurel wilt is very high for the counties in between and surrounding them. The chances of further laurel wilt confirmations in 2026 is certainly very high and may necessitate the need for formal roadside surveys to look for pockets of wilting sassafras.

Figure 16. Sampling of bark from an infected Sassafras tree in Pike County

Beetle photo reference:
https://www.forestry.alabama.gov/Pages/Informational/Insects/Redbay_Ambrosia.aspx

Miscellaneous

A field visit with Dr. Brett Hurley-

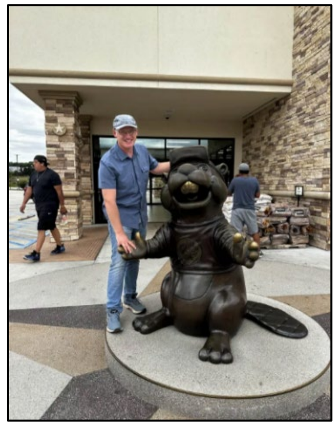

Figure 17. Dr. Brett Hurley posing with Bucky the Beaver

In September, Dr. Brett Hurley, a researcher and professor from the Forestry and Agricultural Biotechnology Institute (FABI) at the University of Pretoria visited Auburn University during his time over in the United States. During this trip, Dr. Hurley accompanied the lab on a field visit to Pike County, where Laurel Wilt on Sassafras was observed and sampled. Ray Metzler accompanied the lab and demonstrated the tools and techniques for scoping gopher tortoise burrows. Metzler is a part-time wildlife biologist with the Alabama Forestry Commission, and their resident Threatened and Endangered Species specialist. His presence allowed Dr. Hurley and some students the opportunity to see gopher tortoises in their own homes. Metzler also emphasized the recovery of longleaf pine habitats, utilizing the surrounding land to demonstrate the different strategies and effectiveness of land management. The trip allowed us to see laurel wilt, gopher tortoises, and a recovering longleaf pine habitat.

Figure 18. Ray Metzler demonstrating burrow scoping

School Visits- The Forest Health Dynamics lab hosted several middle and high school tours throughout the year, allowing the students to engage with undergraduate and graduate lab students. Tours included informational discussions about what the FHDL studies as well as general forest health concerns, including insect pest and pathogen examples. The FHDL also participated in the Beauregard Elementary Field Day, in which two lab members had the opportunity to interact with the second-grade class and teach them about forest health, showing the children how to identify signs of insects and disease in the forests. We hope to make this event a yearly tradition, as our students take great pride in sharing what they know and enjoy having a chance to give back to the community. School visits and tabling events allow the students to gain experience in teaching and to become familiar with the different aspects of the lab. We hope to have more opportunities for visits and tours in the future!

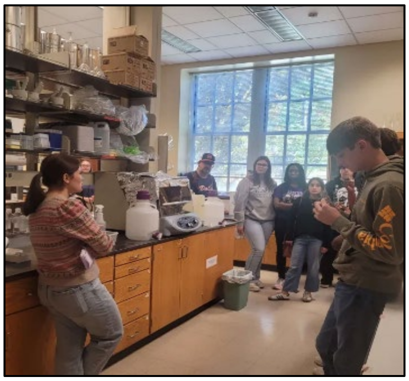

Figure 19. Undergraduate student teaching highschoolers about forest health

Figure 20. Emmanuel Nyarko teaching Forest Health principles to the 2025 Beauregard 2nd grade class

Schools:

TALONS Academic Showcase – 3/7

TALONS Academic Showcase – 3/24

Benjamin Russell High School – 3/28

Beauregard Elementary Field Day – 4/3

Tiger Takeoff – 7/18

Destination STEM Expo – 10/15

Central High School of Clay County – 11/5

Destination STEM Expo – 11/12

New Brockton High School – 12/2

Figure 21. FHDL students riding in the back of a work truck

Call Us!

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Elizabeth Bowersock	**334.844.1012**
Patricia Gordon	**334.844.1538**
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Accolades

Jaden King – progressed to PhD Candidate status

- Graduate Research and Travel Fellowship, College of Forestry, Wildlife and Environment
- 1st Place for Oral Presentation in Science, Technology, Engineering, and Mathematics at the Auburn University Graduate Student Research Symposium
- Graduate Research and Travel Fellowship, Auburn University
- One of four presenters in the 2025 I.E. Melhus Graduate Student Symposium

Gabriel Silva – progressed to PhD Candidate status

- **Publication**: Silva, G., Folorunso, T., Paez, A.M., Lamka, G.F., Singh, S., King, J., Henderson, L., Persyn, M., Mwema, T., Lindow, T., Amiri, N., Eckhardt, L., Narine, L., and Willoughby, J. (2026) Biology, detection, and management of *Lecanosticta acicola* causing brown spot needle blight in pine forests. For. Path. http://dx.doi.org/10.1111/efp.70061

Temitope Folorunso – progressed to PhD Candidate status

- James Floyd Goggans Endowed Fellowship in Forest Biology
- Time and Kathy Pollard Scholarship Award
- John Deere Graduate Fellowship
- **Publication**: Folorunso**, T.R., Silva, G., Giron, M.E., Lindow, T., Persyn, M., Eckhardt, L.G., and Willoughby, J. (2025) Optimized protocol for culturing and extracting DNA from fungal isolates associated with brown spot needle blight. PLOS ONE https://doi.org/10.1371/journal.pone.0337218
- **Publication**: Folorunso**, T.R., Sundaram, M., Potnis, N., Stevison, L., Eckhardt, L.G., and Willoughby, J. (2025) Plant pathogen disease severity is shaped by genetic factors and pathogen life cycle strategies across many pathogen-host systems. J. Plant Path. 10.1007/s42161-025-02011-z

Swati Singh – progressed to PhD Candidate status

- **Publication**: Singh**, S., Narine, L.L., and Eckhardt, L.G. (2025) UAV-multispectral imaging and machine learning for brown spot needle blight severity assessment in southeastern U.S. pine forests. Environ. Res. Commun. 7 091011, DOI 10.1088/2515-7620/ae06ftb
- **Publication**: Singh**, S., Narine, L.L., Eckhardt, L.G. and Willoughby, J. (2025) Remote sensing-based detection of brown spot needle blight: a comprehensive review and future directions. PeerJ 13:e19407 https://doi.org/10.7717/peerj.19407

Forest Health Dynamics Lab Graduates:

- Emmanuel Nyarko
- Gracey Goldsby
- Alexandra Forema

Thank you for your continued support!